CROWLEY MARINE SERVICES, INC.

Mr. Paul E. Skyllingstad
Department of Ecology
Industrial Section
P.O. Box 47706
Olympia, WA 98504-7706

December 20, 1999

Re: Former Columbia Marine Lines Facility, Vancouver, WA

Dear Mr. Skyllingstad:

Enclosed please find a copy of the report entitled "Subsurface Investigation Report" for the former Columbia Marine Lines site, located at 6305 Lower River Road, Vancouver, Washington. This report documents the work that SECOR International Inc. performed on behalf of Crowley Marine Services, Inc. (Crowley) at the Site.

Based on the results of this investigation Crowley has determined that an effective method to remediate this site would be to increase the biodegredation taking place in the subsurface and prevent migration of the impacted groundwater. Crowley is therefore going to perform a pilot test of a total fluids extraction system to attempt to measure what increases of biodegredation ~~is~~ are possible.

This test is scheduled for January, 2000 and will probably run for approximately 2 months. Crowley will then prepare a report, for your review, which will detail the results of the study and outline proposed cleanup levels, technologies, and timelines.

Please call me at (206) ~~443-8042~~ 332-8033 if you have any questions regarding this matter.

Cell - 206-953-2292

Sincerely,

R. Stephen Wilson

Stephen Wilson
Manager, Environmental Affairs

Enclosure

cc: CML Vancouver Correspondence w/o enclosure
Brian Pletcher w/o enclosure
Rod Brown w/ enclosure
Al Piecka w/ enclosure

SECOR
International Incorporated

SUBSURFACE INVESTIGATION REPORT

Former Columbia Marine Lines Facility
6305 Lower River Road
Vancouver, Washington

SECOR PN: 015.08480.006

Submitted by
SECOR International Incorporated
for

Crowley Marine Services, Inc.
2401 Fourth Avenue
Post Office Box 2287
Seattle, Washington 98111

December 3, 1999

Prepared by:

Brian J. Pletcher, R.G.
Associate Geologist

Reviewed by:

James G. Ritchie

James G. Ritchie, R.G.
Principal Geologist

7730 S.W. Mohawk Street, P.O. Box 1508, Tualatin, OR 97062-1508 (503) 691-2030 (503) 692-7074 Fax www.secor.com

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1.0 INTRODUCTION AND SCOPE OF WORK

SECOR International Incorporated (SECOR) conducted Subsurface Investigation at the former Columbia Marine Lines facility (the site) located at 6305 Lower River Road in Vancouver, Washington (see Figure 1). The purpose of the subsurface investigation was to further delineate the extent of petroleum-impacted soil in the vicinity of the former west pond. The former pond was historically used to store barge slops. The barge slops were removed in January 1984 and the pits were filled with dredge sand.

The subsurface investigation consisted of the following activities:

- Drilling 13 geoprobe soil borings.
- Continuously collecting soil samples from each boring for visual inspection (staining and odors) and lithologic description and field screening for the presence of volatile organic compounds (VOCs) using a photoionization detector (PID).
- Analyzing soil samples for petroleum hydrocarbons.
- Preparing this *Subsurface Investigation Report*.

Other field activities presented in this report include:

- Abandoning monitoring well MW-20 by overdrilling.
- Surveying monitoring well top of casing elevations.
- Conducting groundwater monitoring and sampling using existing monitoring wells

2.0 SITE DESCRIPTION

The site is located immediately north of the Columbia River and approximately 3 miles west of the city of Vancouver in Section 19, Township 2N, Range 1E, as indicated on Figure 1. The site is relatively flat, with the highest point on the site lying at an approximate elevation of 32 feet above mean sea level (msl) datum.

The majority of the site is sparsely vegetated with grasses and moss. Alders and willows form a brushy thicket from the river's edge to about 200 feet inland. Willows, alders, and brush are present in isolated low-lying areas in the northern portion of the site. Two settling ponds occupy a portion of the site to the northwest. The settling ponds are currently operated by Vanalco (formerly operated by ALCOA) as part of the aluminum manufacturing process. Figure 2 is a site plan of the subject property.

3.0 FIELD INVESTIGATION

3.1 SOIL BORINGS AND SAMPLING

A total of 13 soil borings (GP-1A through GP-13A) were drilled on September 10 and 14, 1999 by Cascade Drilling Inc. of Portland, Oregon, using a track-mounted Model CME850 geoprobe rig. The borings were

located in the vicinity of wells MW-1, MW-7, MW-8, MW-18 and MW-19, to further evaluate the extent of residual total petroleum hydrocarbon as diesel (TPH-D) in the vicinity of the former west pond. The geoprobe borings locations are depicted on Figure 2.

Soil samples were collected continuously to characterize site stratigraphy. Field screening methods (observation of staining and odor, as well as VOC measurements using a PID) were used to select a soil sample near, but above, the groundwater surface from each boring for laboratory analysis. Field screening was completed by placing a portion of the collected soil into a sealable plastic bag and then monitoring headspace VOC concentrations using a PID.

Soil borings were advanced through the dredge sand to the contact with the underlying, confining silts and were completed to a depth of approximately 15 feet below ground surface (bgs). Saturated soil conditions were observed at a depth of approximately 12.5 feet bgs. Subsurface soils generally consisted of fine- to medium-grained sands and sandy silts.

Soil samples that were collected just above or at the groundwater interface were submitted to North Creek Analytical Laboratory in Beaverton, Oregon (project laboratory) for analysis.

After soil sampling was completed, each soil boring was abandoned with bentonite. Soils descriptions and field screening results are included on the boring logs presented in Appendix A.

3.2 WELL ABANDONMENT

On September 9, 1999, monitoring well MW-20 was abandoned by casing removal. Cascade Drilling removed the well casing from the borehole and overdrilled the borehole to a depth of 78 feet bgs. The borehole was backfilled with bentonite chips to the ground surface. A copy of the Washington Resource Protection Well Report is included in Appendix B.

3.3 GROUNDWATER SAMPLING

Groundwater monitoring wells MW-7, located in vicinity of the former west pond, and MW-16, located in the northern portion of the site, were sampled on August 9, 1999; these samples were analyzed using Washington Department of Ecology (DOE) Method WTPH-D. Additionally, each extract underwent silica gel cleanup analysis. The purpose of this analysis was to determine if the impacts identified in the groundwater samples collected from the northern portion of the site are associated with TPH impacts identified in groundwater in the former west pond.

Table 1 shows a comparison of analytical results for TPH-D and total petroleum hydrocarbons as heavy oil (TPH-O) for samples collected from locations MW-7 and MW-16, with and without silica gel cleanup. The TPH-D and TPH-O analytical results indicated that the hydrocarbon pattern and range for the sample collected from MW-16 may be consistent with weathered diesel with biogenic interference. The silica gel cleanup analytical results confirmed this assessment. Analytical results for the sample collected from MW-7, before and after silica gel cleanup, were 35.8 milligrams per liter (mg/L) and 28.9 mg/L, respectively, for TPH-D. The TPH-D analytical results for the sample collected from MW-16, before and after silica gel cleanup, were 9.90 mg/L and 0.842 mg/L, respectively. Although TPH-O was non-detect for the sample collected from MW-7, both before and after silica gel cleanup, TPH-O was 2.13 mg/L before the silica gel cleanup, and was non-detect after cleanup. According to Mr. Kent Patton, laboratory

manager for North Creek Analytical, the impacts observed in the sample collected from MW-16 were primarily due to biogenic material.

Due to the findings from the groundwater samples collected on August 9, 1999, SECOR personnel conducted additional groundwater monitoring and sampling on October 14, 1999, to re-evaluate the TPH plume using the silica gel cleanup method. Water levels were measured in monitoring wells MW-1 through MW-4, MW-6 through MW-19, and MW-21. Monitoring well MW-15 was not gauged or sampled during the groundwater monitoring event because it was covered by a steel shipping container.

Groundwater samples were collected from monitoring wells MW-1 through MW-9, MW-11 through MW-14, MW-16, and MW-19. Monitoring wells MW-17, MW-18, and MW-21 were dry and could not be sampled. Monitoring well MW-10 contained approximately 0.1 foot of water and was not sampled. Prior to collecting groundwater samples, each monitoring well was purged by bailing. The pH, temperature, and conductivity were recorded for each well volume removed. Water levels and groundwater parameters were recorded on SECOR field forms for each well. Copies of the completed field forms are included in Appendix C.

Monitoring wells MW-8 and MW-19 contained free phase petroleum product (free product). This free product was bailed off the groundwater surface, and then the groundwater was sampled from these wells by dropping a polyethylene tube attached to a peristaltic pump to 1 foot below the water level. After purging each well (except MW-8 and MW-19), groundwater samples were collected using disposable bailers. The water samples were placed in laboratory-prepared containers provided by the project laboratory. Each sample was labeled to identify the sample number, project name, date, and time of sample collection. Each sample was immediately placed in a chilled cooler for storage and transported to the project laboratory under chain of custody protocols.

4.0 FINDINGS

4.1 SITE GEOLOGY AND HYDROGEOLOGY

The soils encountered during the subsurface investigation consisted of unconsolidated sands (dredge fill material) and an underlying silty flood plain deposit. The silt was encountered at depths ranging from 12 feet bgs at geoprobe boring GP-8A to 14.5 feet bgs at geoprobe borings GP-1A, GP-6A, and GP-12A. Saturated soil was encountered within the unconsolidated sands at a depth of approximately 12 feet bgs.

SECOR personnel collected water level data from the existing monitoring wells on October 14, 1999. Static water levels in the wells ranged from 4.85 to 15.43 feet bgs, as measured from the top of each well casing. Groundwater elevations were calculated using new top of casing data obtained from Olsen Engineering. The wells were resurveyed by Olsen Engineering on October 14, 1999. The new survey data were generally consistent with past survey data, with the exception of monitoring wells MW-6 and MW-16. The new top of casing elevations for MW-6 and MW-16 are 1.38 and 1.46 feet lower, respectively, than the past top of casing elevation data. SECOR has been unable to identify the specific causes for this discrepancy in top of casing elevation. Based on the calculated groundwater elevations, SECOR estimated the groundwater gradient and flow direction.

Based on the results of the water level measurements collected on October 14, 1999, groundwater flow in the southern area of the site was oriented in a southwesterly direction toward the Columbia River. The groundwater flow direction in the northwestern portion of the site is to the northwest. The gradient in the southern portion of the site was 0.03 foot/foot (ft/ft). The gradient in the northern portion of the site was

0.005 ft/ft. Groundwater elevation data and flow direction are presented on Figure 3. Table 2 shows historical groundwater elevation data for monitoring wells MW-1 through MW-21, along with historical dissolved analyte concentrations for samples collected from monitoring wells MW-1 through MW-21.

Free product was encountered in monitoring wells MW-8 and MW-19, with an approximate thickness of 0.18 and 0.02 foot, respectively. In addition, a sheen was encountered on the water surface in monitoring wells MW-1, MW-2, MW-4, MW-5, MW-6, and MW-7.

4.2 ANALYTICAL PROGRAM

Thirteen soil samples and fifteen groundwater samples were analyzed for TPH-D and TPH-O by NWTPH-Dx Method and Washington DOE Method TPH-Dx, respectively. Select soil and water samples were also analyzed using the silica gel cleanup method for TPH. The purpose of the silica gel cleanup was to determine if the TPH-D concentrations detected were due to actual hydrocarbon impacts or biogenic interference.

The laboratory analytical reports and chain-of-custody documentation are included in Appendix D. The soil analytical results are presented in Table 3 and on Figure 4. The groundwater analytical results are presented in Table 2 and on Figure 5.

4.3 SOIL SAMPLE ANALYTICAL RESULTS

TPH-D was detected in soil samples collected from all 13 borings, except for boring GP-11A. The concentrations of TPH-D ranged from 78.1 milligrams per kilogram (mg/Kg) in boring GP-2A to 32,500 mg/Kg in boring GP-13A. TPH-O was detected in the soil samples from borings GP-1A, GP-2A, GP-3A, GP-4A, GP-5A, and GP-6A at concentrations ranging from 81.7 mg/Kg (boring GP-4A) to 863 mg/Kg (boring GP-5A). The geoprobe soil analytical results for TPH-D and TPH-O are summarized in Table 1 and on Figure 4. Silica gel cleanup was conducted on soil samples with TPH-D concentrations exceeding 7,000 mg/Kg. Soil samples undergoing silica gel cleanup included those collected from borings GP-3A, GP-5A, GP-6A, GP-7A, GP-10A, and GP-13A. Analytical results indicated that TPH-D concentrations increased slightly or remained the same, using the silica gel cleanup method, due to the absence of biogenic material. If biogenic material is absent from the soil matrix, the solvent used for the extraction process and the silica gel cleanup method may often increase the TPH result.

4.4 GROUNDWATER SAMPLE ANALYTICAL RESULTS

TPH-D was detected in the groundwater samples collected from monitoring wells MW-1 through MW-11, MW-13, MW-14, MW-16, and MW-19 at concentrations ranging from 1.5 mg/L in monitoring well MW-13 to 35 mg/L in monitoring well MW-19. TPH-O was detected in groundwater samples collected from monitoring wells MW-1 through MW-10, MW-13, MW-14, MW-16, and MW-19 at concentrations ranging from 0.68 mg/L in monitoring well MW-5 to 5.18 mg/L in monitoring well MW-4. Based on laboratory identification of potential biogenic interference, silica gel cleanup was conducted on samples collected from wells MW-7, MW-9, MW-11, MW-13, MW-14, MW-16, and MW-19. The concentration of TPH-D in MW-19 was reduced from 35 mg/L to 5.28 mg/L after silica gel cleanup, The silica gel cleanup method reduced the detectable concentrations of TPH-D to less than the laboratory method reporting limit (MRL) in monitoring well MW-13. A summary of the groundwater analytical results are shown in Table 2 and on Figure 5.

5.0 SUMMARY AND CONCLUSIONS

SECOR conducted a Subsurface Investigation at the former Columbia Marine Lines facility in Vancouver, Washington to acquire additional data to more completely characterize soil and groundwater in the vicinity of the former west pond, prior to initiating further remedial activities at the site.

