18608 89th Avenue N.E. • Bothell, Washington 98011 • Telephone (206) 481-4538 • FAX (206) 402-1388

April 23, 1997

Ms. Kathy Bahnick Port of Seattle, Environmental Engineering P.O. Box 1209 Seattle, WA

Re:

ı,

April 4, 1997 Groundwater Sampling Data

Port of Seattle Terminal 115, Seattle, Washington

Dear Ms. Bahnick,

This letter transmits the field data and laboratory results for the April 4, 1997 (first quarter) groundwater sampling event performed by GeoScience Management, Inc. at the Port of Seattle's Foley Cardlock Facility, Terminal 115 (T-115) located at 6730 West Marginal Way, Seattle, Washington (Figure 1). The work was performed under Professional Services Agreement Number P-950137 and subsequent amendments. At your request, I have not included a groundwater flow map or data tables with this transmittal. A report will be submitted at the end of 1997 documenting the results of all 1997 groundwater sampling. The attached map shows the approximate locations of all site wells. Also attached are the field data sampling sheets recording field measurements collected April 4, 1997, and the laboratory reports from North Creek Analytical, Inc. Groundwater sample designations are as follows:

Monitoring Well Number Sample Designation Destroyed in 1995 by Lee Morse during station construction in 1996 MW-13 Not sampled due to presence of product MW-14 97-0404-02 MW-15 MW-16 97-0404-01 MW-17 97-0404-03 MW-18 Not sampled due to presence of product MW-19 97-0404-06 MW-20 97-0404-04 MW-21 97-0404-07 MW-22 97-0404-08

All samples were analyzed for total petroleum hydrocarbons in the diesel- and oil-ranges by method WTPH-D, extended. Diesel-range hydrocarbon concentrations ranged from a low of 0.429 mg/L in well MW-16 to a high of 1.03 mg/L. No oil-range hydrocarbons were reported in any of the samples at concentrations at or above the analytical method reporting limits of 0.750 mg/L. Please refer to the attached laboratory reports for specific analytical results. If you have questions or would like to discuss any of the information presented here, please contact me at your earliest convenience.

Sincerely,

GeoScience Management, Inc.

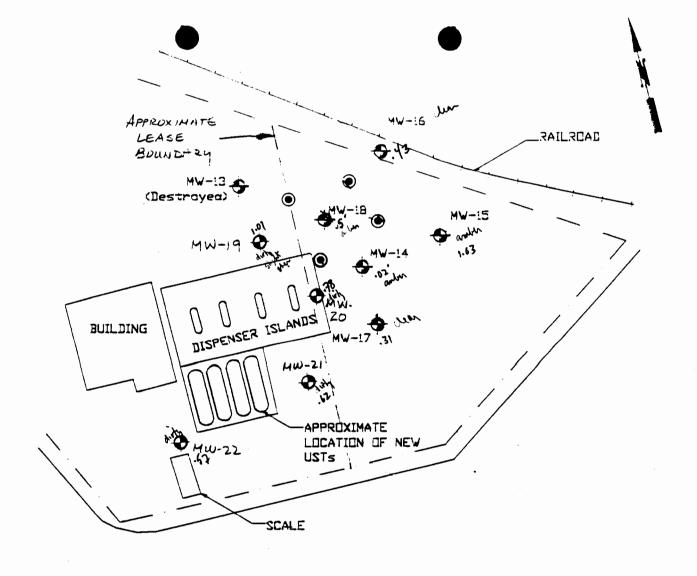
Howard W. Small, R.G., C.P.G.

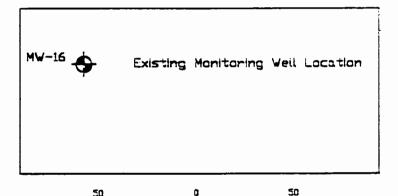
Project Manager

Attachments: Field Sampling Data Sheets

Laboratory Report Number B704109, North Creek Analytical, Inc., dated April 14, 1997

c:\\pos\t115\4qtrgw.n04





GeoScience Management, Inc. Environmental Consulting Services 18608 89th Avenue NE Bothell, Washington 98011

scale

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DRAWN SYS	
DATE	December 1996
JOH Ne.:	1007.01

