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## Technical Memorandum

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To: Mark Conan, Plaid Pantries, Inc.  
From: Paul Ecker, LHG and Chris Rhea, LG  
Date: August 28, 2015

**Subject: Remedial Investigation Supplemental Work Plan**  
Plaid Pantries Store #112  
1002 West Fourth Plain Boulevard  
Vancouver, Washington  
Ecology VCP File #SW1314  
EES Project #1179

EES Environmental Consulting, Inc. (EES) has prepared this work plan to describe proposed Remedial Investigation (RI) activities at the Plaid Pantries (Plaid) Store #112 Site located in Vancouver, Washington (Figure 1). The purpose of proposed investigation activities is to evaluate identified RI data gaps so that gasoline-related impacts at this subject Property are fully delineated, and to develop a conceptual site model and site-specific "Method B" soil cleanup levels that can be applied to future cleanup planning. We expect that a final RI report will be issued after successful completion of the RI tasks as described in this work plan.

This work plan incorporates Site data developed as of April 2015 as discussed with Plaid and the Washington Department of Ecology (Ecology). Maps illustrating the Site location and pertinent features are provided as Figures 1 through 8. Soil and soil vapor analytical testing results are summarized in Tables 1 and 2. Contaminants of Interest (COIs) at the Site include gasoline and related constituents which appear to be limited to shallow soil and vapors beneath the Property and the adjacent Fourth Plain right-of-way (ROW). Groundwater has not been encountered at the Site, is not anticipated within 60 to 80 feet of ground surface, and is not regarded as an affected or threatened medium with regard to gasoline impacts.

Non-gasoline chlorinated solvents including tetrachloroethene (PCE) are present in subsurface vapors at this Site, but are not known or suspected to be related to any current or past fueling or other operations conducted by Plaid. As discussed with and confirmed by Ecology in a meeting on April 30, 2015, Plaid is not responsible for the release of non-gasoline chemical impacts and therefore is not conducting further investigation or cleanup of such chemicals.

## BACKGROUND

The subject Property is located at the northwest corner of Kauffman Avenue and West Fourth Plain Boulevard in Vancouver, Washington (Figures 1 and 2). The 0.26-acre Property is owned by Louise Piacentini and is occupied by a single commercial building. Building tenants include a Plaid convenience store with retail gasoline station, and a Domino's Pizza restaurant (Figure 2). Identified underground utilities on the Property and Site are illustrated on Figure 3.

Remedial investigation efforts to date have identified and evaluated two primary contaminants of concern at the Property: gasoline and chlorinated solvents (as well as related chemical constituents). Gasoline impacts in soil have extended beyond Property margins to the south, beneath the adjacent Fourth Plain Boulevard public right-of-way. The entire area where contamination originating at the Property has come to be located, including potential migration pathways and areas beyond Property boundaries, is defined under MTCA as the Site.

- Gasoline contamination appears to be associated with historical fueling infrastructure, including an abandoned underground tank unrelated to Plaid's operations that Plaid discovered and removed in early 2012. Fuel/petroleum releases may have occurred on the Property prior to Plaid's operations, during its long period of use as a gasoline service station dating back to the 1950s or before. Gasoline-contaminated soils exceeding regulatory cleanup levels have been identified in the fuel pump island area where the abandoned tank was discovered, and extending beyond the southern Property boundary beneath a portion of the sidewalk and Fourth Plain Boulevard (Table 1; Figures 4 through 6).
- Gasoline volatile organic compounds (VOCs) have been measured at concentrations exceeding Ecology's published soil vapor screening criteria (Table 2) in the former tank area. Non-gasoline VOCs were also detected in the soil vapor, including PCE and various other chlorinated compounds typically associated with dry cleaning, paint stripping, and other commercial/industrial activities. The non-gasoline VOCs are not related to Plaid's gasoline fueling station operations on the Property. To date, non-gasoline related VOCs have been detected only in subsurface soil vapors (i.e., not soil or other media), and the non-gasoline VOC source(s) and distribution across the Site have not been fully characterized.

## PLAID FACILITY OPERATIONS

Plaid's operations on the Property included a retail gasoline station and convenience store, which were constructed in 1982 and opened for business in January 1983. Plaid's operating underground gasoline storage tank system includes two 12,000-gallon tanks and one 10,000-gallon tank. During Plaid's operations, only gasoline has been stored and dispensed at the Property. Leaded gasoline is not known to have been used by Plaid during its operations. Plaid did not store or dispense other hydrocarbons such as diesel fuel, bulk motor oil, waste oil, or solvents at any time during its facility operations.

## HISTORICAL PROPERTY OPERATIONS

City directories and building permit information indicate that operations on the Property between the 1940s and 1982 included a gasoline service station, an auto repair shop, an auto detailing and

upholstery shop, a dry cleaner, a barber shop, a dairy, a wood furniture refinishing shop, and a thrift store. According to the Property owner's representative, a building and two underground fuel storage tanks (3,000 and 5,000 gallon capacity) were removed prior to Plaid's redevelopment activities in the early 1980s.

## REGULATORY AND SITE CLEANUP STATUS

Ongoing site investigation and cleanup activities are being conducted by Plaid in accordance with Washington's Model Toxics Control Act (MTCA Chapter 173-340 WAC) and requirements governing petroleum UST systems (173-360 WAC). Ecology's published guidance for the remediation of petroleum-contaminated sites (2011) is applicable and incorporated into this ongoing work. Plaid enrolled in Ecology's Voluntary Cleanup Program (VCP) in 2013 and has submitted pertinent technical documents to the Department for review and comment.

Because gasoline impacts identified at the Site exceeded default MTCA Method A soil cleanup criteria and vapor screening levels, Plaid initiated focused cleanup actions in 2013 to control vapor migration and to mitigate identified soil impacts. The streamlined remedy includes ongoing soil vapor extraction at the gasoline source area and is consistent with elements of an Interim Action (WAC 173-340-430). Interim action operations and performance trends are reported on a quarterly basis.

As discussed with Ecology managers on April 30, 2015, additional efforts are necessary to satisfy regulatory criteria required under MTCA for the remedial investigation and feasibility study (RI/FS) process for this Site. Although the RI is nearly complete, several investigation data gaps should be resolved before proceeding with final cleanup planning under the FS:

- The Conceptual Site Model needs to be updated to evaluate reasonable vapor migration pathways and potential contaminant receptors both at the Property and beyond Property boundaries. A vapor intrusion assessment is proposed to characterize potential vapor impacts and migration pathways (1) approaching the Property building and (2) at off-Property Site locations including the adjacent right-of-way and public and private underground utility infrastructure where highly-permeable granular bedding materials may be present.
- Site cleanup levels must be established under the RI and approved by Ecology before determining Site cleanup options. The use of default Method A soil cleanup levels is broadly applicable to this Site. However, MTCA allows for the calculation of Site-specific Method B cleanup levels which are expected to result in more appropriate and achievable gasoline cleanup levels. Limited additional soil sampling and analytical testing is necessary in order to develop Method B cleanup levels.

## REMEDIATION INVESTIGATION STATUS

Soil and baseline soil gas data were presented in the *Site Assessment Report* dated December 27, 2012 and in subsequent status reports as provided to Ecology. Soil data and default MTCA Method A and Standard Method B soil cleanup levels are provided in Table 1. Soil vapor and SVE emissions data, as well as MTCA Method B cleanup levels (for air) and Ecology screening levels (for soil gas) are shown on Table 2. These published MTCA cleanup and screening levels are appropriate for initial use at the Site,

although final decisions regarding cleanup levels, remedy selection, and cleanup action planning have not been developed at this time. Site-specific Method B cleanup levels will be determined as part of proposed supplemental RI activities addressed under this work plan.

- Residual gasoline concentrations exceed the MTCA Method A soil cleanup level of 30 milligrams per kilogram (mg/kg) on the Property at the Plaid fuel dispenser area and beyond Property boundaries to the south, as illustrated in Figures 4 and 5. Various gasoline constituents also exceed the default MTCA soil cleanup levels (Table 1).
- Non-gasoline chlorinated solvents are present in vapor phase but have not been identified in Site soils. The source of non-gasoline VOCs in soil vapors has not been determined. Because Plaid's operations did not involve non-gasoline chlorinated solvents, Plaid is not conducting further evaluations of non-gasoline VOCs.
- Subsurface vapor concentrations near the fuel dispenser area exceed Ecology's published soil gas screening levels, with gasoline, benzene, and PCE being the primary COIs among subsurface vapors (Table 2). Vapor concentrations in this localized area appear to be controlled and significantly reduced during operation of the SVE system.
- Detections of gasoline in soil extending beneath the Fourth Plain Boulevard right-of-way exceeds 20,000 mg/kg. Subsurface conditions south of the Property beneath the adjacent right-of-way present possible soil and utility corridor contaminant migration and potential exposure pathways that have not been evaluated to date (Figures 5 and 6).
- Ambient air screening levels have been established under Ecology guidance (2010) and standard MTCA Method B air cleanup levels have been published. The applicability of these ambient air numeric criteria to Site conditions has not been determined at this time, because the current operation of an active gasoline station likely establishes an exemption from MTCA's risk-based air cleanup standards (which are typically superseded by less-restrictive worker protection rules under OSHA). The applicability of Ecology/MTCA air and vapor intrusion assessment criteria with regard to non-Plaid store employees and neighboring facilities has not been evaluated.
- RI findings indicate groundwater has not been encountered at maximum exploration depths up to 40 feet bgs and is not anticipated within 60 to 80 feet bgs, indicating a separation of the contamination from groundwater by at least 25 feet. With regard to gasoline contamination, groundwater impacts are not suspected and have not been of concern to Ecology.

## INTERIM ACTION STATUS

The current SVE system is effective at mitigating known source-area gasoline contamination on the subject Property. Operation of the SVE system has resulted in diminished gasoline vapor concentrations and mass removal rates within the limited treatment zone.

- Gasoline and benzene vapor concentrations remain above Ecology soil gas screening levels at the SVE-1 location, where residual soil impacts are inferred to persist.
- PCE vapor concentrations exceeding soil gas screening criteria are observed at all five SVE wells, with the greatest concentrations at deep well SVE-4. Unlike gasoline for which a limited and shallow source area has been defined, the nature and extent of PCE and other chlorinated vapors has not been determined.

System modification and expansion may be appropriate to address gasoline contamination in deeper source-area soils, to mitigate vapor intrusion concerns, and to address off-Property impacts. These issues will be further evaluated in the FS, following vapor assessment, establishment of final Site cleanup levels, and completion of the RI.

## SUPPLEMENTAL INVESTIGATION WORK SCOPE

Supplemental activities are planned in an effort to complete the RI. These tasks are intended to address identified investigation data gaps as discussed with Ecology, including (1) assessing potential gasoline vapor intrusion and vapor migration pathways/receptors, (2) updating the Conceptual Site Model, and (3) developing site-specific MTCA Method B soil cleanup levels. EES will prepare an RI report upon resolution of the data gaps.

### FIELD PREPARATION AND RESEARCH

- Review available documents to confirm Property boundaries with regard to the adjacent Fourth Plain Boulevard where gasoline contamination has migrated.
- Update the site Health and Safety Plan to guide field safety protocols, in accordance with rules established by the Occupational Safety and Health Administration (OSHA).
- Procure City of Vancouver permits as necessary to allow sampling and vapor monitoring well installation in specified right-of-way areas.
- Request utility identification through the public Northwest Utility Notification Center (NUNC) as required before drilling.
- Contract with a qualified local firm in an attempt to identify underground utility features and conduits located at each planned drilling location.
- Contract with flagging company to prepare a site-specific traffic control plan and provide flagging services during ROW work activities.
- Contact owners of nearby utilities to identify depth and location of underground utility infrastructure. Obtain authorization if possible for temporary access and to evaluate soil vapor conditions in underground utility areas.

### SOIL AND SOIL VAPOR SAMPLING

Soil and soil vapor sampling and analysis tasks will be conducted to support Method B cleanup level development and to evaluate potential vapor intrusion/migration issues. Standard operating procedures for proposed field and related sampling activities are available upon request.

### SOIL BORINGS

Advance five direct-push soil borings at the Site's most contaminated locations (Figure 7). Soil data collected from this area will be used for quantitative VPH analysis and calculation of Site-specific Method B cleanup levels in accordance with Ecology guidance (2011). Borings will be advanced to terminal depths of up to 20 feet below ground surface (bgs) as described below. After sampling, two of

these borings located in the public sidewalk area will be converted into re-useable vapor monitoring wells for future characterization and monitoring purposes.

- At each drilling location, EES will retrieve, examine, and log continuous soil cores in five foot long segments during drilling. Soil samples will be field screened for volatile organic vapors using a photo ionization detector (PID). A minimum of one soil sample per boring will be collected from the most highly contaminated zone (5 to 10 feet bgs) for laboratory analysis based on field screening results and soil conditions observed.
- After collecting soil samples, two of the borings located in the public right-of-way will be completed as vapor monitoring wells. The vapor wells will be screened separately in shallow (5 to 10 feet bgs) and deep (15 to 20 feet bgs) intervals for characterization sampling, and can also be converted for future use and performance evaluation of SVE system parameters such as airflow, vacuum influence, and vapor concentration trends over time.

