

**State of Oregon**  
**Department of Environmental Quality**  
**Memorandum**

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**To:** Keith Johnson, Manager  
NWR Cleanup Section

**Date:** June 24, 2009

**From:** Scott Manzano, NWR Cleanup Project Manager

**Through:** Mike Poulsen, NWR Toxicologist

**Subject:** No Further Action Determination  
Former Qualex Facility  
2715 SE Raymond, Portland, Oregon  
ECSI #5088

This memorandum summarizes site characterization information submitted to the Oregon Department of Environmental Quality (DEQ) to support a No Further Action determination at the subject property.

The Former Qualex Facility is a 1.23 acre property located in southeast Portland, and is currently owned by ITA, LLC. ITA entered into an Independent Cleanup Agreement with DEQ in January 2009 to receive consultation regarding a site characterization report presenting information from three subsurface investigations conducted at the property in 2007 and 2008. Based on the information provided in the report, DEQ requested additional groundwater sampling and additional groundwater-use information in order to complete our review and determine if additional action was necessary. In April 2009, DEQ received a *Revised Additional Site Characterization and Final Report*, prepared by PBS Engineering and Environmental (PBS), on behalf of ITA. That report provides the basis for recommending no further action, concluding that the extent of residual, low level subsurface contamination at the property has been sufficiently delineated, and does not pose a threat to human health and the environment.

### **Background**

The Former Qualex Facility was a photo processing business housed within a 37,500 ft<sup>2</sup> building constructed in 1971, and located in an area of commercial and light industrial use in southeast Portland. Guardian Photo Service (GAF) leased the building in 1971 until August 2007; their photo processing operation was completely decommissioned by the end of 2007. The building is currently occupied by Service Master of Portland to store household goods from fire-damaged buildings.

For approximately 16 years, from 1971 to 1987, silver-containing photo processing waste chemicals (liquids) were transported in concrete “wet trenches” (primarily one trench) within the building’s concrete floor to a silver chemical treatment area. From 1987 to 1990, non-silver containing waste chemicals were transported in these same trenches. It is assumed that the waste

chemicals included petroleum hydrocarbon constituents. In 1990, the trenches were filled in with concrete after being replaced by overhead process lines.

From October 2007 through January 2008, subsurface soil and groundwater samples were collected by Geologica, Inc. in conjunction with decommissioning the photo processing business. Geologica conducted similar boiler-plate subsurface investigations for GAF photo-processing businesses nationwide. Soil and groundwater samples were collected from representative locations within the building footprint and surrounding the perimeter of the building. Geologica identified, and analyzed for the following compounds of interest: total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), cyanide, silver, ammonia, nitrite, nitrate, sulfate, and pH. Analyte selection and sampling locations were dependant on locations where specific contaminants were suspected or likely to be present. An additional investigation was conducted in July 2008 by PBS to define the extent and magnitude of silver and petroleum hydrocarbon contamination encountered during the Geologica investigations. After consulting with DEQ, PBS conducted additional groundwater sampling at the property in February 2009.

### **Investigation Summary and Results**

The primary contaminants of interest at the property were silver, VOCs, and PAHs. Based on the results of four subsurface investigations conducted at the property, two “source areas” of residual silver and petroleum hydrocarbon (VOCs and TPH) contamination remain in soil and groundwater beneath the footprint of the building:

- Source Area 1: wet trenches, and
- Source Area 2: flume room, collection location for the transported (via the wet trench) chemical wastes

In addition, low concentrations of silver (analyzed as total silver) are also present in groundwater in two of eight boring locations surrounding (up- and down-gradient) the perimeter of the building. The two borings locations with silver detections are downgradient from Source Area 1. No petroleum hydrocarbons were detected in samples collected from any of the perimeter borings. Groundwater exists from ten to fifteen feet below ground surface (bgs) at the property.

Low concentrations of other photo processing chemicals (ammonia, sulfate, and nitrate) were also detected soil and groundwater in several boring locations within both source areas and outside the building perimeter; however the detections are well below any applicable state or federal screening criteria. No cyanide was encountered in soil or groundwater at the property.

#### **Source Area 1 (SA-1) Silver**

Low concentrations of silver remain in subsurface soils and groundwater in Source Area 1. Soil samples were collected from nineteen borings in this relatively large area, and at sufficient depths to define the extent of contamination. Groundwater samples were collected from six of these borings.

Residual silver concentrations from approximately 20 to 40 mg/kg are present in soil, and exist predominantly near-surface at one to two feet bgs in five borings along a 40 foot section beneath the decommissioned wet trench. Relatively higher concentrations of silver are present in two borings midway along this 40 foot section (38.9 mg/kg - 9 feet bgs, and 128 mg/kg - 5 feet bgs).

Two of six groundwater samples collected in this area have low concentrations of total (unfiltered) silver. The highest concentration of unfiltered silver in groundwater is approximately 7 micrograms per liter (ug/l). Field-filtered (dissolved concentrations) samples, collected from the six groundwater sample locations, were analyzed and were non-detect for silver.

#### Source Area 1(SA-1) Petroleum Hydrocarbons

Soil samples were collected from depths necessary to determine the presence of contamination in nine of the nineteen boring locations in this area. The samples were analyzed for VOCs to determine potential chlorinated solvent contamination, with no detections.

Groundwater samples were collected from three borings at locations where potential contamination would likely be encountered in this area. The groundwater samples were analyzed for VOCs with no detections.

#### Source Area 2 (SA-2) Silver

Soil samples were collected from four of the eight borings placed in this area, and at sufficient depths to define the extent of contamination. Groundwater samples were collected from three of the eight borings.

Low concentrations of silver are present in soil (approximately 2 to 21 mg/kg) in an area approximately 50 ft<sup>2</sup> to a depth of 8 feet bgs in this area.

Field-filtered groundwater samples, collected from three borings in locations beneath silver contaminated soils, were non-detect.

#### Source Area 2 (SA-2) Petroleum Hydrocarbons

Soil samples were collected from all eight borings in this area, and in locations sufficient to define the extent of contamination. Select samples were analyzed for VOCs, TPH<sub>Dx</sub> (diesel), TPH<sub>Gx</sub> (gasoline), TPH<sub>Ho</sub> (heavy oil), and PAHs. The additional petroleum hydrocarbon constituents were suspected in this location based the presence of a chemical collection sump, located in this area of the facility. Low levels of various petroleum hydrocarbon constituents were present in samples collected from several of the boring locations in this area.

Groundwater samples were collected from seven borings near or beneath soil contamination, and in locations sufficient to determine the extent of contamination. Low TPH<sub>Dx</sub> and TPH<sub>Ho</sub> concentrations were detected in one groundwater sample.

### Perimeter Borings

Low levels of total (unfiltered) silver are present in groundwater samples collected from two borings located approximately 60 to 75 feet downgradient from residual silver contamination in soil at Source Area 1. Silver was not detected in filtered (dissolved) groundwater samples collected from these same locations.

No petroleum hydrocarbons were detected in groundwater samples collected from the seven perimeter boring locations.

### **Discussions of Results**

Two fundamental considerations are necessary in order to determine if additional investigation is necessary or other action is warranted for each area of residual contamination.

- Has the extent of contamination been sufficiently defined?
- Do the remaining/residual contaminants pose a risk due to their concentration and proximity and exposure pathway to receptors?

