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TECHNICAL MEMORANDUM

Date:	March 22, 2010
To:	Steve Teel - Department of Ecology
From:	David Dinkuhn, P.E. DLD
Subject:	Solid Wood Incorporated Site Quarterly Groundwater Monitoring Results, Quarter 5, February 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 5 GROUNDWATER MONITORING RESULTS, FEBRUARY 2009

This technical memorandum presents results for the fifth 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 fifth quarterly monitoring event conducted under the site's ongoing Remedial Investigation/Feasibility Study (RI/FS).

QUARTER 5 GROUNDWATER MONITORING RESULTS

Groundwater samples were collected from three new monitoring wells (MW-08 through MW-10) installed in January 2010 in the vicinity of the site's former wood burner in accordance with the work plan. Boring logs for these wells are attached and locations are shown on Figure 1. The wells were installed following the removal of metals and dioxins-contaminated soils from Area D during the Interim Action performed in summer 2009 (Parametrix 2010). The purpose of the wells is to monitor groundwater conditions following the cleanup.

Groundwater samples were collected on February 3, 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 final set of water quality parameter measurements is provided in Table 1. All samples were collected on an outgoing tide. A tide chart for February 3, 2010 at Olympia, Washington is attached for reference. Approximate sampling times are provided in Table 1.

Groundwater samples were submitted to Onsite Environmental of Redmond, Washington for chemical analysis of priority pollutant metals (total and dissolved) and chloride. A summary of the sampling 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

Well ID	Date/Time	pH (units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/l)	Temperature (°C)	Turbidity (NTU)	Redox (mV)	Salinity (%)
MW-08	2/3/10 @ 1439	7.26	2.91	2.12	10.00	<1	-370	1.8
MW-09	2/3/10 @ 1356	7.49	23.0	2.16	10.1	<1	-389	1.4
MW-10	2/3/10 @ 1307	6.42	31.4	4.28	9.0	<1	-213	1.9

Notes:
mS/cm = microsiemens per centimeter.
mg/l = milligrams per liter.
°C = degrees Celsius.
NTU = nephelometric turbidity units.
NM = not measured
mV = millivolts.
% = percent.

DISCUSSION AND RECOMMENDATIONS

As shown in Table 2, constituents that exceeded RLs in the groundwater samples consist of total and dissolved copper and nickel. The apparent source of these metals is the former contaminated soils located in Area D, which were sampled during previous investigations and found to contain elevated levels of copper, lead, nickel, zinc, and dioxins. During the Interim Action, an estimated quantity of 2,346 tons of contaminated soil were excavated from this area and disposed of at an off-site landfill. The results of confirmation soil samples collected during the Interim Action indicate that all soils with concentrations exceeding the RLs established in the RI/FS work plan were successfully removed (Parametrix 2010).

The concentrations of copper and nickel detected in the wells are similar to those detected in nearby groundwater Seeps 4 and 5 (Figure 1), which were sampled in January 2009 as part of the RI/FS activities (Parametrix 2009). The anticipated source of metals in Seeps 4 and 5 was buried metal debris observed in Area E. This debris was removed during the IA.

The concentrations of copper and nickel detected in the seeps and monitoring wells apparently exceed Puget Sound background levels for marine waters (PSWQAT 1997; Table 3).

It is recommended that further evaluation of metals concentrations in groundwater be conducted following the upcoming 6th quarterly monitoring event in May 2010. Seeps 4 and 5 should also be sampled at this time to assess post- debris removal conditions (in accordance with the RI/FS work plan). The seep samples will be analyzed for the same constituents as MW-08 through MW-10 (dissolved and total priority pollutant metals and chloride). The second batch of groundwater data from the wells will provide an indication of groundwater concentration trends following the Interim Action. If the Area D soils were the primary source of the metals, a decreasing concentration trend should be seen.

REFERENCES

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. 2009. Technical Memorandum – Seep Sampling and Storm Drain Line Survey Results. Prepared for City of Olympia Parks, Arts, and Recreation Department. March 25.

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

Puget Sound Water Quality Action Team (PSWQAT). 1997. Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples. Prepared for the United States Environmental Protection Agency (EPA), Seattle, Washington. April.

