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TECHNICAL MEMORANDUM

Date:	October 12, 2010
To:	Steve Teel - Department of Ecology
From:	David Dinkuhn, P.E. (DLD)
Subject:	Solid Wood Incorporated Site Quarterly Groundwater Monitoring Results, Quarter 7 August 2010
cc:	Kip Summers - City of Olympia David Hanna - City of Olympia Tom Morrill - City of Olympia
Project Number:	235-1577-024
Project Name:	Solid Wood Incorporated (West Bay Park) Site RI/FS and Interim Action

SOLID WOOD INCORPORATED SITE - QUARTER 7 GROUNDWATER MONITORING RESULTS, AUGUST 2010

This technical memorandum presents results for the seventh round of quarterly groundwater monitoring conducted at the Solid Wood Incorporated Site in Olympia, Washington. Quarterly groundwater monitoring is being conducted in accordance with the site's Agreed Order (No. DE-08-TCPSR-5415) and project work plan (Parametrix 2008). This sampling round is the seventh quarterly monitoring event conducted under the site's ongoing Remedial Investigation/Feasibility Study (RI/FS).

QUARTER 7 GROUNDWATER SAMPLING

Groundwater samples were collected from three monitoring wells (MW-08 through MW-10) located in the vicinity of the former wood burner and from one surface water station (SW-1) upgradient (relative to tidal flow) of the former wood burner area (Figure 1). The purpose of the wells is to monitor groundwater conditions in the vicinity of Area D, which was cleaned up during the Interim Action performed in summer 2009 (Parametrix 2010). Quarter seven represents the third quarterly sampling event for the three wells (i.e., they were not sampled during quarters one through four). The wells will be sampled for a minimum of four total quarters under the RI/FS work plan. The purpose of the surface water sample was to obtain information on existing surface water quality conditions in the West Bay of Budd Inlet.

Groundwater samples were collected on August 23, 2010 using a peristaltic pump and low-flow purging/sampling techniques. Prior to sampling, the wells were purged until measured water quality parameters stabilized according to criteria specified in the work plan. Upon stabilization, groundwater samples were collected into the appropriate containers.

The surface water sample collected from upgradient of the former wood burner area was also collected on August 23, 2010. The sample was collected by directly placing the sampling container in the surface water in the direction of flow. Care was taken to prevent loss of preservative.

The water quality parameter measurements for both the monitoring wells and the surface water sample are provided in Table 1. Field data sheets from the sample collection are attached. All samples were collected on an outgoing tide. A tide chart for August 23, 2010 at Olympia, Washington is attached for reference as well as boring logs. Approximate sampling times are provided in Table 1.

Water samples were submitted to Onsite Environmental of Redmond, Washington for chemical analysis of priority pollutant metals (total and dissolved), chloride, and dissolved organic carbon (DOC). A summary of the sample results is presented in Table 2. Table 2 also includes remedial levels (RLs) for groundwater as established in the RI/FS work plan. A Quality Assurance/Quality Control (QA/QC) data review memorandum and the laboratory data report are attached.

The depth to groundwater was measured in each well to provide data used to develop inferred elevation contours as shown on Figure 1. The measurements were collected within a 1-hour period to give a representative snapshot of groundwater elevations. Figure 1 also shows inferred groundwater flow directions based on the elevation contours.

Table 1. Final Water Quality Parameters

Location ID	Date/Time	pH (units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/l)	Temperature (ºC)	Turbidity (NTU)	Redox (mV)
MW-08	8/23/10 @ 1024	7.21	24.7	0	16.16	0	-345
MW-09	8/23/10 @ 1057	7.17	23.3	0	16.71	0	-358
MW-10	8/23/10 @ 1136	6.50	30.5	0	19.76	0	-298
SW-1	8/23/10 @ 0920	7.07	26.6	5.61	16.28	10.2	-104

Notes:
mS/cm = millisiemens per centimeter.
mg/l = milligrams per liter.
ºC = degrees Celsius.
NTU = nephelometric turbidity units.
mV = millivolts.
% = percent.

DISCUSSION AND RECOMMENDATIONS

As shown in Table 2, constituents that exceeded RLs in the samples from the monitoring wells consist of copper and nickel. The concentrations present in the samples are similar to those reported during the first two quarters of sampling (Quarters five and six - February and May 2010). These metals were thought to originate from the former wood burner area, which contained soils with elevated levels of copper, lead, nickel, zinc, and dioxins. These soils were successfully removed during the IA (Parametrix 2010) and should not be a contributing source of copper and nickel to groundwater. Table 2 also shows the results of the surface water sample in comparison to the groundwater results. Total copper and nickel concentrations in the surface water were higher than copper and nickel concentrations in groundwater for all three quarters of data. Note the chloride concentrations in the wells which suggest that the three samples consisted of a mixture of fresh water and 46 to 63 percent sea water. The concentrations of total copper and nickel in the surface water indicate that these metals are present in the wells as a result of area background conditions.

Parametrix recommends collection of three additional surface water samples to confirm background concentrations in West Bay; one located north of the former wood burner area, one located at the SW-1 station,

and one located further south near the northern-most trestle. These samples would be collected for total and dissolved copper and nickel, chloride, and DOC during the upcoming eighth quarter sampling event.

DOC concentrations in the groundwater samples ranged from 23 to 120 mg/l. These values are similar to marine sediment pore water which typically contains 20 mg/L to 175 mg/L DOC. DOC values in this range can affect the bioavailability and resulting toxicity of dissolved copper (Arnold et al 2005). Parametrix recommends that groundwater samples collected during future monitoring events be analyzed for DOC. If appropriate, the DOC data will be used to evaluate the toxicity of the measured copper concentrations considering site-specific conditions.

REFERENCES

Arnold, W. Ray et al. 2005. Effects of Dissolved Organic Carbon on Copper Toxicity: Implications for Saltwater Copper Criteria. Integrated Environmental Assessment and Management Volume 1, Number 1. pp. 34-39.

Parametrix. 2008. Work Plan for Remedial Investigation/Feasibility Study and Interim Action, Solid Wood Incorporated Site (West Bay Park). Prepared for City of Olympia Parks, Arts, and Recreation Department. October.

Parametrix. 2010. Solid Wood Incorporated Site (West Bay Park) Interim Action Report. Prepared for City of Olympia Parks, Arts, and Recreation Department. September.

ATTACHMENTS:

Table 2

Figure 1

Groundwater Field Data Sheets

Tide Chart

Boring Logs

Data Validation Technical Memorandum

Laboratory Report

TABLE 2

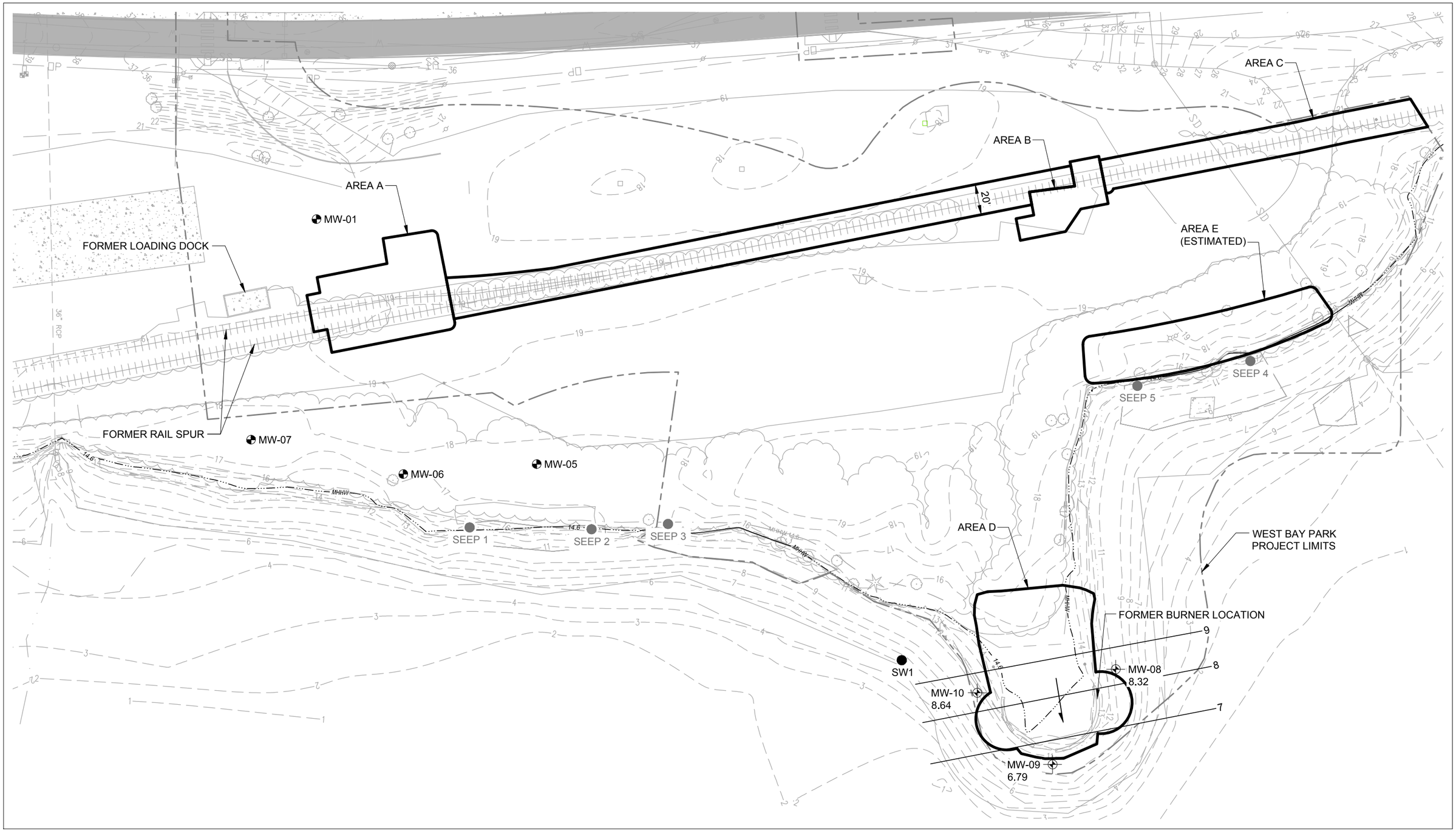
Table 2
Solid Wood Inicorporated Site RI/FS
Quarter 7 Groundwater Results, August 2010

	Location ID		MW-08			MW-09					MW-10				SW1
ANALYTE	**Date Sampled**		**2/3/10**	**5/3/10**	**8/23/10**	**2/3/10**	**2/3/10[a]**	**5/3/10**	**8/23/10**	**8/23/10[a]**	**2/3/10**	**5/3/10**	**5/3/10[a]**	**8/23/10**	**8/23/2010**
	Units	**RL**													
TOTAL METALS															
Antimony	µg/l	6[b]	6U	0.50U	0.50U	6U	6U	0.50U	0.50U	0.50U	6U	0.50U	0.50U	1.3U	1.3U
Arsenic	µg/l	5	*6.5U*	1.8U	2.0U	5U	5U	0.50U	1.2U	2U	*7.5U*	2.0U	2.5U	4.0U	*6U*
Beryllium	µg/l	4[b]	4U	0.50U	0.50U	4U	4U	0.50U	0.50U	0.50U	4U	0.50U	0.50U	0.50U	0.50U
Cadmium	µg/l	5	5U	0.50U	0.50U	5U	5U	0.50U	0.50U	0.50U	5U	0.50U	0.50U	0.50U	0.50U
Chromium	µg/l	50	50U	1.3	1.3	50U	50U	0.98	0.89	1.0	50U	1.4	1.4	1.3	3.2
Copper	µg/l	2.4[c]	5.4	5.1	4.6	4	3.4	2.7	3.6	3.8	6.8	4.5	4.5	6.1	14
Lead	µg/l	8.1[c]	8U	0.50U	0.50U	8U	8U	0.50U	0.50U	0.50U	8U	0.50U	0.50U	0.50U	1.1
Mercury	µg/l	0.025[c]	*0.038U*	0.025U	0.025U	*0.038U*	*0.038U*	0.025	0.025U	0.025U	*0.038U*	0.025U	0.025U	0.025U	0.025U
Nickel	µg/l	8.2[c]	9.8	15	9.3	11	11	11	9.8	11	13	14	13	14	16
Selenium	µg/l	50[b]	50U	8.0U	20U	50U	50U	1.6U	18U	15U	50U	2.5U	4.5U	24U	25U
Silver	µg/l	1.9[c]	1.9U	0.50U	0.50U	1.9U	1.9U	0.50U	0.50U	0.50U	1.9U	0.50U	0.50U	1.3U	1.3U
Thallium	µg/l	0.47[c]	0.45U	*0.50U*	*0.50U*	0.45U	0.45U	*0.50U*	*0.50U*	*0.50U*	0.45U	*0.50U*	*0.50U*	*0.50U*	*0.50U*
Zinc	µg/l	81[c]	80U	18	18J	80U	80U	8.7	9.8J	4.7J	80U	12	11	11J	6.3U
DISSOLVED METALS															
Antimony	µg/l	6[b]	6U	0.50U	0.50U	6U	6U	0.50U	0.50U	0.50U	6U	0.50U	0.50U	1.3U	--
Arsenic	µg/l	5	*8U*	1.4U	1.2U	*6U*	5U	0.50U	1.2U	1.2U	*7.5U*	0.50U	2.2U	3.5U	--
Beryllium	µg/l	4[b]	4U	0.50U	0.50U	4U	4U	0.50U	0.50U	0.50U	4U	0.50U	0.50U	0.50U	--
Cadmium	µg/l	5	5U	0.50U	0.50U	5U	5U	0.50U	0.50U	0.50U	5U	0.50U	0.50U	0.50U	--
Chromium	µg/l	50	50U	0.66	1.1	50U	50U	0.50U	0.75	0.8	50U	0.76	0.66	1.4	--
Copper	µg/l	2.4[c]	5.5	4.9	4.2	4.1	3.4	3.3	3.5	3.4	5.9	4.8	4.5	5.1	--
Lead	µg/l	8.1[c]	8U	0.50U	0.50U	8U	8U	0.50U	0.50U	0.50U	8U	0.50U	0.50U	0.50U	--
Mercury	µg/l	0.025[c]	*0.038U*	0.025U	0.025U	*0.038U*	*0.038U*	0.025U	0.025U	0.025U	*0.038U*	0.025U	0.025U	0.025U	--
Nickel	µg/l	8.2[c]	12	11	10	11	8.9	9.0	7.8	8.3	11	11	10	12	--
Selenium	µg/l	50[b]	50U	6.0U	24U	50U	50U	2.0U	18U	16U	50U	5.0U	4.0U	27U	--
Silver	µg/l	1.9[c]	1.9U	0.50U	0.50U	1.9U	1.9U	0.50U	0.50U	0.50U	1.9U	0.50U	0.50U	1.3U	--
Thallium	µg/l	0.47[c]	0.45U	*0.50U*	*0.50U*	0.45U	0.45U	*0.50U*	*0.50U*	*0.50U*	0.45U	*0.50U*	*0.50U*	*0.50U*	--
Zinc	µg/l	81[c]	80U	15	5.9	80U	80U	6.3	4.5	4.1	80U	8	11	4.8	--
GENERAL CHEMISTRY															
Chloride	mg/l	-	11,000	12,000	8,800	8,600	8,400	8,500	9,100	8,500	13,000	10,000	9,600	12,000	19,000
Dissolved Organic Carbon	mg/l	-	--	--	100J	--	--	--	72J	120J	--	--	--	38J	23J

Notes:

[a] = Duplicate sample.
[b] = State and federal groundater maximum contaminant level (MCL).
[c] = Surface water applicable or relevant and appropriate requirement (ARAR).
italics = PQL exceeds screening level.
J = Analyte was detected. The reported concentration should be considered an estimate.
mg/l = milligrams per liter.
RL = Remedial level.
RL = Remedial level.
µg/l = micrograms per liter.
U = Not detected at given practical quantitation limit (PQL).
-- = Not analyzed.
Exceeds RL.