In evaluating risk, the following current or future potential pathways and receptors were evaluated:

<b>Affected Media</b>	<b>Exposure Pathway</b>	<b>Receptor Scenario</b>
Soil	Ingestion/Inhalation/Dermal Contact	Occupational and Excavation Workers
Soil	Volatilization to Outdoor Air	Occupational
Soil	Vapor Intrusion into Buildings	Occupational
Soil	Leaching to Groundwater	Occupational
Groundwater	Ingestion/Inhalation	Occupational
Groundwater	Volatilization to Outdoor Air	Occupational
Groundwater	Vapor Intrusion into Buildings	Occupational
Groundwater	Dermal Contact/Inhalation	Excavation Workers

Previous evaluations included residential exposure but this pathway was later considered an unrealistic future exposure scenario.

**SA-1 Soil: Extent sufficiently defined; risk levels acceptable.** Very low concentrations (20 to 40 mg/kg) of silver are present in near surface soils in this area. The two highest values for silver in soil are 38.9 mg/kg and 128 mg/kg, collected from five and nine feet bgs (relative hot spots) respectively. The most applicable risk based concentration (RBC) is 5,100 mg/kg for soil ingestion, dermal contact or inhalation in an occupational receptor scenario. One sample in this area with a silver concentration of 30 mg/kg was further analyzed for leaching potential, which resulted in non-detect. The low concentrations of silver in Source Area 1 are also capped under

the concrete slab of the building. No petroleum hydrocarbon contamination was detected in soil in this area.

**SA-1 Groundwater: Extent sufficiently defined; risk levels acceptable.** Groundwater samples were collected from six borings in this area. No detections of silver were present in field filtered samples from the six borings. Two samples contained concentrations of 7.07 ug/l and 2.34 ug/l total silver (unfiltered). The most applicable RBC is 730 ug/l for ingestion or inhalation from tap water in an occupational receptor scenario. Groundwater is not used for tap water in the vicinity of this property. And again, Source Area 1 lies beneath the concrete slab of the building. No petroleum hydrocarbon contamination was detected in groundwater in this area.

**SA-2 Soil: Extent sufficiently defined; risk levels acceptable.** Very low concentrations (2 to 21 mg/kg) of silver are present in a relatively small area (est. 50 ft<sup>2</sup>) of soil to a depth of approximately eight feet bgs in this area. Again, the potentially applicable RBC is 5,100 mg/kg. Low concentrations of several different petroleum hydrocarbon constituents are present in soil samples collected from this area. The highest comparable concentration of any constituent to the most applicable RBC was 0.773 mg/kg ethylbenzene, which is below the most applicable RBC of 12 mg/kg for vapor intrusion in an occupational scenario. Toluene and xylene were 2-3 orders of magnitude less, respectively, compared to applicable RBCs. Consistent with SA-1, soil in SA-2 is also capped under a concrete slab.

**SA-2 Groundwater: Extent sufficiently defined; risk levels acceptable.** Groundwater samples were collected for petroleum hydrocarbon analyses from seven borings in this area. TPH<sub>Dx</sub> and TPH<sub>Ho</sub> concentrations were detected (1.36 mg/l and 6.03 mg/l, respectively) in one of these samples, and exceed the most applicable RBC (.35 mg/l and 1.1 mg/l, respectively) for ingestion or inhalation for tap water in an occupational receptor scenario. This sample represents a low level of localized TPH in groundwater beneath a concrete slab with no current exposure pathway and no reasonable future potential exposure. No detections of silver were present in field filtered samples collected from three borings in this area.

**Perimeter Borings: Extent sufficiently defined; risk levels acceptable.** Petroleum hydrocarbons are not present in representative groundwater samples collected from five (of eight) representative perimeter boring locations. Silver, as total silver, was detected in two downgradient groundwater samples at 3.6 ug/l and 9 ug/l; dissolved silver was not detected in samples collected these boring locations. Again, the most applicable RBC is 730 ug/l for ingestion or inhalation from tap water in an occupational receptor scenario; groundwater is not used for tap water in the vicinity of this property.

### **Groundwater Beneficial Use Assessment**

PBS conducted a groundwater well record review to identify water supply wells within four square miles of the property. Eighteen records were identified; nine of these records were eliminated from the assessment because the wells were not used for water supply, were no longer in use or abandoned, or were incorrectly recorded to be within four square miles of the property.

Groundwater direction was determined to be to the southwest based on a DEQ records review of monitoring well sampling reports from four nearby facilities. Of the nine remaining wells used for the assessment, none are directly downgradient of the property. If the groundwater gradient shifted more to the west or south, two industrial use wells - located approximately ½ mile downgradient in area of heavy industrial use - could be potentially affected. However, the industrial business locations that may be using these two wells are serviced by municipal drinking water.

### **Human Health Risk Assessment**

As discussed above, residual concentrations of petroleum hydrocarbon, cyanide, silver, ammonia, nitrite, nitrate, sulfate, and pH in soil and groundwater are less than any potentially applicable RBCs except for an isolated concentration of TPH in groundwater found in one boring location in Source Area 2. However, there is no unacceptable human health risk for TPH in this location because there is no current or expected future exposure pathway; there is no direct exposure, and groundwater is not used as drinking water in the vicinity of this property.

**Ecological Risk Assessment.** Groundwater in the vicinity of this property is assumed to eventually discharge to Crystal Springs Creek, located approximately 2,200 feet south-southwest. Another potential discharge point is the Willamette River, located approximately one mile due west of the property. PBS completed a Level I Ecological Risk Assessment, which referred to applicable discussion to support the assessment within the *Revised Additional Site Characterization and Final Report* submitted to DEQ. Their evaluation of potential ecological receptors/habitat affected by residual contamination at the property concludes that no ecologically important specie or habitat could be potentially impacted by the residual soil and groundwater contamination at the property.

**Locality of the Facility Determination.** The locality of the facility is defined in DEQ's Cleanup Program rules (OAR 340-122-115) as any point where a human or an ecological receptor contacts, or is reasonably likely to come into contact with, facility-related hazardous substances (OAR 340-122-115). An assessment of risk must consider all receptors within the locality of the facility. As provided above, there are no existing exposure pathways resulting in unacceptable risk for residual contamination at the property. Also, there would be no exposure pathways resulting in unacceptable risk from residual contamination to a human or ecological receptor even if the building were demolished and potential receptors had direct exposure to residual contaminated soil.

**Recommendation for a No Further Action Determination.** Based on the information provided by PBS Engineering and Environmental (PBS), on behalf of ITA, I concur with the overall conclusions, and recommend that a No Further Action determination be issued for this property.