Attachments: Table 2

Figure 1

Tide Chart

Monitoring Well Logs

Data Validation Technical Memorandum

Laboratory Report

Table 2
Solid Wood Inicorporated Site RI/FS
Quarter 5 Groundwater Results, February 2010

ANALYTE	Units	Well ID / Date Sampled / RL	MW-08 2/3/10	MW-09 2/3/10	MW-09 (Dup) 2/3/10	MW-10 2/3/10
TOTAL METALS						
Antimony	µg/l	6[a]	6U	6U	6U	6U
Arsenic	µg/l	5	*6.5U*	5U	5U	*7.5U*
Beryllium	µg/l	4[a]	4U	4U	4U	4U
Cadmium	µg/l	5	5U	5U	5U	5U
Chromium	µg/l	50	50U	50U	50U	50U
Copper	µg/l	2.4[b]	5.4	4	3.4	6.8
Lead	µg/l	8.1[b]	8U	8U	8U	8U
Mercury	µg/l	0.025[b]	*0.038U*	*0.038U*	*0.038U*	*0.038U*
Nickel	µg/l	8.2[b]	9.8	11	11	13
Selenium	µg/l	50[a]	50U	50U	50U	50U
Silver	µg/l	1.9[b]	1.9U	1.9U	1.9U	1.9U
Thallium	µg/l	0.47[b]	0.45U	0.45U	0.45U	0.45U
Zinc	µg/l	81[b]	80U	80U	80U	80U
DISSOLVED METALS						
Antimony	µg/l	6[a]	6U	6U	6U	6U
Arsenic	µg/l	5	*8U*	*6U*	5U	*7.5U*
Beryllium	µg/l	4[a]	4U	4U	4U	4U
Cadmium	µg/l	5	5U	5U	5U	5U
Chromium	µg/l	50	50U	50U	50U	50U
Copper	µg/l	2.4[b]	5.5	4.1	3.4	5.9
Lead	µg/l	8.1[b]	8U	8U	8U	8U
Mercury	µg/l	0.025[b]	*0.038U*	*0.038U*	*0.038U*	*0.038U*
Nickel	µg/l	8.2[b]	12	11	8.9	11
Selenium	µg/l	50[a]	50U	50U	50U	50U
Silver	µg/l	1.9[b]	1.9U	1.9U	1.9U	1.9U
Thallium	µg/l	0.47[b]	0.45U	0.45U	0.45U	0.45U
Zinc	µg/l	81[b]	80U	80U	80U	80U
GENERAL CHEMISTRY						
Chloride	mg/l	-	11,000	8,600	8,400	13,000

Notes:

[a] = State and federal groundater maximum contaminant level (MCL).

[b] = Surface water applicable or relevant and appropriate requirement (ARAR).

italics PQL exceeds screening level.

