

August 3, 2010

Puget Sound Energy
PO Box 90868, PSE-11N
Bellevue, Washington 98009-0868

Attention: Greg Andrina and John Rork

Subject: Off-Property Investigation Work Plan
Former Columbia Street Manufactured Gas Plant Property
320 Columbia Street NW
Olympia, Washington
File No. 0186-774-00

This work plan describes soil and groundwater sampling to be performed during the off-property investigation for the Former Columbia Street Manufactured Gas Plant (MGP) Property in Olympia, Washington (the Property). The Property is located at 320 Columbia Street NW in Olympia (Figure 1). Puget Sound Energy (PSE) is performing remedial actions at the Property in accordance with the Model Toxics Control Act (MTCA) Cleanup Regulation (Washington Administrative Code [WAC] Chapter 173-340), and has entered the Washington Department of Ecology's (Ecology's) Voluntary Cleanup Program (VCP). Ecology's designated site name for the Property is "Columbia Square Property." The Ecology site number is 91682829, and the VCP project number is SW0984.

The objectives of the off-property investigation are to:

- Assess whether MGP-related contamination detected in soil and groundwater at the Property extends beyond the Property boundaries; and
- Evaluate whether the elevated arsenic concentrations detected in groundwater at the Property are migrating onto the Property from upgradient sources.

BACKGROUND AND INVESTIGATION RATIONALE

The Property history and previous environmental investigations at the Property are summarized in a several previous documents (GeoEngineers 2008a; 2008b; 2010). Previous investigations have shown that in several areas of the Property, soil between the ground surface and a depth of approximately 8 to 12 feet below ground surface (bgs) contains concentrations of carcinogenic polycyclic aromatic hydrocarbons (cPAHs) that exceed the Model Toxics Control Act (MTCA) Method A soil cleanup level of 100 micrograms per kilogram. At some locations, the cPAH exceedances are collocated with



concentrations of mercury, lead, lube oil-range total petroleum hydrocarbons (TPH), gasoline-range TPH, and/or benzene that also exceed MTCA Method A cleanup levels. Although the extent of the soil contamination on the Property has been characterized, Ecology has requested further sampling to determine whether the soil contamination extends off-property.

Analytical results for groundwater samples collected from monitoring wells at the Property in 2008 and 2009 indicate that there are limited impacts to groundwater from the former MGP activities. In addition, arsenic has also been detected at concentrations above the MTCA Method A groundwater cleanup level in most of the monitoring wells; however, the arsenic does not appear to be related to historical Property activities. This conclusion is supported by the fact that two of the wells with elevated arsenic (wells MW-5 and MW-7) are located along the apparent upgradient Property boundary. Additionally, the arsenic concentrations in soil at the Property are consistent with natural background soil arsenic concentrations in Washington state (Ecology, 1994). The lack of an identified arsenic source in soil suggests that the elevated arsenic concentrations detected in groundwater may be migrating onto the Property from upgradient anthropogenic or natural sources of arsenic in the downtown Olympia area. Further soil and groundwater sampling off-property is necessary to evaluate whether the arsenic in groundwater is attributable to an off-property source.

PROPOSED EXPLORATIONS

Five soil borings (SB-18 through SB-22) will be completed and six monitoring wells (MW-00D, MW-11, MW-12S, MW-12D, MW-13S, and MW-13D) will be installed to assess off-property soil and groundwater conditions. The explorations will be completed along the perimeter of the Property and farther to the south and east, as shown in Figure 2. The explorations will extend to a maximum depth of 30 feet bgs.

The soil and groundwater sampling and analytical testing plan is presented in Table 1. The sampling locations, depths, and analytical parameters presented in this table were chosen to satisfy the investigation objectives outlined above; details regarding sampling objectives at each location are provided in Table 1. Analytical parameters were selected based on the known Property history and the results of previous investigations. The sampling plan presented in Table 1 will be used as general guidance during field activities; however, final sampling decisions will be based on field-screening results and observations during drilling. After the initial round of groundwater sampling at the off-property monitoring wells (to be performed concurrent with sampling of the existing on-property wells), three additional rounds of quarterly monitoring will be performed at the off-property wells to evaluate seasonal variations.

Soil and groundwater samples collected for analytical testing will be submitted to OnSite Environmental in Redmond, Washington. Analytical methods will have target detection limits less than MTCA Method A cleanup levels. Laboratory quality assurance/quality control (QA/QC) reporting will be consistent with U.S. Environmental Protection Agency Level II analytical data.