PORT OF SEATTLE - TERMINAL 115 PROPOSED FOLEY CARDLOCK FACILITY WELL LOCATIONS

			WELL ID:	MW-14	
Project Name:	Port of Seattle - Termin	nal 115	Project #:	1002.01	
Client:	Port of Seattle		Client Project ID:	N/A	
Date:	4/4/1997		Time:	РМ	
Personnel:	Howard W. Small		Location:	6730 West Margin	al Way, Seattle, WA
Weather:	Clear 🔀 Raining 🔲	Overcast Snowing	Hot	Warm 🔀	Cold
		SAMPLING	DATA		-
6.52 Depth to water 6.5 Depth to product 14 Well depth	Feet Units Feet Units Feet Units Full Units	Below Below Below	Top of PVC Casing Measurin Top of PVC Casing Measurin Top of PVC Casing Measurin	ng point , North Side ng point , North Side	= 0.02 feet product
Based on:	Field Measurements	Well Log	Z: 1 (1 5 1 (6)	— 0.1	
Well Diameter: 5	2-inch (0.17 gal./ft.)		6-inch (1.5 gal./ft.)	Other:	
Casing Volume: Volume Purged: Purge Method:	4-inch (0.66 gal./ft.) N/A 4 Bailer		8-inch (2.6 gal./ft.) 0.17 Other/Material:	gallons per foot =	N/A gallons
Well Condition:	⊠ Satisfactory	Other:			
Purge Volume Number 1 2	Total Volume Discharged (gallons) . 4	pH Not Measured	Specific Conductance (MicroSiemans/cm) Not Measured	Temperature F° Not Measured	Comments
3					
NOTES: Purge water is amb Strong hydrocarbon	er, fairly sediment free. n-like odor.				
Sampler Decontan	nination.				
Soap/water Analyses:	☐ Hexane ☐ None.	Methanol [Distilled Water	Other	·
Sample ID:	Not Sampled		Signature:	qual	

			WELL ID:	MW-15		
Project Name:	Port of Seattle - Termi	inal 115	Project #:	1002.01		
Client:	Port of Seattle		Client Project ID:	N/A		
Date:	4/4/1997		Time:	 PM		
Personnel:	Howard W. Small		•		arginal Way, Seattle,	. WA
	220 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 // 20 //				<u></u>	
Weather:	Clear 🔀 Raining 🔲	Overcast Snowing	Hot	Warm 🔀	Cold	
		SAMPLING	DATA			
5.11	Feet	Below	Top of PVC Casing,	North Side		
Depth to water	Units	D. 1	Measurin	g point		
None Depth to product	Units	Below	Top of PVC Casing, Measurin			
14	Feet	Below	Top of PVC Casing,			
Well depth	Units		Measurin			
Based on:	Field Measurements	Well Log				
Well Diameter:		_	6-inch (1.5 gal./ft.)	□ O	ther:	
	4-inch (0.66 gal./ft.)) 🗆	8-inch (2.6 gal./ft.)			
Casing Volume:	8.89	feet of water X	0.17	gallons per fo	pot = 1.51	gallon
Volume Purged:	5	gallons				_
Purge Method:	Bailer	☐ Pump ☐	Other/Material:		_ 	
Well Condition:	Satisfactory	Other:				
Purge	Total Volume		Specific			
Volume	Discharged		Conductance	Temperatu		
Number	(gallons)	pH	(MicroSiemans/cm)	<u>F。</u>	Comments	
1		7.8	2780	57		
2	<u>3</u> 5	7.9	2830	57		
3		8.0	2790	57		
NOTES:						
Purge water is amb	er-colored, slight undefi	nable odor, froth/bi	ıbbles.			
Not much suspende	ed sediment.					
Sampler Decontar	nination					
Soap/water	Hexane	Methanol [Distilled Water	X 0	ther Disposable ba	iler
Analyses:						
TPH-D, Extended						
				/		
				7.0)	
Sample ID:	97-0404-02		Signature:	MILL		