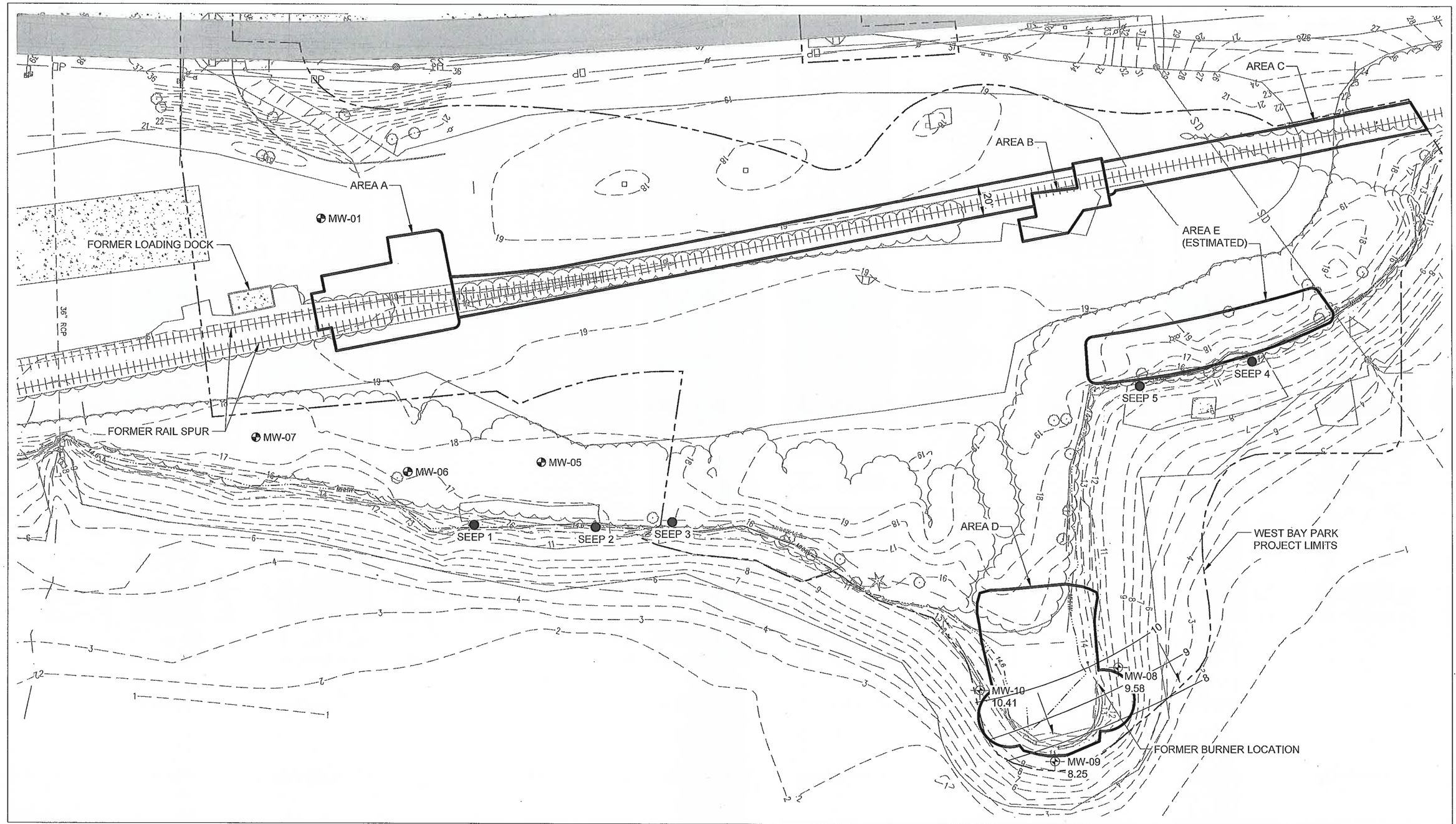
mg/l = milligrams per liter.

RL = Remedial level.

µg/l = micrograms per liter.

U = Not detected at given practical quantitation limit (PQL).

Exceeds screening level.



Parametrix DATE: 03/19/08 09:06am FILE: BR1577024P04T05F-05

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SCALE IN FEET

LEGEND

- INTERIM ACTION AREAS FROM SUMMER 2009 CLEANUP ACTIVITIES
- EXISTING MONITORING WELL
- SEEP SAMPLE LOCATION (JANUARY 2009)
- GROUNDWATER FLOW
- 10 — INFERRED GROUND WATER SURFACE ELEVATION CONTOUR
- MW-10 10.41 — NEW MONITORING WELL AND GROUNDWATER ELEVATION MEASURED 2/ 3/ 10

NOTES

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

Figure 1
Solid Wood Incorporated Site
(West Bay Park)
Olympia, Washington
Qtr 5 GW Surface Elevation Contours
February 2010

MW sampling

Tides for Olympia, Budd Inlet starting with February 3, 2010.

Day		High /Low	Tide Time	Height Feet	Sunrise Sunset	Moon	Time	% Moon Visible
W	3	Low	2:09 AM	1.7	7:34 AM	Set	9:19 AM	81
	3	High	8:29 AM	16.8	5:17 PM	Rise	11:44 PM	
	3	Low	3:13 PM	2.1				
	3	High	9:02 PM	12.6				

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.