### **SOIL GAS AND UTILITY CORRIDOR VAPOR BORINGS**

Advance shallow soil gas borings to provide vapor intrusion and vapor migration assessment, particularly with regard to existing underground utility infrastructure located in close proximity to known soil impacts at the Site. Typical soil gas samples will be collected at depths of 5 feet bgs, while vapor samples from utility corridor backfill materials may range in depth between approximately 3 and 10 feet bgs. Targeted sample locations are described below, and shown on Figure 8.

- Two soil gas borings are proposed in the asphalt parking area immediately south of the existing Plaid/Domino's store building to delineate gasoline vapors north of the source-area and to evaluate potential vapor intrusion into the building. In view of continuing SVE operations and ongoing vapor data needs, one of these sampling points will be converted to a re-useable vapor monitoring well, screened between 5 and 10 feet bgs.
- Four soil gas borings are proposed near previous soil gas sampling locations S-1 through S-4 for comparison to elevated vapor concentrations identified during the 2013 investigation (originally sampled prior to beginning SVE operations). The sampling point advanced at S-3 (slightly north of the source area) will be converted to a re-useable vapor monitoring well, screened between 5 and 10 feet bgs.
- Re-useable vapor monitoring well points will be installed if possible at three Property locations within trench bedding materials in locations traversing or near the soil gasoline source area. Gasoline vapors, if present in these bedding materials, could migrate towards the Property building or (within the sewer line trench) away from the Property into the Fourth Plain public right-of-way where the sanitary sewer main line is present.
- In addition to the two sidewalk soil gas sampling and well installation locations described above, up to 10 soil gas borings are proposed within the Fourth Plain ROW in an effort to delineate gasoline vapors extending south of the Property and potentially migrating into utility corridors in this area. Underground utility bedding materials will be accessed if possible (after securing permission from utility owners) by careful use of an air knife/hand auger system to minimize the risk of infrastructure damage. EES will attempt to identify backfill material and collect vapor samples from various utility trench locations to evaluate these possible preferential vapor migration pathways where they are located in close proximity to soil impacts. Ideal sampling locations are noted below, subject to confirming

line locations and practical and safe access (preliminary discussions with utility representatives indicate the proposed sampling locations are feasible).

- One vapor sample will be collected from the fiber-optic trench backfill material in the access vault located southwest of the Property.
- One vapor sample will be collected from the City water main trench backfill at the gate valve access location in the Fourth Plain ROW.
- One vapor sample will be collected from the City water main trench backfill located south of the Property in the ROW.

## **VAPOR MONITORING WELL INSTALLATION**

As described above, seven vapor monitoring wells are proposed at targeted locations across the Site, and will be constructed in a manner which supports continued future vapor monitoring, and future SVE use and performance evaluation. Vapor well construction will consist of 1 or 2 inch diameter schedule 40 PVC casing fitted with 0.020-inch slotted screens. Depending on sampling location, each well will be screened at shallow (5 to 10 feet bgs) or deep (15 to 20 feet bgs) intervals, or in utility trench backfill material (at various depths). Proposed typical well construction schematics are presented on Figures 9a and 9b.

## **ANALYTICAL TESTING**

### **SOIL**

EES will submit selected soil samples for laboratory analyses to evaluate current soil conditions and in support of development of site-specific MTCA Method B cleanup levels. A minimum of one soil sample will be submitted from each of the five borings as indicated below. Additional samples may also be analyzed based on field observations and/or preliminary laboratory analytical results.

- Gasoline-range petroleum hydrocarbons by Method NWTPH-Gx.
- VOCs by EPA Method 8260.
- Fuel fraction analysis by Method NWTPH-VPH.
- Organic carbon content by EPA Method 5310B.
- Moisture content by ASTM Method D-2216.

### **SOIL VAPOR**

At each soil gas sampling location, EES will purge and collect discrete soil gas samples using specially-designed sampling equipment and laboratory-certified Summa canisters.

- Submit up to 21 vapor samples for laboratory analysis of gasoline and related volatile constituents by EPA Method TO-15.

## **DEVELOPMENT OF METHOD B CLEANUP LEVELS**

As discussed with Ecology and in accordance with published guidance, the results of supplemental soil testing will be used to calculate site-specific MTCA Method B soil cleanup levels. The methodology



presented in Ecology's 2011 Guidance will provide the framework for calculating the standard MTCA B cleanup values for TPH.

### CONCEPTUAL SITE MODEL REVISION

The Conceptual Site Model (CSM) evaluates current and reasonably likely future Site conditions, and identifies potential sources of hazardous substances, potentially affected media, and potential migration and exposure pathways for anticipated human and ecological receptors. The CSM is a required element of Site cleanup planning (Ecology 2011), and will be updated to reflect current site conditions as determined during this supplemental investigation.

### PROPOSED SCHEDULE AND REPORTING

EES proposes to initiate supplemental site investigation work plan activities immediately, subject to Plaid's authorization, Ecology's approval of this work plan, and site access/right-of-way permitting. Field sampling activities will require approximately one week to complete.

Upon completion of all specified field and analytical testing activities, EES will compile pertinent documentation and prepare a draft RI Report. The RI Report will be prepared in accordance with Ecology guidance and will include the following elements:

- Site Description (including site and neighborhood setting, site description and zoning, physiographic setting, and regulatory status)
- Property Development and History (Plaid operations and underground utilities)
- Environmental Investigation and Interim Action Summary
- Natural Setting (soil and groundwater conditions)
- Contaminant Occurrence and Movement (soil and vapor)
- Conceptual Site Model
- Terrestrial Ecological Evaluation
- Preliminary Cleanup Levels
- Areas Potentially Requiring Cleanup
- Recommended Next Steps

### ASSUMPTIONS

The proposed work is recommended in accordance with Ecology's published environmental cleanup rules and EES's experience at similar sites as well as recent discussions with Plaid and Ecology. Additional investigation or remedial actions may be required to fully address areas of concern, if identified.



## ATTACHMENTS

Tables	Table 1: Soil Analytical Results - Fuels and Related Constituents Table 2: Soil Vapor Results - Fuels and Related Constituents
Figures	Figure 1: Vicinity Map Figure 2: Site Features Figure 3: Utility Map Figure 4: Maximum Gasoline Concentrations in Soil (2012) Figure 5: North-South Cross Section A-A' Figure 6: Benzene Concentrations in Soil Vapor (2012) Figure 7: Proposed Soil Sample Locations Figure 8: Proposed Vapor Sample Locations Figure 9a: Proposed Soil Vapor Monitoring Point Construction Figure 9b: Proposed Utility Vapor Monitoring Point Construction

## REFERENCES

Ecology, 2009. *Draft Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*. Washington Department of Ecology, Toxics Cleanup Program. October 2009.

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EES 2012. *Site Assessment Report - Plaid Pantry Store #112*. EES Environmental Consulting. December 31, 2012.

EES 2014. *Interim Remedial Action Status Report - Plaid Pantry Store #112*. EES Environmental Consulting. February 3, 2014.

Phillips, William M. *Geologic Map of the Vancouver Quadrangle, Washington and Oregon*. Washington Division of Geology and Earth Resources Open File Report 87-10. 1987.

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# TABLES

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TABLE 1  
Soil Analytical Results - Gasoline, Diesel, and Related Constituents (mg/kg)  
Plaid Pantry No. 112  
Vancouver, Washington

Location	Date	Sample Depth (feet)	Gasoline	Diesel	Heavy Oil/Lube	Benzene	Toluene	Ethylbenzene	Xylenes	EDB	EDC	MTBE	Naphthalene	Lead	PCE	TCE	2-Butanone	Carbon Tetrachloride	1,1,1-Trichloroethane
Soil Cleanup Levels																			
MTCA Method A <sup>1</sup> Unrestricted Use			100,30 <sup>2</sup>	2,000	2,000	0.03	7	6	9	0.005	NA	0.10	5	250	0.05	0.03	NA	NA	2
MTCA Method B <sup>3</sup>			NC	NC	NC	18.2	6,400 <sup>4</sup>	8,000 <sup>4</sup>	16,000 <sup>4</sup>	0.5	11	556	1,600 <sup>4</sup>	NC	476	12	NC	14.3	160,000 <sup>4</sup>
B1-3	09/08/2011	3	24 U	59 U	118 U	0.011 U	0.044 U	0.022 U	0.065 U	0.022 U	0.022 U	0.044 U	0.087 U	-	0.022 U	0.022 U	0.44 U	0.022 U	0.022 U
B1-9	09/08/2011	9	22 U	54 U	108 U	0.013 U	0.051 U	0.026 U	0.077 U	0.026 U	0.026 U	0.051 U	0.10 U	8.3	0.026 U	0.026 U	0.51 U	0.026 U	0.026 U
B1-15	09/08/2011	15	21 U	52 U	103 U	0.013 U	0.052 U	0.026 U	0.078 U	0.026 U	0.026 U	0.052 U	0.10 U	-	0.026 U	0.026 U	0.52 U	0.026 U	0.026 U
B2-3	09/07/2011	3	21 U	53 U	107 U	0.011 U	0.043 U	0.022 U	0.065 U	0.022 U	0.022 U	0.043 U	0.087 U	-	0.022 U	0.022 U	0.43 U	0.022 U	0.022 U
B2-9	09/07/2011	9	25 U	25 U <sup>b1</sup>	54 <sup>b1</sup>	0.0088 U	0.035 U	0.018 U	0.053 U	0.018 U	0.018 U	0.035 U	0.010 U <sup>d</sup>	-	0.018 U	0.018 U	0.35 U	0.018 U	0.018 U
B2-15	09/09/2011	15	21 U	53 U	105 U	0.0068 U	0.027 U	0.014 U	0.041 U	0.014 U	0.014 U	0.027 U	0.054 U	-	0.014 U	0.014 U	0.27 U	0.014 U	0.014 U
B3-3	09/07/2011	3	23 U	57 U	113 U	0.012 U	0.047 U	0.024 U	0.071 U	0.024 U	0.024 U	0.047 U	0.094 U	-	0.024 U	0.024 U	0.47 U	0.024 U	0.024 U
B3-9	09/07/2011	9	26 U	64 U	128 U	0.014 U	0.055 U	0.028 U	0.083 U	0.028 U	0.028 U	0.055 U	0.11 U	12	0.028 U	0.028 U	0.55 U	0.028 U	0.028 U
B4-3	09/07/2011	3	23 U	57 U	114 U	0.013 U	0.051 U	0.026 U	0.076 U	0.026 U	0.026 U	0.051 U	0.10 U	-	0.026 U	0.026 U	0.51 U	0.026 U	0.026 U
B4-9	09/07/2011	9	21 U	53 U	106 U	0.012 U	0.049 U	0.024 U	0.073 U	0.024 U	0.024 U	0.049 U	0.097 U	-	0.024 U	0.024 U	0.49 U	0.024 U	0.024 U
B5-3	09/08/2011	3	22 U	56 U	112 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5-6	09/08/2011	6	2,900 <sup>a</sup>	>57 <sup>c</sup>	114 U	0.28 U	1.1 U	12	74	0.56 U	0.56 U	1.1 U	14	21	0.56 U	0.56 U	11 U	0.56 U	0.56 U
B5-9	09/08/2011	9	4,070 <sup>a</sup>	>54 <sup>c</sup>	108 U	0.24 U	0.95 U	29	121	0.48 U	0.48 U	0.95 U	8.8	11	0.48 U	0.48 U	9.5 U	0.48 U	0.48 U
B5-12.5	09/08/2011	12.5	444 <sup>a</sup>	638 <sup>b,c</sup>	50 U <sup>b</sup>	2.1	0.13 U	5.3	21	0.063 U	0.063 U	0.13 U	1.1	13	0.063 U	0.063 U	1.3 U	0.063 U	0.13 U
B5-20	09/08/2011	20	2.9 U <sup>a</sup>	-	-	0.0073 U	0.029 U	0.015 U	0.044 U	0.015 U	0.015 U	0.029 U	0.058 U	-	0.015 U	0.015 U	0.29 U	0.015 U	0.015 U
B6-3	09/08/2011	3	22 U	54 U	107 U	0.0096 U	0.038 U	0.019 U	0.057 U	0.019 U	0.019 U	0.038 U	0.077 U	-	0.019 U	0.019 U	0.38 U	0.019 U	0.019 U
B6-9	09/08/2011	9	23 U	58 U	116 U	0.0093 U	0.037 U	0.019 U	0.056 U	0.019 U	0.019 U	0.037 U	0.074 U	-	0.019 U	0.019 U	0.37 U	0.019 U	0.019 U
B6-12	09/09/2011	12	26 U	64 U	128 U	0.011 U	0.044 U	0.022 U	0.065 U	0.022 U	0.022 U	0.044 U	0.087 U	-	0.022 U	0.022 U	0.44 U	0.022 U	0.022 U
SVE-1/5.0	02/03/2012	5	22 U	55 U	110 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SVE-1/10.0	02/03/2012	10	2,750 <sup>a</sup>	>56.1 <sup>c</sup>	112 U	0.39	48	40	301	0.19 U	0.16 U	0.62 U	13	7.6	0.31 U	0.31 U	6.2 U	0.31 U	0.31 U
PIT S/1.5	02/14/2012	1.5	23 U	25 U <sup>b</sup>	116 <sup>b</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tank Sludge	02/14/2012	NA	2,410 <sup>a</sup>	172 U <sup>c</sup>	345 U	0.040 J	1.9	2.7	19	0.090 U	0.090 U	0.19 U	7.1 <sup>e</sup>	-	0.094 U	0.094 U	2.8 U	0.094 U	0.094 U
PIT N/2	02/14/2012	2	21 U	52 U	104 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PIT N/6	02/14/2012	6	8.7 U <sup>a</sup>	57 <sup>c</sup>	113 U	0.020 U	0.090 U	0.040 U	0.14	0.040 U	0.040 U	0.090 U	0.17 U	-	0.043 U	0.043 U	0.87 U	0.043 U	0.043 U
PIT S/2	02/14/2012	2	1,320 <sup>a</sup>	54 <sup>c</sup>	109 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PIT S/6	02/14/2012	6	5,800 <sup>a</sup>	62 <sup>c</sup>	124 U	3.4	23	78	411	0.81 U	0.81 U	1.6 U	34	-	0.81 U	0.81 U	16 U	0.81 U	0.81 U
PIT E/2	02/14/2012	2	24 U	60 U	120 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PIT E/6	02/14/2012	6	64,200 <sup>a</sup>	62 <sup>c</sup>	123 U	93	3,570	1,350	9,090	6.5 U	6.5 U	13 U	241	-	6.5 U	6.5 U	182 U	6.5 U	6.5 U
PIT W/2	02/14/2012	2	1,210 <sup>a</sup>	59 <sup>c</sup>	118 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PIT W/6	02/14/2012	6	18,700 <sup>a</sup>	61 <sup>c</sup>	122 U	26	572	296	1,693	1.6 U	1.6 U	3.2 U	67	-	1.6 U	1.6 U	48 U	1.6 U	1.6 U
PIT Floor/6	02/14/2012	6	34,900 <sup>a</sup>	2,660 <sup>b</sup>	81 U <sup>b</sup>	56	1,460	609	3,605	0.81 U	0.81 U	1.6 U	27 <sup>e</sup>	-	0.81 U	0.81 U	105 U	0.81 U	0.81 U