### **Administrative Record**

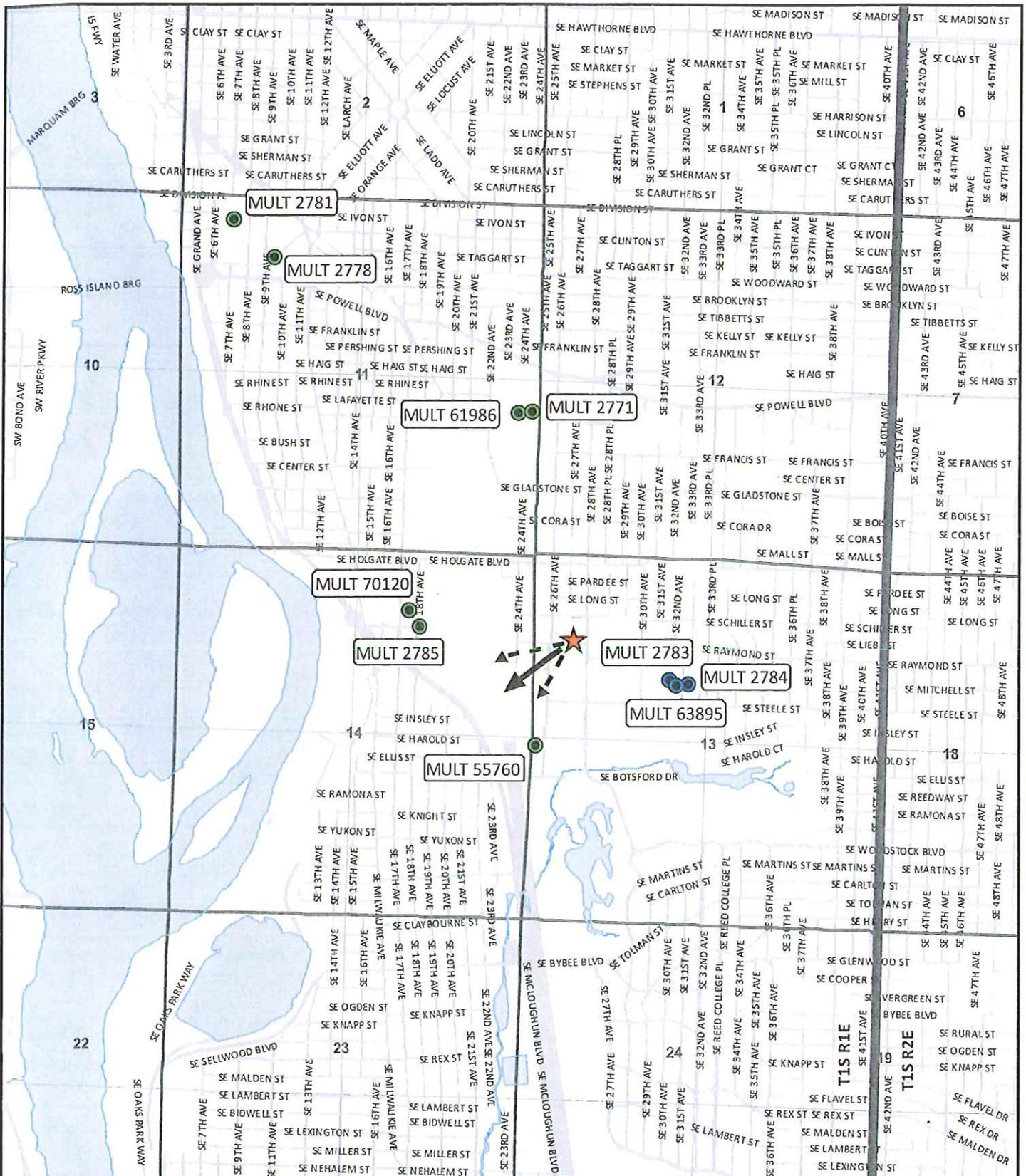
NFA Memorandum - Former Qualex Facility  
2715 SE Raymond, Portland, Oregon, ECSI #5088  
June 24, 2009  
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PBS Engineering and Environmental, August 2008, "Additional Site Characterization and Final Report"

PBS Engineering and Environmental, April 2009, "Revised Additional Site Characterization and Final Report"

DEQ ESCI Database

Attachments: Qualex Site Map – Nearby Water Wells  
Subsurface Boring Locations Figure  
PBS Sampling Results (Tables 2, 3, and 4)  
Geologica Sampling Results (Tables 1A, 1B, 1-C, and 2)  
PBS Residual Silver Figures (Figures 1, 1A, and 2)



★ Former Qualex Facility (Subject Property)    
 Assumed Groundwater Flow Direction    
 1 Sections    
 SOURCE: DEQ FACILITY PROFILER

● Domestic Water Supply Well    
 Other Potential Groundwater Flow Directions    
 Waterbodies

