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June 28, 2011
PMX No. 555-3747-003

Mr. Richard Morck, PE
Landmarc Technologies, Inc.
14816 439th Place, SE
North Bend, WA 98045-9248

Re: May 2011 Surface Water Monitoring Results for Newcastle Landfill

Dear Mr. Morck:

This letter and data summary table reports the results of the May 3, 2011 routine surface water monitoring of Coal Creek and China Creek near Newcastle Landfill. Rainfall at Sea-Tac Airport on the previous day was 0.18 inch. The weather was mostly cloudy and cool on the day of sampling.

Current *Water Quality Standards for Surface Waters of the State of Washington* (Chapter 173-201A WAC) provide standards based on use designations for waters of the state. As feeder streams to lakes, Coal and China creeks are protected for the designated uses of: salmon and trout spawning, core rearing, and migration; extraordinary primary contact recreation; domestic, industrial and agricultural water supply; stock watering; wildlife habitat; harvesting; commerce and navigation; boating; and aesthetic values.

Field measurements and observations indicated that water quality conditions in Coal and China creeks were similar or improved compared to previous monitoring events. The likely sources of elevated fecal coliform in samples from SW-14 and SW-15 are wildlife and pet waste carried by rainfall runoff from the residential areas in these watersheds. Dissolved oxygen less than 9.5 mg/L in the China Creek headwaters at SW-8 and SW-9 was attributed to naturally-occurring processes of organic matter (e.g. leaf litter) decomposition and respiration.

Sampling and analysis methods were consistent with past monitoring events and Post-Closure Plan (Parametrix 1998) requirements. Conventional water quality parameters (i.e., temperature, dissolved oxygen, pH, and conductivity) were measured at all sampling stations with field meters. Laboratory samples were analyzed for fecal coliform, hardness, and sulfide (see attached laboratory data package). The field meter was not producing reasonable results for turbidity so that parameter was also analyzed in the laboratory.

A quality assurance review of laboratory results (i.e. method blanks, spike samples, duplicate analyses, etc.) indicated acceptable accuracy and precision of analyses; no data qualifiers were necessary. A field duplicate sample was also collected at SW-15 (duplicate labeled SW-16) for fecal coliform, sulfide and hardness analyses.

Coal Creek

Results from the May monitoring event indicated that the landfill had no substantive impacts on Coal Creek water quality (north of the landfill). There was no surface runoff entering Coal Creek from the direction of the landfill. All monitoring results for Coal Creek met Washington State water quality standards for fecal coliform, dissolved oxygen, turbidity, pH, and temperature. Unlike some past monitoring events, fecal coliform did not exceed the 50 colonies/100 ml limit at any Coal Creek monitoring site and dissolved oxygen was above the 9.5 mg/L minimum standard at all Coal Creek sites. Similar to past monitoring events, sulfide concentrations were below the 0.05 mg/L detection limit at all sites. Hardness concentrations were also within the range of past monitoring results.

China Creek

Similar to Coal Creek, surface water samples from the China Creek drainage (south of the landfill) were within Washington State water quality standards for temperature, pH and turbidity, but the standards for dissolved oxygen and fecal coliform were not met in samples from some sites (Table 1). Dissolved oxygen concentrations were at or above the 9.5 mg/L minimum standard at all sites except SW-9 (8.9 mg/L) and the background site SW-8 (9.4 mg/L). The lower dissolved oxygen levels may be attributed to the natural oxygen-consuming processes of respiration and plant decomposition, particularly in the wetland pond upstream from SW-9. Turbidity, water temperature, and pH measurements were within State numerical standards at all sample locations. Flow at monitoring station SW-13 was insufficient for monitoring, and station SW-12 was dry.

State water quality standards for fecal coliform were exceeded in samples from the China Creek drainage at SW-14 (95 colonies/100 ml) and SW-15 (145 colonies/100ml). However, the duplicate sample SW-16 contained only 25 colonies/100 ml, indicating that SW-15 did not have a consistently high fecal coliform count. Although the duplicate samples were collected from the same location and only a few minutes apart, the observed variability in bacteria concentrations is not unusual. Wildlife and residential pets are likely sources of fecal coliform bacteria in the area.

The range of hardness concentrations in the China Creek watershed was similar to previous monitoring events, and sulfide was not detected in any samples.

Conclusions

Coal Creek samples met all evaluated Washington State numerical surface water quality standards at every site. China Creek samples met all Washington State numerical surface water quality standards during this monitoring event, with only two exceptions (Table 1). The low dissolved oxygen concentration at background station SW-8 and station SW-9 were attributed to naturally-occurring processes of organic matter (e.g. leaf litter) decomposition and respiration, particularly in the stagnant upstream wetland area. Fecal coliform counts exceeded the water quality standard at SW-14 and SW-15 downstream from residential developments.

In summary, the excursions from surface water quality standards at China Creek were attributed to sources other than the landfill, and Coal Creek monitoring results were all within the numerical standards. No monitoring observations or laboratory results indicated adverse water quality conditions attributed to the landfill.