TABLE 1 Soil Analytical Results - Gasoline, Diesel, and Related Constituents (mg/kg) Plaid Pantry No. 112 Vancouver, Washington																			
Location	Date	Sample Depth (feet)	Gasoline	Diesel	Heavy Oil/Lube	Benzene	Toluene	Ethylbenzene	Xylenes	EDB	EDC	MTBE	Naphthalene	Lead	PCE	TCE	2-Butanone	Carbon Tetrachloride	1,1,1-Trichloroethane
Soil Cleanup Levels																			
MTCA Method A <sup>1</sup> Unrestricted Use			100,30 <sup>2</sup>	2,000	2,000	0.03	7	6	9	0.005	NA	0.10	5	250	0.05	0.03	NA	NA	2
MTCA Method B <sup>3</sup>			NC	NC	NC	18.2	6,400 <sup>4</sup>	8,000 <sup>4</sup>	16,000 <sup>4</sup>	0.5	11	556	1,600 <sup>4</sup>	NC	476	12	NC	14.3	160,000 <sup>4</sup>
B-7/6	08/16/2012	6	473 <sup>a</sup>	-	-	0.21 U	0.86 U	2.1	12	0.011 U <sup>e</sup>	0.43 U	0.86 U	1.7 U	-	0.43 U	0.43 U	8.6 U	0.43 U	0.43 U
B-7/9	08/16/2012	9	1,730 <sup>a</sup>	-	-	0.80	0.82 U	0.89	1.2 U	0.41 U	0.41 U	0.82 U	1.6 U	-	0.41 U	0.41 U	8.2 U	0.41 U	0.41 U
B-7/13	08/16/2012	13	303 <sup>a</sup>	-	-	0.15	0.089 U	0.17	0.25	0.0089 U <sup>e</sup>	0.045 U	0.089 U	0.30	-	0.045 U	0.045 U	0.89 U	0.045 U	0.045 U
B-7/14	08/16/2012	14	5.8 U <sup>a</sup>	-	-	0.015 U	0.058 U	0.029 U	0.087 U	0.0058 U <sup>e</sup>	0.029 U	0.058 U	0.12 U	-	0.029 U	0.029 U	0.58 U	0.029 U	0.029 U
B-8/6	08/16/2012	6	8.4 U <sup>a</sup>	-	-	0.026	0.084 U	0.072	0.30	0.0084 U <sup>e</sup>	0.042 U	0.084 U	0.17 U	-	0.042 U	0.042 U	0.84 U	0.042 U	0.042 U
B-8/9	08/16/2012	9	7.4 U <sup>a</sup>	-	-	0.042	0.074 U	0.037 U	0.25	0.037 U	0.037 U	0.074 U	0.15 U	-	0.037 U	0.037 U	0.74 U	0.037 U	0.037 U
B-8/13	08/16/2012	13	8.9 U <sup>a</sup>	-	-	0.022 U	0.089 U	0.044 U	0.13 U	0.0089 U <sup>e</sup>	0.044 U	0.089 U	0.18 U	-	0.044 U	0.044 U	0.88 U	0.044 U	0.044 U
B-9/3	08/13/2012	3	5.7 U <sup>a</sup>	59 U	117 U	0.014 U	0.057 U	0.029 U	0.086 U	0.029 U	0.029 U	0.057 U	0.11 U	-	0.029 U	0.029 U	0.57 U	0.029 U	0.029 U
B-9/6	08/13/2012	6	5.2 U <sup>a</sup>	-	-	0.013 U	0.052 U	0.026 U	0.078 U	0.026 U	0.026 U	0.052 U	0.10 U	-	0.026 U	0.026 U	0.52 U	0.026 U	0.026 U
B-9/9	08/13/2012	9	8.2 U <sup>a</sup>	-	-	0.020 U	0.082 U	0.041 U	0.12 U	0.041 U	0.041 U	0.082 U	0.16 U	-	0.041 U	0.041 U	0.82 U	0.041 U	0.041 U
B-9/13	08/13/2012	13	5.9 U <sup>a</sup>	-	-	0.015 U	0.059 U	0.029 U	0.088 U	0.029 U	0.029 U	0.059 U	0.12 U	-	0.029 U	0.029 U	0.59 U	0.029 U	0.029 U
B-10/3	08/13/2012	3	5.4 U <sup>a</sup>	55 U	109 U	0.013 U	0.054 U	0.027 U	0.080 U	0.027 U	0.027 U	0.054 U	0.11 U	-	0.027 U	0.027 U	0.54 U	0.027 U	0.027 U
B-10/6	08/13/2012	6	9.2 U <sup>a</sup>	-	-	0.023 U	0.092 U	0.046 U	0.14 U	0.046 U	0.046 U	0.092 U	0.18 U	-	0.046 U	0.046 U	0.92 U	0.046 U	0.046 U
B-10/9	08/13/2012	9	11 U <sup>a</sup>	-	-	0.028 U	0.11 U	0.056 U	0.17 U	0.056 U	0.056 U	0.11 U	0.22 U	-	0.056 U	0.056 U	1.1 U	0.056 U	0.056 U
B-10/13	08/13/2012	13	4.7 U <sup>a</sup>	-	-	0.012 U	0.047 U	0.024 U	0.071 U	0.024 U	0.024 U	0.047 U	0.095 U	-	0.024 U	0.024 U	0.47 U	0.024 U	0.024 U
B-10/18	08/13/2012	18	20 U	51 U	102 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-11/3	08/14/2012	3	13 <sup>a</sup>	56 U	113 U	0.017 U	0.068 U	0.034 U	0.10 U	0.034 U	0.034 U	0.068 U	0.14 U	-	0.034 U	0.034 U	0.68 U	0.034 U	0.034 U
B-11/6	08/14/2012	6	20,400 <sup>a</sup>	62 X	123 U	3.7	0.81 U	3.9	1.6 U	0.41 U	0.41 U	0.81 U	57	24	0.41 U	0.41 U	8.1 U	0.41 U	0.41 U
B-11/9	08/14/2012	9	1,560 <sup>a</sup>	-	-	0.47	0.095 U	0.62	0.14 U	0.048 U	0.048 U	0.095 U	1.9	-	0.048 U	0.048 U	2.7 U	0.048 U	0.048 U
B-11/11	08/14/2012	11	5.7 U <sup>a</sup>	-	-	0.014 U	0.057 U	0.029 U	0.086 U	0.006 U <sup>e</sup>	0.029 U	0.057 U	0.11 U	3.3	0.029 U	0.029 U	0.57 U	0.029 U	0.029 U
B-11/17	08/14/2012	17	5.6 U <sup>a</sup>	-	-	0.014 U	0.056 U	0.028 U	0.084 U	0.028 U	0.028 U	0.056 U	0.11 U	-	0.028 U	0.028 U	0.56 U	0.028 U	0.028 U
B-11/23	08/14/2012	23	20 U	51 U	102 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-11/29	08/14/2012	29	20 U	51 U	102 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-12/3	08/14/2012	3	5.2 U <sup>a</sup>	58 U	116 U	0.013 U	0.052 U	0.026 U	0.078 U	0.026 U	0.026 U	0.052 U	0.10 U	-	0.026 U	0.026 U	0.52 U	0.026 U	0.026 U
B-12/6	08/14/2012	6	8.1 U <sup>a</sup>	-	-	0.020 U	0.081 U	0.040 U	0.12 U	0.040 U	0.040 U	0.081 U	0.16 U	-	0.040 U	0.040 U	0.81 U	0.040 U	0.040 U
B-12/9	08/14/2012	9	9.6 U <sup>a</sup>	-	-	0.024 U	0.096 U	0.048 U	0.14 U	0.048 U	0.048 U	0.096 U	0.19 U	-	0.048 U	0.048 U	0.96 U	0.048 U	0.048 U
B-12/13	08/14/2012	13	8.1 U <sup>a</sup>	-	-	0.020 U	0.081 U	0.040 U	0.12 U	0.040 U	0.040 U	0.081 U	0.16 U	-	0.040 U	0.040 U	0.81 U	0.040 U	0.040 U
B-12/18	08/14/2012	18	20 U	50 U	100 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-13/3	08/15/2012	3	7.8 U <sup>a</sup>	-	-	0.019 U	0.078 U	0.039 U	0.12 U	0.039 U	0.039 U	0.078 U	0.16 U	-	0.039 U	0.039 U	0.78 U	0.039 U	0.039 U
B-13/6	08/15/2012	6	6.5 U <sup>a</sup>	-	-	0.016 U	0.065 U	0.032 U	0.097 U	0.032 U	0.032 U	0.065 U	0.13 U	-	0.032 U	0.032 U	0.65 U	0.032 U	0.032 U
B-13/9	08/15/2012	9	6.9 U <sup>a</sup>	-	-	0.017 U	0.069 U	0.034 U	0.10 U	0.034 U	0.034 U	0.069 U	0.14 U	-	0.034 U	0.034 U	0.69 U	0.034 U	0.034 U
B-13/13	08/15/2012	13	8.0 U <sup>a</sup>	-	-	0.020 U	0.080 U	0.040 U	0.12 U	0.040 U	0.040 U	0.080 U	0.16 U	-	0.040 U	0.040 U	0.80 U	0.040 U	0.040 U
B-14/3	08/15/2012	3	6.6 U <sup>a</sup>	-	-	0.017 U	0.066 U	0.033 U	0.099 U	0.033 U	0.033 U	0.066 U	0.13 U	-	0.033 U	0.033 U	0.66 U	0.033 U	0.033 U
B-14/6	08/15/2012	6	7.0 U <sup>a</sup>	-	-	0.018 U	0.070 U	0.035 U	0.11 U	0.035 U	0.035 U	0.070 U	0.14 U	-	0.035 U	0.035 U	0.70 U	0.035 U	0.035 U
B-14/9	08/15/2012	9	7.6 U <sup>a</sup>	-	-	0.019 U	0.076 U	0.038 U	0.11 U	0.038 U	0.038 U	0.076 U	0.15 U	-	0.038 U	0.038 U	0.76 U	0.038 U	0.038 U
B-14/13	08/15/2012	13	6.2 U <sup>a</sup>	-	-	0.016 U	0.062 U	0.031 U	0.094 U	0.031 U	0.031 U	0.062 U	0.13 U	-	0.031 U	0.031 U	0.62 U	0.031 U	0.031 U
B-15/3	08/15/2012	3	6.6 U <sup>a</sup>	-	-	0.017 U	0.066 U	0.033 U	0.099 U	0.033 U	0.033 U	0.066 U	0.13 U	-	0.033 U	0.033 U	0.66 U	0.033 U	0.033 U
B-15/6	08/15/2012	6	7.9 U <sup>a</sup>	-	-	0.020 U	0.079 U	0.040 U	0.12 U	0.040 U	0.040 U	0.079 U	0.16 U	-	0.040 U	0.040 U	0.79 U	0.040 U	0.040 U
B-15/9	08/15/2012	9	7.6 U <sup>a</sup>	-	-	0.019 U	0.076 U	0.038 U	0.11 U	0.038 U	0.038 U	0.076 U	0.15 U	-	0.038 U	0.038 U	0.76 U	0.038 U	0.038 U
B-15/13	08/15/2012	13	6.2 U <sup>a</sup>	-	-	0.016 U	0.062 U	0.031 U	0.093 U	0.031 U	0.031 U	0.062 U	0.12 U	-	0.031 U	0.031 U	0.62 U	0.031 U	0.031 U
B-16/6	08/16/2012	6	5.8 U <sup>a</sup>	-	-	0.015 U	0.058 U	0.029 U	0.087 U	0.0058 U <sup>e</sup>	0.029 U	0.058 U	0.17 U	11	0.029 U	0.029 U	0.58 U	0.029 U	0.029 U
B-16/9	08/16/2012	9	8.0 U <sup>a</sup>	-	-	0.020 U	0.080 U	0.040 U	1.2 U	0.040 U	0.040 U	0.080 U	0.16 U	12	0.040 U	0.040 U	0.80 U	0.040 U	0.040 U
B-16/13	08/16/2012	13	5.9 U <sup>a</sup>	-	-	0.015 U	0.059 U	0.030 U	0.089 U	0.0059 U <sup>e</sup>	0.030 U	0.059 U	0.12 U	-	0.030 U	0.030 U	0.59 U	0.030 U	0.030 U

