



Ash Creek Associates, Inc.

Environmental and Geotechnical Consultants

May 6, 2011

Mr. Kelly Madalinski
Port of Portland
7200 NE Airport Way
Portland, Oregon 97218

Re: 2010 Source Control Sampling Results
Willamette Cove Upland Facility
Portland, Oregon
ECSI No. 2066
1056-02

Dear Mr. Madalinski:

This letter presents the results of sampling activities completed to support the preparation of a Source Control Evaluation (SCE) for the Willamette Cove Upland Facility (the Facility; Figures 1 and 2) in the St. Johns area of Portland, Oregon. Investigation activities are being conducted under Voluntary Agreement EC-NWR-00-26 (VCP Agreement) between the Port of Portland (Port), Metro, and the Oregon Department of Environmental Quality (DEQ). The sampling activities were conducted at the Facility in accordance with the *Source Control Sampling Work Plan* (the Work Plan; dated March 31, 2010) and the *Source Control Sampling Work Plan Addendum* (the Addendum; dated September 2, 2010), and field decisions agreed upon by DEQ, Port, and Metro. The DEQ approved the Addendum in a letter dated September 21, 2010. An email documenting the field decisions is included in Attachment A. The methods, procedures, and results of the chemical analyses are presented in this letter.

SAMPLING ACTIVITIES

The sampling activities were completed between September 27 and October 4, 2010. DEQ provided field oversight during the activities completed in the Inner Cove and former Wharf Road area. Field procedures for the sampling, field screening, and chemical analysis were presented in the Sampling and Analysis Plan (SAP; Appendix C) of the Work Plan. The Standard Operating Procedures (SOPs) utilized are included in Attachment B of this letter. A photograph log is included in Attachment C. The laboratory analytical reports are provided in Attachment D along with a data quality review.

The sample locations were recorded using a high-accuracy, handheld global positioning system (GPS) device (Trimble© GeoXH™).

Preparatory Activities

The following activities were completed in preparation for the field work.

- **Health and Safety Plan (HASP).** Ash Creek Associates (Ash Creek) prepared a HASP for its personnel and all contractors involved with the project.
- **Underground Utility Location.** An underground utility locate was conducted prior to the sampling activities.

CHARACTERIZATION ACTIVITIES AND CHEMICAL ANALYSES

Erodible Soil Riverbank Sampling. The November 16, 2009 site visit conducted between the Port, Metro, and DEQ identified multiple locations along the riverbank where shallow soils could potentially erode. Previous investigations have found no known sources of upland impacts to the erodible soils; however, sampling of the erodible soil was conducted to confirm this conclusion. Four-point composite surface soil samples were collected from the identified locations from approximately 0 to 6 inches below the ground surface (bgs), with the exception of locations WC-SSM and WC-SSN, which were marked by DEQ and included 2 and 3 locations, respectively (Figure 3). Samples at location WC-SSL were split into two groups and marked by DEQ. As acknowledged by DEQ, the erodible sampling areas with less than four aliquots in the composite sample were the result of minimal distinct areas of erosion. Discrete samples from each sub-sample location were collected and retained for potential future analysis. Additional samples were collected for potential follow-up analysis from 2 to 2.5 feet bgs at the sampling locations identified as being at or below mean high (WC-SSP, WC-SSQ, WC-SSR, WC-SST, and WC-SSV).

Sample location WC-SSQ had inadequate soil volume available for the sample size required at the mean high sample location. The DEQ agreed that the sample could be collected from upslope where erodible material was available.

Sample locations at WC-SSZ were not sampled due to safety concerns regarding access.

No field indications of volatile organic compounds (VOCs) or petroleum hydrocarbons were observed in any of the sample locations.

Wharf Road Erodible Soils. Sampling of erodible soil in the former Wharf Road area was included due to the DEQ's concerns that the riverbank armoring was incomplete. Following observations for exposed soil, the DEQ indicated that erodible soils were not easily accessible due to thick and continuous armor cover. As an alternative, DEQ requested that surface soil from the heavily vegetated bench area above the ordinary line of high water (OLHW; locations WC-1 through WC-3; Figure 4; Photograph 1) be sampled. Vegetated cover was first removed from locations WC-1 through WC-3 and then a three-point composite surface soil sample was collected between 0 and 6 inches bgs. Discrete samples from each sub-sample location were collected and retained for potential future analysis. No field indications of VOCs or petroleum hydrocarbons were observed.

Characterization of Inner Cove (East Parcel) Area Beach Materials. In accordance with the request from the DEQ, the nature and extent of petroleum was qualitatively evaluated through completion of approximately 20 hand-excavated shallow potholes (e.g., shovel-pits dug a few inches into the sediment or deeper as necessary to assess the vertical extent of observed impacts; Figure 5; Photograph 2) completed at low river stage (above the ordinary line of low water [OLLW] at the time of the field activities). The shallow potholing was completed until the Port, Metro, and DEQ were satisfied that the width of the impacted area had been identified (through field screening observations for petroleum sheen, odor, and discoloration). Two samples of surface sediment with the highest-relative field evidence of petroleum were collected at the locations requested by DEQ.



Inner Cove - Potential Connection of Beach-Related Petroleum to the Upland Facility. Trenching was completed to assess the potential connection between the Facility and the beach area as described in the Work Plan. The lateral extent of the trenching was determined by DEQ based on field observations during the shallow potholing described above. The trenching was completed as series of short trenches (approximately 15 feet long by 8 feet deep; Figure 5) that followed the toe of the riverbank slope. A series of trenches was used rather than a continuous trench due to limitations from subsurface debris and Portland-cement concrete blocks. Exploration logs are presented in Attachment B.

- **Trench 1.** Buried debris including 20-foot-long segments of 1-inch metal piping was encountered to the full depth of this exploration (Photograph 3). Other items observed included braided wire and porcelain fragments. Groundwater was encountered at approximately 8 feet bgs.
- **Trench 2.** Minor scrap metal including segments of 1-inch metal piping, remnants of a 55-gallon drum, and a heavy link chain were observed (Photographs 4 through 6). Decayed wood fragments were observed near the groundwater table (approximately 8 feet bgs).
- **Trench 3.** Large blocks of Portland-cement concrete were encountered between 2 and 6 feet bgs and consequently limited the extent of the excavation (Photograph 7). Excavation between the blocks of concrete encountered groundwater at approximately 8 feet bgs. Decayed wood fragments were observed near the groundwater table.
- **Trench 4.** Trench 4 was attempted but unsuccessful at two locations where additional blocks of Portland-cement concrete were encountered (Photograph 8). Trench 4 was successfully completed by further "stepping out" from the riverbank toward the river. In-place wood pilings were observed on the north wall of the trench (Photograph 9). Decayed wood fragments were observed near the groundwater table (approximately 8 feet bgs).

Discrete soil samples were collected from two locations in each trench (with the exception of Trench 3 where only one sample could be collected) just above the groundwater interface. Two sequential test pits were combined into a composite for the laboratory analysis.

Grab groundwater samples were collected from Trench 2 and Trench 4. A pre-packed PVC well screen was placed in the trenches at least two hours prior to sampling to minimize turbidity (Photograph 9).

Characterization of Wharf Road Area Beach Materials. In accordance with the request from the DEQ, the nature and extent of petroleum was qualitatively evaluated through completion of 15 hand-excavated shallow potholes completed at low river stage (above the OLLW at the time of the field activities; Photograph 10). The shallow potholing was completed until the Port, Metro, and DEQ were satisfied that the extent of the impacted area had been identified (through field screening observations for petroleum sheen, odor, and discoloration).

DEQ indicated that since the most obviously contaminated area was restricted to a small area, only one sediment sample was required.

Former Wharf Road (Central Parcel) – Potential Connection of Beach-Related Petroleum to Upland Facility. Five push-probe explorations (WC-4 through WC-8) were completed at the top of the riverbank to assess the area for potential connection to upland impacts (Figure 4; Photograph 11). The explorations were chosen by the Port, Metro, and DEQ to provide lateral coverage across the former Wharf Road (with 20-foot spacing between locations). The explorations were completed as close as practicable to the top of the riverbank slope. The exploration logs are provided in Attachment B. Discrete soil samples were collected above the water table at the groundwater interface.

Groundwater grab samples were collected from each of the explorations using a groundwater sampling attachment with a 4-foot-long screen. The temporary screen was placed to span the groundwater table based on the field screening observations of moisture content.



An additional three hand-held push probes (WC-1 through WC-3) were attempted on the riverbank slope but refusal was met above the groundwater interface (Photograph 12).

CHEMICAL ANALYSES

The soil samples collected from the above activities were submitted to Pace Analytical Services, Inc. in Seattle, Washington for chemical analysis. The laboratory analytical reports (in CD-Rom format due to the length of the Level III deliverable reports) are provided in Attachment D along with a data quality review.

The laboratory analytical results are presented in tables included in Attachment D along with screening level values (SLVs) from the Joint Source Control Strategy (JSCS) guidance document (DEQ/EPA 2005; screening criteria revised July 16, 2007).

Erodible Soil Riverbank Sampling. The chemical analyses included one or more of the following as requested by the DEQ:

- Priority Pollutant 13 Metals by EPA 6000/7000 Series Methods;
- Polychlorinated biphenyls (PCBs) Aroclors by EPA Method 8082;
- Butyl tins by the Krones Method;
- Organochlorine pesticides by EPA Method 8081A; and
- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270-SIM.

Wharf Road Erodible Soils. The chemical analyses included total petroleum hydrocarbon (TPH) hydrocarbon identification (HCID) by Northwest Method NWTPH-HCID, dioxins/furans by EPA Method 8290, Priority Pollutant 13 Metals, PCBs, butyl tins, and PAHs. A follow-up analysis for diesel- and oil-range TPH by Northwest Method NWTPH-Dx (with silica gel cleanup) was completed on the composite sample. Additional follow-up analyses for metals and dioxins/furans were completed on the discrete samples.

Characterization of Inner Cove (East Parcel) Area Beach Materials. The chemical analyses included HCID, Priority Pollutant 13 Metals, PCBs, butyl tins, PAHs, and VOCs by EPA Method 8260B. A follow-up analysis for diesel- and oil-range TPH by Northwest Method NWTPH-Dx (with silica gel cleanup) was completed on each sample.

Inner Cove - Potential Connection of Beach-Related Petroleum to the Upland Facility. The composite soil samples from the trenches were submitted for the analysis of diesel- and oil-range TPH, Priority Pollutant 13 Metals, PCBs, PAHs, VOCs, and organochlorine pesticides (OCPs) by EPA Method 8081A.

Grab groundwater samples were collected from Trench 2 and Trench 4 and analyzed for diesel- and oil-range TPH, total and dissolved Priority Pollutant 13 Metals, total PCBs, total OCPs, total PAHs, and VOCs.

Characterization of Wharf Road Area Beach Materials. The chemical analyses included HCID, dioxins/furans, Priority Pollutant 13 Metals, PCBs, butyl tins, and PAHs.

Former Wharf Road (Central Parcel) – Potential Connection of Beach-Related Petroleum to Upland Facility. The chemical analyses for the discrete soil samples included diesel and oil TPH, Priority Pollutant 13 Metals, PCBs, PAHs, and VOCs.

Grab groundwater samples were analyzed for diesel and oil-range TPH, total and dissolved Priority Pollutant 13 Metals, total PCBs, total PAHs, and VOCs.

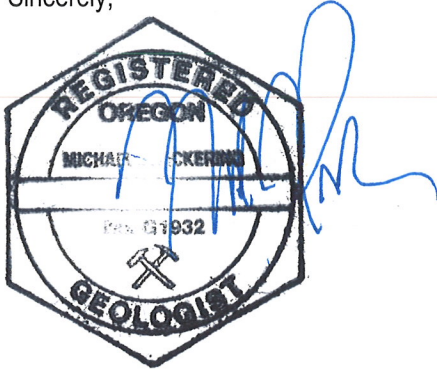


CONCLUSIONS

These data will be incorporated into the *Source Control Evaluation*.

If you have any questions regarding these activities, please contact the undersigned at (503) 924-4704.

Sincerely,



Michael J. Pickering, R.G.
Associate Hydrogeologist

ATTACHMENTS

Figure 1 – Facility Location Map
Figure 2 – Upland Facility Plan
Figure 3 – Riverbank Sample Locations
Figure 4 – Former Wharf Road Area Explorations
Figure 5 – Inner Cove Explorations

Attachment A – DEQ Email – Field Decisions
Attachment B – Field Procedures and Exploration Logs
Attachment C – Photograph Log
Attachment D – Laboratory Analytical Reports (CD-ROM) and Data Quality Review
Attachment E – Data Tables

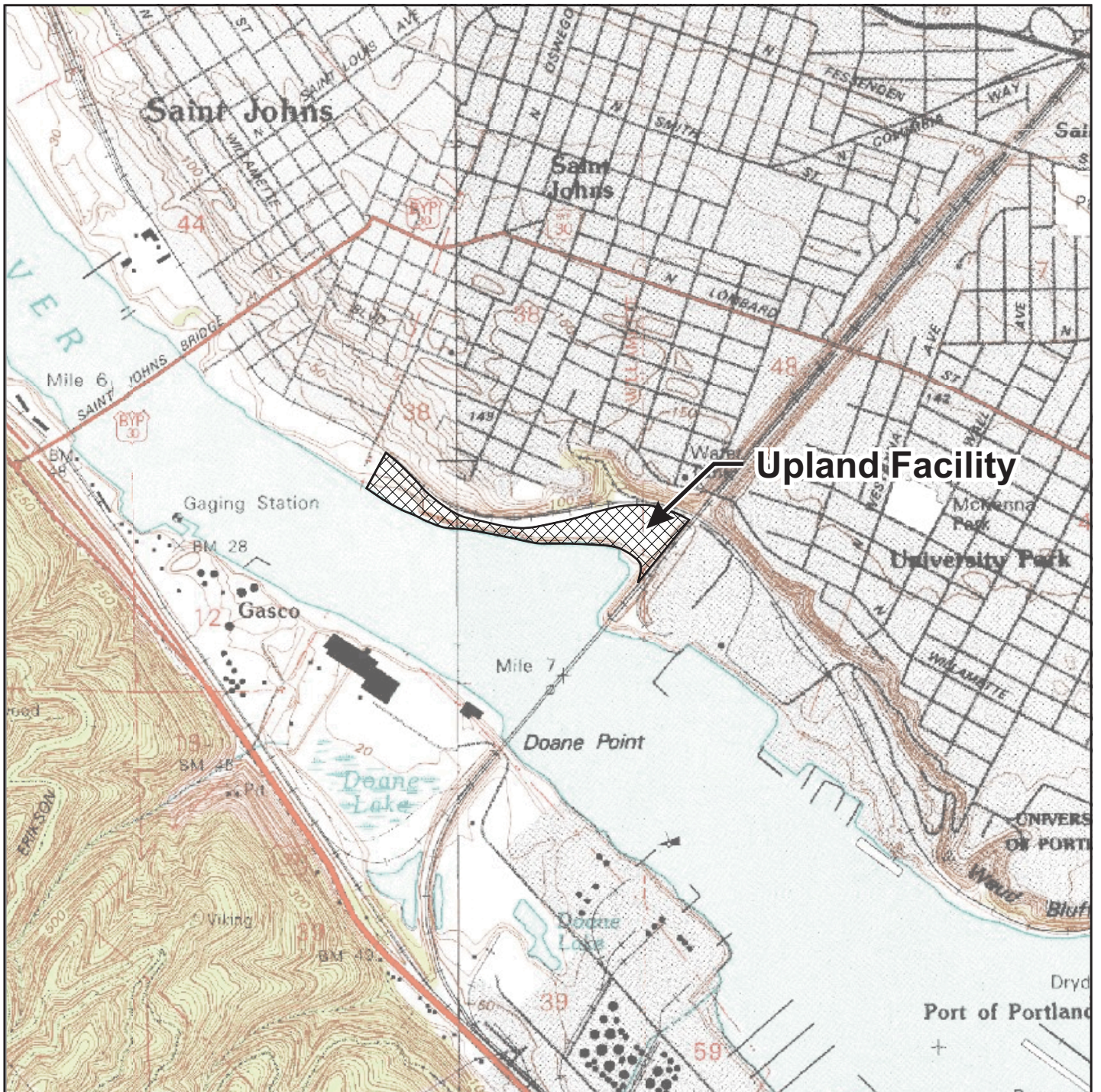
REFERENCES

Ash Creek, 2010a. Source Control Sampling Work Plan, Willamette Cove Upland Facility, Portland, Oregon. March 31, 2010.

Ash Creek, 2010b. Source Control Sampling Work Plan Addendum, Willamette Cove Upland Facility, Portland, Oregon. September 2, 2010.

DEQ/EPA, 2005. Portland Harbor Joint Source Control Strategy – Final (Table 3-1 Updated July 16, 2007). December 2005.





Base map prepared from USGS 7.5-minute quadrangles as provided by TerraServer.

0 2,000 4,000
Approximate Scale in Feet



Facility Location Map

2010 Source Control Sampling Results Letter
Port of Portland / Metro
Willamette Cove Upland Facility - Portland, Oregon



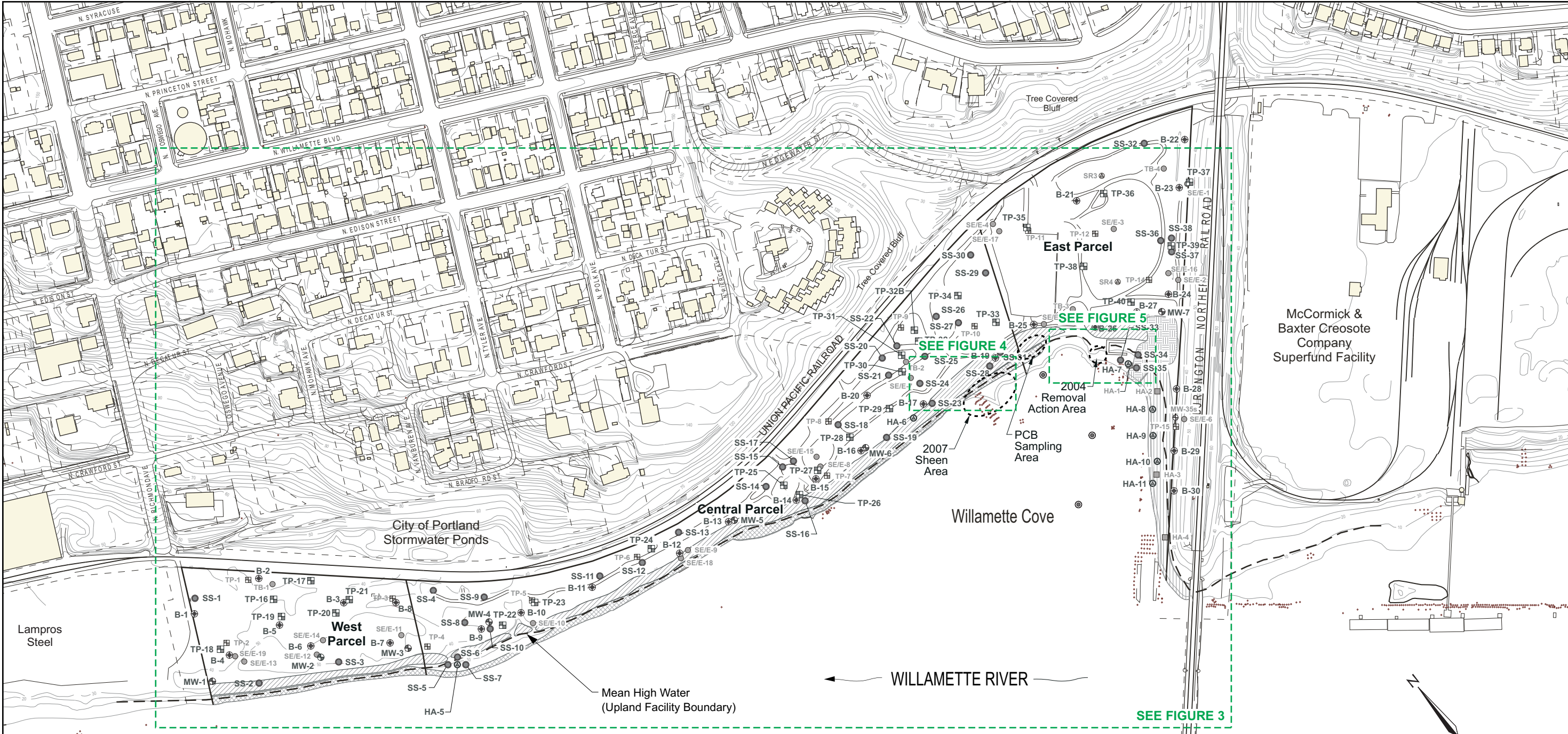
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Project Number 1056-02

May 2011

Figure

1



Legend:

