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Technical Memorandum

To:	Mark Conan
From:	Paul Ecker, LHG and Leonard Farr, LG
Date:	9/25/2012
Subject:	Site Characterization Status Report Plaid Pantries Store #23 5210 East Fourth Plain Boulevard Vancouver, Washington Ecology Voluntary Cleanup Program File #SW1166 EES Project #E-839

EES Environmental Consulting, Inc. (EES) is providing this status report regarding additional characterization activities conducted in May and July 2012 at the former Plaid Pantries Inc. (Plaid) Store #23 site located at 5210 East Fourth Plain Boulevard (Figure 1). Site activities were conducted in accordance with the Work Plan for Supplemental Site Characterization, dated December 6, 2011, as approved by Plaid and the Washington Department of Ecology (Ecology). The purpose of the characterization is to satisfy Ecology's administrative requirements for site closure.

BACKGROUND

The subject site is currently occupied by a commercial strip mall and paved parking lot area located along a commercial thoroughfare in Vancouver, Washington (Figure 2). The subject property is owned by M & P Properties. Plaid was a tenant and operated the site as a retail gasoline station and convenience store between 1982 and early 2002. The Underground Storage Tank (UST) Site Number Plaid registered with Ecology was 11397. During Plaid's operations, only gasoline is known to have been stored and dispensed at the site. Leaded gasoline may have been dispensed at the site during phase-out of that product in the 1980s. EES understands that Plaid did not store or dispense other hydrocarbons such as diesel fuel, bulk motor oil, or bulk solvents at any time during its site operations.

Prior to Plaid's operations, the site was occupied continuously as a gasoline service station since the early 1960s. The nature and volume of fuel and other products used and stored at the site by others have not been determined by EES, although the facility appears to have been operated as a Chevron service station during much or all of its operations prior to Plaid. The pre-Plaid service station building was located near the southwestern margin of the existing site building and was demolished during site redevelopment in the early 1980s. Current and historical site infrastructure is illustrated on Figure 2.

ECOLOGY REQUEST FOR FURTHER ACTION

In an Opinion Letter dated October 31, 2011 (Attachment A), Ecology indicated that further site characterization and administrative actions were necessary to support Plaid's request for a No Further Action (NFA) determination. The supplemental data gathering and clarification tasks as specified will enable Ecology to determine whether interim remedial actions undertaken by Plaid to date have resulted in adequate cleanup of the site. The interim actions completed to date were intended to result in a permanent solution and to achieve cleanup requirements as defined under the Model Toxics Control Act (MTCA).

SUPPLEMENTAL SITE CHARACTERIZATION (2012)

Beginning in April 2012, EES conducted the following activities as required by the site work plan. Because of uncertainties regarding specific closure criteria, Plaid and EES will coordinate site characterization findings with Ecology and will prepare separate work plan(s) for additional work, if required, after Ecology's review of the site characterization activities described below.

FIELD PREPARATION TASKS

As required by the work plan, EES performed the following specific tasks prior to conducting field activities:

- Updated the current Health and Safety Plan to guide field safety protocols, in accordance with rules established by the Occupational Safety and Health Administration and the Washington Industrial Safety and Health Act.
- Reviewed site plans and as-built maps provided to EES by Plaid.
- Requested utility identification through the public Utility Notification Service, and contracted with an experienced local firm in an effort to locate and map existing utilities within the work areas.

PHYSICAL EXAMINATION OF GEOPHYSICAL ANOMALIES

In accordance with the work plan, four-inch diameter air-knife excavation techniques were used at specific locations where a prior (2005) geophysical survey had identified two subsurface anomalies that Ecology suspected may represent USTs from pre-Plaid site operations (Figures 2 and 3). A third small anomaly was also evaluated as summarized below.

- Anomaly A (borings VAC-1, VAC-2, and VAC-3). The total depth of each of these three borings was between 5 and 5.4 feet. A small piece of metal pipe was found at 1.5 feet depth, and a small piece of cast iron pipe and several pieces of broken concrete debris were found at a depth of 1 foot in boring VAC-1. No debris was found in boring VAC-2. A large broken piece of concrete was found in boring VAC-3 at a depth of 4 feet. Direct observation of air-knife borings at Anomaly A confirmed that the anomaly was attributed to shallow piping and debris and not caused by the presence of a UST. A private locator was called to the site in an effort to trace these pipes. The locator confirmed that these were relic features not currently in use and each not greater than approximatyely 10-feet in length. Soils surrounding the piping were observed and field-screened using a photo-ionization detector (PID). No indication of fuel contamination was identified based on these field observations.
- Anomaly B (borings VAC-4, VAC-5, and VAC-6). The total depth of each of the three borings was five feet. A 4 inch diameter metal pipe was found at a depth of 1 foot bgs in VAC-4 and at a depth of 1.1 feet bgs in VAC-6. No piping was found in VAC-5. The pipe encountered in VAC-4 and VAC-6 is aligned with a cleanout plug observed at the Plaid building and a storm water catch basin on East 4th Plain Boulevard. No other pipes or debris were found in these borings. Air-knife borings at Anomaly B

confirmed that the anomaly was attributed to shallow drainage piping and not caused by the presence of a UST. Soils surrounding the piping were observed and field-screened using a PID. No indication of fuel contamination was identified based on these field observations.

- Although Ecology did not express concern regarding Anomaly C, three borings (VAC-7A, VAC-7B, and VAC-7C) were advanced approximately 3 feet apart from each other as requested by the property owner's representative. A concrete surface was envountered 1.5 feet bgs in all three borings, which the air knife could not penetrate. The location of this concrete surface is consistent with a remnant building foundation or other historical structural feature. Soils above this feature were observed and field-screened using a PID. No indication of fuel contamination was identified based on these field observations.

Characterization of the geophysical anomalies identified no evidence of UST features, nor were fuel impacts identified or suspected based on field observations. This supplemental site characterization task requested by Ecology has been completed, and no further work to resolve this issue appears warranted.

CONFIRMATION SOIL SAMPLING

Confirmation soil sampling was conducted using direct-push drilling techniques at three locations where elevated gasoline and/or BTEX compounds historically were detected in soil, as specifically requested by Ecology (Figure 3):

- Boring location B-22 adjacent to Dames & Moore/Pemco soil boring B-7/P2, near the southwest property corner;
- Boring location B-23 adjacent to PNG soil boring B-6, near the southwest corner of the former Plaid UST pit; and
- Boring location B-24 adjacent to PNG soil boring B-13, near the west end of the former southern fuel dispenser island associated with pre-Plaid operations.

As specified in the work plan, borings B-22 and B-24 were advanced to 15 feet bgs and boring B-23 was advanced to 10 feet bgs. Copies of boring logs are provided as Attachment B. Soil cores were field screened for the potential presence of contaminants. Since no indication of contamination was detected through field screening, one soil sample from the base of each boring was submitted for laboratory analysis for gasoline range hydrocarbons by Method NWTPH-Gx, volatile organic compounds (VOCs) by EPA Method 8260B, and total lead by EPA Method 6020.

No gasoline range hydrocarbons or VOCs were detected in any of the soil samples. Total lead concentrations ranged from 4.8 to 6.9 milligrams per kilogram (mg/kg) (Table 1). The lead concentrations detected in soil are consistent with the typical background concentration for lead in soil, and are not indicative of leaded fuel release(s). Laboratory analytical reports are provided in Appendix C.

Characterization of these three locations identified no evidence of dectectable gasoline or related lead or volatile constituent impacts. This supplemental site characterization task requested by Ecology has been completed, and no further work to resolve this issue appears warranted.

WELLHEAD SURVEYING

In accordance with Ecology's request, Plaid's seven-well network was surveyed by Centerline Concepts Land Surveying, Inc., using a licensed Professional Land Surveyor. The survey verified well locations and top of casing elevations relative to Mean Sea Level as referenced to a local USGS benchmark. A copy of Centerline's survey map is provided as Attachment D. Wellhead elevations are incorporated into the groundwater elevation data summary table (Table 2).

CONFIRMATION GROUNDWATER MONITORING

As stated in the work plan, confirmation groundwater samples are specified for collection from down-gradient monitoring wells MW-6 and MW-7 only if depth to water in these wells exceeds 14 feet during quarterly monitoring over a one-year period.

During both the April and July 2012 site activities, depth to groundwater in all site wells was shalower than 14 feet bgs and ranged from 10.92 to 13.00 feet bgs in MW-6 and MW-7 specifically (Table 2). Therefore, no confirmation groundwater samples were collected during these two quarterly events. Water table maps for April and July 2012 are provided as Figures 4 and 5 respectively, and indicate that groundwater flow is generally to the west/southwest (consistent with prior observations at the site). Results of prior groundwater analytical testing are provided in Table 3 and illustrated on Figure 6.

Characterization of water quality in downgradient monitoring wells MW-6 and MW-7 has not been necessary during 2012 since water levels have not been observed below 14 feet in depth. This supplemental site characterization task requested by Ecology is underway with two of four quarterly monitoring events completed to date. Additional monitoring events are planned for October 2012 and January 2013. Each monitoring event will include water level measurements, and sampling of groundwater in monitoring wells MW-6 and MW-7 if water levels are below 14 feet in depth.

SUMMARY AND CONCLUSIONS

EES conducted additional characterization activities at the former Plaid Store #23 site located at 5210 East Fourth Plain Boulevard. Activities included confirmation of three geophysical anomalies using air knife techniques and physical observation, confirmation soil sampling in three borings using direct-push drilling, wellhead surveying, and groundwater level measurements.

- Previously identified geophysical anomalies were determined to have been caused by remnant pipe and debris features and a storm sewer line based on direct observation during “air-knife” excavation in these specific locations. A third anomaly was determined to be a buried concrete surface that appears to be a remnant footing or other structural component associated with historical site construction. No evidence of fuel impacts or fuel-related infrastructure was observed at any of the three anomaly locations. No further characterization work is necessary to address this issue.
- Soil samples collected from three additional borings were observed and submitted for laboratory analyses. Based on this work, no evidence of gasoline-related contaminants was encountered within the unsaturated zone, extending to depths of up to 15 feet at these locations. No further characterization work is necessary to address this issue.
- Groundwater level measurements in both April and July 2012 determined that groundwater levels were shallower than 14 feet in all site monitoring wells. In accordance with the work plan therefore, groundwater samples were not collected for analysis. Additional seasonal monitoring events are scheduled for October 2012 and January 2013 to address Ecology’s request for characterization of this issue.

ATTACHMENTS

TABLES

Table 1: Soil Analytical Results – Gasoline and Related Constituents
Table 2: Groundwater Elevation Data
Table 3: Groundwater Analytical Results Summary - Gasoline and Related Constituents

FIGURES

Figure 1: Site Location Map
Figure 2: Historical Site Features and Prior Sample Locations
Figure 3: Supplemental Soil Sampling Locations
Figure 4: Water Table Elevations and Flow Direction (4/19/2012)
Figure 5: Water Table Elevations and Flow Direction (7/20/2012)
Figure 6: Gasoline and Benzene in Groundwater (2010)

ATTACHMENTS

Attachment A: Ecology Opinion Letter
Attachment B: Boring Logs
Attachment C: Laboratory Analytical Reports
Attachment D: Centerline Survey Map

Tables

TABLE 1

Soil Analytical Results - Gasoline and Related Constituents (mg/kg)

Former Plaid Pantry #23, Vancouver, Washington

Location	Date	Depth[a]	Field Headspace[b]	Gasoline	Benzene	Toluene	Ethylbenzene	Xylenes	PCE	MTBE	Naphthalene	EDB	EDC	1,2,4-TMB	1,3,5-TMB	Lead
Temporary Borings																
PEMCO Offsite Investigation (1991)																
B-5/P4 (PEMCO)	1992	10-11	NA	-	ND	0.003	ND	0.002	-	-	-	-	-	-	-	-
B-5/P4 (PEMCO)	1992	15-16	NA	-	ND	0.003	ND	ND	-	-	-	-	-	-	-	-
B-6/P3 (PEMCO)	1992	10-11	NA	-	ND	0.006	0.002	0.011	-	-	-	-	-	-	-	-
B-6/P3 (PEMCO)	1992	15-16	NA	-	ND	ND	ND	ND	-	-	-	-	-	-	-	-
B-7/P2 (PEMCO)	1992	10-11	NA	-	ND	0.005	ND	0.006	-	-	-	-	-	-	-	-
B-7/P2 (PEMCO)	1992	15-16	NA	-	1.9	2.8	0.17	1.0	-	-	-	-	-	-	-	-
PNG Site Check (1998)																
B-1	02/19/1998	12.0	NA	20 U[h]	-	-	-	-	-	-	-	-	-	-	-	-
B-2	02/19/1998	12.0	NA	20 U[h]	-	-	-	-	-	-	-	-	-	-	-	-
B-3	02/19/1998	12.0	NA	20 U[h]	-	-	-	-	-	-	-	-	-	-	-	-
B-4	02/19/1998	13.0	NA	20 U[h]	-	-	-	-	-	-	-	-	-	-	-	-
B-5	02/19/1998	13.0	NA	20 U[h]	-	-	-	-	-	-	-	-	-	-	-	-
B-6	02/19/1998	10.0	NA	4,400	3.0	170	75	430	-	-	-	-	-	-	-	-
Stockpile	02/19/1998	Composite	NA	20 U	-	-	-	-	-	-	-	-	-	-	-	20 U
PNG Well Installation (2002)																
MW-1	01/29/2002	15.0	NA	236	0.20 U	0.20 U	0.20 U	0.30	0.10 U	0.10 U	0.21	0.10 U	0.10 U	-	-	-
MW-2	01/29/2002	13.0	NA	2.0 U	0.05 U	0.05 U	0.05 U	0.05 U	-	-	-	-	-	-	-	-
MW-3	01/29/2002	13.5	NA	2.0 U	0.05 U	0.05 U	0.05 U	0.05 U	-	-	-	-	-	-	-	-
MW-4	01/29/2002	13.0	NA	2.6	0.05 U	0.05 U	0.05 U	0.05 U	0.10 U	0.10 U	0.20 U	0.10 U	0.10 U	-	-	-
MW-5	01/29/2002	13.0	NA	2.0 U	0.05 U	0.05 U	0.05 U	0.05 U	-	-	-	-	-	-	-	-
MW-6	01/29/2002	12.0	NA	2.0 U	0.05 U	0.05 U	0.05 U	0.05 U	-	-	-	-	-	-	-	-
PNG Site Investigation (2002)																
B-7	01/21/2002	14.0	NA	2.0 U	0.05 U	0.05 U	0.05 U	0.05 U	-	-	-	-	-	-	-	-
B-8	01/21/2002	14.0	NA	2.0 U	0.05 U	0.05 U	0.05 U	0.05 U	-	-	-	-	-	-	-	-
B-9	01/21/2002	14.0	NA	2.0 U	0.05 U	0.05 U	0.05 U	0.05 U	-	-	-	-	-	-	-	-
B-11	01/21/2002	14.0	NA	2.0 U	0.05 U	0.05 U	0.05 U	0.05 U	-	-	-	-	-	-	-	-
B-12	01/21/2002	14.0	NA	2.0 U	0.05 U	0.05 U	0.05 U	0.05 U	0.10 U	0.10 U	0.20 U	0.10 U	0.10 U	-	-	-
PNG Monitoring Well Installation (2005)																
MW7/5	03/09/2005	5.0	NA	1.0 U	-	-	-	-	-	-	-	-	-	-	-	-
MW7/10	03/09/2005	10.0	NA	1.0 U	-	-	-	-	-	-	-	-	-	-	-	-
MW7/12.5	03/09/2005	12.5	NA	1.0 U	0.03 U	0.05 U	0.05 U	1.5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	-
DB (IDW soil)	03/09/2005	Composite	NA	20 U[h]	0.03 U	0.05 U	0.05 U	1.5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	-