Tide Sun **www.saltwatertides.com** Moon Tide

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

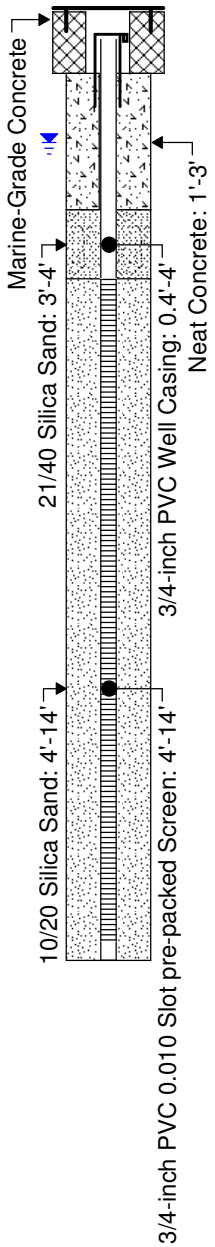
Log ID: MW-08/BCC757

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*

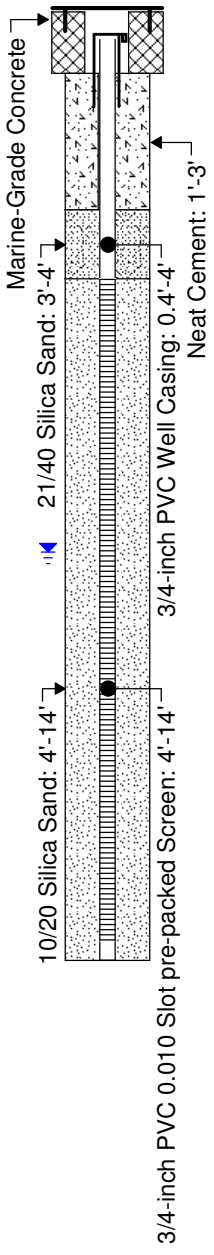
Log ID: MW-09/BCC758

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



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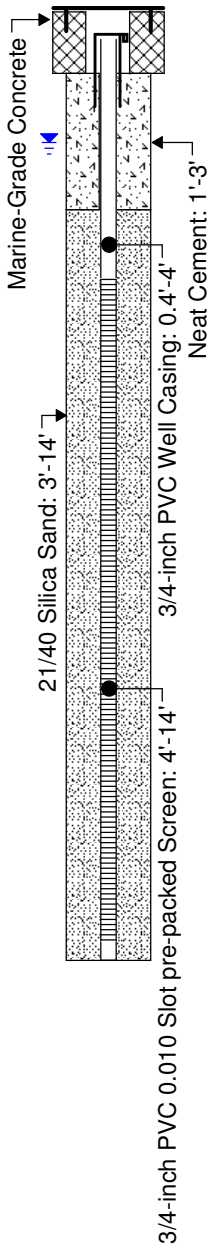
Log ID: MW-10/BCC759

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



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TECHNICAL MEMORANDUM

Date:	February 25, 2010
To:	Project File
From:	Lara Linde
Subject:	Quality Assurance/Quality Control Review for West Bay
cc:	David Dinkuhn
Project Number:	235-1577-024 04/04
Project Name:	West Bay Fifth Quarter 2010 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 on February 3, 2010. Four groundwater samples (including a field duplicate [WB-GW-MW09-1090]) were submitted to OnSite Environmental, Inc. (Redmond, WA) for analysis. All groundwater samples were analyzed for total and dissolved priority pollutant metals and chloride.

Final laboratory data were submitted to Parametrix via a Tier II-type data report (On-Site Laboratory Reference Number 1002-043). 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 chain-of-custody were conducted, and no laboratory method blank contamination was observed. Elevated practical quantitation limits (PQLs) were reported for total and dissolved arsenic due to interferences present in a portion of the samples.

All other analytical QC results were in control, indicating acceptable analytical accuracy and precision. Field duplicate results were acceptable.

CONCLUSION

All samples were analyzed within holding times and appropriate standard methods were used. No laboratory method blank contamination was observed. Elevated PQLs for total and dissolved arsenic were reported in some samples, however, did not appear to affect data quality. Analytical accuracy and precision were determined to be generally acceptable based on this review. Field duplicate results were acceptable. All data reported should be considered valid as qualified and acceptable for further use.

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

February 18, 2010

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

Re: Analytical Data for Project 235-1577-024
Laboratory Reference No. 1002-043

Dear David:

Enclosed are the analytical results and associated quality control data for samples submitted on February 5, 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: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
Project: 235-1577-024

Case Narrative

Samples were collected on February 3, 2010, and received by the laboratory on February 5, 2010. They were maintained at the laboratory at a temperature of 2°C to 6°C except as noted below.

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 limit for Arsenic is elevated for samples WB-GW-MW08-0090 and WB-GW-MW10-0080 due to interferences present in the sample.

Dissolved Metals EPA 200.8/7470A Analysis

The practical quantitation limit for Arsenic is elevated for samples WB-GW-MW08-0090, WB-GW-MW09-0090, and WB-GW-MW10-0080 due to interferences present in the sample.