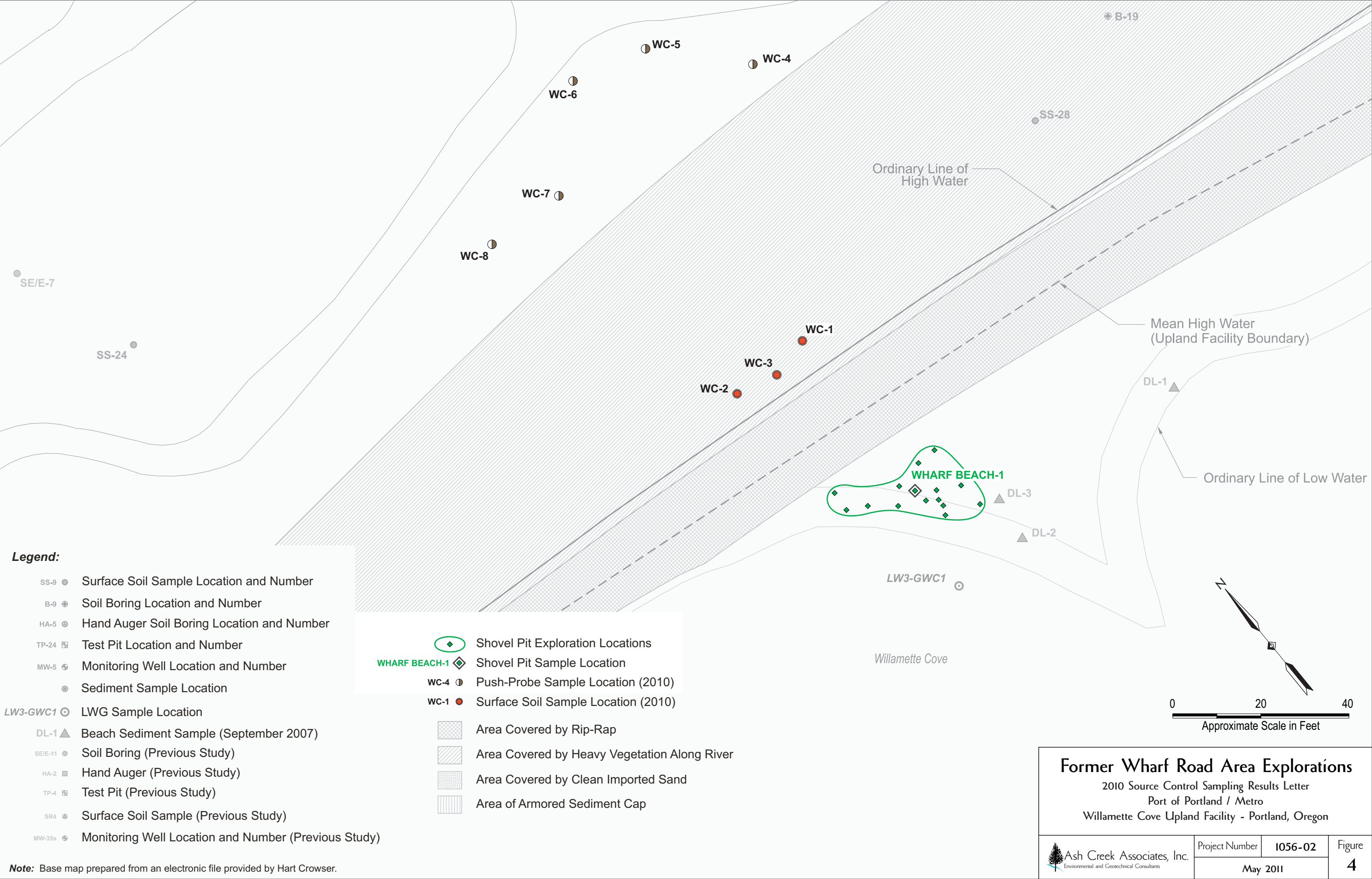
SS-9 ●	Surface Soil Sample Location and Number	SE/E-11 ●	Soil Boring (Previous Study)		Area Covered by Rip-Rap
B-9 ⊕	Soil Boring Location and Number	HA-2 ■	Hand Auger (Previous Study)		Area Covered by Heavy Vegetation Along River
HA-5 ⊕	Hand Auger Soil Boring Location and Number	TP-4 ▢	Test Pit (Previous Study)		Area Covered by Clean Imported Sand
TP-24 ▢	Test Pit Location and Number	SR4 ⊕	Surface Soil Sample (Previous Study)		Area of Armored Sediment Cap
MW-5 ⊕	Monitoring Well Location and Number	MW-35s ⊕	Monitoring Well Location and Number (Previous Study)		
●	Sediment Sample Location				

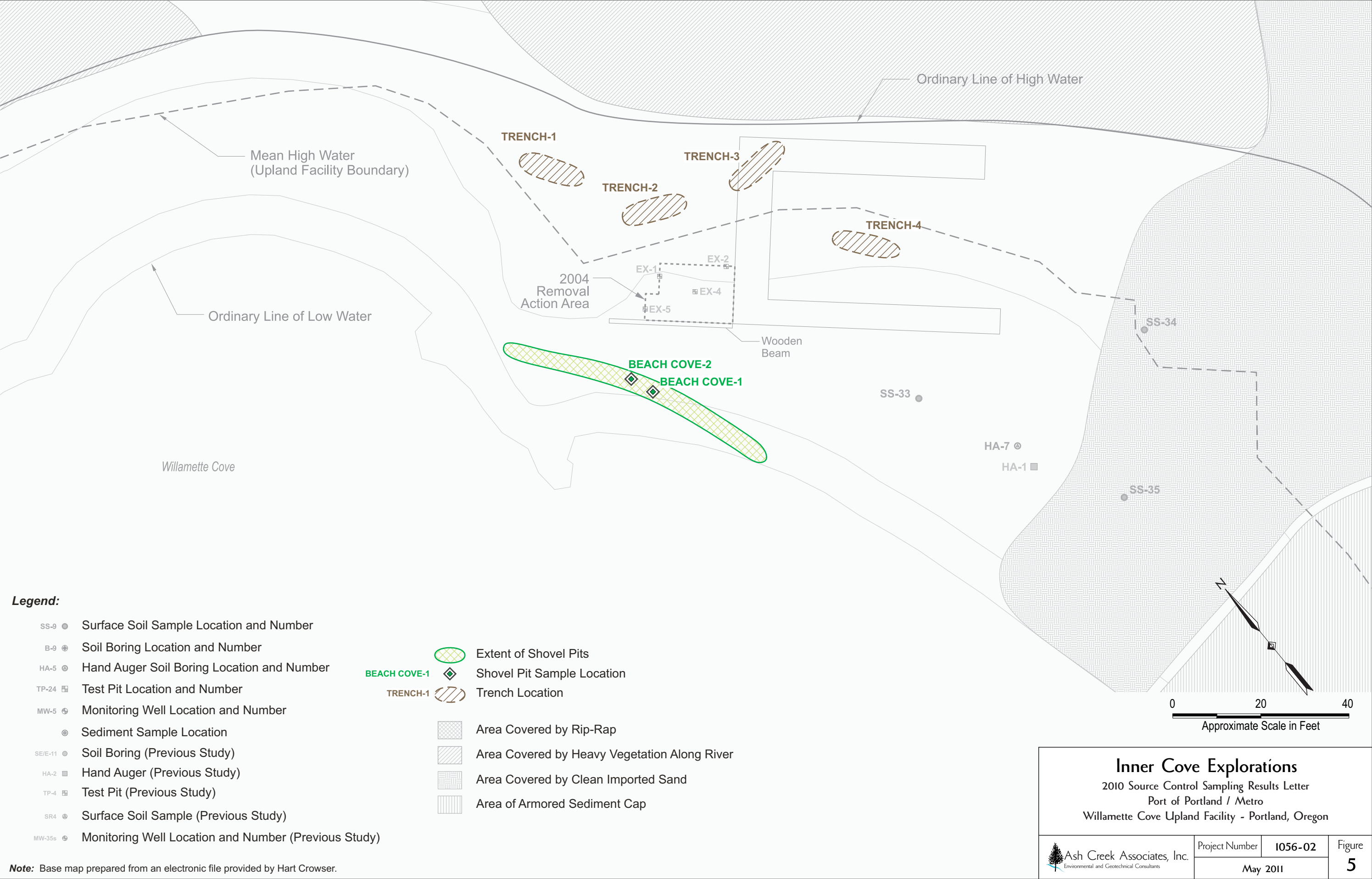
Note: Base map prepared from an electronic file provided by Hart Crowser.

Upland Facility Plan
2010 Source Control Sampling Results Letter
Port of Portland / Metro
Willamette Cove Upland Facility - Portland, Oregon

Ash Creek Associates, Inc.
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Project Number	I056-02	Figure
May 2011		2





Attachment A

DEQ Email – Field Decisions

From: Madalinski, Kelly

Sent: Tuesday, October 05, 2010 3:58 PM

To: 'THIESSEN Kenneth'

Subject: RE: Willamette Cove field decision summary

Ken,

Thanks for the summary. Highlighted in red are edits to the below summary.

Please let me know if you have any questions.

Thanks,

Kelly

From: THIESSEN Kenneth [mailto:THIESSEN.Kenneth@deq.state.or.us]

Sent: Monday, October 04, 2010 4:41 PM

To: Madalinski, Kelly

Subject: Willamette Cove field decision summary

Kelly,

The following field decisions are what I had in my notes. Are these the same as what you recorded?

Ken

- Wharf Road beach area. Workplan called for sampling of two most obviously contaminated beach material samples. Since the most obviously contaminated area was restricted to a small area, it was decided that one sample would be representative of this area.
- Some pocket beaches areas slated for sampling have inadequate soil volume available for the sample size required, in these cases, sediment may be collected from above revetment materials upslope from the pocket beaches.
- Pocket beach erodable samples from the western end of the Willamette cove property, may be omitted from sampling as access to these areas is a safety concern.
- Some lettered erodable sampling areas may have less than four aliquots in the composite sample due to minimal distinct areas of erosion.
- Erodable soils on lower riverbank slope beneath wharf road are not easily accessible due to thick and continuous armor cover. Alternately, surficial soils from the bench area above the MHW line (the

bench area of hand-drilled Geoprobe work) can be substitute as the erodable soils sampling location for the wharf road area.

- Top of bank Geoprobe samples are installed from wharf road centerline to locations laterally on 20 foot spacing. Geoprobe borings are installed I zigzag pattern to optimize coverage away from and toward the river.
- Inner cove beach trench was installed (across the width requested by the DEQ) as series of short trenches or potholes (as specified in the work plan) rather than continuous trench due to limitations from subsurface debris and in-place concrete ways.
- Group WC-SSL erodable soils were split into two groups to limit areal coverage of each four-point composite sample.
- Discrete sample locations at composite areas WC-SSM and WC-SSN were marked by DEQ and included 2 and 3 locations, respectively.

Kenneth Thiessen

Certified Engineering Geologist

Oregon Dept. of Environmental Quality

NW Region Cleanup Program

2020 SW 4th Ave, Ste, 400

Portland, OR 97201

(503) 229-6015

Attachment B

Field Procedures and Exploration Logs

Sample Descriptions

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, and grain size, and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:

MAJOR CONSTITUENT with additional remarks; color, moisture, minor constituents, density/consistency.

Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance. Soil density/consistency in test pits and push probe explorations is estimated based on visual observation and is presented parenthetically on test pit and push probe exploration logs.

SAND and GRAVEL	Standard Penetration Resistance in Blows/Foot	SILT or CLAY	Standard Penetration Resistance in Blows/Foot	Approximate Shear Strength in TSF
<u>Density</u>		<u>Density</u>		
Very loose	0 - 4	Very soft	0 - 2	<0.125
Loose	4 - 10	Soft	2 - 4	0.125 - 0.25
Medium dense	10 - 30	Medium stiff	4 - 8	0.25 - 0.5
Dense	30 - 50	Stiff	8 - 15	0.5 - 1.0
Very dense	>50	Very Stiff	15 - 30	1.0 - 2.0
		Hard	>30	>2.0

Moisture

Dry	Little perceptible moisture.
Sl. Moist	Some perceptible moisture, probably below optimum.
Moist	Probably near optimum moisture content.
Wet	Much perceptible moisture, probably above optimum.

Minor Constituents

Minor Constituents	Estimated Percentage
Not identified in description	0 - 5
Slightly (clayey, silty, etc.)	5 - 12
Clayey, silty, sandy, gravelly	12 - 30
Very (clayey, silty, etc.)	30 - 50

Sampling Symbols

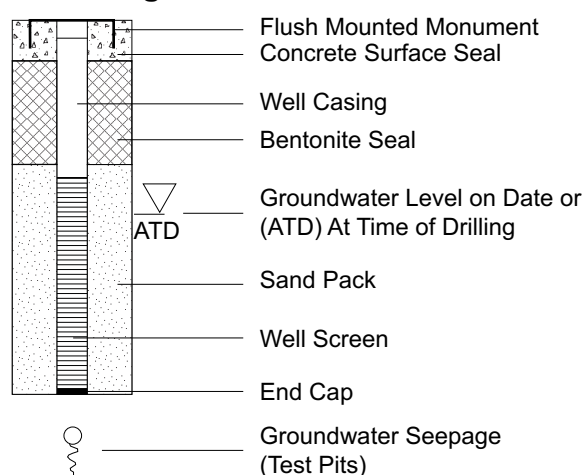
BORING AND PUSH-PROBE SYMBOLS

	Recovery
	No Recovery
	Temporarily Screened Interval
PID	Photoionization Detector Reading
W	Water Sample
	Sample Submitted for Chemical Analysis
NS	No Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen
BF	Biogenic Film

TEST PIT SOIL SAMPLES

	Grab (Jar)
	Bag
	Shelby Tube

Groundwater Observations and Monitoring Well Construction



Key to Exploration Logs

Port of Portland / METRO
Willamette Cove Upland Facility - Portland, Oregon



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Project Number **1056-02**
May 2011

Figure
Key



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Port of Portland / METRO
Willamette Cove Upland Facility - Portland, Oregon

Boring Number: **WC-1**

Project Number: **1056-02**

Logged By: **I. Maguire**

Date: **September 29, 2010**

Site Conditions: --

Drilling Contractor: **Cascade Drilling**

Drilling Equipment: **Rotohammer**

Sampler Type: **3'**

Depth to Water (ATD): --

Surface Elevation: --

Well Construction Details and Notes:

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen	Lithologic Description
0					Wood fragments and some sandy SILT.
2					2-Inch SILT/SAND lens; brown, dry, low plasticity, loose, (80% silt, 20% very fine sand).
5			<5	NS	SILT with sand; brown, low plasticity, wood fragments, loose, (80% silt, 20% sand).
8			<5	NS	SILT with wood fragments; reddish brown, dry, loose, (90% silt).
10					Fine to medium coarse SAND; slightly moist, loose, occasional rounded gravels.
9.0					Bottom of Boring at 9.0' BGS.



Lithologic Description

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen	Lithologic Description	
5			<5	NS	4-Inch brown SILT lens with organics (roots, wood fragments). SAND; dry, loose.	5
			<5	NS	Fine SAND with organics; dark brown, dry, loose, (90% sand, 10% silt).	
			<5	NS	3-Inch fine, silty SAND lens with wood fragments; brown, dry, occasional rounded gravel, loose.	
10			<5	NS	SILT with wood fragments; brown, dry, low plasticity, loose, SILT; brown, dry, loose.	10
			<5	NS	Fine to coarse-grained SAND; with rounded, fine gravels; brown.	
					Bottom of Boring at 11.0' BGS.	
15						15
20						20
25						25
30						30
35						35



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Port of Portland / METRO
Willamette Cove Upland Facility - Portland, Oregon

Boring Number: **WC-3**

Project Number: **1056-02**

Logged By: **I. Maguire**

Date: **September 29, 2010**

Site Conditions: --

Drilling Contractor: **Cascade Drilling**

Drilling Equipment: **Rotohammer**

Sampler Type: **3'**

Depth to Water (ATD): --

Surface Elevation: --

Well Construction Details and Notes:

Depth, feet

Core Interval/Recovery

Laboratory Sample ID

PID

Sheen

Lithologic Description

Equipment refusal at three locations.

Bottom of Boring at 0.5' BGS.

5

10

15

20

25

30

35

5

10

15

20

25

30

35



Lithologic Description

Organics (2") over crushed rock (3").

SAND; brown, slightly moist, loose, with occasional organics, (95% medium sand, <5% silt).

Becomes dark brown and moist.

Becomes medium dense.

2-Inch lens with gravels (well-rounded).

Becomes dark gray and wet with occasional gravels.

Bottom of Boring at 30.0' BGS.





Lithologic Description

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen	
5			<5	NS	SAND with silt; dark brown, slightly moist, medium dense, with some organics, (80% sand, 20% silt).
			<5		SAND; grayish brown, slightly moist, non-plastic, loose, (95% fine to medium-grained sand, <5% silt).
5			<5	NS	Becomes brown.
10			<5	NS	Some occasional rounded to subrounded, fine gravels.
			<5	NS	
15			<5	NS	
			<5	NS	
20			<5	NS	
			<5	NS	
25			<5		
			<5		
30			<5		SAND with silt; brown, moist, medium dense, (70% sand, 30% silt). Increasing silt.
					SILT with sand; brown, moist to wet, medium plasticity, (75% silt, 25% sand).
					SAND with silt; dark gray, wet, medium dense, (70% sand, 30% silt).
					Bottom of Boring at 30.0' BGS.
35					



Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen	Lithologic Description	
			<5		SAND with silt and some organics (roots, grass, etc.); brown, slightly moist, medium dense, (70% sand, 30% silt).	
			<5	NS	SAND; brown, dry to slightly moist, loose, (95% medium-grained sand, <5% silt).	
5					Becomes more dense. Some occasional subrounded gravel.	5
			<5	NS		
			<5	NS		
10					Becomes slightly moist.	10
			<5	NS		
			<5	NS		
15					Becomes dark grayish brown.	15
			<5	NS		
20						20
			<5	NS	SILT with sand; brown, slightly moist, medium plasticity, (70% silt, 30% fine to medium sand).	
			<5	NS		
25					SAND; brown, slightly moist, medium-grained, loose, (90% sand, 10% fines).	25
			<5		Becomes grayish black.	
			<5		Becomes wet.	
30					Bottom of Boring at 30.0' BGS.	30
35						35



Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen	Lithologic Description
0			<5	NS	SAND; brown, slightly moist, medium-grained, loose, (85% sand, 15% fine silt). 3" concrete. Pushed through.
5			<5	NS	Occasional gravels (rounded/subrounded).
			<5	NS	
10			<5	NS	6-Inch SAND with silt lens; brown, slightly moist, (70% sand 30% silt).
			<5	NS	
15			<5	NS	Increasing silt.
			<5	NS	SILT with sand; brown, slightly moist, medium plasticity, medium stiff, (70% silt, 30%).
			<5	NS	SAND; brown, slightly moist, loose, (85% medium sand, 15% silt).
20			<5	NS	SAND with silt; grayish brown, dry, (70% sand 30% silt).
			<5	NS	SAND; brown, slightly moist, loose, (90% sand, 10% silt).
25					
					Increasing moisture.
30			<5		SAND with silt; dark gray to black, wet, medium stiff.
					Bottom of Boring at 30.0' BGS.
35					





Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen	Lithologic Description
5			<5		SILT with organics (roots); brown, dry, low plasticity, loose, (90% fines).
					Sandy SILT; brown, slightly moist, low plasticity, loose, (70% silt, 30% fine sand).
					Increasing sand.
5					Fine to coarse SAND with occasional rounded/subrounded gravels; light brown, slightly moist, loose, (85% sand).
			<5	NS	2 Inches of sloughing at top organics.
					Becoming brown.
10			<5	NS	
			<5	NS	Silty SAND; light brown, dry, loose, with occasional gravels, (70% fine to medium sand, 30% silt)/
			<5	NS	Becoming sandier, brown, slightly moist, medium-grained, (90% sand).
					2-Inch silt lens; brown, moist, medium plasticity, soft, (95% fines).
15					SAND; brown, slightly moist, medium-grained, loose, (90% sand).
			<5		3 Inches of sloughing. Sandy SILT with organics.
					SAND; brown, slightly moist, medium-grained, loose, (90% sand, 10% silt).
20			<5	NS	
			<5	NS	SAND; brown, slightly moist, loose, (<5% fines).
					SILT with sand; brown, slightly moist, medium plasticity, medium stiff, (85% silt, 15% sand).
25					
			<5	NS	Silty SAND; brown, slightly moist, with occasional fine gravels, loose, (70% sand, 30% silt). Increasing sand.
					Silty SAND; brown, moist, medium stiff, (85% sand, 15% silt).
			<5	NS	
					SAND with silt; dark gray to black, wet, medium dense, (70% sand, 30% silt).
30					Bottom of Boring at 30.0' BGS.
35					



Sample Descriptions

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, and grain size, and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:

MAJOR CONSTITUENT with additional remarks; color, moisture, minor constituents, density/consistency.

Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance. Soil density/consistency in test pits and push probe explorations is estimated based on visual observation and is presented parenthetically on test pit and push probe exploration logs.

SAND and GRAVEL	Standard Penetration Resistance in Blows/Foot	SILT or CLAY	Standard Penetration Resistance in Blows/Foot	Approximate Shear Strength in TSF
<u>Density</u>		<u>Density</u>		
Very loose	0 - 4	Very soft	0 - 2	<0.125
Loose	4 - 10	Soft	2 - 4	0.125 - 0.25
Medium dense	10 - 30	Medium stiff	4 - 8	0.25 - 0.5
Dense	30 - 50	Stiff	8 - 15	0.5 - 1.0
Very dense	>50	Very Stiff	15 - 30	1.0 - 2.0
		Hard	>30	>2.0

Moisture

Dry	Little perceptible moisture.
Sl. Moist	Some perceptible moisture, probably below optimum.
Moist	Probably near optimum moisture content.
Wet	Much perceptible moisture, probably above optimum.

Minor Constituents

Minor Constituents	Estimated Percentage
Not identified in description	0 - 5
Slightly (clayey, silty, etc.)	5 - 12
Clayey, silty, sandy, gravelly	12 - 30
Very (clayey, silty, etc.)	30 - 50

Sampling Symbols

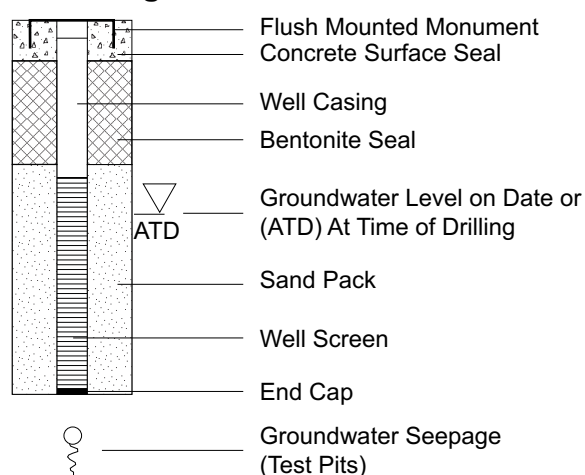
BORING AND PUSH-PROBE SYMBOLS

	Recovery
	No Recovery
	Temporarily Screened Interval
PID	Photoionization Detector Reading
W	Water Sample
	Sample Submitted for Chemical Analysis
NS	No Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen
BF	Biogenic Film

TEST PIT SOIL SAMPLES

	Grab (Jar)
	Bag
	Shelby Tube

Groundwater Observations and Monitoring Well Construction



Key to Exploration Logs

Port of Portland / METRO
Willamette Cove Upland Facility - Portland, Oregon



Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number **1056-02**
May 2011

Figure
Key



Trench Number: **Trench-1**

Project Number: **1056-02**

Logged By: **M. Whitson**

Date: **September 28, 2010**

Site Conditions: **Overcast (60's)**

Contractor: **Terra Hydr**

Equipment: **Backhoe Excavator**

Sampler Type: **Backhoe Bucket**

Depth to Water (ATD): **8.0'**

Surface Elevation: **Not Measured**

Trench Details and Notes:

Depth, feet

Core Interval/Recovery

Laboratory Sample ID

PID

Sheen

Lithologic Description

SAND (SP); medium brown, moist, fine to medium-grained, loose, with occasional gravel (<5%).