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Location	Date	Depth[a]	Field Headspace[b]	Gasoline	Benzene	Toluene	Ethylbenzene	Xylenes	PCE	MTBE	Naphthalene	EDB	EDC	1,2,4-TMB	1,3,5-TMB	Lead
PNG Site Investigation (2005)																
B13/5	03/09/2005	5.0	NA	1.0 U	-	-	-	-	-	-	-	-	-	-	-	-
B13/12.5	03/09/2005	12.5	NA	1.0 U	0.03 U	0.05 U	0.05 U	1.5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	-
B13/15	03/09/2005	15.0	NA	1,700	-	-	-	-	-	-	-	-	-	-	-	-
B14/12.5	03/09/2005	12.5	NA	1.0 U	0.03 U	0.05 U	0.05 U	1.5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	-
B14/15	03/09/2005	15.0	NA	2.0	-	-	-	-	-	-	-	-	-	-	-	-
B15/5	03/09/2005	5.0	NA	1.0 U	-	-	-	-	-	-	-	-	-	-	-	-
B15/12.5	03/09/2005	12.5	NA	1.0 U	0.03 U	0.05 U	0.05 U	1.5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	-
B15/18	03/09/2005	18.0	NA	1.0 U	-	-	-	-	-	-	-	-	-	-	-	-
B16/12.5	03/09/2005	12.5	NA	1.0 U	0.03 U	0.05 U	0.05 U	1.5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	-
B16/18	03/09/2005	18.0	NA	1.0 U	-	-	-	-	-	-	-	-	-	-	-	-
B20/5	03/09/2005	5.0	NA	1.0 U	-	-	-	-	-	-	-	-	-	-	-	-
B20/13.5	03/09/2005	13.5	NA	1.0 U	0.03 U	0.05 U	0.05 U	1.5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	-
B21/5	03/09/2005	5.0	NA	1.0 U	-	-	-	-	-	-	-	-	-	-	-	-
B21/13.5	03/09/2005	13.5	NA	1.0 U	0.03 U	0.05 U	0.05 U	1.5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	-
UST Decomissioning Confirmatory Samples																
Final Sidewall Samples																
North Wall/11	10/05/2006	11.0	5.6[c]	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	0.05 U[g]	0.05 U	0.05 U	0.05 U	-
North Wall/12	10/05/2006	12.0	1 U	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	-	-	-	-	-
South Wall/12	10/04/2006	12.0	1 U	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	-	-	-	-	-
East Wall/12	10/04/2006	12.0	1 U	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	-	-	-	-	-
West Wall/12.5	10/04/2006	12.5	1 U	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	-	-	-	-	-
West Wall/13	10/06/2006	13.0	1 U	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	-	-	-	-	-
West Wall/14	10/06/2006	14.0	1 U[c]	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	-	-	-	-	-
NE Corner/8	10/05/2006	8.0	12.2[c]	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	-	-	-	-	-
NE Corner/12	10/05/2006	12.0	1 U	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	-	-	-	-	-
SW Corner/12	10/06/2006	12.0	1 U	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	-	-	-	-	-
NW Corner/14	10/06/2006	14.0	1 U	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	-	-	-	-	-
Final Floor Samples																
Floor-T1/13.5	10/05/2006	13.5	1 U	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	-	-	-	-	-
Floor-T2/13.5	10/05/2006	13.5	1 U	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	0.05 U[g]	0.05 U	0.05 U	0.05 U	-
Floor-T3/14	10/06/2006	14.0	1 U[c]	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	-	-	-	-	-
Final Pump Island Samples																
Pipe/1.5	10/04/2006	1.5	1 U	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	-	-	-	-	-
PI East/3	10/04/2006	3.0	1 U	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	-	-	-	-	-
PI West/3	10/04/2006	3.0	1 U	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	-	-	-	-	-
Excavated PCS Samples																
T2-T3/10.5	10/03/2006	10.5	576[c]	140	0.02 U	0.03	0.14	0.78	-	0.05 U	1.3	0.05 U[g]	0.05 U	4.0	0.8	5.42
North Wall/11	10/04/2006	11.0	131[c]	4	0.02 U	0.02 U	0.02 U	0.06 U	-	0.1 U	-	-	-	-	-	-
North Wall/12.5	10/04/2006	12.5	1 U	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	-	-	-	-	-

TABLE 1

Soil Analytical Results - Gasoline and Related Constituents (mg/kg)

Former Plaid Pantry #23, Vancouver, Washington

Location	Date	Depth[a]	Field Headspace[b]	Gasoline	Benzene	Toluene	Ethylbenzene	Xylenes	PCE	MTBE	Naphthalene	EDB	EDC	1,2,4-TMB	1,3,5-TMB	Lead
2012 PNG Samples																
B22-15/16	04/19/2012	15-16	NA	2 U	0.02 U	0.02 U	0.02 U	0.06 U	0.025 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	4.8
B23-15	04/19/2012	15.0	NA	2 U	0.02 U	0.02 U	0.02 U	0.06 U	0.025 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	6.9
B24-10	04/19/2012	10.0	NA	2 U	0.02 U	0.02 U	0.02 U	0.06 U	0.025 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	4.8
Clean Stockpile Sample (1 cubic yard re-used fill)																
Overburden Pile			1 U	2 U	0.02 U	0.02 U	0.02 U	0.06 U	-	0.05 U	0.05 U	-	-	-	-	-
MTCA Method A[d]			**NA**	**30/100[e]**	**0.03**	**7**	**6**	**9**	**0.05**	**0.1**	**5**	**0.005[f]**	**NA**	**NA**	**NA**	**250**

Notes:

[a] Depth indicates feet below pavement surface

[b] Field headspace screening for volatile organic compounds using GasTech Explosimeter Model GT303, values in parts per million vapor

[c] Organic odor and gray discoloration were observed in the field

[d] Model Toxics Control Act Cleanup Amendments, Method A Soil Cleanup Levels For Unrestricted Land Uses (WDOE, October 12, 2007)

[e] Per MTCA, cleanup values for gasoline are either (1) a default value of 30 mg/Kg where benzene is $\leq$ 0.03 mg/Kg, or (2) a value of 100 mg/Kg where benzene is not detected and the sum of ethylbenzene + toluene + xylenes is < 1% of the gasoline concentration

[f] EDB cleanup level for soil is based on groundwater protection where groundwater is used for drinking water

[g] Compound was not detected but the Method Reporting Limit exceeds the MTCA standard

[h] Gasoline by Method NWTPH_HCID

mg/Kg = Milligrams per kilogram

Gasoline by Method NWTPH-Gx

BTEX Volatile Compounds by EPA Method 8021B; all other Volatile Compounds by EPA Method 8260B

PCE = Tetrachloroethene

MTBE = Methyl tert-butyl ether

EDB = 1,2-Dibromoethane

EDC = 1,2-Dichloroethane

1,2,4-TMB = 1,2,4-Trimethylbenzene

1,3,5-TMB = 1,3,5-Trimethylbenzene

U = Undetected at method detection limit shown

- = Not analyzed for this parameter

NA = Not applicable

ND = Not detected above laboratory reporting limits

TABLE 2

Groundwater Elevation Data

Former Plaid Pantry #23, Vancouver, Washington

Well Identification	TOC Elevation (feet) [a]	Date Measured	Depth to Water (feet below TOC)	Groundwater Elevation [a] (feet)
MW-1	180.00	01/29/2002	12.70	167.30
		03/10/2005	15.31	164.69
		03/14/2005	15.35	164.65
		10/10/2006	14.71	165.29
		01/30/2007	11.57	168.43
		04/30/2007	12.17	167.83
		07/23/2007	13.76	166.24
		10/29/2007	14.84	165.16
		01/09/2008	12.79	167.21
		04/14/2008	12.54	167.46
		09/05/2008	14.43	165.57
		12/17/2008	15.07	164.93
		03/11/2009	14.31	165.69
		06/09/2009	14.17	165.83
		09/10/2009	15.26	164.74
		12/01/2009	15.11	164.89
		03/01/2010	13.18	166.82
		06/07/2010	12.64	167.36
		09/13/2010	13.99	166.01
		12/01/2010	13.26	166.74
		04/19/2012	11.46	168.54
		07/20/2012	12.73	167.27
MW-2	180.47	01/29/2002	12.99	167.48
		03/10/2005	15.62	164.85
		03/14/2005	15.66	164.81
		10/10/2006	14.98	165.49
		01/30/2007	11.81	168.66
		04/30/2007	12.41	168.06
		07/23/2007	14.02	166.45
		10/29/2007	15.16	165.31
		01/09/2008	13.12	167.35
		04/14/2008	12.78	167.69
		09/05/2008	14.66	165.81
		12/17/2008	15.32	165.15
		03/11/2009	14.62	165.85
		06/09/2009	14.46	166.01
		09/10/2009	15.59	164.88
		12/01/2009	15.44	165.03
		03/01/2010	13.47	167.00
		06/07/2010	12.92	167.55

TABLE 2

Groundwater Elevation Data

Former Plaid Pantry #23, Vancouver, Washington

Well Identification	TOC Elevation (feet) [a]	Date Measured	Depth to Water (feet below TOC)	Groundwater Elevation [a] (feet)
MW-2 (cont'd)		09/13/2010	14.26	166.21
		12/01/2010	13.57	166.90
		04/19/2012	11.70	168.77
		07/20/2012	12.99	167.48
MW-3	179.49	01/29/2002	12.00	167.49
		03/10/2005	14.67	164.82
		03/14/2005	14.73	164.76
		10/10/2006	14.06	165.43
		01/30/2007	10.87	168.62
		04/30/2007	11.49	168.00
		07/23/2007	13.08	166.41
		10/29/2007	14.22	165.27
		01/09/2008	12.09	167.40
		04/14/2008	11.84	167.65
		09/05/2008	13.80	165.69
		12/17/2008	14.45	165.04
		03/11/2009	13.61	165.88
		06/09/2009	13.47	166.02
		09/10/2009	14.64	164.85
		12/01/2009	14.48	165.01
		03/01/2010	12.46	167.03
		06/07/2010	11.95	167.54
		09/13/2010	13.29	166.20
		12/01/2010	12.54	166.95
		04/19/2012	10.78	168.71
		07/20/2012	12.05	167.44
MW-4	180.57	01/29/2002	13.47	167.10
		03/10/2005	15.95	164.62
		03/14/2005	15.99	164.58
		10/10/2006	15.38	165.19
		01/30/2007	12.22	168.35
		04/30/2007	12.82	167.75
		07/23/2007	14.43	166.14
		10/29/2007	15.55	165.02
		01/09/2008	13.36	167.21
		04/14/2008	13.15	167.42
		09/05/2008	15.15	165.42
		12/17/2008	15.75	164.82
		03/11/2009	14.92	165.65
		06/09/2009	14.80	165.77

TABLE 2

Groundwater Elevation Data

Former Plaid Pantry #23, Vancouver, Washington

Well Identification	TOC Elevation (feet) [a]	Date Measured	Depth to Water (feet below TOC)	Groundwater Elevation [a] (feet)
MW-4 (cont'd)		09/10/2009	15.91	164.66
		12/01/2009	15.71	164.86
		03/01/2010	13.79	166.78
		06/07/2010	13.22	167.35
		09/13/2010	14.61	165.96
		12/01/2010	13.86	166.71
		04/19/2012	12.12	168.45
		07/20/2012	13.38	167.19
MW-5	180.50	01/29/2002	13.51	166.99
		03/10/2005	NA	NA
		03/14/2005	16.06	164.44
		10/10/2006	NA	NA
		01/30/2007	12.42	168.08
		04/30/2007	13.00	167.50
		07/23/2007	14.54	165.96
		10/29/2007	15.58	164.92
		01/09/2008	13.58	166.92
		04/14/2008	13.36	167.14
		09/05/2008	15.23	165.27
		12/17/2008	15.82	164.68
		03/11/2009	15.09	165.41
		06/09/2009	14.95	165.55
		09/10/2009	15.98	164.52
		12/01/2009	15.79	164.71
		03/01/2010	14.00	166.50
		06/07/2010	13.42	167.08
		09/13/2010	14.77	165.73
		12/01/2010	14.01	166.49
		04/19/2012	12.29	168.21
		07/20/2012	13.56	166.94
MW-6	179.72	01/29/2002	12.88	166.84
		03/10/2005	15.51	164.21
		03/14/2005	15.54	164.18
		10/10/2006	14.92	164.80
		01/30/2007	11.84	167.88
		04/30/2007	12.45	167.27
		07/23/2007	13.99	165.73
		10/29/2007	15.01	164.71
		01/09/2008	12.92	166.80
		04/14/2008	12.81	166.91

TABLE 2

Groundwater Elevation Data

Former Plaid Pantry #23, Vancouver, Washington

Well Identification	TOC Elevation (feet) [a]	Date Measured	Depth to Water (feet below TOC)	Groundwater Elevation [a] (feet)
MW-6 (cont'd)		09/05/2008	14.72	165.00
		12/17/2008	15.30	164.42
		03/11/2009	14.51	165.21
		06/09/2009	14.37	165.35
		09/10/2009	15.42	164.30
		12/01/2009	15.21	164.51
		03/01/2010	13.38	166.34
		06/07/2010	12.78	166.94
		09/13/2010	14.20	165.52
		12/01/2010	13.38	166.34
		04/19/2012	11.71	168.01
		07/20/2012	13.00	166.72
MW-7	179.28	01/29/2002	NA	NA
		03/10/2005	14.77	164.51
		03/14/2005	14.81	164.47
		10/10/2006	NA	NA
		01/30/2007	11.04	168.24
		04/30/2007	11.66	167.62
		07/23/2007	13.23	166.05
		10/29/2007	14.32	164.96
		01/09/2008	12.13	167.15
		04/14/2008	12.00	167.28
		09/05/2008	13.94	165.34
		12/17/2008	14.56	164.72
		03/11/2009	13.73	165.55
		06/09/2009	13.62	165.66
		09/10/2009	14.71	164.57
		12/01/2009	14.51	164.77
		03/01/2010	12.59	166.69
		06/07/2010	11.99	167.29
		09/13/2010	13.42	165.86
		12/01/2010	12.56	166.72
		04/19/2012	10.92	168.36
		07/20/2012	12.20	167.08

Notes:

[a]Vertical datum was established relative to Mean Sea Level by a licensed surveyor on 04/23/2012, based on a local benchmark using the NAVD 88 datum.