The following items present the findings from this Subsurface Investigation:

- The top of casing of monitoring wells was resurveyed. The top of casing data was generally consistent with past survey data, with the exception of monitoring wells MW-6 and MW-16, which were 1.38 and 1.46 feet lower, respectively, than previous top of casing elevation data. Groundwater flow direction calculated from the new casing elevations and sounding data from October 1998, May 1999, and October 1999 remain generally the same except for the northern portion of the site near MW-16. In this area the flow is actually to the north, whereas previously it appeared to be to the south.

- Monitoring well MW-20 was abandoned by overdrilling methods on September 9, 1999.

- Soil samples collected from above the water table and analyzed for TPH-D ranged from 78.1 mg/Kg in boring GP-2A to 32,500 mg/Kg in boring GP-13A. Concentration of TPH-O ranged from 81.7 mg/Kg in boring GP-4A to 863 mg/Kg in boring GP-5A. Silica gel cleanup of soil samples did not identify biogenic material.

- TPH-D was detected in the groundwater samples collected from monitoring wells MW-1 through MW-11, MW-13, MW-14, MW-16, and MW-19 at concentrations ranging from 1.5 mg/L in monitoring well MW-13 to 35 mg/L in monitoring well MW-19. TPH-O was detected in groundwater samples collected from monitoring wells MW-1 through MW-10, MW-13, MW-14, MW-16, and MW-19 at concentrations ranging from 0.68 mg/L in monitoring well MW-5 to 5.18 mg/L in monitoring well MW-4.

- Compliance wells MW-13 and MW-14 were non-detect after silica gel cleanup for TPH-D and TPH-O.

FIGURES

REFERENCE: USGS 7.5 MINUTE QUADRANGLE; VANCOUVER, WASHINGTON.

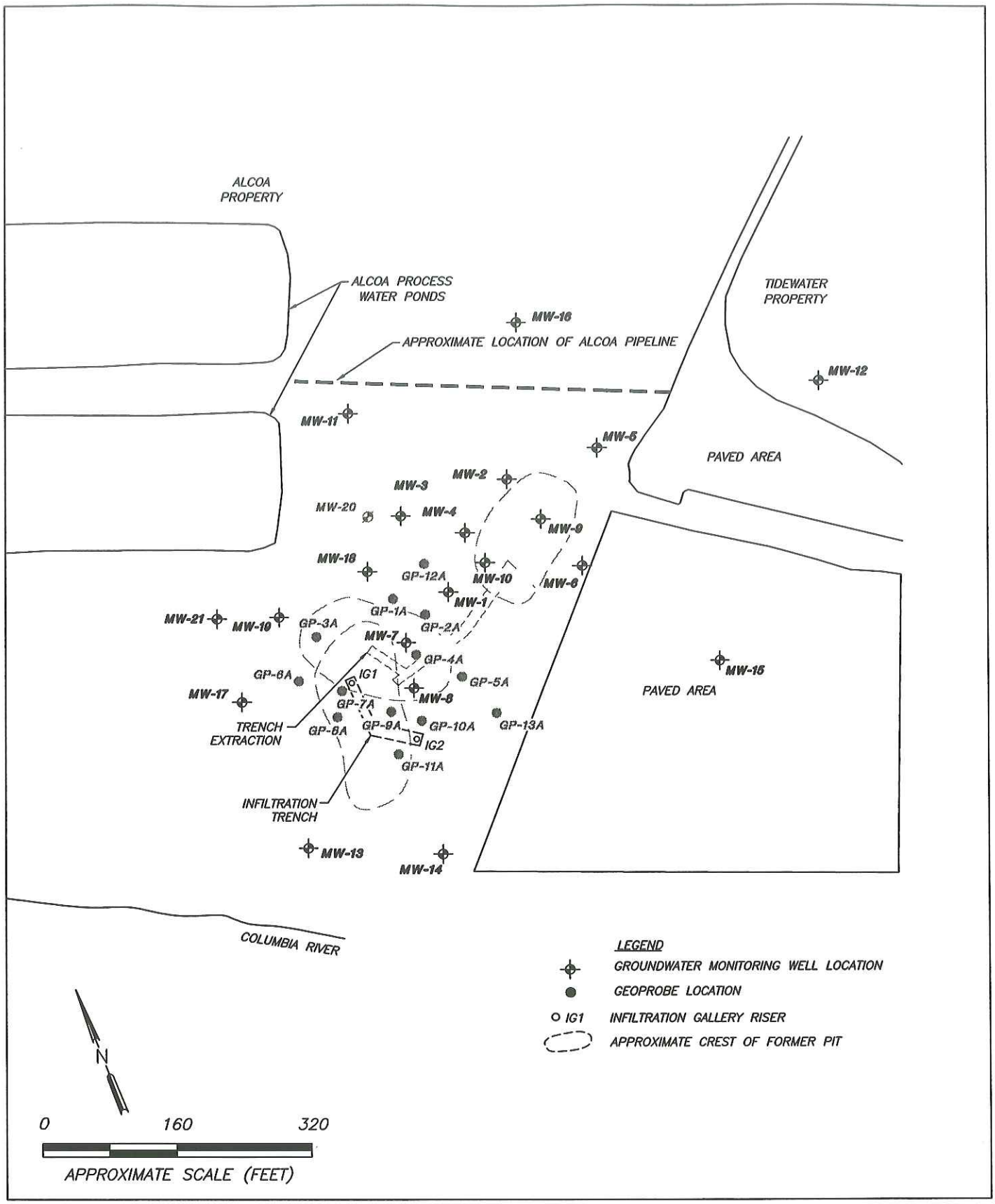
SECOR International Incorporated

SITE LOCATION MAP
FORMER COLUMBIA MARINE LINES FACILITY
VANCOUVER, WASHINGTON

FIGURE: **1**

JOB#: 00255-003-01 APPR: DWN: DJM DATE: 12/2/97

DWG: CR003088



SECOR International Incorporated
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SITE PLAN

FORMER COLUMBIA MARINE LINES FACILITY
6305 LOWER RIVER ROAD
VANCOUVER, WASHINGTON

FIGURE: **2**

JOB#: **015.08480.001** APPR: DWN: **KSM** DATE: **11/8/99**

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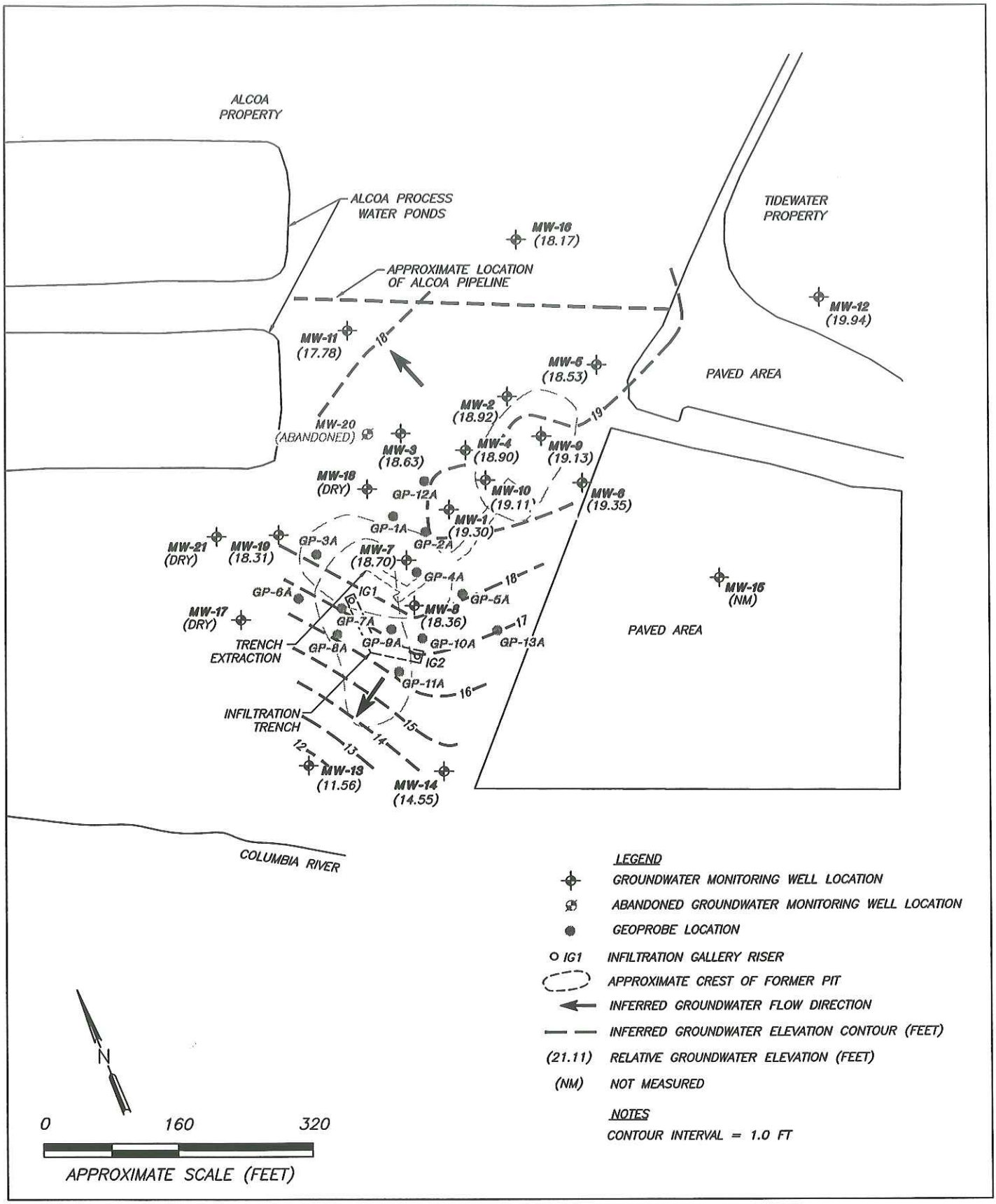

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GROUNDWATER ELEVATION CONTOUR MAP (10/14/99)
FORMER COLUMBIA MARINE LINES FACILITY
6305 LOWER RIVER ROAD
VANCOUVER, WASHINGTON

FIGURE: 3

JOB#: 015.08480.001 APPR: DWN: KSM DATE: 11/9/99

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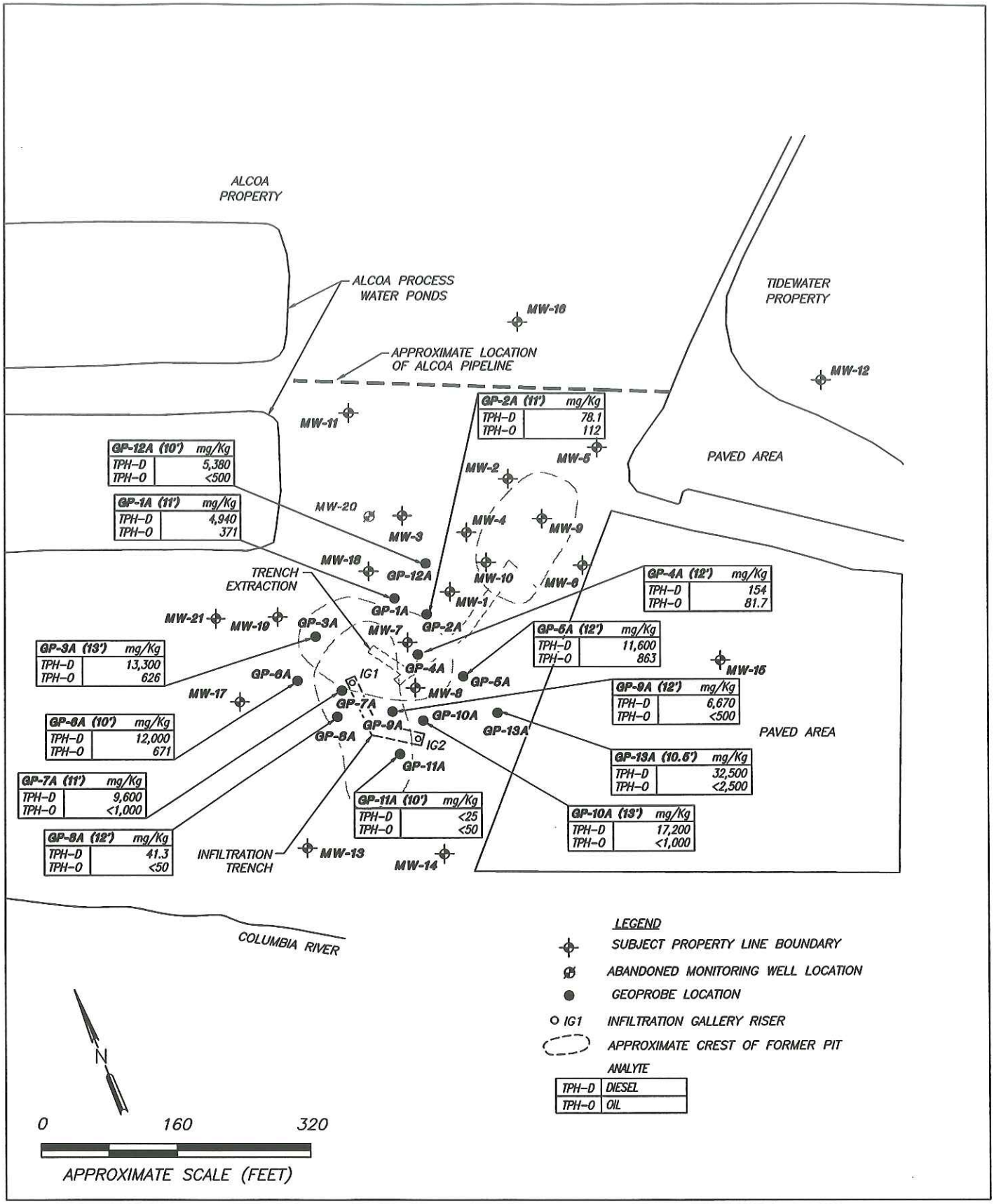

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GEOPROBE SOIL ANALYTICAL RESULTS (SEPTEMBER 10 AND 14, 1999)
FORMER COLUMBIA MARINE LINES FACILITY
6305 LOWER RIVER ROAD
VANCOUVER, WASHINGTON