FIELD PROCEDURES

The off-property investigation will utilize field procedures consistent with those used during the 2008 and 2009 investigations (GeoEngineers 2008a; 2009). This includes utility location, drilling, field screening, well installation, soil and groundwater sampling, QA/QC sampling, equipment decontamination, and



investigation-derived waste management procedures. Access agreements and right-of-way or street-use permits will be obtained as necessary by GeoEngineers prior to field activities.

DATA ANALYSIS AND REPORTING

The laboratory analytical data will be reviewed to confirm acceptable laboratory QA/QC performance. Soil and groundwater analytical results will be compared to MTCA Method A cleanup levels, and constituent concentrations exceeding cleanup levels will be identified. Groundwater elevations measured in the monitoring wells will be used to estimate hydraulic gradients. A report summarizing the results of the soil sampling and the initial round of groundwater sampling will be prepared after analytical results for these samples are received and assessed for data quality. The results of subsequent quarterly groundwater monitoring events will be reported in brief technical memoranda to be prepared following each monitoring event.

REFERENCES

GeoEngineers. 2008a. Sampling and Analysis Plan, Former Columbia Street Manufactured Gas Plant Site, 320 Columbia Street NW, Olympia, Washington. Letter submitted to Puget Sound Energy. July 16, 2008.

GeoEngineers. 2008b. Site Investigation Report, Former Columbia Street MGP Site, Olympia, Washington. November 26, 2008.

GeoEngineers. 2009. Sampling and Analysis Plan – Supplemental Site Investigation, Former Columbia Street Manufactured Gas Plant Site, 320 Columbia Street NW, Olympia, Washington. Letter submitted to Puget Sound Energy. October 27, 2009.

GeoEngineers. 2010. Supplemental Site Investigation Report, Former Columbia Street Manufactured Gas Plant Property, Olympia, Washington. January 29, 2010.

Washington State Department of Ecology (Ecology) 1994. Natural Background Soil Metals Concentrations in Washington State. Ecology Publication No. 94-115. October 1994.

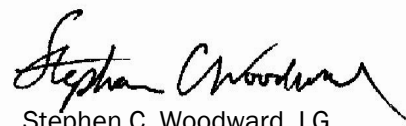
Please contact us should you have questions about this work plan. We appreciate the opportunity to assist PSE with this project.

Sincerely,

GeoEngineers, Inc.



Robert C. Leet, PhD, LG
Senior Project Manager



Stephen C. Woodward, LG
Principal

ZAS/RCL

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Table 1. Soil and Groundwater Sampling and Analytical Testing Plan

Figure 1. Vicinity Map

Figure 2. Proposed Off-Property Exploration Locations

1 copy submitted

cc: Eugene Radcliffe, Ecology
Mark Schneider, Perkins Coie

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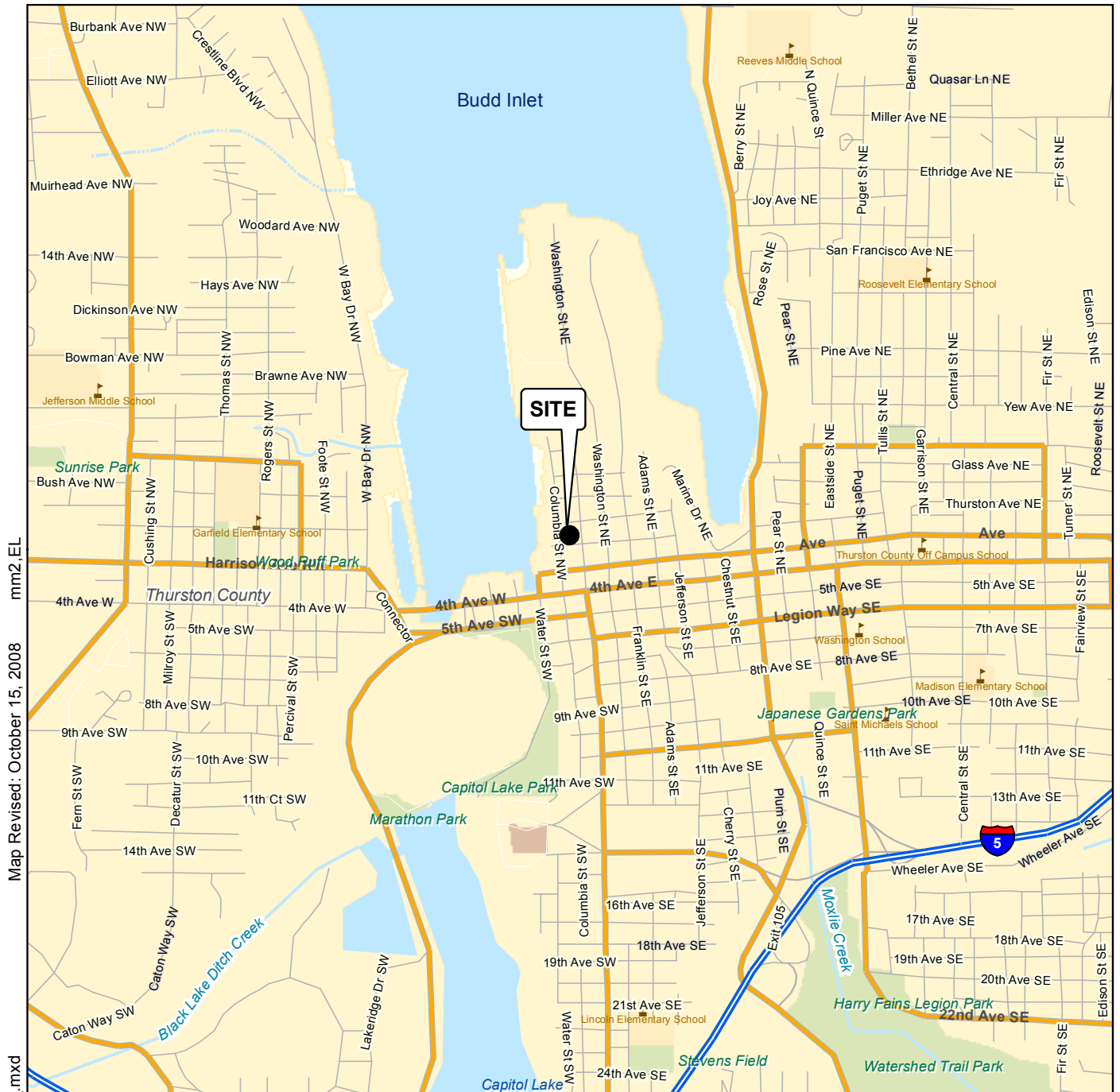