FIGURE 1



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SCALE IN FEET

LEGEND

- INTERIM ACTION AREAS FROM SUMMER 2009 CLEANUP ACTIVITIES
- EXISTING MONITORING WELL NOT SAMPLED
- SEEPS SAMPLED PREVIOUSLY DURING THE RI
- SURFACE WATER SAMPLE LOCATION
- 10 — INFERRED GROUND WATER SURFACE ELEVATION CONTOUR
- MW-10 8.32 — MONITORING WELL SAMPLED AND GROUNDWATER ELEVATION MEASURED 8/23/2010
- GROUNDWATER FLOW

NOTES

1. ELEVATION DATUM: MLLW
2. TOPOGRAPHY SHOWN BASED IN PRE-PARK CONSTRUCTION CONDITIONS.

Figure 1
Solid Wood Incorporated Site
(West Bay Park)
Olympia, Washington
Qtr 7 GW Surface Elevation Contours
August 2010

GROUNDWATER
FIELD DATA
SHEETS

Parametrix, Inc.

Well #: MW-08
Sample #: _____

Groundwater Sampling Field Data Sheet

WB-GW-MW08-0080

Project Number	235-1577-024 01/03	Date	8/23/10
Project Name	West Bay	Location	Burner
Project Address		Sampled By	L. Linde
Client Name	City of Olympia-Parks	Purged By	"

Casing Diameter: 2" ____ 4" ____ 6" ____ Other 3/4"

Depth to Water (feet)	2.62	Purge Vol. Meas.Method	Stopwatch/meas. cup
Depth of Well (feet)	14 ft	Date Purged	8/23/10
Reference Point (surveyors notch/etc)	TOC	Purge Time (from/to)	1008 - 1024
Date/Time Sampled	8/23/10 1025	300 ml/min	

Purge Volume Calculation: $(\pi r^2 h)(7.48 \text{ gal/ft}^3)$(# Casing volumes)
Purge Volume (gallons) for 2" = (0.16)(h)(#Cv); 4" = (0.653)(h)(#Cv); 6" = (1.48)(h)(#Cv)
Calculated Purge Volume (gallons) _____ Actual Purge Volume (gallons) _____

TIME (2400 hr)	WATER LEVEL (feet)	pH (units) ± 0.1	COND (mS/cm) ± 3%	DO (mg/L) ±10%	TEMP °C	TURB. ±10%	ORP (mV)	CUM. VOL. (gal)
1008	2.30	7.27	21.0	11.50	15.44	3.4	-279	
1012	2.61	7.24	23.0	~~16.050~~	16.09	0	-331	
1016	2.97	7.23	23.9	0	16.15	0	-342	
1020	2.97	7.22	24.3	0	16.19	0	-344	
1024	2.97	7.21	24.7	0	16.16	0	-345	2 gal

Purge Equipment	Peristaltic	Sampling Equipment	Same
Laboratory	Onsite	Date Sent to Lab	8/23/10
Chain-of-Custody (yes/no)	YES	Field QC Sample Number	N/A
Shipment Method	UPS	Split with (name(s)/organization)	N/A

Well Integrity: Good
Remarks: Water in monument
Signature: L. Linde

Parametrix, Inc.

Well #: MW-09
Sample #: WB-GW-MW09-0080

Groundwater Sampling Field Data Sheet

Project Number	235-1577-024	Date	8/23/10
Project Name	West Bay	Location	Farmer
Project Address		Sampled By	L. Linde
Client Name	City of Olympia Parks	Purged By	

Casing Diameter: 2" ____ 4" ____ 6" ____ Other 3/4"

Depth to Water (feet)	3.48	Purge Vol. Meas.Method	meas tape/stopwatch
Depth of Well (feet)	14.74	Date Purged	8/23
Reference Point (surveyors notch/etc)	TOC	Purge Time (from/to)	1042-1057
Date/Time Sampled	8/23/10 1110		300 ml/min

Purge Volume Calculation: $(\pi r^2 h)(7.48\ gal/ft^3)$(# Casing volumes)
Purge Volume (gallons) for 2" = (0.16)(h)(#Cv); 4" = (0.653)(h)(#Cv); 6" = (1.48)(h)(#Cv)
Calculated Purge Volume (gallons) _____ Actual Purge Volume (gallons) _____

TIME (2400 hr)	WATER LEVEL (feet)	pH (units) ± 0.1	COND (mS/cm) ± 3%	DO (mg/L) ±10%	TEMP °C	TURB. ±10%	ORP (mV)	CUM. VOL. (gal)
1042	4.00	7.17	24.3	11.41	16.92	0	-331	
1045	3.55	7.17	24.1	1.27	16.85	0	-347	
1049	4.00	7.18	23.9	0	16.75	0	-351	
1053	4.00	7.18	23.9	0	16.61	0	-356	
1057	4.00	7.17	23.3	0	16.71	0	-358	1.5 gal

Purge Equipment	Peristaltic	Sampling Equipment	Cyme
Laboratory	Onsite	Date Sent to Lab	8/23
Chain-of-Custody (yes/no)	YES	Field QC Sample Number	WB-GW-MW09-1080 @ 1110
Shipment Method	UPS	Split with (name(s)/organization)	N/A

Well Integrity Good
Remarks Empty in monument
Signature L. Linde
Page 1 of 1

Duplicate collected @ 1110 WB-GW-MW09-1080

Parametrix, Inc.

Well #: MW-1D
Sample #: _____

Groundwater Sampling Field Data Sheet

WB-GW-MW1D-0080

Project Number	235-1577-024	Date	8/23/10
Project Name	West Bay	Location	Burner
Project Address		Sampled By	L. Linde
Client Name	City of Olympia Parks	Purged By	L. Linde

Casing Diameter: 2" ____ 4" ____ 6" ____ Other 3/4"

Depth to Water (feet)	2.44	Purge Vol. Meas.Method	Stop watch / meas. cup
Depth of Well (feet)	9 ft	Date Purged	8/23/10
Reference Point (surveyors notch/etc)	TOC	Purge Time (from/to)	1120 - 1136
Date/Time Sampled	8/23/10	250 ml/min	

Purge Volume Calculation: $(\pi r^2 h)(7.48\ gal/ft^3)$(# Casing volumes)
Purge Volume (gallons) for 2" = (0.16)(h)(#Cv); 4" = (0.653)(h)(#Cv); 6" = (1.48)(h)(#Cv)
Calculated Purge Volume (gallons) _____ Actual Purge Volume (gallons) _____

TIME (2400 hr)	WATER LEVEL (feet)	pH (units) ± 0.1	COND (mS/cm) ± 3%	DO (mg/L) ±10%	TEMP °C	TURB. ±10%	ORP (mV)	CUM. VOL. (gal)
1120	2.95	6.66	26.7	6.34	19.15	5.7	-296	
1124	2.82	6.51	29.0	0.86	19.13	0	-301	
1128	2.75	6.50	29.7	0	19.36	0	-302	
1132	2.78	6.50	30.3	0	19.70	0	-299	
1136	2.78	6.50	30.5	0	19.76	0	-298	1.5 gal