FIGURE: 4

JOB#: 015.08480.001 APPR: DWN: KSM DATE: 11/9/99

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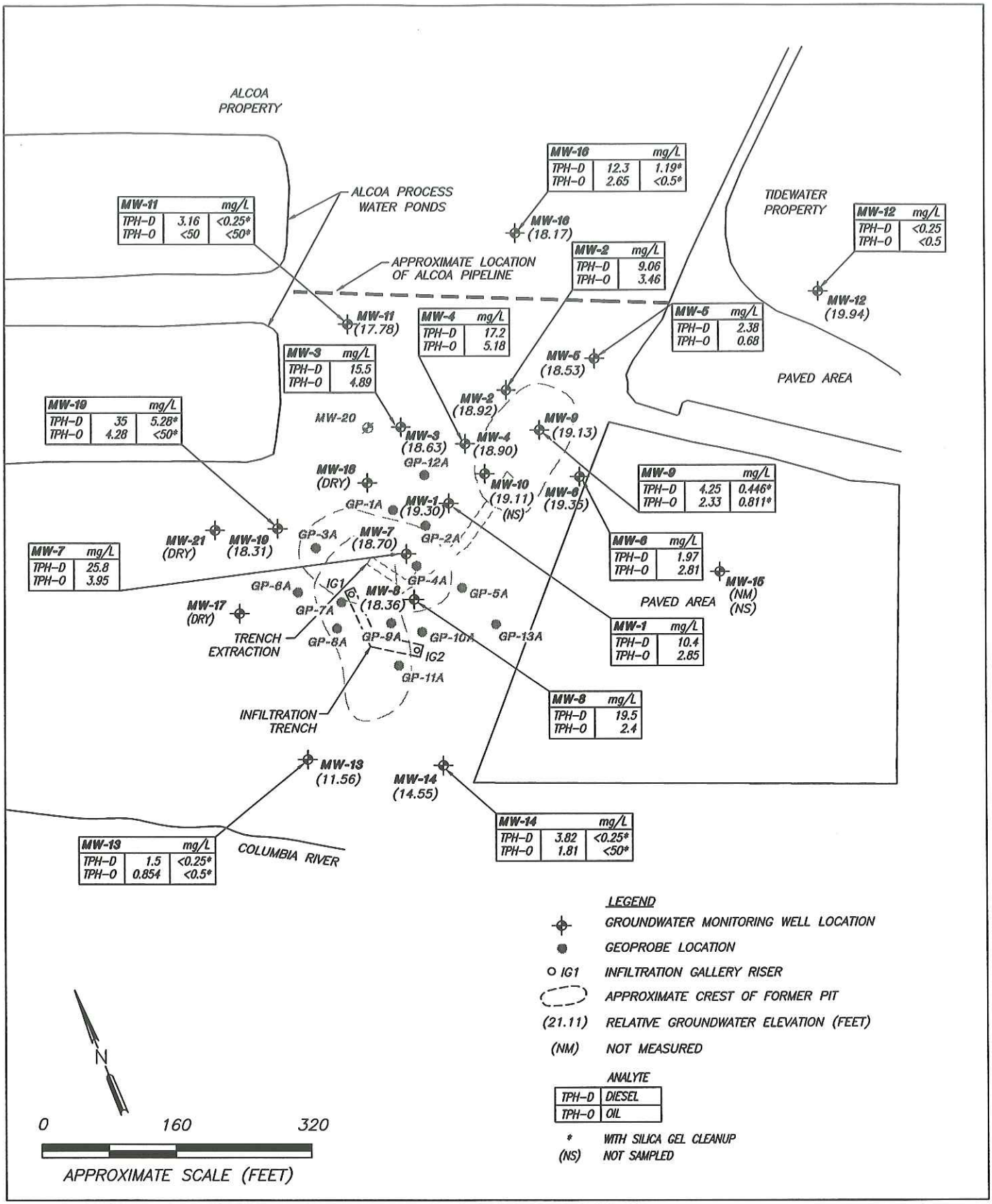

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GROUNDWATER ANALYTICAL RESULTS (10/14/99)
FORMER COLUMBIA MARINE LINES FACILITY
6305 LOWER RIVER ROAD
VANCOUVER, WASHINGTON

FIGURE: 5

JOB#: 015.08480.001 APPR: DWN: KSM DATE: 11/9/99

F:/FILES/PORTLAND/CROWLEY

DWG: 15-8480-15A-1099

TABLES

Table 1. Comparison of Analytical Methods for Wells MW-7 and MW-16
Groundwater Analytical Results
Former Columbia Marine Lines Facility
6305 Lower River Road, Vancouver, Washington

Sample Location	Sample Preparation Method	TPH-D (mg/L)	
		Diesel	Heavy Oil
MW-7	Without Silica Gel Cleanup	35.8	<10
	With Silica Gel Cleanup	28.9	<5.0
MW-16	Without Silica Gel Cleanup	9.9	2.13
	With Silica Gel Cleanup	0.842	<0.50

TPH-D = Total petroleum hydrocarbons as diesel (TPH-D) analysis by Washington DOE Method WTPH-D (extended) with silica gel cleanup analysis based on possible biogenic interference.

mg/L = Milligrams per liter, or approximate parts per million.

< = Less than laboratory method reporting limits (MRLs).

Table 2. Historical Groundwater Database
Former Columbia Marine Lines Facility
6305 Lower River Road, Vancouver, Washington

Sample Location/ TOC Elevation (feet)	Sample Date	TPH-G (mg/L)	TPH-D (mg/L)		BTEX (µg/L)				HVOCs (µg/L)	PAHs (µg/L)	DTW (feet)	LHT (feet)	WTE (feet)
			Diesel	Heavy Oil	Benzene	Toluene	Ethyl-benzene	Total Xylenes					
MW-1	11/08/83	--	--	--	<20	<20	<20	--	--	--	--	--	--
31.66	12/13/84	--	--	--	<5	<5	<5	<5	--	--	--	--	--
	11/13/95	<0.08	12	<5.0	<0.50	<0.50	<0.50	<0.50	ND	ND	9.19	0.00	22.47
	08/01/96	--	--	--	--	--	--	--	--	--	10.23	0.00	21.43
	10/30/97	--	--	--	--	--	--	--	--	--	9.54	0.00	22.12
	10/29/98	0.233	5.43	1.23	<0.50	<0.50	<0.50	<1.0	--	--	12.26	0.00	19.40
	05/07/99	--	--	--	--	--	--	--	--	--	9.51	0.00	22.15
31.69	10/14/99	--	10.4	2.85	--	--	--	--	--	--	12.39	0.00	19.30
MW-2	11/08/83	--	--	--	510	450	100	770	--	--	--	--	--
33.97	02/05/86	--	--	--	69	390	110	900	--	--	--	--	--
	08/28/90	<0.05	26.4	--	<100	<100	<100	566	--	--	--	--	--
	08/02/94	3.1	10	--	6.3	3	35	110	--	ND	--	--	--
	11/13/95	4	40	7.4	1.7	2.3	22	110	--	--	12.95	0.00	21.02
	08/01/96	<0.08	4.7	--	2.3	1	20	44	--	--	13.75	0.00	20.22
	10/30/97	--	--	--	--	--	--	--	--	--	13.55	0.00	20.42
	10/29/98	3.22	9.03	<2.50	<0.50	0.641	<0.50	6.21	--	--	14.92	0.00	19.05
	05/07/99	--	--	--	--	--	--	--	--	--	12.79	0.00	21.18
33.98	10/14/99	--	9.06	3.46	--	--	--	--	--	--	15.06	0.00	18.92
MW- 3	11/08/83	--	--	--	95	64	15	90	--	--	--	--	--
30.90	12/17/84	--	--	--	<1	<1	<1	--	--	--	--	--	--
	11/13/95	0.29	4.6	<5.0	<0.50	<0.50	<0.50	<0.50	--	--	11.24	0.00	19.66
	08/01/96	--	--	--	--	--	--	--	--	--	11.11	0.00	19.79
	10/30/97	--	--	--	--	--	--	--	--	--	11.23	0.00	19.67
	10/30/98	0.28	11.4	4.1	<0.50	1.55	<0.50	<1.0	--	--	12.28	0.00	18.62
	05/07/99	--	--	--	--	--	--	--	--	--	9.98	0.00	20.92
30.96	10/14/99	--	15.5	4.89	--	--	--	--	--	--	12.33	0.00	18.63

Table 2. Historical Groundwater Database
Former Columbia Marine Lines Facility
6305 Lower River Road, Vancouver, Washington

Sample Location/ TOC Elevation (feet)	Sample Date	TPH-G (mg/L)	TPH-D (mg/L)		BTEX (µg/L)				HVOCs (µg/L)	PAHs (µg/L)	DTW (feet)	LHT (feet)	WTE (feet)
			Diesel	Heavy Oil	Benzene	Toluene	Ethyl-benzene	Total Xylenes					
MW-4	11/08/83	--	--	--	700	150	110	800	--	--	--	--	--
28.42	12/12/84	--	--	--	<1	<1	<1	<1	--	--	--	--	--
	11/13/95	0.39	7.8	<5.0	3	1.4	1.1	6.7	--	--	8.27	0.00	20.15
	08/01/96	0.38	11	--	1.6	5	<0.50	<1.0	--	--	8.40	0.00	20.02
	10/30/97	--	--	--	--	--	--	--	--	--	8.45	0.00	19.97
	10/29/98	1.12	11.2	2.92	<0.50	1	<0.50	<1.0	--	--	9.65	0.00	18.77
	05/07/99	--	--	--	--	--	--	--	--	--	7.26	0.00	21.16
28.64	10/14/99	--	17.2	5.18	--	--	--	--	--	--	9.74	0.00	18.90
MW-5	11/08/83	--	--	--	35	<2	<2	--	--	--	--	--	--
23.37	12/17/84	--	--	--	<20	380	<20	--	--	--	--	--	--
	11/13/95	<0.08	2.6	0.77	<0.50	<0.50	<0.50	<0.50	--	--	3.07	0.00	20.30
	08/01/96	--	--	--	--	--	--	--	--	--	3.60	0.00	19.77
	10/29/98	--	--	--	--	--	--	--	--	--	--	--	--
	05/07/99	--	--	--	--	--	--	--	--	--	2.45	0.00	20.92
23.38	10/14/99	--	2.38	0.68	--	--	--	--	--	--	4.85	0.00	18.53
MW-6	12/12/84	--	--	--	<1	<1	<1	<1	--	--	--	--	--
26.14	11/13/95	0.74	48	<5.0	<0.50	<0.50	<0.50	<0.50	--	--	5.23	0.00	20.91
	08/01/96	--	--	--	--	--	--	--	--	--	5.50	0.00	20.64
	10/30/98	<0.08	27	6.79	<0.50	<0.50	<0.50	<1.0	--	--	5.44	0.00	20.70
	05/07/99	--	--	--	--	--	--	--	--	--	3.18	0.00	22.96
24.76	10/14/99	--	19.7	2.81	--	--	--	--	--	--	5.41	0.00	19.35

Table 2. Historical Groundwater Database
Former Columbia Marine Lines Facility
6305 Lower River Road, Vancouver, Washington

Sample Location/ TOC Elevation (feet)	Sample Date	TPH-G (mg/L)	TPH-D (mg/L)		BTEX (µg/L)				HVOCs (µg/L)	PAHs (µg/L)	DTW (feet)	LHT (feet)	WTE (feet)
			Diesel	Heavy Oil	Benzene	Toluene	Ethyl-benzene	Total Xylenes					
MW-7	11/08/83	--	--	--	<20	<20	<20	--	--	--	--	--	--
33.36	08/02/94	1.6	7.7	--	<2.5	<2.5	<2.5	<2.5	--	ND	--	--	--
	11/13/95	1.8	43	<5.0	1.6	1.2	<1.0	<1.0	--	--	12.54	0.00	20.82
	08/01/96	--	--	--	--	--	--	--	--	--	13.55	0.62	20.31
	10/30/97	--	--	--	--	--	--	--	--	--	13.24	0.17	20.26
	10/30/98	DET[a]	DET	ND	--	--	--	--	--	--	14.51	0.07	18.91
	05/07/99	--	--	--	--	--	--	--	--	--	11.82	0.02	21.56
	08/24/99	--	35.8	<10	--	--	--	--	DET/ND[b]	--	--	--	--
With Silica Gel Cleanup		--	28.9	<5.0	--	--	--	--	--	--	--	--	--
33.40	10/14/99	--	25.8	3.95	--	--	--	--	--	--	14.70	0.00	18.70
MW-8	11/08/83	--	--	--	208	<2	<2	--	--	--	--	--	--
33.49	11/13/95	5.4	490	41	2	1.5	1.9	5	--	--	12.90	0.50	20.99
	08/01/96	--	--	--	--	--	--	--	--	--	12.98	0.15	20.63
	10/30/97	--	--	--	--	--	--	--	--	--	13.20	0.21	20.46
	10/30/98	DET[a]	DET	DET	--	--	--	--	--	--	14.94	0.14	18.66
	05/07/99	--	--	--	--	--	--	--	--	--	12.05	0.37	21.74
33.53	10/14/99	--	19.5	2.4	--	--	--	--	--	--	15.31	0.18	18.36
MW-9	12/13/84	--	--	--	<1	<1	<1	<1	--	--	--	--	--
26.36	11/13/95	<0.08	0.88	0.63	<0.50	<0.50	<0.50	<0.50	--	--	4.25	0.00	22.11
	08/01/96	--	--	--	--	--	--	--	--	--	5.81	0.00	20.55
	10/30/97	--	--	--	--	--	--	--	--	--	1.87	0.00	24.49
	10/30/98	<0.08	5.76	2.3	<0.50	<0.50	<0.50	<1.0	--	--	6.31	0.00	20.05
	05/07/99	--	--	--	--	--	--	--	--	--	5.02	0.00	21.34
26.38	10/14/99	--	4.25	2.33	--	--	--	--	--	--	7.25	0.00	19.13
With Silica Gel Cleanup		--	0.446	0.811	--	--	--	--	--	--	--	--	--

Table 2. Historical Groundwater Database
Former Columbia Marine Lines Facility
6305 Lower River Road, Vancouver, Washington