TOC = Top of casing

NA = Not applicable

TABLE 3

Groundwater Analytical Results Summary - Gasoline and Related Constituents (ug/L)

Former Plaid Pantry #23, Vancouver, Washington

Location	Date	Gasoline	Diesel	Heavy/Lube Oil	Benzene	Toluene	Ethylbenzene	Xylenes	PCE	EDB	EDC	MTBE	1,2,4-TMB	1,3,5-TMB	Naphthalene	Hexane	Total Lead	Dissolved Lead
Temporary Borings																		
Dames & Moore Offsite Investigation																		
P-1	04/28/1995	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
P-2	04/28/1995	ND	ND	ND	**290** [j]	41 [j]	390 [j]	**1,300** [j]	-	-	-	-	-	-	-	-	-	-
P-3	04/28/1995	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
P-4	04/28/1995	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
PNG Site Check (1998)																		
B-1	02/19/1998	250 U	-	-	0.5 U	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-	-	**317**	-
B-3	02/19/1998	420	-	-	0.5 U	1.0 U	1.0	4.0	-	-	-	-	-	-	-	-	**167**	-
B-5	02/19/1998	**26,000**	630 U[a]	630 U[a]	240	**25,000**	**10,000**	**63,000**	-	-	-	-	-	-	-	-	**269**	-
PNG Site Investigation (2002)																		
B-7	01/21/2002	423	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-8	01/21/2002	80 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-9	01/21/2002	**112,000**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-11	01/21/2002	80 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-12	01/22/2002	**107,000**	**25,100** [e]	**1,220** [e]	50 U	**6,240**	**2,740**	**20,190**	50 U	50 U	50 U	50 U	6,900	2,160	**722**	-	-	-
PNG Site Investigation (2005)																		
B-13	03/09/2005	510	-	-	2.0	74	12	53	1.0 U	1.0 U	1.0 U	1.0 U	4.0	1.0	3.0 [c]	-	-	-
B-14	03/09/2005	**36,000**	**4,300** [e]	250 U	1.0	**1,400**	**1,500**	**5,400**	1.0 U	1.0 U	1.0 U	1.0 U	590	400	150	-	-	-
B-15	03/09/2005	**19,000**	**170** [e]	250 U	**120**	1.0 U	130	62	1.0 U	1.0 U	1.0 U	1.0 U	110	64	20 [c]	-	-	-
B-16	03/09/2005	540	170 [e]	250 U	**5.0**	2.0	67	61	1.0 U	1.0 U	1.0 U	1.0 U	32	6.0	5.0	-	-	-
B-17	03/09/2005	50 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
B-18	03/09/2005	50 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
B-19	03/09/2005	50 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
B-20	03/09/2005	50 U	54 U	216 U	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.1 [c]	-	-	-
B-21	03/09/2005	50 U	54 U	216 U	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
Monitoring Wells																		
MW-1	01/29/2002	121	630 U[a]	630 U[a]	0.5 U[d]	0.63	0.5 U[d]	1.0 U[d]	1.8	0.01 U[b]	1.0 U	1.0 U	2.2	1.0 U	0.02 U [c]	-	1.0 U	1.0 U
	03/14/2005	50 U	50 U	200 U	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.1 U [c]	-	-	-
	01/30/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	04/30/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	07/23/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	10/29/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	01/09/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	04/14/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	09/05/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	12/17/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	03/11/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	06/09/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	09/10/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	12/01/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	03/01/2010	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	1.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	06/07/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	09/13/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	12/01/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
MW-2	01/29/2002	80 U	-	-	0.5 U[d]	0.5 U[d]	0.5 U[d]	1.0 U[d]	-	-	-	-	-	-	-	-	-	-
	03/14/2005	50 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	2.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	01/30/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	04/30/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	07/23/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	10/29/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	01/09/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-

TABLE 3

Groundwater Analytical Results Summary - Gasoline and Related Constituents (ug/L)

Former Plaid Pantry #23, Vancouver, Washington

Location	Date	Gasoline	Diesel	Heavy/Lube Oil	Benzene	Toluene	Ethylbenzene	Xylenes	PCE	EDB	EDC	MTBE	1,2,4-TMB	1,3,5-TMB	Naphthalene	Hexane	Total Lead	Dissolved Lead
MW-2 (con't)	04/14/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	09/05/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	12/17/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	03/11/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	06/09/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	09/10/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	12/01/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	03/01/2010	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	06/07/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	09/13/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	12/01/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
MW-3	01/29/2002	80 U	-	-	0.5 U[d]	0.5 U[d]	0.5 U[d]	1.0 U[d]	-	-	-	-	-	-	-	-	-	-
	03/14/2005	50 U	50 U	200 U	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	01/30/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	04/30/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	07/23/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	10/29/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	01/09/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	04/14/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	09/05/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	12/17/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	03/11/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	06/09/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	09/10/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	12/01/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	03/01/2010	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	1.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	06/07/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	09/13/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	12/01/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
MW-4	01/29/2002	80 U	-	-	0.5 U[d]	0.60 [d]	0.5 U[d]	1.0 U[d]	-	-	-	-	-	-	-	-	-	-
	03/14/2005	50 U	50 U	200 U	1.0 U	1.0 U	1.0 U	3.0 U	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	01/30/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	04/30/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	07/23/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	10/29/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	01/09/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	04/14/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	09/05/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	12/17/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	03/11/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	06/09/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	09/10/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	12/01/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	03/01/2010	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	06/07/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	09/13/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	12/01/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
MW-5	01/29/2002	80 U	-	-	0.5 U[d]	0.5 U[d]	0.5 U[d]	1.0 U[d]	-	-	-	-	-	-	-	-	-	-
	03/14/2005	50 U	50 U	200 U	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	01/30/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	04/30/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	07/23/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	10/29/2007	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	01/09/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-

TABLE 3

Groundwater Analytical Results Summary - Gasoline and Related Constituents (ug/L)

Former Plaid Pantry #23, Vancouver, Washington

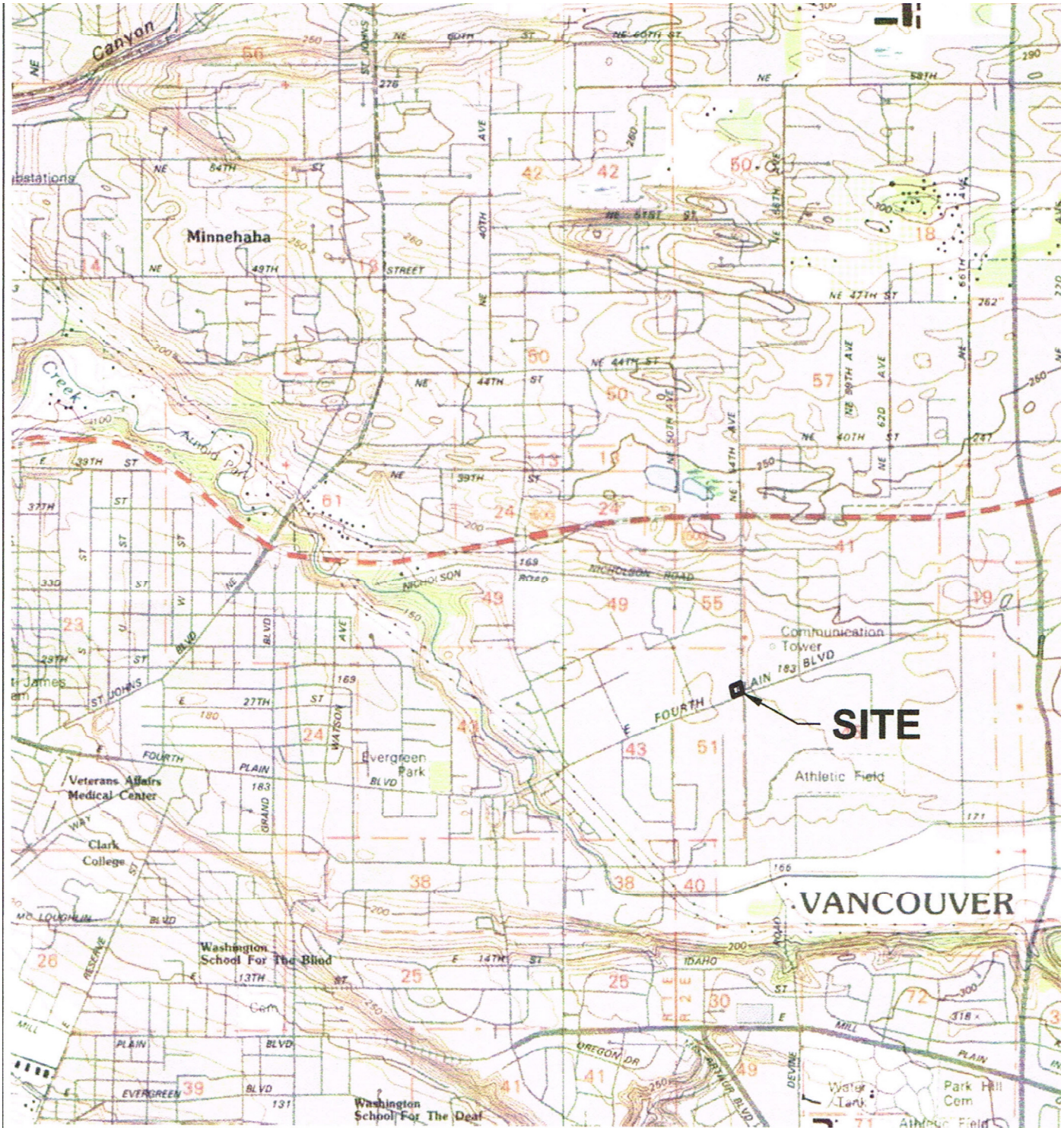
Location	Date	Gasoline	Diesel	Heavy/Lube Oil	Benzene	Toluene	Ethylbenzene	Xylenes	PCE	EDB	EDC	MTBE	1,2,4-TMB	1,3,5-TMB	Naphthalene	Hexane	Total Lead	Dissolved Lead
MW-5 (con't)	04/14/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	09/05/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	12/17/2008	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	03/11/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	06/09/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	09/10/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	12/01/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	03/01/2010	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	06/07/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	09/13/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	12/01/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
MW-6	01/29/2002	**5,530**	630 U[a]	630 U[a]	**523**	4.6	558	536	5.0 U	0.01 U[b]	5.0 U	5.0 U	376	114	43.4 [c]	-	1.6	1.0 U
	03/14/2005	**13,000**	**4,700** [e]	100 [e]	**420**	880	**1,300**	**2,370**	1.0 U	1.0 U	1.0 U	1.0 U	1,200	440	**180** [c]	-	-	-
MW-50 (dup)	03/14/2005	**22,000**	**4,800**		**610**	**1,200**	**1,900**	**3,330**	1.0 U	1.0 U	1.0 U	1.0 U	1,500	560	**440**	35 L	-	-
	01/30/2007	100 U	-	-	1.5	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
MW-50 (dup)	01/30/2007	100 U	-	-	1.5	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	04/30/2007	100 U	-	-	4.4	1.0 U	3.2	3.1	-	1.0 U	1.0 U	1.0 U	3.7	1.0 U	1.0 U	-	-	-
MW-50 (dup)	04/30/2007	100 U	-	-	4.3	1.0 U	3.1	2.9	-	1.0 U	1.0 U	1.0 U	3.4	1.0 U	1.0 U	-	-	-
	07/23/2007	**1,800**	-	-	**63**	1.0 U	17	64	-	1.0 U	1.0 U	1.0 U	45	45	33	-	-	-
MW-50 (dup)	07/23/2007	**1,900**	-	-	**68**	1.0 U	19	75	-	1.0 U	1.0 U	1.0 U	52	51	36	-	-	-
	10/29/2007	**810**	-	-	**40**	17	11	43	-	1.0 U	1.0 U	1.0 U	6.8	1.6	2.3	-	-	-
MW-50 (dup)	10/29/2007	580	-	-	**32**	24	12	59	-	1.0 U	1.0 U	1.0 U	8.3	2.1	2.8	-	-	-
	01/09/2008	**940**	-	-	**58**	1.0 U	72	155	-	1.0 U	1.0 U	1.0 U	68	16	11	-	-	-
MW-50 (dup)	01/09/2008	**2,700**	-	-	**100**	10 U	220	457	-	10 U	10 U	10 U	180	34	22	-	-	-
	04/14/2008	700	-	-	**17**	150	50	240	-	1.0 U	1.0 U	1.0 U	33	8.0	5.4	-	-	-
MW-50 (dup)	04/14/2008	**1,600**	-	-	**24**	270	72	330	-	1.0 U	1.0 U	1.0 U	46	11	7.5	-	-	-
	09/05/2008	120	-	-	3.5	3.8	11	15	-	1.0 U	1.0 U	1.0 U	2.5	1.4	2.0	-	-	-
MW-50 (dup)	09/05/2008	120	-	-	3.2	3.2	10	13	-	1.0 U	1.0 U	1.0 U	1.8	1.0 U	3.5	-	-	-
	12/17/2008	100 U	-	-	1.0 U	1.0	1.2	7.0	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
MW-50 (dup)	12/17/2008	100 U	-	-	1.0 U	1.0	1.2	7.1	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	03/11/2009	720	-	-	18	20	73	110	-	1.0 U	1.0 U	1.0 U	6.9	1.0 U	1.0 U	-	-	-
MW-50 (dup)	03/11/2009	450	-	-	19	22	80	119	-	1.0 U	1.0 U	1.0 U	7.9	1.0 U	1.1	-	-	-
	06/09/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
MW-50 (dup)	06/09/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	2.6	1.0 U	1.0 U	-	-	-
	09/10/2009	100 U	-	-	1.0 U	1.0 U	1.7	8.4	-	1.0 U	1.0 U	1.0 U	2.8	1.0 U	1.0 U	-	-	-
MW-50 (dup)	09/10/2009	100 U	-	-	1.0 U	1.1	1.9	10	-	1.0 U	1.0 U	1.0 U	2.6	1.0 U	1.0 U	-	-	-
	12/01/2009	160	-	-	3.2	1.0 U	19	26	-	1.0 U	1.0 U	1.0 U	6.0	1.0 U	1.0 U	-	-	-
MW-50 (dup)	12/01/2009	140	-	-	4.0	1.0 U	24	34	-	1.0 U	1.0 U	1.0 U	8.0	1.0 U	1.0 U	-	-	-
	03/01/2010	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
MW-50 (dup)	03/01/2010	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	06/07/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
MW-50 (dup)	06/07/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	09/13/2010	100 U	-	-	0.45	1.0 U	2.5	1.6 [h]	1.0 U	1.0 U	1.0 U	1.0 U	7.4	1.5	1.2	1.0 U	-	-
MW-50 (dup)	09/13/2010	110	-	-	0.60	1.0 U	3.3	1.8 [h]	1.0 U	1.0 U	1.0 U	1.0 U	5.4	1.1	1.1	1.0 U	-	-
	12/01/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
MW-50 (dup)	12/01/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
MW-7	01/29/2002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	03/14/2005	**63,000**	**5,500** [e]	250 U	**16** E	**5,800**	**3,100**	**16,100**	1.0 U	1.0 U	1.0 U	1.0 U	2,400	600	**270** [c]	-	-	-
	01/30/2007	100 U	-	-	1.0 U	3.4	1.5	13	-	1.0 U	1.0 U	1.0 U	1.9	1.0 U	1.0 U	-	-	-
	04/30/2007	100 U	-	-	1.0 U	1.3	1.5	6.6	-	1.0 U	1.0 U	1.0 U	2.8	1.0 U	1.0 U	-	-	-
	07/23/2007	610	-	-	1.0 U	44	36	170	-	1.0 U	1.0 U	1.0 U	32	8.3	2.2	-	-	-
	10/29/2007	**20,000**	-	-	4.3	**1,600**	680	**2,860**	-	1.0 U	1.0 U	1.0 U	1,000	720	120	-	-	-
	01/09/2008	100 U	-	-	1.0 U	3.4	1.7	13	-	1.0 U	1.0 U	1.0 U	3.4	1.0 U	1.0 U	-	-	-
	04/14/2008	100 U	-	-	1.0 U	2.3	1.9	11	-	1.0 U	1.0 U	1.0 U	1.9	1.0 U	1.0 U	-	-	-