Metal debris primarily comprised of 1-inch metal pipe with some braided wire and porcelain fragments.

Becomes dark gray, wet, loose, organic odor.

Bottom of Boring at 9.0' BGS.

5

10

☐ Trench-1A/1B

<5

SS

5

10

Trench Number: **Trench-2**

Logged By: **M. Whitson**

Date: **September 28, 2010**

Site Conditions: **Overcast (60's)**

Contractor: **Terra Hydr**

Equipment: **Backhoe Excavator**

Sampler Type: **Backhoe Bucket**

Depth to Water (ATD): **8.0'**

Surface Elevation: **Not Measured**

Temporary Well Construction Details:

Depth, feet

Core Interval/Recovery

Laboratory Sample ID

PID

Sheen

Lithologic Description

SAND (SP); medium brown, moist, fine to medium-grained, loose, occasional gravel (<5%).

Metal debris including 1-inch metal pipe, remnants of a 55-gallon drum, and a heavy link chain.

Becomes SAND with silt; black, wet, decayed wood fragments and decayed organic matter, low plastic silt (~5-10%).

Bottom of Boring at 9.0' BGS.

5

10

☐ Trench-2A/2B

<5

SS

5

10



Trench-2 (Water Sample)



Trench Number: **Trench-3**

Project Number: **1056-02**

Logged By: **M. Whitson**

Date: **September 28, 2010**

Site Conditions: **Overcast (60's)**

Contractor: **Terra Hydr**

Equipment: **Backhoe Excavator**

Sampler Type: **Backhoe Bucket**

Depth to Water (ATD): **8.0'**

Surface Elevation: **Not Measured**

Trench Details and Notes:

Depth, feet

Core Interval/Recovery

Laboratory Sample ID

PID

Sheen

Lithologic Description

SAND (SP); medium brown, moist, fine to medium-grained, loose, with occasional gravel (<5%).

Large reinforced concrete blocks.

Large reinforced concrete pad extending east.

Becomes dark gray, wet, loose, with decayed wood fragments.

Bottom of Boring at 9.0' BGS.

5

10

☐ Trench-3

<5

NS

5

10

Trench Number: **Trench-4**

Logged By: **M. Whitson**

Date: **September 29, 2010**

Site Conditions: **Overcast (60's)**

Contractor: **Terra Hydr**

Equipment: **Backhoe Excavator**

Sampler Type: **Backhoe Bucket**

Depth to Water (ATD): **8.0'**

Surface Elevation: **Not Measured**

Temporary Well Construction Details:

Depth, feet

Core Interval/Recovery

Laboratory Sample ID

PID

Sheen

Lithologic Description

SAND (SP); medium brown, moist, fine to medium-grained, loose, occasional gravel (<5%).

Large reinforced concrete blocks.

Becomes gray, wet, with black decayed wood fragments and decayed organic matter.

Bottom of Boring at 9.0' BGS.

5

10

☐ Trench-4a/4b

<5

BF

5

10

▽

Trench-4 (Water Sample)

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) provides instructions for standard field screening. Field screening results are used to aid in the selection of soil samples for chemical analysis. This procedure is applicable during all Ash Creek Associates (ACA) soil sampling operations.

Standard field screening techniques include the use of a photoionization detector (PID) to assess for volatile organic compounds (VOCs), for the presence of petroleum hydrocarbons using a sheen test, and for non-aqueous phase liquids (NAPLs) using dyes and UV light. These methods will not detect all potential contaminants, so selection of screening techniques shall be based on an understanding of the site history. The PID is not compound or concentration-specific, but it can provide a qualitative indication of the presence of VOCs. PID measurements are affected by other field parameters such as temperature and soil moisture.

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- PID with calibration gas (record daily calibration/calibration check in field notes)
- Glass jars (with aluminum foil) or resealable bags
- NAPL Dye (such as OilScreen DNAPL-Lens) if needed for NAPL screening
- UV Light Box (if needed for NAPL screening)

3. METHODOLOGY

Each soil sample will be field screened for VOCs using a PID (with a 10.2 eV probe) and for the presence of petroleum hydrocarbons using a sheen test. If the presence of NAPLs is suspected, then screening using dye and UV light is also to be completed. The PID used on site will be calibrated on a daily basis according to the manufacturer's specifications. The PID is also used as a safety tool. The PID can be used to monitor air during activities where vapors may be present in the breathing space. Document all calibration activities and field observations per SOP 1.1. The field screening procedures are summarized below.

PID Calibration Procedure:

- Zero the PID using ambient air from the general area where the work will be done.
- A standard gas of 100 ppm isobutylene gas is then used to calibrate the PID. If questionable readings are encountered, the PID will be recalibrated using new 100 ppm isobutylene gas.

PID Screening Procedure:

- Place a representative portion (approximately one ounce) of freshly exposed, uncompacted soil into a clean resealable plastic bag or glass jar.
- Seal the bag or jar (with aluminum foil) and shake to expose vapors from the soil matrix.
- Allow the bag to sit to reach ambient temperature.
- Carefully insert the intake port of the PID into the plastic bag or jar.
- Record the sample concentration in the field notes.

Sheen Test Procedure:

- Following the PID screen, add enough water to the bag/jar to cover the sample.
- Observe the water surface for signs of discoloration/sheen and characterize.

No Sheen (NS)	No visible sheen on the water surface
Slight Sheen (SS)	Light, colorless, dull sheen, irregular spread, not rapid. Biological content may produce a slight sheen (typically platy/blocky).
Moderate Sheen (MS)	Light to heavy coverage, may have some color/iridescence, spread is irregular to flowing, few remaining areas of no sheen on water surface.
Heavy Sheen (HS)	Heavy sheen coverage with color/iridescence, spread is rapid, entire water surface may be covered with sheen.

NAPL Dye Procedure:

- Dye can be either liquid form, dissolvable tablet, or spray applied.
- Follow manufacturers instructions for specific product used.
- NAPL testing is completed after other field screening and sample collection is complete.
- For OilScreen DANPL-Lens dye, the remaining soil sample is sprayed along its length so the soil surface is visibly wetted. A royal blue color of the dye about one minute after spraying would be considered a positive indication of NAPL.

UV Light Screening Procedure:

- UV Light Screening involves placement of a portion of the soil sample into a resealable plastic bag (which can be the same as used for PID screening, but before sheen test is performed).
- The sample was then examined in a dark space under UV light using a small, portable UV light box.
- The plastic bag is manipulated during examination to squeeze fluid against the bag beneath the lamp.
- Fluorescence (glowing color) indicates presence of NAPLs.

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the methods used for obtaining surface soil samples for physical and/or chemical analysis. For purposes of this SOP, surface soil (including shallow subsurface soil) is loosely defined as soil that is present within 3 feet of the ground surface at the time of sampling. Various types of sampling equipment are used to collect surface soil samples including spoons, scoops, trowels, shovels, and hand augers.

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Spoons, scoops, trowels, shovels, and/or hand augers. Stainless steel is preferred.
- Stainless steel bowls
- Laboratory-supplied sample containers
- Field documentation materials
- Decontamination materials
- Personal protective equipment (as required by Health and Safety Plan)

3. METHODOLOGY

Project-specific requirements will generally dictate the preferred type of sampling equipment used at a particular site. The following parameters should be considered: sampling depth, soil density, soil moisture, use of analyses (e.g., chemical versus physical testing), type of analyses (e.g., volatile versus non-volatile). Analytical testing requirements will indicate sample volume requirements that also will influence the selection of the appropriate type of sampling tool. The project sampling plan should define the specific requirements for collection of surface soil samples at a particular site.

Collection of Samples

- **Volatile Analyses.** Surface soil sampling for volatile organics analysis (VOA) is different than other routine physical or chemical testing because of the potential loss of volatiles during sampling. To limit volatile loss, the soil sample must be obtained as quickly and as directly as possible. If a VOA sample is to be collected as part of a multiple analyte sample, the VOA sample portion will be obtained first. The VOA sample should be obtained from a discrete portion of the entire collected sample and should not be composited or homogenized. Sample bottles should be filled to capacity, with no headspace. Specific procedures for collecting VOA samples using the EPA Method 5035 are discussed in SOP 2-7.
- **Other Analyses.** Once the targeted sample interval has been collected, the soil sample will be thoroughly homogenized in a stainless steel bowl prior to bottling. Sample homogenizing is accomplished by manually mixing the entire soil sample in the stainless steel bowl with the sampling tool or with a clean teaspoon or spatula until a uniform mixture is achieved. If packing of the samples into the bottles is necessary, a clean stainless steel teaspoon or spatula may be used.

General Sampling Procedure:

- Decontaminate sampling equipment in accordance with the Sampling and Analysis Plan (SAP) before and after each individual soil sample.
- Remove surface debris that blocks access to the actual soil surface or loosen dense surface soils, such as those encountered in heavy traffic areas. If sampling equipment is used to remove surface debris,

the equipment should be decontaminated prior to sampling to reduce the potential for sample interferences.

- When using a hand auger, push and rotate downward until the auger becomes filled with soil. Usually a 6- to 12-inch long core of soil is obtained each time the auger is inserted. Once filled, remove the auger from the ground and empty into a stainless steel bowl. If a VOA sample is required, the sample should be taken directly from the auger using a teaspoon or spatula and/or directly filling the sample container from the auger. Repeat the augering process until the desired sample interval has been augered and placed into the stainless steel bowl.

Backfilling Sample Locations:

Backfill in accordance with federal and state regulations including OAR 690-240 (e.g., bentonite requirements). The soils from the excavation will be used as backfill unless project-specific or state requirements include the use of clean backfill material.

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the methods for observing and sampling from test pits and trenches. Test pits/trenches are utilized for environmental observations and sampling when subsurface observation is required in multiple dimensions. This procedure is applicable during all Ash Creek Associates (ACA) test pit and trenching activities.

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Stakes, flagging/caution tape, measuring tape, and sheet plastic
- Sampling equipment and laboratory-supplied sample containers
- Field documentation materials
- Decontamination materials
- Personal protective equipment (as required by project Health and Safety Plan)

3. METHODOLOGY

Excavation Procedure:

Verify that the subcontractor decontaminates all excavation equipment (per SOP 1.2) before and after all test pits/trenches. Communicate the excavation depth and extent to the excavation subcontractor as specified in the project-specific plan. Excavation sidewalls should initially be cut as near to vertical as possible to facilitate stratigraphic observation. It is ACA's general policy not to enter test pit excavations. If the nature of the project requires test pit entry, the slope or bench the excavation sidewalls in accordance with Occupational Health and Safety Administration requirements. Test pits deeper than 4 feet should never be entered, unless appropriate sloping or benching is in place.

The excavation subcontractor should place the excavated soils to one side of the excavation, no closer than 2 to 3 feet from the edge of excavation. Sheet plastic may be required to cover the ground surface before placing excavation soils on the ground.

Proceed slowly and with caution during the excavation. View the excavation (from the far end wall) after each bucket of soil is removed for waste accumulations, free liquids (water or free product), buried utilities, and other items designated in the project-specific plan.

Logging and Sample Collection:

Sketch a vertical profile depicting the physical orientation of the strata, soil types, depth of stratigraphic changes, depth to water table, identification of waste materials, and the depth/location of any environmental samples that were collected. Record the dimensions and orientation of each test pit/trench. Collect soil samples directly from the excavator bucket, taking care to collect soil that has not been in contact with the bucket. Complete field screening as specified in SOP-2.1. Collect samples in accordance with the surface soil sample procedures specified in SOP-2.2.

Backfilling the Excavation:

Backfill the test pit once completed or at the end of the work day. Open test pits left unsupervised must be secured to prevent accidental entry. Return soils from the deeper portion of the test pit first. Periodically, project-specific requirements may include the use of clean backfill material and disposing test pit spoils. Unless otherwise directed, test pits should be compacted to a dense, non-yielding state. If possible, mound the test pit to prevent accumulation of surface water after settlement.

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the methods for observing and sampling from push-probes (i.e., GeoProbe™). Subsurface soil cores may be obtained using this system for purposes of determining subsurface soil conditions and for obtaining soil samples for physical and/or chemical evaluation. Grab groundwater samples may be collected using temporary well screens. Soil vapor samples may be obtained using temporary well points. Shallow (less than 50 feet), small-diameter (2-inch max) pre-packed wells may also be installed using push-probe equipment. This procedure is applicable during all Ash Creek Associates (ACA) push-probe activities.

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Traffic cones, measuring tape, spatula, and buckets/drums
- Sampling equipment (water level probe, pumps, tubing) and laboratory-supplied sample containers
- Field documentation materials
- Decontamination materials
- Personal protective equipment (as required by project Health and Safety Plan)

3. METHODOLOGY

Coring Procedure (Conducted by Drilling Subcontractor):

The sampling procedure includes driving a 2-inch outside-diameter, 5-foot-long, push-probe soil sampler to the desired depth using a combination of hydraulic pressure and mechanical hammer blows. When the sampling depth is reached, the pin attaching the sampler's tip is released (if a tip is used), which allows the tip to slide inside the sampler (Macro-Core Sampler with removable plastic liner). The sampler is driven the length of the sampler to collect a soil core, which is then withdrawn from the exploration. When the sampler is retrieved from the borehole the drive head/cutting shoe is detached and the liner is removed. Soil cores are collected continuously to the full depth of the exploration unless otherwise specified in a project-specific sampling and analysis plan (SAP). Verify that the subcontractor decontaminates the sampling device (per SOP 1.2) prior to its initial use and following collection of each soil sample.

Logging and Soil Sample Collection:

Remove the soil core from the sampler for field screening, description, and placement into sample jars. Soil samples will be collected for field screening and possible chemical analysis on two foot intervals unless otherwise specified in a project-specific SAP. The sampling interval will be determined in the field based on recovery, soil variability, and evidence of contamination. Complete field screening as specified in SOP-2.1. Soil samples should be collected using different procedures for volatile on non-volatile analyses, as follows.

- **Volatile Analyses.** Sampling for volatile organics analysis (VOA) is different than other routine physical or chemical testing because of the potential loss of volatiles during sampling. To limit volatile loss, the soil sample must be obtained as quickly and as directly as possible. If a VOA sample is to be collected as part of a multiple analyte sample, the VOA sample portion will be obtained first. The VOA sample should be obtained from a discrete portion of the entire collected sample and should not be composited or homogenized. Sample bottles should be filled to capacity, with no headspace. Specific procedures for collecting VOA samples using the EPA Method 5035 are discussed in SOP 2.7.
- **Other Analyses.** Soil samples for non-volatile analyses will be thoroughly homogenized in a stainless steel bowl prior to bottling. Sample homogenizing is accomplished by manually mixing the entire soil

sample in the stainless steel bowl with a clean sampling tool until a uniform mixture is achieved. The sample jar should be filled completely.

Any extra soil generated during probing activities will be placed in Department of Transportation (DOT) approved drums.

Grab Groundwater Sample Collection:

Collect grab groundwater samples using a sampling attachment with a 4 to 5-foot-long temporary screen (decontaminated stainless steel or disposable PVC). Obtain samples using a peristaltic pump with new tubing for each boring. Record field parameters (e.g., temperature, conductivity, and pH) prior to sampling.

Backfilling the Excavation (Conducted by Drilling Subcontractor):

After sampling activities are completed, abandon each exploration in accordance with Oregon Water Resources Department (OWRD) regulations and procedures. The abandonment procedure typically consists of filling the exploration with granular bentonite and hydrating the bentonite with water. Match the surface completion to the surrounding materials.

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the methods used for obtaining soil samples for chemical analysis for volatile organic compounds (VOCs) by EPA Method 5035A. Samples collected using the 5035A protocols are not exposed to the atmosphere after sampling thereby reducing the potential for loss of VOCs during sample transport, handling, and analysis. This procedure assumes the use of the PowerStop Handle sampler with disposable EasyDraw Syringes or Terra Core Samplers. This procedure is applicable during all Ash Creek Associates (ACA) soil sampling activities where the 5035A protocols are employed.

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Sampling equipment (PowerStop Handle, disposable EasyDraw Syringes, Terra Core Samplers)
- Laboratory-supplied sample containers (pre-weighed 40ml VOA vials including labels, preservative, stir bars, etc. [number and type as specified by the lab], two ounce jars)
 - Vials used from ACA stock must be weighed to confirm loss of reagents is less than 0.02 grams. Record vial tare weight in field notes. Discard vials with dates over 6 months old.
- Field documentation materials
- Decontamination materials
- Personal protective equipment (as required by Health and Safety Plan)

3. METHODOLOGY

The project-specific sampling and analysis plan (SAP) will define the specific requirements for 5035A methodology required for a particular site or by a regulatory agency.

Analytical Requirements

- VOCs must be analyzed within 14 days of collection.
- Field preserved samples (e.g., sodium bisulfate or methanol) must be maintained at 4° C.
- Sample collected without preservative (e.g., reagent water) must frozen or analyzed within 48 hours.

Collection of Samples

- When using the PowerStop Handle, clip the syringe into the handle in one of the three 5 gram positions. Use the heavy position for dense clay, the light position for dry sandy soil, and the medium position for all others.
- Using the handle, push the sampler into the soil to collect the sample. Continue pushing until the soil column has forced the plunger in the syringe to the stopping point or filled the sampler.
- Wipe all debris from the outside of the sampler. The soil plug should be flush with the mouth of the sampler. Remove any excess soil that extends beyond the mouth of the sampler.
- Extrude the 5 gram sample into vial and cap vial immediately. Hold vial at an angle when extruding to minimize splashing. Gently swirl vial for 10 seconds to break up soil particles (do not shake).
- When capping the vial, be sure to remove any soil or debris from the threads of the vial.
- Repeat process for each additional vial.
- Fill a two ounce container (to capacity) for percent total solids determination.

Additional Considerations

- Methanol contamination can occur from adjacent activities (e.g., exhaust from running equipment or vehicles, hot tar roofing, facility operations, etc). Collection and analysis of methanol field blank (e.g., additional methanol vial left open during period of sampling) is recommended.
- Acidification of carbonaceous soils with sodium bisulfate can cause effervescence and loss of VOCs.
- Certain volatile compounds such as 2-chloroethylvinyl ether may be lost by acidification.
- Acidification of certain soils with sodium bisulfate may cause the formation of acetone through oxidation of soil waxes and humic material (e.g., organic materials such as roots).

Attachment C

Photograph Log

Attachment C PHOTOGRAPH LOG

Project Name: Willamette Cove Upland Facility
Project Number: 1056-02

Client: Port of Portland
Location: Portland, Oregon

Photo No: 1	
Photo Date: October 1, 2010	
Orientation: West	
Description: Locations WC-1 through WC-3 (in white circles) on heavily vegetated bench in former Wharf Road Area.	
Photo No: 2	
Photo Date: September 27, 2010	
Orientation: Southwest	
Description: Hand-excavated shallow potholes on Inner Cove beach.	

Attachment C PHOTOGRAPH LOG

Project Name: Willamette Cove Upland Facility
Project Number: 1056-02

Client: Port of Portland
Location: Portland, Oregon

Photo No: 3	
Photo Date: September 28, 2010	
Orientation: North	
Description: Buried 1-inch metal piping encountered in Trench 1.	
Photo No: 4	
Photo Date: September 29, 2010	
Orientation: Not applicable	
Description: Remnant of drum body observed in Trench 2.	

Attachment C PHOTOGRAPH LOG

Project Name: Willamette Cove Upland Facility
Project Number: 1056-02

Client: Port of Portland
Location: Portland, Oregon

Photo No: 5	
Photo Date: September 29, 2010	
Orientation: Not Applicable	
Description: Remnant of drum lid observed in Trench 2.	
Photo No: 6	
Photo Date: September 29, 2010	
Orientation: Not Applicable	
Description: Heavy link chain observed in Trench 2.	

Attachment C PHOTOGRAPH LOG

Project Name: Willamette Cove Upland Facility
Project Number: 1056-02

Client: Port of Portland
Location: Portland, Oregon

Photo No: 7	
Photo Date: September 28, 2010	
Orientation: Northwest	
Description: Large blocks of Portland-cement concrete encountered in Trench 3.	
Photo No: 8	
Photo Date: September 29, 2010	
Orientation: Southeast	
Description: Blocks of Portland-cement concrete encountered in the shallow subsurface required Trench 4 to be "stepped out" from the riverbank toward the river. Trench on left of photograph is unsuccessful attempt number 2. Trench on right of photograph was successful location.	

Attachment C PHOTOGRAPH LOG

Project Name: Willamette Cove Upland Facility
Project Number: 1056-02

Client: Port of Portland
Location: Portland, Oregon

Photo No: 9	
Photo Date: September 29, 2010	
Orientation: Northwest	
Description: In-place wood pilings observed in Trench 4 on the north wall of the trench (in white circles). Pre-packed well screen in bottom left of trench.	
Photo No: 10	
Photo Date: September 27, 2010	
Orientation: Southwest	
Description: Hand-excavated shallow potholes in former Wharf Road area.	

Attachment C PHOTOGRAPH LOG

Project Name: Willamette Cove Upland Facility
Project Number: 1056-02

Client: Port of Portland
Location: Portland, Oregon

Photo No: 11	
Photo Date: September 29, 2010	
Orientation: Southwest	
Description: Push-probe explorations completed at the top of the riverbank.	
Photo No: 12	
Photo Date: September 29, 2010	
Orientation: Southwest	
Description: Hand-held push probes attempted on the riverbank slope.	