● Industrial Water Supply Well    
 Streams

Well Search Area

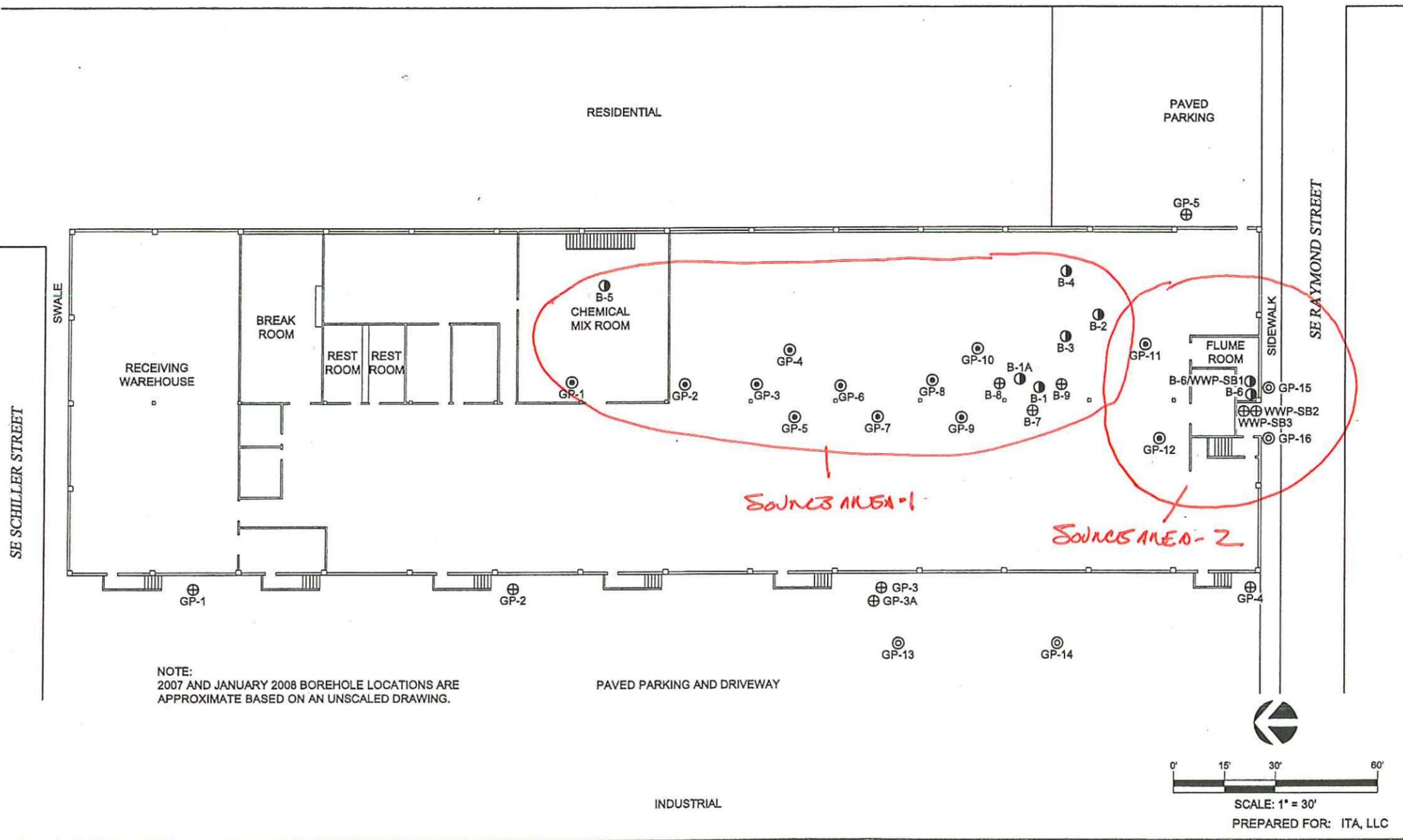
0    1,000    2,000       4,000 Feet

Prepared for: ITA, LLC

**LEGEND**

- ⊙ GP-1 PBS GEOPROBE® BORING NUMBER AND LOCATION (JULY 2008)
- ⊙ B-1 PREVIOUS HAND AUGER BORING NUMBER AND LOCATION (OCTOBER AND NOVEMBER 2007)
- ⊕ GP-1 PREVIOUS GEOPROBE® BORING NUMBER AND LOCATION (OCTOBER, NOVEMBER 2007 AND JANUARY 2008)
- ⊙ GP-13 GEOPROBE® BORING NUMBER AND LOCATION (MARCH 2009)

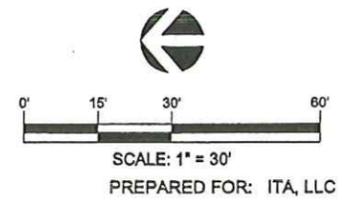
SE 28TH AVENUE



NOTE:  
2007 AND JANUARY 2008 BOREHOLE LOCATIONS ARE APPROXIMATE BASED ON AN UNSCALED DRAWING.

PAVED PARKING AND DRIVEWAY

INDUSTRIAL



**PBS**  
Engineering +  
Environmental  
4412 SW Corbett Ave  
Portland, OR 97239  
503.248.1939 Main  
503.248.0223 Fax  
www.pbsenv.com

**2007-2009 BOREHOLE LOCATIONS**

2715 SE RAYMOND  
PORTLAND, OREGON

FORMER	
QUALEX FACILITY	
PROJECT:	18875.000
DATE:	APRIL 2009
FIGURE:	<b>6</b>

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**Table 2 - Soil Sampling Results - Source Area 1**  
**Former Qualex Facility, 2715 SE Raymond**  
**Portland, Oregon**

Sample ID	Sampling Depth (ft bgs)	Sample Date	Silver <sup>1</sup>	VOCs
			mg/kg	ug/kg
GP-1 1'	1	7/7/2008	<2.38	NA
GP-1 3'	3	7/7/2008	NA	NonDet <sup>2</sup>
GP-1 5'	5	7/7/2008	<2.59	NA
GP-2 1'	1	7/7/2008	<2.21	NA
GP-2 3'	3	7/7/2008	NA	NonDet <sup>2</sup>
GP-2 5'	5	7/7/2008	<3.83	NA
GP-3 1'	1	7/7/2008	<2.26	NonDet <sup>2</sup>
GP-3 5'	5	7/7/2008	<3.77	NA
GP-4 1'	1	7/7/2008	<2.39	NA
GP-4 5'	5	7/7/2008	<2.73	NA
GP-5 1'	1	7/7/2008	<2.28	NA
GP-5 5'	5	7/7/2008	<4.24	NA
GP-6 1'	1	7/7/2008	<2.38	NA
GP-6 5'	5	7/7/2008	<3.00	NA
GP-7 1'	1	7/7/2008	<2.29	NA
GP-7 5'	5	7/7/2008	<3.01	NA
GP-8 1'	1	7/7/2008	30.3	NonDet <sup>2</sup>
GP-8 5'	5	7/7/2008	0.25	NA
GP-9 1'	1	7/7/2008	<2.24	NA
GP-9 5'	5	7/7/2008	<3.03	NA
GP-10 1'	1	7/8/2008	<2.43	NA
GP-10 5'	5	7/8/2008	<2.97	NA
GP-13 1'	1	2/26/2009		NA
GP-13 7'	7	2/26/2009		NA
Oregon RBC - Ingestion, Dermal Contact, Inhalation		Occupational	5,100	None detected
		Excavation	43,000	
Oregon RBC - Soil Leaching to Groundwater		Occupational	NP	
		EPA Screening Levels <sup>3</sup>		
		DAF 1 <sup>4</sup>	2	

NA: Not analyzed in this sample

NP: Not provided for inorganic compounds

ft bgs: feet below ground surface

<sup>1</sup> Includes detections down to Method Detection Limits (see lab report).

<sup>2</sup> No VOCs detected. See lab report for method detection limits.

<sup>3</sup> EPA Region 6 Human Health Medium Specific Screening Levels

<sup>4</sup> Dilution Attenuation Factor - EPA's soil leaching to groundwater pathway

**Table 3 - Soil Sampling Results - Source Area 2**  
**Former Qualex Facility, 2715 SE Raymond**  
**Portland, Oregon**

Sample ID	Sampling Depth (ft bgs)	Sample Date	Silver	Diesel	Heavy Oil	VOCs					PAHs				
						n-butylbenzene	sec-butylbenzene	4-isopropyltoluene	n-propylbenzene	1,2,4-trimethylbenzene	Benzo(a)pyrene	Benzo(b,k)fluoranthene <sup>1</sup>	Benzo(g,h,i)perylene	Fluoranthene	Pyrene
			mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
GP-11 1'	1	7/8/2008	NA	<36.2	<72.5	<28.9	<28.9	<28.9	<28.9	<57.8	39.4	57.9	39.7	51.1	66.4
GP-11 5'	5	7/8/2008	NA	<38.2	<76.4	<33.4	<33.4	<33.4	<33.4	<66.9	<46.4	<46.4	<46.4	<46.4	<46.4
GP-12 1'	1	7/8/2008	<2.35	972	3,050	85.7	88.2	64.4	29.4	68.4	<677	<745	<677	<677	<677
GP-12 5'	5	7/8/2008	<3.08	<39.0	<77.9	<35.2	<35.2	<35.2	<35.2	<70.4	<99.0	<99.0	<99.0	<99.0	<99.0
Oregon RBC - Ingestion, Dermal Contact, Inhalation	Occupational		5,100	70,000	NS <sup>2</sup>	4,900,000	4,900,000	NS	4,900,000	1,600,000	270	2,700	NS	29,000,000	21,000,000
	Excavation		43,000	>100,000	NS <sup>2</sup>	65,000,000	65,000,000	NS	65,000,000	44,000,000	59,000	590,000	NS	>100,000,000	>100,000,000
Oregon RBC - Volatilization to Outdoor Air	Occupational		NV	>100,000	NS <sup>2</sup>	>167,000	>129,000	NS	>198,000	790,000	NV	NV	NS	NV	NV
Oregon RBC - Vapor Intrusion into Buildings	Occupational		NV	>100,000	NS <sup>2</sup>	>167,000	>129,000	NS	>198,000	840,000	NV	NV	NS	NV	NV
Oregon RBC - Soil Leaching to Groundwater	Occupational		NP	>100,000	NS <sup>2</sup>	>167,000	160,000	NS	>198,000	55,000	>8,260	>9,230	NS	>110,000	>70,900
EPA Screening Levels <sup>3</sup>	Industrial Indoor Worker		1,000	NS	NS	240,000	220,000	NS	240,000	200,000	780	7,800	NS	82,000,000	54,000,000
	DAF 1 <sup>4</sup>		2	NS	NS	NS	NS	NS	NS	NS	400	200	NS	210,000	210,000