TABLE 3
Groundwater Analytical Results Summary - Gasoline and Related Constituents (ug/L)
Former Plaid Pantry #23, Vancouver, Washington

Location	Date	Gasoline	Diesel	Heavy/Lube Oil	Benzene	Toluene	Ethylbenzene	Xylenes	PCE	EDB	EDC	MTBE	1,2,4-TMB	1,3,5-TMB	Naphthalene	Hexane	Total Lead	Dissolved Lead
MW-7 (con't)	09/05/2008	**16,000**	-	-	3.4	**1,700**	**750**	**3,300**	-	1.0 U	1.0 U	1.0 U	590	210	**160**	-	-	-
	12/17/2008	**3,900**	-	-	1.0 U*	240	180	**1,150**	-	1.0 U[i]	1.0 U[i]	1.0 U[i]	170	69	25	-	-	-
	03/11/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	1.4 c	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	06/09/2009	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
	09/10/2009	**9,400**	-	-	1.1	320	360	**1,660**	-	1.0 U	1.0 U	1.0 U	270	61	53	-	-	-
	12/01/2009	**8,300**	-	-	1.0 U	860	560	**2,900**	-	1.0 U	1.0 U	1.0 U	440	120	46	-	-	-
	03/01/2010	100 U	-	-	1.0 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	06/07/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	09/13/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
	12/01/2010	100 U	-	-	0.35 U	1.0 U	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-
MTCA Method A[f]		800/1,000 [g]	500	500	5.0	1,000	700	1,000	5.0	0.01	5.0	20	NA	NA	160	NA	15	15

Notes:
[a] TPH by Method NWTPH-HCID
[b] EDB by EPA Method 8011
[c] Naphthalene by EPA Method 8270C SIM
[d] BTEX by EPA Method 8021B
[e] Weathered or degraded fuel detected, not indicative of diesel or heavy oil
[f] Model Toxics Control Act Cleanup (MTCA) Amendments (WDOE, October 12, 2007)
[g] Per MTCA, values for gasoline are for benzene present (Gx < 800 ug/L) versus no benzene present (Gx < 1,000 ug/L)
[h] Results for o-Xylene only, Result for m,p-Xylene was below the reporting limit.
[i] Results obtained from non-diluted sample; all other data from this sample obtained from a dilution.
[j] BTEX by EPA Method 8020
Volatile Compounds by EPA Method 8260B unless otherwise noted
TPH by Method NWTPH-Gx (gasoline) and NWTPH-Dx (non-gasoline) unless otherwise noted
PCE = Tetrachloroethene
MTBE = Methyl tert-butyl ether
EDB = 1,2-Dibromoethane
EDC = 1,2-Dichloroethane
1,2,4-TMB = 1,2,4-Trimethylbenzene
1,3,5-TMB = 1,3,5-Trimethylbenzene
ug/L = Micrograms per liter
c = Lab qualifier - o-Xylene concentration (1.4 ug/L may be due to carryover from the previously analyzed sample. Result for m,p-Xylene was below the reporting limit.)
U = Undetected at method reporting limit shown
E = Some laboratory carryover possible; see laboratory analytical report
L = The reported concentration was generated from a library search
- = Not tested
NA = Not applicable
ND = Not detected
Values in bold indicate compound was detected at a concenration exceeding the most stringent MTCA Method A standard

Figures



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SITE VICINITY MAP

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FILE:	839-04		839-04
DRAWN:	SRN	FIGURE NO.	
APPROVED:	PDE		1

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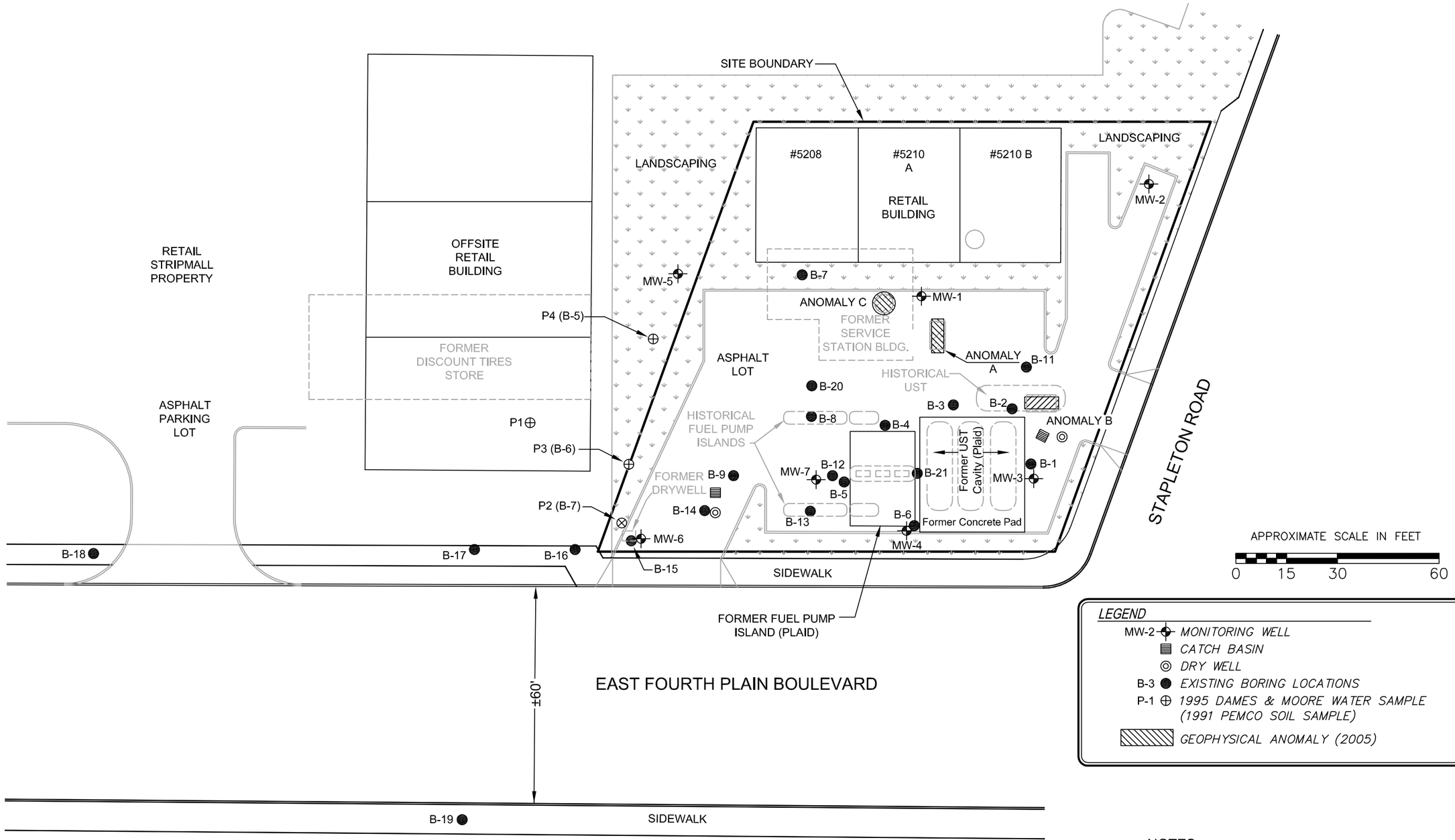

APPROXIMATE SCALE IN FEET

0 15 30 60

LEGEND

- MW-2 — *MONITORING WELL*
- *CATCH BASIN*
- *DRY WELL*
- B-3 — *EXISTING BORING LOCATIONS*
- P-1 — *1995 DAMES & MOORE WATER SAMPLE (1991 PEMCO SOIL SAMPLE)*
- *GEOPHYSICAL ANOMALY (2005)*

NOTES:

1. SITE FEATURES ARE APPROXIMATE.

PROJECT NO.	839-04
FIGURE NO.	2
DATE:	9-6-2012
FILE:	839-04
DRAWN:	SRN
APPROVED:	PDE

HISTORICAL SITE FEATURES AND PRIOR SAMPLE LOCATIONS

FORMER PLAID PANTRY #23
5210 E FOURTH PLAIN BLVD.
VANCOUVER, WASHINGTON

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(503) 847-2740
www.ees-environmental.com

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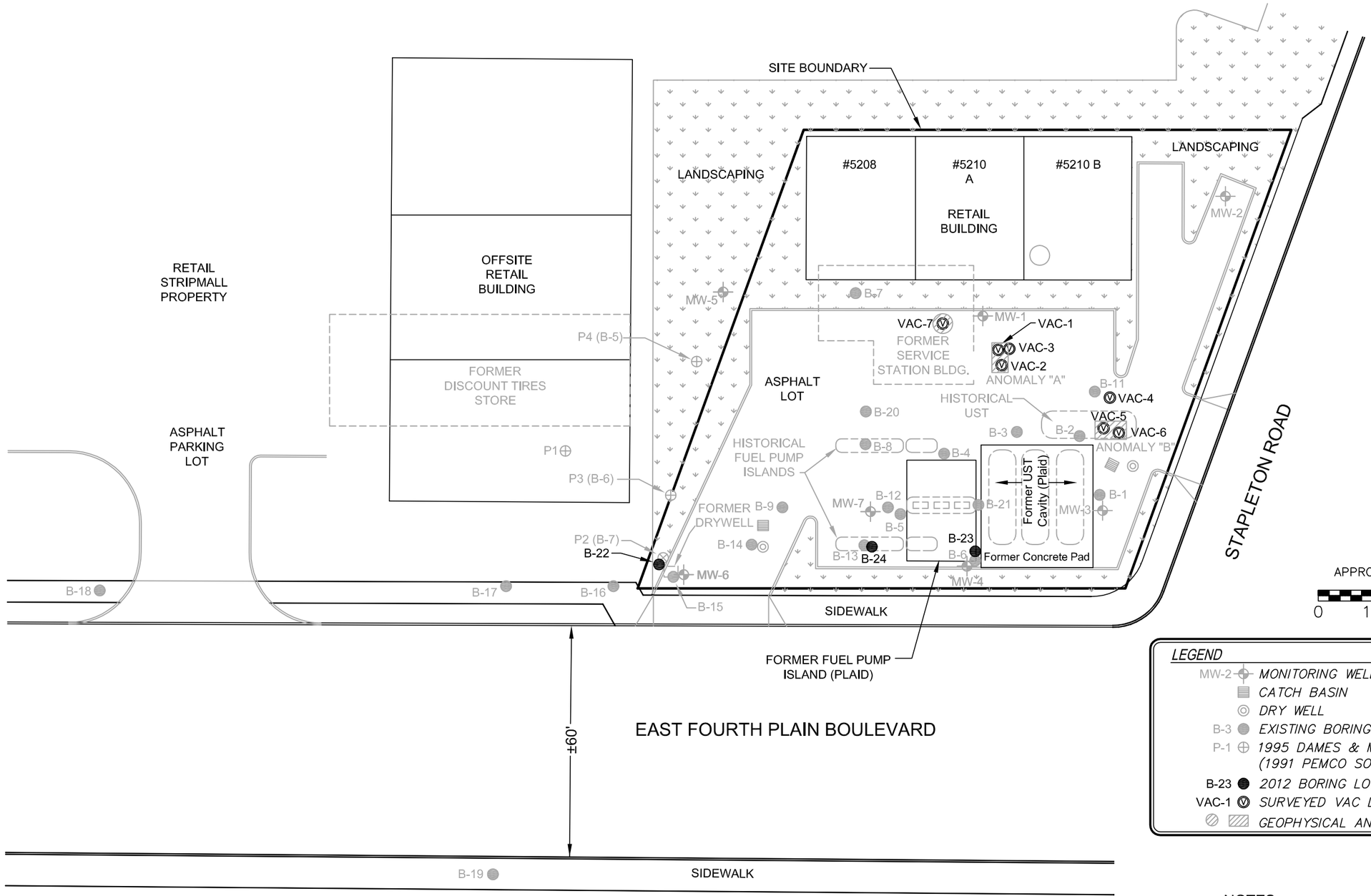