TABLE 1
Soil and Groundwater Sampling and Analytical Testing Plan
2010 Off-Property Investigation
Former Columbia Street MGP Property
320 Columbia Street NW, Olympia, Washington
Puget Sound Energy

Location	Total Boring Depth (feet bgs)	Soil Sample Depth (feet bgs)	Soil Analytical Parameters							Well Screen Interval (feet bgs)	Groundwater Analytical Parameters		Sampling Objective (a)
			cPAHs (EPA 8270D-SIM)	TPH-G/BTEX (NWTPH-Gx/ EPA 8021B)	BTEX (EPA 8021B)	TPH-D/LO (NWTPH-Dx)	Mercury (EPA 7471A)	Lead (EPA 6010B)	Arsenic (EPA 6010B)		cPAHs (EPA 8270D-SIM)	Total Arsenic (EPA 200.8)	
SB-18	15	2.5	x			x	x			NA			Assess soil conditions in street north of property and north of cPAH, TPH-LO, and/or mercury exceedances at previous sampling locations SB-12, SB-13, SB-15, and SB-16.
		7.5	x			x	x						
		10	x			x	x						
		15	x										
SB-19	15	2.5	x			x	x			NA			Assess soil conditions in street north of property and north of cPAH, TPH-LO, and/or mercury exceedances at previous sampling locations SB-12, SB-13, SB-15, and SB-16.
		7.5	x			x	x						
		10	x			x	x						
		15	x										
SB-20	25	2.5	x		x	x		x		NA			Assess soil conditions in alley, southeast of cPAH, benzene, TPH-LO, and/or lead exceedances at previous sampling locations B-5, TP-7, SB-7, SB-11, and MW-5. Assess arsenic in soil in the presumed upgradient direction to assess possible correlation of soil arsenic concentrations and dissolved concentrations in MW-4 (on-property well with the highest arsenic concentrations).
		7.5	x		x	x		x	x				
		10	x		x	x		x					
		15	x										
		20	x										
25	x												
SB-21	30	2.5	x					x		NA			Assess soil conditions in alley, south of cPAH and/or lead exceedances at previous sampling locations TP-1, SB-10, SB-11, and MW-4. Assess arsenic in soil in the presumed upgradient direction and across a depth interval that includes the MW-4 well screen (on-property well with the highest arsenic concentrations), to assess possible correlation of soil arsenic concentrations at depth and dissolved concentrations in MW-4.
		7.5	x					x	x				
		10	x										
		15											
		20											
		25											
30													
SB-22	10	2.5	x					x	x	NA			Assess soil conditions in alley, south of cPAH and/or lead exceedances at previous sampling locations SB-9, SB-10, and MW-4. Assess arsenic in soil in the presumed upgradient direction to assess possible correlation of soil arsenic concentrations and dissolved concentrations in MW-4 (on-property well with the highest arsenic concentrations).
		7.5	x					x					
		10	x						x				
MW-00D	30	5								25-30		x	Assess arsenic in soil for comparison to groundwater results from this well. Assess arsenic concentrations in groundwater at the same depth interval as MW-4 (on-property well with the highest arsenic concentrations), adjacent to existing shallow well MW-00 and in the presumed upgradient direction. Sampling groundwater at two depth intervals will allow for direct comparison to data from on-property wells screened over the same intervals.
		10											
		15											
		20											
		25											
30													
MW-11	20	2.5	x	x		x	x	x		5-20	x	x	Assess soil conditions near southeast corner of Gardner's Restaurant and east/southeast of cPAH, TPH-G, benzene, TPH-LO, mercury, and/or lead exceedances at previous sampling locations B-3, TP-3, TP-4, SB-12, and MW-7. Assess arsenic in soil for comparison to groundwater results from this well. Assess arsenic and cPAH concentrations in shallow groundwater (cPAHs for comparison to MW-7 data), in the presumed upgradient direction.
		7.5	x	x		x	x	x	x				
		10	x	x		x	x	x					
		15	x	x									
20	x												
MW-12S/12D (shallow/deep well pair)	20 (S) 30 (D)	5 (b)								5-20 (S)		x	Assess arsenic in soil for comparison to groundwater results from this well. Assess arsenic concentrations in shallow groundwater and in groundwater at the same depth interval as MW-4 (on-property well with the highest arsenic concentrations), in the presumed upgradient direction. Sampling groundwater at two depth intervals will allow for direct comparison to data from on-property wells screened over the same intervals.
		10 (b)								25-30 (D)		x	
		15 (b)											
		20 (b)											
		25 (b)											
		30 (b)											
MW-13S/13D (shallow/deep well pair)	20 (S) 30 (D)	5 (b)								5-20 (S)		x	Assess arsenic in soil for comparison to groundwater results from this well. Assess arsenic concentrations in shallow groundwater and in groundwater at the same depth interval as MW-4 (on-property well with the highest arsenic concentrations), in the presumed upgradient direction. Sampling groundwater at two depth intervals will allow for direct comparison to data from on-property wells screened over the same intervals.
		10 (b)								25-30 (D)		x	
		15 (b)											
		20 (b)											
		25 (b)											
		30 (b)											