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

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
Project: 235-1577-024

CHLORIDE
SM 4500-Cl E

Matrix: Water
Units: mg /L

Client ID	Lab ID	**Result**	PQL
WB-GW-MW08-0090	02-043-01	**11000**	1000
WB-GW-MW09-0090	02-043-02	**8600**	200
WB-GW-MW09-1090	02-043-03	**8400**	200
WB-GW-MW10-0080	02-043-04	**13000**	1000

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
Project: 235-1577-024

CHLORIDE
SM 4500-Cl E
QUALITY CONTROL

Date Analyzed: 2-12-10

Matrix: Water
Units: mg /L

METHOD BLANK QUALITY CONTROL

Lab ID	Result	PQL
MB0212W1	ND	2.0

SPIKE BLANK QUALITY CONTROL

Lab ID	Result	Spiked Amount	Percent Recovery	Control Limit	Flag
SB0212W1	58.2	50.0	116	91-127	

MATRIX SPIKE QUALITY CONTROL

Lab ID	Result	Spiked Amount	Percent Recovery	Control Limit	Flag
02-050-01	7.93				
Matrix Spike	62.6	50.0	109	91-125	

DUPLICATE QUALITY CONTROL

Lab ID	Result	Duplicate Result	RPD	Control Limit	Flag
02-050-01	7.93	7.72	3	15	

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
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:	02-043-01					
Client ID:	**WB-GW-MW08-0090**					
Antimony	**ND**	6.0	200.8	2-16-10	2-16-10	
Arsenic	**ND**	6.5	200.8	2-16-10	2-16-10	
Beryllium	**ND**	4.0	200.8	2-16-10	2-16-10	
Cadmium	**ND**	5.0	200.8	2-16-10	2-16-10	
Chromium	**ND**	50	200.8	2-16-10	2-16-10	
Copper	**5.4**	2.4	200.8	2-16-10	2-16-10	
Lead	**ND**	8.0	200.8	2-16-10	2-16-10	
Mercury	**ND**	0.038	7470A	2-8-10	2-8-10	
Nickel	**9.8**	8.0	200.8	2-16-10	2-16-10	
Selenium	**ND**	50	200.8	2-16-10	2-16-10	
Silver	**ND**	1.9	200.8	2-16-10	2-16-10	
Thallium	**ND**	0.45	200.8	2-16-10	2-16-10	
Zinc	**ND**	80	200.8	2-16-10	2-16-10	

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
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:	02-043-02					
Client ID:	**WB-GW-MW09-0090**					
Antimony	**ND**	6.0	200.8	2-16-10	2-16-10	
Arsenic	**ND**	5.0	200.8	2-16-10	2-16-10	
Beryllium	**ND**	4.0	200.8	2-16-10	2-16-10	
Cadmium	**ND**	5.0	200.8	2-16-10	2-16-10	
Chromium	**ND**	50	200.8	2-16-10	2-16-10	
Copper	**4.0**	2.4	200.8	2-16-10	2-16-10	
Lead	**ND**	8.0	200.8	2-16-10	2-16-10	
Mercury	**ND**	0.038	7470A	2-8-10	2-8-10	
Nickel	**11**	8.0	200.8	2-16-10	2-16-10	
Selenium	**ND**	50	200.8	2-16-10	2-16-10	
Silver	**ND**	1.9	200.8	2-16-10	2-16-10	
Thallium	**ND**	0.45	200.8	2-16-10	2-16-10	
Zinc	**ND**	80	200.8	2-16-10	2-16-10	

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
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:	02-043-03					
Client ID:	**WB-GW-MW09-1090**					
Antimony	**ND**	6.0	200.8	2-16-10	2-16-10	
Arsenic	**ND**	5.0	200.8	2-16-10	2-16-10	
Beryllium	**ND**	4.0	200.8	2-16-10	2-16-10	
Cadmium	**ND**	5.0	200.8	2-16-10	2-16-10	
Chromium	**ND**	50	200.8	2-16-10	2-16-10	
Copper	**3.4**	2.4	200.8	2-16-10	2-16-10	
Lead	**ND**	8.0	200.8	2-16-10	2-16-10	
Mercury	**ND**	0.038	7470A	2-8-10	2-8-10	
Nickel	**11**	8.0	200.8	2-16-10	2-16-10	
Selenium	**ND**	50	200.8	2-16-10	2-16-10	
Silver	**ND**	1.9	200.8	2-16-10	2-16-10	
Thallium	**ND**	0.45	200.8	2-16-10	2-16-10	
Zinc	**ND**	80	200.8	2-16-10	2-16-10	