Purge Equipment	peristaltic	Sampling Equipment	same
Laboratory	Onsite	Date Sent to Lab	8/23/10
Chain-of-Custody (yes/no)	YES	Field QC Sample Number	N/A
Shipment Method	UPS	Split with (name(s)/organization)	N/A

Well Integrity Good
Remarks water in monument
Signature L. Linde

PARAMETRIX

Form 02-EN-100/Rev. 10/02

Sampling Field Data Sheet

Station #: SW1

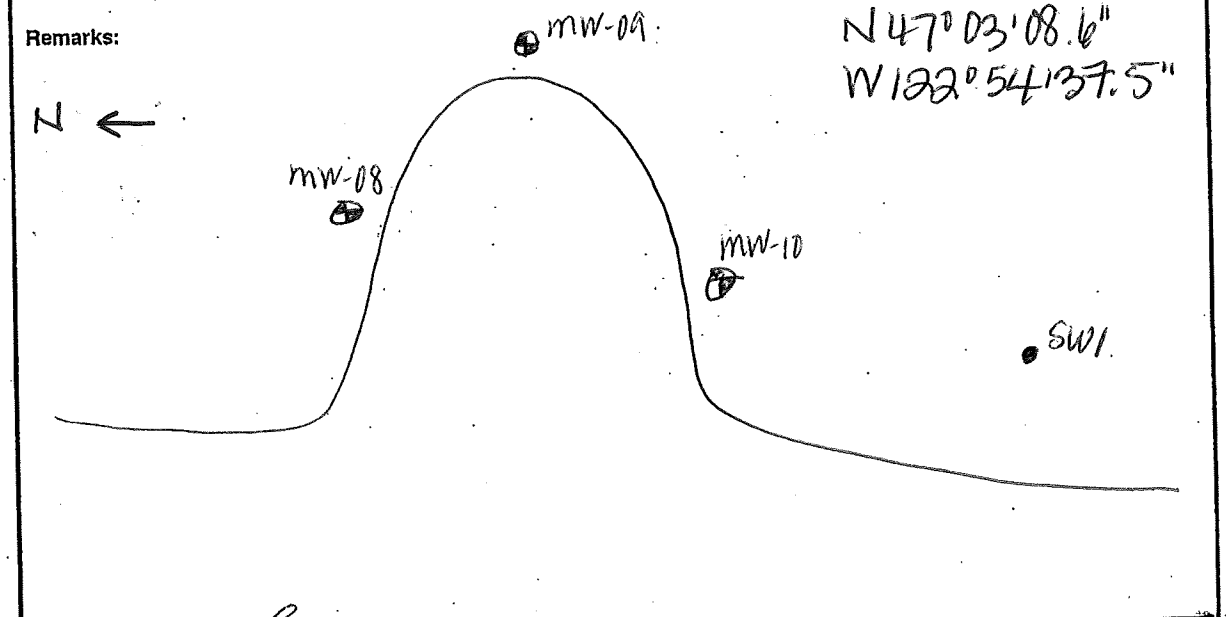
Project Number:	235-1577-024 04/03	Date:	8/23/10
Project Name:	West Bay D	Client Name	OPARD
Project Address:	West Bay Dr Olympia, WA	Sampled By:	L. Linde

TIME (2400 hr)	pH (units) (± 0.1)	Ec ~~(µmhos/cm~~ 25°C) (± 3%) mS/cm	TEMPERATURE °C	DO (mg/L)	~~COLOR~~ (visual) ORP (mV)	TURBIDITY ~~(visual)~~ (NTU)
0920	7.07	36.6	16.28	5.61	-104	10.2

Sampling Equipment:

Laboratory:	Onsite	Date Sent to Lab:	8/23/10
Chain-of-Custody (yes/no):	Yes	Field QC Sample Number:	N/A
Shipment Method:	NPS	Split With (names[s]/organization):	N/A

Remarks:



Signature: L. Linde

TIDE CHART

Tides for Olympia, Budd Inlet starting with August 23, 2010.

Day		High /Low	Tide Time	Height Feet	Sunrise Sunset	Moon	Time	% Moon Visible
M	23	Low	12:19 AM	5.8	6:19 AM	Set	5:23 AM	97
	23	High	5:04 AM	12.4	8:08 PM	Rise	7:29 PM	
	23	Low	11:50 AM	0.0				
	23	High	6:47 PM	14.1				
Tu	24	Low	12:46 AM	5.2	6:21 AM	Set	6:27 AM	99
	24	High	5:46 AM	12.4	8:06 PM	Rise	7:48 PM	
	24	Low	12:24 PM	0.4				
	24	High	7:03 PM	14.1				
W	25	Low	1:11 AM	4.5	6:22 AM	Set	7:30 AM	99
	25	High	6:26 AM	12.4	8:05 PM	Rise	8:06 PM	
	25	Low	12:56 PM	1.0				
	25	High	7:20 PM	14.2				
Th	26	Low	1:37 AM	3.8	6:23 AM	Set	8:33 AM	98
	26	High	7:07 AM	12.4	8:03 PM	Rise	8:24 PM	
	26	Low	1:28 PM	1.7				
	26	High	7:41 PM	14.2				
F	27	Low	2:06 AM	2.9	6:25 AM	Set	9:37 AM	95
	27	High	7:49 AM	12.4	8:01 PM	Rise	8:43 PM	
	27	Low	2:01 PM	2.7				
	27	High	8:05 PM	14.2				

Return to the Washington selection page, the FAQs/definitions page, the region selection page, the script licensing page, or to the home page.

For information on regulations for fishing in Washington contact: Washington Department of Fish and Wildlife

Typhoons, Hurricanes, etc., are NOT included in the predictions. Tidal current direction changes and tide high and low time predictions can be very different. Tide predictions are PREDICTIONS, they can be wrong so use common sense.

BORING LOGS

Parametrix *inspired people - inspired solutions - making a difference*

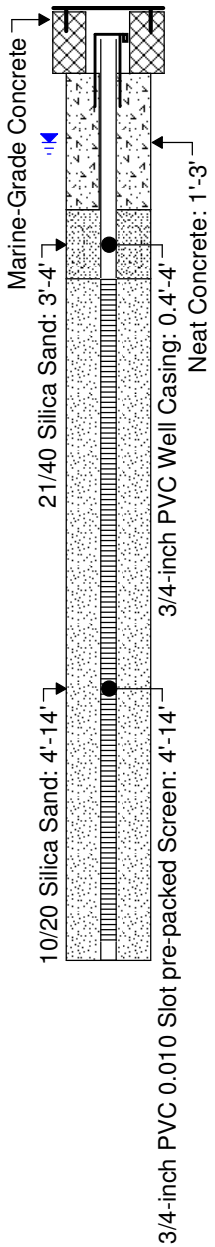
Log ID: MW-08/BCC757

Project Name: West Bay RI/FS
Project #: 235-1577-024
Location: Burner Point
Coordinates: N47°03'10.2" / W122°54'41.6"

Drilling Company: ESN Northwest
Drilling Method: Direct Push
Logged by: L. Linde
Checked by: M. Marshall, L.G.