Please call me if you have any questions about these results or the monitoring program in general.

Sincerely,

Parametrix

Jim Good, Senior Water Quality Specialist

Attachment

cc: Bill Lasby, Public Health Seattle & King County
Lisa Gilbert, Parametrix Project Manager

Table 1. Newcastle Landfill Surface Water Monitoring Results, May 3, 2011

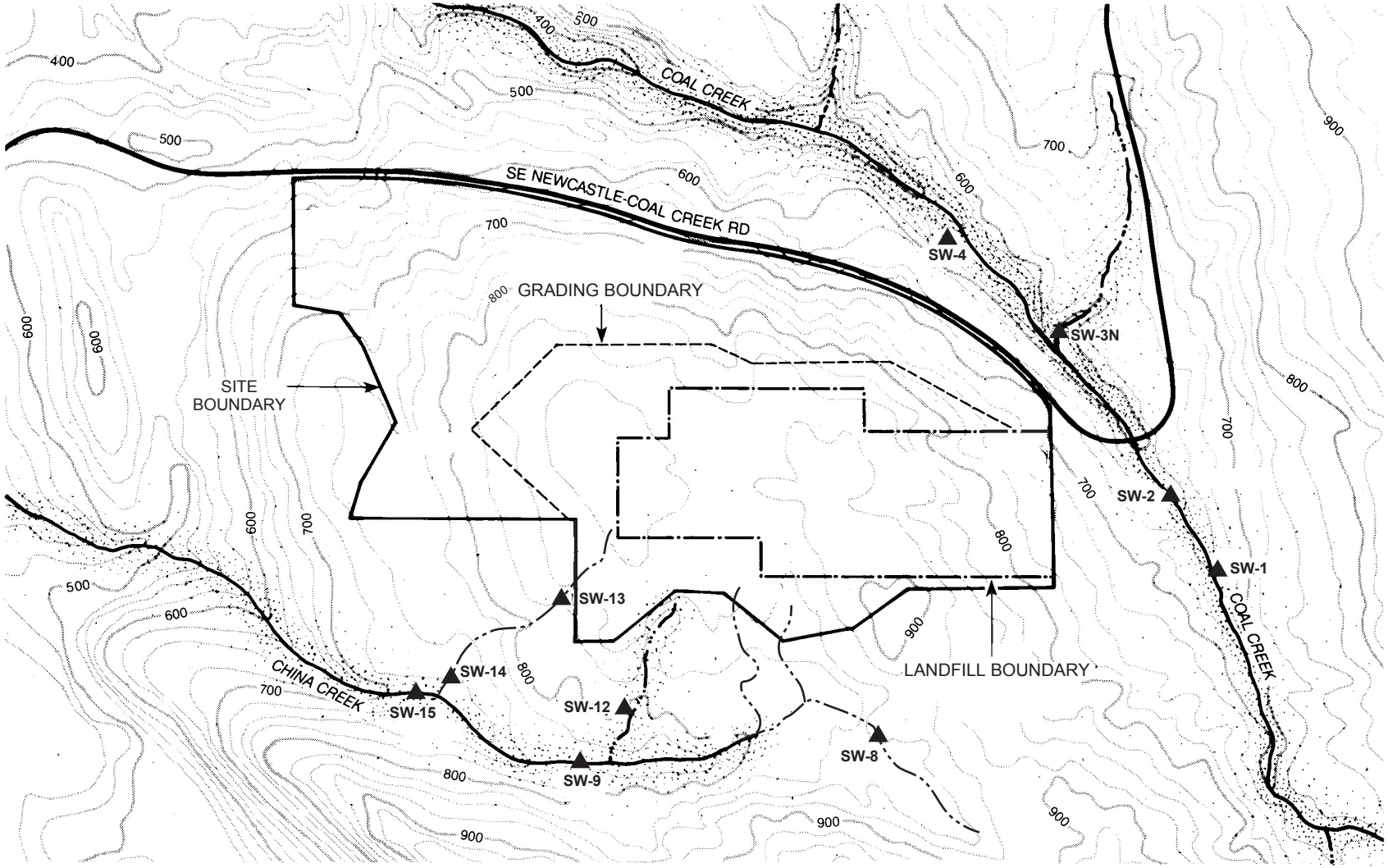
Station	Temperature (°C)	Dissolved Oxygen (mg/L)	pH	Conductivity (umhos/cm)	Turbidity (NTU)	Hardness (mg/L)	Fecal Coliform (#/100 ml)	Sulfide (mg/L)
Coal Creek								
SW-1 (background)	7.5	10.1	7.1	85	0.53	26.0	10	<0.05
SW-2	7.4	10.8	7.1	85	0.52	27.6	<5	<0.05
SW-3N	8.0	10.7	7.3	206	3.3	62.7	<5	<0.05
SW-4	7.6	10.8	7.4	138	2.0	44.0	<5	<0.05
China Creek								
SW-8 (background)	8.8	9.4	7.0	108	0.54	37.7	10	<0.05
SW-9	8.9	8.3	7.2	188	0.67	71.9	25	<0.05
SW-12	--	--	--	--	--	--	--	--
SW-13	--	--	--	--	--	--	--	--
SW-14	8.6	9.5	7.3	198	0.63	80.3	95	<0.05
SW-15	8.7	10.1	7.2	188	1.6	73.1	145	<0.05
SW-16 (SW-15 duplicate)	--	--	--	--	0.66	73.1	25	<0.05
Water Quality Standards (WAC 173-201A)	16°C	9.5 mg/L minimum	6.5 - 8.5	N/A	5 NTU over background	N/A	50/100 ml	N/A