TABLE 1 Soil Analytical Results - Gasoline, Diesel, and Related Constituents (mg/kg) Plaid Pantry No. 112 Vancouver, Washington																			
Location	Date	Sample Depth (feet)	Gasoline	Diesel	Heavy Oil/Lube	Benzene	Toluene	Ethylbenzene	Xylenes	EDB	EDC	MTBE	Naphthalene	Lead	PCE	TCE	2-Butanone	Carbon Tetrachloride	1,1,1- Trichloroethane
Soil Cleanup Levels																			
MTCA Method A <sup>1</sup> Unrestricted Use			100,30 <sup>2</sup>	2,000	2,000	0.03	7	6	9	0.005	NA	0.10	5	250	0.05	0.03	NA	NA	2
MTCA Method B <sup>3</sup>			NC	NC	NC	18.2	6,400 <sup>4</sup>	8,000 <sup>4</sup>	16,000 <sup>4</sup>	0.5	11	556	1,600 <sup>4</sup>	NC	476	12	NC	14.3	160,000 <sup>4</sup>
SVE-2/8	08/16/2012	8	6,800 <sup>a</sup>	-	-	14	48	96	436	0.45 U	0.45 U	0.90 U	27	11	0.45 U	0.45 U	9.0 U	0.45 U	0.45 U
SVE-2/12	08/16/2012	12	5.7 U <sup>a</sup>	-	-	0.014 U	0.057 U	0.029 U	0.086 U	0.0057 U <sup>e</sup>	0.029 U	0.057 U	0.11 U	2.8	0.029 U	0.029 U	0.57 U	0.029 U	0.029 U
SVE-2/16	08/16/2012	16	7.0 U <sup>a</sup>	-	-	0.018 U	0.070 U	0.035 U	0.11 U	0.0070 U <sup>e</sup>	0.035 U	0.070 U	0.14 U	-	0.035 U	0.035 U	0.70 U	0.035 U	0.035 U
SVE-2/20	08/16/2012	20	5.9 U <sup>a</sup>	-	-	0.014 U	0.059 U	0.030 U	0.089 U	0.030 U	0.030 U	0.059 U	0.12 U	-	0.030 U	0.030 U	0.59 U	0.030 U	0.030 U
SVE-3/5	08/16/2012	5	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	-
SVE-3/8	08/16/2012	8	3,820 <sup>a</sup>	-	-	6.5	117	70	389	0.60 U	0.60 U	1.2 U	16	10	0.60 U	0.60 U	12 U	0.60 U	0.60 U
SVE-3/12.5	08/16/2012	12.5	216 <sup>a</sup>	-	-	1.5	4.8	3.9	21	0.0072 U <sup>e</sup>	0.36 U	0.72 U	1.4 U	-	0.36 U	0.36 U	7.2 U	0.36 U	0.36 U
SVE-3/14	08/16/2012	14	6.3 U <sup>a</sup>	-	-	0.016 U	0.063 U	0.031 U	0.094 U	0.0063 U <sup>e</sup>	0.031 U	0.063 U	0.13 U	-	0.031 U	0.031 U	0.63 U	0.031 U	0.031 U
SVE-3/20	08/16/2012	20	6.0 U <sup>a</sup>	-	-	0.015 U	0.060 U	0.030 U	0.089 U	0.030 U	0.030 U	0.060 U	0.12 U	-	0.030 U	0.030 U	0.60 U	0.030 U	0.030 U
SVE-4/6	08/16/2012	6	8.1 U <sup>a</sup>	-	-	0.020 U	0.081 U	0.040 U	0.12 U	0.0081 U <sup>e</sup>	0.040 U	0.081 U	0.16 U	-	0.040 U	0.040 U	0.81 U	0.040 U	0.040 U
SVE-4/9	08/16/2012	9	97 <sup>a</sup>	-	-	0.018	0.072 U	0.30	0.58	0.036 U	0.036 U	0.072 U	1.4	-	0.036 U	0.036 U	0.72 U	0.036 U	0.036 U
SVE-4/11	08/16/2012	11	54 <sup>a</sup>	-	-	0.034	0.15	0.82	1.5	0.0076 U <sup>e</sup>	0.038 U	0.076 U	1.4	-	0.038 U	0.038 U	0.76 U	0.038 U	0.038 U
SVE-4/14	08/16/2012	14	6.0 U <sup>a</sup>	-	-	0.015 U	0.060 U	0.030 U	0.090 U	0.0060 U <sup>e</sup>	0.030 U	0.060 U	0.12 U	-	0.030 U	0.030 U	0.60 U	0.030 U	0.030 U
SVE-5/5	08/16/2012	5	6.1 U <sup>a</sup>	-	-	0.015 U	0.061 U	0.031 U	0.092 U	0.0061 U <sup>e</sup>	0.031 U	0.061 U	0.12 U	7.5	0.031 U	0.031 U	0.61 U	0.031 U	0.031 U
SVE-5/7.5	08/16/2012	7.5	793 <sup>a</sup>	-	-	0.15	9.0	7.4	57	0.16 U	0.16 U	0.32 U	21	11	0.16 U	0.16 U	3.2 U	0.16 U	0.16 U

**Notes:**

Gasoline, Diesel, and Heavy Oil/Lube by Method by NWTPH-HCID unless otherwise noted.

Volatiles by EPA Method 8260B

<sup>1</sup> Model Toxics Control Act (MTCA) Cleanup Amendments, Method A Soil Cleanup Levels for Unrestricted Land Use (WDOE, CLARC Database, May 2014)

<sup>2</sup> Per MTCA, the cleanup value for gasoline is 30 mg/kg if benzene is detected and/or if the sum of the toluene, ethylbenzene, and xylenes is greater than one percent of the gasoline concentration, and 100 mg/kg for all other gasoline mixtures.

<sup>3</sup> Model Toxics Control Act (MTCA) Cleanup Amendments, Method B Soil Cleanup Levels (cancer) (WDOE, CLARC Database, May 2014)

<sup>4</sup> Stated cleanup level is a non-cancer value. No cancer value available.

<sup>a</sup> Gasoline by Method NWTPH-Gx/EPA 8260B

<sup>b</sup> Diesel and Heavy Oil/Lube by Method NWTPH-Dx

<sup>b1</sup> Diesel and Heavy Oil/Lube by Method NWTPH-Dx with silica-gel cleanup

<sup>c</sup> Results in the diesel organics range are due to overlap from a gasoline range product.

<sup>d</sup> Naphthalene analyzed by EPA Method 8270D SIM. No detections were reported for any of the PAH compounds.

<sup>e</sup> 1,2-Dibromoethane (EDB) analyzed by EPA 8260B SIM.

MTBE = Methyl tert-butyl ether

EDB = 1,2-Dibromoethane


EDC = 1,2-Dichloroethane

PCE = Tetrachloroethene

TCE = Trichloroethene

mg/kg = milligrams per kilogram

**Bold** values indicate concentrations exceed the Method A cleanup level shown.

 Highlighted values exceed Method B cleanup level shown.

*Italics* indicate analytical reporting limit exceeds lowest cleanup level shown.

U = Undetected at method limit shown

J = Estimated value. Result was below the method reporting limit, but above the method detection limit.

X = The detection in the diesel range is due to overlap from a gasoline range product.

NA = Not Applicable/Not Available

NC = Not Calculated

- = Not analyzed for this parameter

TABLE 2  
Soil Vapor Analytical Results - Volatile Organic Compounds (µg/m<sup>3</sup>)  
Plaid Pantry No. 112  
Vancouver, Washington