NA: Not analyzed in this sample

NP: Not provided for inorganic compounds

NS: Not set for this compound

NV: Compound not volatile so pathway is not valid

<sup>1</sup> Set at lower of screening levels for benzo(b)fluoranthene

<sup>2</sup> RBC not set for this compound; the diesel RBC is typically used for comparison

<sup>3</sup> EPA Region 6 Human Health Medium Specific Screening Levels

<sup>4</sup> Dilution Attenuation Factor - EPA's soil leaching to groundwater pathway



Engineering + Environmental

**Table 4 - Groundwater Sampling Results**  
**Former Qualex Facility, 2715 SE Raymond**  
**Portland, Oregon**

Source Area	Sample ID	Sample Date	Silver Total	Silver Dissolved	Diesel	Heavy Oil	VOCs	BTEX	PAHs
			ug/L	ug/L	mg/L	mg/L	ug/L		ug/L
Source Area 1	GP-1	7/7/2008	<2.0	<2.0	NA	NA	No VOCs detected <sup>1</sup>	NA	NA
	GP-7	7/7/2008	2.34	<2.0	NA	NA		NA	NA
	GP-10	7/8/2008	7.07	<2.0	NA	NA		NA	NA
	GP-13	2/26/2009	9	<2.0	NA	NA		NA	NA
	GP-14	2/26/2009	<2.0	<2.0	NA	NA		NA	NA
Source Area 2	GP-11	7/8/2008	NA	NA	<0.248	<0.495	No VOCs detected <sup>1</sup>	NA	No PAHs detected <sup>1</sup>
	GP-12	7/8/2008	NA	NA	<0.255	<0.510		NA	
	GP-15	2/26/2009	NA	NA	<0.236	<0.472		NA	
	GP-16	2/26/2009	NA	NA	<0.236	<0.472		NA	
Oregon RBC - Ingestion & Inhalation		Occupational	730	730	0.350	NS	None detected	None detected	None detected
Oregon RBC - Volatilization to Outdoor Air		Occupational	NV	NV	>0.034 to 25 <sup>3</sup>	NS			
Oregon RBC - Vapor Intrusion into Buildings		Occupational	NV	NV	>0.034 to 25 <sup>3</sup>	NS			
Oregon RBC - Groundwater in Excavation			1,000	1,000	>0.034 to 25 <sup>3</sup>	NS			
EPA Screening Levels <sup>2</sup>		Residential Water	180	180	NS	NS			

NA: Not analyzed in this sample

NV: Compound not volatile so pathway is not valid

NS: Screening Level not set for this compound

<sup>1</sup> Method Reporting Limits for each analyte provided in laboratory report

<sup>2</sup> EPA Region 6 Human Health Medium Specific Screening Levels

<sup>3</sup> Value is greater than the solubility limit. Limits from mid-range diesel hydrocarbon (C10 - C12) for aliphatic and aromatic hydrocarbons are provided.

**Table 1A**  
**Summary of Soil Sampling Data**  
**Former Paper Processing Area Trench** *SOIL AREA - 1*

Supplemental Phase II Subsurface Investigation

Former Qualex Photofinishing Facility  
 2715 SE Raymond Street  
 Portland, Oregon 97202

Method	Analyte	Units	Former Paper Processing Area Trench																	OR DEQ Pre-Calculated Hot Spot Value for residential Land Use		OR DEQ Risk-Based Decision Making Values			USEPA Region 6 Human Health Medium-Specific Screening Levels 2007		OR DEQ Guidance for Ecological Risk Assessment	
			B-1-1'	B-1-3'	B-1-5'	B-1A-1'	B-1A-3'	B-1A-5'	B-1A-7'	B-1A-9'	B-7-1.5'	B-7-6.5'	B-7-11.5'	B-8-1'	B-8-7'	B-8-14'	B-9-2'	B-9-7'	B-9-15'	Acceptable Risk Level / Risk-Based Concentration	Highly Concentrated Hot Spot Removal	Residential Ingestion, Dermal Contact, and Inhalation	Residential Vapor Intrusion Into Buildings	Residential Leaching to Groundwater	Residential Soil	DAF 1	Level II Screening Values Soils - Terrestrial Receptors	
Sample Depth, feet (ft) below ground surface (bgs)			1 ft bgs	3 ft bgs	5 ft bgs	1 ft bgs	3 ft bgs	5 ft bgs	7 ft bgs	9 ft bgs	1.5 ft bgs	6.5 ft bgs	11.5 ft bgs	1 ft bgs	7 ft bgs	14 ft bgs	2 ft bgs	7 ft bgs	15 ft bgs									
Date Sampled			10/17/07	10/17/07	10/17/07	11/15/07	11/15/07	11/15/07	11/15/07	11/15/07	1/21/08	1/21/08	1/21/08	1/21/08	1/21/08	1/21/08	1/21/08	1/21/08	1/21/08									
<b>Volatile Organic Compounds</b>																												
8260B	Ethylbenzene	µg/kg	ND <sup>(1)</sup>	- <sup>(2)</sup>	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,900,000	19,000,000	4,000,000	NA/NA <sup>(3)</sup>	160,000	230,000	700	NA/NA	
8260B	Toluene	µg/kg	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	660,000	66,000,000	54,000,000	NA/NA	140,000	520,000	600	200,000	
8260B	m,p-Xylenes <sup>(4)</sup>	µg/kg	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	270,000	2,700,000	790,000.0	110,000	25,000	210,000	10,000	100,000	
8260B	o-Xylene <sup>(4)</sup>	µg/kg	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	270,000	2,700,000	790,000.0	110,000	25,000	280,000	10,000	1,000	
<b>Metals</b>																												
EPA 6020	Silver	mg/kg dry	40.9	11.5	128	21.4	8.72	ND	40.8	38.9	3.27	ND	1.39	44.7	10.9	0.693	29.8	ND	1.67	390	3,900	390	NV	NA/NA	390	2	2	
<b>Inorganics</b>																												
EPA 350.1	Ammonia	mg/kg dry	22.8	-	4.76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
EPA 335.2	Cyanide (total)	mg/kg dry	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-									
EPA 300.0	Nitrite	mg/kg dry	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-									
EPA 300.0	Nitrate	mg/kg dry	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-									
EPA 300.0	Sulfate as SO4	mg/kg dry	754	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
<b>Other</b>																												
NCA SOP	pH	pH Units	7.81	-	7.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA

Notes:  
 Refer to Figure 2  
 (1) ND = Not Detected Above MRL  
 (2) - = Not Analyzed  
 (3) NA/NA = Not Available / Not Applicable  
 (4) Criteria given are for Total Xylenes  
 Criteria Exceedance  
 Compound Not Detected and Criteria Not Evaluated

**Table 1B**  
**Summary of Soil Sampling Data** - SOURCE AREA - 1  
**Former Film Processing Area and Chemical Mix Area Sump**