Drilling Dates: 1-21-2010
Boring Depth: 14 ft
Depth to Water: 2 ft
Ground Elevation: ~11 ft

Depth (ft)	Lithologic Symbol	Description/Classification of Materials	Sample Details: PID (ppm)	Sample Details: Sample ID	Sample Details: Recovery	Boring Diagram	Lithologic Symbol	Depth (ft)
0		Ground Surface						0
		Imported Gravel and Cobble (Fill) Brown						
5								5
10		**Sand (Native)** Gray, shells, easy drilling						10
		Bottom of boring at 14 feet below ground surface.						
15								15
20								20



Parametrix *inspired people - inspired solutions - making a difference*

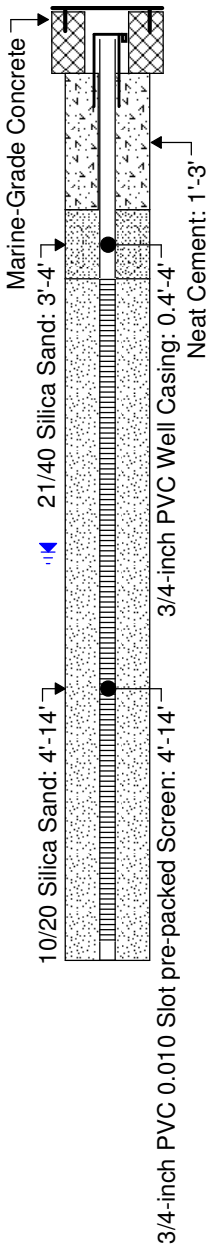
Log ID: MW-09/BCC758

Project Name: West Bay RI/FS
Project #: 235-1577-024
Location: Burner Point
Coordinates: N47°03'09.8" / W122°54'40.6"

Drilling Company: ESN Northwest
Drilling Method: Direct Push
Logged by: L. Linde
Checked by: M. Marshall, L.G.

Drilling Dates: 1-21-2010
Boring Depth: 14 ft
Depth to Water: 8 ft
Ground Elevation: ~9 ft

Depth (ft)	Lithologic Symbol	Description/Classification of Materials	Sample Details: PID (ppm)	Sample Details: Sample ID	Sample Details: Recovery	Boring Diagram	Lithologic Symbol	Depth (ft)
0		Ground Surface						0
		Imported Gravel and Cobble (Fill) Brown						
5								5
10								10
		Bottom of boring at 14 feet below ground surface.						
15								15
20								20



Parametrix *inspired people - inspired solutions - making a difference*

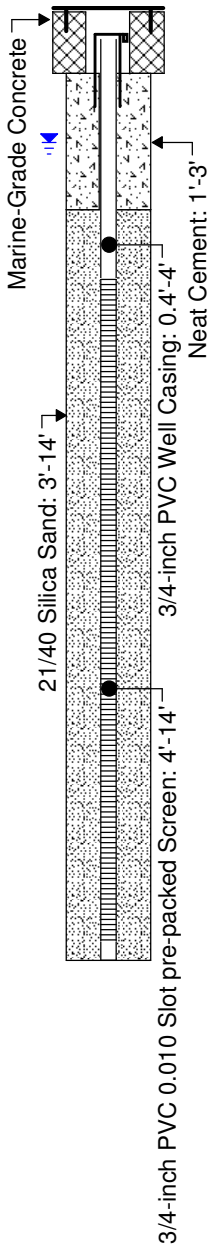
Log ID: MW-10/BCC759

Project Name: West Bay RI/FS
Project #: 235-1577-024
Location: Burner Point
Coordinates: N47°03'09.3" / W122°54'41.3"

Drilling Company: ESN Northwest
Drilling Method: Direct Push
Logged by: L. Linde
Checked by: M. Marshall, L.G.

Drilling Dates: 1-22-2010
Boring Depth: 14 ft
Depth to Water: 2 ft
Ground Elevation: 12 ft

Depth (ft)	Lithologic Symbol	Description/Classification of Materials	Sample Details: PID (ppm)	Sample Details: Sample ID	Sample Details: Recovery	Boring Diagram	Lithologic Symbol	Depth (ft)
0		Ground Surface						0
		Imported Gravel and Cobble (Fill) Brown						
5								5
10		Hard drilling, difficult to advance						10
		Sand (Native) Gray, shells, easy drilling						
		Bottom of boring at 14 feet below ground surface.						
15								15
20								20



DATA VALIDATION TECHNICAL MEMORANDUM

Parametrix ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

411 108th AVENUE NE, SUITE 1800
BELLEVUE, WA 98004-5571
T. 425.458.6200 F. 425.458.6363
www.parametrix.com

TECHNICAL MEMORANDUM

Date:	September 20, 2010
To:	Project File
From:	Annika Deutsch
Subject:	Quality Assurance/Quality Control Review for West Bay
cc:	David Dinkuhn Lara Linde
Project Number:	235-1577-024 (04/04)
Project Name:	West Bay 7th Quarter Groundwater Monitoring

INTRODUCTION

This technical memorandum summarizes the results of an internal quality assurance/quality control (QA/QC) review of analytical results for groundwater samples collected for the 7th Quarter groundwater monitoring event at the Solid Wood Inc. Site. Samples were collected on August 23, 2010. One surface water and four groundwater samples (including a field duplicate [WB-GW-MW09-1080]) were submitted to OnSite Environmental, Inc. (Redmond, WA) for analysis. Dissolved organic carbon analysis was subcontracted to Am Test Inc. (Kirkland, WA).

All samples were analyzed for total priority pollutant metals, chloride, and dissolved organic carbon (DOC). Filtered groundwater samples were analyzed for dissolved priority pollutant metals.

Final laboratory data were submitted to Parametrix via a Tier II-type data report (On-Site Laboratory Reference Number 1008-163). All data and analytical QC elements were reviewed against laboratory and method QC criteria, and qualifiers were applied where judged appropriate.

DATA REVIEW SUMMARY

All samples collected were prepared and analyzed using standard methods. All method holding times were met. All analyses requested on the COC were conducted.

No laboratory method blank contamination was observed.

Field duplicate results were acceptable, with the exception of total zinc (relative percent difference [RPD] = 70% [limit = 25%]) and DOC (RPD = 50% [limit = 25%]). All detections of total zinc and DOC results were qualified as estimated "J" as a result. Samples without detections of these analytes were not affected.

All other analytical QC results were in control, indicating acceptable analytical accuracy and precision. Table 1 summarizes all data qualified based on this review (i.e., does not include laboratory qualified data).

Table 1. Qualified West Bay Groundwater Data

Sample ID	Matrix	Analyte	Result	Qualifier	Reason
WB-SW-SW01-0000	Surface Water	DOC	23 mg/L	J	Field duplicate RPD out of control.
WB-GW-MW08-0080	Groundwater	Total Zinc	18 µg/L	J	Field duplicate RPD out of control.
WB-GW-MW08-0080	Groundwater	DOC	100 mg/L	J	Field duplicate RPD out of control.
WB-GW-MW09-0080	Groundwater	Total Zinc	9.8 µg/L	J	Field duplicate RPD out of control.
WB-GW-MW09-0080	Groundwater	DOC	72 mg/L	J	Field duplicate RPD out of control.
WB-GW-MW09-1080	Groundwater	Total Zinc	4.7 µg/L	J	Field duplicate RPD out of control.
WB-GW-MW09-1080	Groundwater	DOC	120 mg/L	J	Field duplicate RPD out of control.
WB-GW-MW10-0080	Groundwater	Total Zinc	11 µg/L	J	Field duplicate RPD out of control.
WB-GW-MW10-0080	Groundwater	DOC	38 mg/L	J	Field duplicate RPD out of control.

J Analyte was detected; the reported concentration should be considered an estimate due to field duplicate RPD out of control.

CONCLUSION

All samples were analyzed within holding times, and appropriate standard methods were used. No laboratory method blank contamination was observed. Analytical accuracy and precision were determined to be generally acceptable based on this review. Field duplicate results were acceptable, with the exception of total zinc and dissolved organic carbon as noted. All data reported should be considered valid as qualified and acceptable for further use.

LABORATORY REPORT

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

September 3, 2010

David Dinkuhn
Parametrix, Inc.
4660 Kitsap Way, Suite A
Bremerton, WA 98312

Re: Analytical Data for Project 235-1577-024
Laboratory Reference No. 1008-163

Dear David:

Enclosed are the analytical results and associated quality control data for samples submitted on August 24, 2010.