			WELL ID:	MW-17	
Project Name:	Port of Seattle - Termi	nal 115	Project #:	1002.01	
Client:	Port of Seattle		Client Project ID:	N/A	
Date:	4/4/1997		Time:	<u>PM</u>	
Personnel:	Howard W. Small		Location:	6730 West Margir	nal Way, Seattle, WA
Weather:	Clear Raining	Overcast Snowing	Hot	Warm 🔀	Cold
		SAMPLING 1	DATA		
6.26	Feet	Below	Top of PVC Casing,		_
Depth to water	Units	D .	Measurin		
None Depth to product	Units	_ Below	Top of PVC Casing, Measurin		-
14	Feet	Below	Top of PVC Casing,		
Well depth	Units		Measurin		_
Based on:	Field Measurements	Well Log			
Well Diameter:	2-inch (0.17 gal./ft.)		6-inch (1.5 gal./ft.)	Other	
	4-inch (0.66 gal./ft.)) 🗆	8-inch (2.6 gal./ft.)		
Casing Volume:	7.74	feet of water X	0.17	gallons per foot =	. 1.32 gallon
Volume Purged:	7.74 5	gallons	0.17	ganons per root	ganon
Purge Method:	⊠ Bailer	Pump 🗆	Other/Material:		
Well Condition:	☐ Satisfactory	Other:	Wellhead badly dan	naged. Monument	top is gone.
Purge	Total Volume		Specific		
Volume	Discharged		Conductance	Temperature	_
<u>Number</u>	(gallons)	pH	(MicroSiemans/cm)	<u>F°</u>	Comments
1		6.9	750	57	
2	3	6.8	730	57	
3	5	6.9	730	58	
NOTES:					
Purge water is clear	r without much suspende	ed sediment.			
No odor.			<u> </u>		
					<u> </u>
Sampler Decontan					
☐ Soap/water	Hexane	Methanol [Distilled Water		Disposable bailer
Analyses:					·
TPH-D, Extended					
				(
Sample ID:	97-0404-03		Signature: ///1/	MARI	

			WELL ID:	MW-18		
Project Name:	Port of Seattle - Term	inal 115	Project #:	1002.01		
Client:	Port of Seattle		Client Project ID:	N/A		
Date:	4/4/1997		Time:	<i>PM</i>		_
Personnel:	Howard W. Small		Location:	6730 West Margin	al Way, Seattle, WA	
Weather:	Clear 🔀 Raining 🗌	Overcast Snowing	Hot	Warm 🔀	Cold	
		SAMPLING 1	DATA		· · · · · · · · · · · · · · · · · · ·	_
Not Measured	Feet	Below	Top of PVC Casing,		_	
Depth to water	Units	Deless	Measurin	• •		
Not Measured Depth to product	<u>Feet</u> Units	Below	Top of PVC Casing, Measurin		-	
14	Feet	Below	Top of PVC Casing,	• •		
Well depth	Units	-	Measurin		-	
Based on:	Field Measurements	Well Log				
Well Diameter:	2-inch (0.17 gal./ft.)	6-inch (1.5 gal./ft.)	Other:		_
×	4-inch (0.66 gal./ft.) 🗆	8-inch (2.6 gal./ft.)			
Casing Volume:	<i>N/A</i>	_ feet of water X		gallons per foot =	gallo	ns
Volume Purged:	2	_ gallons				
Purge Method:	Bailer	☐ Pump ☐	Other/Material:			_
Well Condition:	☐ Satisfactory	Other:	All three bolts for li	d are broken.		
Purge	Total Volume		Specific			_
Volume	Discharged		Conductance	Temperature		
Number	(gallons)	рН	(MicroSiemans/cm)	F <u> </u>	Comments	_
	2	Not Measured	Not Measured	Not Measured		_
2						_
3						_
NOTES:						_
	er-colored, and fairly se	adiment free				_
	which was full. Drained		ar to maggura annroy	rimatahi 5 inchas o	f product in well	-
	ly 1 additional gallon o					_
Reset skimmer.	y I danional gallon o	product (total of do	out 1 1/2 gations pro	auci removea), uno	I I gation water.	_
Sampler Decontam	ination.					_
Soap/water	Hexane	Methanol [Distilled Water	Other		_
Analyses:	None.					_
			· · · · · · · · · · · · · · · · · · ·	/		_
				, 1	1	_
Sample ID:	Not Sampled		Signature: Tow	10/1/2011	V\	_