Notes:

- - = no sample taken

N/A = not applicable, no State standard

< = less than, not detected at the given concentration



Parametrix 555-3747-001/01(01) 6/11 (B)

N

0 1,000

SCALE IN FEET

▲ **SW-1** Surface Water Monitoring Station

Figure 1
Surface Water Monitoring Locations at Newcastle Landfill

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER:	**PAR025-28**		**PAGE 1**
REPORT DATE:	**05/16/11**		
DATE SAMPLED:	**05/03/11**	**DATE RECEIVED:**	**05/03/11**

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM PARAMETRIX

CASE NARRATIVE

Nine water samples were received by the laboratory in good condition. Analysis was performed according to the chain of custody received with the samples. No difficulties were encountered in the preparation or analysis of these samples. Sample data follows while QA/QC data is contained on subsequent pages.

SAMPLE DATA

SAMPLE ID	FECAL COLIFORM (#/100mL)	HARDNESS (mgCaCO3/L)	SULFIDE (mg/L)	TURBIDITY (NTU)
SW-1	10	26.0	<0.05	0.53
SW-2	<5	27.6	<0.05	0.52
SW-3	<5	62.7	<0.05	3.3
SW-4	<5	44.0	<0.05	2.0
SW-8	10	37.7	<0.05	0.54
SW-9	25	71.9	<0.05	0.67
SW-14	95	80.3	<0.05	0.63
SW-15	145	73.1	<0.05	1.6
SW-16	25	73.1	<0.05	0.66

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QA/QC DATA

QC PARAMETER	FECAL COLIFORM (#/100mL)	HARDNESS (mgCaCO3/L)	SULFIDE (mg/L)	TURBIDITY (NTU)
METHOD	SM20 9222D	EPA 130.2	EPA 376.1	SM20 2130B
DATE ANALYZED	05/03/11	05/16/11	05/04/11	05/05/11
DETECTION LIMIT	5	2.00	0.05	0.10
DUPLICATE				
SAMPLE ID	SW-16	SW-16	SW-16	SW-16
ORIGINAL	25	73.1	<0.05	0.66
DUPLICATE	20	72.7	<0.05	0.67
RPD	22.22%	0.54%	NC	1.50%
SPIKE SAMPLE				
SAMPLE ID		SW-16		
ORIGINAL		73.1		
SPIKED SAMPLE		92.1		
SPIKE ADDED		20.0		
% RECOVERY	NA	94.79%	NA	NA
QC CHECK				
FOUND		39.5		0.78
TRUE		40.0		0.80
% RECOVERY	NA	98.70%	NA	97.50%
BLANK	<5	<2.00	<0.05	NA

RPD = RELATIVE PERCENT DIFFERENCE.
NA = NOT APPLICABLE OR NOT AVAILABLE.
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TO LOW RELATIVE TO SAMPLE CONCENTRATION.

Submitted By:

Steven Lazoff
Laboratory Director

Aquatic Research Incorporated
3927 Aurora Ave. N / Seattle, WA 98103 / (206) 632-2715

PAR025-28

CHAIN-OF-CUSTODY RECORD

SHEET 1 OF 1

CLIENT: PARAMETRIX
SAMPLING DATE: 5/3/11
SAMPLERS: JIM GOOD

PROJECT ID: Newcastle
CASE FILE NO.:
DATA RECORDED BY: J. Good

SAMPLE INFORMATION

SAMPLE ID	DATE/TIME COLLECTED	PARAMETERS: SULFIDE	FC	TOXICITY	HARDNESS	BOTT #	NOTES
	5/3/11						added request for turbidity
SW-1	0840	✓	✓	✓	✓	3	
SW-2	0900	✓	✓	✓	✓		
SW-3	0930	✓	✓	✓	✓		
SW-4	0950	✓	✓	✓	✓		
SW-8	1210	✓	✓	✓	✓		
SW-9	1145	✓	✓	✓	✓		
SW-14	1100	✓	✓	✓	✓		
SW-15	1045	✓	✓	✓	✓		
SW-16	1150	✓	✓	✓	✓	3	

	Relinquished By	Date/Time	Received By	Date/Time
Printed Name	Jim Good		JAMIEN GNOMSKI	
Signature		5/3/11 1320		5/3/11 1320
Affiliation	Parametrix		ART	

	Relinquished By	Date/Time	Received By	Date/Time
Printed Name				
Signature				
Affiliation				

Miscellaneous Notes (Hazardous Materials, Quick turn-around time, etc.):