Attachment D

**Laboratory Analytical Reports and Data Quality
Review (CD-ROM)**

Attachment E

Data Tables

Table 1A - Former Wharf Road Area
Willamette Cove Upland Facility
Portland, Oregon

		Former Wharf Road Area - Soil									
		Beach	Surface Soil - Handheld Probe Locations on Riverbank				Push-Probe Locations - Top of Riverbank				
PRIMARY SAMPLE	JSCS SLV	Wharf Beach -1	WC-1/2/3	WC-1 Surface	WC-2 Surface	WC-3 Surface	WC-4	WC-5	WC-6	WC-7	WC-8
DISCRETE SAMPLES											
Date Sampled		9/27/2010	10/1/2010	10/1/2010	10/1/2010	10/1/2010	9/30/2010	9/30/2010	9/30/2010	9/29/2010	9/29/2010
Sample Interval (inches)		12-18	3-10	4-10	3-9	3-9	27 (feet)	27 (feet)	27 (feet)	29.5 (feet)	28 (feet)
TPH-HCID (mg/kg)											
Diesel Range	--	DET	72.1	--	--	--	--	--	--	--	--
Gasoline Range	--	ND	<20.5	--	--	--	--	--	--	--	--
Motor Oil Range	--	DET	738	--	--	--	--	--	--	--	--
NWTPH-Gx (mg/kg)											
Gasoline Range Organics	--	1.4 J	--	--	--	--	--	--	--	--	--
NWTPH-Dx Silica Gel Cleanup (mg/kg)											
Diesel Range	--	397	72.3	--	--	--	<3.5	<4.0	<3.5	31.5	42.9
Motor Oil Range	--	199	388	--	--	--	<23.8	<26.8	<23.7	44.4 J	60.0 J
Metals (EPA 6000/7000 Series Methods; mg/kg)											
Antimony	64	0.57 J	4.9	6.9	7.2	2.5	<0.28	<0.32	<0.20	<0.32	<0.23
Arsenic	7	39	8.6	24.8	11.9	7.3	4.7	3.4	3.4	4.3	4.5
Beryllium	--	0.45	0.19	0.31	0.38	0.28	0.35	0.33	0.35	0.53	0.46
Cadmium	1	1	1.7	0.37	0.49	0.88	0.050 J	0.059 J	0.088	0.11	0.073 J
Chromium	111	33.4	42.3	62.1	48.8	31.7	17.4	24.5	18.3	25.5	22
Copper	149	1,400	251	262	188	195	17.9	19.8	16.4	30	23.5
Lead	17	8,660 B	693	889 B	770 B	727 B	3.6	5	3.4	22.1	23.7
Nickel	49	25	28.4	54.5	43.1	49.1	21.2	25	24.1	25.8	23.7
Selenium	2	1	0.75	0.20 J,B	0.21 J,B	0.13 J	0.95	0.81	1.2	1.2	1
Silver	5	0.18 J,B	0.44 J,B	0.6 B	0.40 J,B	0.35 J,B	0.067 J,B	<0.025	<0.016	0.54 J,B	0.062 J,B
Thallium	--	0.080 J	0.24	0.070 J	0.077 J	0.056 J	0.043 J	0.057 J	0.070 J	0.062 J	0.058 J
Zinc	459	684	548	451	383	410	54	58.1	54.7	75.1	65.4
Mercury	0.07	113	5.5	8.1	1.7	1.4 H1	0.012 J	0.020 J	0.0038 J	0.21	0.066 J
PAHs (EPA 8270 SIM; ug/kg)											
1-Methylnaphthalene	--	40	15.3	--	--	--	2.3 J	8.7	<1.0	73.2	96.7
2-Methylnaphthalene	200	79	35	--	--	--	5.0 J	16.4	<2.2	142	190
Acenaphthene	300	13	7.5	--	--	--	<1.7	3.3 J	<1.8	425	201
Acenaphthylene	200	51	19.4	--	--	--	9.6	2.7 J	0.96 J	125	225
Anthracene	845	34	27.3	--	--	--	36.4	9	1.3 J	214	395
Benzo(a)anthracene	1,050	103	82.1	--	--	--	97.7	22.5	6.1 J	572	928
Benzo(a)pyrene	1,450	78	121	--	--	--	80.9	27.9	6.5 J	678	1200
Benzo(b)fluoranthene	--	123 1n(a)	155	--	--	--	38.5	15.2	2.6 J	269	582
Benzo(g,h,i)perylene	300	30	90.8	--	--	--	19.4	8.4	1.8 J	225	384
Benzo(k)fluoranthene	13,000	110 1n(a)	94.6	--	--	--	53.9	17	4.7 J	472	743
Chrysene	1,290	146	116	--	--	--	89.2	21.7	5.6 J	491	797
Dibenz(a,h)anthracene	1,300	13	34.6	--	--	--	8.8	2.2 J	0.55 J	73.4	121
Fluoranthene	2,230	315	152	--	--	--	125	29.9	8.6	939	1200
Fluorene	536	30	9.5	--	--	--	6.8 J	3.6 J	<2.1	199	181
Indeno(1,2,3-cd)pyrene	100	30	78.6	--	--	--	21.9	8.7	1.8 J	225	397
Naphthalene	561	203	75.2	--	--	--	7.1 J	25.4	<2.1	695	682
Phenanthrene	1,170	187	104	--	--	--	91.7	16.2	<3.7	712	510
Pyrene	1,520	256	139	--	--	--	132	27.6	8.6	786	1,820
PCBs (EPA Method 8082; ug/kg)											
PCB-1016 (Aroclor 1016)	530	<5.7	<5.4	--	--	--	<4.5	<5.1	<4.8	<54.3	<54.6
PCB-1221 (Aroclor 1221)	--	<11.3	<2.7	--	--	--	<9.1	<10.2	<9.6	<109	<109
PCB-1232 (Aroclor 1232)	--	<11.3	<3.7	--	--	--	<9.1	<10.2	<9.6	<109	<109
PCB-1242 (Aroclor 1242)	--	<8.5	<5.0	--	--	--	<6.8	<7.7	<7.2	<81.4	<82.0
PCB-1248 (Aroclor 1248)	1,500	<8.5	<4.7	--	--	--	<6.8	<7.7	<7.2	<81.4	<82.0
PCB-1254 (Aroclor 1254)	300	<7.1	<2.9	--	--	--	<5.7	<6.4	<6.0	<67.8	<68.3
PCB-1260 (Aroclor 1260)	200	<12.7	<5.8	--	--	--	<10.2	<11.5	<10.8	<122	<123
PCB-1262 (Aroclor 1262)	--	<5.7	<3.4	--	--	--	<4.5	<5.1	<4.8	<54.3	<54.6
PCB-1268 (Aroclor 1268)	--	<5.7	<1.6	--	--	--	<4.5	<5.1	<4.8	<54.3	<54.6
Pesticides (EPA 8081; ug/kg)											
alpha-BHC	--	--	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--	--	--
gamma-BHC (Lindane)	4.99	--	--	--	--	--	--	--	--	--	--
Heptachlor	10	--	--	--	--	--	--	--	--	--	--
Aldrin	40	--	--	--	--	--	--	--	--	--	--
Heptachlor Epoxide	16	--	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--	--	--
Dieldrin	0.0081	--	--	--	--	--	--	--	--	--	--
Endrin	207	--	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--	--	--
Endosulfan Sulfate	--	--	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--	--	--
Endrin Ketone	--	--	--	--	--	--	--	--	--	--	--
Endrin Aldehyde	--	--	--	--	--	--	--	--	--	--	--
trans-Chlordane	--	--	--	--	--	--	--	--	--	--	--
cis-Chlordane	--	--	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDE	0.33	--	--	--	--	--	--	--	--	--	--
4,4'-DDD	0.33	--	--	--	--	--	--	--	--	--	--
4,4'-DDT	0.33	--	--	--	--	--	--	--	--	--	--
2,4'-DDT	--	--	--	--	--	--	--	--	--	--	--
2,4'-DDE	--	--	--	--	--	--	--	--	--	--	--
2,4'-DDD	--	--	--	--	--	--	--	--	--	--	--
Dioxins/Furans (EPA 8290; ng/kg)											
2,3,7,8-TCDF	0.77	0.5 J	5.0	<5.3 P	<3.8 P	<1.6 P	--	--	--	--	--
2,3,7,8-TCDD	0.0091	<0.4	1.0 J	<1.9 I	4.5 J	24	--	--	--	--	--
1,2,3,7,8-PeCDF	2.6	<0.61	5.8	<5.7 P	<2.8 P	<11 P	--	--	--	--	--
2,3,4,7,8-PeCDF	--	<0.42	8.3	1,500	180	16,000	--	--	--	--	--
1,2,3,7,8-PeCDD	2.6	<0.54	8.5	35 J	18 J	240	--	--	--	--	--
1,2,3,4,7,8-HxCDF	2.7	1.4 J	22	220	43 J	1,400	--	--	--	--	--
1,2,3,6,7,8-HxCDF	2.7	2.2 J	13	<4.6 P	<2.2 P	<12 P	--	--	--	--	--
2,3,4,6,7,8-HxCDF	2.7	3.1 J	13	310	58	3,200	--	--	--	--	--
1,2,3,7,8,9-HxCDF	2.7	0.96 J	14	120	20 J	1,000	--	--	--	--	--
1,2,3,4,7,8-HxCDD	--	<0.55	15	42 J	25 J	150	--	--	--	--	--
1,2,3,6,7,8-HxCDD	--	0.51 J	150	150	110	680	--	--	--	--	--
1,2,3,7,8,9-HxCDD	--	<0.49	29	90	65	430	--	--	--	--	--
1,2,3,4,6,7,8-HpCDF	690	2.5 J	250	430	210	2,300	--	--	--	--	--
1,2,3,4,7,8,9-HpCDF	690	<0.58	16	52	19 J	340	--	--	--	--	--
1,2,3,4,6,7,8-HpCDD	690	2.5 J	3,100	2,000	1,200	2,400	--	--	--	--	--
OCDF	23,000	2.9 J	490	630	240	460	--	--	--	--	--
OCDD	23,000	8.5 J	27,000	13,000	7,500	10,000	--	--	--	--	--
Total TCDF	--	12	79	3,500	610	16,000 E	--	--	--	--	--
Total TCDD	--	<0.4	35	160	84	890	--	--	--	--	--
Total PeCDF	--	34	140	16,000	2,200	150,000 E	--	--	--	--	--
Total PeCDD	--	<0.54	53	510	200	3,700	--	--	--	--	--
Total HxCDF	--	20	570	8,500	1,400	93,000 E	--	--	--	--	--
Total HxCDD	--	4.5 J	600	1,300	920	7,300	--	--	--	--	--
Total HpCDF	--	4.6 J	800	1,300	500	6,300	--	--	--	--	--
Total HpCDD	--	4.9	6,000	3,900	2,600	5,000	--	--	--	--	--
TEQ	--	1.5	80	600	130	5,700	--	--	--	--	--
Butyl Tins (Krones Method; ug/kg)											
Tributyltin	2.3	<37	<36	--	--	--	--	--	--	--	--
Dibutyltin	--	<56	<53	--	--	--	--	--	--	--	--
Butyltin	--	<39	<38	--	--	--	--	--	--	--	--

Notes:

1. µg/kg (ppb) = micrograms per kilogram (parts per billion)

2. mg/kg (ppm) = milligrams per kilogram (parts per million)

3. < = Not detected above the method reporting limit (MRL)

4. JSCS = Screening levels from Portland Harbor Joint Source Control Strategy – Final (Table 3-1 Updated July 16, 2007). December 2005.

5. 1n(a) = Reported as total Benzo(b,k)fluoranthene: result may be biased high.

6. P = The analyte was detected on both chromatographic columns but the quantified values differ by greater than or equal to 40% RPD with no obvious chromatographic interference.

7. B = Analyte was detected in associated method blank above the reporting limit. Sample concentrations were less than 5 times the concentration detected in the method blank.

8. Shading denotes exceedence of JSCS SLV.

9. J = Estimated.

Table 1B - Former Wharf Road Area
Willamette Cove Upland Facility
Portland, Oregon

		Former Wharf Road Area - Soil					
		Beach	Push-Probe Locations - Top of Riverbank				
Sample	JSCS SLV	Wharf Beach -1	WC-4	WC-5	WC-6	WC-7	WC-8
Date Sampled		9/27/2010	9/30/2010	9/30/2010	9/30/2010	9/29/2010	9/29/2010
Sample Interval (inches)		12-18	27 (feet)	27 (feet)	27 (feet)	29.5 (feet)	28 (feet)
VOCs (EPA 8260B; ug/kg)							
1,1,1,2-Tetrachloroethane	--	<0.21	<0.16	<0.17	<0.17	<0.20	<0.19
1,1,1-Trichloroethane	--	<0.26	<0.20	<0.21	<0.21	<0.25	<0.24
1,1,2,2-Tetrachloroethane	--	<0.39	<0.30	<0.32	<0.32	<0.38	<0.37
1,1,2-Trichloroethane	--	<0.39	<0.30	<0.32	<0.32	<0.38	<0.37
1,1-Dichloroethane	--	<0.34	<0.26	<0.28	<0.28	<0.32	<0.31
1,1-Dichloroethene	--	<0.53	<0.40	<0.43	<0.43	<0.50	<0.49
1,1-Dichloropropene	--	<0.49	<0.38	<0.41	<0.41	<0.47	<0.46
1,2,3-Trichlorobenzene	--	<0.39	<0.30	<0.32	<0.32	<0.38	<0.37
1,2,3-Trichloropropane	--	<0.48	<0.37	<0.40	<0.40	<0.46	<0.45
1,2,4-Trichlorobenzene	9,200	0.38 J,B	<0.26	<0.28	<0.28	<0.33	<0.32
1,2,4-Trimethylbenzene	--	0.98 J,B	<0.56	<0.60	<0.60	1.0 J,B	0.71 J,B
1,2-Dibromo-3-chloropropane	--	<0.55	<0.42	<0.45	<0.45	<0.53	<0.52
1,2-Dibromoethane (EDB)	--	<0.30	<0.23	<0.25	<0.25	<0.28	<0.28
1,2-Dichlorobenzene	1,700	<0.35	<0.27	<0.29	<0.29	<0.33	<0.33
1,2-Dichloroethane	--	<0.31	<0.24	<0.26	<0.26	<0.30	<0.29
1,2-Dichloropropane	--	<0.26	<0.20	<0.21	<0.21	<0.24	<0.24
1,3,5-Trimethylbenzene	--	<0.45	<0.35	<0.37	<0.37	<0.43	<0.42
1,3-Dichlorobenzene	300	<0.27	<0.21	<0.22	<0.22	<0.26	<0.25
1,3-Dichloropropane	--	<0.39	<0.30	<0.32	<0.32	<0.38	<0.37
1,4-Dichlorobenzene	300	<0.34	<0.26	<0.28	<0.28	<0.32	<0.32
2,2-Dichloropropane	--	<0.26	<0.20	<0.22	<0.22	<0.25	<0.25
2-Butanone (MEK)	--	<2.1	<1.6	<1.8	<1.8	16.5	25.2
2-Chlorotoluene	--	<0.45	<0.34	<0.37	<0.37	<0.43	<0.42
2-Hexanone	--	<0.51	<0.39	<0.42	<0.42	<0.49	<0.48
4-Chlorotoluene	--	<0.38	<0.29	<0.31	<0.31	<0.36	<0.35
4-Methyl-2-pentanone (MIBK)	--	<0.43	1.5 J,B	1.4 J	<0.35	1.9 J	2.3 J
Acetone	--	5.4 J, L1	<1.2	2.9 J,B	4.7 J,B	100 B	109 B
Benzene	--	<0.21	<0.16	<0.17	<0.17	<0.20	<0.20
Bromobenzene	--	<0.33	<0.25	<0.27	<0.27	<0.32	<0.31
Bromochloromethane	--	<0.31	<0.24	<0.26	<0.26	<0.30	<0.29
Bromodichloromethane	--	<0.17	<0.13	<0.14	<0.14	<0.16	<0.16
Bromoform	--	<0.33	<0.25	<0.27	<0.27	<0.31	<0.31
Bromomethane	--	<0.45	<0.34	<0.37	<0.37	<0.43	<0.42
Carbon disulfide	--	<0.40	<0.30	<0.32	<0.32	<0.38	<0.37
Carbon tetrachloride	--	<0.26	<0.20	<0.21	<0.21	<0.25	<0.24
Chlorobenzene	--	<0.26	<0.20	<0.21	<0.21	<0.25	<0.24
Chloroethane	--	<0.41	<0.31	<0.34	<0.34	<0.39	<0.38
Chloroform	--	<0.28	<0.21	<0.23	<0.23	<0.26	<0.26
Chloromethane	--	<0.29	<0.22	<0.24	<0.24	<0.28	<0.27
cis-1,2-Dichloroethene	--	<0.30	<0.23	<0.24	<0.24	<0.28	<0.28
cis-1,3-Dichloropropene	--	<0.19	<0.14	<0.15	<0.15	<0.18	<0.17
Dibromochloromethane	--	<0.14	<0.11	<0.12	<0.12	<0.14	<0.13
Dibromomethane	--	<0.30	<0.23	<0.24	<0.24	<0.28	<0.28
Dichlorodifluoromethane	--	<0.59	<0.45	<0.48	<0.48	<0.56	<0.55
Ethylbenzene	--	<0.54	<0.41	<0.44	<0.44	<0.51	<0.50
Hexachloro-1,3-butadiene	600	<0.42	<0.32	<0.35	<0.35	<0.40	<0.39
Isopropylbenzene (Cumene)	--	<0.49	<0.38	<0.40	<0.40	<0.47	<0.46
m&p-Xylene	--	1.7 J,B	<0.81	<0.87	<0.87	1.2 J,B	1.0 J,B
Methylene chloride	--	<3.7	<2.9	<3.1	<3.1	<3.6	<3.5
Methyl-tert-butyl ether	--	<0.35	<0.27	<0.29	<0.29	<0.34	<0.33
Naphthalene	561	<0.78	<0.59	<0.64	<0.64	<0.74	<0.73
n-Butylbenzene	--	<0.65	<0.50	<0.53	<0.53	<0.62	<0.61
n-Propylbenzene	--	<0.50	<0.38	<0.41	<0.41	<0.48	<0.47
o-Xylene	--	<0.46	<0.35	<0.38	<0.38	<0.44	<0.43
p-Isopropyltoluene	--	<0.55	<0.42	<0.45	<0.45	<0.52	<0.51
sec-Butylbenzene	--	<0.59	<0.45	<0.49	<0.49	<0.57	<0.55
Styrene	--	0.61 J	<0.31	<0.33	<0.33	<0.39	<0.38
tert-Butylbenzene	--	<0.49	<0.37	<0.40	<0.40	<0.47	<0.46
Tetrachloroethene	500	<0.54	<0.41	<0.45	<0.44	<0.52	<0.51
Toluene	--	0.53 J	<0.33	<0.36	<0.36	<0.42	<0.41
trans-1,2-Dichloroethene	--	<0.42	<0.33	<0.35	<0.35	<0.41	<0.40
trans-1,3-Dichloropropene	--	<0.30	<0.23	<0.25	<0.24	<0.28	<0.28
Trichloroethene	2,100	<0.30	<0.23	<0.24	<0.24	<0.28	<0.28
Trichlorofluoromethane	--	<0.32	<0.25	<0.27	<0.27	<0.31	<0.30
Vinyl chloride	--	<0.40	<0.30	<0.33	<0.33	<0.38	<0.37
Xylene (Total)	--	1.7 J,B	0.86 J,B	0.99 J,B	<0.87	1.7 J,B	1.3 J,B

Notes:

1. µg/kg (ppb) = micrograms per kilogram (parts per billion)
2. mg/kg (ppm) = milligrams per kilogram (parts per million)
3. < = Not detected above the method reporting limit (MRL)
4. JSCS = Screening levels from Portland Harbor Joint Source Control Strategy – Final (Table 3-1 Updated July 16, 2007). December 2005.
5. J = Estimated.
6. B = Analyte was detected in associated method blank above the reporting limit. Sample concentrations were less than 5 times the concentration detected in the method blank.

Table 1C - Former Wharf Road Area
Willamette Cove Upland Facility
Portland, Oregon

		Former Wharf Road Area - Groundwater				
		Push-Probe Locations - Top of Riverbank				
Sample	JSCS SLV	WC-4	WC-5	WC-6	WC-7	WC-8
Date Sampled		9/30/2010	9/30/2010	9/30/2010	9/29/2010	9/29/2010
NWTPH-Dx (mg/L)						
Diesel Range SG	--	0.13	<0.035	<0.036	0.15	<0.035
Motor Oil Range SG	--	0.37 J	<0.058	<0.060	0.18 J	<0.058
Metals (EPA 6000/7000 Series Methods; ug/L)						
Antimony	6	<0.16	<0.16	<0.16	<0.16	<0.16
Antimony, Dissolved	6	<0.16	<0.16	<0.16	<0.16	<0.16
Arsenic	0.05	5	1.1	14.2	9.4	7.7
Arsenic, Dissolved	0.05	4.2	0.32 J	13.2	3.9	4.7
Beryllium	--	0.43	0.14 J	<0.069	0.64	<0.069
Beryllium, Dissolved	--	0.19 J	<0.069	<0.069	<0.069	<0.069
Cadmium	0.1	0.058 J	<0.020	<0.020	0.089	0.044 J
Cadmium, Dissolved	0.1	0.051 J	<0.020	<0.020	<0.020	0.020 J
Chromium	100	16.4	8.2	1.1	27.4	3.6
Chromium, Dissolved	100	8.4	0.84	0.55	<0.24	1.5
Copper	2.7	16.6	7.6	0.53	37	5.0
Copper, Dissolved	2.7	9.8	<0.20	<0.20	<0.20	2.2
Lead	0.54	10.7	2.0	0.24	14.6	3.4
Lead, Dissolved	0.54	6.2	0.1	0.088 J	<0.020	1.5
Nickel	--	16.7	10.8	2.3	30.6	45.4
Nickel, Dissolved	--	9.8	4.9	2.7	2.8	3.2
Selenium	5	0.64	0.11 J	<0.10	0.94	0.18 J
Selenium, Dissolved	5	0.17 J	<0.10	<0.10	<0.10	<0.10
Silver	0.12	<0.071	<0.071	<0.071	<0.071	<0.071
Silver, Dissolved	0.12	0.55	0.083 J	<0.071	<0.071	<0.071
Thallium	--	0.051 J	<0.050	<0.050	0.10	<0.050
Thallium, Dissolved	--	<0.050	<0.050	<0.050	<0.050	<0.050
Zinc	36	45.4	79.2	21.4	154	14.2
Zinc, Dissolved	36	28.7	17.6	16.4	8.0	10.5
Mercury	0.77	<0.011	<0.011	<0.011	<0.011	<0.011
Mercury, Dissolved	0.77	<0.011	<0.011	<0.011	<0.011	<0.011
PAHs (EPA 8270 SIM; ug/L)						
1-Methylnaphthalene	--	0.010 J	0.012 J	0.0073 J	0.015	0.031
2-Methylnaphthalene	0.2	0.019 B	0.02 B	0.013 J, B	0.022 B	0.033 B
Acenaphthene	0.2	0.016	0.38	0.0053 J	1.6	0.097
Acenaphthylene	0.2	0.034	0.087	0.0039 J	0.076	0.019
Anthracene	0.2	0.12	0.32	0.019	0.32	0.036
Benzo(a)anthracene	0.018	0.36	0.21	0.012 J	0.096	0.072
Benzo(a)pyrene	0.018	0.32	0.13	0.0086 J	0.018	0.081
Benzo(b)fluoranthene	0.018	0.24	0.11	0.0093 J	0.016	0.061
Benzo(g,h,i)perylene	0.2	0.11	0.069	0.0069 J	0.0049 J	0.05
Benzo(k)fluoranthene	0.018	0.19	0.089	0.0092 J	0.016	0.057
Chrysene	0.018	0.33	0.23	0.012 J	0.100	0.068
Dibenz(a,h)anthracene	0.018	0.047	0.018	0.0051 J	<0.0017	0.014
Fluoranthene	0.2	0.65	1.7	0.087	1.6	0.12
Fluorene	0.2	0.026	0.066	0.0057 J	0.21	0.039
Indeno(1,2,3-cd)pyrene	0.018	0.11	0.059	0.0069 J	0.0038 J	0.04
Naphthalene	0.2	0.028 B	0.044 B	0.02 B	0.039 B	0.12 B
Phenanthrene	0.2	0.22	1.9	0.064 B	2.2	0.082 B
Pyrene	0.2	0.67	1.8	0.100	1.7	0.26
PCBs (EPA Method 8082; ug/L)						
PCB-1016 (Aroclor 1016)	0.96	<0.010	<0.010	<0.010	<0.010	<0.010
PCB-1221 (Aroclor 1221)	0.034	<0.010	<0.010	<0.010	<0.010	<0.010
PCB-1232 (Aroclor 1232)	0.034	<0.010	<0.010	<0.010	<0.010	<0.010
PCB-1242 (Aroclor 1242)	0.034	<0.010	<0.010	<0.010	<0.010	<0.010
PCB-1248 (Aroclor 1248)	0.034	<0.010	<0.010	<0.010	<0.010	<0.010
PCB-1254 (Aroclor 1254)	0.033	<0.010	<0.010	<0.010	<0.010	<0.010
PCB-1260 (Aroclor 1260)	0.034	<0.010	<0.010	<0.010	<0.010	<0.010
PCB-1262 (Aroclor 1262)	--	<0.010	<0.010	<0.010	<0.010	<0.010
PCB-1268 (Aroclor 1268)	--	<0.010	<0.010	<0.010	<0.010	<0.010
Pesticides (EPA 8081; ug/L)						
alpha-BHC	0.0049	--	--	--	--	--
beta-BHC	0.017	--	--	--	--	--
delta-BHC	0.037	--	--	--	--	--
gamma-BHC (Lindane)	0.052	--	--	--	--	--
Heptachlor	0.000079	--	--	--	--	--
Aldrin	0.00005	--	--	--	--	--
Heptachlor Epoxide	0.000039	--	--	--	--	--
Endosulfan I	0.056	--	--	--	--	--
Dieldrin	0.000054	--	--	--	--	--
Endrin	0.036	--	--	--	--	--
Endosulfan II	0.056	--	--	--	--	--
Endosulfan Sulfate	89	--	--	--	--	--
Methoxychlor	0.03	--	--	--	--	--
Endrin Ketone	--	--	--	--	--	--
Endrin Aldehyde	0.3	--	--	--	--	--
trans-Chlordane	--	--	--	--	--	--
cis-Chlordane	--	--	--	--	--	--
Toxaphene	0.0002	--	--	--	--	--
4,4'-DDE	0.00022	--	--	--	--	--
4,4'-DDD	0.00031	--	--	--	--	--
4,4'-DDT	0.00022	--	--	--	--	--
2,4'-DDT	--	--	--	--	--	--
2,4'-DDE	--	--	--	--	--	--
2,4'-DDD	--	--	--	--	--	--