APPROXIMATE SCALE IN FEET

0 15 30 60

LEGEND

- MW-2 — *MONITORING WELL*
- *CATCH BASIN*
- *DRY WELL*
- B-3 — *EXISTING BORING LOCATIONS*
- P-1 — *1995 DAMES & MOORE WATER SAMPLE (1991 PEMCO SOIL SAMPLE)*
- B-23 — *2012 BORING LOCATIONS*
- VAC-1 — *SURVEYED VAC LOCATIONS*
- *GEOPHYSICAL ANOMALY (2005)*

NOTES:

1. SITE FEATURES ARE APPROXIMATE.

PROJECT NO.	839-04
FIGURE NO.	3
DATE:	9-6-2012
FILE:	839-04
DRAWN:	SRN
APPROVED:	PDE

SUPPLEMENTAL SOIL SAMPLING LOCATIONS

(4/19/2012)

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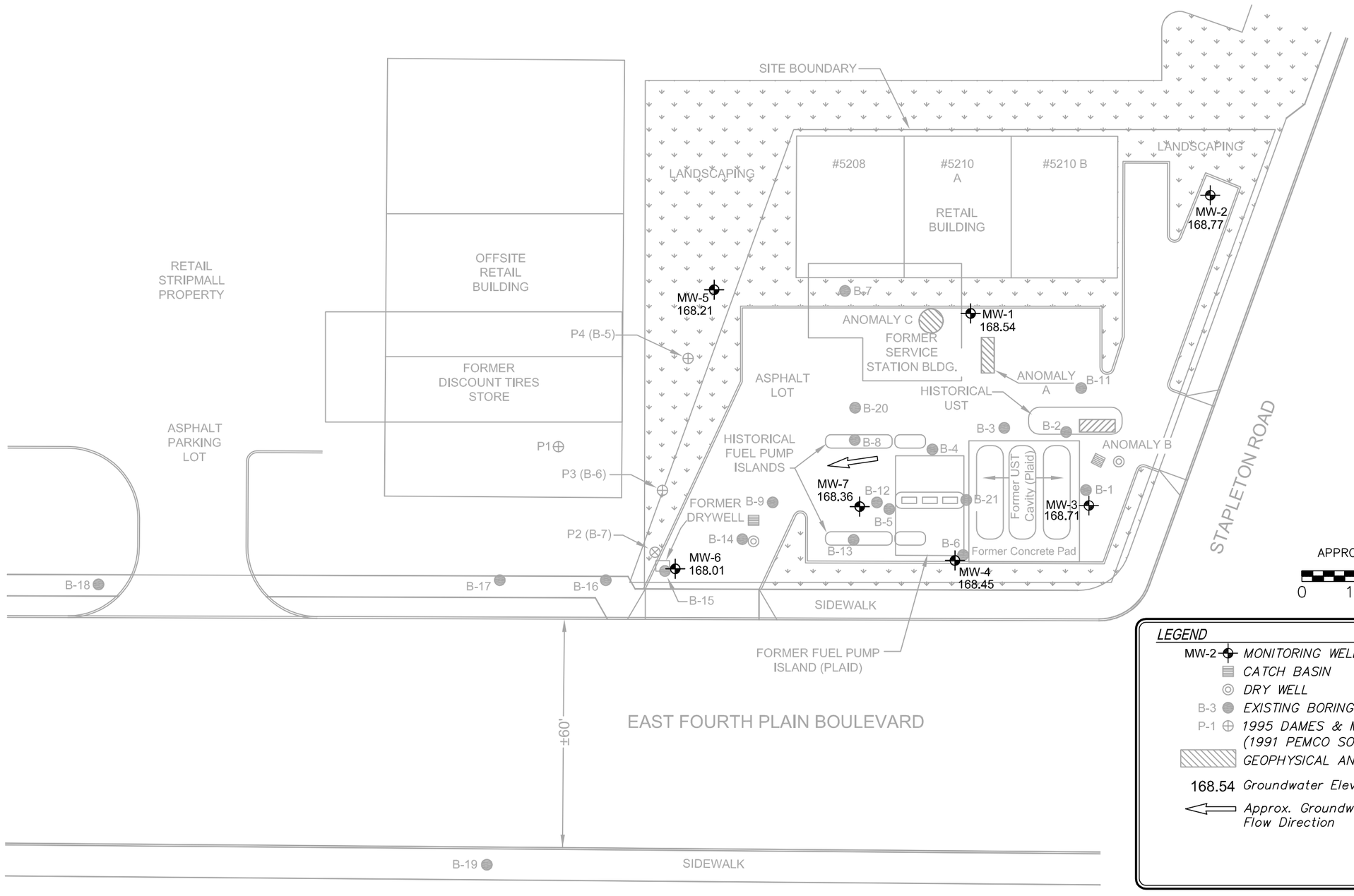

APPROXIMATE SCALE IN FEET

0 15 30 60

LEGEND

- MW-2 — *MONITORING WELL*
- *CATCH BASIN*
- *DRY WELL*
- B-3 — *EXISTING BORING LOCATIONS*
- P-1 — *1995 DAMES & MOORE WATER SAMPLE (1991 PEMCO SOIL SAMPLE)*
- *GEOPHYSICAL ANOMALY (2005)*
- 168.54 *Groundwater Elevations (Feet MSL)*
- *Approx. Groundwater Flow Direction*

NOTES:

1. SITE FEATURES ARE APPROXIMATE.
2. GROUNDWATER ELEVATIONS SURVEYED RELATIVE TO MEAN SEA LEVEL USING NAVD-88 DATUM, APRIL 2012.

PROJECT NO.	839-04
FIGURE NO.	4
DATE:	9-17-2012
FILE:	839-04
DRAWN:	CJB
APPROVED:	PDE

WATER TABLE ELEVATIONS AND FLOW DIRECTION (4/19/2012)

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VANCOUVER, WASHINGTON

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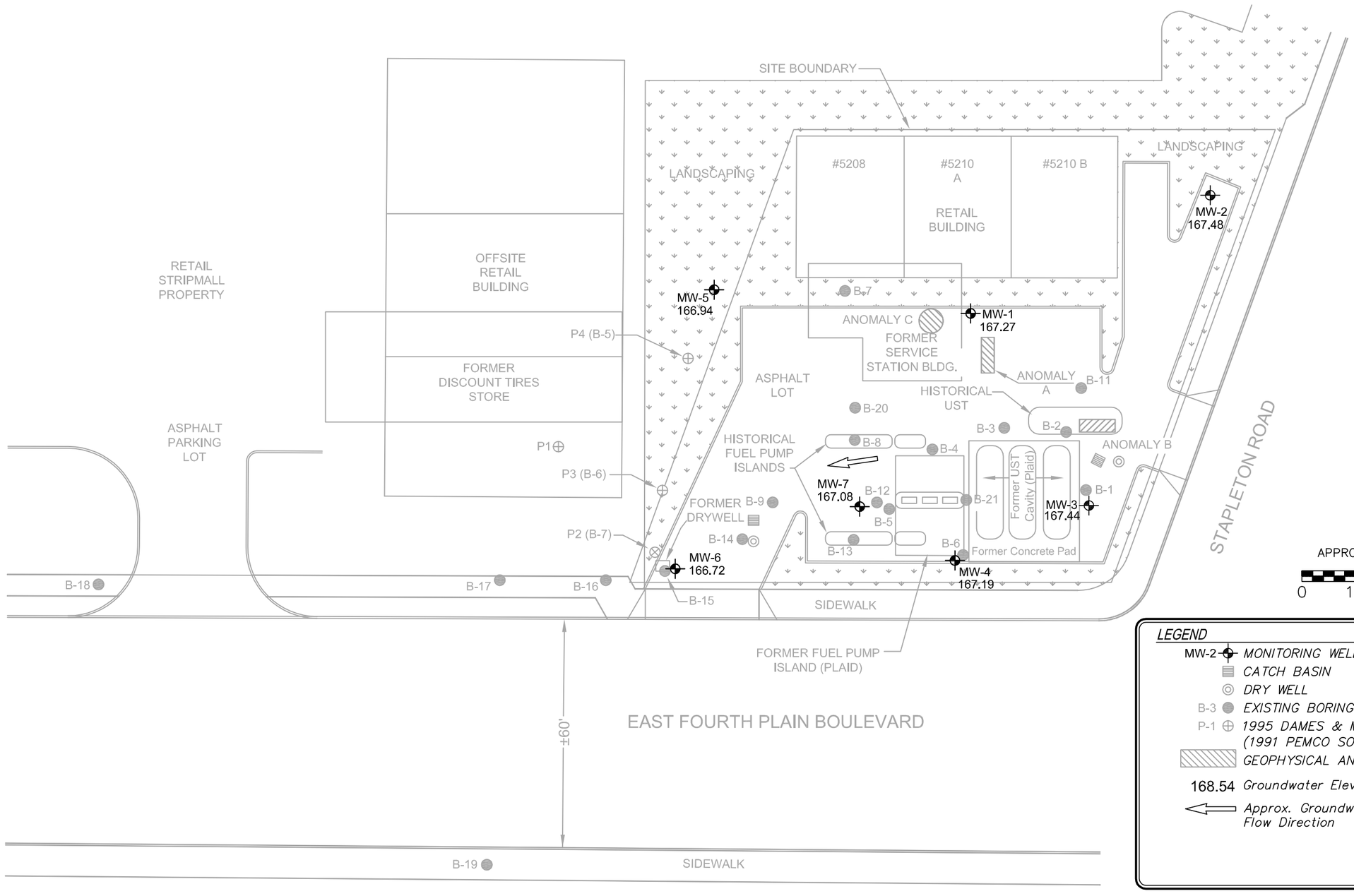

APPROXIMATE SCALE IN FEET

0 15 30 60

LEGEND

- MW-2 — *MONITORING WELL*
- *CATCH BASIN*
- *DRY WELL*
- B-3 — *EXISTING BORING LOCATIONS*
- P-1 — *1995 DAMES & MOORE WATER SAMPLE (1991 PEMCO SOIL SAMPLE)*
- *GEOPHYSICAL ANOMALY (2005)*
- 168.54 *Groundwater Elevations (Feet MSL)*
- *Approx. Groundwater Flow Direction*

NOTES:

1. SITE FEATURES ARE APPROXIMATE.
2. GROUNDWATER ELEVATIONS SURVEYED RELATIVE TO MEAN SEA LEVEL USING NAVD-88 DATUM, APRIL 2012.