			WELL ID:	MW-19		
Project Name:	Port of Seattle - Termi	nal 115	Project #:	1002.01		
Cliente	Port of Scattle		Client Project ID:	NI/A		
Client:	Port of Seattle		Client Project ID:	N/A_		_
Date:	4/4/1997		Time:	PM		_
Personnel:	Howard W. Small		Location:	6730 West Margi	nal Way, Seattle, WA	1
Weather:	Clear Raining	Overcast Snowing	Hot	Warm 🔀	Cold	
		SAMPLING	DATA	·		_
8.86	Feet	Below	Top of PVC Casing,	North Side		
Depth to water	Units	-	Measurin	g point	_	
None Depth to product	Units	Below	Top of PVC Casing, Measuring		_	
15	Feet	Below	Top of PVC Casing,			
Well depth	Units	-	Measuring		_	
Based on:	Field Measurements	Well Log				
Well Diameter:	2-inch (0.17 gal./ft.)		6-inch (1.5 gal./ft.)	Other	r:	_
	4-inch (0.66 gal./ft.)		8-inch (2.6 gal./ft.)			
Casing Volume:	6.14		0.17	gallons per foot =	= <u>1.04</u> galle	on:
Volume Purged:	4	_ gallons				
Purge Method:	Bailer	Pump	Other/Material:			
Well Condition:	⊠ Satisfactory	Other:				
Purge	Total Volume		Specific			_
Volume	Discharged		Conductance	Temperature		
Number	(gallons)	<u>pH</u>	(MicroSiemans/cm)	<u>F °</u>	Comments	_
	1	6.7	710	56		_
2	2	6.8	710	56		_
3	4	6.9	720	56		
NOTES:						_
Purge water is dirty	with much suspended s	ediment (silt and fin	e sand).			_
Slight hydrocarbon-	-like odor, slight sheen i	n bucket.				
						_
Sampler Decontam						_
☐ Soap/water	Hexane	Methanol	Distilled Water	Othe:	r Disposable bailer	_
Analyses:						
TPH-D, Extended						_
Sample ID:	97-0404-06		Signature: ////	108		_
Normania III.	U / D/ID/LOK		SIGNOTHED ////////////////////////////////////	<i>\u111111111111111111111111111111111111</i>		

			WELL ID:	MW-20		
Project Name:	Port of Seattle - Termin	nal 115	Project #:	1002.01		
Client:	Port of Seattle		Client Project ID:	N/A		
Date:	4/4/1997		Time:	PM		
Personnel:	Howard W. Small			6730 West Margi	nal Way Seattle	WA
1 01 00 1				8		
Weather:	Clear 🔀 Raining 🔲	Overcast Snowing	041	Warm 🔀	Cold	
		SAMPLING 1	DATA			
6.78	Feet	Below	Top of PVC Casing,	North Side		
Depth to water	Units		Measurin		_	
None		Below	Top of PVC Casing,		_	
Depth to product	Units	D-1	Measurin	-		
Well depth	Feet Units	Below	Top of PVC Casing, Measurin		_	
-		_ ,,,,,,,	Measurii	ig point		
Based on:	Field Measurements	Well Log				
Well Diameter:	2-inch (0.17 gal./ft.)		6-inch (1.5 gal./ft.)	☐ Other	r:	
	4-inch (0.66 gal./ft.)		8-inch (2.6 gal./ft.)			
Casing Volume:	8.22	feet of water X	0.17	gallons per foot =	= 1.40	gallon
Volume Purged:	4	gallons				
Purge Method:	■ Bailer	☐ Pump ☐	Other/Material:			
Well Condition:	⊠ Satisfactory	Other:	<u> </u>			
Purge	Total Volume		Specific			
Volume	Discharged		Conductance	Temperature		
Number_	(gallons)	pH	(MicroSiemans/cm)	F °	Comments	
1	1	7.0	740	56		
2	2	7.1	760	55		
3	4	7.1	760	56		
NOTES:						
Purge water is dirty	with much suspended se	diment (silt and fine	e sand).			
No odor.	·					
Sampler Decontan	nination.					
☐ Soap/water	☐ Hexane ☐	Methanol [Distilled Water	⊠ Other	r <i>Disposable bai</i>	ler
Analyses:						
TPH-D, Extended				/		
				1 ()	0	
Sample ID:	97-0404-04		Signature + 1/1) ALA	1	