Location	Sample Depth (feet bgs)	Date	Gasoline	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene	EDB	EDC	MTBE	Naphthalene	PCE	TCE	2-Butanone	Carbon Tetrachloride	1,1,1- Trichloroethane
Soil Gas Screening Levels WDOE Method B <sup>1</sup>			-	3.2/32	22,000/220,000	4,600/46,000	460/4,600 <sup>2</sup>	460/4,600	0.11/1.1	0.96/9.6	96/960	14/140	4.2/42	1/10	NA	1.7/17	48,000/480,000
<b>2013-2015 System Monitoring</b>																	
SVE-1	5-10	08/22/2013	11,000,000	<b>97,000</b>	<b>350,000</b>	<b>15,000</b>	<b>82,000</b>	<b>25,000</b>	2,400 U	1,200 U	1,100 U	-	2,100 U	1,600 U	6,900	1,900 U	1,700 U
	5-10	12/04/2013	2,000,000	360 U	2,000	2,200	<b>62,000</b>	<b>31,000</b>	860 U	450 U	400 U	-	760 U	600 U	1,300 U	700 U	610 U
	5-10	02/10/2014	1,600,000	<b>710</b>	3,300	3,600	<b>38,000</b>	<b>15,000</b>	710 U	370 U	330 U	-	630 U	500 U	1,100 U	580 U	500 U
	5-10	05/08/2014	2,100,000	<b>220</b>	1,100	3,400	<b>60,000</b>	<b>34,000</b>	460 U	240 U	220 U	-	410 U	320 U	710 U	380 U	330 U
	5-10	08/08/2014	420,000	40 U	96	77	<b>3,700</b>	<b>3,300</b>	95 U	50 U	45 U	-	<b>620</b>	<b>73</b>	150 U	78 U	68 U
	5-10	11/14/2014	460,000 <sup>a</sup>	<b>65</b>	44 U	50 U	50 U	50 U	90 U	47 U	42 U	-	79 U	63 U	140 U	73 U	64 U
	5-10	02/06/2015	65,000	77 U	91 U	100 U	100 U	100 U	190 U	98 U	87 U	510 U	160 U	130 U	290 U	150 U	130 U
	5-10	03/06/2015	660	3.8 U	13	5.2	11	5.2 U	9.2 U	4.8 U	4.3 U	25 U	<b>580</b>	6.4 U	14 U	7.6 U	6.5 U
	5-10	06/19/2015	3,300	4.2 U	8.0	5.8 U	5.8 U	5.8 U	10 U	5.4 U	4.8 U	14 U	<b>67</b>	7.1 U	17	8.3 U	7.2 U
SVE-2	15-20	08/22/2013	250 U	3.9 U	4.6 U	5.3 U	5.3 U	5.3 U	9.4 U	5.0 U	4.4 U	-	14	6.6 U	290	7.7 U	6.7 U
	15-20	03/07/2014	560	4.0 U	4.7 U	5.4 U	5.6	5.4 U	9.6 U	5.1 U	4.5 U	-	<b>94</b>	6.7 U	86	7.9 U	6.8 U
	15-20	05/08/2014	1,600 U	26 U	30 U	35 U	35 U	35 U	62 U	32 U	29 U	-	<b>87</b>	43 U	95 U	51 U	44 U
	15-20	08/08/2014	1,700	3.9 U	17	5.3 U	16	6.6	9.3 U	4.9 U	4.4 U	-	<b>170</b>	<b>20</b>	28	7.6 U	6.6 U
	15-20	11/14/2014	240 U	3.8 U	4.5 U	5.2 U	6.7	5.2 U	9.1 U	4.8 U	4.3 U	-	26	6.4 U	14	7.5 U	6.5 U
	15-20	02/06/2015	520 U	4.0 U	4.8	5.5 U	5.5 U	5.5 U	9.7 U	5.1 U	4.5 U	26 U	23	6.8 U	15 U	7.9 U	6.9 U
	15-20	03/06/2015	510 U	4.0 U	4.8	5.4 U	5.9	5.4 U	9.6 U	5.0 U	4.5 U	26 U	<b>98</b>	6.7 U	15 U	7.9 U	6.8 U
	15-20	06/19/2015	530 U	4.2 U	4.9 U	5.6 U	5.6 U	5.6 U	10 U	5.3 U	4.7 U	14 U	<b>20</b>	7.0 U	15 U	8.2 U	7.1 U
SVE-3	5-10	08/22/2013	16,000	<b>55</b>	15	5.3 U	8.3	5.3 U	9.4 U	4.9 U	4.4 U	-	8.3 U	6.6 U	1,600 E	7.7 U	6.6 U
	5-10	12/04/2013	160,000	<b>72</b>	720	57	<b>730</b>	360	9.1 U	4.8 U	4.3 U	-	8.1 U	6.4 U	38	7.5 U	6.5 U
	5-10	02/10/2014	91,000	<b>36</b>	130	30	240	150	35 U	19 U	16 U	-	31 U	25 U	54 U	29 U	25 U
	5-10	05/08/2014	1,300 U	20 U	24 U	27 U	27 U	27 U	48 U	25 U	23 U	-	43 U	34 U	74 U	40 U	34 U
	5-10	08/08/2014	1,600	4.0 U	17	5.5 U	16	6.7	9.8 U	5.1 U	4.6 U	-	8.6 U	6.8 U	25	8.0 U	6.9 U
	5-10	11/14/2014	240 U	3.7 U	4.4 U	5.0 U	5.0 U	5.0 U	8.9 U	4.7 U	4.2 U	-	<b>8.8</b>	6.2 U	14 U	7.3 U	6.3 U
	5-10	02/06/2015	380,000	80 U	95 U	110 U	110 U	110 U	190 U	100 U	91 U	530 U	170 U	140 U	300 U	160 U	140 U
	5-10	03/06/2015	25,000	4.0 U	5.7	5.4 U	5.9	5.4 U	9.6 U	5.1 U	4.5 U	26 U	8.5 U	6.7 U	15 U	7.9 U	6.8 U
	5-10	06/19/2015	1,000	4.2 U	5.4	5.8 U	5.8 U	5.8 U	10 U	5.4 U	4.8 U	14 U	9.0 U	7.1 U	16 U	8.4 U	7.2 U
SVE-4	15-20	08/22/2013	250 U	3.9 U	4.6 U	5.3 U	5.3 U	5.3 U	9.4 U	5.0 U	4.4 U	-	8.5	6.6 U	450	7.7 U	6.7 U
	15-20	12/04/2013	53,000	15 U	460	21 U	21 U	21 U	36 U	19 U	17 U	-	<b>3,600</b>	26 U	56 U	30 U	26 U
	15-20	03/07/2014	670	4.0 U	4.7 U	5.4 U	6.5	5.4 U	9.5 U	5.0 U	4.5 U	-	<b>1,200</b>	6.7 U	21	7.8 U	6.8 U
	15-20	05/08/2014	950 U	15 U	18 U	20 U	20 U	20 U	36 U	19 U	17 U	-	<b>2,700</b>	25 U	55 U	29 U	25 U
	15-20	08/08/2014	2,700	4.0 U	35	6.7	24	8.7	9.6 U	5.0 U	4.5 U	-	<b>3,200</b>	6.7 U	46	7.9 U	6.8 U
	15-20	11/14/2014	240 U	3.8 U	4.5 U	5.2 U	6.0	5.2 U	9.2 U	4.8 U	4.3 U	-	<b>130</b>	6.4 U	14 U	7.5 U	6.5 U
	15-20	02/06/2015	140,000	79 U	93 U	110 U	110 U	110 U	190 U	100 U	89 U	520 U	<b>220</b>	130 U	290 U	160 U	130 U
	15-20	03/06/2015	520 U	4.0 U	4.7 U	5.5 U	5.5 U	5.5 U	9.7 U	5.1 U	4.5 U	26 U	<b>2,500</b>	6.8 U	15 U	7.9 U	6.9 U
	15-20	06/19/2015	540 U	4.2 U	5.0	5.7 U	5.7 U	5.7 U	10 U	5.3 U	4.8 U	14 U	<b>400</b>	7.1 U	16 U	8.3 U	7.2 U
SVE-5	5-10	08/22/2013	8,600	17 U	20 U	23 U	23 U	23 U	41 U	21 U	19 U	-	36 U	28 U	4,500	33 U	29 U
	5-10	12/04/2013	8,100	<b>19</b>	640	53	180	92	8.8 U	4.6 U	4.1 U	-	<b>18</b>	6.2 U	20	7.2 U	6.2 U
	5-10	02/10/2014	110,000	<b>4,000</b>	8,400	810	<b>2,800</b>	<b>970</b>	71 U	38 U	34 U	-	63 U	50 U	110 U	58 U	51 U
	5-10	05/08/2014	3,200 U	51 U	60 U	69 U	69 U	69 U	120 U	64 U	57 U	-	<b>280</b>	85 U	200	100 U	86 U
	5-10	08/08/2014	2,000	4.1 U	18	5.6 U	18	7.8	9.8 U	5.2 U	4.6 U	-	8.7 U	6.9 U	37	8.0 U	7.0 U
	5-10	11/14/2014	230 U	3.6 U	4.3 U	5.0 U	13	5.0 U	8.8 U	4.6 U	4.1 U	-	<b>87</b>	6.2 U	14 U	7.2 U	6.2 U
	5-10	02/06/2015	74,000	41 U	49 U	56 U	56 U	56 U	99 U	52 U	46 U	270 U	88 U	69 U	150 U	81 U	70 U
	5-10	03/06/2015	41,000	<b>13</b>	990	69	<b>760</b>	330	14 U	7.6 U	6.8 U	39 U	13 U	10 U	22 U	12 U	10 U
	5-10	06/19/2015	560	4.3 U	5.1 U	5.9 U	5.9 U	5.9 U	10 U	5.5 U	4.9 U	14 U	9.2 U	7.3 U	18	8.6 U	7.4 U



TABLE 2 Soil Vapor Analytical Results - Volatile Organic Compounds (µg/m <sup>3</sup> ) Plaid Pantry No. 112 Vancouver, Washington																	
Location	Sample Depth (feet bgs)	Date	Gasoline	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene	EDB	EDC	MTBE	Naphthalene	PCE	TCE	2-Butanone	Carbon Tetrachloride	1,1,1- Trichloroethane
Soil Gas Screening Levels WDOE Method B <sup>1</sup>			-	3.2/32	22,000/220,000	4,600/46,000	460/4,600 <sup>2</sup>	460/4,600	0.11/1.1	0.96/9.6	96/960	14/140	4.2/42	1/10	NA	1.7/17	48,000/480,000
SVE Blower Inlet	NA	08/22/2013	160,000	<b>2,100</b>	2,100	65	290	85	92 <i>U</i>	48 <i>U</i>	43 <i>U</i>	-	81 <i>U</i>	64 <i>U</i>	140 <i>U</i>	76 <i>U</i>	65 <i>U</i>
	NA	09/27/2013	24,000	<b>95</b>	92	5.2	18	5.2 <i>U</i>	9.2 <i>U</i>	4.8 <i>U</i>	4.3 <i>U</i>	-	8.1 <i>U</i>	6.4 <i>U</i>	14 <i>U</i>	7.5 <i>U</i>	6.5 <i>U</i>
	NA	11/01/2013	68,000	<b>200</b>	1,200	450	<b>2,200</b>	<b>630</b>	18 <i>U</i>	9.7 <i>U</i>	8.6 <i>U</i>	-	<b>300</b>	13 <i>U</i>	28 <i>U</i>	15 <i>U</i>	13 <i>U</i>
	NA	12/04/2013	26,000	<b>12</b>	1,500	16	130	52	8.8 <i>U</i>	4.6 <i>U</i>	4.1 <i>U</i>	-	<b>1,200</b>	6.2 <i>U</i>	14 <i>U</i>	7.2 <i>U</i>	6.2 <i>U</i>
	NA	12/18/2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	NA	03/07/2014	50,000	<b>8.3</b>	65	70	<b>1,100</b>	<b>470</b>	18 <i>U</i>	9.7 <i>U</i>	8.6 <i>U</i>	-	<b>410</b>	13 <i>U</i>	28 <i>U</i>	15 <i>U</i>	13 <i>U</i>
	NA	05/08/2014	24,000	39 <i>U</i>	46 <i>U</i>	54 <i>U</i>	<b>510</b>	290	95 <i>U</i>	50 <i>U</i>	44 <i>U</i>	-	<b>1,200</b>	66 <i>U</i>	140 <i>U</i>	78 <i>U</i>	67 <i>U</i>
	NA	08/08/2014	25,000	3.8 <i>U</i>	35	8.3	130	100	9.1 <i>U</i>	4.8 <i>U</i>	4.2 <i>U</i>	-	<b>1,200</b>	<b>9.4</b>	21	7.4 <i>U</i>	6.4 <i>U</i>
	NA	11/14/2014	19,000 <sup>a</sup>	36 <i>U</i>	43 <i>U</i>	49 <i>U</i>	50 <i>U</i>	50 <i>U</i>	88 <i>U</i>	46 <i>U</i>	41 <i>U</i>	-	77 <i>U</i>	61 <i>U</i>	130 <i>U</i>	72 <i>U</i>	62 <i>U</i>
	NA	02/06/2015	94,000	79 <i>U</i>	93 <i>U</i>	110 <i>U</i>	110 <i>U</i>	110 <i>U</i>	190 <i>U</i>	100 <i>U</i>	89 <i>U</i>	520 <i>U</i>	170 <i>U</i>	<b>150</b>	290 <i>U</i>	160 <i>U</i>	140 <i>U</i>
	NA	06/19/2015	590 <i>U</i>	4.6 <i>U</i>	5.4 <i>U</i>	6.2 <i>U</i>	6.2 <i>U</i>	6.2 <i>U</i>	11 <i>U</i>	5.8 <i>U</i>	5.2 <i>U</i>	15 <i>U</i>	<b>38</b>	7.7 <i>U</i>	17 <i>U</i>	9.1 <i>U</i>	7.8 <i>U</i>
	Post-GAC	NA	08/22/2013	230 <i>U</i>	3.6 <i>U</i>	4.3 <i>U</i>	4.9 <i>U</i>	4.9 <i>U</i>	4.9 <i>U</i>	8.7 <i>U</i>	4.6 <i>U</i>	4.1 <i>U</i>	-	7.7 <i>U</i>	6.1 <i>U</i>	13	7.1 <i>U</i>
NA		09/27/2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NA		11/01/2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NA		12/04/2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NA		12/18/2013	1,900	3.8 <i>U</i>	5.4	5.2 <i>U</i>	5.2 <i>U</i>	5.2 <i>U</i>	9.2 <i>U</i>	4.8 <i>U</i>	4.3 <i>U</i>	-	8.1 <i>U</i>	6.4 <i>U</i>	14 <i>U</i>	7.6 <i>U</i>	6.5 <i>U</i>
NA		03/07/2014	43,000	37 <i>U</i>	44 <i>U</i>	51 <i>U</i>	51 <i>U</i>	51 <i>U</i>	90 <i>U</i>	47 <i>U</i>	42 <i>U</i>	-	79 <i>U</i>	63 <i>U</i>	140 <i>U</i>	74 <i>U</i>	64 <i>U</i>
NA		05/08/2014 <sup>b</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

**Notes:**

<sup>1</sup> Washington Department of Ecology (WDOE) Soil Vapor Intrusion DRAFT Guidance, Method B Soil Gas Screening Levels (WDOE, October 2009).  
The numerator soil gas value is the screening level for sub-slab (<15 foot depth) measurements; the denominator value is for deep (>=15 foot depth) soil gas measurements.

<sup>2</sup> Screening levels for m-xylene

<sup>a</sup> The hydrocarbon profile present did not resemble that of commercial gasoline. Results calculated using the response factor derived from the gasoline calibration.

<sup>b</sup> Carbon treatment for system exhaust discontinued on March 28, 2014.

Volatiles by EPA Method TO-15

MTBE = Methyl tert-butyl ether

EDB = 1,2-Dibromoethane

EDC = 1,2-Dichloroethane

PCE = Tetrachloroethene

TCE = Trichloroethene

µg/m<sup>3</sup> = Micrograms per cubic meter

**Bold** values indicate concentrations exceed the Method B soil gas screening level for representative sample depth.

*Italics* indicate analytical reporting limits exceeds Method B soil gas screening level for representative sample depth.

U = Undetected at method reporting limit shown

NA = Not Applicable/Not Available

E = Estimated concentration. Result exceeds calibration range for the instrument.

- = not analyzed for this parameter

# FIGURES

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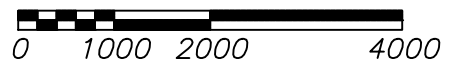




SOURCE:  
USGS, VANCOUVER QUADRANGLE  
WASHINGTON-OREGON  
7.5 MINUTE SERIES (TOPOGRAPHIC)



APPROXIMATE SCALE IN FEET



**EES**

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VICINITY MAP

PLAID PANTRY #112  
1002 W. FOURTH PLAIN BLVD.  
VANCOUVER, WA.