The standard policy of OnSite Environmental Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

Case Narrative

Samples were collected on August 23, 2010 and received by the laboratory on August 24, 2010. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Total Metals EPA 200.8/7470A Analysis

The practical quantitation limits for Arsenic and Selenium are elevated due to interferences present in the samples.

The practical quantitation limits for Antimony, Silver, and Zinc are elevated for sample WB-SW-SW01-0000 due to interferences present in the sample.

The practical quantitation limits for Antimony and Silver are elevated in sample WB-GW-MW10-0080 due to interferences present in the sample.

Dissolved Metals by EPA 200.8/7470A Analysis

The practical quantitation limits for Arsenic and Selenium are elevated due to interferences present in the samples.

The practical quantitation limits for Antimony and Silver are elevated in sample WB-GW-MW10-0080 due to interferences present in the sample.

Please note that any other QA/QC issues associated with these extractions and analyses will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

TOTAL METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	08-163-01					
Client ID:	**WB-SW-SW01-0000**					
Antimony	**ND**	1.3	200.8	8-31-10	9-2-10	
Arsenic	**ND**	6	200.8	8-31-10	9-2-10	
Beryllium	**ND**	0.50	200.8	8-31-10	8-31-10	
Cadmium	**ND**	0.50	200.8	8-31-10	9-1-10	
Chromium	**3.2**	0.50	200.8	8-31-10	8-31-10	
Copper	**14**	2.5	200.8	8-31-10	9-1-10	
Lead	**1.1**	0.50	200.8	8-31-10	9-1-10	
Mercury	**ND**	0.025	7470A	9-1-10	9-1-10	
Nickel	**16**	1.3	200.8	8-31-10	9-1-10	
Selenium	**ND**	25	200.8	8-31-10	9-1-10	
Silver	**ND**	1.3	200.8	8-31-10	9-2-10	
Thallium	**ND**	0.50	200.8	8-31-10	9-1-10	
Zinc	**ND**	6.3	200.8	8-31-10	9-1-10	
Lab ID:	08-163-02					
Client ID:	**WB-GW-MW08-0080**					
Antimony	**ND**	0.50	200.8	8-31-10	9-2-10	
Arsenic	**ND**	2.0	200.8	8-31-10	8-31-10	
Beryllium	**ND**	0.50	200.8	8-31-10	8-31-10	
Cadmium	**ND**	0.50	200.8	8-31-10	8-31-10	
Chromium	**1.3**	0.50	200.8	8-31-10	8-31-10	
Copper	**4.6**	1.0	200.8	8-31-10	8-31-10	
Lead	**ND**	0.50	200.8	8-31-10	9-1-10	
Mercury	**ND**	0.025	7470A	9-1-10	9-1-10	
Nickel	**9.3**	0.50	200.8	8-31-10	8-31-10	
Selenium	**ND**	20	200.8	8-31-10	9-1-10	
Silver	**ND**	0.50	200.8	8-31-10	9-2-10	
Thallium	**ND**	0.50	200.8	8-31-10	9-1-10	
Zinc	**18**	2.5	200.8	8-31-10	8-31-10	

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

TOTAL METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	08-163-03					
Client ID:	**WB-GW-MW09-0080**					
Antimony	**ND**	0.50	200.8	8-31-10	9-2-10	
Arsenic	**ND**	1.2	200.8	8-31-10	9-2-10	
Beryllium	**ND**	0.50	200.8	8-31-10	8-31-10	
Cadmium	**ND**	0.50	200.8	8-31-10	8-31-10	
Chromium	**0.89**	0.50	200.8	8-31-10	8-31-10	
Copper	**3.6**	1.0	200.8	8-31-10	8-31-10	
Lead	**ND**	0.50	200.8	8-31-10	8-31-10	
Mercury	**ND**	0.025	7470A	9-1-10	9-1-10	
Nickel	**9.8**	0.50	200.8	8-31-10	8-31-10	
Selenium	**ND**	18	200.8	8-31-10	9-2-10	
Silver	**ND**	0.50	200.8	8-31-10	9-2-10	
Thallium	**ND**	0.50	200.8	8-31-10	8-31-10	
Zinc	**9.8**	2.5	200.8	8-31-10	8-31-10	
Lab ID:	08-163-04					
Client ID:	**WB-GW-MW09-1080**					
Antimony	**ND**	0.50	200.8	8-31-10	9-2-10	
Arsenic	**ND**	2.0	200.8	8-31-10	9-2-10	
Beryllium	**ND**	0.50	200.8	8-31-10	8-31-10	
Cadmium	**ND**	0.50	200.8	8-31-10	8-31-10	
Chromium	**1.0**	0.50	200.8	8-31-10	8-31-10	
Copper	**3.8**	1.0	200.8	8-31-10	8-31-10	
Lead	**ND**	0.50	200.8	8-31-10	9-1-10	
Mercury	**ND**	0.025	7470A	9-1-10	9-1-10	
Nickel	**11**	0.50	200.8	8-31-10	8-31-10	
Selenium	**ND**	15	200.8	8-31-10	9-1-10	
Silver	**ND**	0.50	200.8	8-31-10	9-1-10	
Thallium	**ND**	0.50	200.8	8-31-10	9-1-10	
Zinc	**4.7**	2.5	200.8	8-31-10	8-31-10	

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

TOTAL METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	08-163-05					
Client ID:	**WB-GW-MW10-0080**					
Antimony	**ND**	1.3	200.8	8-31-10	9-2-10	
Arsenic	**ND**	4.0	200.8	8-31-10	8-31-10	
Beryllium	**ND**	0.50	200.8	8-31-10	8-31-10	
Cadmium	**ND**	0.50	200.8	8-31-10	9-1-10	
Chromium	**1.3**	0.50	200.8	8-31-10	8-31-10	
Copper	**6.1**	1.0	200.8	8-31-10	8-31-10	
Lead	**ND**	0.50	200.8	8-31-10	9-1-10	
Mercury	**ND**	0.025	7470A	9-1-10	9-1-10	
Nickel	**14**	0.50	200.8	8-31-10	8-31-10	
Selenium	**ND**	24	200.8	8-31-10	9-1-10	
Silver	**ND**	1.3	200.8	8-31-10	9-2-10	
Thallium	**ND**	0.50	200.8	8-31-10	9-1-10	
Zinc	**11**	2.5	200.8	8-31-10	8-31-10	

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

TOTAL METALS
EPA 200.8
METHOD BLANK QUALITY CONTROL

Date Extracted:	8-31-10
Date Analyzed:	8-31&9-2-10
Matrix:	Water
Units:	ug/L (ppb)
Lab ID:	MB0831W1

Analyte	Method	Result	PQL
Antimony	200.8	**ND**	0.50
Arsenic	200.8	**ND**	1.2
Beryllium	200.8	**ND**	0.50
Cadmium	200.8	**ND**	0.50
Chromium	200.8	**ND**	0.50
Copper	200.8	**ND**	1.0
Lead	200.8	**ND**	0.50
Nickel	200.8	**ND**	0.50
Selenium	200.8	**ND**	1.0
Silver	200.8	**ND**	0.50
Thallium	200.8	**ND**	0.50
Zinc	200.8	**ND**	2.5

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

TOTAL MERCURY
EPA 7470A
METHOD BLANK QUALITY CONTROL

Date Extracted:	9-1-10
Date Analyzed:	9-1-10
Matrix:	Water
Units:	ug/L (ppb)
Lab ID:	MB0901W1

Analyte	Method	Result	PQL
Mercury	7470A	**ND**	0.025

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

TOTAL METALS
EPA 200.8
DUPLICATE QUALITY CONTROL

Date Extracted: 8-31-10
Date Analyzed: 8-31&9-2-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: 08-153-02