			WELL ID:	MW-21		
Project Name:	Port of Seattle - Termin	nal 115	Project #:	1002.01		
Client:	Port of Seattle		Client Project ID:	N/A		
Date:	4/4/1997		Time:	PM .		
Personnel:	Howard W. Small	-	•	6730 West Margin	nal Way, Seattle,	WA
Weather:	Clear 🔀 Raining 🔲	Overcast Snowing	Hot 🔲	Warm 🔀	Cold	
	<u> </u>	SAMPLING	DATA			
7.23 Depth to water None Depth to product	Units Units	Below Below	Top of PVC Casing, Measurin Top of PVC Casing, Measurin	g point North Side	-	
Well depth	Feet Units	Below	Top of PVC Casing, Measurin	North Side	_	
Based on: Well Diameter:	Field Measurements 2-inch (0.17 gal./ft.)	Well Log	6-inch (1.5 gal./ft.)	Other	:	
Casing Volume: Volume Purged: Purge Method: Well Condition:	4-inch (0.66 gal./ft.) 7.77 5 ■ Bailer ■ Satisfactory	_	8-inch (2.6 gal./ft.) 0.17 Other/Material:	gallons per foot =	1.32	gallon
Purge Volume Number	Total Volume Discharged (gallons)	рН	Specific Conductance (MicroSiemans/cm)	Temperature F°	Comments	
1	1	6.8	780	55		
3	5	6.8	740 730	55 55		
NOTES: Purge water is dirty No odor.	with much suspended se	ediment (silt and fin	e sand).			
Sampler Decontan		Mathamal 5	Distilled W.	M Out	Diamondal	1
Soap/water Analyses:	Hexane	Methanol	Distilled Water	⊠ Other	Disposable bai	ier
TPH-D, Extended						
Sample ID:	97-0404-07		Signature 1	Smill	<i>P</i>	

				WELL ID:	MW-22	
	Project Name:	Port of Seattle - Termin	nal 115	Project #:	1002.01	
	Client:	Port of Seattle		Client Project ID:	N/A	
	Date:	4/4/1997		Time:	PM	
•		Howard W. Small		•		nal Way, Seattle, WA
	Weather:	Clear Raining □	Overcast Snowing	~.	Warm 🔽	Cold
	. .		SAMPLING I	DATA		
	6.78 Depth to water None	Feet Units	Below Below	Top of PVC Casing, Measuring Top of PVC Casing,	g point	_
	Depth to product 15 Well depth	Units Feet Units	Below	Measuring Top of PVC Casing, Measuring	g point <i>North Side</i>	_
	Based on: ☐ Well Diameter: ☑	Field Measurements 2-inch (0.17 gal./ft.)	Well Log	6-inch (1.5 gal./ft.)	☐ Other	:
	Casing Volume: Volume Purged: Purge Method: Well Condition:	4-inch (0.66 gal./ft.) 8.22 5 ■ Bailer Satisfactory		8-inch (2.6 gal./ft.) 0.17 Other/Material:	gallons per foot =	
	Purge Volume Number	Total Volume Discharged (gallons)	pН	Specific Conductance (MicroSiemans/cm)	Temperature F°	Comments
	1	1	6.9	770	57	
	3	5	6.8	750	57 56	
	NOTES: Purge water is dirty No odor.	with much suspended so	ediment (silt and fine	e sand).		
	Sampler Decontam	ination.				
	Soap/water	Hexane	Methanol [Distilled Water	⊠ Other	Disposable bailer
	Analyses:					
	TPH-D, Extended					
	Sample ID:	97-0404-08		Signature:	Jual	



BOTHELL = (206) 481-9200 = FAX 485-2992 SPOKANE = (509) 924-9200 = FAX 924-9290

PORTLAND = (503) 643-9200 = FAX 644-2202

Geo Science Management, Inc.

Project: Port of Seattle

Sampled: 4/1/97

18608 89th Avenue NE

Project Number: 1002.02

Received: 4/7/97

Bothell, WA 98011

Project Manager: Howard Small

Reported: 4/14/97 08:13

Summary Report*

(Please refer to the Analytical Report for a thorough review of the complete data set.)

Method	Analyte	Units	97-0404-01	Water 16	4/1/97	B704109-01	97-0404-02	Water	4/1/97	B704109-02	97-0404-03	Water	4/1/97	B704109-03	97-0404-04	Water	4/1/97	B704109-04	97-0404-06	Water 19	4/1/97	B704109-05
WTPH-Dext	Diesel Range Hydrocarbons Heavy Oil Range Hydrocarbons	mg/l			0. < 0. '	429 750				1 .03				308 750				77 9 750				1.01 .750
Method	Analyte	Units	97-0404-07	Water	4/1/97	B704109-06	97-0404-08	Water &	4/1/97	B704109-07												
WTPH-Dext	Diesel Range Hydrocarbons Heavy Oil Range Hydrocarbons	mg/l			0. 0<0.7	616 750				. 570 .750												

North Creek Analytical, Inc.