Supplemental Phase II Subsurface Investigation

Former Qualex Photofinishing Facility  
 2715 SE Raymond Street  
 Portland, Oregon 97202

Method	Analyte	Units	Former Film Processing Area Floor Crack		Former Film Processing Area Trench				Chemical Mix Area Sump		OR DEQ Pre-Calculated Hot Spot Value for residential Land Use		OR DEQ Risk-Based Decision Making Values			USEPA Region 6 Human Health Medium-Specific Screening Levels 2007		OR DEQ Guidance for Ecological Risk Assessment
			B-2-1'	B-2-5'	B-3-1'	B-3-5'	B-4-1'	B-4-5'	B-5-1'	B-5-5'	Acceptable Risk Level / Risk-Based Concentration	Highly Concentrated Hot Spot Removal	Residential Ingestion, Dermal Contact, and Inhalation	Residential Vapor Intrusion Into Buildings	Residential Leaching to Groundwater	Residential Soil	DAF 1	Level II Screening Values Soils - Terrestrial Receptors
Sample Depth, feet (ft) below ground surface (bgs)			1 ft bgs	5 ft bgs	1 ft bgs	5 ft bgs	1 ft bgs	5 ft bgs	1 ft bgs	5 ft bgs								
Date Sampled			10/17/07	10/17/07	10/17/07	10/17/07	10/17/07	10/17/07	10/17/07	10/17/07								
<b>Volatile Organic Compounds</b>																		
8260B	Ethylbenzene	µg/kg	ND <sup>(1)</sup>	ND	ND	ND	ND	ND	ND	ND	1,900,000	19,000,000	4,000,000	NA/NA	160,000	230,000	700	NA/NA
8260B	Toluene	µg/kg	ND	ND	ND	ND	ND	ND	ND	ND	660,000	66,000,000	54,000,000	NA/NA	140,000	520,000	600	200,000
8260B	m,p-Xylenes <sup>(3)</sup>	µg/kg	ND	ND	ND	ND	ND	ND	ND	ND	270,000	2,700,000	790,000	110,000	25,000	210,000	10,000	100,000
8260B	o-Xylene <sup>(3)</sup>	µg/kg	ND	ND	ND	ND	ND	ND	ND	ND	270,000	2,700,000	790,000	110,000	25,000	280,000	10,000	1,000
<b>Metals</b>																		
EPA 6020	Silver	mg/kg	2.78	ND	ND	ND	ND	ND	ND	ND	390	3,900	390	NV	NA/NA	390	2	2
<b>Inorganics</b>																		
EPA 350.1	Ammonia	mg/kg	1,630	2.4	428	5.4	800	15.8	42.1	22.3	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
EPA 335.2	Cyanide (total)	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND								
EPA 300.0	Nitrite	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND								
EPA 300.0	Nitrate	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND								
EPA 300.0	Sulfate as SO <sub>4</sub>	mg/kg	9,310	189	3,240	132	5,630	593	ND	ND	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
<b>Other</b>																		
NCA SOP	pH	pH Units	8.13	7.79	7.97	7.51	6.87	7.15	7.01	7.31	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA

- Notes:
- (1) Refer to Figure 2
  - (2) ND = Not Detected Above MRL
  - (3) NA/NA = Not Available / Not Applicable
  - Criteria given are for Total Xylenes
  - Criteria Exceedence
  - Compound Not Detected and Criteria Not Evaluated

**Table 1C**  
**Summary of Soil Sampling Data** - SOURCE AREA-2  
**Former Wastewater Flume Pit Area**

Supplemental Phase II Subsurface Investigation

Former Qualex Photofinishing Facility  
 2715 SE Raymond Street  
 Portland, Oregon 97202

			Former Wastewater Flume Pit Area													OR DEQ Pre-Calculated Hot Spot Value for residential Land Use		OR DEQ Risk-Based Decision Making Values			USEPA Region 6 Human Health Medium-Specific Screening Levels 2007		OR DEQ Guidance for Ecological Risk Assessment			
Method	Analyte	Units	B-6-1'	B-6-11'	B-6-13'	WWP-SB-1A	WWP-SB-1B	WWP-SB-1C	WWP-SB1-C'	WWP-SB-2A	WWP-SB-2-2'	WWP-SB-2-6.5'	WWP-SB-2-11.5'	WWP-SB-3-1'	WWP-SB-3-7.5'	WWP-SB-3-15'	Acceptable Risk Level / Risk-Based Concentration	Highly Concentrated Hot Spot Removal	Residential Ingestion, Dermal Contact, and Inhalation	Residential Vapor Intrusion Into Buildings	Residential Leaching to Groundwater	Residential Soil	DAF 1	Level II Screening Values Soils - Terrestrial Receptors		
	Sample Depth, feet (ft) below ground surface (bgs)		1 ft bgs	11 ft bgs	13 ft bgs	5 ft bgs	6.5 ft bgs	8.5 ft bgs	8.5 ft bgs	4 ft bgs	2 ft bgs	6.5 ft bgs	11.5 ft bgs	1 ft bgs	7.5 ft bgs	15 ft bgs										
	Date Sampled		11/15/07	1/21/08	1/21/08	1/3/08	1/3/08	1/3/08	1/3/08	1/3/08	1/22/08	1/22/08	1/22/08	1/22/08	1/22/08	1/22/08										
<b>Petroleum Hydrocarbons</b>																										
8015B	Gasoline Range Organics	mg/L	ND <sup>(1)</sup>	ND <sup>(2)</sup>	ND	-	-	-	-	-	ND	ND	ND	ND	ND	ND	NA/NA <sup>(3)</sup>	NA/NA	720	140	26	NA/NA	NA/NA	NA/NA		
8015B	Diesel Range Organics	mg/L	-	ND	ND	-	-	-	-	-	17.3	ND	47.3	-	ND	ND	NA/NA	NA/NA	3,900	NA/NA	2,800	NA/NA	NA/NA	NA/NA		
8015B	Heavy Oil Range	mg/L	-	ND	ND	-	-	-	-	-	112	ND	372	-	ND	ND	NA/NA	NA/NA	9,800	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA		
<b>Volatile Organic Compounds</b>																										
8260B	Ethylbenzene	µg/kg	733	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,900,000	19,000,000	4,000,000	NA/NA	160,000	230,000	700	NA/NA		
8260B	Toluene	µg/kg	11,500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	660,000	66,000,000	5,400,000	NA/NA	140,000	520,000	600	200,000		
8260B	m,p-Xylenes <sup>(4)</sup>	µg/kg	2,860	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	270,000	2,700,000	790,000	110,000	25,000	210,000	10,000	100,000		
8260B	o-Xylene <sup>(4)</sup>	µg/kg	929	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	270,000	2,700,000	790,000	110,000	25,000	280,000	10,000	1,000		
<b>Metals</b>																										
EPA 6020	Silver	mg/kg	21.5	ND	ND	21.5	2.36	6.55	14.3	ND	ND	ND	ND	ND	11.87	ND	390	3,900	390	NV	NA/NA	390	2	2		
<b>Inorganics</b>																										
EPA 350.1	Ammonia - Nitrogen	mg/kg	937	2.21	3.10	283	54.1	12.2	138	14.6	20.0	1.98	6.32	9.39	3.17	3.4	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA		
EPA 335.2	Cyanide (total)	mg/kg	297	ND	0.580	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,200	12,000								
EPA 300.0	Nitrite	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND										
EPA 300.0	Nitrate	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND										
EPA 300.0	Sulfate as SO4	mg/kg	42	ND	ND	381	67.7	134	531	105	ND	78.1	ND	98.6	ND	ND	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA		
<b>Other</b>																										
NCA SOP	pH	pH Units	9.28	7.18	7.25	9.02	7.96	7.49	9.69	7.41	7.79	9.42	8.81	7.51	8.28	7.75	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA		