DATE:	4-21-15	PROJECT NO.	1179-02
FILE:	1179-02	FIGURE NO.	1
DRAWN:	JJT		
APPROVED:	AG		



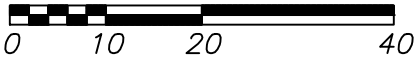
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LEGEND

- Property Boundary
- Catch Basin
- Dry Well

SITE FEATURES ARE APPROXIMATE.

APPROXIMATE SCALE IN FEET



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PLAID PANTRY #112  
1002 W. FOURTH PLAIN BLVD.  
VANCOUVER, WA.

SITE FEATURES

DATE: 7-6-15 PROJECT NO.

FILE: 1179-01 1179-01

DRAWN: JJT FIGURE NO.

APPROVED: CR 2

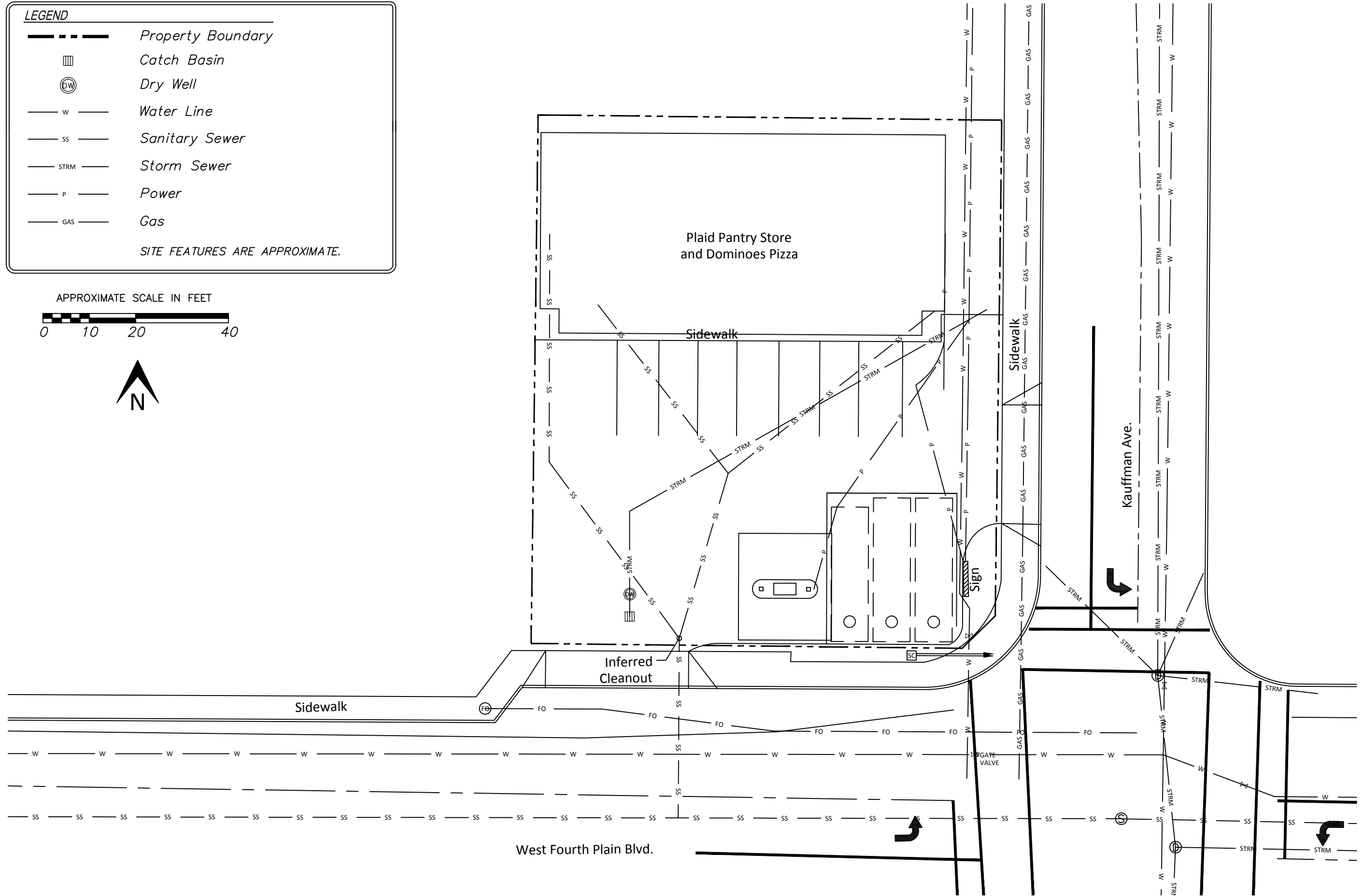
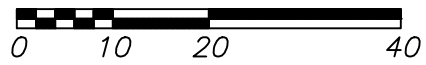
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LEGEND

- -- Property Boundary
- ▢ Catch Basin
- ⊙ DW Dry Well
- W — Water Line
- SS — Sanitary Sewer
- STRM — Storm Sewer
- P — Power
- GAS — Gas

SITE FEATURES ARE APPROXIMATE.

APPROXIMATE SCALE IN FEET



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PLAID PANTRY #112  
1002 W. FOURTH PLAIN BLVD.  
VANCOUVER, WA.

UTILITY LAYOUT

DATE:	7-6-15	PROJECT NO.	
FILE:	1179-01		1179-01
DRAWN:	JJT	FIGURE NO.	
APPROVED:	CR		3

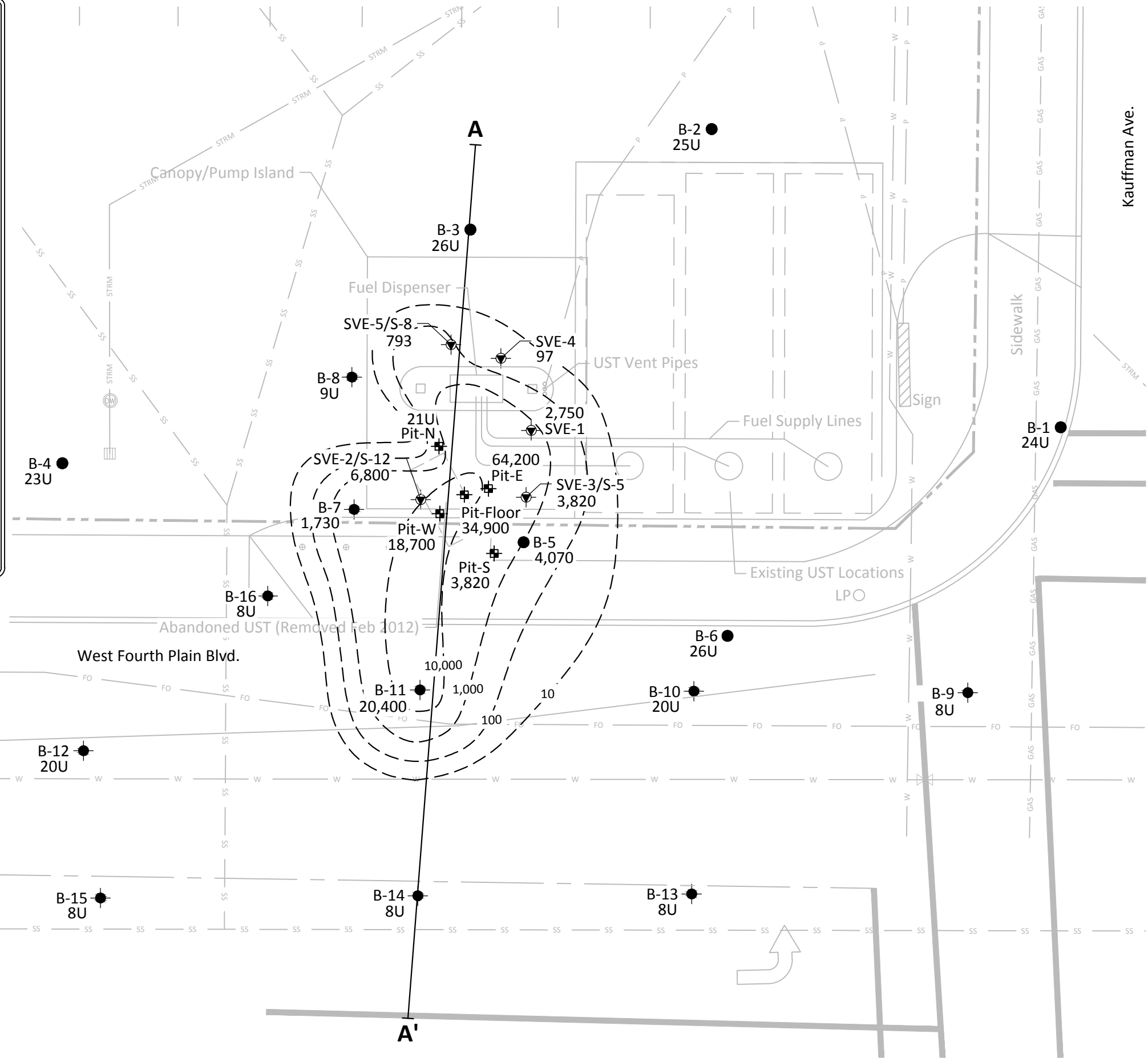
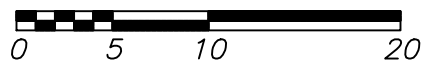
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LEGEND

- Property Boundary
- Direct-Push Boring Location (Sept 2011)
- Direct-Push Boring Location (Aug 2012)
- Catch Basin
- Dry Well
- Bollards
- SVE-1 Shallow SVE test well (screened 5-10' bgs)
- SVE-2 Deep SVE test well (screened 15-20' bgs)
- 793 Maximum Detected Gasoline Concentration in Soil (mg/kg)
- 24U Not Detected at Method Reporting Limits Shown
- Gasoline Isoconcentration Contour (mg/kg)
- Cross Section A-A' Location (See Figure 5)

SITE FEATURES ARE APPROXIMATE.

APPROXIMATE SCALE IN FEET



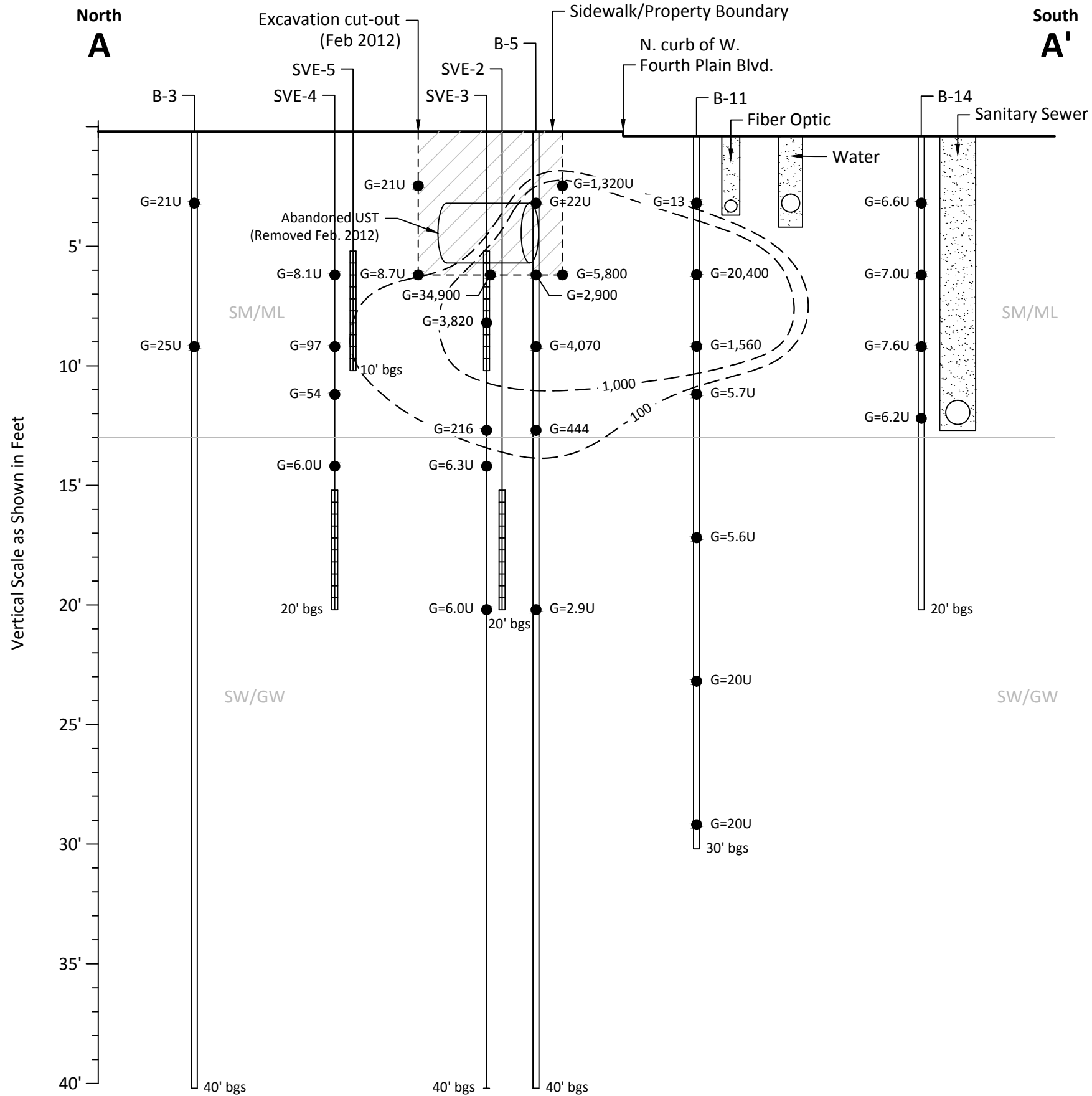
DATE:	7-6-15	PROJECT NO.	1179-01
FILE:	1179-01	FIGURE NO.	4
DRAWN:	JJT		
APPROVED:	CR		

MAXIMUM GASOLINE  
CONCENTRATIONS IN SOIL


PLAID PANTRY #112  
1002 W. FOURTH PLAIN BLVD.  
VANCOUVER, WA.