PROJECT NO.	839-04
FIGURE NO.	5
DATE:	9-6-2012
FILE:	839-04
DRAWN:	SRN
APPROVED:	PDE

WATER TABLE ELEVATIONS AND FLOW DIRECTION (7/20/2012)

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5210 E FOURTH PLAIN BLVD.
VANCOUVER, WASHINGTON

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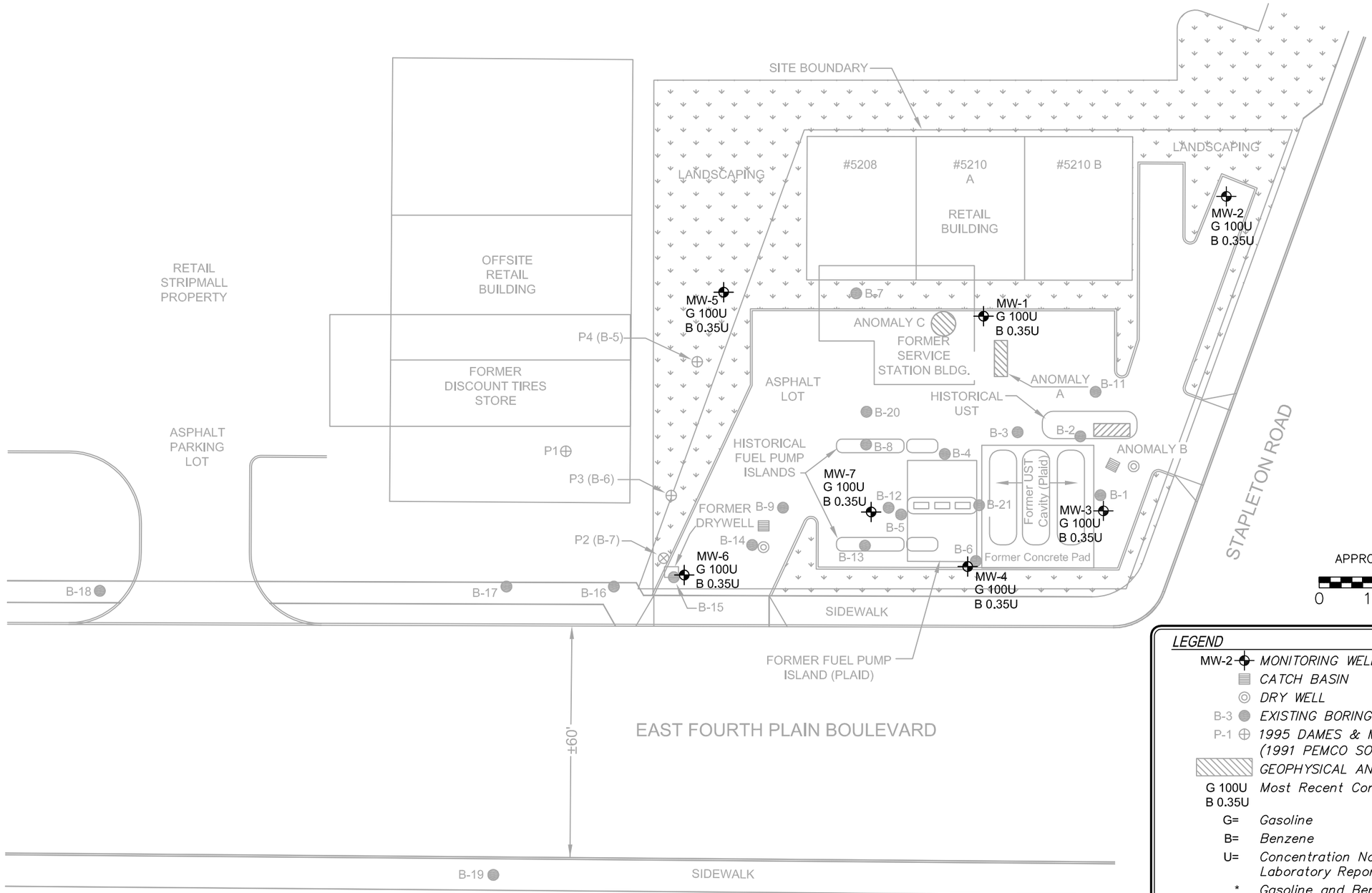

MONITORING WELL DATA SUMMARY (MICROGRAMS PER LITER)

MW-1		
DATE	G	B
3/1/10	100U	1U
6/7/10	100U	0.35U
9/13/10	100U	0.35U
12/1/10	100U	0.35U

MW-2		
DATE	G	B
3/1/10	100U	1U
6/7/10	100U	0.35U
9/13/10	100U	0.35U
12/1/10	100U	0.35U

MW-3		
DATE	G	B
3/1/10	100U	1U
6/7/10	100U	0.35U
9/13/10	100U	0.35U
12/1/10	100U	0.35U

MW-4		
DATE	G	B
3/1/10	100U	1U
6/7/10	100U	0.35U
9/13/10	100U	0.35U
12/1/10	100U	0.35U

MW-5		
DATE	G	B
3/1/10	100U	1U
6/7/10	100U	0.35U
9/13/10	100U	0.35U
12/1/10	100U	0.35U

MW-6		
DATE	G	B
3/1/10	100U	1U
6/7/10	100U	0.35U
9/13/10	100U	0.45
12/1/10	100U	0.35U

MW-7		
DATE	G	B
3/1/10	100U	1U
6/7/10	100U	0.35U
9/13/10	100U	0.35U
12/1/10	100U	0.35U

LEGEND

- MW-2 — *MONITORING WELL*
- *CATCH BASIN*
- *DRY WELL*
- B-3 — *EXISTING BORING LOCATIONS*
- P-1 — *1995 DAMES & MOORE WATER SAMPLE (1991 PEMCO SOIL SAMPLE)*
- *GEOPHYSICAL ANOMALY (2005)*
- G 100U / B 0.35U — *Most Recent Concentrations (in ug/L)*
- G= *Gasoline*
- B= *Benzene*
- U= *Concentration Not Detected at Laboratory Reporting Limit Shown*
- * *Gasoline and Benzene Concentrations Shown in Micrograms per Liter (ug/L)*

NOTES:

1. SITE FEATURES ARE APPROXIMATE.

PROJECT NO.	839-04
FIGURE NO.	6
DATE:	9-6-2012
FILE:	839-04
DRAWN:	SRN
APPROVED:	PDE

GASOLINE AND BENZENE IN GROUNDWATER (2010)

FORMER PLAID PANTRY #23
5210 E FOURTH PLAIN BLVD.
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Attachment A
Ecology Opinion Letter

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

October 31, 2011

Mr. Terry Pyle
Plaid Pantries, Inc
10025 SW Allen Boulevard
Beaverton, Oregon 97005

Re: Further Action at the following Site:

- **Site Name:** Plaid Pantry 23
- **Site Address:** 5210 East Fourth Plain Boulevard, Vancouver, Washington
- **Facility/Site No.:** 78978458
- **VCP Project No.:** SW1166

Dear Mr. Pyle:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your independent cleanup of the Plaid Pantry 23 facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

Issue Presented and Opinion

Is further remedial action necessary to clean up contamination at the Site?

YES. Ecology has determined that further remedial action is necessary to clean up contamination at the Site.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, Chapter 70.105D RCW, and its implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA"). The analysis is provided below.

Description of the Site

This opinion applies only to the Site described below. The Site is defined by the nature and extent of contamination associated with the following releases:

- Total petroleum hydrocarbons in the gasoline-range (TPH-G) into the Soil and Groundwater.
- Volatile Organic Compounds (VOCs) into the Soil and Groundwater.
- Metals into the Groundwater.

Enclosure A includes a detailed description and diagram of the Site, as currently known to Ecology.

Please note a parcel of real property can be affected by multiple sites. At this time, we have no information that the parcel(s) associated with this Site are affected by other sites.

Basis for the Opinion

This opinion is based on the information contained in the following documents:

1. PNG Environmental, Inc., **Environmental Assessment, Plaid Pantry No. 23, 5210 East Fourth Plain Boulevard, Vancouver, Washington,** dated November 5, 1997.

2. PNG Environmental, Inc., **Site Check, Plaid Pantries #23, 5210 East Fourth Plain Boulevard, Vancouver, Washington,** dated March 31, 1998.

3. PNG Environmental, Inc., **Site Characterization Report, Plaid Pantry No. 23, 5210 East Fourth Plain Boulevard, Vancouver, Washington,** dated April 9, 2002.

4. GeoPotential Environmental & Exploration Geophysics, **Subsurface Mapping Survey,** dated March 2005.

5. Rengenesis [Proposal], **Application of ORC Advanced to Accelerate Natural Attenuation of Contaminants of Concern (COCs) at the Former Plaid Pantry Site, Vancouver, Washington,** dated April 6, 2005.

6. PNG Environmental, Inc., **Site Investigation Report, September 26, 2005, Plaid Pantry # 23,** dated September 26, 2005 (PNG 2005).

7. PNG Environmental, Inc., **UST Decommissioning and Site Assessment Report, Former Plaid Pantry #23, 5210 East Fourth Plain Boulevard, Vancouver, Washington,** dated January 24, 2007.

8. PNG Environmental, Inc., **In-Situ Remedial Actions and Monitoring Summary Report, January – December 2009, Plaid Pantries Store # 23, Vancouver, Washington,** dated February 20, 2009.

9. PNG Environmental, Inc., **Groundwater Monitoring Summary Report, January 2009 – March 2010,** dated April 12, 2010.

10. PNG Environmental, Inc., **Final Site Characterization and Closure Report, Plaid Pantries Store # 23, Vancouver, Washington,** dated March 4, 2011.

Those documents are kept in the Central Files of the Southwest Regional Office of Ecology (SWRO) for review by appointment only. You can make an appointment by calling the SWRO resource contact at (360) 407-6365.

This opinion is void if any of the information contained in those documents is materially false or misleading.

Analysis of the Cleanup

Ecology has concluded that **further remedial action** is necessary to clean up contamination at the Site. That conclusion is based on the following analysis:

1. Characterization of the Site.

Ecology has determined your characterization of the Site is not sufficient to establish cleanup standards and select a cleanup action. The Site is described above and in **Enclosure A.**

The Site is located at 5210 East Fourth Plain Boulevard in Vancouver, Washington. The Site was operated as a Plaid Pantry convenience store and refueling station from 1982 to 2002. Plaid Pantry operated three gasoline underground storage tanks (USTs) at the Site during that time: one 10,000-gallon and two 12,000-gallon single-wall steel tanks with single-wall distribution piping. From 1998 to 2002, when the USTs were removed from service, the USTs were out of compliance with *WAC 173-360-310 Upgrading requirements for existing UST systems* by not being upgraded with a lining and/or cathodic protection.

In 1991, PEMCO conducted an environmental assessment of the adjacent, down-gradient Gramor parcel west of the Site and found VOC soil contamination. Laboratory analytical results for boring B-7 indicated benzene was present in the soil at 1.9 milligrams per kilogram (mg/kg) and above the MTCA Method A Soil Cleanup Level (CUL) for unrestricted land uses of 0.03 mg/kg; TPH-G was not analyzed for. A follow on investigation by Dames and Moore in 1995 found benzene in groundwater at 290 micrograms per liter (µg/L) and total xylenes at 1,300 µg/L. MTCA Method A Groundwater CULs for benzene and total xylenes were 5 µg/L and 1,000 µg/L, respectively, and there was no mention if TPH-G was analyzed for (see Figure 3, Table 1, and Table 2). The consultant determined that the parcel was not the source of the contamination and notified the Ecology. In January 1997, Ecology notified Plaid Pantry that their Site was placed on the *Confirmed and Suspected Contaminated Sites* list.

In November 1997, PNG Environmental, Inc. (PNG) provided an Environmental Assessment of the Site and concluded that there could be multiple off-Site sources to explain the contamination on the Gramor parcel. In February 1998, PNG conducted a Site Check of the Plaid Pantry parcel and concluded there were TPH-G and VOCs present in the groundwater at location boring B-5. Analytical results indicated total lead was also present in the

groundwater at three locations, all above the MTCA Method A CUL of 15 µg/L; the highest lead concentration was 317 µg/L at B-1. Also during their investigation, the driller penetrated a fuel distribution line at the location of B-6. The investigation advanced at total of six borings using direct-push methods and found TPH-G and VOCs in the Site soil at one location, B-6, at 10 feet below ground surface (bgs). PNG estimated a release of eight gallons of gasoline. The B-6 soil sample had the highest reported TPH-G soil concentration at the Site with a concentration of 4,400 mg/kg; the MTCA Method A Soil CUL for TPH-G was 30 mg/kg due to benzene being present at the Site (see Figure 3, Table 1, and Table 2). PNG installed two soil vapor extraction (SVE) wells at B-6 to remediate petroleum-contaminated soil (PCS). Ecology was notified of a leaking UST (LUST) at the Site (LUST identification number 4379070).

From 2002 to 2010, PNG conducted activities at the Site, including a Site Characterization in 2005, UST decommissioning activities (removing three USTs and associated piping) in 2006, in-situ remedial actions by injecting oxygenating compounds in solution into the subsurface in June 2008, and groundwater monitoring activities from 2007 to 2010. During the UST decommissioning and removal, three USTs and associated piping were removed and disposed of. PNG collected soil samples from the excavation pit side walls and floor. The excavation soil samples submitted for analysis indicated the contamination was removed (see Figure 5).

The 2008 in-situ remedy action involved the injection of 3,125 pounds of a RegenOx®/ORC-A[dvanced]™ mix of material blended with 5,000 gallons of water into 35 locations in the southwestern corner of the parcel. The oxygen reducing compound (ORC) mix was injected between 10 feet and 20 feet bgs (see Figure 4). The injection was conditionally rule authorized under an Ecology Underground Injection Control Program Well registration Letter dated May 1, 2008, which authorized the injection of ORC blended material into the subsurface and required the meeting of groundwater quality standards under Chapter 173-200 WAC.

From 2007 to 2010, PNG conducted quarterly groundwater monitoring at six monitoring wells on the Site. The last four quarters indicated the constituents of concern (COCs) were at all wells were either not detected at the laboratory reporting limit or were not detected above their applicable MTCA Method A CUL (see Table 2).

Based on a review of the available information, Ecology has the following comments:

1. In April 2002, North Creek Analytical, Inc. (NCA) performed a forensic analysis of soil and water samples from the Site to differentiate similarities and differences of the samples to establish dates of the releases for samples collected from MW1 and B12. NAC found that there appeared to be at least two separate release events temporally separated by 10 years; however, NCA could not make a determination as to whether the releases were attributable to separate sources. The forensic analysis also discussed the presence of gasoline range organics at 121 parts per billion (ppb) and

tetrachloroethene at 1.81 ppb in the groundwater at MW-1. Tetrachloroethene is a notable COC often associated with parts cleaning operations. Although this halogenated hydrocarbon is not found in commercial gasoline, diesel, or lube oil, it is often a contaminant of waste oil.

The findings of the March 2005 *Subsurface Mapping Survey* (found in Appendix A in PNG 2005) indicated there were two large subsurface anomalies, one metal object (MO) and one ground penetrating radar (GPR) anomaly (see Figure 3[IM]). GPR and hand-held metal detectors identified the MO, and the size of the MO was estimated to be 11 feet long by 3 feet wide; it was located near monitoring well MW-1 (just outside the footprint of the former service station). There was no narrative discussing the GPR anomaly; however, it was identified in Figure 3[IM] as being near the historic service station UST location.

During the 2005 UST removal, a single, uncapped, steel fuel distribution pipe was uncovered at the bottom of the UST excavation pit. It was attributed to being part of the historic UST system; the pipe was reported to enter into the excavation's north sidewall in the general direction towards the historic UST and GPR location. PNG reported the pipe to have been severed and removed, and the remaining portion capped in place in the northern excavation wall.

WAC 173-340-740 (b) requires a cleanup action be conducted to address all areas where the concentration of hazardous substances in the soil exceeds cleanup levels at the relevant point of compliance. The information discussed above indicates that the area around MW-1 was not thoroughly characterized nor was any remedial action applied at that location. TPH-G soil contamination above the MTCA cleanup level remains at MW-1. The source of that contamination was not determined. The information seems to indicate the MO as a potential source near MW-1 and future releases cannot be ruled out. Per WAC 173-360-395, if previously closed or abandoned USTs pose a current or potential threat to human health and the environment, Ecology can require that the UST be decommissioned and/or removed. The Ecology database does not contain any information on the historic USTs.