Notes:  
 Refer to Figure 3  
 (1) - = Not Analyzed  
 (2) ND = Not Detected Above MRL  
 (3) NA/NA = Not Available / Not Applicable  
 (4) Criteria given are for Total Xylenes  
 Criteria Exceedence  
 Compound Not Detected and Criteria Not Evaluated  
 Duplicate of Sample WWP-SB-1C

**Table 2**  
Summary of Groundwater Sampling Data

Supplemental Phase II Subsurface Investigation

Former Qualex Photofinishing Facility  
2715 SE Raymond Street  
Portland, Oregon 97202

Method	Analyte	Units	Westside of Building						East side of Building	Flume Room Sump			Building Interior			OR DEQ Pre-Calculated Hot Spot Value	OR DEQ Risk-Based Decision Making Values		USEPA Region 6 Human Health Medium-Specific Screening Levels 2007	OR DEQ Guidance for Ecological Risk Assessment	
			GP-1 <sup>(1)</sup>	GP-2 <sup>(1)</sup>	GP-3 <sup>(1)</sup>	GP-3A <sup>(2)</sup>	GP-3A <sup>(3)</sup>	GP-4 <sup>(1)</sup>	GP-5 <sup>(1)</sup>	WWP-SB-1 <sup>(2)</sup>	WWP-SB-2 <sup>(2)</sup>	WWP-SB-3 <sup>(2)</sup>	B-7 <sup>(2)</sup>	B-8 <sup>(2)</sup>	B-9 <sup>(2)</sup>		Significant Adverse Effect Level	Residential Ingestion and Inhalation from Tapwater			Residential Vapor Intrusion into Buildings
Date Sampled			10/19/07	10/19/07	10/19/07	11/15/07	11/15/07	10/19/07	10/19/07	1/21/08	1/22/08	1/22/08	1/21/08	1/21/08	1/21/08						
<b>Petroleum Hydrocarbons</b>																					
NW TPH-GX	Gasoline Range Hydrocarbons	mg/L	ND <sup>(4)</sup>	ND	ND	- <sup>(5)</sup>	-	ND	ND	ND	ND	ND	-	-	-						
NWTPH-Dx	Diesel Range Organics	mg/L	ND	ND	ND	-	-	ND	ND	1.36	ND	ND	-	-	-		0.088				
NWTPH-Dx	Heavy Oil Range Hydrocarbons	mg/L	ND	ND	ND	-	-	ND	ND	6.03	ND	ND	-	-	-		0.290				
<b>Volatile Organic Compounds</b>																					
8260B	8260B List Compounds	µg/L	ND	ND	ND	-	-	ND	ND	ND	ND	ND	-	-	-						
<b>Metals</b>																					
6020	Silver	µg/L	ND	ND	3.64	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	180	NV <sup>(6)</sup>	180	0.12	
<b>Inorganic Parameters et al</b>																					
EPA 350.1	Ammonia - Nitrogen	mg/L	ND	2.59	13.4	-	-	0.45	ND	10.0	ND	0.653	-	-	-	NA/NA <sup>(7)</sup>	NA/NA	NA/NA	210	17	
EPA 300.0	Nitrite as Nitrogen	mg/L	-	-	-	-	-	-	-	ND	ND	ND	-	-	-				1		
EPA 353.2	Nitrate / Nitrite as Nitrogen <sup>(8)</sup>	mg/L	4.86	ND	ND	-	-	ND	1.36	ND <sup>(9)</sup>	0.14 <sup>(9)</sup>	0.11 <sup>(9)</sup>	-	-	-	NA/NA	NA/NA	NA/NA	10	NA/NA	
EPA 300.0	Sulfate <sup>(10)</sup>	mg/L	98.0	38.0	ND	-	-	49.0	81.0	31.9	54.7	58.1	-	-	-	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	
EPA 335.4	Total Cyanide	mg/L	ND	ND	ND	-	-	ND	ND	ND	ND	ND	-	-	-	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	
	pH	pH Units	-	-	-	-	-	-	-	7.43	6.81	7.12	-	-	-	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	

- Notes: Refer to Figure 2 and Figure 3
- (1) Unfiltered Sample
  - (2) Field Filtered Sample
  - (3) Lab Filtered Sample
  - (4) ND = Not Detected Above MRL
  - (5) - = Not Analyzed
  - (6) NV = This chemical is considered nonvolatile for purposes of the exposure calculations.
  - (7) NA/NA = Not Available / Not Applicable
  - (8) Concentration values assumed to be 80% Nitrate.
  - (9) Sample analyzed for Nitrate as Nitrogen by EPA Method 300.0
  - (10) US EPA Secondary Maximum Contaminant Level is 250 mg/L
- Criteria Exceedence

# Silver in Soil

Occupational Ing/Inh RBC = 5,100 mg/kg

ND / NO concentration @ 1' (unless otherwise noted)  
 ND / NO concentration @ 5'

## LEGEND

- PBS GEOPROBE BORING NUMBER AND LOCATION (JULY 2008)
- PREVIOUS HAND AUGER BORING NUMBER AND LOCATION (OCTOBER AND NOVEMBER 2007)
- PREVIOUS GEOPROBE BORING NUMBER AND LOCATION (OCTOBER, NOVEMBER 2007 AND JANUARY 2008)

SE 28TH AVENUE



# PBS

Engineering + Environmental  
 4412 SW Corbett Ave  
 Portland, OR 97239  
 503.248.1939 Main  
 503.248.0223 Fax  
 www.pbsenv.com