		Former Wharf Road Area - Groundwater				
		Push-Probe Locations - Top of Riverbank				
Sample	JSCS SLV	WC-4	WC-5	WC-6	WC-7	WC-8
Date Sampled		9/30/2010	9/30/2010	9/30/2010	9/29/2010	9/29/2010
VOCs (EPA 8260B; ug/L)						
1,1,1,2-Tetrachloroethane	2.5	<0.15	<0.15	<0.15	<0.15	<0.15
1,1,1-Trichloroethane	11	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,2,2-Tetrachloroethane	0.33	<0.22	<0.22	<0.22	<0.22	<0.22
1,1,2-Trichloroethane	1.2	<0.19	<0.19	<0.19	<0.19	<0.19
1,1-Dichloroethane	47	<0.23	0.28 J	<0.23	<0.23	<0.23
1,1-Dichloroethene	--	<0.12	<0.12	<0.12	<0.12	<0.12
1,1-Dichloropropene	--	<0.094	<0.094	<0.094	<0.094	<0.094
1,2,3-Trichlorobenzene	--	<0.11	<0.11	<0.11	<0.11	<0.11
1,2,3-Trichloropropane	0.0095	<0.37	<0.37	<0.37	<0.37	<0.37
1,2,4-Trichlorobenzene	8.2	<0.15	<0.15	<0.15	<0.15	<0.15
1,2,4-Trimethylbenzene	--	<0.086	<0.086	<0.086	<0.086	<0.086
1,2-Dibromo-3-chloropropane	--	<0.79	<0.79	<0.79	<0.79	<0.79
1,2-Dichlorobenzene	49	<0.25	<0.25	<0.25	<0.25	<0.25
1,2-Dichloroethane	0.73	<0.074	<0.074	<0.074	<0.074	<0.074
1,2-Dichloropropane	0.97	<0.16	<0.16	<0.16	<0.16	<0.16
1,3,5-Trimethylbenzene	--	<0.16	<0.16	<0.16	<0.16	<0.16
1,3-Dichlorobenzene	14	<0.16	<0.16	<0.16	<0.16	<0.16
1,3-Dichloropropane	--	<0.22	<0.22	<0.22	<0.22	<0.22
1,4-Dichlorobenzene	2.8	<0.20	<0.20	<0.20	<0.20	<0.20
2,2-Dichloropropane	--	<0.27	<0.27	<0.27	<0.27	<0.27
2-Butanone (MEK)	7,100	<1.6	<1.6	<1.6	<1.6	<1.6
2-Chlorotoluene	--	<0.098	<0.098	<0.098	<0.098	<0.098
2-Hexanone	99	<0.57	<0.57	<0.57	<0.57	<0.57
4-Chlorotoluene	--	<0.13	<0.13	<0.13	<0.13	<0.13
4-Methyl-2-pentanone (MIBK)	170	<0.32	<0.32	<0.32	<0.32	<0.32
Acetone	1,500	<0.75	<0.75	<0.75	<0.75	<0.75
Benzene	1.2	<0.12	<0.12	<0.12	<0.12	<0.12
Bromobenzene	--	<0.16	<0.16	<0.16	<0.16	<0.16
Bromochloromethane	--	<0.34	<0.34	<0.34	<0.34	<0.34
Bromodichloromethane	1.1	<0.11	<0.11	<0.11	<0.11	<0.11
Bromoform	8.5	<0.23	<0.23	<0.23	<0.23	<0.23
Bromomethane	8.7	<0.072	<0.072	<0.072	<0.072	<0.072
Carbon disulfide	0.92	<0.16	<0.16	0.23 J	<0.16	<0.16
Carbon tetrachloride	0.51	<0.25	<0.25	<0.25	<0.25	<0.25
Chlorobenzene	50	<0.12	<0.12	<0.12	<0.12	<0.12
Chloroethane	23	<0.27	<0.27	<0.27	<0.27	<0.27
Chloroform	0.17	<0.15	<0.15	<0.15	<0.15	<0.15
Chloromethane	2.1	<0.20	<0.20	<0.20	<0.20	<0.20
cis-1,2-Dichloroethene	61	<0.32	<0.32	<0.32	<0.32	<0.32
cis-1,3-Dichloropropene	0.055	<0.086	<0.086	<0.086	<0.086	<0.086
Dibromochloromethane	0.79	<0.12	<0.12	<0.12	<0.12	<0.12
Dibromomethane	61	<0.18	<0.18	<0.18	<0.18	<0.18
Dichlorodifluoromethane	390	<0.19	<0.19	<0.19	<0.19	<0.19
Ethylbenzene	7.3	<0.20	<0.20	<0.20	<0.20	<0.20
Hexachloro-1,3-butadiene	0.86	<0.27	<0.27	<0.27	<0.27	<0.27
Isopropylbenzene (Cumene)	660	<0.11	<0.11	<0.11	<0.11	<0.11
m&p-Xylene	1.8	<0.27	<0.27	<0.27	<0.27	<0.27
Methylene chloride	8.9	<0.26	<0.26	<0.26	<0.26	<0.26
Methyl-tert-butyl ether	37	<0.16	<0.16	<0.16	<0.16	<0.16
Naphthalene	0.2	<0.10	<0.10	<0.10	<0.10	<0.10
n-Butylbenzene	--	<0.10	<0.10	<0.10	<0.10	<0.10
n-Propylbenzene	660	<0.16	<0.16	<0.16	<0.16	<0.16
o-Xylene	13	<0.15	<0.15	<0.15	<0.15	<0.15
p-Isopropyltoluene	--	<0.074	<0.074	<0.074	<0.074	<0.074
sec-Butylbenzene	--	<0.10	<0.10	<0.10	<0.10	<0.10
Styrene	100	<0.074	<0.074	<0.074	<0.074	<0.074
tert-Butylbenzene	--	<0.11	<0.11	<0.11	<0.11	<0.11
Tetrachloroethene	0.12	<0.10	<0.10	<0.10	<0.10	<0.10
Toluene	9.8	<0.21	<0.21	<0.21	<0.21	<0.21
trans-1,2-Dichloroethene	100	<0.22	<0.22	<0.22	<0.22	<0.22
trans-1,3-Dichloropropene	0.055	<0.16	<0.16	<0.16	<0.16	<0.16
Trichloroethene	0.17	<0.060	<0.060	<0.060	<0.060	<0.060
Trichlorofluoromethane	1,300	<0.24	<0.24	<0.24	<0.24	<0.24
Vinyl chloride	0.015	<0.050	<0.050	<0.050	<0.050	<0.050
Xylene (Total)	--	<0.42	<0.42	<0.42	<0.42	<0.42

- Notes:**
- 1. µg/L (ppb) = micrograms per liter (parts per billion)
 - 2. mg/L (ppm) = milligram per liter (parts per million)
 - 3. < = Not detected above the method reporting limit (MRL)
 - 4. JSCS = Screening levels from Portland Harbor Joint Source Control Strategy – Final (Table 3-1 Updated July 16, 2007). December 2005.
 - 5. Shading denotes exceedence of JSCS SLV.
 - 6. J = Estimated.

Table 2A - Inner Cove Area
Willamette Cove Upland Facility
Portland, Oregon

		Inner Cove Area - Soil						
		Beach		Trench				
PRIMARY SAMPLE	JSCS SLV	Beach Cove-1	Beach Cove-2	Trench 1/2	Trench 3/4	Trench 3	Trench 4A	Trench 4B
DISCRETE SAMPLES								
Date Sampled		9/27/2010	9/27/2010	9/28/2010	9/29/2010	9/28/2010	9/29/2010	9/29/2010
Sample Interval (inches)		12-18	12-18	8.0 (feet)	8.0 (feet)	8.0 (feet)	8.0 (feet)	8.0 (feet)
TPH-HCID (mg/kg)								
Diesel Range	--	DET	DET	--	--	--	--	--
Gasoline Range	--	ND	ND	--	--	--	--	--
Motor Oil Range	--	DET	DET	--	--	--	--	--
NWTPH-Gx (mg/kg)								
Gasoline Range Organics	--	--	--	--	--	--	--	--
NWTPH-Dx Silica Gel Cleanup (mg/kg)								
Diesel Range	--	18,500	14,900	236	1,340	--	--	--
Motor Oil Range	--	49,400	46,700	1,050	1,140	--	--	--
Metals (EPA 6000/7000 Series Methods; mg/kg)								
Antimony	64	154	0.96 J	3.4	6.9	--	--	--
Arsenic	7	14.8	2.5	6.8	4	--	--	--
Beryllium	--	0.27 J	0.18 J	0.27	0.20 J	--	--	--
Cadmium	1	0.3	0.8	0.3	0.15	--	--	--
Chromium	111	14.5	11.7	17	18	--	--	--
Copper	149	72.9	36.2	34.8	130	--	--	--
Lead	17	1160 B	59.4 B	92.3	137	--	--	--
Nickel	49	15.1	12.4	17.6	20.9	--	--	--
Selenium	2	0.60 J	0.29 J	0.83	0.79	--	--	--
Silver	5	0.87 J,B	0.68 J,B	0.22 J,B	0.66 J,B	--	--	--
Thallium	--	0.18 J	0.076 J	0.044 J	0.055 J	--	--	--
Zinc	459	119	555	159	115	--	--	--
Mercury	0.07	0.085	0.24	0.087	0.054 J	--	--	--
PAHs (EPA 8270 SIM; ug/kg)								
1-Methylnaphthalene	--	108	11.8 J	61.5	29	--	--	--
2-Methylnaphthalene	200	70.9	18.0 J	113	75.2	--	--	--
Acenaphthene	300	118	14.5 J	28.2	5.1 J	--	--	--
Acenaphthylene	200	73.1	16.9 J	46.3	31.3	--	--	--
Anthracene	845	519 J	<10.2	28.9	19.6	--	--	--
Benzo(a)anthracene	1,050	2,820	401	78	66.4	--	--	--
Benzo(a)pyrene	1,450	849	222	79.3	58.6	--	--	--
Benzo(b)fluoranthene	--	1760 1n(a)	510 1n(a)	57.4 J	41.5 J	--	--	--
Benzo(g,h,i)perylene	300	380	161 J	46.6	23.9	--	--	--
Benzo(k)fluoranthene	13,000	1560 1n(a)	488 1n(a)	63.7 J	48.4 J	--	--	--
Chrysene	1,290	6,220	1280	92.6	93.7	--	--	--
Dibenz(a,h)anthracene	1,300	233 J	136 J	13.7	8.1 J	--	--	--
Fluoranthene	2,230	1260	249	160	208	--	--	--
Fluorene	536	577	11.9 J	33.1	15.9	--	--	--
Indeno(1,2,3-cd)pyrene	100	169	138	34.7	20.9	--	--	--
Naphthalene	561	130	63	421	146	--	--	--
Phenanthrene	1,170	2,710	126 J	153	139	--	--	--
Pyrene	1,520	3,370	532	190	141	--	--	--
PCBs (EPA Method 8082; ug/kg)								
PCB-1016 (Aroclor 1016)	530	<89.2	<111	<62.8	<72.3	<4.8	<4.8	<4.9
PCB-1221 (Aroclor 1221)	--	<178	<222	<126	<145	<2.4	<2.4	<2.4
PCB-1232 (Aroclor 1232)	--	<178	<222	<126	<145	<3.3	<3.4	<3.4
PCB-1242 (Aroclor 1242)	--	<134	<167	<94.2	<108	<4.4	<4.5	<4.5
PCB-1248 (Aroclor 1248)	1,500	<134	<167	<94.2	<108	<4.2	<4.3	<4.3
PCB-1254 (Aroclor 1254)	300	<112	<139	<78.5	7,940	<2.6	363	207,000
PCB-1260 (Aroclor 1260)	200	<201	<250	<141	<163	<5.2	<5.2	<5.2
PCB-1262 (Aroclor 1262)	--	<89.2	<111	<62.8	<72.3	<3.0	<3.0	<3.0
PCB-1268 (Aroclor 1268)	--	<89.2	<111	<62.8	<72.3	<1.4	<1.4	<1.4
Pesticides (EPA 8081; ug/kg)								
alpha-BHC	--	--	--	<0.98	<4.4	--	--	--
beta-BHC	--	--	--	<0.98	<4.4	--	--	--
delta-BHC	--	--	--	<0.98	<4.4	--	--	--
gamma-BHC (Lindane)	4.99	--	--	<0.98	<4.4	--	--	--
Heptachlor	10	--	--	<0.98	<4.4	--	--	--
Aldrin	40	--	--	<0.98	<95 Y	--	--	--
Heptachlor Epoxide	16	--	--	<0.98	<630 Y	--	--	--
Endosulfan I		--	--	<0.98	<990 Y	--	--	--
Dieldrin	0.0081	--	--	<2.0	<310 Y	--	--	--
Endrin	207	--	--	<2.0	<620 Y	--	--	--
Endosulfan II	--	--	--	<2.0	<390 Y	--	--	--
Endosulfan Sulfate	--	--	--	<2.0	<8.7	--	--	--
Methoxychlor	--	--	--	<9.8	<44	--	--	--
Endrin Ketone	--	--	--	<2.0	<8.7	--	--	--
Endrin Aldehyde	--	--	--	<2.0	<37 Y	--	--	--
trans-Chlordane	--	--	--	<0.98	<240 Y	--	--	--
cis-Chlordane	--	--	--	<0.98	<4.4	--	--	--
Toxaphene	--	--	--	<98	<440	--	--	--
4,4'-DDE	0.33	--	--	<0.20	<280 Y	--	--	--
4,4'-DDD	0.33	--	--	<0.20	<2.0	--	--	--
4,4'-DDT	0.33	--	--	<0.35 Y	<2.0	--	--	--
2,4'-DDT	--	--	--	<0.20	<310 Y	--	--	--
2,4'-DDE	--	--	--	<0.20	<460 Y	--	--	--
2,4'-DDD	--	--	--	<0.20	<110 Y	--	--	--
Dioxins/Furans (EPA 8290; ng/kg)								
2,3,7,8-TCDF	0.77	--	--	--	--	--	--	--
2,3,7,8-TCDD	0.0091	--	--	--	--	--	--	--
1,2,3,7,8-PeCDF	2.6	--	--	--	--	--	--	--
2,3,4,7,8-PeCDF	--	--	--	--	--	--	--	--
1,2,3,7,8-PeCDD	2.6	--	--	--	--	--	--	--
1,2,3,4,7,8-HxCDF	2.7	--	--	--	--	--	--	--
1,2,3,6,7,8-HxCDF	2.7	--	--	--	--	--	--	--
2,3,4,6,7,8-HxCDF	2.7	--	--	--	--	--	--	--
1,2,3,7,8,9-HxCDF	2.7	--	--	--	--	--	--	--
1,2,3,4,7,8-HxCDD	--	--	--	--	--	--	--	--
1,2,3,6,7,8-HxCDD	--	--	--	--	--	--	--	--
1,2,3,7,8,9-HxCDD	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-HpCDF	690	--	--	--	--	--	--	--
1,2,3,4,7,8,9-HpCDF	690	--	--	--	--	--	--	--
1,2,3,4,6,7,8-HpCDD	690	--	--	--	--	--	--	--
OCDF	23,000	--	--	--	--	--	--	--
OCDD	23,000	--	--	--	--	--	--	--
Total TCDF	--	--	--	--	--	--	--	--
Total TCDD	--	--	--	--	--	--	--	--
Total PeCDF	--	--	--	--	--	--	--	--
Total PeCDD	--	--	--	--	--	--	--	--
Total HxCDF	--	--	--	--	--	--	--	--
Total HxCDD	--	--	--	--	--	--	--	--
Total HpCDF	--	--	--	--	--	--	--	--
Total HpCDD	--	--	--	--	--	--	--	--
TEQ	--	--	--	--	--	--	--	--
Butyl Tins (Krones Method; ug/kg)								
Tributyltin	2.3	<38	<37	--	--	--	--	--
Dibutyltin	--	<56	<55	--	--	--	--	--
Butyltin	--	<40	<39	--	--	--	--	--

- Notes:
- µg/kg (ppb) = micrograms per kilogram (parts per billion)
 - mg/kg (ppm) = milligrams per kilogram (parts per million)
 - < = Not detected above the method reporting limit (MRL)
 - JSCS = Screening levels from Portland Harbor Joint Source Control Strategy – Final (Table 3-1 Updated July 16, 2007). December 2005.
 - Shading denotes exceedence of JSCS SLV.
 - J = Estimated.
 - B = Analyte was detected in associated method blank above the reporting limit. Sample concentrations were less than 5 times the concentration detected in the method blank.