Available information indicates characterization of the MO near MW-1 and the GPR anomaly are warranted. The true nature of both anomalies should characterized by physical examination, and if they are confirmed as the historic UST and waste oil tank, they should be removed per WAC 173-360-395.

Analytical data also indicates PCS above the MTCA Method A CULs remains at 15 feet bgs at the Site. TPH-G and benzene were identified above their applicable MTCA Method A CULs. Areas of concern are B7/P2, where the benzene

concentration in the soil was above the MTCA CUL, and B-6[1] and B-13, where the TPH-G concentration was above the MTCA CUL. Soil sample analytical results indicated the PCS was removed from the UST excavation; however, no confirmation soil sample was collected from the southwest corner of the UST excavation near B-6, the location with the highest TPH-G concentration. Confirmation soil samples should be collected from B7/P2 at 15 to 16 feet bgs, B-6 at 10 feet bgs, and B-13 at 15 feet bgs. The COCs for the soil at these locations will be TPH-G, BTEX, and lead.

If any USTs are confirmed present, they will need to be characterized and decommissioned; confirmation soil and groundwater samples will be needed. Due to the potential for the MO anomaly to be a former waste oil UST, the soil and groundwater should be analyzed for applicable constituents listed on MTCA Table 830-1. The COCs for the Site groundwater near MW-1 will be TPH-G, TPH-D, TPH-O, benzene, toluene, ethylbenzene, and total xylenes (BTEX), ethylene dibromide (EDB) (via EPA Method 8011), ethylene dichloride (EDC), methyl tertiary-butyl ether (MTBE), total lead, carcinogenic polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and halogenated VOCs. The COCs for the Site soil around MW-1 will be TPH-G, TPH-D, TPH-O, BTEX, and lead. If EDB, EDC, MTBE, carcinogenic PAHs, PCBs, and halogenated VOCs are present in the groundwater then those COCs will have to be evaluated for also. The COCs for the Site groundwater near the historic UST location will be TPH-G, TPH-D, TPH-O, BTEX, EDB (via EPA Method 8011), EDC, MTBE, and total lead. The COCs for the Site soil around the historic UST location will be TPH-G, TPH-D, TPH-O, BTEX, and lead. If EDB, EDC, MTBE are present in the groundwater then those COCs will have to be evaluated for also.

2. PNG provided four quarters of groundwater analytical results where COC concentrations were below the applicable MTCA Method A CULs or not detected; however, Ecology noted that COC concentrations at MW-7 indicated a rebound effect in September and December 2009. There was also a demonstrated pattern where COC concentrations increased above the applicable MTCA Method A CULs when the depth to groundwater at that well was measured at 14 feet bgs or deeper. Groundwater sampling events for the last four quarters were above 13.50 feet bgs and followed the variable concentration pattern consistently displayed at the well. Ecology recommends that downgradient wells MW-6 and MW-7 be sampled again

[1] Because of the limited release of TPH-G caused by the push probe penetration into the fuel distribution pipeline at the B-6 location, PNG singularly remediated the soil at this location via a SVE system; however, no operational or performance reports, field logs, results tables, SVE well installation logs, analytical results, or soil confirmation samples were provided to Ecology for review to demonstrate compliance with MTCA. Once a remedial action is determined to have remediated the Site media to comply with the MTCA cleanup standards, Ecology requires that confirmation sample analytical results demonstrate the affected media concentrations are below the applicable MTCA CULs before a no further action opinion will be provided.

when the groundwater depth is below 14 feet bgs to confirm that the implemented remedy is permanent (see Table 2, Table 4, and Figure 9). Ecology recognizes the variable nature of the groundwater table and suggests that the depth to water be evaluated for the next year, if the groundwater table does not reach the desired depth, Ecology will accept the available groundwater data as representative of Site conditions.

Please note that Ecology requires *at least* four consecutive quarters of clean groundwater monitoring analytical results to demonstrate compliance with the MTCA cleanup regulations. The reason for this is to determine any seasonal variations or long-term patterns in the contaminant concentration fluctuations, so that Ecology can determine whether the implemented remedy is permanent.

3. PNG used an arbitrary vertical datum for this Site investigation. MTCA requires the use of United States Geological Survey (USGS) datum as a basis for all elevations. Please calibrate all elevation points used in the investigation to a known USGS datum point per *WAC 173-340-840 General Submittal Requirements.*

4. Please provide Ecology with an updated work plan for the remedial activities identified above for review and approval to ensure that the proposed activities will likely meet the substantive requirements of MTCA.

5. MTCA requires the submittal of three copies of a plan or report. Please submit two bound hard copies and one electronic copy (portable document format [pdf]) for future plans or reports provided to Ecology for review per *WAC 173-340-840 General Submittal Requirements.*

6. In accordance with *WAC 173-340-840(5)* and Ecology Toxics Cleanup Program *Policy 840 (Data Submittal Requirements)*, all data generated for Independent Remedial Actions shall be submitted simultaneously in both a written and electronic format. For additional information regarding electronic format requirements, see the website http://www.ecy.wa.gov/eim. Be advised that according to the policy, any reports containing sampling data that are submitted for Ecology review are considered incomplete until the electronic data has been entered. Please ensure that data generated during on-site activities is submitted pursuant to this policy. **Data must be submitted to Ecology in this format for Ecology to issue a No Further Action determination.** Please be sure to submit all soil and groundwater data collected to date, as well as any future data, in this format. Data collected prior to August 2005 (effective date of this policy) is not required to be submitted; however, you are encouraged to do so if it is available. Be advised that Ecology requires up to two weeks to process the data once it is received.

2. Establishment of cleanup standards.

Ecology has determined the cleanup levels and points of compliance you established for the Site do not meet the substantive requirements of MTCA.

Applicable MTCA Method A CULs for soil and groundwater shall be used to characterize the Site. Standard points of compliance are being used for the Site. The point of compliance for protection of groundwater will be established in the soils throughout the Site. For soil cleanup levels based on human exposure via direct contact or other exposure pathways where contact with the soil is required to complete the pathway, the point of compliance shall be established in the soils throughout the Site from the ground surface to 15 feet bgs. In addition, the point of compliance for the groundwater is established throughout the Site from the uppermost level of the saturated zone extending vertically to the lowest most depth that could potentially be affected by the Site.

3. Selection of cleanup action.

Ecology has determined the cleanup action you selected for the Site does not meet the substantive requirements of MTCA.

The affected Site media must be fully characterized prior to selecting any final cleanup action. For a Site cleanup action to qualify for a no further action opinion, it must meet one or more of the minimum cleanup requirements in WAC 173-340-360(2). MTCA requires the use of permanent solutions to the maximum extent practicable. If permanent solutions are not part of the remedy, it will be necessary to develop a feasibility study based on the information collected in the characterization phase. The feasibility study should include all practicable methods of treatment in addressing the Site cleanup. Please note that monitored natural attenuation is a cleanup alternative that must be approved by Ecology before implementation.

4. Cleanup.

Ecology has determined the cleanup you performed does not meet any cleanup standards at the Site.

The Site was not fully characterized prior to initiating cleanup activities. PNG decommissioned and removed three USTs from the Site. PNG excavated approximately 590 tons of PCS from the Site and disposed of it the Wasco County Landfill in Oregon. PNG applied ORCs to the UST excavation floor and sidewalls prior to backfilling the excavation. Finally, PNG injected approximately 3,000 pounds of ORCs into subsurface soil and groundwater to help remove residual groundwater impacts. Soil sample analytical results indicated the PCS was removed from the UST excavation; however, no confirmation soil

sample was collected from the southwest corner of the UST excavation near B-6, the location with the highest TPH-G concentration.

After a review of the available data, Ecology determined the CSM was not developed enough to define the Site nor did the analytical data define the Site. MTCA defines a Site as wherever the contamination has come to lie. Laboratory analytical results indicated a source of the Site contamination near the Plaid Pantry USTs or fuel dispenser pad; however, there was speculation that more than one source was responsible for the Site contamination. A review of the groundwater gradient history would suggest the UST excavation or fuel pad was an unlikely source for the soil contamination at MW-1.

Limitations of the Opinion

1. Opinion does not settle liability with the state.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70.105D.040(4).

2. Opinion does not constitute a determination of substantial equivalence.

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you performed is substantially equivalent. Courts make that determination. *See* RCW 70.105D.080 and WAC 173-340-545.

3. State is immune from liability.

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. *See* RCW 70.105D.030(1)(i).

Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may request another review of your cleanup. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our web site: www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm. If you have any questions about this opinion, please contact me by phone at (360) 407-7404 or e-mail at erad461@ecy.wa.gov.

Sincerely,

Eugene Radcliff, L.G.
Site Manager
SWRO Toxics Cleanup Program

GER/ksc:Plaid Pantry 23 FA Opinion

Enclosures (10): A – Description and Diagrams of the Site

Figure 1	Site Vicinity Map
Figure 3[IM]	2005 Mapping Survey Interpretation Map
Figure 3	Historical Site Features
Figure 4	ISCO Injection Locations
Figure 5	UST Decommissioning Confirmation Soil Sample Locations (October 2006)
Figure 7	Groundwater Elevation Contour Map for September 2010
Figure 9	Gasoline & Benzene in Groundwater
Table 1	Soil Analytical Results
Table 2	Groundwater Analytical Results Summary
Table 4	Groundwater Elevation Data for MW-7 [modified]

By certified mail: (7009 3410 0000 1272 3670)

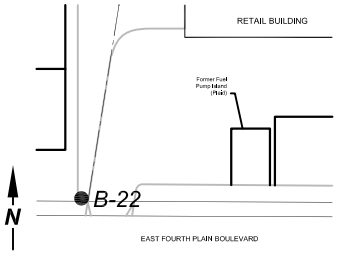
cc: Ms. Louise Piacentini and Mr. Gene McIntosh, C/O M & P Properties
Mr. Bryan DeDoncker, Clark County Health
Mary Shaleen-Hansen – Ecology
Mr. Scott Rose – Ecology
Ms. Dolores Mitchell – Ecology (without enclosures)

Attachment B
Boring Logs

EES
ENVIRONMENTAL CONSULTING, INC.

2405 NE 16th Avenue, Portland, OR 97212
(503) 847-2740
www.ees-environmental.com

LOCATION MAP



WELL/BORING NUMBER B22

PROJECT NAME: Plaid Pantry #23
PROJECT NUMBER: 839-04
LOCATION: Vancouver, WA
LOGGED BY: CH
REVIEWED BY: PE
DATE: 4/19/12

SAMPLE INFORMATION								STRATA	SOIL TYPE	DESCRIPTION (USCS Classification, Depth Interval, Color, Grain Size, Plasticity, Shapes, Mineral Composition, Density or Consistency, Moisture, Odor, Geological Interpretation)	BOREHOLE/WELL CONSTRUCTION DETAIL
SAMPLE TYPE	Blow Counts	PID (ppm)	REC %	First Water	LAB SAMPLE I.D.	DEPTH bgs (ft)	SAMPLE INTERVAL				
		0							ML	Sandy silt, 0'-5', brown, ~80% low plastic fines, 20% fine sand, local tree roots and wood debris, increase sand content with depth, moist, no odor. Note: Air knife to 5' bgs. Wohlers Environmental observed air knife boring and collected soil samples.	
		0				5			SP/ SM	Sand with silt, 5'-16', brown, 80% fine to medium sand, 10-15% low plastic fines, local trace fine to medium subangular gravel, moist, no odor.	
		0									
		0				10					
		0		▽						Wet at ~12'	
		0				15					
Grab		0			B22-15/16					Backfill boring with hydrated bentonite and topsoil.	
						20					
						25					
						30					

DRILLING CONTRACTOR: Major Drilling
DRILLING METHOD: Direct Push
SAMPLING METHOD: Macro Core
DRILLING START DATE: 4-19-12
DRILLING END DATE: 4-19-12

COORDINATES: X530.81, Y396.33
SURFACE ELEVATION: 180.19' MSL
CASING ELEVATION: --
SITE DATUM: NAVD 88
--

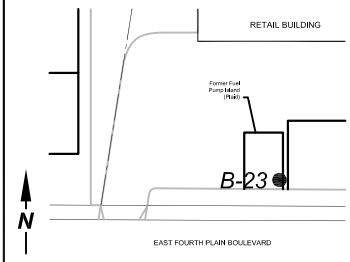
TIME	DATE	DTW

Z:\EES-Autocad\839-04 plaid pantry #23\2012\April 2012\839-04_WL.dwg, Model, 6/6/2012 11:23:22 AM

EES
ENVIRONMENTAL CONSULTING, INC.

2405 NE 16th Avenue, Portland, OR 97212
(503) 847-2740
www.ees-environmental.com

LOCATION MAP



WELL/BORING NUMBER: B23

PROJECT NAME: Plaid Pantry #23
PROJECT NUMBER: 839-04
LOCATION: Vancouver, WA
LOGGED BY: CH
REVIEWED BY: PE
DATE: 4/19/12

SAMPLE INFORMATION								STRATA	SOIL TYPE	DESCRIPTION (USCS Classification, Depth Interval, Color, Grain Size, Plasticity, Shapes, Mineral Composition, Density or Consistency, Moisture, Odor, Geological Interpretation)	BOREHOLE/WELL CONSTRUCTION DETAIL
SAMPLE TYPE	Blow Counts	PID (ppm)	REC %	First Water	LAB SAMPLE I.D.	DEPTH bgs (ft)	SAMPLE INTERVAL				
		0								(0'-0.2') Asphalt.	
									GP	Sandy gravel, 0.2'-3', gray, >50% fine to coarse subangular gravel, <50% fine to coarse sand, up to 10% low plastic fines, moist, no odor (fill).	
		0									
									SP/ SM	Sand with silt, 3'-10', brown, ~80% fine to medium sand, <20% low plastic fines, local fine to medium subangular gravel, moist, no odor.	
		0				5					
		0									
Grab		0			B23-10	10				Backfill boring with hydrated bentonite and asphalt surface patch.	
						15					
						20					
						25					
						30					

DRILLING CONTRACTOR: Major Drilling
DRILLING METHOD: Direct Push
SAMPLING METHOD: Macro Core
DRILLING START DATE: 4-19-12
DRILLING END DATE: 4-19-12

COORDINATES: X618.34, Y399.98
SURFACE ELEVATION: 180.31' MSL
CASING ELEVATION: --
SITE DATUM: NAVD 88
--

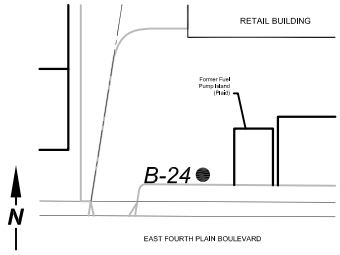
TIME	DATE	DTW

Z:\EES-Autocad\839-04 plaid pantry #23\2012\April 2012\839-04_WL.dwg, Model, 6/6/2012 11:23:04 AM

EES
ENVIRONMENTAL CONSULTING, INC.