Sample Location/ TOC Elevation (feet)	Sample Date	TPH-G (mg/L)	TPH-D (mg/L)		BTEX (µg/L)				HVOCs (µg/L)	PAHs (µg/L)	DTW (feet)	LHT (feet)	WTE (feet)
			Diesel	Heavy Oil	Benzene	Toluene	Ethyl-benzene	Total Xylenes					
MW-10	11/13/95	0.76	<0.25	<5.0	1.1	1	1.2	1.5	--	--	5.09	0.00	20.80
25.89	08/01/96	--	--	--	--	--	--	--	--	--	5.62	0.00	20.27
	10/30/97	--	--	--	--	--	--	--	--	--	5.64	0.00	20.25
	10/30/98	--	--	--	--	--	--	--	--	--	DRY	DRY	DRY
	05/07/99	--	--	--	--	--	--	--	--	--	4.53	0.00	21.36
25.92	10/14/99	--	--	--	--	--	--	--	--	--	6.81	0.00	19.11
MW-11	12/17/84	--	--	--	<1	<1	<1	--	--	--	--	--	--
25.89	08/02/94	<0.20	<0.50	--	<0.50	<0.50	<0.50	1	--	ND	--	--	--
	11/13/95	<0.08	11	<5.0	<0.50	<0.50	<0.50	<0.50	--	--	6.57	0.00	19.32
	08/01/96	--	--	--	--	--	--	--	--	--	6.71	0.00	19.18
	10/30/97	--	--	--	--	--	--	--	--	--	6.75	0.00	19.14
	10/29/98	<0.08	3.16	0.7	<0.50	<0.50	<0.50	<1.0	--	--	8.12	0.00	17.77
	05/07/99	--	--	--	--	--	--	--	--	--	5.49	0.00	20.40
25.90	10/14/99	--	3.16	<0.50	--	--	--	--	--	--	8.12	0.00	17.78
With Silica Gel Cleanup		--	<0.25	<0.50	--	--	--	--	--	--	--	--	--
MW-12	12/18/84	--	--	--	<1	<1	<1	--	--	--	--	--	--
28.17	11/13/95	<0.08	<0.25	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	6.07	0.00	22.10
	08/01/96	<0.08	<0.25	--	<0.50	<0.50	<0.50	<1	--	--	7.15	0.00	21.02
	10/30/97	--	--	--	--	--	--	--	--	--	6.61	0.00	21.56
	10/29/98	<0.08	<0.25	<0.50	<0.50	<0.50	<0.50	<1.0	--	--	8.01	0.00	20.16
	05/07/99	--	--	--	--	--	--	--	--	--	6.36	0.00	21.81
28.28	10/14/99	--	<0.25	<0.50	--	--	--	--	--	--	8.34	0.00	19.94

Table 2. Historical Groundwater Database
Former Columbia Marine Lines Facility
6305 Lower River Road, Vancouver, Washington

Sample Location/ TOC Elevation (feet)	Sample Date	TPH-G (mg/L)	TPH-D (mg/L)		BTEX (µg/L)				HVOCs (µg/L)	PAHs (µg/L)	DTW (feet)	LHT (feet)	WTE (feet)
			Diesel	Heavy Oil	Benzene	Toluene	Ethyl-benzene	Total Xylenes					
MW-13	12/19/84	--	--	--	<1	<1	<1	<2	--	--	--	--	--
22.78	02/05/86	--	--	--	<1	<1	<1	<2	--	--	--	--	--
	08/28/90	<0.05	<0.05	--	<100	<100	<100	<100	--	--	--	--	--
	08/02/94	<0.20	1.2	--	<0.50	<0.50	<0.50	<0.50	--	ND	--	--	--
	11/13/95	<0.08	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	10.60	0.00	12.18
	08/01/96	<0.08	0.9	--	<0.50	<0.50	<0.50	<1	--	--	10.70	0.00	12.08
	10/30/97	<0.08	1.53	0.75	<0.50	<0.50	<0.50	<1	--	--	10.48	0.00	12.30
	10/29/98	--	--	--	--	--	--	--	--	--	--	--	--
	05/07/99	--	--	--	--	--	--	--	--	--	9.60	0.00	13.18
22.75	10/14/99	--	1.5	0.854	--	--	--	--	--	--	11.19	0.00	11.56
With Silica Gel Cleanup		--	<0.25	<0.50	--	--	--	--	--	--	--	--	--
MW-14	12/19/84	--	--	--	<1	<1	<1	--	--	--	--	--	--
26.25	11/13/95	<0.08	1	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	8.08	0.00	18.17
	08/01/96	<0.08	1.8	--	<0.50	<0.50	<0.50	<1	--	--	9.15	0.00	17.10
	10/30/97	<0.08	<0.25	<0.50	<0.50	<0.50	<0.50	<1	--	--	8.89	0.00	17.36
	10/29/98	--	--	--	--	--	--	--	--	--	--	--	--
	05/07/99	--	--	--	--	--	--	--	--	--	8.03	0.00	18.22
26.28	10/14/99	--	3.82	1.81	--	--	--	--	--	--	11.73	0.00	14.55
With Silica Gel Cleanup		--	<0.25	<0.50	--	--	--	--	--	--	--	--	--
MW-15	02/05/86	--	--	--	<1	<1	<1	<2	--	--	--	--	--
26.24	08/02/94	<0.20	<0.50	--	<0.50	<0.50	<0.50	<0.50	--	ND	--	--	--
	11/13/95	--	--	--	--	--	--	--	--	--	--	--	--
	08/01/96	--	--	--	--	--	--	--	--	--	--	--	--
	05/07/99	--	--	--	--	--	--	--	--	--	--	--	--
	10/14/99	--	--	--	--	--	--	--	--	--	--	--	--

Table 2. Historical Groundwater Database
Former Columbia Marine Lines Facility
6305 Lower River Road, Vancouver, Washington

Sample Location/ TOC Elevation (feet)	Sample Date	TPH-G (mg/L)	TPH-D (mg/L)		BTEX (µg/L)				HVOCs (µg/L)	PAHs (µg/L)	DTW (feet)	LHT (feet)	WTE (feet)
			Diesel	Heavy Oil	Benzene	Toluene	Ethyl-benzene	Total Xylenes					
MW-16	02/05/86	--	--	--	93	<10	<10	240	--	--	--	--	--
31.13	08/28/90	1	4.91	--	<100	<100	<100	445	--	--	--	--	--
	08/02/94	1.1[c]	11[c]	--	2.0[c]	0.73[c]	0.74[c]	4.8[c]	--	11[c]	--	--	--
	11/13/95	0.9	10	2.1	1	1.3	53	8	--	--	9.94	0.00	21.19
	08/01/09	0.74	<0.50	--	<0.50	2.2	<0.50	3	--	--	10.36	0.00	20.77
	10/30/97	1.22	9.01	2.7	<0.50	<0.50	7.86	4	--	--	10.26	0.00	20.87
	10/29/98	0.482	11.6	2.59	<0.50	3.73	<0.50	<1.0	--	--	11.43	0.00	19.70
	05/07/99	--	--	--	--	--	--	--	--	--	9.33	0.00	21.80
	08/24/99	--	9.9	2.13	--	--	--	--	--	--	--	--	--
With Silica Gel Cleanup		--	0.842	<0.50	--	--	--	--	--	--	--	--	--
29.67	10/14/99	--	12.3	2.65	--	--	--	--	--	--	11.50	0.00	18.17
With Silica Gel Cleanup		--	1.19	<0.50	--	--	--	--	--	--	--	--	--
MW-17	02/05/86	--	--	--	<1	<1	<1	<2	--	--	--	--	--
33.94	11/13/95	--	--	--	--	--	--	--	--	--	DRY	DRY	DRY
	08/01/96	--	--	--	--	--	--	--	--	--	14.62	0.00	19.32
	10/30/97	--	--	--	--	--	--	--	--	--	15.61	0.00	18.33
	10/29/98	--	--	--	--	--	--	--	--	--	DRY	DRY	DRY
	05/07/99	--	--	--	--	--	--	--	--	--	13.42	0.00	20.52
33.97	10/14/99	--	--	--	--	--	--	--	--	--	DRY	DRY	DRY
MW-18	11/13/95	<0.08	4.9	2.1	<0.50	<0.50	<0.50	<0.50	--	--	8.47	0.00	24.72
33.19	08/01/96	<0.08	9.6	--	<0.50	1.1	0.82	<1.0	--	--	9.96	0.00	23.23
	10/30/97	--	--	--	--	--	--	--	--	--	DRY	DRY	DRY
	10/29/98	--	--	--	--	--	--	--	--	--	DRY	DRY	DRY
	05/07/99	--	--	--	--	--	--	--	--	--	DRY	DRY	DRY
33.24	10/14/99	--	--	--	--	--	--	--	--	--	DRY	DRY	DRY

Table 2. Historical Groundwater Database
Former Columbia Marine Lines Facility
6305 Lower River Road, Vancouver, Washington

Sample Location/ TOC Elevation (feet)	Sample Date	TPH-G (mg/L)	TPH-D (mg/L)		BTEX (µg/L)				HVOCs (µg/L)	PAHs (µg/L)	DTW (feet)	LHT (feet)	WTE (feet)
			Diesel	Heavy Oil	Benzene	Toluene	Ethyl-benzene	Total Xylenes					
MW-19	12/05/86	--	--	--	140	<10	30	<20	--	--	--	--	--
33.67	08/28/90	<0.05	35.2	--	<100	<100	<100	<100	--	--	--	--	--
	11/13/95	4.3	69	<25	<2.5	<2.5	<2.5	<2.5	--	--	14.77	0.00	18.90
	08/01/96	--	--	--	--	--	--	--	--	--	14.24	0.00	19.43
	10/30/97	2.86	21.6	3.18	<0.50	<0.50	<0.50	1.45	--	--	14.47	0.00	19.20
	10/30/98	DET[a]	DET	DET	--	--	--	--	--	--	16.11	0.75	18.16
	05/07/99	--	--	--	--	--	--	--	--	--	12.95	0.00	20.72
33.72	10/14/99	--	35	4.28	--	--	--	--	--	--	15.43	0.02	18.31
With Silica Gel Cleanup		--	5.28	<0.50	--	--	--	--	--	--	--	--	--
MW-20	02/05/86	--	--	--	<1	<1	<1	<2	--	--	--	--	--
30.36	11/13/95	<0.08	0.87	0.73	<0.50	<0.50	<0.50	<0.50	ND	--	21.99	0.00	8.37
	08/01/96	--	--	--	--	--	--	--	--	--	22.66	0.00	7.70
	10/30/97	--	--	--	--	--	--	--	--	--	23.72	0.00	6.64
	10/30/98	<0.08	<0.25	<0.50	<0.50	<0.50	<0.50	<1.0	--	--	27.70	0.00	2.66
	05/07/99	--	--	--	--	--	--	--	--	--	19.30	0.00	11.06
	Well Abandoned 09/09/99.												
MW-21	02/05/86	--	--	--	<1	<1	<1	<2	--	--	--	--	--
30.06	11/13/95	--	--	--	--	--	--	--	--	--	DRY	DRY	DRY
	08/01/96	--	--	--	--	--	--	--	--	--	10.65	0.00	19.41
	10/30/97	--	--	--	--	--	--	--	--	--	11.50	0.00	18.56
	10/29/98	--	--	--	--	--	--	--	--	--	DRY	DRY	DRY
	05/07/99	--	--	--	--	--	--	--	--	--	9.57	0.00	20.49
30.08	10/14/99	--	--	--	--	--	--	--	--	--	DRY	DRY	DRY
P-1	11/13/95	--	--	--	--	--	--	--	--	--	9.74	0.00	19.61
29.35													
P-2	11/13/95	--	--	--	--	--	--	--	--	--	4.35	0.00	20.87
25.22													

Table 2. Historical Groundwater Database
Former Columbia Marine Lines Facility
6305 Lower River Road, Vancouver, Washington

Sample Location/ TOC Elevation (feet)	Sample Date	TPH-G (mg/L)	TPH-D (mg/L)		BTEX (µg/L)				HVOCs (µg/L)	PAHs (µg/L)	DTW (feet)	LHT (feet)	WTE (feet)
			Diesel	Heavy Oil	Benzene	Toluene	Ethyl-benzene	Total Xylenes					
EX-1 32.30	11/13/95	--	--	--	--	--	--	--	--	--	14.72	0.00	17.58
EX-2 33.53	02/03/96	5.3	13	2.5	1.4	1.3	0.54	2.4	--	--	--	--	--
PMX-5 26.70	08/02/94	<0.2	1.3	--	<0.5	<0.5	<0.5	<0.5	--	ND	--	--	--
MTCA Method A Cleanup Levels		1	1		5	40	30	20	Various	0.1[d]			

TOC = Top of casing elevation relative to assigned benchmark.
TPH-G = Total petroleum hydrocarbons as gasoline analysis by Washington DOE Method WTPH-G; results in milligrams per liter (mg/L).
TPH-D = TPH as diesel and heavy oil analysis by Washington DOE Method WTPH-D (extended) with silica gel cleanup analysis based on possible biogenic intererence; results in mg/L.
BTEX = Benzene, toluene, ethylbenzene, and total xylene analysis by EPA Method 8020; results in micrograms per liter (µg/L).
HVOCs = Halogenated volatile organic compound analysis by EPA Method 8010/8260B; results in µg/L.
PAHs = Polynuclear aromatic hydrocarbon analysis by EPA Method 8310; results in µg/L.
DTW = Depth to water below top of casing.
LHT = Liquid hydrocarbon thickness.
WTE = Water table elevation.
-- = Not measured, not analyzed, or not sampled.
ND = Not detected above laboratory method reporting limit (MRL).
a = Detected (DET) hydrocarbons in gasoline range appear to be due to overlap of diesel-range hydrocarbons.
b = Isopropylbenzene was detected 8.18 µg/L, and n-Propylbenzene was detected at 10.9 µg/L. All other HVOCs were ND.
c = Results include higher of 08/02/94 MW-16 or blind duplicate listed as "MW-30." Fluorene was detected at 11 µg/L in MW-30; all other PAH results were below laboratory MRLs.
d = Model Toxics Control Act (MTCA) Method A cleanup level for carcinogenic PAHs.

Analytical methods prior to 1995 include Hydrocarbon Scan by EPA Methods 3510/Modified 8015, and Oil and Grease by EPA Method 413.1.
Note: Water elevation corrected if liquid hydrocarbon present; corrected water level elevation = TOC - DTW + (LHT x 0.8).