Table 2B - Inner Cove Area
Willamette Cove Upland Facility
Portland, Oregon

		Inner Cove Area - Soil						
		Beach		Trench				
PRIMARY SAMPLE	JSCS SLV	Beach Cove-1	Beach Cove-2	Trench 1/2	Trench 3/4			
DISCRETE SAMPLES						Trench 3	Trench 4A	Trench 4B
Date Sampled		9/27/2010	9/27/2010	9/28/2010	9/29/2010	9/28/2010	9/29/2010	9/29/2010
Sample Interval (inches)		12-18	12-18	8.0 (feet)	8.0 (feet)	8.0 (feet)	8.0 (feet)	8.0 (feet)
VOCs (EPA 8260B; ug/kg)								
1,1,1,2-Tetrachloroethane	--	<0.52	<1.1	<4.6	<7.1	--	--	--
1,1,1-Trichloroethane	--	<0.65	<1.4	<4.8	<7.5	--	--	--
1,1,2,2-Tetrachloroethane	--	<0.99	<2.1	<6.2	<9.6	--	--	--
1,1,2-Trichloroethane	--	<0.99	<2.1	<4.7	<7.2	--	--	--
1,1-Dichloroethane	--	<0.84	<1.8	<4.0	<6.2	--	--	--
1,1-Dichloroethene	--	<1.3	<2.8	<7.0	<10.9	--	--	--
1,1-Dichloropropene	--	<1.2	<2.6	<10.2	<15.8	--	--	--
1,2,3-Trichlorobenzene	--	<0.99	5.0 J	<6.2	<9.6	--	--	--
1,2,3-Trichloropropane	--	<1.2	<2.5	<17.5	<27.1	--	--	--
1,2,4-Trichlorobenzene	9,200	<0.86	4.1 J	<4.4	<6.8	--	--	--
1,2,4-Trimethylbenzene	--	47.7	14.4 J	8.9 J	13.2 J	--	--	--
1,2-Dibromo-3-chloropropane	--	<1.4	<2.9	<39.7	<61.7	--	--	--
1,2-Dibromoethane (EDB)	--	<0.75	<1.6	<4.4	<6.8	--	--	--
1,2-Dichlorobenzene	1,700	<0.88	1.9 J	<3.9	<6.0	--	--	--
1,2-Dichloroethane	--	<0.79	<1.6	<7.5	<11.6	--	--	--
1,2-Dichloropropane	--	<0.64	<1.3	<6.5	<10.1	--	--	--
1,3,5-Trimethylbenzene	--	18.9	4.5 J	<2.8	<4.4	--	--	--
1,3-Dichlorobenzene	300	<0.68	1.9 J	3.4 J	5.2 J	--	--	--
1,3-Dichloropropane	--	<0.99	<2.1	<6.0	<9.4	--	--	--
1,4-Dichlorobenzene	300	3.7 J	3.1 J	5.8 J	23.0 J	--	--	--
2,2-Dichloropropane	--	<0.66	<1.4	<7.9	<12.3	--	--	--
2-Butanone (MEK)	--	198	30.1 J	<87.8	<136	--	--	--
2-Chlorotoluene	--	<1.1	<2.3	<2.7	<4.2	--	--	--
2-Hexanone	--	<1.3	<2.7	<25.4	<39.5	--	--	--
4-Chlorotoluene	--	<0.94	<2.0	<4.4	<6.8	--	--	--
4-Methyl-2-pentanone (MIBK)	--	<1.1	<2.3	<7.3	<11.4	--	--	--
Acetone	--	1180	210	<35.2	<54.6	--	--	--
Benzene	--	0.57 J	<1.1	7.1 J	11.7 J	--	--	--
Bromobenzene	--	<0.83	<1.7	<1.9	<3.0	--	--	--
Bromochloromethane	--	<0.78	<1.6	<7.7	<12.0	--	--	--
Bromodichloromethane	--	<0.42	<0.87	<7.2	<11.2	--	--	--
Bromoform	--	<0.82	<1.7	<9.0	<14.0	--	--	--
Bromomethane	--	<1.1	<2.4	<25.8	<40.1	--	--	--
Carbon disulfide	--	7.4 J	2.8 J	<22.5	<35.0	--	--	--
Carbon tetrachloride	--	<0.64	<1.3	<6.4	<9.9	--	--	--
Chlorobenzene	--	<0.65	<1.4	3.3 J	4.3 J	--	--	--
Chloroethane	--	<1.0	<2.1	<7.0	<10.9	--	--	--
Chloroform	--	<0.69	<1.4	<5.4	<8.4	--	--	--
Chloromethane	--	<0.73	<1.5	11.5 J	23.1 J	--	--	--
cis-1,2-Dichloroethene	--	<0.74	<1.5	<4.6	<7.1	--	--	--
cis-1,3-Dichloropropene	--	<0.46	<0.97	<3.9	<6.0	--	--	--
Dibromochloromethane	--	<0.36	<0.75	<3.4	<5.3	--	--	--
Dibromomethane	--	<0.74	<1.5	<6.7	<10.4	--	--	--
Dichlorodifluoromethane	--	<1.5	<3.1	<9.3	<14.4	--	--	--
Ethylbenzene	--	9.8 J	3.5 J	5.5 J	9.1 J	--	--	--
Hexachloro-1,3-butadiene	600	<1.1	<2.2	<19.6	<30.4	--	--	--
Isopropylbenzene (Cumene)	--	<1.2	<2.6	3.4 J	6.2 J	--	--	--
m&p-Xylene	--	20.3 J	12.1 J	16.0 J	20.8 J	--	--	--
Methylene chloride	--	<9.4	<19.6	<5.7	<8.8	--	--	--
Methyl-tert-butyl ether	--	<0.89	<1.9	<2.7	<4.2	--	--	--
Naphthalene	561	<1.9	<4.1	22.5 J	36.2 J	--	--	--
n-Butylbenzene	--	<1.6	3.5 J	9.0 J	13.1 J	--	--	--
n-Propylbenzene	--	10.8	3.7 J	7.1 J	8.4 J	--	--	--
o-Xylene	--	8.7 J	3.6 J	5.5 J	<7.1	--	--	--
p-Isopropyltoluene	--	10.0 J	<2.9	13.5 J	44.8 J	--	--	--
sec-Butylbenzene	--	4.4 J	<3.1	5.1 J	6.9 J	--	--	--
Styrene	--	1.0 J	<2.1	3.7 J	5.4 J	--	--	--
tert-Butylbenzene	--	<1.2	<2.6	<1.4	<2.1	--	--	--
Tetrachloroethene	500	<1.4	<2.8	<8.9	<13.9	--	--	--
Toluene	--	9.4 J	3.0 J	69.0 J	98.8 J	--	--	--
trans-1,2-Dichloroethene	--	<1.1	<2.2	<3.9	<6.0	--	--	--
trans-1,3-Dichloropropene	--	<0.75	<1.6	<3.5	<5.4	--	--	--
Trichloroethene	2,100	<0.75	<1.6	<3.6	<5.6	--	--	--
Trichlorofluoromethane	--	<0.81	<1.7	<9.2	<14.3	--	--	--
Vinyl chloride	--	<0.99	<2.1	<5.3	<8.2	--	--	--
Xylene (Total)	--	29.0 J	15.6 J	21.4 J	26.8 J	--	--	--

- Notes:
1. µg/kg (ppb) = micrograms per kilogram (parts per billion)
 2. mg/kg (ppm) = milligrams per kilogram (parts per million)
 3. < = Not detected above the method reporting limit (MRL)
 4. JSCS = Screening levels from Portland Harbor Joint Source Control Strategy – Final (Table 3-1 Updated July 16, 2007). December 2005.
 5. -- = Not analyzed or not available.
 6. J = Estimated.

Table 2C - Inner Cove Area
Willamette Cove Upland Facility
Portland, Oregon

	Inner Cove Area - Groundwater		
Sample	JSCS SLV	TRENCH 2	TRENCH 4
Date Sampled		9/28/2010	9/29/2010
NWTPH-Dx (mg/L)			
Diesel Range SG	--	0.11	1.4
Motor Oil Range SG	--	0.29 J	1
Metals (EPA 6000/7000 Series Methods; ug/L)			
Antimony	6	1.1	0.88
Antimony, Dissolved	6	0.49 J	0.85
Arsenic	0.05	3.9	1.7
Arsenic, Dissolved	0.05	1.9	1.3
Beryllium	--	<0.069	<0.069
Beryllium, Dissolved	--	<0.069	<0.069
Cadmium	0.1	0.63	0.15
Cadmium, Dissolved	0.1	0.31	0.038 J
Chromium	100	4	1.0
Chromium, Dissolved	100	0.26 J	0.52
Copper	2.7	29	21.8
Copper, Dissolved	2.7	0.6	3.0
Lead	0.54	45.6	5.0
Lead, Dissolved	0.54	0.18	0.57
Nickel	--	10.1	1.8
Nickel, Dissolved	--	6.7	1.7
Selenium	5	<0.10	<0.10
Selenium, Dissolved	5	<0.10	<0.10
Silver	0.12	<0.071	<0.071
Silver, Dissolved	0.12	<0.071	<0.071
Thallium	--	<0.050	<0.050
Thallium, Dissolved	--	<0.050	<0.050
Zinc	36	119	12.3
Zinc, Dissolved	36	43	10.6
Mercury	0.77	<0.011	<0.011
Mercury, Dissolved	0.77	<0.011	<0.011
PAHs (EPA 8270 SIM; ug/L)			
1-Methylnaphthalene	--	0.0092 J	0.019
2-Methylnaphthalene	0.2	0.014 B	0.018 B
Acenaphthene	0.2	0.0053 J	0.32
Acenaphthylene	0.2	0.0055 J	0.055
Anthracene	0.2	0.0055 J	0.025
Benzo(a)anthracene	0.018	0.0091 J	0.012 J
Benzo(a)pyrene	0.018	0.013 J	0.0042 J
Benzo(b)fluoranthene	0.018	0.010 J	0.0061 J
Benzo(g,h,i)perylene	0.2	0.016	0.0035 J
Benzo(k)fluoranthene	0.018	0.0094 J	0.0030 J
Chrysene	0.018	0.012 J	0.031
Dibenz(a,h)anthracene	0.018	0.0043 J	0.0018 J
Fluoranthene	0.2	0.015	0.023
Fluorene	0.2	0.0065 J	0.33
Indeno(1,2,3-cd)pyrene	0.018	0.0096 J	0.0024 J
Naphthalene	0.2	0.023 B	0.065 B
Phenanthrene	0.2	0.016 B	0.51
Pyrene	0.2	0.017	0.036
PCBs (EPA Method 8082; ug/L)			
PCB-1016 (Aroclor 1016)	0.96	<0.010	<0.010
PCB-1221 (Aroclor 1221)	0.034	<0.010	<0.010
PCB-1232 (Aroclor 1232)	0.034	<0.010	<0.010
PCB-1242 (Aroclor 1242)	0.034	<0.010	<0.010
PCB-1248 (Aroclor 1248)	0.034	<0.010	<0.010
PCB-1254 (Aroclor 1254)	0.033	<0.010	1.3
PCB-1260 (Aroclor 1260)	0.034	<0.010	<0.010
PCB-1262 (Aroclor 1262)	--	<0.010	<0.010
PCB-1268 (Aroclor 1268)	--	<0.010	<0.010
Pesticides (EPA 8081; ug/L)			
alpha-BHC	0.0049	<0.00083	<0.00083
beta-BHC	0.017	<0.00083	<0.00083
delta-BHC	0.037	<0.00083	<0.00083
gamma-BHC (Lindane)	0.052	<0.00083	<0.00083
Heptachlor	0.000079	<0.00083	<0.00083
Aldrin	0.00005	<0.00083	<0.00083
Heptachlor Epoxide	0.000039	<0.00083	<0.026
Endosulfan I	0.056	<0.00083	<0.00083
Dieldrin	0.000054	<0.0017	<0.015
Endrin	0.036	<0.0017	<0.0017
Endosulfan II	0.056	<0.0017	<0.019
Endosulfan Sulfate	89	<0.0017	<0.0017
Methoxychlor	0.03	<0.0083	<0.0083
Endrin Ketone	--	<0.0017	<0.0017
Endrin Aldehyde	0.3	<0.0017	<0.0026
trans-Chlordane	--	<0.00083	<0.00083
cis-Chlordane	--	<0.00083	<0.00083
Toxaphene	0.0002	<0.083	<0.083
4,4'-DDE	0.00022	<0.00042	<0.020
4,4'-DDD	0.00031	<0.00042	<0.00042
4,4'-DDT	0.00022	<0.00042	<0.00042
2,4'-DDT	--	<0.00042	<0.0028
2,4'-DDE	--	<0.00042	<0.034
2,4'-DDD	--	<0.00042	<0.0094

	Inner Cove Area - Groundwater		
Sample	JSCS SLV	TRENCH 2	TRENCH 4
Date Sampled		9/28/201	9/29/2010
VOCs (EPA 8260B; ug/L)			
1,1,1,2-Tetrachloroethane	2.5	<0.15	<0.15
1,1,1-Trichloroethane	11	<0.20	<0.20
1,1,2,2-Tetrachloroethane	0.33	<0.22	<0.22
1,1,2-Trichloroethane	1.2	<0.19	<0.19
1,1-Dichloroethane	47	<0.23	<0.23
1,1-Dichloroethene	--	<0.12	<0.12
1,1-Dichloropropene	--	<0.094	<0.094
1,2,3-Trichlorobenzene	--	<0.11	<0.11
1,2,3-Trichloropropane	0.0095	<0.37	<0.37
1,2,4-Trichlorobenzene	8.2	<0.15	<0.15
1,2,4-Trimethylbenzene	--	<0.086	<0.086
1,2-Dibromo-3-chloropropane	--	<0.79	<0.79
1,2-Dichlorobenzene	49	<0.25	<0.25
1,2-Dichloroethane	0.73	<0.074	<0.074
1,2-Dichloropropane	0.97	<0.16	<0.16
1,3,5-Trimethylbenzene	--	<0.16	<0.16
1,3-Dichlorobenzene	14	<0.16	<0.16
1,3-Dichloropropane	--	<0.22	<0.22
1,4-Dichlorobenzene	2.8	<0.20	<0.20
2,2-Dichloropropane	--	<0.27	<0.27
2-Butanone (MEK)	7,100	<1.6	<1.6
2-Chlorotoluene	--	<0.098	<0.098
2-Hexanone	99	<0.57	<0.57
4-Chlorotoluene	--	<0.13	<0.13
4-Methyl-2-pentanone (MIBK)	170	<0.32	<0.32
Acetone	1,500	5.9 L1	3.8 J
Benzene	1.2	<0.12	<0.12
Bromobenzene	--	<0.16	<0.16
Bromochloromethane	--	<0.34	<0.34
Bromodichloromethane	1.1	<0.11	<0.11
Bromoform	8.5	<0.23	<0.23
Bromomethane	8.7	<0.072	<0.072
Carbon disulfide	0.92	<0.16	<0.16
Carbon tetrachloride	0.51	<0.25	<0.25
Chlorobenzene	50	<0.12	<0.12
Chloroethane	23	<0.27	<0.27
Chloroform	0.17	<0.15	<0.15
Chloromethane	2.1	<0.20	<0.20
cis-1,2-Dichloroethene	61	<0.32	<0.32
cis-1,3-Dichloropropene	0.055	<0.086	<0.086
Dibromochloromethane	0.79	<0.12	<0.12
Dibromomethane	61	<0.18	<0.18
Dichlorodifluoromethane	390	<0.19	<0.19
Ethylbenzene	7.3	<0.20	<0.20
Hexachloro-1,3-butadiene	0.86	<0.27	<0.27
Isopropylbenzene (Cumene)	660	<0.11	<0.11
m&p-Xylene	1.8	<0.27	<0.27
Methylene chloride	8.9	<0.26	<0.26
Methyl-tert-butyl ether	37	<0.16	<0.16
Naphthalene	0.2	<0.10	<0.10
n-Butylbenzene	--	<0.10	<0.10
n-Propylbenzene	660	<0.16	<0.16
o-Xylene	13	<0.15	<0.15
p-Isopropyltoluene	--	<0.074	<0.074
sec-Butylbenzene	--	<0.10	<0.10
Styrene	100	<0.074	<0.074
tert-Butylbenzene	--	<0.11	<0.11
Tetrachloroethene	0.12	<0.10	<0.10
Toluene	9.8	<0.21	<0.21
trans-1,2-Dichloroethene	100	<0.22	<0.22
trans-1,3-Dichloropropene	0.055	<0.16	<0.16
Trichloroethene	0.17	<0.060	<0.060
Trichlorofluoromethane	1,300	<0.24	<0.24
Vinyl chloride	0.015	<0.050	<0.050
Xylene (Total)	--	<0.42	<0.42

- Notes:
- µg/L (ppb) = micrograms per liter (parts per billion)
 - mg/L (ppm) = milligram per liter (parts per million)
 - < = Not detected above the method reporting limit (MRL)
 - JSCS = Screening levels from Portland Harbor Joint Source Control Strategy – Final (Table 3-1 Updated July 16, 2007). December 2005.
 - Shading denotes exceedence of JSCS SLV.
 - J = Estimated.
 - B = Analyte was detected in associated method blank above the reporting limit.
Sample concentrations were less than 5 times the concentration detected in the method blank.
 - L1 = Analyte recovery in the LCS was above QC limits. Results for this analyte in associated samples may be biased high.

Table 3 - Riverbank Soil Samples
Willamette Cove Upland Facility
Portland, Oregon

Riverbank Soil Samples								
PRIMARY SAMPLE	JSCS SLV	WC-SSM Composite	WC-SSN Composite	WC-SSO Composite	WC-SSO-1	WC-SSO-2	WC-SSO-3	WC-SSO-4
DISCRETE SAMPLES								
Date Sampled		9/30/2010	9/30/2010	9/30/2010	9/30/2010	9/30/2010	9/30/2010	9/30/2010
Sample Interval (inches)		0-6	0-6	0-6	0-6	0-6	0-6	0-6
TPH-HCID (mg/kg)								
Diesel Range	--	--	--	--	--	--	--	--
Gasoline Range	--	--	--	--	--	--	--	--
Motor Oil Range	--	--	--	--	--	--	--	--
NWTPH-Gx (mg/kg)								
Gasoline Range Organics	--	--	--	--	--	--	--	--
NWTPH-Dx Silica Gel Cleanup (mg/kg)								
Diesel Range	--	--	--	--	--	--	--	--
Motor Oil Range	--	--	--	--	--	--	--	--
Metals (EPA 6000/7000 Series Methods; mg/kg)								
Antimony	64	--	<0.23	1.3	0.78	0.36 J	1	0.88
Arsenic	7	--	3.3	6.1	4.8	5.5	5.2	3.7
Beryllium	--	--	0.29	0.37	0.34	0.39	0.31	0.35
Cadmium	1	--	0.12	1	0.48	0.5	0.75	0.45
Chromium	111	--	16.4	21.9	17.2	14.4	14.8	22.4
Copper	149	--	17.5	51.9	37.1	87.5	37.4	28.3
Lead	17	--	11.6	126	193 B	111 B	66.8 B	76 B
Nickel	49	--	19.9	28.1	25.6	19.7	27.7	27.4
Selenium	2	--	0.9	1.3	<0.13	<0.12	0.15 J,B	<0.12
Silver	5	--	0.36 J,B	0.15 J,B	0.29 J,B	0.21 J,B	0.21 J,B	0.20 J,B
Thallium	--	--	0.052 J	0.064 J	0.069 J	0.058 J	0.059 J	0.049 J
Zinc	459	--	74.7	377	264	222	440	341
Mercury	0.07	--	0.019 J	0.21	0.21 H1	1.1 H1	0.059 J,H1	0.058 J,H1
PAHs (EPA 8270 SIM; ug/kg)								
1-Methylnaphthalene	--	<0.92	<0.93	10.8	--	--	--	--
2-Methylnaphthalene	200	<1.9	<1.9	26.3	--	--	--	--
Acenaphthene	300	<1.6	<1.6	4.2 J	--	--	--	--
Acenaphthylene	200	2.0 J	1.1 J	16.6	--	--	--	--
Anthracene	845	4.0 J	0.90 J	9.9	--	--	--	--
Benzo(a)anthracene	1,050	15.9	3.2 J	38.4	--	--	--	--
Benzo(a)pyrene	1,450	16.4	5.2 J	61.9	--	--	--	--
Benzo(b)fluoranthene	--	14.2	5.2 J	54.6	--	--	--	--
Benzo(g,h,i)perylene	300	7.4	5.6 J	44.1	--	--	--	--
Benzo(k)fluoranthene	13,000	11	3.1 J	42.1	--	--	--	--
Chrysene	1,290	15.1	4.7 J	56	--	--	--	--
Dibenz(a,h)anthracene	1,300	3.0 J	0.91 J	12.1	--	--	--	--
Fluoranthene	2,230	25.5	4.6 J	84.6	--	--	--	--
Fluorene	536	<1.9	<1.9	5.9 J	--	--	--	--
Indeno(1,2,3-cd)pyrene	100	6.6 J	3.5 J	34.8	--	--	--	--
Naphthalene	561	3.0 J	3.1 J	83.9	--	--	--	--
Phenanthrene	1,170	9.4	<3.3	62.4	--	--	--	--
Pyrene	1,520	25.5	5.4 J	94.8	--	--	--	--
PCBs (EPA Method 8082; ug/kg)								
PCB-1016 (Aroclor 1016)	530	--	--	--	--	--	--	--
PCB-1221 (Aroclor 1221)	--	--	--	--	--	--	--	--
PCB-1232 (Aroclor 1232)	--	--	--	--	--	--	--	--
PCB-1242 (Aroclor 1242)	--	--	--	--	--	--	--	--
PCB-1248 (Aroclor 1248)	1,500	--	--	--	--	--	--	--
PCB-1254 (Aroclor 1254)	300	--	--	--	--	--	--	--
PCB-1260 (Aroclor 1260)	200	--	--	--	--	--	--	--
PCB-1262 (Aroclor 1262)	--	--	--	--	--	--	--	--
PCB-1268 (Aroclor 1268)	--	--	--	--	--	--	--	--
Pesticides (EPA 8081; ug/kg)								
alpha-BHC	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--
gamma-BHC (Lindane)	4.99	--	--	--	--	--	--	--
Heptachlor	10	--	--	--	--	--	--	--
Aldrin	40	--	--	--	--	--	--	--
Heptachlor Epoxide	16	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--
Dieldrin	0.0081	--	--	--	--	--	--	--
Endrin	207	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--
Endosulfan Sulfate	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--
Endrin Ketone	--	--	--	--	--	--	--	--
Endrin Aldehyde	--	--	--	--	--	--	--	--
trans-Chlordane	--	--	--	--	--	--	--	--
cis-Chlordane	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--
4,4'-DDE	0.33	--	--	--	--	--	--	--
4,4'-DDD	0.33	--	--	--	--	--	--	--
4,4'-DDT	0.33	--	--	--	--	--	--	--
2,4'-DDT	--	--	--	--	--	--	--	--
2,4'-DDE	--	--	--	--	--	--	--	--
2,4'-DDD	--	--	--	--	--	--	--	--
Dioxins/Furans (EPA 8290; ng/kg)								
2,3,7,8-TCDF	0.77	--	--	--	--	--	--	--
2,3,7,8-TCDD	0.0091	--	--	--	--	--	--	--
1,2,3,7,8-PeCDF	2.6	--	--	--	--	--	--	--
2,3,4,7,8-PeCDF	--	--	--	--	--	--	--	--
1,2,3,7,8-PeCDD	2.6	--	--	--	--	--	--	--
1,2,3,4,7,8-HxCDF	2.7	--	--	--	--	--	--	--
1,2,3,6,7,8-HxCDF	2.7	--	--	--	--	--	--	--
2,3,4,6,7,8-HxCDF	2.7	--	--	--	--	--	--	--
1,2,3,7,8,9-HxCDF	2.7	--	--	--	--	--	--	--
1,2,3,4,7,8-HxCDD	--	--	--	--	--	--	--	--
1,2,3,6,7,8-HxCDD	--	--	--	--	--	--	--	--
1,2,3,7,8,9-HxCDD	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-HpCDF	690	--	--	--	--	--	--	--
1,2,3,4,7,8,9-HpCDF	690	--	--	--	--	--	--	--
1,2,3,4,6,7,8-HpCDD	690	--	--	--	--	--	--	--
OCDF	23,000	--	--	--	--	--	--	--
OCDD	23,000	--	--	--	--	--	--	--
Total TCDF	--	--	--	--	--	--	--	--
Total TCDD	--	--	--	--	--	--	--	--
Total PeCDF	--	--	--	--	--	--	--	--
Total PeCDD	--	--	--	--	--	--	--	--
Total HxCDF	--	--	--	--	--	--	--	--
Total HxCDD	--	--	--	--	--	--	--	--
Total HpCDF	--	--	--	--	--	--	--	--
Total HpCDD	--	--	--	--	--	--	--	--
TEQ	--	--	--	--	--	--	--	--
Butyl Tins (Krones Method; ug/kg)								
Tributyltin	2.3	--	--	--	--	--	--	--
Dibutyltin	--	--	--	--	--	--	--	--
Butyltin	--	--	--	--	--	--	--	--

Please see notes on last page.