2007-2008 BOREHOLE LOCATIONS

2715 SE RAYMOND  
 PORTLAND, OREGON

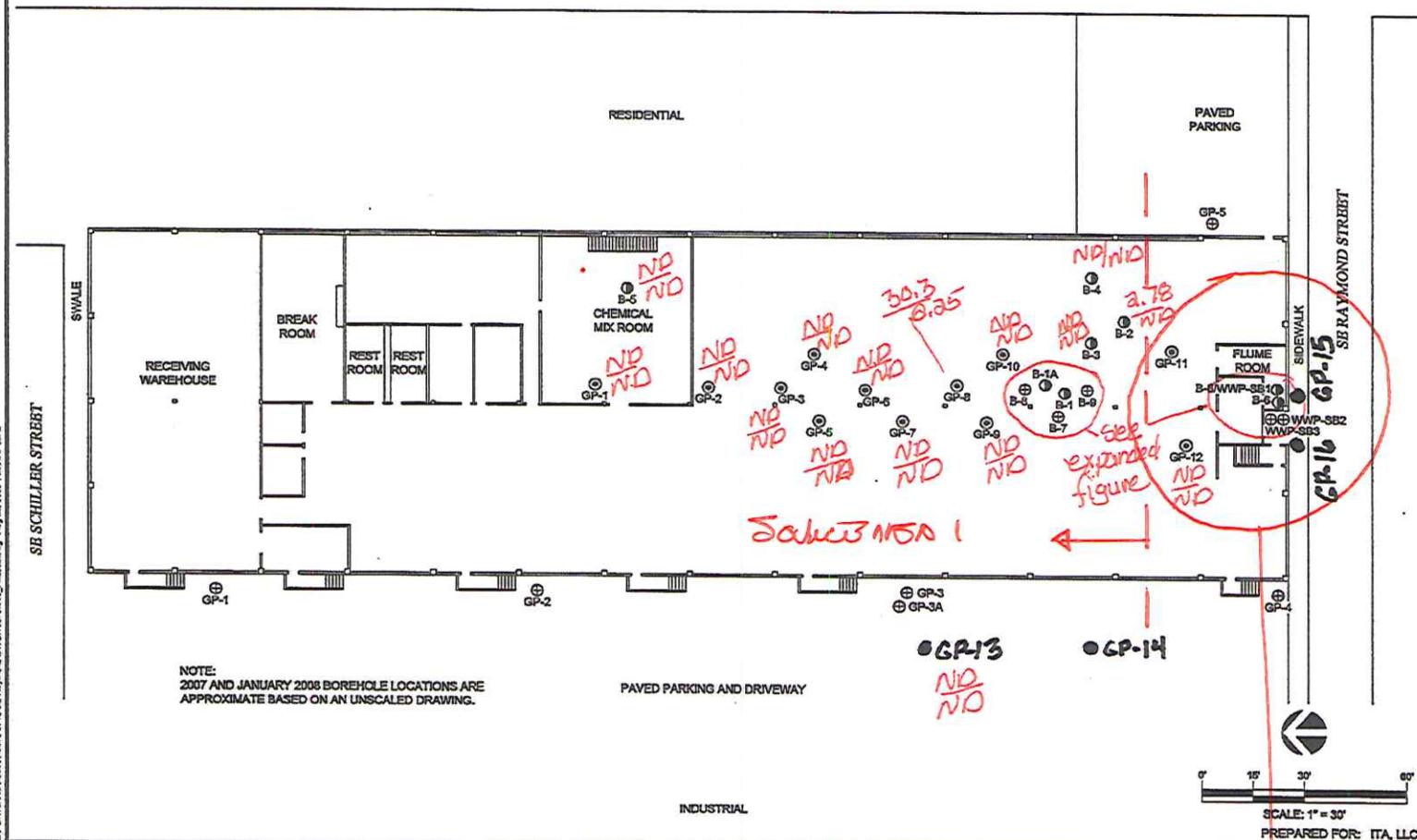
FORMER

QUALEX FACILITY

PROJECT: 18875.000

DATE: AUGUST 2008

FIGURE: 4/1



NOTE:  
 2007 AND JANUARY 2008 BOREHOLE LOCATIONS ARE APPROXIMATE BASED ON AN UNSCALED DRAWING.

SCALE: 1" = 30'  
 PREPARED FOR: ITA, LLC

Silver in Soil 2

L:\PORTLAND\18875\2715 SE Raymond\CONVE\18875\_000\_Planet.dwg Aug 21, 2008 1:08pm JTB

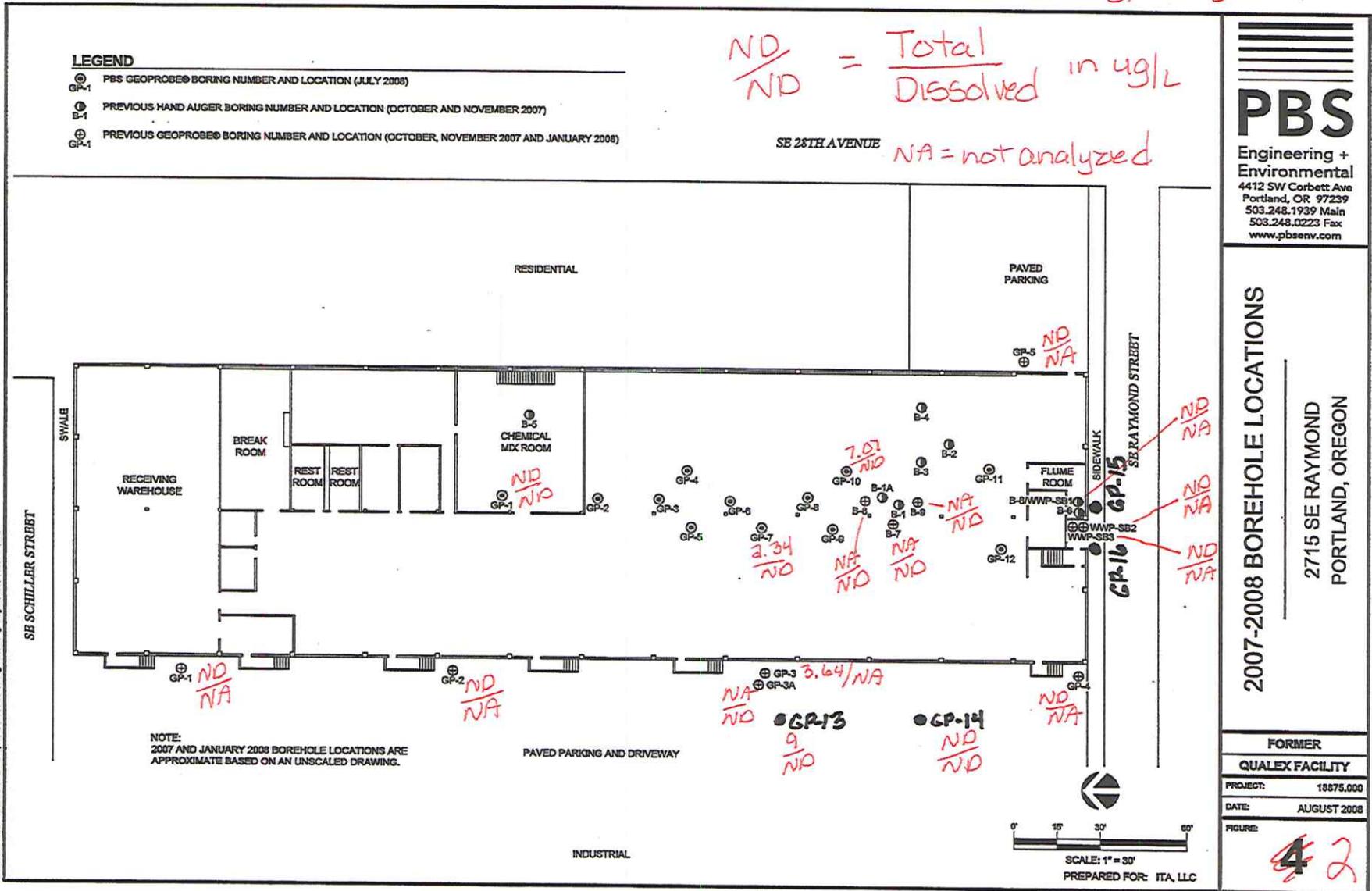


# Silver in Groundwater

RBC = 730  $\mu\text{g/L}$  ingestion/inhalation

$\frac{\text{ND}}{\text{ND}} = \frac{\text{Total}}{\text{Dissolved}}$  in  $\mu\text{g/L}$

NA = not analyzed



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