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
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:	02-043-04					
Client ID:	**WB-GW-MW10-0080**					
Antimony	**ND**	6.0	200.8	2-16-10	2-16-10	
Arsenic	**ND**	7.5	200.8	2-16-10	2-16-10	
Beryllium	**ND**	4.0	200.8	2-16-10	2-16-10	
Cadmium	**ND**	5.0	200.8	2-16-10	2-16-10	
Chromium	**ND**	50	200.8	2-16-10	2-16-10	
Copper	**6.8**	2.4	200.8	2-16-10	2-16-10	
Lead	**ND**	8.0	200.8	2-16-10	2-16-10	
Mercury	**ND**	0.038	7470A	2-8-10	2-8-10	
Nickel	**13**	8.0	200.8	2-16-10	2-16-10	
Selenium	**ND**	50	200.8	2-16-10	2-16-10	
Silver	**ND**	1.9	200.8	2-16-10	2-16-10	
Thallium	**ND**	0.45	200.8	2-16-10	2-16-10	
Zinc	**ND**	80	200.8	2-16-10	2-16-10	

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
Project: 235-1577-024

TOTAL METALS
EPA 200.8
METHOD BLANK QUALITY CONTROL

Date Extracted: 2-12-10
Date Analyzed: 2-16-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0212W1

Analyte	Method	Result	PQL
Antimony	200.8	**ND**	6.0
Arsenic	200.8	**ND**	5.0
Beryllium	200.8	**ND**	4.0
Cadmium	200.8	**ND**	5.0
Chromium	200.8	**ND**	50
Copper	200.8	**ND**	2.4
Lead	200.8	**ND**	8.0
Nickel	200.8	**ND**	8.0
Selenium	200.8	**ND**	50
Silver	200.8	**ND**	1.9
Thallium	200.8	**ND**	0.45
Zinc	200.8	**ND**	80

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
Project: 235-1577-024

TOTAL MERCURY
EPA 7470A
METHOD BLANK QUALITY CONTROL

Date Extracted:	2-8-10
Date Analyzed:	2-8-10
Matrix:	Water
Units:	ug/L (ppb)
Lab ID:	MB0208W1

Analyte	Method	Result	PQL
Mercury	7470A	**ND**	0.038

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
Project: 235-1577-024

TOTAL METALS
EPA 200.8
DUPLICATE QUALITY CONTROL

Date Extracted: 2-12-10
Date Analyzed: 2-16-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: 02-043-03

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Antimony	**ND**	**ND**	NA	6.0	
Arsenic	**ND**	**ND**	NA	5.0	
Beryllium	**ND**	**ND**	NA	4.0	
Cadmium	**ND**	**ND**	NA	5.0	
Chromium	**ND**	**ND**	NA	50	
Copper	**3.37**	**3.93**	15	2.4	
Lead	**ND**	**ND**	NA	8.0	
Nickel	**11.2**	**10.1**	11	8.0	
Selenium	**ND**	**ND**	NA	50	
Silver	**ND**	**ND**	NA	1.9	
Thallium	**ND**	**ND**	NA	0.45	
Zinc	**ND**	**ND**	NA	80	

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
Project: 235-1577-024

TOTAL MERCURY
EPA 7470A
DUPLICATE QUALITY CONTROL

Date Extracted: 2-8-10
Date Analyzed: 2-8-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: 02-043-01

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Mercury	**ND**	**ND**	NA	0.038	

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
Project: 235-1577-024

TOTAL METALS
EPA 200.8
MS/MSD QUALITY CONTROL

Date Extracted: 2-12-10
Date Analyzed: 2-16-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: 02-043-03

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Antimony	100	**108**	108	**105**	105	3	
Arsenic	100	**117**	117	**111**	111	5	
Beryllium	100	**111**	111	**105**	105	6	
Cadmium	100	**105**	105	**99.7**	100	5	
Chromium	100	**97.1**	97	**97.1**	97	0	
Copper	100	**99.8**	96	**95.2**	92	5	
Lead	100	**99.1**	99	**94.1**	94	5	
Nickel	100	**110**	99	**106**	95	4	
Selenium	100	**120**	120	**116**	116	3	
Silver	100	**88.5**	88	**87.0**	87	2	
Thallium	100	**99.5**	100	**96.1**	96	4	
Zinc	100	**108**	108	**103**	103	5	