Table 3 - Riverbank Soil Samples
Willamette Cove Upland Facility
Portland, Oregon

Riverbank Soil Samples									
PRIMARY SAMPLE	JSCS SLV	WC-SSP (Comp)-1	WC-SSP (Comp)-2		WC-SSP (Comp)-2		WC-SSQ(Composite)	WC-SSR(Composite)	
DISCRETE SAMPLES			WC-SSP-1-1	WC-SSP-3-1		WC-SSP-1-2	WC-SSP-3-2		
Date Sampled		10/4/2010	10/4/2010	10/4/2010	10/4/2010	10/4/2010	10/4/2010	10/1/2010	10/1/2010
Sample Interval (inches)		0-6	0-6	0-6	24-30	24-30	24-30	0-6	0-6
TPH-HCID (mg/kg)									
Diesel Range	--	--	--	--	--	--	--	--	--
Gasoline Range	--	--	--	--	--	--	--	--	--
Motor Oil Range	--	--	--	--	--	--	--	--	--
NWTPH-Gx (mg/kg)									
Gasoline Range Organics	--	--	--	--	--	--	--	--	--
NWTPH-Dx Silica Gel Cleanup (mg/kg)									
Diesel Range	--	--	--	--	--	--	--	--	--
Motor Oil Range	--	--	--	--	--	--	--	--	--
Metals (EPA 6000/7000 Series Methods; mg)									
Antimony	64	0.21 J	0.81	<0.25	<0.23	3	<0.22	<0.18	<0.21
Arsenic	7	4.8	7.9	2.9	5.2	10.1	5.6	3.3	4.4
Beryllium	--	0.31	0.3	0.28	0.3	0.32	0.41	0.3	0.36
Cadmium	1	0.75	<0.017	<0.020	<0.018	0.97	0.057 J	0.15	0.065 J
Chromium	111	15.9	13.4	14.2	13.7	18.7	18.1	13.7	19.8
Copper	149	2,860	5,440 B	28.2 B	1,030	2,420	27.2	27.2	22.2
Lead	17	262	436	15.7	175	386	23.8	13.8	18.3
Nickel	49	16.4 B	19.2	18	17.3	20.4	20.8	14.2 B	19.6 B
Selenium	2	0.87	<0.10	<0.12	<0.11	1.5	1.7	1	1
Silver	5	0.51 B	0.54 B	0.22 J,B	0.28 J,B	0.48 J,B	0.076 J,B	0.28 J,B	0.083 J,B
Thallium	--	0.28	0.77	0.052 J	0.2	0.41	0.050 J	0.062 J	0.045 J
Zinc	459	538	1,030	53.4	298	680	59.7	69	66.1
Mercury	0.07	3.5	9.8 B	0.15 H1	1.9 H1	3.4 H1	0.077 H1	0.11	0.033 J
PAHs (EPA 8270 SIM; ug/kg)									
1-Methylnaphthalene	--	30.7	60.1	<1.8	33.2	83.8 J	<0.95	<0.90	<0.93
2-Methylnaphthalene	200	69.5	132	<3.8	58.3	175	<2.0	2.5 J	<1.9
Acenaphthene	300	21.1	25.8	<3.2	41.5	110	<1.7	<1.6	<1.6
Acenaphthylene	200	699	1,180	1.7 J	1,080	2,970	1.2 J	6.8	1.7 J
Anthracene	845	371	826	2.3 J	1,290	2,420	1.7 J	17.6	2.3 J
Benzo(a)anthracene	1,050	1,580	3,790	7.6 J	2,500	5,410	4.6 J	105	13.8
Benzo(a)pyrene	1,450	4,060	11,200	11.2 J	6,890	12,900	5.9 J	98.1	20.1
Benzo(b)fluoranthene	--	3,140	9330	7.8 J	5740	9640	4.5 J	70.3	17.6
Benzo(g,h,i)perylene	300	2,620	4,260	9.9 J	2,480	5,520	6.5 J	35.6	13.1
Benzo(k)fluoranthene	13,000	3,390	10500	9.6 J	5830	10000	4.3 J	65.3	13.7
Chrysene	1,290	1,810	5,320	9.1 J	3,370	7,590	4.1 J	89.7	16.4
Dibenz(a,h)anthracene	1,300	621	2,020	2.1 J	1,280	2,810	0.81 J	15.5	3.3 J
Fluoranthene	2,230	1,960	3,930	11.1 J	4,470	8,340	7.3	163	18.3
Fluorene	536	47.9	177	<3.7	174	370	<1.9	2.5 J	<1.9
Indeno(1,2,3-cd)pyrene	100	2,100	3,960	6.5 J	2,410	5,230	3.5 J	33.1	10.6
Naphthalene	561	214	468	<3.7	167	506	<1.9	4.0 J	2.0 J
Phenanthrene	1,170	560	712	<6.4	2,330	4,030	3.9 J	28	6.8 J
Pyrene	1,520	1,880	4490	14.2	4,290	7,270	8.2	162	21.9
PCBs (EPA Method 8082; ug/kg)									
PCB-1016 (Aroclor 1016)	530	--	--	--	--	--	--	<4.2	<4.3
PCB-1221 (Aroclor 1221)	--	--	--	--	--	--	--	<8.4	<8.6
PCB-1232 (Aroclor 1232)	--	--	--	--	--	--	--	<8.4	<8.6
PCB-1242 (Aroclor 1242)	--	--	--	--	--	--	--	<6.3	<6.5
PCB-1248 (Aroclor 1248)	1,500	--	--	--	--	--	--	<6.3	<6.5
PCB-1254 (Aroclor 1254)	300	--	--	--	--	--	--	<5.2	<5.4
PCB-1260 (Aroclor 1260)	200	--	--	--	--	--	--	<9.4	<9.7
PCB-1262 (Aroclor 1262)	--	--	--	--	--	--	--	<4.2	<4.3
PCB-1268 (Aroclor 1268)	--	--	--	--	--	--	--	<4.2	<4.3
Pesticides (EPA 8081; ug/kg)									
alpha-BHC	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--
gamma-BHC (Lindane)	4.99	--	--	--	--	--	--	--	--
Heptachlor	10	--	--	--	--	--	--	--	--
Aldrin	40	--	--	--	--	--	--	--	--
Heptachlor Epoxide	16	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--
Dieldrin	0.0081	--	--	--	--	--	--	--	--
Endrin	207	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--
Endosulfan Sulfate	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--
Endrin Ketone	--	--	--	--	--	--	--	--	--
Endrin Aldehyde	--	--	--	--	--	--	--	--	--
trans-Chlordane	--	--	--	--	--	--	--	--	--
cis-Chlordane	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--
4,4'-DDE	0.33	--	--	--	--	--	--	--	--
4,4'-DDD	0.33	--	--	--	--	--	--	--	--
4,4'-DDT	0.33	--	--	--	--	--	--	--	--
2,4'-DDT	--	--	--	--	--	--	--	--	--
2,4'-DDE	--	--	--	--	--	--	--	--	--
2,4'-DDD	--	--	--	--	--	--	--	--	--
Dioxins/Furans (EPA 8290; ng/kg)									
2,3,7,8-TCDF	0.77	--	--	--	--	--	--	--	--
2,3,7,8-TCDD	0.0091	--	--	--	--	--	--	--	--
1,2,3,7,8-PeCDF	2.6	--	--	--	--	--	--	--	--
2,3,4,7,8-PeCDF	--	--	--	--	--	--	--	--	--
1,2,3,7,8-PeCDD	2.6	--	--	--	--	--	--	--	--
1,2,3,4,7,8-HxCDF	2.7	--	--	--	--	--	--	--	--
1,2,3,6,7,8-HxCDF	2.7	--	--	--	--	--	--	--	--
2,3,4,6,7,8-HxCDF	2.7	--	--	--	--	--	--	--	--
1,2,3,7,8,9-HxCDF	2.7	--	--	--	--	--	--	--	--
1,2,3,4,7,8-HxCDD	--	--	--	--	--	--	--	--	--
1,2,3,6,7,8-HxCDD	--	--	--	--	--	--	--	--	--
1,2,3,7,8,9-HxCDD	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-HpCDF	690	--	--	--	--	--	--	--	--
1,2,3,4,7,8,9-HpCDF	690	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-HpCDD	690	--	--	--	--	--	--	--	--
OCDF	23,000	--	--	--	--	--	--	--	--
OCDD	23,000	--	--	--	--	--	--	--	--
Total TCDF	--	--	--	--	--	--	--	--	--
Total TCDD	--	--	--	--	--	--	--	--	--
Total PeCDF	--	--	--	--	--	--	--	--	--
Total PeCDD	--	--	--	--	--	--	--	--	--
Total HxCDF	--	--	--	--	--	--	--	--	--
Total HxCDD	--	--	--	--	--	--	--	--	--
Total HpCDF	--	--	--	--	--	--	--	--	--
Total HpCDD	--	--	--	--	--	--	--	--	--
TEQ	--	--	--	--	--	--	--	--	--
Butyl Tins (Krones Method; ug/kg)									
Tributyltin	2.3	<3.6	--	--	--	--	--	<3.1	<3.2
Dibutyltin	--	<5.4	--	--	--	--	--	<4.6	<4.8
Butyltin	--	<3.8	--	--	--	--	--	<3.3	<3.4

Please see notes on last page.

Table 3 - Riverbank Soil Samples
Willamette Cove Upland Facility
Portland, Oregon

		Riverbank Soil Samples										
PRIMARY SAMPLE	JSCS SLV	WC-SSS(Composite)					WC-SST(Comp)-1			WC-SST-(Comp)-2		
DISCRETE SAMPLES			WC-SSS-1a	WC-SSS-1b	WC-SSS-2a	WC-SSS-2b		WC-SST-1-1	WC-SST-2-1		WC-SST-1-2	WC-SST-2-2
Date Sampled		10/1/2010	10/1/2010	10/1/2010	10/1/2010	10/1/2010	10/4/2010	10/4/2010	10/4/2010	10/4/2010	10/4/2010	10/4/2010
Sample Interval (inches)		0-6	0-6	0-6	0-6	0-6	0-6	0-6	0-6	18-24	18-24	18-24
TPH-HCID (mg/kg)												
Diesel Range	--	--	--	--	--	--	--	--	--	--	--	--
Gasoline Range	--	--	--	--	--	--	--	--	--	--	--	--
Motor Oil Range	--	--	--	--	--	--	--	--	--	--	--	--
NWTPH-Gx (mg/kg)												
Gasoline Range Organics	--	--	--	--	--	--	--	--	--	--	--	--
NWTPH-Dx Silica Gel Cleanup (mg/kg)												
Diesel Range	--	--	--	--	--	--	--	--	--	--	--	--
Motor Oil Range	--	--	--	--	--	--	--	--	--	--	--	--
Metals (EPA 6000/7000 Series Methods; mg)												
Antimony	64	3.1	0.42 J	8.4	1.1	2.5	0.26 J	0.44 J	<0.29	0.39 J	0.31 J,M6	0.27 J
Arsenic	7	12.1	4.3	15.9	3.9	21.3	5.6	3.3	5	4.7	5.4	5.7
Beryllium	--	0.34	0.27	0.28	0.3	0.25	0.5	0.28	0.55	0.34	0.47	0.41
Cadmium	1	0.76	0.43	0.19	0.088	0.83	0.18	0.075 J	<0.024	0.49	0.38	0.87
Chromium	111	25.5	12.6	20.2	14.4	35.7	29.5	13.4	26.7	16.3	25.2 M6	17.2
Copper	149	116	57.7 B	140 B	33.6 B	417 B	89.9	98.7 B	75.2 B	58.6 B	71.4 M6	36.7
Lead	17	733	203	388	111	4,040	119	186	52.2	1,430	84.7 M6	1,800
Nickel	49	28.4 B	22.2	25.5	21.8	39.9	26.3 B	23.2	28.6	69.5	24.7 M6	57.5
Selenium	2	0.89	<0.11	<0.10	<0.11	0.096 J	1.5	<0.12	<0.14	<0.13	1.7	1.5
Silver	5	0.12 J,B	0.20 J,B	0.18 J,B	0.16 J,B	0.66 B	0.33 J,B	0.55 B	0.43 J,B	0.28 J,B	0.19 J,B	0.074 J,B
Thallium	--	0.044 J	0.039 J	0.044 J	0.047 J	0.048 J	0.083 J	0.063 J	0.11 J	0.067 J	0.12	0.074 J
Zinc	459	876	234	653	148	1,460	117	138	119	472	166 M6	788
Mercury	0.07	2.4	2.7 H1	2.9 H1	0.24 H1	4.8 H1	1.1	0.62 H1	1.2 H1	1.3 H1	0.76 H1	0.66 H1
PAHs (EPA 8270 SIM; ug/kg)												
1-Methylnaphthalene	--	10.5	--	--	--	--	12.4	1.6 J	8.9 J	4.4 J	--	--
2-Methylnaphthalene	200	22	--	--	--	--	19	3.2 J	18.4	7.4 J	--	--
Acenaphthene	300	6.7 J	--	--	--	--	22.1	2.1 J	11.5 J	<3.5	--	--
Acenaphthylene	200	18.9	--	--	--	--	104	20	31.1	8.3 J	--	--
Anthracene	845	21.6	--	--	--	--	183	34.2	50.9	9.5 J	--	--
Benzo(a)anthracene	1,050	93	--	--	--	--	1030	139	93.1	53	--	--
Benzo(a)pyrene	1,450	137	--	--	--	--	1030	164	144	106	--	--
Benzo(b)fluoranthene	--	176	--	--	--	--	719	98.4	109	87.7	--	--
Benzo(g,h,i)perylene	300	79.7	--	--	--	--	434	97.7	111	96.9	--	--
Benzo(k)fluoranthene	13,000	108	--	--	--	--	642	139	103	71.3	--	--
Chrysene	1,290	143	--	--	--	--	926	154	118	70.6	--	--
Dibenz(a,h)anthracene	1,300	23.5	--	--	--	--	186	32.6	26.8	30.1	--	--
Fluoranthene	2,230	164	--	--	--	--	1220	305	185	68.8	--	--
Fluorene	536	6.5 J	--	--	--	--	31	5.2 J	15.3 J	<4.0	--	--
Indeno(1,2,3-cd)pyrene	100	69.5	--	--	--	--	401	79	85.8	74.2	--	--
Naphthalene	561	35.7	--	--	--	--	35.2	8.8	40.3	17.7	--	--
Phenanthrene	1,170	86.9	--	--	--	--	392	114	121	37.3	--	--
Pyrene	1,520	179	--	--	--	--	1270	348	209	77.2	--	--
PCBs (EPA Method 8082; ug/kg)												
PCB-1016 (Aroclor 1016)	530	<4.3	--	--	--	--	<4.7	--	--	--	--	--
PCB-1221 (Aroclor 1221)	--	<8.6	--	--	--	--	<9.4	--	--	--	--	--
PCB-1232 (Aroclor 1232)	--	<8.6	--	--	--	--	<9.4	--	--	--	--	--
PCB-1242 (Aroclor 1242)	--	<6.4	--	--	--	--	<7.0	--	--	--	--	--
PCB-1248 (Aroclor 1248)	1,500	<6.4	--	--	--	--	<7.0	--	--	--	--	--
PCB-1254 (Aroclor 1254)	300	<5.4	--	--	--	--	<5.8	--	--	--	--	--
PCB-1260 (Aroclor 1260)	200	<9.7	--	--	--	--	<10.5	--	--	--	--	--
PCB-1262 (Aroclor 1262)	--	<4.3	--	--	--	--	<4.7	--	--	--	--	--
PCB-1268 (Aroclor 1268)	--	<4.3	--	--	--	--	<4.7	--	--	--	--	--
Pesticides (EPA 8081; ug/kg)												
alpha-BHC	--	--	--	--	--	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--	--	--	--	--	--
gamma-BHC (Lindane)	4.99	--	--	--	--	--	--	--	--	--	--	--
Heptachlor	10	--	--	--	--	--	--	--	--	--	--	--
Aldrin	40	--	--	--	--	--	--	--	--	--	--	--
Heptachlor Epoxide	16	--	--	--	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--	--	--	--	--
Dieldrin	0.0081	--	--	--	--	--	--	--	--	--	--	--
Endrin	207	--	--	--	--	--	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--	--	--	--	--	--
Endosulfan Sulfate	--	--	--	--	--	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--	--	--	--	--	--
Endrin Ketone	--	--	--	--	--	--	--	--	--	--	--	--
Endrin Aldehyde	--	--	--	--	--	--	--	--	--	--	--	--
trans-Chlordane	--	--	--	--	--	--	--	--	--	--	--	--
cis-Chlordane	--	--	--	--	--	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDE	0.33	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDD	0.33	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDT	0.33	--	--	--	--	--	--	--	--	--	--	--
2,4'-DDT	--	--	--	--	--	--	--	--	--	--	--	--
2,4'-DDE	--	--	--	--	--	--	--	--	--	--	--	--
2,4'-DDD	--	--	--	--	--	--	--	--	--	--	--	--
Dioxins/Furans (EPA 8290; ng/kg)												
2,3,7,8-TCDF	0.77	--	--	--	--	--	--	--	--	--	--	--
2,3,7,8-TCDD	0.0091	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8-PeCDF	2.6	--	--	--	--	--	--	--	--	--	--	--
2,3,4,7,8-PeCDF	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8-PeCDD	2.6	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8-HxCDF	2.7	--	--	--	--	--	--	--	--	--	--	--
1,2,3,6,7,8-HxCDF	2.7	--	--	--	--	--	--	--	--	--	--	--
2,3,4,6,7,8-HxCDF	2.7	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8,9-HxCDF	2.7	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8-HxCDD	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,6,7,8-HxCDD	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8,9-HxCDD	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-HpCDF	690	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8,9-HpCDF	690	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-HpCDD	690	--	--	--	--	--	--	--	--	--	--	--
OCDF	23,000	--	--	--	--	--	--	--	--	--	--	--
OCDD	23,000	--	--	--	--	--	--	--	--	--	--	--
Total TCDF	--	--	--	--	--	--	--	--	--	--	--	--
Total TCDD	--	--	--	--	--	--	--	--	--	--	--	--
Total PeCDF	--	--	--	--	--	--	--	--	--	--	--	--
Total PeCDD	--	--	--	--	--	--	--	--	--	--	--	--
Total HxCDF	--	--	--	--	--	--	--	--	--	--	--	--
Total HxCDD	--	--	--	--	--	--	--	--	--	--	--	--
Total HpCDF	--	--	--	--	--	--	--	--	--	--	--	--
Total HpCDD	--	--	--	--	--	--	--	--	--	--	--	--
TEQ	--	--	--	--	--	--	--	--	--	--	--	--
Butyl Tins (Krones Method; ug/kg)												
Tributyltin	2.3	<3.1	--	--	--	--	<3.6	--	--	--	--	--
Dibutyltin	--	<4.7	--	--	--	--	<5.4	--	--	--	--	--
Butyltin	--	<3.3	--	--	--	--	<3.8	--	--	--	--	--

Please see notes on last page.

Table 3 - Riverbank Soil Samples
Willamette Cove Upland Facility
Portland, Oregon