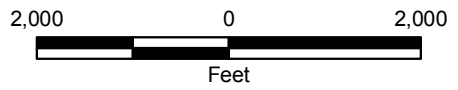
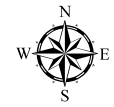
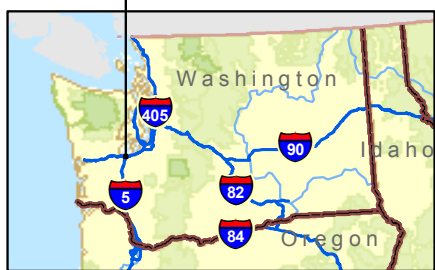
Notes:

- bgs = Below ground surface
- BTEX = Benzene, toluene, ethylbenzene, and xylenes
- cPAHs = Carcinogenic polycyclic aromatic hydrocarbons
- NA = Not applicable
- S = Shallow
- D = Deep
- TPH-G = Gasoline-range total petroleum hydrocarbons
- TPH-D/LO = Diesel- and lube oil-range total petroleum hydrocarbons
- (a) Previous sampling results/data referenced in this table are discussed in detail in *Site Investigation Report, Former Columbia Street MGP Site* (GeoEngineers 2008b) and *Supplemental Site Investigation Report, Former Columbia Street Manufactured Gas Plant Property* (GeoEngineers 2010).
- (b) Soil samples collected at MW-12S/12D and MW-13S/13D will be obtained from only the deep (30-foot) boring at each location.



Map Revised: October 15, 2008 mm2.EL

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Notes:

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2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
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Data Sources: ESRI Data & Maps, Street Maps 2005
 Transverse Mercator, Zone 10 N North, North American Datum 1983
 North arrow oriented to grid north

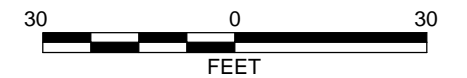
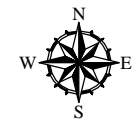
Vicinity Map	
Former Columbia Street MGP Site Olympia, Washington	
	Figure 1

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Legend

- 1908 Site facilities / features
- Existing building
- Former office building (demolished 10/2009)
- x Existing fence
- Existing monitoring well
- Proposed monitoring well
- Proposed soil boring



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Proposed Off-Property Exploration Locations	
Former Columbia Street MGP Property Olympia, Washington	
	Figure 2