Table 3. Geoprobe Soil Analytical Results
Former Columbia Marine Lines Facility
6305 Lower River Road, Vancouver, Washington

Sample ID	Depth (feet bgs)	Sample Date	TPH-D (mg/Kg)	TPH-D With Silica Gel Cleanup (mg/Kg)	TPH-O (mg/Kg)	TPH-O With Silica Gel Cleanup (mg/Kg)
GP-1A	11	09/10/99	4,940	--	371	--
GP-2A	11	09/10/99	78.1	--	112	--
GP-3A	13	09/10/99	13,300	13,500	626	476
GP-4A	12	09/10/99	154	--	81.7	--
GP-5A	12	09/10/99	11,600	11,200	863	581
GP-6A	10	09/14/99	12,000	13,100	671	513
GP-7A	11	09/14/99	9,600	9,870	<1,000	<500
GP-8A	12	09/10/99	41.3	--	<50	--
GP-9A	12	09/10/99	6670	--	<500	--
GP-10A	13	09/10/99	17,200	17,400	<1,000	<500
GP-11A	10	09/14/99	<25	--	<50	--
GP-12A	10	09/14/99	5,380	--	<500	--
GP-13A	10.5	09/14/99	32,500	31,400	<2,500	<500

bgs = Below ground surface.
TPH-D = Total petroleum hydrocarbons (TPH) as diesel analysis by NWTPH-Dx Method, with silica gel cleanup analysis based on possible biogenic interference.
TPH-O = TPH as heavy oil analysis by NWTPH-Dx Method, with silica gel cleanup analysis based on possible biogenic interference.
mg/Kg = Milligrams per kilogram, or approximate parts per million.
< = Less than laboratory method reporting limits (MRLs).

APPENDIX A
BORING LOGS

Additional Subsurface Investigation Report
Former Columbia Marine Lines Facility
6305 Lower River Road
Vancouver, Washington
SECOR PN: 015.08480.006
December 3, 1999

SECOR
International Incorporated
015

FACILITY **CROWLEY** JOB # **015.08490.500** BORING/WELL **GP1A**
LOCATION SURFACE ELEVATION **NA**
START **9:00 9/9/99** FINISH **9:40 9/10/99** CASING TOP ELEVATION **NA**
LOGGED BY **K. WARNER** MONITORING DEVICE **OVM 580B**
SUBCONTRACTOR AND EQUIPMENT **CASCADE DRILLING - GEOPROBE TRACK RIG**
COMMENTS

Penetration Results: Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				5			5	
				0	SAND; gray brown, fine to medium, dry.		0	
		0	NS					
				5	grades to moist.		5	
		523	SD			SP		
		609	SD	10			10	
		12.8	SD		some wood debris.			
		0	NS	15	Sandy SILT; dark gray, fine, saturated.	SM	15	
					Boring terminated at 15 feet.			
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

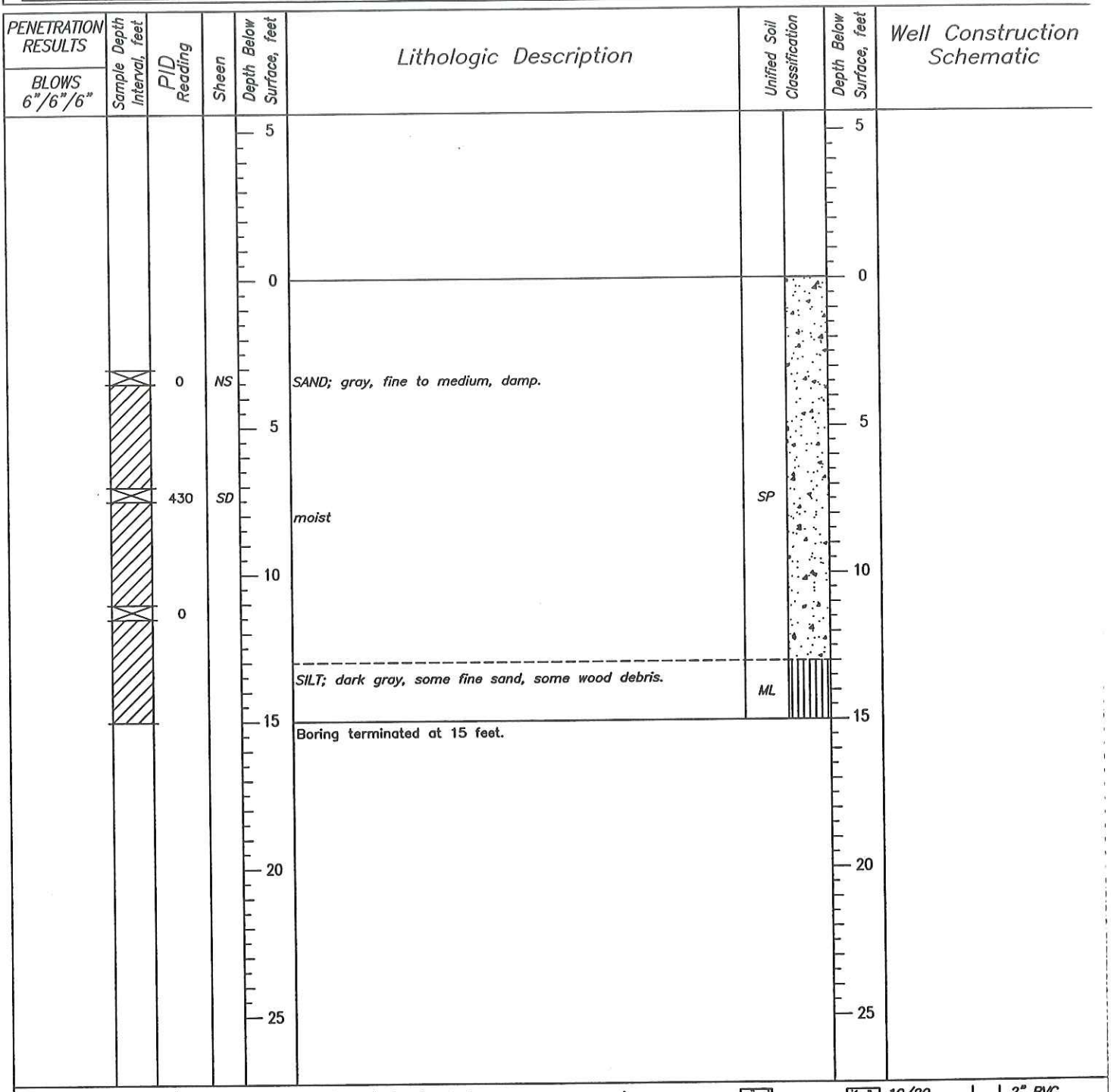
10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8490-5(BL1)

SECOR
International Incorporated
015

FACILITY **CROWLEY** JOB # **015.08480.500** BORING/WELL **GP2A**
LOCATION SURFACE ELEVATION **NA**
START **9:45 9/10/99** FINISH **10:30 9/10/99** CASING TOP ELEVATION **NA**
LOGGED BY **K. WARNER** MONITORING DEVICE **OVM 580B**
SUBCONTRACTOR AND EQUIPMENT **CASCADE DRILLING - GEOPROBE TRACK RIG**
COMMENTS **GROUNDWATER AT 12.5 FEET DEPTH NEAR BY MW-7**



Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8480-5(GP2A)

SECOR
International Incorporated
015

FACILITY **CROWLEY** JOB # **015.08480.500** BORING/WELL **GP3A**
LOCATION _____ SURFACE ELEVATION **NA**
START **10:40 9/10/99** FINISH **11:20 9/10/99** CASING TOP ELEVATION **NA**
LOGGED BY **K. WARNER** MONITORING DEVICE **OVM 580B**
SUBCONTRACTOR AND EQUIPMENT **CASCADE DRILLING - GEOPROBE TRACK RIG**
COMMENTS _____

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				5			5	
				0			0	
		0	NS		SAND; gray, fine to medium, damp.			
				5	SAND; dark gray, fine to medium, moist, (stained).	SP	5	
		430	SD					
				10			10	
		517	SD					
		544	SD					
				15	SILT; dark gray, moist to wet.	ML	15	
					Boring terminated at 15 feet.			
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8480-5(GP3A)

SECOR
International Incorporated
015

FACILITY **CROWLEY** JOB # **015.08480.500** BORING/WELL **GP4A**
LOCATION SURFACE ELEVATION **NA**
START **11:30 9/10/99** FINISH **12:20 9/10/99** CASING TOP ELEVATION **NA**
LOGGED BY **K. WARNER** MONITORING DEVICE **OVM 580B**
SUBCONTRACTOR AND EQUIPMENT **CASCADE DRILLING - GEOPROBE TRACK RIG**
COMMENTS

Penetration Results: Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				5			5	
				0			0	
		0	NS		SAND; gray, fine to medium, dry.			
				5		SP	5	
		100	SD	10	SAND; dark gray, fine to medium, some gravel to 1" diameter, moist, (stained).		10	
		150	SD					
				15	SILT; dark gray, moist to wet.	ML	15	
					Boring terminated at 15 feet.			
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8480-5(GP4A)

SECOR
International Incorporated
015

FACILITY **CROWLEY** JOB # **015.08480.500** BORING/WELL **GP5A**
LOCATION SURFACE ELEVATION **NA**
START **12:30 9/10/99** FINISH **13:05 9/10/99** CASING TOP ELEVATION **NA**
LOGGED BY **K. WARNER** MONITORING DEVICE **OVM 580B**
SUBCONTRACTOR AND EQUIPMENT **CASCADE DRILLING - GEOPROBE TRACK RIG**
COMMENTS

Penetration Results (Blows 6"/6"/6")	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				5			5	
				0			0	
		0	NS		SAND; gray–brown, fine to medium, dry.	SP		
		199	SD	10	SAND; dark gray, fine to medium, moist, (stained).		10	
		385	SD					
					SILT; dark gray, wet.	ML		
		27	NS	15	Boring terminated at 15 feet.		15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

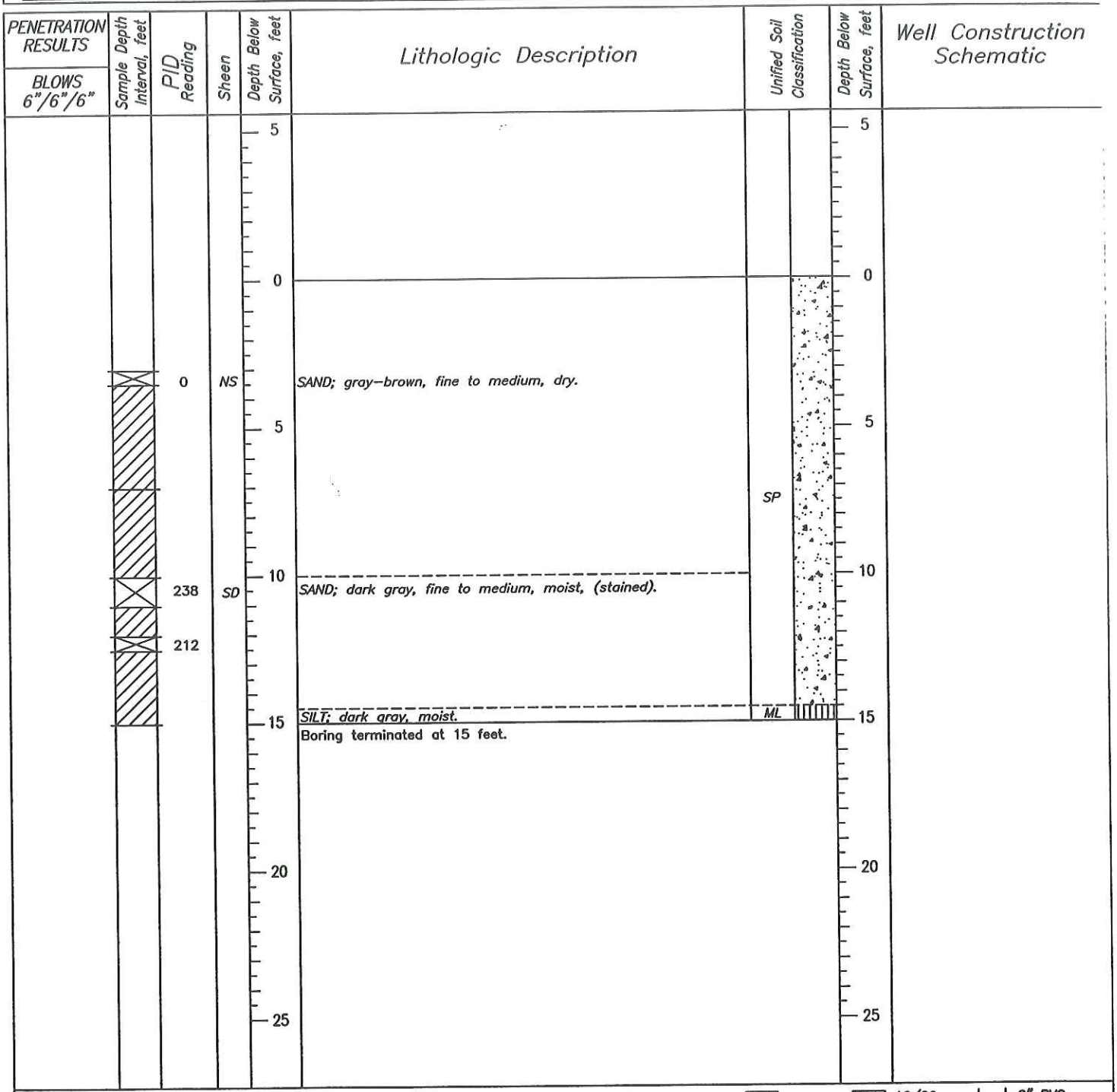
Concrete
Bentonite
10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8480-5(GP5A)

SECOR
International Incorporated
015

FACILITY **CROWLEY** JOB # **015.08480.500** BORING/WELL **GP6A**
LOCATION _____ SURFACE ELEVATION **NA**
START **16:30 9/14/99** FINISH **16:55 9/14/99** CASING TOP ELEVATION **NA**
LOGGED BY **K. WARNER** MONITORING DEVICE **OVM 580B**
SUBCONTRACTOR AND EQUIPMENT **CASCADE DRILLING - GEOPROBE TRACK RIG**
COMMENTS _____



Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

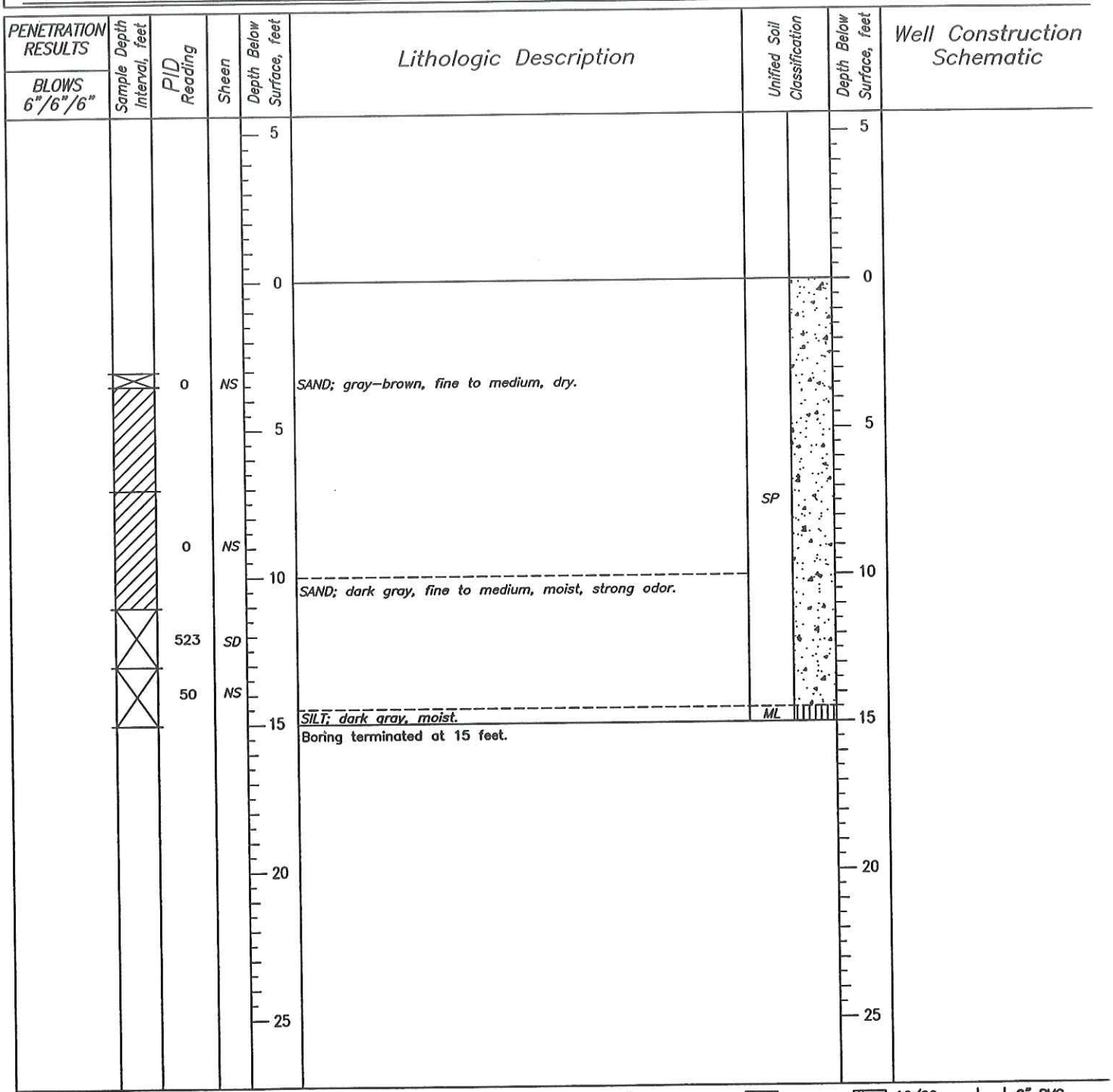
10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 158480-5(GP6A)

SECOR
International Incorporated
015

FACILITY **CROWLEY** JOB # **015.08480.500** BORING/WELL **GP7A**
LOCATION SURFACE ELEVATION **NA**
START **12:15 9/14/99** FINISH **14:00 9/14/99** CASING TOP ELEVATION **NA**
LOGGED BY **K. WARNER** MONITORING DEVICE **OVM 580B**
SUBCONTRACTOR AND EQUIPMENT **CASCADE DRILLING - GEOPROBE TRACK RIG**
COMMENTS



Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8480-5(GP7A)

SECOR
International Incorporated
015

FACILITY **CROWLEY** JOB # **015.08480.500** BORING/WELL **GP8A**
LOCATION SURFACE ELEVATION **NA**
START **15:20 9/10/99** FINISH **16:10 9/10/99** CASING TOP ELEVATION **NA**
LOGGED BY **K. WARNER** MONITORING DEVICE **OVM 580B**
SUBCONTRACTOR AND EQUIPMENT **CASCADE DRILLING - GEOPROBE TRACK RIG**
COMMENTS

Penetration Results (Blows 6"/6"/6")	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				5			5	
				0			0	
		0	NS		SAND; gray–brown, fine to medium, dry.	SP		
				5			5	
		12.8	NS	10			10	
					SILT; dark gray, moist.	ML		
				15	Boring terminated at 15 feet.		15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8480-5(GP8A)

SECOR
International Incorporated
015

FACILITY **CROWLEY** JOB # **015.08480.500** BORING/WELL **GP9A**
LOCATION _____ SURFACE ELEVATION **NA**
START **13:35 9/10/99** FINISH **14:55 9/10/99** CASING TOP ELEVATION **NA**
LOGGED BY **K. WARNER** MONITORING DEVICE **OVM 580B**
SUBCONTRACTOR AND EQUIPMENT **CASCADE DRILLING - GEOPROBE TRACK RIG**
COMMENTS _____

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				5			5	
				0			0	
		20	NS		SAND; gray–brown, fine to medium, dry.			
				5		SP	5	
		305	NS	10			10	
		319	SD		Oily drops noted in sheen. Rock in probe tip – no recovery, below 12 ft			
				15	Boring terminated at 15 feet.		15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

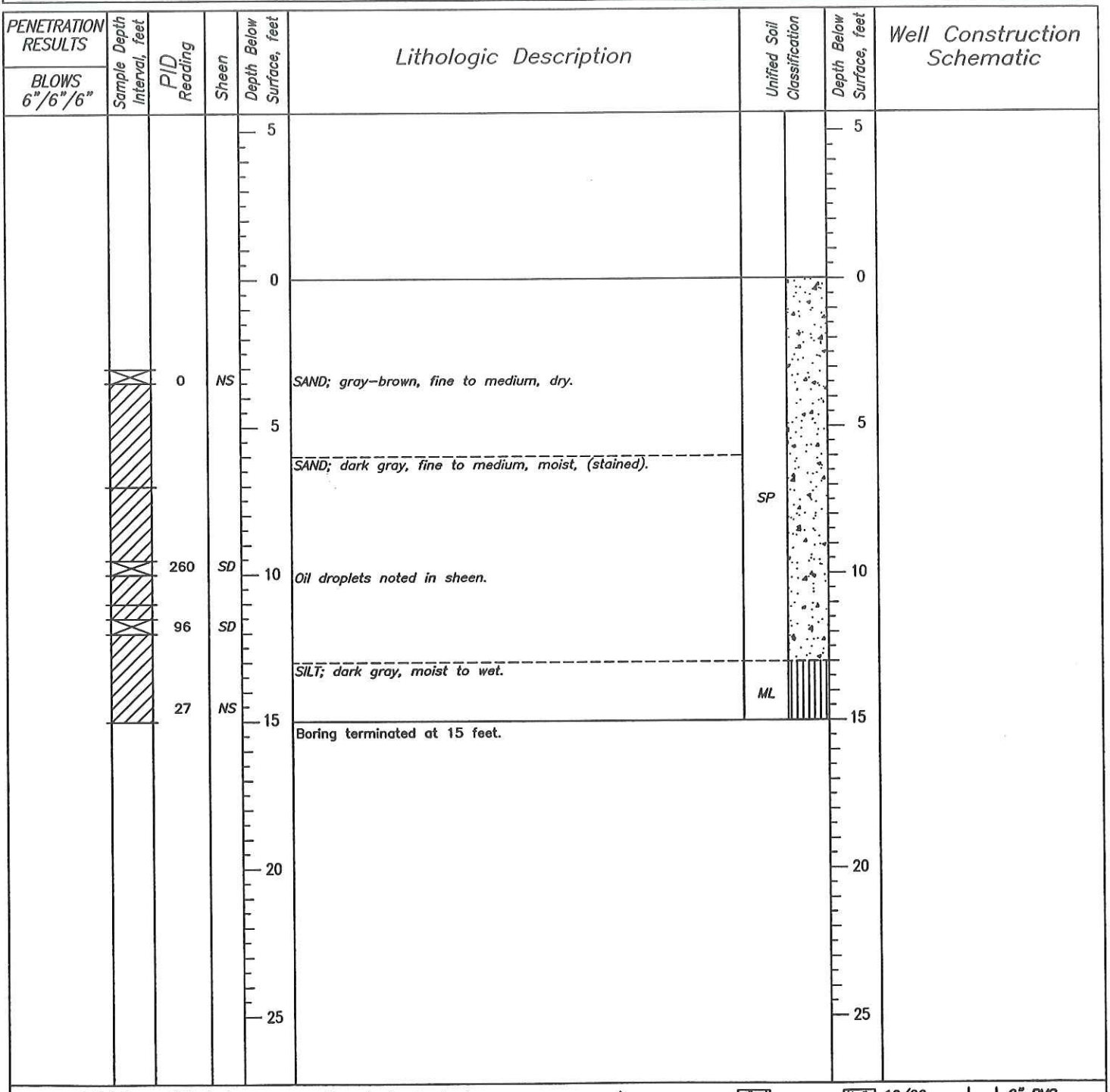
10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8480-5(GP9A)

SECOR
International Incorporated
015

FACILITY **CROWLEY** JOB # **015.08480.500** BORING/WELL **GP10A**
LOCATION SURFACE ELEVATION **NA**
START **13:10 9/10/99** FINISH **13:30 9/10/99** CASING TOP ELEVATION **NA**
LOGGED BY **K. WARNER** MONITORING DEVICE **OVM 580B**
SUBCONTRACTOR AND EQUIPMENT **CASCADE DRILLING - GEOPROBE TRACK RIG**
COMMENTS



Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

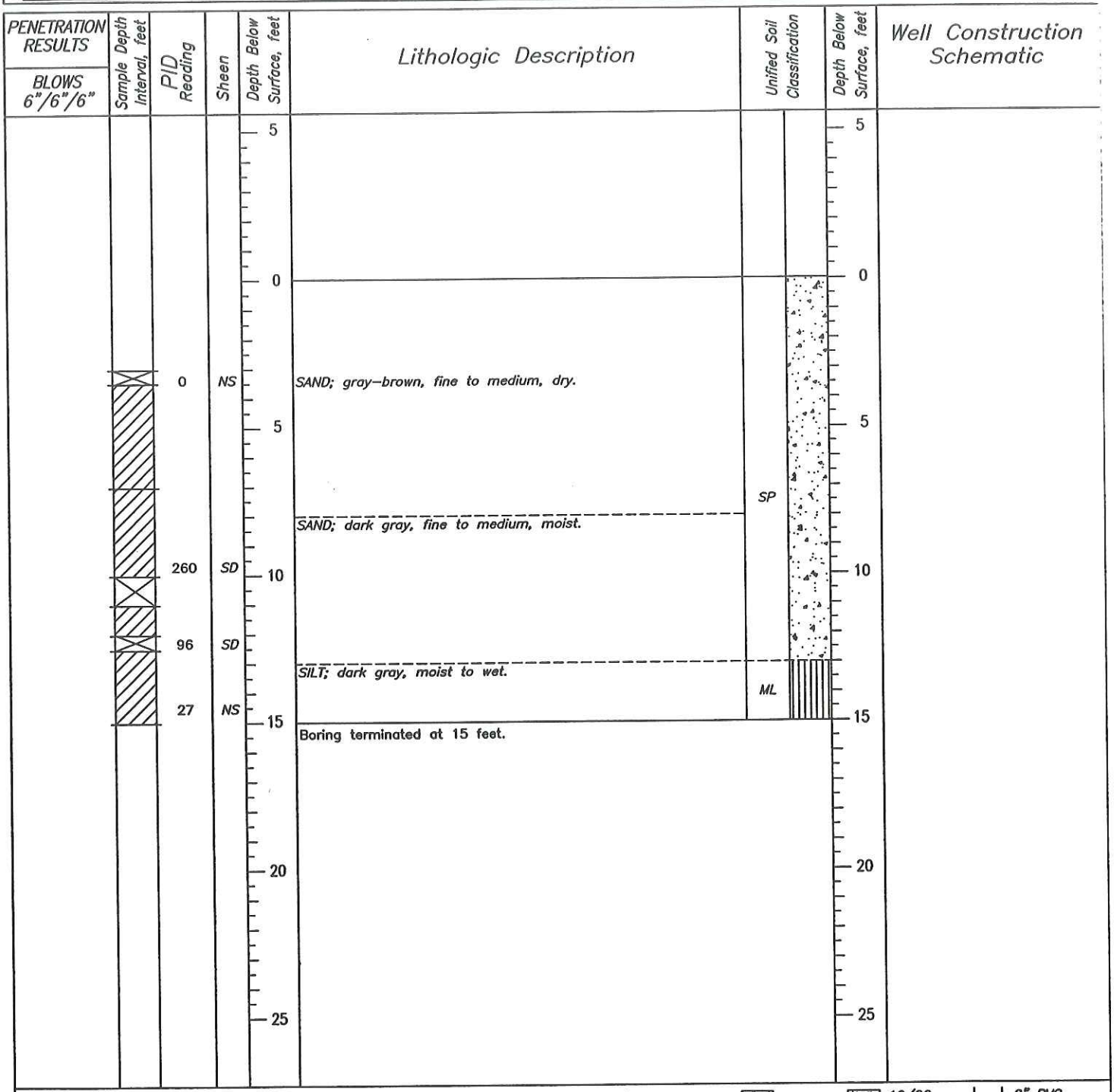
10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8480-5(GP10A)

SECOR
International Incorporated
015

FACILITY **CROWLEY** JOB # **015.08480.500** BORING/WELL **GP11A**
LOCATION SURFACE ELEVATION **NA**
START **17:15 9/14/99** FINISH **17:50 9/14/99** CASING TOP ELEVATION **NA**
LOGGED BY **K. WARNER** MONITORING DEVICE **OVM 580B**
SUBCONTRACTOR AND EQUIPMENT **CASCADE DRILLING - GEOPROBE TRACK RIG**
COMMENTS



Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

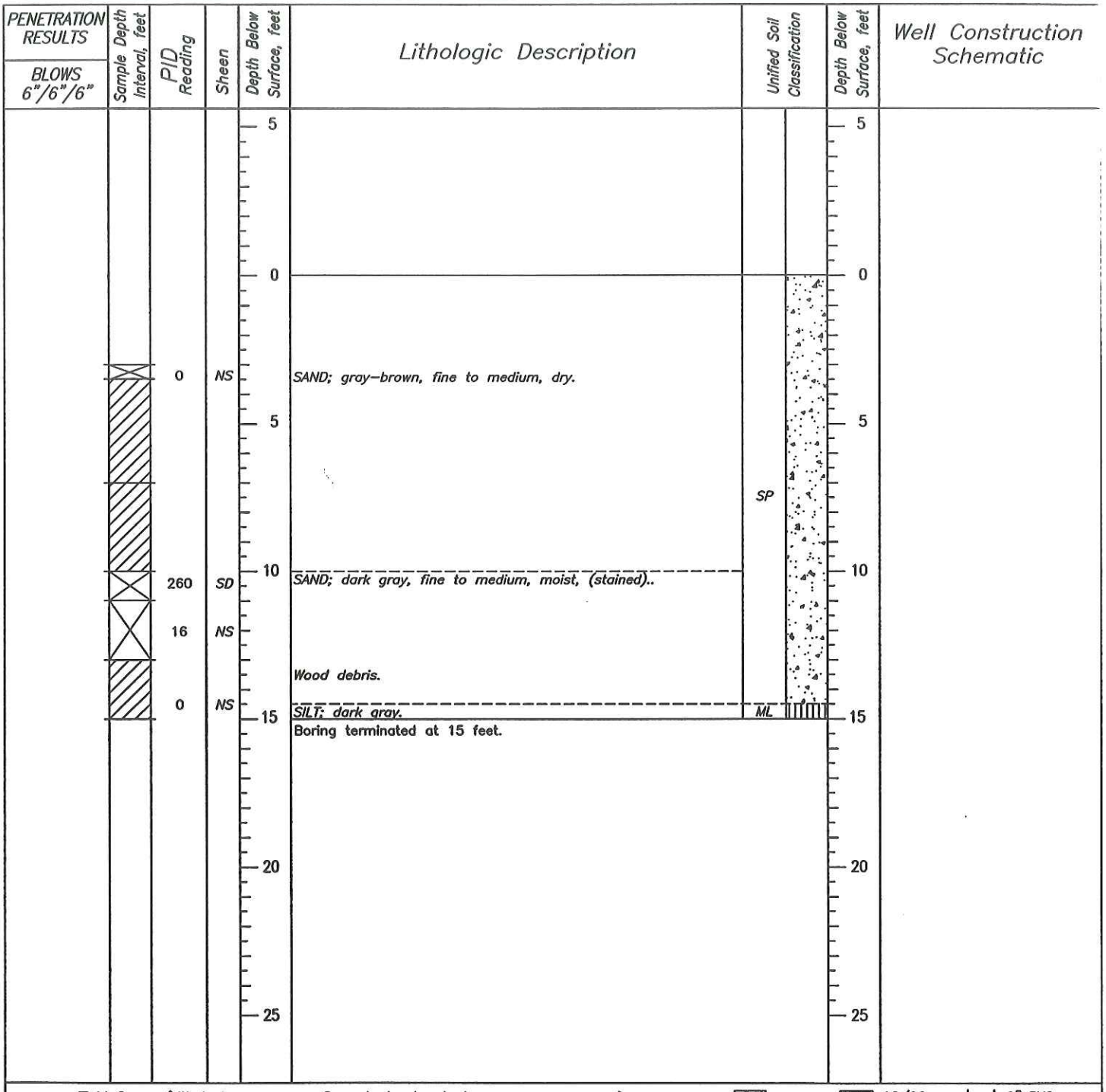
Concrete
Bentonite

10/20 Colorado Silica Sand
2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8480-5(GP11A)

SECOR
International Incorporated
015

FACILITY **CROWLEY** JOB # **015.08480.500** BORING/WELL **GP12A**
LOCATION SURFACE ELEVATION **NA**
START **14:20 9/14/99** FINISH **15:30 9/14/99** CASING TOP ELEVATION **NA**
LOGGED BY **K. WARNER** MONITORING DEVICE **OVM 580B**
SUBCONTRACTOR AND EQUIPMENT **CASCADE DRILLING - GEOPROBE TRACK RIG**
COMMENTS



Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-848-5(GP12A)

SECOR
International Incorporated
015

FACILITY **CROWLEY** JOB # **015.08480.500** BORING/WELL **GP13A**
LOCATION SURFACE ELEVATION **NA**
START **15:45 9/14/99** FINISH **16:15 9/14/99** CASING TOP ELEVATION **NA**
LOGGED BY **K. WARNER** MONITORING DEVICE **OVM 580B**
SUBCONTRACTOR AND EQUIPMENT **CASCADE DRILLING - GEOPROBE TRACK RIG**
COMMENTS

Penetration Results Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				5			5	
				0			0	
		0	NS		SAND; gray–brown, fine to medium, dry.			
				5		SP	5	
					SAND; dark gray, fine to medium, moist, (slight sheen), (stained).			
		27	SD	10	Becomes wet at 11.0 feet.		10	
					SILT; dark gray, wet.	ML		
		0	NS	15	Boring terminated at 15 feet.		15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15–8480–5(GP13A)

APPENDIX B
WASHINGTON RESOURCE PROTECTION WELL REPORT

Additional Subsurface Investigation Report
Former Columbia Marine Lines Facility
6305 Lower River Road
Vancouver, Washington
SECOR PN: 015.08480.006
December 3, 1999

RESOURCE PROTECTION WELL REPORT

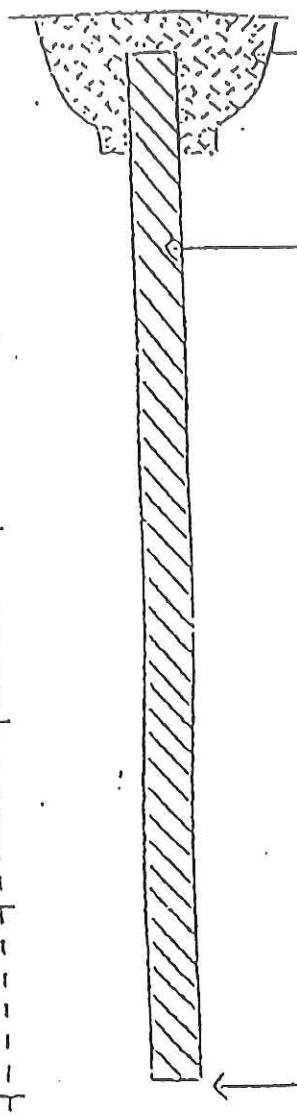
START CARD NO. 44840 A ~~32210~~

PROJECT NAME: Crowley Site
WELL IDENTIFICATION NO. n/a
DRILLING METHOD: Abandon
DRILLER: Michael Colbert
FIRM: Cascade Drilling, Inc.
SIGNATURE: Michael Colbert
CONSULTING FIRM: Secor / OREGON
REPRESENTATIVE: Kurt Warner

COUNTY: CLARK
LOCATION: SW ¼ NE ¼ Sec 18 Twn 2N R 1E
STREET ADDRESS OF WELL: 6305 Lower River Rd, Vancouver
WATER LEVEL ELEVATION: N/A
GROUND SURFACE ELEVATION: N/A
~~DRILLED~~: AB 9/9/99
~~DEVELOPED~~: n/a

9496

AS-BUILT



WELL DATA

CONCRETE SURFACE SEAL

BACKFILL

DEPTH OF BORING 78'

FORMATION DESCRIPTION

0 - 78 ft.
abandonment
bark chips

- ft.

- ft.

SCALE: 1" = _____

PAGE _____ OF _____

APPENDIX C
FIELD FORMS

Additional Subsurface Investigation Report
Former Columbia Marine Lines Facility
6305 Lower River Road
Vancouver, Washington
SECOR PN: 015.08480.006
December 3, 1999

SECOR MONITORING WELL DATA FORM

Project Number: 015.08480.001
Client: Crowley
Site Location: 6305 Lower River Road, Vancouver, Washington

Station Number:
Samplers: TJV / DEC
Date: 10/14/99

Date	Time	Well I.D.	Elevation Top of Casing	Depth to Water	Depth to Product	Elevation Groundwater	Apparent Product Thickness	Stick Up (+) Down (-)	Depth to Bottom	Odor/Sheen	Remarks
10/14/99		MW1		12.39					20.00		
		MW2		15.06					20.00		
		MW3		12.33					19.50		
		MW4		9.74					20.00		
		MW5		4.85					15.00		
		MW6		5.41					16.00		
		MW7		14.70	Ø		Ø		20.00		
		MW8		15.31	15.13		0.18		18.50		
		MW9		7.25					11.50		
		MW10		6.81					12.00	→ Inaccurate	Actual TD 6.84
		MW11		8.12					22.50		
		MW12		8.34					23.50		
		MW13		11.19					13.50		
		MW14		11.73					13.50		
		MW16		11.50					16.50		
		MW17		dry					23.00		well dry
		MW18		dry	—		—		9.00		well dry
		MW19		15.43	15.41		0.02		22.00		passive bailer empty

72919:MWDATA.FRM/1

SECOR MONITORING WELL DATA FORM

Project Number: 015.0840.001
Client: Crowley
Site Location: 6305 Lower River Road, Vancouver, Washington

Station Number:
Samplers: TJV/DEC
Date: 10/14/99

Date	Time	Well I.D.	Elevation Top of Casing	Depth to Water	Depth to Product	Elevation Groundwater	Apparent Product Thickness	Stick Up (+) Down (-)	Depth to Bottom	Odor/Sheen	Remarks
10/14/99		~~MW20~~									
10/14/99		MW21		dry					12.50		well dry

72919:MWDATA.FRM/1

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.0f480.001 DATE: 10/14,15/99 WELL NO. MW1

FACILITY NAME: Crowley TEMPERATURE: 60 (F) or °C

FIELD PERSONNEL: TJV/DEC WEATHER: sunshine

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 12.39 (FT.) or IN.
B. Thickness of Free Product, if present: Ø Inches
C. Total Depth of well (TD) from top of casing/piezometer: 20.00 (FT.) or IN.
D. Height of Water Column in casing (h = TD - SWL): 7.61 (FT.) or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
(2") diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____ =	4.00	PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____ =	____	PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____ =	____	PV (gallons)

PURGING METHOD: Bailer DURATION: ≈ 2 minutes

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1st Volume:	1306	mod.	lt. brown	yes	6.4	15.3	201	____
2nd Volume:	____	____	____	____	____	____	____	____
3rd Volume:	____	____	____	____	____	____	____	____
4th Volume:	____	____	purged dry at 1.00 gallons			____	____	____
Addl. Volumes:	____	____	____	____	____	____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: 1.00 gallon
PURGE WATER STORED/DISPOSED OF WHERE/HOW: Drummed onsite

SAMPLES COLLECTED: Depth to Water at time of sample collection: >80%

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
MW1-101499	1443	1 x 1L amber	

COMMENTS:

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: ____
Original Water Column: ____ x 0.80 = --( )
Collect sample when Depth to Water measures Less than or equal to: ____

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.0P480.001 DATE: 10/14,15/99 WELL NO. MW2

FACILITY NAME: Crowley TEMPERATURE: 60 (F) or °C

FIELD PERSONNEL: TJV/DEC WEATHER: Sunshine

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 15.06 (FT). or IN.

B. Thickness of Free Product, if present: 0 Inches

C. Total Depth of well (TD) from top of casing/piezometer: 20.00 (FT). or IN.

D. Height of Water Column in casing (h = TD - SWL): 4.94 (FT). or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
(2") diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____	=	2.50 PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____	=	____ PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____	=	____ PV (gallons)

PURGING METHOD: Bailer DURATION: ~10 min

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1st Volume:	1311	low	clr	light	6.6	17.6	292	____
2nd Volume:	1314	low	clr	light	6.6	17.4	292	____
3rd Volume:	1317	low	clr	light	6.6	17.0	291	____
4th Volume:	____	____	____	____	____	____	____	____
Addl. Volumes:	____	____	____	____	____	____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: 2.50 gal

PURGE WATER STORED/DISPOSED OF WHERE/HOW: Drummed onsite

SAMPLES COLLECTED: Depth to Water at time of sample collection: >80%

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
MW2-101499	1436	1 x 1L amber	

COMMENTS:

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: ____

Original Water Column: ____ x 0.80 = --( )

Collect sample when Depth to Water measures Less than or equal to: ____

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.0P480.001 DATE: 10/14,15/99 WELL NO. MW3

FACILITY NAME: Crowley TEMPERATURE: 60 (F) or °C

FIELD PERSONNEL: TJV/DEC WEATHER: sunshine

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 12.33 (FT) or IN.
B. Thickness of Free Product, if present: 0 Inches
C. Total Depth of well (TD) from top of casing/piezometer: 19.50 (FT) or IN.
D. Height of Water Column in casing (h = TD - SWL): 7.17 (FT) or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
(2") diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____ =	3.50	PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____ =	____	PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____ =	____	PV (gallons)

PURGING METHOD: Bailer DURATION: ____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1st Volume:	1224	low	clr	N	6.7	16.4	327	____
2nd Volume:	1227	low	clr	N	6.6	16.1	326	____
3rd Volume:	1230	low	clr	N	6.6	15.9	331	____
4th Volume:	____	____	____	____	____	____	____	____
Addl. Volumes:	____	____	____	____	____	____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: 3.50 gal
PURGE WATER STORED/DISPOSED OF WHERE/HOW: Drummed onsite

SAMPLES COLLECTED: Depth to Water at time of sample collection: >80%

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
MW3-101499	1427	1x1L amber	HCL
____	____	____	____

COMMENTS:

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: ____
Original Water Column: ____ x 0.80 = ____
Collect sample when Depth to Water measures
Less than or equal to: ____

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.0P480.001 DATE: 10/14,15/99 WELL NO. MW4