		Riverbank Soil Samples					
PRIMARY SAMPLE	JSCS SLV	WC-SSU(Composite)			WC-SSW(Composite)	WC-SSX(Composite)	WC-SSY(Composite)
DISCRETE SAMPLES			WC-SSV-1-1	WC-SSV-2-2			
Date Sampled		10/1/2010	10/4/2010	10/4/2010	10/4/2010	10/4/2010	10/4/2010
Sample Interval (inches)		0-6	0-6	18-24	0-6	0-6	0-6
TPH-HCID (mg/kg)							
Diesel Range	--	--	--	--	--	--	--
Gasoline Range	--	--	--	--	--	--	--
Motor Oil Range	--	--	--	--	--	--	--
NWTPH-Gx (mg/kg)							
Gasoline Range Organics	--	--	--	--	--	--	--
NWTPH-Dx Silica Gel Cleanup (mg/kg)							
Diesel Range	--	--	--	--	--	--	--
Motor Oil Range	--	--	--	--	--	--	--
Metals (EPA 6000/7000 Series Methods; mg)							
Antimony	64	--	29.9	11.3	--	--	--
Arsenic	7	--	7.5	30.9	--	--	--
Beryllium	--	--	0.45	0.36	--	--	--
Cadmium	1	--	1.9	<0.028	--	--	--
Chromium	111	--	25.4	36.5	--	--	--
Copper	149	--	3,360	693 B	--	--	--
Lead	17	--	677	833	--	--	--
Nickel	49	--	39.3 B	144	--	--	--
Selenium	2	--	1.8	1.2	--	--	--
Silver	5	--	2.8 B	1.7 B	--	--	--
Thallium	--	--	0.15	0.49	--	--	--
Zinc	459	--	412	838	--	--	--
Mercury	0.07	--	0.6	1.4 B	--	--	--
PAHs (EPA 8270 SIM; ug/kg)							
1-Methylnaphthalene	--	1.5 J	--	--	--	<5.0 H2	--
2-Methylnaphthalene	200	1.9 J	--	--	--	<5.0 H2	--
Acenaphthene	300	<1.6	--	--	--	<5.0 H2	--
Acenaphthylene	200	1.4 J	--	--	--	<0.88 H2	--
Anthracene	845	2.9 J	--	--	--	<5.0 H2	--
Benzo(a)anthracene	1,050	13.8	--	--	--	<5.0 H2	--
Benzo(a)pyrene	1,450	21.1	--	--	--	<5.0 H2	--
Benzo(b)fluoranthene	--	20.8	--	--	--	<0.76 H2	--
Benzo(g,h,i)perylene	300	14.5	--	--	--	<5.0 H2	--
Benzo(k)fluoranthene	13,000	17.2	--	--	--	<5.0 H2	--
Chrysene	1,290	18.5	--	--	--	<5.0 H2	--
Dibenz(a,h)anthracene	1,300	5.3 J	--	--	--	<5.0 H2	--
Fluoranthene	2,230	21.3	--	--	--	<5.0 H2	--
Fluorene	536	<1.9	--	--	--	<5.0 H2	--
Indeno(1,2,3-cd)pyrene	100	12.5	--	--	--	<5.0 H2	--
Naphthalene	561	3.5 J	--	--	--	<5.0 H2	--
Phenanthrene	1,170	11.8	--	--	--	<5.0 H2	--
Pyrene	1,520	23.1	--	--	--	<5.0 H2	--
PCBs (EPA Method 8082; ug/kg)							
PCB-1016 (Aroclor 1016)	530	<4.3	<4.9	--	<4.3	<4.0	<5.5
PCB-1221 (Aroclor 1221)	--	<8.6	<9.7	--	<8.5	<8.1	<11.0
PCB-1232 (Aroclor 1232)	--	<8.6	<9.7	--	<8.5	<8.1	<11.0
PCB-1242 (Aroclor 1242)	--	<6.4	<7.3	--	<6.4	<6.1	<8.2
PCB-1248 (Aroclor 1248)	1,500	<6.4	<7.3	--	<6.4	<6.1	<8.2
PCB-1254 (Aroclor 1254)	300	<5.4	<6.1	--	<5.3	<5.0	<6.8
PCB-1260 (Aroclor 1260)	200	<9.6	<10.9	--	<9.6	<9.1	<12.3
PCB-1262 (Aroclor 1262)	--	<4.3	<4.9	--	<4.3	<4.0	<5.5
PCB-1268 (Aroclor 1268)	--	<4.3	<4.9	--	<4.3	<4.0	<5.5
Pesticides (EPA 8081; ug/kg)							
alpha-BHC	--	--	--	--	--	--	--
beta-BHC	--	--	--	--	--	--	--
delta-BHC	--	--	--	--	--	--	--
gamma-BHC (Lindane)	4.99	--	--	--	--	--	--
Heptachlor	10	--	--	--	--	--	--
Aldrin	40	--	--	--	--	--	--
Heptachlor Epoxide	16	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--
Dieldrin	0.0081	--	--	--	--	--	--
Endrin	207	--	--	--	--	--	--
Endosulfan II	--	--	--	--	--	--	--
Endosulfan Sulfate	--	--	--	--	--	--	--
Methoxychlor	--	--	--	--	--	--	--
Endrin Ketone	--	--	--	--	--	--	--
Endrin Aldehyde	--	--	--	--	--	--	--
trans-Chlordane	--	--	--	--	--	--	--
cis-Chlordane	--	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--	--
4,4'-DDE	0.33	--	--	--	--	--	--
4,4'-DDD	0.33	--	--	--	--	--	--
4,4'-DDT	0.33	--	--	--	--	--	--
2,4'-DDT	--	--	--	--	--	--	--
2,4'-DDE	--	--	--	--	--	--	--
2,4'-DDD	--	--	--	--	--	--	--
Dioxins/Furans (EPA 8290; ng/kg)							
2,3,7,8-TCDF	0.77	--	--	--	--	--	--
2,3,7,8-TCDD	0.0091	--	--	--	--	--	--
1,2,3,7,8-PeCDF	2.6	--	--	--	--	--	--
2,3,4,7,8-PeCDF	--	--	--	--	--	--	--
1,2,3,7,8-PeCDD	2.6	--	--	--	--	--	--
1,2,3,4,7,8-HxCDF	2.7	--	--	--	--	--	--
1,2,3,6,7,8-HxCDF	2.7	--	--	--	--	--	--
2,3,4,6,7,8-HxCDF	2.7	--	--	--	--	--	--
1,2,3,7,8,9-HxCDF	2.7	--	--	--	--	--	--
1,2,3,4,7,8-HxCDD	--	--	--	--	--	--	--
1,2,3,6,7,8-HxCDD	--	--	--	--	--	--	--
1,2,3,7,8,9-HxCDD	--	--	--	--	--	--	--
1,2,3,4,6,7,8-HpCDF	690	--	--	--	--	--	--
1,2,3,4,7,8,9-HpCDF	690	--	--	--	--	--	--
1,2,3,4,6,7,8-HpCDD	690	--	--	--	--	--	--
OCDF	23,000	--	--	--	--	--	--
OCDD	23,000	--	--	--	--	--	--
Total TCDF	--	--	--	--	--	--	--
Total TCDD	--	--	--	--	--	--	--
Total PeCDF	--	--	--	--	--	--	--
Total PeCDD	--	--	--	--	--	--	--
Total HxCDF	--	--	--	--	--	--	--
Total HxCDD	--	--	--	--	--	--	--
Total HpCDF	--	--	--	--	--	--	--
Total HpCDD	--	--	--	--	--	--	--
TEQ	--	--	--	--	--	--	--
Butyl Tins (Krones Method; ug/kg)							
Tributyltin	2.3	<3.1	--	--	--	--	--
Dibutyltin	--	<4.6	--	--	--	--	--
Butyltin	--	<3.2	--	--	--	--	--

- Notes:
1. µg/kg (ppb) = micrograms per kilogram (parts per billion)

2. mg/kg (ppm) = milligrams per kilogram (parts per million)

3. < = Not detected above the method reporting limit (MRL)

4. JSCS = Screening levels from Portland Harbor Joint Source Control Strategy – Final (Table 3-1 Updated July 16, 2007). December 2005.

5. B = Analyte was detected in associated method blank above the reporting limit. Sample concentrations were less than 5 times the concentration detected in the method blank.

6. H1 = Analysis conducted outside of the EPA method holding range.

7. H2 = Extraction or preparation was conducted outside of the recognized method holding time.

8. Shading denotes exceedence of JSCS SLV.

9. J = Estimated.

Table 4 - Railroad Embankment Soil Samples
Willamette Cove Upland Facility
Portland, Oregon

Railroad Embankment Soil Samples											
PRIMARY SAMPLE	JSCS SLV	WC-SSL-1 Composite	WC-SSL-1 Composite (Dilution)	WC-SSL-1-1	WC-SSL-1-1 (Dilution 1)	WC-SSL-1-1 (Dilution 2)	WC-SSL-1-2	WC-SSL-1-2 (Dilution)	WC-SSL-1-3	WC-SSL-1-3 (Dilution)	WC-SSL-1-4
DISCRETE SAMPLES											
Date Sampled		9/28/2010	9/28/2010	9/28/2010	9/28/2010	9/28/2010	9/28/2010		9/28/2010		9/28/2010
Sample Interval (inches)		0-6	0-6	0-6	0-6	0-6	0-6		0-6		0-6
TPH-HCID (mg/kg)											
Diesel Range	--	--	--	--	--	--	--	--	--	--	--
Gasoline Range	--	--	--	--	--	--	--	--	--	--	--
Motor Oil Range	--	--	--	--	--	--	--	--	--	--	--
NWTPH-Gx (mg/kg)											
Gasoline Range Organics	--	--	--	--	--	--	--	--	--	--	--
NWTPH-Dx Silica Gel Cleanup (mg/kg)											
Diesel Range	--	--	--	--	--	--	--	--	--	--	--
Motor Oil Range	--	--	--	--	--	--	--	--	--	--	--
Metals (EPA 6000/7000 Series Methods; mg/kg)											
Antimony	64	13.3		24.8			192		12.5		140
Arsenic	7	12.1		10.3			36.2		10.7		11.5
Beryllium	--	0.28		0.43			0.26		0.33		0.59
Cadmium	1	1.7		<0.020			<0.019		<0.019		<0.023
Chromium	111	61.8		33.4			145		39.9		35.1
Copper	149	746		143			47,500		233		153
Lead	17	610		631 B			3,090 B		381 B		915 B
Nickel	49	54.7		45.4			306		53.6		45.3
Selenium	2	0.71		0.14 J,B			0.54 B		0.23 J,B		<0.14
Silver	5	0.62 B		0.30 J,B			8.6 B		0.77 B		0.8 B
Thallium	--	0.085 J		0.072 J			0.044 J		0.062 J		0.027 J
Zinc	459	697		849			1,810		586		231
Mercury	0.07	0.073		0.14 H1			0.051 J,H1		0.066 J,H1		0.022 J,H1
PAHs (EPA 8270 SIM; ug/kg)											
1-Methylnaphthalene	--	67.1		92.7			23.9		14.5		15.1
2-Methylnaphthalene	200	146		259			65.4		40.7		36.8
Acenaphthene	300	29.2		64.8			11.6		9.5		12.7
Acenaphthylene	200	138		289			36.1		81.3		108
Anthracene	845	171		328			40.6		56.7		107
Benzo(a)anthracene	1,050	336		568			69.1		218		145
Benzo(a)pyrene	1,450	512		589			73.4		311		182
Benzo(b)fluoranthene	--	675		782			73.2		237		194
Benzo(g,h,i)perylene	300	343		335			56.4		286		178
Benzo(k)fluoranthene	13,000	332		555			57.4		221		144
Chrysene	1,290	449		803			86.8		295		220
Dibenz(a,h)anthracene	1,300	85.6		127			14.7		43		50.7
Fluoranthene	2,230	507		745			91.6		342		152
Fluorene	536	39.1		80.8			13.7		20.9		22.8
Indeno(1,2,3-cd)pyrene	100	269		278			39		174		120
Naphthalene	561	277		506			99.6		90.2		64
Phenanthrene	1,170	313		470			106		165		117
Pyrene	1,520	549		798			116		437		205
PCBs (EPA Method 8082; ug/kg)											
PCB-1016 (Aroclor 1016)	530	<5.8		--			--		--		--
PCB-1221 (Aroclor 1221)	--	<2.9		--			--		--		--
PCB-1232 (Aroclor 1232)	--	<4.1		--			--		--		--
PCB-1242 (Aroclor 1242)	--	<5.4		--			--		--		--
PCB-1248 (Aroclor 1248)	1,500	<5.2		--			--		--		--
PCB-1254 (Aroclor 1254)	300	<3.1		--			--		--		--
PCB-1260 (Aroclor 1260)	200	<6.3		--			--		--		--
PCB-1262 (Aroclor 1262)	--	<3.7		--			--		--		--
PCB-1268 (Aroclor 1268)	--	<1.7		--			--		--		--
Pesticides (EPA 8081; ug/kg)											
alpha-BHC	--	<0.98		--			--		--		--
beta-BHC	--	<8.7 Y		--			--		--		--
delta-BHC	--	<0.98		--			--		--		--
gamma-BHC (Lindane)	4.99	<1.6Y		--			--		--		--
Heptachlor	10	<0.98		--			--		--		--
Aldrin	40	<0.98		--			--		--		--
Heptachlor Epoxide	16	<1.6 Y		--			--		--		--
Endosulfan I		<0.98		--			--		--		--
Dieldrin	0.0081	<2.0		--			--		--		--
Endrin	207	<5.6 Y		--			--		--		--
Endosulfan II	--	<2.0		--			--		--		--
Endosulfan Sulfate	--	<2.0		--			--		--		--
Methoxychlor	--	<9.8		--			--		--		--
Endrin Ketone	--	<2.0		--			--		--		--
Endrin Aldehyde	--	<2.0		--			--		--		--
trans-Chlordane	--	3.5		--			--		--		--
cis-Chlordane	--	4.1		--			--		--		--
Toxaphene	--	<98		--			--		--		--
4,4'-DDE	0.33	5.3	4.8	25 E	26	<39	2.5	<4.0	4.0	5.2	3.6
4,4'-DDD	0.33	<0.39	<3.9	4.2 P	9.7	<39	<0.40	<4.0	2.0	<4.0	<0.40
4,4'-DDT	0.33	30 E	30	100 ESP	140 E	180	9.6 E	10	44 ES	51	5.3
2,4'-DDT	--	<3.0 Y	<3.9	13 E	19	<39	1.7	<4.0	5.7	7.0	0.85
2,4'-DDE	--	<0.39	<3.9	<0.39	<3.9	<39	<0.40	<4.0	<0.40	<4.0	<0.40
2,4'-DDD	--	<0.39	<3.9	1.9 P	<3.9	<39	<0.40	<4.0	0.40	<4.0	<0.40
Dioxins/Furans (EPA 8290; ng/kg)											
2,3,7,8-TCDF	0.00077	--		--			--		--		--
2,3,7,8-TCDD	0.0000091	--		--			--		--		--
1,2,3,7,8-PeCDF	0.0026	--		--			--		--		--
2,3,4,7,8-PeCDF	--	--		--			--		--		--
1,2,3,7,8-PeCDD	0.0026	--		--			--		--		--
1,2,3,4,7,8-HxCDF	0.0027	--		--			--		--		--
1,2,3,6,7,8-HxCDF	0.0027	--		--			--		--		--
2,3,4,6,7,8-HxCDF	0.0027	--		--			--		--		--
1,2,3,7,8,9-HxCDF	0.0027	--		--			--		--		--
1,2,3,4,7,8-HxCDD	--	--		--			--		--		--
1,2,3,6,7,8-HxCDD	--	--		--			--		--		--
1,2,3,7,8,9-HxCDD	--	--		--			--		--		--
1,2,3,4,6,7,8-HpCDF	0.69	--		--			--		--		--
1,2,3,4,7,8,9-HpCDF	0.69	--		--			--		--		--
1,2,3,4,6,7,8-HpCDD	0.69	--		--			--		--		--
OCDF	23	--		--			--		--		--
OCDD	23	--		--			--		--		--
Total TCDF	--	--		--			--		--		--
Total TCDD	--	--		--			--		--		--
Total PeCDF	--	--		--			--		--		--
Total PeCDD	--	--		--			--		--		--
Total HxCDF	--	--		--			--		--		--
Total HxCDD	--	--		--			--		--		--
Total HpCDF	--	--		--			--		--		--
Total HpCDD	--	--		--			--		--		--
TEQ	--	--		--			--		--		--
Butyl Tins (Krones Method; ug/kg)											
Tributyltin	2.3	--		--			--		--		--
Dibutyltin	--	--		--			--		--		--
Butyltin	--	--		--			--		--		--

Table 4 - Railroad Embankment Soil Samples
Willamette Cove Upland Facility
Portland, Oregon

		Railroad Embankment Soil Samples							
PRIMARY SAMPLE	JSCS SLV	WC-SSL-2 Composite	WC-SSL-2 Composite (Dilution)	WC-SSL-2-1	WC-SSL-2-1 (Dilution)	WC-SSL-2-2	WC-SSL-2-3	WC-SSL-2-4	WC-SSL-2-4 (Dilution)
DISCRETE SAMPLES				WC-SSL-2-1	WC-SSL-2-1 (Dilution)	WC-SSL-2-2	WC-SSL-2-3	WC-SSL-2-4	WC-SSL-2-4 (Dilution)
Date Sampled		9/30/2010	9/30/2010	9/30/2010	9/30/2010	9/30/2010	9/30/2010	9/30/2010	9/30/2010
Sample Interval (inches)		0-6	0-6	0-6	0-6	0-6	0-6	0-6	0-6
TPH-HCID (mg/kg)									
Diesel Range	--	--	--	--	--	--	--	--	--
Gasoline Range	--	--	--	--	--	--	--	--	--
Motor Oil Range	--	--	--	--	--	--	--	--	--
NWTPH-Gx (mg/kg)									
Gasoline Range Organics	--	--	--	--	--	--	--	--	--
NWTPH-Dx Silica Gel Cleanup (mg/kg)									
Diesel Range	--	--	--	--	--	--	--	--	--
Motor Oil Range	--	--	--	--	--	--	--	--	--
Metals (EPA 6000/7000 Series Methods; mg/kg)									
Antimony	64	23.3		21.5		4.8	7	38.5	--
Arsenic	7	15.1		9.8		5.8	9.7	10.2	--
Beryllium	--	0.31		0.43		0.38	0.48	0.37	--
Cadmium	1	1.3		<0.019		<0.018	<0.018	<0.017	--
Chromium	111	48.5		38.7		32.9	62	26.3	--
Copper	149	13,500		207		194	276	204	--
Lead	17	1,150		147 B		145 B	169 B	362 B	--
Nickel	49	73		47.9		35	47	41.3	--
Selenium	2	1.1		0.11 J		0.29 J,B	<0.11	0.23 J,B	--
Silver	5	4.4 B		0.53 B		0.45 J,B	0.37 J,B	0.32 J,B	--
Thallium	--	0.072 J		0.064 J		0.068 J	0.021 J	0.056 J	--
Zinc	459	524		421		415	294	1,640	--
Mercury	0.07	0.085		0.14 H1		0.070 J,H1	0.074 H1	0.059 J,H1	--
PAHs (EPA 8270 SIM; ug/kg)									
1-Methylnaphthalene	--	64.4		--		--	--	--	--
2-Methylnaphthalene	200	193		--		--	--	--	--
Acenaphthene	300	12.7		--		--	--	--	--
Acenaphthylene	200	154		--		--	--	--	--
Anthracene	845	79.1		--		--	--	--	--
Benzo(a)anthracene	1,050	190		--		--	--	--	--
Benzo(a)pyrene	1,450	272		--		--	--	--	--
Benzo(b)fluoranthene	--	243		--		--	--	--	--
Benzo(g,h,i)perylene	300	105		--		--	--	--	--
Benzo(k)fluoranthene	13,000	173		--		--	--	--	--
Chrysene	1,290	243		--		--	--	--	--
Dibenz(a,h)anthracene	1,300	35.4		--		--	--	--	--
Fluoranthene	2,230	258		--		--	--	--	--
Fluorene	536	14.9		--		--	--	--	--
Indeno(1,2,3-cd)pyrene	100	101		--		--	--	--	--
Naphthalene	561	211		--		--	--	--	--
Phenanthrene	1,170	188		--		--	--	--	--
Pyrene	1,520	353		--		--	--	--	--
PCBs (EPA Method 8082; ug/kg)									
PCB-1016 (Aroclor 1016)	530	<5.9		--		--	--	--	--
PCB-1221 (Aroclor 1221)	--	<2.9		--		--	--	--	--
PCB-1232 (Aroclor 1232)	--	<4.1		--		--	--	--	--
PCB-1242 (Aroclor 1242)	--	<5.4		--		--	--	--	--
PCB-1248 (Aroclor 1248)	1,500	<5.2		--		--	--	--	--
PCB-1254 (Aroclor 1254)	300	<3.1		--		--	--	--	--
PCB-1260 (Aroclor 1260)	200	<6.3		--		--	--	--	--
PCB-1262 (Aroclor 1262)	--	<3.7		--		--	--	--	--
PCB-1268 (Aroclor 1268)	--	<1.7		--		--	--	--	--
Pesticides (EPA 8081; ug/kg)									
alpha-BHC	--	<1.0		--		--	--	--	--
beta-BHC	--	<2.5 Y		--		--	--	--	--
delta-BHC	--	<1.0		--		--	--	--	--
gamma-BHC (Lindane)	4.99	<1.0		--		--	--	--	--
Heptachlor	10	<1.0		--		--	--	--	--
Aldrin	40	<1.0		--		--	--	--	--
Heptachlor Epoxide	16	<1.0		--		--	--	--	--
Endosulfan I		<1.0		--		--	--	--	--
Dieldrin	0.0081	<2.0		--		--	--	--	--
Endrin	207	<2.0		--		--	--	--	--
Endosulfan II	--	<2.0		--		--	--	--	--
Endosulfan Sulfate	--	<2.0		--		--	--	--	--
Methoxychlor	--	<10		--		--	--	--	--
Endrin Ketone	--	<2.0		--		--	--	--	--
Endrin Aldehyde	--	<2.0		--		--	--	--	--
trans-Chlordane	--	<1.0		--		--	--	--	--
cis-Chlordane	--	<1.0		--		--	--	--	--
Toxaphene	--	<100		--		--	--	--	--
4,4'-DDE	0.33	4.3	3.6	26 E	17	4.8	<0.40	7.9 E	8.9
4,4'-DDD	0.33	<0.39	0.99	5.4	7.1	0.78	<0.40	<0.40	<4.0
4,4'-DDT	0.33	7.5 E	7.2	42 ES	45	6.3	<0.40	8.3 E	9.8
2,4'-DDT	--	<0.39	1.1	10 E	8.9	0.96	<0.40	0.76	<4.0
2,4'-DDE	--	<0.39	<0.78	<0.39	<3.9	<0.40	<0.40	<0.40	<4.0
2,4'-DDD	--	<0.39	<0.78	1.7	<3.9	<0.40	<0.40	<0.40	<4.0
Dioxins/Furans (EPA 8290; ng/kg)									
2,3,7,8-TCDF	0.00077	--		--		--	--	--	--
2,3,7,8-TCDD	0.0000091	--		--		--	--	--	--
1,2,3,7,8-PeCDF	0.0026	--		--		--	--	--	--
2,3,4,7,8-PeCDF	--	--		--		--	--	--	--
1,2,3,7,8-PeCDD	0.0026	--		--		--	--	--	--
1,2,3,4,7,8-HxCDF	0.0027	--		--		--	--	--	--
1,2,3,6,7,8-HxCDF	0.0027	--		--		--	--	--	--
2,3,4,6,7,8-HxCDF	0.0027	--		--		--	--	--	--
1,2,3,7,8,9-HxCDF	0.0027	--		--		--	--	--	--
1,2,3,4,7,8-HxCDD	--	--		--		--	--	--	--
1,2,3,6,7,8-HxCDD	--	--		--		--	--	--	--
1,2,3,7,8,9-HxCDD	--	--		--		--	--	--	--
1,2,3,4,6,7,8-HpCDF	0.69	--		--		--	--	--	--
1,2,3,4,7,8,9-HpCDF	0.69	--		--		--	--	--	--
1,2,3,4,6,7,8-HpCDD	0.69	--		--		--	--	--	--
OCDF	23	--		--		--	--	--	--
OCDD	23	--		--		--	--	--	--
Total TCDF	--	--		--		--	--	--	--
Total TCDD	--	--		--		--	--	--	--
Total PeCDF	--	--		--		--	--	--	--
Total PeCDD	--	--		--		--	--	--	--
Total HxCDF	--	--		--		--	--	--	--
Total HxCDD	--	--		--		--	--	--	--
Total HpCDF	--	--		--		--	--	--	--
Total HpCDD	--	--		--		--	--	--	--
TEQ	--	--		--		--	--	--	--
Butyl Tins (Krones Method; ug/kg)									
Tributyltin	2.3	--		--		--	--	--	--
Dibutyltin	--	--		--		--	--	--	--
Butyltin	--	--		--		--	--	--	--

- Notes:
1. µg/kg (ppb) = micrograms per kilogram (parts per billion)
 2. mg/kg (ppm) = milligrams per kilogram (parts per million)
 3. < = Not detected above the method reporting limit (MRL)
 4. JSCS = Screening levels from Portland Harbor Joint Source Control Strategy – Final (Table 3-1 Updated July 16, 2007). December 2005.
 5. Shading denotes exceedence of JSCS SLV.
 6. J = Estimated.
 7. B = Analyte was detected in associated method blank above the reporting limit. Sample concentrations were less than 5 times the concentration detected in the method blank.
 8. E = Estimated concentration calculated for an analyte response above the valid instrument calibration range.
 9. S = The calculated concentration is not valid because the analyte response saturated the detector. A dilution is required to obtain valid quanfication.
 10. P = The analyte was detected on both chromatographic columns but the quanified values differ by greater than or equal to 40% RPD with no obovious chromatographic interference.
 11. Y = Reporting limit raised due to chromatographic interference. Analyte was not detected above the adjusted reporting limit