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
Project: 235-1577-024

TOTAL MERCURY
EPA 7470A
MS/MSD QUALITY CONTROL

Date Extracted: 2-8-10
Date Analyzed: 2-8-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: 02-043-01

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Mercury	12.5	**11.5**	92	**11.5**	92	0	

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
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:	02-043-01					
Client ID:	**WB-GW-MW08-0090**					
Antimony	**ND**	6.0	200.8		2-16-10	
Arsenic	**ND**	8.0	200.8		2-16-10	
Beryllium	**ND**	4.0	200.8		2-16-10	
Cadmium	**ND**	5.0	200.8		2-16-10	
Chromium	**ND**	50	200.8		2-16-10	
Copper	**5.5**	2.4	200.8		2-16-10	
Lead	**ND**	8.0	200.8		2-16-10	
Mercury	**ND**	0.038	7470A		2-8-10	
Nickel	**12**	8.0	200.8		2-16-10	
Selenium	**ND**	50	200.8		2-16-10	
Silver	**ND**	1.9	200.8		2-17-10	
Thallium	**ND**	0.45	200.8		2-16-10	
Zinc	**ND**	80	200.8		2-16-10	

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
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:	02-043-02					
Client ID:	**WB-GW-MW09-0090**					
Antimony	**ND**	6.0	200.8		2-16-10	
Arsenic	**ND**	6.0	200.8		2-16-10	
Beryllium	**ND**	4.0	200.8		2-16-10	
Cadmium	**ND**	5.0	200.8		2-16-10	
Chromium	**ND**	50	200.8		2-16-10	
Copper	**4.1**	2.4	200.8		2-16-10	
Lead	**ND**	8.0	200.8		2-16-10	
Mercury	**ND**	0.038	7470A		2-8-10	
Nickel	**11**	8.0	200.8		2-16-10	
Selenium	**ND**	50	200.8		2-16-10	
Silver	**ND**	1.9	200.8		2-17-10	
Thallium	**ND**	0.45	200.8		2-16-10	
Zinc	**ND**	80	200.8		2-16-10	

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
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:	02-043-03					
Client ID:	**WB-GW-MW09-1090**					
Antimony	**ND**	6.0	200.8		2-16-10	
Arsenic	**ND**	5.0	200.8		2-16-10	
Beryllium	**ND**	4.0	200.8		2-16-10	
Cadmium	**ND**	5.0	200.8		2-16-10	
Chromium	**ND**	50	200.8		2-16-10	
Copper	**3.4**	2.4	200.8		2-16-10	
Lead	**ND**	8.0	200.8		2-16-10	
Mercury	**ND**	0.038	7470A		2-8-10	
Nickel	**8.9**	8.0	200.8		2-16-10	
Selenium	**ND**	50	200.8		2-16-10	
Silver	**ND**	1.9	200.8		2-17-10	
Thallium	**ND**	0.45	200.8		2-16-10	
Zinc	**ND**	80	200.8		2-16-10	

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
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:	02-043-04					
Client ID:	**WB-GW-MW10-0080**					
Antimony	**ND**	6.0	200.8		2-16-10	
Arsenic	**ND**	7.5	200.8		2-16-10	
Beryllium	**ND**	4.0	200.8		2-16-10	
Cadmium	**ND**	5.0	200.8		2-16-10	
Chromium	**ND**	50	200.8		2-16-10	
Copper	**5.9**	2.4	200.8		2-16-10	
Lead	**ND**	8.0	200.8		2-16-10	
Mercury	**ND**	0.038	7470A		2-8-10	
Nickel	**11**	8.0	200.8		2-16-10	
Selenium	**ND**	50	200.8		2-16-10	
Silver	**ND**	1.9	200.8		2-17-10	
Thallium	**ND**	0.45	200.8		2-16-10	
Zinc	**ND**	80	200.8		2-16-10	

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
Project: 235-1577-024

DISSOLVED METALS
EPA 200.8
METHOD BLANK QUALITY CONTROL

Date Analyzed: 2-16&17-10
Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0211D1&MB0217D1