*The Summary Report is a subset of the final Analytical Report and does not include substantial supportive information such as quality control data; this report accurately summarizes sample results for your convenience only.

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132



BOTHELL **=** (206) 481-9200 **=** FAX 485-2992 SPOKANE **=** (509) 924-9200 **=** FAX 924-9290

PORTLAND = (503) 643-9200 = FAX 644-2202

Geo Science Management, Inc.

Project: Port of Seattle

Sampled: 4/1/97

18608 89th Avenue NE

Project Number: 1002.02

Received: 4/7/97

Bothell, WA 98011

Project Manager: Howard Small Rep

Reported: 4/14/97 08:11

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
97-0404-01	B704109-01	Water	4/1/97
97-0404-02	B704109-02	Water	4/1/97
97-0404-03	B704109-03	Water	4/1/97
97-0404-04	B704109-04	Water	4/1/97
97-0404-06	B704109-05	Water	4/1/97
97-0404-07	B704109-06	Water	4/1/97
97-0404-08	B704109-07	Water	4/1/97

North Creek Analytical, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document.

This analytical report must be reproduced in its entirety.

Matthew Essig, Project Manager



BOTHELL **=** (206) 481-9200 **=** FAX 485-2992 SPOKANE **=** (509) 924-9200 **=** FAX 924-9290 PORTLAND **=** (503) 643-9200 **=** FAX 644-2202

Geo Science Management, Inc.

Project: Port of Seattle
Sampled: 4/1/97
18608 89th Avenue NE
Project Number: 1002.02
Received: 4/7/97

Bothell, WA 98011 Project Manager: Howard Small Reported: 4/14/97 08:11

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) by WTPH-D (extended) North Creek Analytical - Bothell

	Batch	Date	Date	Surrogate	Reporting			
Analyte	Number	Prepared	Analyzed	Limits	Limit	Result	Units	Notes*
97-0404-01			B70410	00.01			Water	
Diesel Range Hydrocarbons	0470204	4/8/97	4/9/97	55-01	0.250	0.429	mg/l	
Heavy Oil Range Hydrocarbons	"	"	11		0.750	ND	"	
Surrogate: 2-FBP		,,	··· ,	50.0-150	0.730	81.2	%	
97-0404-02			B70410	09-02			Water	
Diesel Range Hydrocarbons	0470204	4/8/97	4/10/97		0.250	1.03	mg/l	
Heavy Oil Range Hydrocarbons	•	"	"		0.750	ND	"	
Surrogate: 2-FBP			"	50.0-150		80.6	%	
97-0404-03			B70410	09-03			Water	
Diesel Range Hydrocarbons	0470204	4/8/97	4/10/97		0.250	0.308	mg/l	
Heavy Oil Range Hydrocarbons	u	"	"		0.750	ND	"	
Surrogate: 2-FBP	,,,,,,	<i>"</i>	"	50.0-150		88.5	%	
97-0404-04			B70410	09-04			Water	
Diesel Range Hydrocarbons	0470204	4/8/97	4/10/97		0.250	0.779	mg/l	1
Heavy Oil Range Hydrocarbons	"	**	**		0.750	ND	"	
Surrogate: 2-FBP	<i>"</i>	<i>"</i>	,, –	50.0-150		94.3	%	
97-0404-06			B70410	09-05			Water	
Diesel Range Hydrocarbons	0470204	4/8/97	4/10/97		0.250	1.01	mg/l	1
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	**	
Surrogate: 2-FBP	,,	"	"	50.0-150		86.7	%	
97-0404-07			B70410	<u> </u>			Water	
Diesel Range Hydrocarbons	0470204	4/8/97	4/10/97		0.250	0.616	mg/l	
Heavy Oil Range Hydrocarbons	"	"	n		0.750	ND	rt .	
Surrogate: 2-FBP	"	"	"	50.0-150		88.9	%	
97-0404-08			B70410	<u> </u>			<u>Water</u>	
Diesel Range Hydrocarbons	0470246	4/9/97	4/11/97	_	0.250	0.570	mg/l	1,2
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	11	
Surrogate: 2-FBP	,,	"	"	50.0-150		75.5	%	-

North Creek Analytical, Inc.

*Refer to end of report for text of notes and definitions.

Matthew Essig, Project Manager



BOTHELL **=** (206) 481-9200 **=** FAX 485-2992 SPOKANE **=** (509) 924-9200 **=** FAX 924-9290 PORTLAND **=** (503) 643-9200 **=** FAX 644-2202

Geo Science Management, Inc.