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**LEGEND**

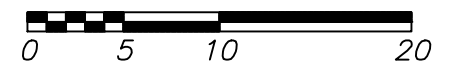
- Soil Sample (January 2009)
-  SVE – Soil Vapor Extraction Well and Screened Interval
- G= Gasoline Concentration (mg/kg)
- U= Not Detected Above Method Reporting Limit

ML/SM= Sandy Silt/Silty Sand

SW/GW= Sand & Gravels

SITE FEATURES ARE APPROXIMATE.

APPROXIMATE SCALE IN FEET



DATE:	7-6-15	PROJECT NO.	1179-01
FILE:	1179-01	FIGURE NO.	5
DRAWN:	JJT		
APPROVED:	CR		

NORTH-SOUTH CROSS SECTION A-A'

PLAID PANTRY #112  
1002 W. FOURTH PLAIN BLVD.  
VANCOUVER, WA.

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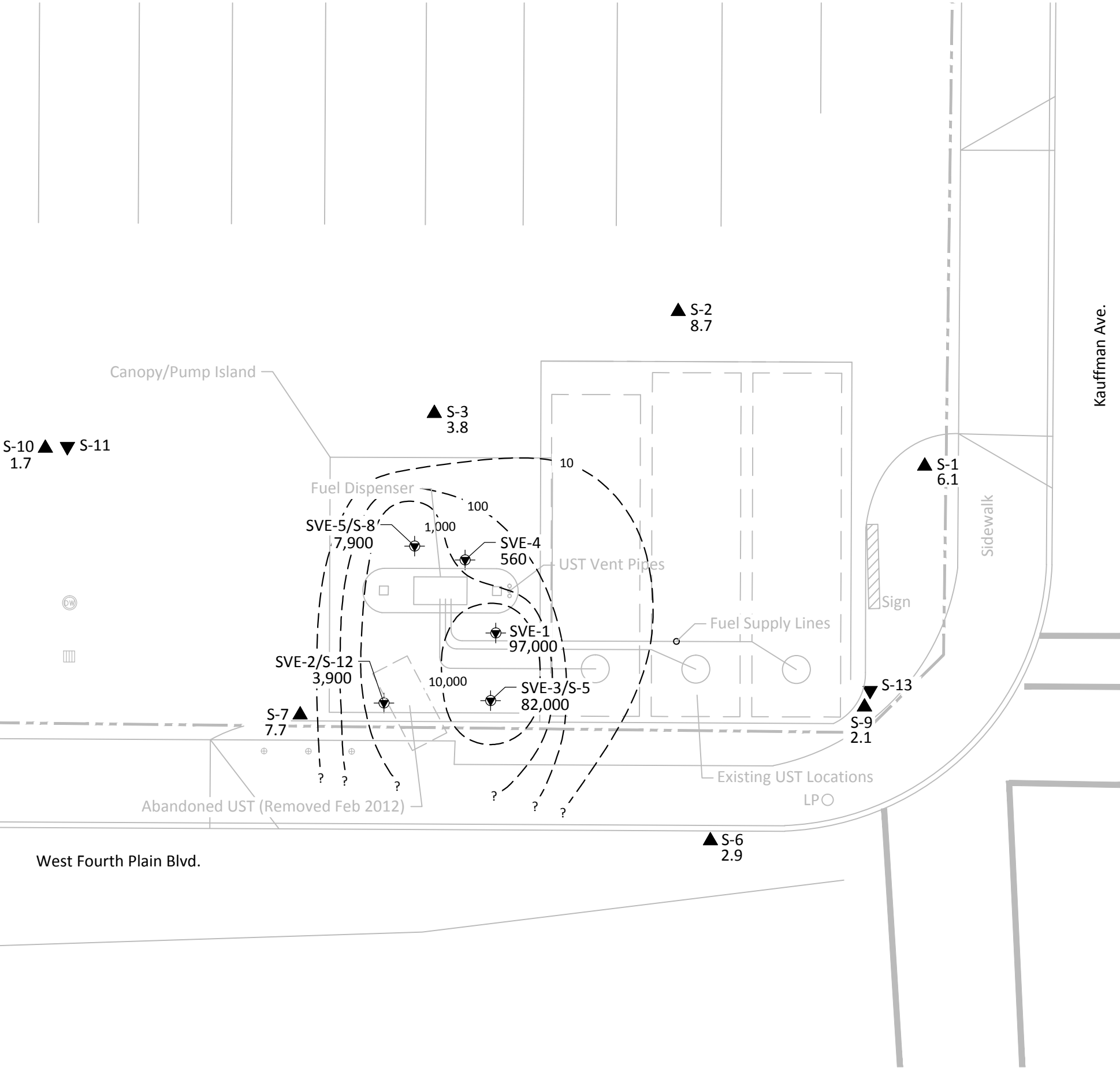
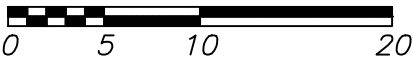
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LEGEND

- Property Boundary
- Catch Basin
- Dry Well
- Bollards
- Soil Gas Sample Location (5' depth) (Aug 2012)
- Soil Gas Sample Location (15' depth) (Aug 2012)
- SVE-1 Shallow SVE test well (screened 5-10' bgs)
- SVE-2 Deep SVE test well (screened 15-20' bgs)
- 3.8 Benzene Concentrations in Soil Vapor ( $\mu\text{g}/\text{m}^3$ )
- 10 Benzene Vapor Isoconcentration Contour ( $\mu\text{g}/\text{m}^3$ )

SITE FEATURES ARE APPROXIMATE.

APPROXIMATE SCALE IN FEET



DATE:	7-6-15	PROJECT NO.	
FILE:	1179-01		1179-01
DRAWN:	JJT	FIGURE NO.	6
APPROVED:	CR		

BENZENE CONCENTRATIONS  
IN SOIL VAPOR  
(2012)

PLAID PANTRY #112  
1002 W. FOURTH PLAIN BLVD.  
VANCOUVER, WA.

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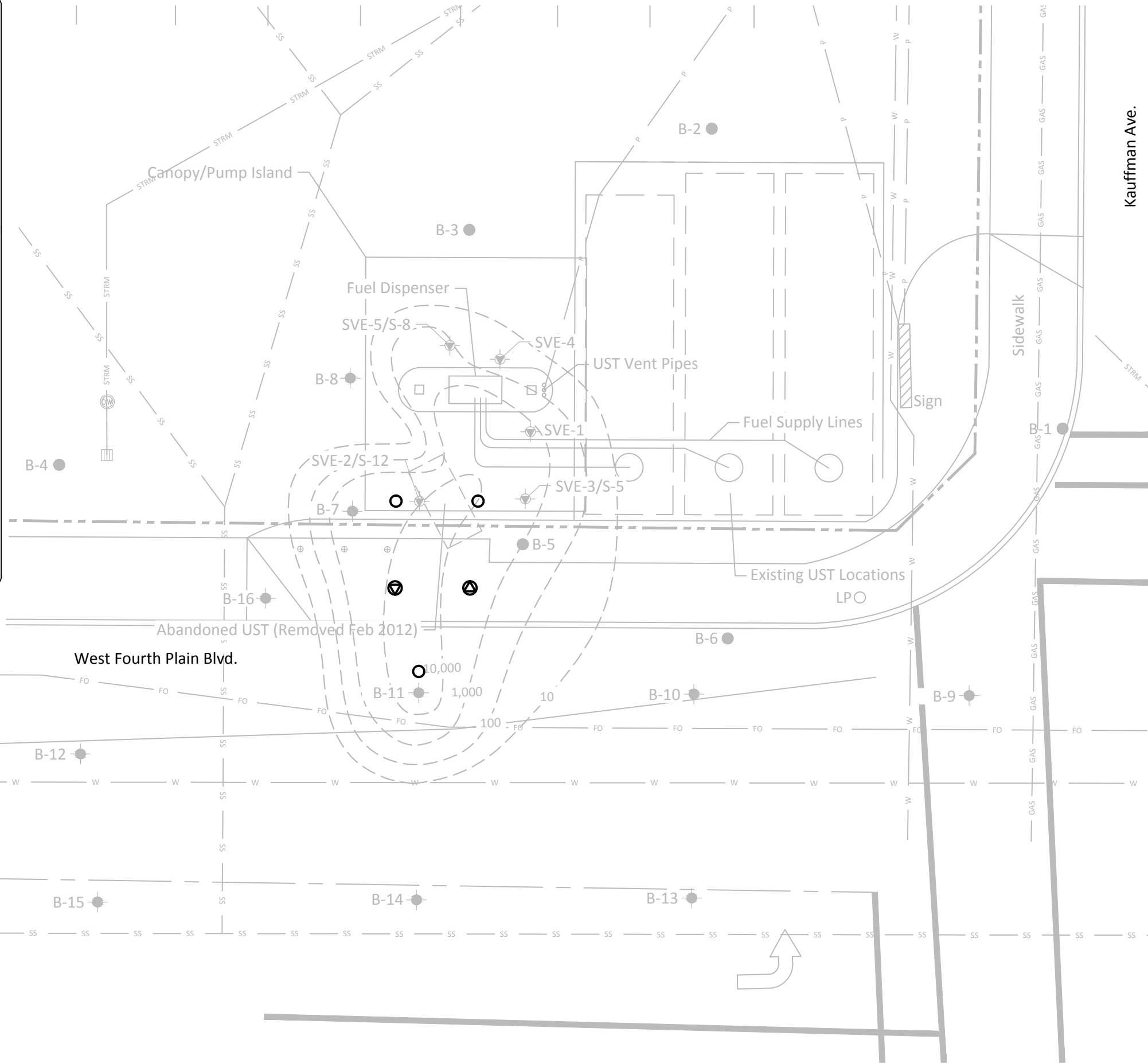
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LEGEND

- Property Boundary
  - Direct-Push Boring Location (Sept 2011)
  - Direct-Push Boring Location (Aug 2012)
  - Catch Basin
  - Dry Well
  - Bollards
  - SVE-1 Shallow SVE test well (screened 5-10' bgs)
  - SVE-2 Deep SVE test well (screened 15-20' bgs)
  - Gasoline Isoconcentration Contour (mg/kg)
  - Proposed Soil Boring and Vapor Monitoring Point (Screened 5-10 ft bgs)
  - Proposed Soil Boring and Vapor Monitoring Point (Screened 15-20 ft bgs)
  - Proposed Soil Boring Location
- SITE FEATURES ARE APPROXIMATE.

APPROXIMATE SCALE IN FEET

0 5 10 20



DATE:	7-20-15	PROJECT NO.	1179-01
FILE:	1179-01	FIGURE NO.	7
DRAWN:	JJT		
APPROVED:	CR		

PROPOSED SOIL SAMPLE LOCATIONS

PLAID PANTRY #112  
1002 W. FOURTH PLAIN BLVD.