2405 NE 16th Avenue, Portland, OR 97212
(503) 847-2740
www.ees-environmental.com

LOCATION MAP



WELL/BORING NUMBER: B24

PROJECT NAME: Plaid Pantry #23
PROJECT NUMBER: 839-04
LOCATION: Vancouver, WA
LOGGED BY: CH
REVIEWED BY: PE
DATE: 4/19/12

SAMPLE INFORMATION

SAMPLE TYPE	Blow Counts	PID (ppm)	REC %	First Water	LAB SAMPLE I.D.	DEPTH bgs (ft)	SAMPLE INTERVAL	STRATA	SOIL TYPE	DESCRIPTION (USCS Classification, Depth Interval, Color, Grain Size, Plasticity, Shapes, Mineral Composition, Density or Consistency, Moisture, Odor, Geological Interpretation)
		0								(0'-0.2') Asphalt.
									GP	Sandy gravel, 0.2'-2.5', gray, >50% fine to coarse subangular gravel, <50% fine to coarse sand, <10% fines, moist, no odor (fill).
									ML	Sandy silt, 2.5'-5', brown, ~75% low plastic fines, ~25% fine sand, damp to moist, no odor.
		0				5			SP	Sand, 5'-15', brown, predominantly fine to medium sand, up to 10% low plastic fines, local trace subround to subangular gravel, moist, no odor.
		0		▽		10				Wet @ 12' bgs.
Grab		0			B24-15	15				Backfill boring with hydrated bentonite and asphalt surface patch.
						20				
						25				
						30				

BOREHOLE/WELL CONSTRUCTION DETAIL

DRILLING CONTRACTOR: Major Drilling
DRILLING METHOD: Direct Push
SAMPLING METHOD: Macro Core
DRILLING START DATE: 4-19-12
DRILLING END DATE: 4-19-12

COORDINATES: X589.75, Y401.24
SURFACE ELEVATION: 179.76' MSL
CASING ELEVATION: --
SITE DATUM: NAVD 88
--

TIME	DATE	DTW

Z:\EES-Autocad\839-04 plaid pantry #23\2012\April 2012\839-04_WL.dwg, Model, 6/6/2012 11:22:42 AM

Attachment C
Laboratory Analytical Reports

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
e-mail: fbi@isomedia.com

April 26, 2012

Paul Ecker
EES Environmental Consulting, Inc.
2405 NE 16th Ave
Portland, OR 97212

Dear Mr. Ecker:

Included are the results from the testing of material submitted on April 20, 2012 from the Plaid 23, PO 839-04, F&BI 204296 project. There are 9 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
EES0426R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 20, 2012 by Friedman & Bruya, Inc. from the EES Environmental Consulting Plaid 23, PO 839-04, F&BI 204296 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	EES Environmental Consulting
204296-01	B22-15/16
204296-02	B23-15
204296-03	B24-10

All quality control requirements were acceptable.

Date of Report: 04/26/12
Date Received: 04/20/12
Project: Plaid 23, PO 839-04, F&BI 204296
Date Extracted: 04/20/12
Date Analyzed: 04/20/12

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-132)
B22-15/16 204296-01	<0.02	<0.02	<0.02	<0.06	<2	95
B23-15 204296-02	<0.02	<0.02	<0.02	<0.06	<2	96
B24-10 204296-03	<0.02	<0.02	<0.02	<0.06	<2	96
Method Blank 02-0663 MB	<0.02	<0.02	<0.02	<0.06	<2	93

Analysis For Total Metals By EPA Method 200.8

Client ID:	B22-15/16	Client:	EES Environmental Consulting
Date Received:	04/20/12	Project:	Plaid 23, PO 839-04, F&BI 204296
Date Extracted:	04/20/12	Lab ID:	204296-01
Date Analyzed:	04/24/12	Data File:	204296-01.031
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	97	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	4.77

Analysis For Total Metals By EPA Method 200.8

Client ID:	B23-15	Client:	EES Environmental Consulting
Date Received:	04/20/12	Project:	Plaid 23, PO 839-04, F&BI 204296
Date Extracted:	04/20/12	Lab ID:	204296-02
Date Analyzed:	04/24/12	Data File:	204296-02.032
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	100	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	6.86

Analysis For Total Metals By EPA Method 200.8

Client ID:	B24-10	Client:	EES Environmental Consulting
Date Received:	04/20/12	Project:	Plaid 23, PO 839-04, F&BI 204296
Date Extracted:	04/20/12	Lab ID:	204296-03
Date Analyzed:	04/24/12	Data File:	204296-03.033
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	98	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	4.80

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	EES Environmental Consulting
Date Received:	NA	Project:	Plaid 23, PO 839-04, F&BI 204296
Date Extracted:	04/20/12	Lab ID:	I2-262 mb
Date Analyzed:	04/24/12	Data File:	I2-262 mb.017
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	<1

Date of Report: 04/26/12
Date Received: 04/20/12
Project: Plaid 23, PO 839-04, F&BI 204296

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 204266-02 (Duplicate)

Analyte	Reporting Units	(Wet Wt) Sample Result	(Wet Wt) Duplicate Result	Relative Percent Difference (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<2	<2	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	81	66-121
Toluene	mg/kg (ppm)	0.5	90	72-128
Ethylbenzene	mg/kg (ppm)	0.5	91	69-132
Xylenes	mg/kg (ppm)	1.5	93	69-131
Gasoline	mg/kg (ppm)	20	105	61-153

Date of Report: 04/26/12
Date Received: 04/20/12
Project: Plaid 23, PO 839-04, F&BI 204296

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 204283-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	mg/kg (ppm)	50	3.18	100	100	64-139	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	mg/kg (ppm)	50	100	83-118

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

204296

SAMPLE CHAIN OF CUSTODY

ME 04-20-12 BI1 / VS1

Page # 1 of

Send Report To Paul Ecker

Company EES

Address 2405 NE 16th Ave.

City, State, ZIP Portland, OR 97212

Phone # (503) 847-2740 Fax #

SAMPLERS (signature)

PROJECT NAME/NO. Plaid 23

PO# 839-04

REMARKS

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
- Rush charges authorized by

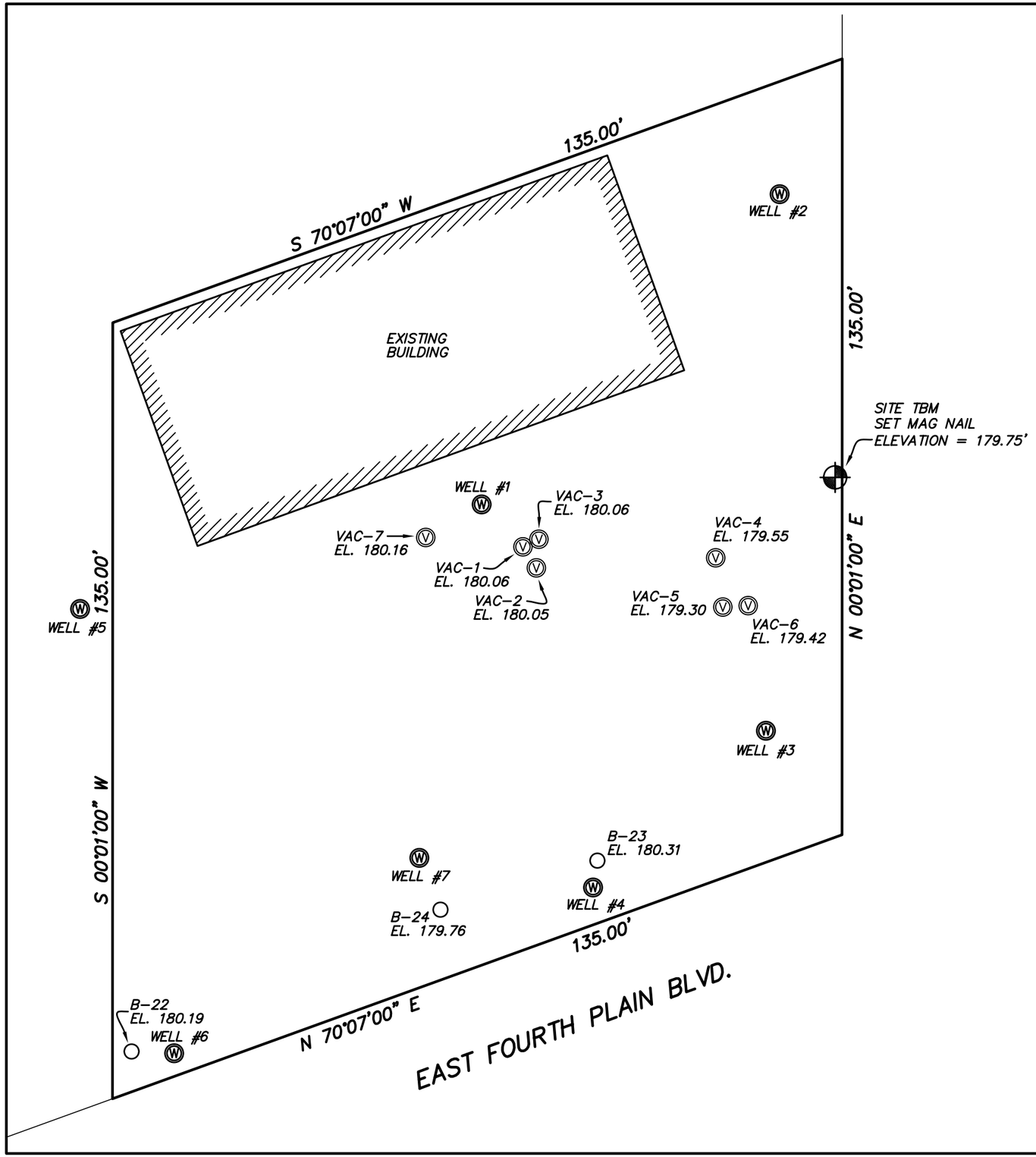
SAMPLE DISPOSAL
- [ ] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Total Pb						Notes
B22-15/16	01A-B	4/19/12	1000	Soil	5		X	X				X						
B23-15	02	↓	1100	↓	5		X	X				X						
B24-10	03	↓	1200	↓	5		X	X				X						

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Craig Hultgren	PNG	4/19/12	1500
Received by:	DO VO	F+BI	4-20-12	8:20
Relinquished by:				
Received by:		Samples received at 6 °C		

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

Attachment D
Wellhead Survey Map



WELL TABLE:

WELL #1
NORTHING: 452.15
EASTING: 682.13
TOP OF RIM: 180.24'
TOP OF CASE: 180.00'

WELL #2
NORTHING: 506.21
EASTING: 734.03
TOP OF RIM: 180.85'
TOP OF CASE: 180.47'

WELL #3
NORTHING: 412.90
EASTING: 731.64
TOP OF RIM: 179.80'
TOP OF CASE: 179.49'

WELL #4
NORTHING: 385.63
EASTING: 701.47
TOP OF RIM: 180.88'
TOP OF CASE: 180.57'

WELL #5
NORTHING: 434.03
EASTING: 612.24
TOP OF RIM: 180.89'
TOP OF CASE: 180.50'

WELL #6
NORTHING: 356.63
EASTING: 628.58
TOP OF RIM: 180.05'
TOP OF CASE: 179.72'

WELL #7
NORTHING: 390.88
EASTING: 671.27
TOP OF RIM: 179.69'
TOP OF CASE: 179.28'

NOTES:

1. THE VERTICAL DATUM FOR THIS REPORT IS BASED UPON A FOUND BENCHMARK POINT ID 206, BENCHMARK DESCRIPTION HAZEL-99, ELEVATION= 238.04, NAVD 88 DATUM.
2. THE HORIZONTAL COORDINATE SYSTEM USED FOR THIS REPORT IS AN ASSUMED LOCAL COORDINATE SYSTEM.
3. THE HORIZONTAL LOCATION OF THE WELLS SHOWN HEREON IS THE CENTER OF THE EXISTING WELLS.
4. THE ELEVATION SHOWN FOR THE RIM OF THE WELLS SHOWN HEREON WERE TAKEN ON THE NORTH EDGE OF THE RIM AS INSTRUCTED.
5. THE ELEVATION SHOWN FOR THE TOP OF CASE SHOWN HEREON WERE TAKEN ON THE NORTH EDGE OF THE TOP OF CASE AS INSTRUCTED.

N

SIGNED ON: _____

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
NOVEMBER 30, 2007
JAMES BURTON BROWN
60379

VALID THROUGH DECEMBER 31, 2013

WELL MONITORING

N.W. 1/4 SEC. 19, T.2N., R.2E., W.M.

CITY OF VANCOUVER
CLARK COUNTY, WASHINGTON
APRIL 23, 2012
DRAWN BY: MPW CHECKED BY: JBB
SCALE 1"=20' CLIENT: EES
M:\PROJECTS\PNG-EES FOURTH PLAIN

5210 E. FOURTH PLAIN BLVD.
VANCOUVER, WA

CENTERLINE CONCEPTS
LAND SURVEYING, INC.
729 MOLALLA AVE., SUITE 1 & 2
OREGON CITY, OREGON 97045
PHONE 503.650.0188 FAX 503.650.0189