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Antimony	**ND**	**ND**	NA	0.50	
Arsenic	**12.7**	**12.7**	0	1.2	
Beryllium	**ND**	**ND**	NA	0.50	
Cadmium	**ND**	**ND**	NA	0.50	
Chromium	**0.568**	**ND**	NA	0.50	
Copper	**5.09**	**4.54**	11	1.0	
Lead	**ND**	**ND**	NA	0.50	
Nickel	**3.55**	**3.24**	9	0.50	
Selenium	**ND**	**ND**	NA	1.0	
Silver	**ND**	**ND**	NA	0.50	
Thallium	**ND**	**ND**	NA	0.50	
Zinc	**4.48**	**4.18**	7	2.5	

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

TOTAL MERCURY
EPA 7470A
DUPLICATE QUALITY CONTROL

Date Extracted: 9-1-10
Date Analyzed: 9-1-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: 08-163-01

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Mercury	**ND**	**ND**	NA	0.025	

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

TOTAL METALS
EPA 200.8
MS/MSD QUALITY CONTROL

Date Extracted: 8-31-10
Date Analyzed: 8-31&9-2-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: 08-153-02

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Antimony	100	**91.9**	92	**93.5**	94	2	
Arsenic	100	**102**	90	**104**	91	2	
Beryllium	100	**83.6**	84	**81.4**	81	3	
Cadmium	100	**95.4**	95	**93.2**	93	2	
Chromium	100	**80.7**	80	**78.0**	77	4	
Copper	100	**94.3**	89	**95.0**	90	1	
Lead	100	**94.1**	94	**93.9**	94	0	
Nickel	100	**94.1**	91	**94.5**	91	0	
Selenium	100	**93.9**	94	**91.4**	91	3	
Silver	100	**89.4**	89	**92.6**	93	4	
Thallium	100	**95.8**	96	**90.6**	91	6	
Zinc	100	**101**	96	**98.8**	94	2	

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

TOTAL MERCURY
EPA 7470A
MS/MSD QUALITY CONTROL

Date Extracted: 9-1-10
Date Analyzed: 9-1-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: 08-163-01

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Mercury	6.25	**5.92**	95	**5.70**	91	4	

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

DISSOLVED METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	08-163-02					
Client ID:	**WB-GW-MW08-0080**					
Antimony	**ND**	0.50	200.8		9-2-10	
Arsenic	**ND**	1.2	200.8		8-31-10	
Beryllium	**ND**	0.50	200.8		8-31-10	
Cadmium	**ND**	0.50	200.8		9-1-10	
Chromium	**1.1**	0.50	200.8		8-31-10	
Copper	**4.2**	1.0	200.8		8-31-10	
Lead	**ND**	0.50	200.8		9-1-10	
Mercury	**ND**	0.025	7470A		9-1-10	
Nickel	**10**	0.50	200.8		9-1-10	
Selenium	**ND**	24	200.8		8-31-10	
Silver	**ND**	0.50	200.8		9-1-10	
Thallium	**ND**	0.50	200.8		9-1-10	
Zinc	**5.9**	2.5	200.8		8-31-10	
Lab ID:	08-163-03					
Client ID:	**WB-GW-MW09-0080**					
Antimony	**ND**	0.50	200.8		9-2-10	
Arsenic	**ND**	1.2	200.8		9-2-10	
Beryllium	**ND**	0.50	200.8		8-31-10	
Cadmium	**ND**	0.50	200.8		8-31-10	
Chromium	**0.75**	0.50	200.8		8-31-10	
Copper	**3.5**	1.0	200.8		8-31-10	
Lead	**ND**	0.50	200.8		8-31-10	
Mercury	**ND**	0.025	7470A		9-1-10	
Nickel	**7.8**	0.50	200.8		9-1-10	
Selenium	**ND**	18	200.8		9-2-10	
Silver	**ND**	0.50	200.8		9-2-10	
Thallium	**ND**	0.50	200.8		8-31-10	
Zinc	**4.5**	2.5	200.8		8-31-10	

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

DISSOLVED METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	08-163-04					
Client ID:	**WB-GW-MW09-1080**					
Antimony	**ND**	0.50	200.8		9-2-10	
Arsenic	**ND**	1.2	200.8		9-2-10	
Beryllium	**ND**	0.50	200.8		8-31-10	
Cadmium	**ND**	0.50	200.8		8-31-10	
Chromium	**0.80**	0.50	200.8		8-31-10	
Copper	**3.4**	1.0	200.8		8-31-10	
Lead	**ND**	0.50	200.8		8-31-10	
Mercury	**ND**	0.025	7470A		9-1-10	
Nickel	**8.3**	0.50	200.8		9-1-10	
Selenium	**ND**	16	200.8		9-2-10	
Silver	**ND**	0.50	200.8		9-2-10	
Thallium	**ND**	0.50	200.8		8-31-10	
Zinc	**4.1**	2.5	200.8		8-31-10	
Lab ID:	08-163-05					
Client ID:	**WB-GW-MW10-0080**					
Antimony	**ND**	1.3	200.8		9-2-10	
Arsenic	**ND**	3.5	200.8		8-31-10	
Beryllium	**ND**	0.50	200.8		8-31-10	
Cadmium	**ND**	0.50	200.8		9-1-10	
Chromium	**1.4**	0.50	200.8		8-31-10	
Copper	**5.1**	1.0	200.8		8-31-10	
Lead	**ND**	0.50	200.8		9-1-10	
Mercury	**ND**	0.025	7470A		9-1-10	
Nickel	**12**	0.50	200.8		9-1-10	
Selenium	**ND**	27	200.8		8-31-10	
Silver	**ND**	1.3	200.8		9-2-10	
Thallium	**ND**	0.50	200.8		9-1-10	
Zinc	**4.8**	2.5	200.8		8-31-10	

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

DISSOLVED METALS
EPA 200.8
METHOD BLANK QUALITY CONTROL

Date Analyzed: 8-31&9-2-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0831D1

Analyte	Method	Result	PQL
Antimony	200.8	**ND**	0.50
Arsenic	200.8	**ND**	1.2
Beryllium	200.8	**ND**	0.50
Cadmium	200.8	**ND**	0.50
Chromium	200.8	**ND**	0.50
Copper	200.8	**ND**	0.50
Lead	200.8	**ND**	0.50
Nickel	200.8	**ND**	0.50
Selenium	200.8	**ND**	1.00
Silver	200.8	**ND**	0.50
Thallium	200.8	**ND**	0.50
Zinc	200.8	**ND**	2.5

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

DISSOLVED MERCURY
EPA 7470A
METHOD BLANK QUALITY CONTROL

Date Analyzed: 9-1-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0901D1

Analyte	Method	Result	PQL
Mercury	7470A	**ND**	0.025

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

DISSOLVED METALS
EPA 200.8
DUPLICATE QUALITY CONTROL

Date Analyzed: 8-31&9-2-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: 08-213-02

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Antimony	**3.34**	**3.40**	2	0.50	
Arsenic	**3.43**	**3.40**	1	1.20	
Beryllium	**ND**	**ND**	NA	0.50	
Cadmium	**ND**	**ND**	NA	0.50	
Chromium	**1.49**	**1.45**	3	0.50	
Copper	**15.3**	**17.3**	13	0.50	
Lead	**ND**	**ND**	NA	0.50	
Nickel	**6.17**	**6.48**	5	0.50	
Selenium	**1.12**	**1.19**	7	1.0	
Silver	**ND**	**ND**	NA	0.50	
Thallium	**ND**	**ND**	NA	0.50	
Zinc	**16.1**	**17.1**	6	2.5	

Date of Report: September 3, 2010
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Laboratory Reference: 1008-163
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DISSOLVED MERCURY
EPA 7470A
DUPLICATE QUALITY CONTROL

Date Analyzed: 9-1-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: 08-163-02

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Mercury	**ND**	**ND**	NA	0.025	

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

DISSOLVED METALS
EPA 200.8/7470A
MS/MSD QUALITY CONTROL

Date Analyzed: 8-31&9-2-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: 08-213-02