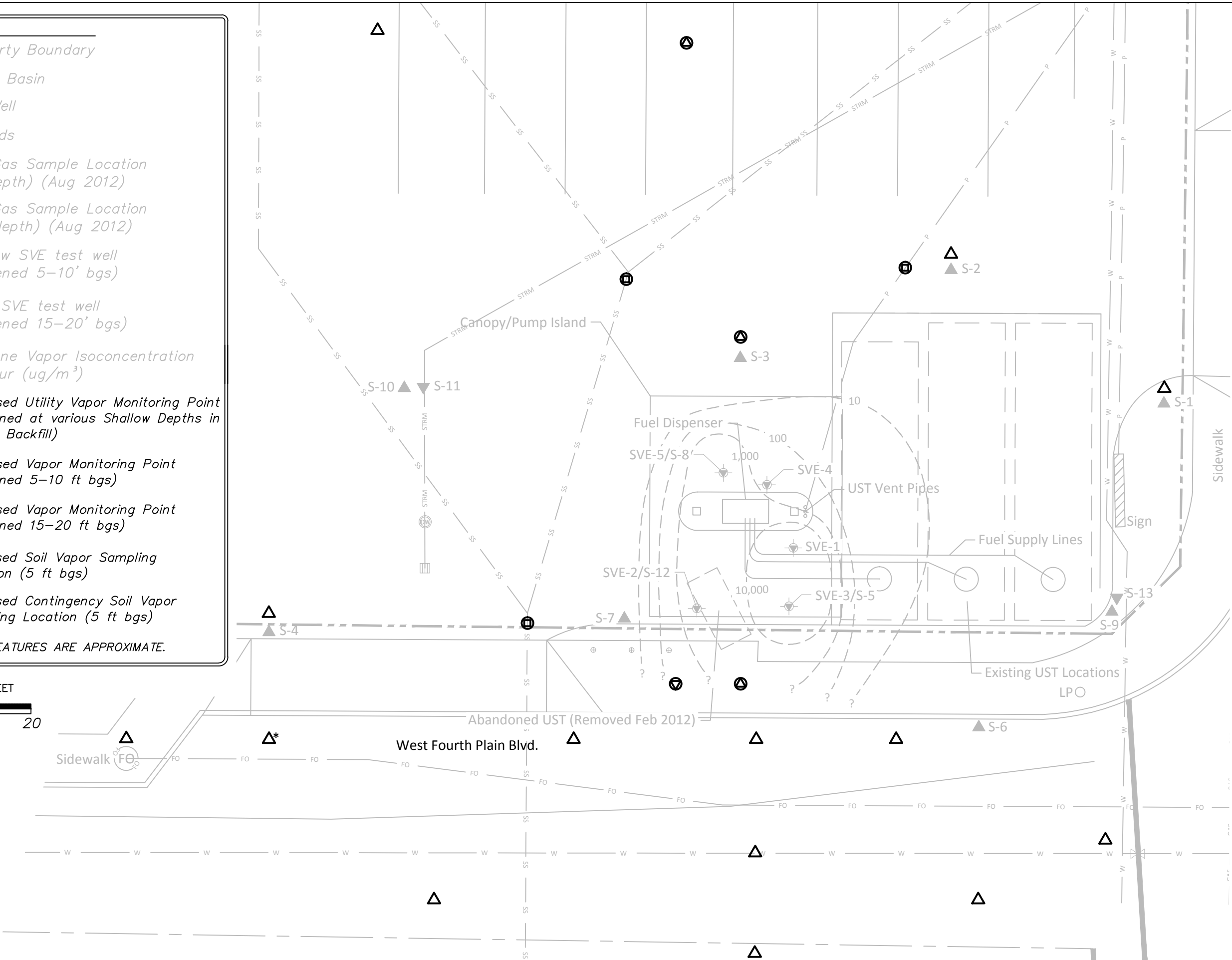
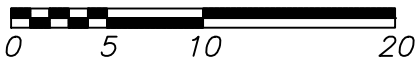
EES  
ENVIRONMENTAL CONSULTING, INC.  
240 N Broadway #203, Portland, OR 97227  
(503) 847-2740  
www.ees-environmental.com

C:\Users\Josh\Desktop\Autocad Backup\EES-Autocad\1179-01 Plaid Pantry #112\2015 June 2015\1179-01\_BW-Data-072015.dwg 12.19.2014

LEGEND

- Property Boundary
- Catch Basin
- Dry Well
- Bollards
- Soil Gas Sample Location (5' depth) (Aug 2012)
- Soil Gas Sample Location (15' depth) (Aug 2012)
- SVE-1 Shallow SVE test well (screened 5–10' bgs)
- SVE-2 Deep SVE test well (screened 15–20' bgs)
- 10 Benzene Vapor Isoconcentration Contour (ug/m<sup>3</sup>)
- Proposed Utility Vapor Monitoring Point (Screened at various Shallow Depths in Trench Backfill)
- Proposed Vapor Monitoring Point (Screened 5–10 ft bgs)
- Proposed Vapor Monitoring Point (Screened 15–20 ft bgs)
- Proposed Soil Vapor Sampling Location (5 ft bgs)
- Proposed Contingency Soil Vapor Sampling Location (5 ft bgs)
- SITE FEATURES ARE APPROXIMATE.

APPROXIMATE SCALE IN FEET

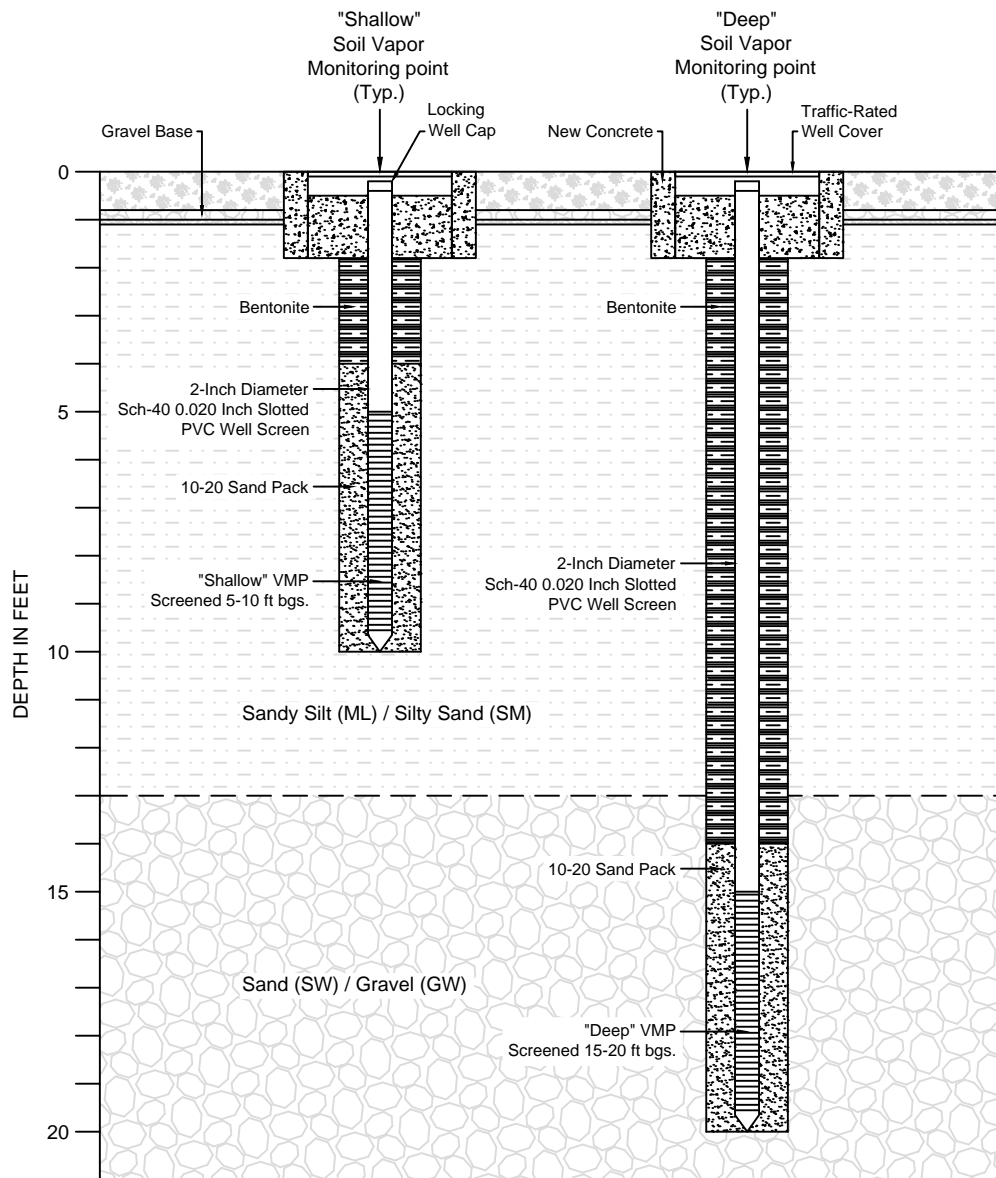


DATE:	7-21-15	PROJECT NO.	
FILE:	1179-01	1179-01	
DRAWN:	JJT	FIGURE NO.	8
APPROVED:	CR		

PROPOSED SOIL VAPOR  
SAMPLING LOCATIONS

PLAID PANTRY #112  
1002 W. FOURTH PLAIN BLVD.  
VANCOUVER, WA.

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PROPOSED SOIL VAPOR  
MONITORING POINT  
CONSTRUCTION

PLAID PANTRY #112  
1002 W. FOURTH PLAIN BLVD.  
VANCOUVER, WA.

DATE: 7-22-15

FILE: 1179-01

DRAWN: JJT

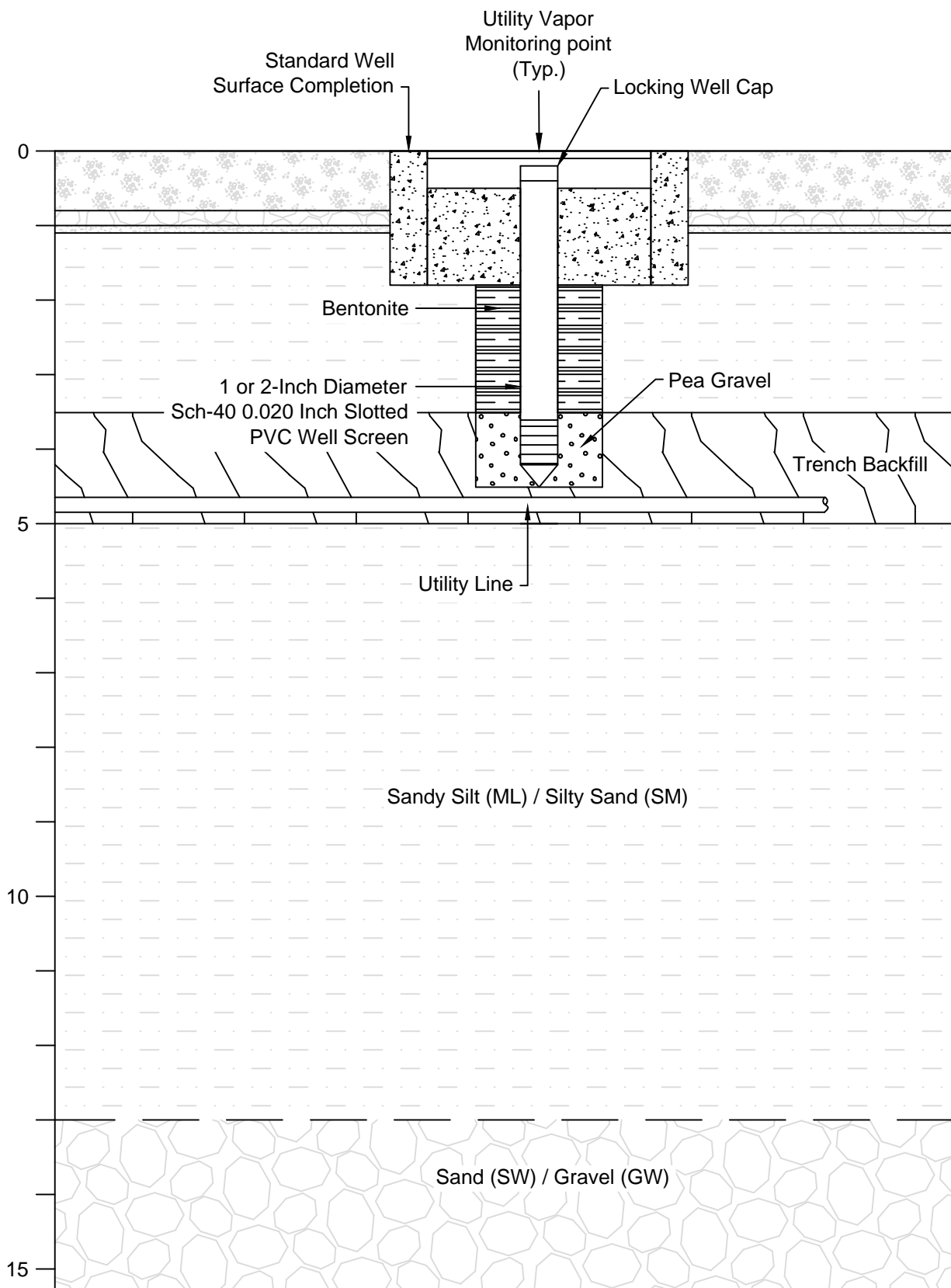
APPROVED: CR

PROJECT NO.

1179-01

FIGURE NO.

9A



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PROPOSED UTILITY VAPOR  
MONITORING POINT  
CONSTRUCTION

PLAID PANTRY #112  
1002 W. FOURTH PLAIN BLVD.  
VANCOUVER, WA.

DATE: 7-22-15

FILE: 1179-01

DRAWN: JJT

APPROVED: CR

PROJECT NO.

1179-01

FIGURE NO.

9B