Project: Port of Seattle

Sampled: 4/1/97

18608 89th Avenue NE

Project Number: 1002.02

Received: 4/7/97

Bothell, WA 98011

Project Manager: Howard Small

Reported: 4/14/97 08:11

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) by WTPH-D (extended)/Quality Control North Creek Analytical - Bothell

	Date	Spike	Sample	QC		Reporting Limit	Recov.	RPD	RPD	
Analyte	Analyzed	Level_	Result	Result	Units	Recov. Limits	%	Limit	%	Notes*
Batch: 0470204	Date Prepa	red: 4/8/9'	<u>7</u>		Extract	tion Method: EP.	A 3520/6	00 Series		
Blank	0470204-BI	LK1	_							
Diesel Range Hydrocarbons	4/9/97			ND	mg/l	0.250				
Heavy Oil Range Hydrocarbons	"			ND	"	0.750				
Surrogate: 2-FBP		0.350		0.305		50.0-150	87.1			
LCS	0470204-BS	<u>81</u>								
Diesel Range Hydrocarbons	4/9/97	2.04		2.07	mg/l	52.0-131	101			
Surrogate: 2-FBP	"	0.350		0.324	,,	50.0-150	92.6			
Duplicate	0470204-D	U P1 B'	704109-01							<u>3</u>
Diesel Range Hydrocarbons	4/10/97		0.429	0.483	mg/l			44.0	11.8	
Surrogate: 2-FBP		0.660		0.572	"	50.0-150	86 . 7			
Batch: 0470246	Date Prepa	red: 4/9/9	7		Extract	tion Method: EP	A_3520/6	00 Series		
Blank	0470246-BI	_K1	_							
Diesel Range Hydrocarbons	4/10/97			ND	mg/l	0.250				
Heavy Oil Range Hydrocarbons	. "			ND	"	0.750				
Surrogate: 2-FBP	"	0.350		0.278	"	50.0-150	7 9 .4			
LCS	0470246-BS	<u> </u>								
Diesel Range Hydrocarbons	4/10/97	2.04		1.85	mg/l	52.0-131	90.7			
Surrogate: 2-FBP	<u>"</u>	0.350		0.294		50.0-150	84.0			
Duplicate	0470246-D1	UP1 B	704073-26							
Diesel Range Hydrocarbons	4/11/97		ND	ND	mg/l			44.0		
Surrogate: 2-FBP	"	0.700		0.533		50.0-150	76.1			

North Creek Analytical, Inc.

*Refer to end of report for text of notes and definitions.

Matthew Essig, Project Manager



BOTHELL = (206) 481-9200 = FAX 485-2992 SPOKANE = (509) 924-9200 = FAX 924-9290 PORTLAND = (503) 643-9200 = FAX 644-2202

Geo Science Management, Inc.

Project: Port of Seattle

18608 89th Avenue NE

Project Number: 1002.02

Sampled: 4/1/97 Received: 4/7/97

Bothell, WA 98011

Project Manager: Howard Small

Reported: 4/14/97 08:11

Notes and Definitions

#	Note
1	The hydrocarbon concentration result in this sample is partially due to one or more individual peaks eluting in the diesel/heavy oil range. Quantitation by EPA method 8270 is recommended.
2	The sample chromatographic pattern does not resemble the fuel standard used for quantitation.
3	Analyses are not controlled on RPD values from sample concentrations less than 10 times the reporting limit.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference

North Creek Analytical, Inc.

Matthew Essis, Project Manager



18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (206) 481-9200 FAX 485-2992 East 11115 Montgomery, Suite B, Spokane, WA 99206-4779 (509) 924-9200 FAX 924-9290 9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 643-9200 FAX 644-2202

CHAIN OF CUSTODY REPORT

Work Order # 701/109

ANDROSE FOR 18 FOL SIGHT C. ANDRESS 18 FOL SIGH C. ANDRESS 18	REPORT TO: CHED SCIEULE Flang LAHING, INC	and, Inc	INVOICE TO: CSM		TURNAROUND REQUEST in Business Days *	Fin Business Days *
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Analysis Request. NCA SAMPLE ID MATRIX NATRIX NCA SAMPLE ID MATRIX NATRIX N	PHONE 2424 104 451-4538 FAX: 206	401-1358	P.O. NUMBER:	NCA QUOTE#:	5 3.4 2	Same Day
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