Analyte	Method	Result	PQL
Antimony	200.8	**ND**	6.0
Arsenic	200.8	**ND**	5.0
Beryllium	200.8	**ND**	4.0
Cadmium	200.8	**ND**	5.0
Chromium	200.8	**ND**	50
Copper	200.8	**ND**	2.4
Lead	200.8	**ND**	8.0
Nickel	200.8	**ND**	8.0
Selenium	200.8	**ND**	50
Silver	200.8	**ND**	1.9
Thallium	200.8	**ND**	0.45
Zinc	200.8	**ND**	80

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
Project: 235-1577-024

DISSOLVED MERCURY
EPA 7470A
METHOD BLANK QUALITY CONTROL

Date Analyzed: 2-8-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0208D1

Analyte	Method	Result	PQL
Mercury	7470A	**ND**	0.038

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
Project: 235-1577-024

DISSOLVED METALS
EPA 200.8
DUPLICATE QUALITY CONTROL

Date Analyzed: 2-16&17-10
Matrix: Water
Units: ug/L (ppb)

Lab ID: 02-043-03

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Antimony	**ND**	**ND**	NA	6.0	
Arsenic	**ND**	**5.26**	NA	5.0	
Beryllium	**ND**	**ND**	NA	4.0	
Cadmium	**ND**	**ND**	NA	5.0	
Chromium	**ND**	**ND**	NA	50	
Copper	**3.36**	**3.65**	8	2.4	
Lead	**ND**	**ND**	NA	8.0	
Nickel	**8.94**	**8.82**	1	8.0	
Selenium	**ND**	**ND**	NA	50	
Silver	**ND**	**ND**	NA	1.9	
Thallium	**ND**	**ND**	NA	0.45	
Zinc	**ND**	**ND**	NA	80	

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
Project: 235-1577-024

DISSOLVED MERCURY
EPA 7470A
DUPLICATE QUALITY CONTROL

Date Analyzed: 2-8-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: 02-043-01

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Mercury	**ND**	**ND**	NA	0.038	

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
Project: 235-1577-024

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

Date Analyzed: 2-16&17-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: 02-043-03

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Antimony	100	**104**	104	**109**	109	4	
Arsenic	100	**113**	113	**115**	115	1	
Beryllium	100	**102**	102	**105**	105	2	
Cadmium	100	**98.9**	99	**102**	102	3	
Chromium	100	**94.0**	94	**97.5**	98	4	
Copper	100	**95.1**	92	**94.7**	91	0	
Lead	100	**92.3**	92	**93.3**	93	1	
Nickel	100	**105**	96	**104**	95	1	
Selenium	100	**108**	108	**114**	114	5	
Silver	100	**83.4**	83	**89.7**	90	7	
Thallium	100	**93.9**	94	**95.0**	95	1	
Zinc	100	**104**	104	**106**	106	2	

Date of Report: February 18, 2010
Samples Submitted: February 5, 2010
Laboratory Reference: 1002-043
Project: 235-1577-024

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

Date Analyzed: 2-8-10

Matrix: Water
Units: ug/L (ppb)

Lab ID: 02-043-01

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Mercury	12.5	**11.6**	93	**11.4**	91	2	

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 the diesel range are impacting the lube oil range result.

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

Chain of Custody

OnSite Environmental Inc.
Phone: (425) 883-3881 • Fax: (425) 885-4603

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: 02-043

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	PAHs by 8270D / SIM	PCBs by 8082	Pesticides by 8081A	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	Chloride	PP Metals (total)	PP Metals (diss)*				% Moisture
1	WB-GW-MW08-0090	2/3/10	1440	GW	3														X	X	X				
2	WB-GW-MW09-0090	↓	1400	↓	↓														X	X	X				
3	WB-GW-MW09-1090		1405																X	X	X				
4	WB-GW-MW10-0080		1320																X	X	X				

	Signature	Company	Date	Time	Comments/Special Instructions:
Relinquished by	Lara Linde	Parametrix	2/4/10	1340	*field filtered
Received by		CASE	2/5/10	1000	EIM EDDs
Relinquished by					PQL to meet RI/FS requirements (attached Table 4-1)
Received by					
Relinquished by					
Received by					
Reviewed by/Date		Reviewed by/Date			Chromatograms with final report ☐

DISTRIBUTION LEGEND: White - OnSite Copy Yellow - Report Copy Pink - Client Copy