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Antimony	100	**99.1**	96	**101**	98	2	
Arsenic	100	**95.6**	92	**97.4**	94	2	
Beryllium	100	**94.5**	95	**96.5**	97	2	
Cadmium	100	**93.3**	93	**94.6**	95	1	
Chromium	100	**90.1**	89	**91.4**	90	2	
Copper	100	**110**	94	**111**	95	1	
Lead	100	**94.1**	94	**96.2**	96	2	
Nickel	100	**100**	94	**102**	96	2	
Selenium	100	**94.0**	93	**95.9**	95	2	
Silver	100	**81.3**	81	**78.1**	78	4	
Thallium	100	**94.6**	95	**96.8**	97	2	
Zinc	100	**106**	90	**108**	92	2	

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

DISSOLVED MERCURY
EPA 7470A
MS/MSD QUALITY CONTROL

Date Analyzed: 9-1-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: 08-163-02

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Mercury	6.25	**5.40**	86	**5.63**	90	4	

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

CHLORIDE
SM 4500-Cl E

Date Analyzed: 8-26-10

Matrix: Water

Units: mg /L

Client ID	Lab ID	**Result**	PQL
WB-SW-SW01-0000	08-163-01	**19000**	400
WB-GW-MW08-0080	08-163-02	**8800**	200
WB-GW-MW09-0080	08-163-03	**9100**	200
WB-GW-MW09-1080	08-163-04	**8500**	200
WB-GW-MW10-0080	08-163-05	**12000**	500

Date of Report: September 3, 2010
Samples Submitted: August 24, 2010
Laboratory Reference: 1008-163
Project: 235-1577-024

CHLORIDE
SM 4500-Cl E
QUALITY CONTROL

Date Analyzed: 8-26-10

Matrix: Water
Units: mg /L

METHOD BLANK QUALITY CONTROL

Lab ID	Result	PQL
MB0826W1	ND	2.0

SPIKE BLANK QUALITY CONTROL

Lab ID	Result	Spiked Amount	Percent Recovery	Control Limit	Flag
SB0826W1	59.5	50.0	119	95-127	

MATRIX SPIKE QUALITY CONTROL

Lab ID	Result	Spiked Amount	Percent Recovery	Control Limit	Flag
08-163-05	11900				
Matrix Spike	26000	12500	113	97-124	

DUPLICATE QUALITY CONTROL

Lab ID	Result	Duplicate Result	RPD	Control Limit	Flag
08-163-05	11900	11700	2	12	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Sep 3 2010
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
WB-SW-SW01-000	Water	10-A014338	CONV
WB-GW-MW08-0080	Water	10-A014339	CONV
WB-GW-MW09-0080	Water	10-A014340	CONV
WB-GW-MW09-1080	Water	10-A014341	CONV
WB-GW-MW10-0080	Water	10-A014342	CONV

Your samples were received on Wednesday, August 25, 2010. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Method Detection Limits (MDL's), as opposed to Practical Quantitation Limits (PQL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 235-1577-024

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics
NUT=Nutrients
DEM=Demand
MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project #: 235-1577-024
All results reported on an as received basis.

Date Received: 08/25/10
Date Reported: 9/ 3/10

AMTEST Identification Number **10-A014338**
Client Identification **WB-SW-SW01-000**
Sampling Date **08/23/10, 09:20**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Dissolved Organic Carbon	23.	mg/l		0.50	EPA 415.2	KK	08/27/10

AMTEST Identification Number **10-A014339**
Client Identification **WB-GW-MW08-0080**
Sampling Date **08/23/10, 10:25**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Dissolved Organic Carbon	100	mg/l		0.50	EPA 415.2	KK	08/27/10

AMTEST Identification Number **10-A014340**
Client Identification **WB-GW-MW09-0080**
Sampling Date **08/23/10, 11:00**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Dissolved Organic Carbon	72.	mg/l		0.50	EPA 415.2	KK	08/27/10

AMTEST Identification Number **10-A014341**
Client Identification **WB-GW-MW09-1080**
Sampling Date **08/23/10, 11:10**

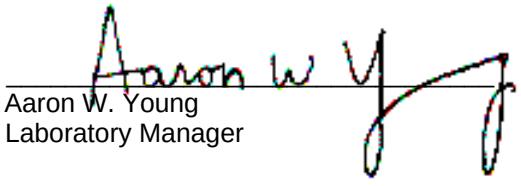
Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Dissolved Organic Carbon	120	mg/l		0.50	EPA 415.2	KK	09/01/10

AMTEST Identification Number **10-A014342**
Client Identification **WB-GW-MW10-0080**
Sampling Date **08/23/10, 11:45**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Dissolved Organic Carbon	38.	mg/l		0.50	EPA 415.2	KK	09/01/10



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

QC Summary for sample numbers: 10-A014338 to 10-A014342

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
10-A014639	Dissolved Organic Carbon	mg/l	2.7	3.3	20.

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
10-A014639	Dissolved Organic Carbon	mg/l	2.7	100	100	97.30 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Dissolved Organic Carbon	mg/l	100	92.	92.0 %
Dissolved Organic Carbon	mg/l	100	100	100. %
Dissolved Organic Carbon	mg/l	100	100	100. %

BLANKS

ANALYTE	UNITS	RESULT
Dissolved Organic Carbon	mg/l	< 0.5
Dissolved Organic Carbon	mg/l	< 0.5
Dissolved Organic Carbon	mg/l	< 0.5

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 08-163

Subcontract Laboratory: AmTest Laboratories

Turnaround Request: 1 Day 2 Day 3 Day (Standard)

Project Manager: David Baumeister

Attention: Aaron Young

email: dbaumeister@onsite-env.com

13600 NE 126th Pl Kirkland, WA 98034

Project Number: 235-1577-024

Phone Number: (206) 695-6200

Other: _____

Project Name: _____

Date/Time: _____

7.0 °C

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analysis
14388	WB-SW-SW01-0000	8/23/10	0920	W	2	Diss. Organic Carbon
39	WB-GW-MW08-0080	↓	1025	↓	↓	↓
40	WB-GW-MW09-0080		1100			
41	WB-GW-MW09-1080		1110			
42	WB-GW-MW10-0080	↓	1145	↓	↓	↓

	Signature	Company	Date	Time
Relinquished by:		OSE	8/25/10	1245
Received by:		Amtest	8/25/10	1245
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

Comments/Special Instructions

EIM

Chain of Custody

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: Parametrix
Project Number: 235-1577-024
Project Name: West Bay
Project Manager: D. Dinkuhn
Sampled by: L. Linde

Turnaround Request (in working days)

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Day
- ☐ 3 Day
- ☒ Standard (7 working days)
  (TPH analysis 5 working days)
- ☐ _____ (other)

Laboratory Number: * 08-163

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270D / SIM	PAHs by 8270D / SIM	PCBs by 8082	Pesticides by 8081A	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	PP metals (Total)	PP metals (Diss.)	Chloride	Diss. Organic Carbon			% Moisture
1	WB-SW-SW01-0000	8/23/10	0920	SW	4														X		X	X			
2	WB-GW-MW08-0080	↓	1025	GW	5														↓	X	↓	↓			
3	WB-GW-MW09-0080		1100	↓	↓															↓					
4	WB-GW-MW09-1080		1110																						
5	WB-GW-MW10-0080		1145																						

	Signature	Company	Date	Time
Relinquished by	Lara Linde	PMX	8/23/10	1430
Received by		QSE	8/24/10	945
Relinquished by				
Received by				
Relinquished by				
Received by				

Comments/Special Instructions:

* Field filtered

① EIM EDDs

Reviewed by/Date

Reviewed by/Date

Chromatograms with final report ☐

DISTRIBUTION LEGEND: White - OnSite Copy Yellow - Client Copy