FACILITY NAME: Crowley TEMPERATURE: 60 °F or °C

FIELD PERSONNEL: TJV/DEC WEATHER: sunshine

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 9.74 FT. or IN.
B. Thickness of Free Product, if present: Ø Inches
C. Total Depth of well (TD) from top of casing/piezometer: 20.00 FT. or IN.
D. Height of Water Column in casing (h = TD - SWL): 10.26 FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
(2") diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____ =	5.00	PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____ =	____	PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____ =	____	PV (gallons)

PURGING METHOD: Bailer DURATION: ≈ 9 minutes

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1st Volume:	1316	mod.	lt. brown	yes	6.6	15.8	346	____
2nd Volume:	1321	mod.	lt. brown	no	6.6	15.6	359	____
3rd Volume:	1325	mod.	lt. brown	no	6.6	15.6	340	____
4th Volume:	____	____	____	____	____	____	____	____
Addl. Volumes:	____	____	____	____	____	____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: 5.00 gallons
PURGE WATER STORED/DISPOSED OF WHERE/HOW: Drummed onsite

SAMPLES COLLECTED: Depth to Water at time of sample collection: >80%

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
MW4-1014 99	1435	1x1L amber	

COMMENTS:

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: ____
Original Water Column: ____ x 0.80 = --( )
Collect sample when Depth to Water measures
Less than or equal to: ____

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.0P480.001 DATE: 10/14,15/99 WELL NO. MW5

FACILITY NAME: Crowley TEMPERATURE: 60 °F or °C

FIELD PERSONNEL: TJV/DEC WEATHER: sunshine

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 4.85 FT. or IN.
B. Thickness of Free Product, if present: Ø Inches
C. Total Depth of well (TD) from top of casing/piezometer: 15.00 FT. or IN.
D. Height of Water Column in casing (h = TD - SWL): 10.15 FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
(2") diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____ =	5.00	PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____ =	____	PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____ =	____	PV (gallons)

PURGING METHOD: Bailer DURATION: ≈ 9 minutes

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1st Volume:	1041	high	brown	yes	6.6	16.9	1425	____
2nd Volume:	1046	high	brown	yes	6.7	16.9	1459	____
3rd Volume:	1050	high	brown	yes	6.7	16.4	1458	____
4th Volume:	____	____	____	____	____	____	____	____
Addl. Volumes:	____	____	____	____	____	____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: 5.00 gallons
PURGE WATER STORED/DISPOSED OF WHERE/HOW: Drummed onsite

SAMPLES COLLECTED: Depth to Water at time of sample collection: >80%

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
MW5-1014 99	1405	1 x 1L amber	

COMMENTS:

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: ____
Original Water Column: ____ x 0.80 = --( )
Collect sample when Depth to Water measures
Less than or equal to: ____

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.0P480.001 DATE: 10/14,15/99 WELL NO. MW6

FACILITY NAME: Crowley TEMPERATURE: 60 (F) or °C

FIELD PERSONNEL: TJV/DEC WEATHER: sunshine

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 5.41 (FT). or IN.
B. Thickness of Free Product, if present: (0) Inches
C. Total Depth of well (TD) from top of casing/piezometer: 16.00 (FT). or IN.
D. Height of Water Column in casing (h = TD - SWL): 10.59 (FT). or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
(2") diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____ =	5.25	PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____ =	____	PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____ =	____	PV (gallons)

PURGING METHOD: Bailer DURATION: ≈ 5 minutes

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1st Volume:	1107	high	brown	yes	6.8	16.7	409	____
2nd Volume:	____	____	____	____	____	____	____	____
3rd Volume:	____	____	____	____	____	____	____	____
4th Volume:	____	____	purged dry @ 3.00 gallons		____	____	____	____
Addl. Volumes:	____	____	____	____	____	____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: 3.00 gallons
PURGE WATER STORED/DISPOSED OF WHERE/HOW: Drummed onsite

SAMPLES COLLECTED: Depth to Water at time of sample collection: >80%

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
MW6-101499	1409	1 x 1L amber	

COMMENTS:

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: ____
Original Water Column: ____ x 0.80 = --( )
Collect sample when Depth to Water measures
Less than or equal to: ____

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.0P480.001 DATE: 10/14,15/99 WELL NO. MW7

FACILITY NAME: Crowley TEMPERATURE: 60 (F) or °C

FIELD PERSONNEL: TJV/DEC WEATHER: sunshine

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 14.70 (FT). or IN.

B. Thickness of Free Product, if present: 0 Inches

C. Total Depth of well (TD) from top of casing/piezometer: 20.00 (FT). or IN.

D. Height of Water Column in casing (h = TD - SWL): 5.30 (FT). or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
(2") diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____	=	2.50 PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____	=	____ PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____	=	____ PV (gallons)

PURGING METHOD: Bailer DURATION: ____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1st Volume:	1338	mod	lt brn	Y	6.3	17.0	451	____
2nd Volume:	1342	high	dk grey	Y	6.3	16.6	461	____
3rd Volume:	____	____	Purged	Dry	____	____	____	____
4th Volume:	____	____			____	____	____	____
Addl. Volumes:	____	____	____	____	____	____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: 1.25 gal

PURGE WATER STORED/DISPOSED OF WHERE/HOW: Drummed onsite

SAMPLES COLLECTED: Depth to Water at time of sample collection: >80%

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
MW7-101499	1450	1 x 1L amber	

COMMENTS:

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: ____

Original Water Column: ____ x 0.80 = --( )

Collect sample when Depth to Water measures Less than or equal to: ____

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.0P480.001 DATE: 10/14,15/99 WELL NO. MW8

FACILITY NAME: Crowley TEMPERATURE: 60 (F) or °C

FIELD PERSONNEL: TJV/DEC WEATHER: Clear

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 15.31 FT. or IN.
B. Thickness of Free Product, if present: 0.18 ~~ft~~ FT. or IN.
C. Total Depth of well (TD) from top of casing/piezometer: 18.50 FT. or IN.
D. Height of Water Column in casing (h = TD - SWL): 3.19 FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
2" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____	=	____ PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____	=	____ PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____	=	____ PV (gallons)

PURGING METHOD: ~~Bailer~~ No purge DURATION: ____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp.	Conduct.	SWL
1st Volume:	____	____	____	____	____	____	____	____
2nd Volume:	____	No purge, product in well.				____	____	____
3rd Volume:	____	Sample collected 1' below product/H_2O interface						
4th Volume:	____	at approx. 16.25' below TOC using a peristaltic						
Addl. Volumes:	____	pump and polyethylene tubing. TV				____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: NP
PURGE WATER STORED/DISPOSED OF WHERE/HOW: Drummed onsite

SAMPLES COLLECTED: Depth to Water at time of sample collection: >50%

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
MW8-101599	1012	1 x 1L amber	HCL

COMMENTS: 250mL pumped ~~through~~ through tubing to insure no product collects in sample. TV

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: ____
Original Water Column: ____ x 0.80 = ____
Collect sample when Depth to Water measures Less than or equal to: ____

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.0P480.001 DATE: 10/14,15/99 WELL NO. MW9

FACILITY NAME: Crowley TEMPERATURE: 60 (F) or °C

FIELD PERSONNEL: TJV/DEC WEATHER: sunshine

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 7.25 (FT). or IN.
B. Thickness of Free Product, if present: (0) Inches
C. Total Depth of well (TD) from top of casing/piezometer: 11.50 (FT). or IN.
D. Height of Water Column in casing (h = TD - SWL): 4.25 (FT). or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
(2") diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____	=	2.00 PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____	=	____ PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____	=	____ PV (gallons)

PURGING METHOD: Bailer DURATION: ____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1st Volume:	1328	high	grey	N	6.4	16.5	388	____
2nd Volume:	____	____	____	____	____	____	____	____
3rd Volume:	____	Purged dry at			1.00 gal	____	____	____
4th Volume:	____	____	____	____	____	____	____	____
Addl. Volumes:	____	____	____	____	____	____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: 1.00 gal
PURGE WATER STORED/DISPOSED OF WHERE/HOW: Drummed onsite

SAMPLES COLLECTED: Depth to Water at time of sample collection: >80%

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
MW9-10149	1440	1x1L amber	

COMMENTS:

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: ____
Original Water Column: ____ x 0.80 = ____
Collect sample when Depth to Water measures
Less than or equal to: ____

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.0P480.001 DATE: 10/14,15/99 WELL NO. MW10

FACILITY NAME: Crowley TEMPERATURE: 60 (F) or °C

FIELD PERSONNEL: TJV/DEC WEATHER: sunshine

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 6.81 (FT). or IN.
B. Thickness of Free Product, if present: 0 Inches
C. Total Depth of well (TD) from top of casing/piezometer: 12.00 (FT). or IN.
D. Height of Water Column in casing (h = TD - SWL): 5.19 (FT). or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
(2) diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____ =	2.50	PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____ =	____	PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____ =	____	PV (gallons)

PURGING METHOD: Bailer DURATION: ____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1st Volume:	1338	____	____	____	____	____	____	____
2nd Volume:	____	____	____	____	____	____	____	____
3rd Volume:	no parameters - only 1" in water column					____	____	____
4th Volume:	____	TD of well not accurate on borine log				____	____	____
Addl. Volumes:	____	(GeoEngineers 12/5/84)				____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: ____
PURGE WATER STORED/DISPOSED OF WHERE/HOW: Drummed onsite

SAMPLES COLLECTED: Depth to Water at time of sample collection: >80'

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
MW10-10/4 99	NS	1 x 1L amber	

COMMENTS:

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: ____
Original Water Column: ____ x 0.80 = --( )
Collect sample when Depth to Water measures
Less than or equal to: ____

29.75
32.25

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.0P480.001 DATE: 10/14,15/99 WELL NO. MW11

FACILITY NAME: Crowley TEMPERATURE: 60 (F) or °C

FIELD PERSONNEL: TJV/DEC WEATHER: sunshine

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 8.12 (FT.) or IN.

B. Thickness of Free Product, if present: (0) Inches

C. Total Depth of well (TD) from top of casing/piezometer: 22.50 (FT.) or IN.

D. Height of Water Column in casing (h = TD - SWL): 14.38 (FT.) or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
(2") diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____ =	7.00	PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____ =	____	PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____ =	____	PV (gallons)

PURGING METHOD: Bailer DURATION: ~10 min

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1st Volume:	1207	mod	lt brn	N	7.1	15.8	377	____
2nd Volume:	1211	mod	lt brn	N	6.9	15.7	409	____
3rd Volume:	1216	mod	lt brn	N	6.9	15.0	378	____
4th Volume:	____	____	____	____	____	____	____	____
Addl. Volumes:	____	____	____	____	____	____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: 7.00 gal

PURGE WATER STORED/DISPOSED OF WHERE/HOW: Drummed onsite

SAMPLES COLLECTED: Depth to Water at time of sample collection: >80%

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
MW11-101499	1426	1 x 1L amber	

COMMENTS:

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: ____

Original Water Column: ____ x 0.80 = --( )

Collect sample when Depth to Water measures Less than or equal to: ____

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.0P480.001 DATE: 10/14,15/99 WELL NO. MW12

FACILITY NAME: Crowley TEMPERATURE: 60 (F) or °C

FIELD PERSONNEL: TJV/DEC WEATHER: sunshine

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: (TD taken from boring log - GeoEngineers 12/6/84) 8.34 (FT.) or IN.

B. Thickness of Free Product, if present: 0 Inches

C. Total Depth of well (TD) from top of casing/piezometer: (Actual TD 14.75) 23.50 (FT.) or IN.

D. Height of Water Column in casing (h = TD - SWL): 15.16 (FT.) or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
(2") diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____ =	7.50	PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____ =	____	PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____ =	____	PV (gallons)

PURGING METHOD: Bailer DURATION: ____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1st Volume:	1106	mod	cloudy	N	7.1	17.4	176	____
2nd Volume:	1110	mod	cloudy	N	7.1	17.6	153	____
3rd Volume:	1115	mod	cloudy	N	7.2	17.5	151	____
4th Volume:	____	____	____	____	____	____	____	____
Addl. Volumes:	____	____	____	____	____	____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: 7.50 gallons

PURGE WATER STORED/DISPOSED OF WHERE/HOW: Drummed onsite

SAMPLES COLLECTED: Depth to Water at time of sample collection: ~80%

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
MW12-101499	1410	1x 1L amber	

COMMENTS:

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: ____

Original Water Column: ____ x 0.80 = ( )

Collect sample when Depth to Water measures Less than or equal to: ____

35.28
4.76

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.0P480.001 DATE: 10/14,15/99 WELL NO. MW13

FACILITY NAME: Crowley TEMPERATURE: 60 °F or °C

FIELD PERSONNEL: TJV/DEC WEATHER: sunshine

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 11.19 FT. or IN.
B. Thickness of Free Product, if present: 0 Inches
C. Total Depth of well (TD) from top of casing/piezometer: 13.50 FT. or IN.
D. Height of Water Column in casing (h = TD - SWL): 2.31 FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
(2") diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____ =	1.00	PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____ =	____	PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____ =	____	PV (gallons)

PURGING METHOD: Bailer DURATION: ≈ 2 minutes

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1st Volume:	1129	high	brown	no	7.0	15.0	874	____
2nd Volume:	____	____	____	____	____	____	____	____
3rd Volume:	____	____	____	____	____	____	____	____
4th Volume:	____	____	____	____	____	____	____	____
Addl. Volumes:	____	____	____	____	____	____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: 1.00
PURGE WATER STORED/DISPOSED OF WHERE/HOW: Drummed onsite

SAMPLES COLLECTED: Depth to Water at time of sample collection: >80%

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
MW13-10/4 99	1417	1x 1L amber	

COMMENTS:

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: ____
Original Water Column: ____ x 0.80 = --( )
Collect sample when Depth to Water measures
Less than or equal to: ____

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.0P480.001 DATE: 10/14,15/99 WELL NO. MW14

FACILITY NAME: Crowley TEMPERATURE: 60 (F) or °C

FIELD PERSONNEL: TJV/DEC WEATHER: sunshine

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 11.73 (FT) or IN.
B. Thickness of Free Product, if present: 0 Inches
C. Total Depth of well (TD) from top of casing/piezometer: 13.50 (FT) or IN.
D. Height of Water Column in casing (h = TD - SWL): 1.77 (FT) or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
(2)" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____ =	1.00	PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____ =	____	PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____ =	____	PV (gallons)

PURGING METHOD: Bailer DURATION: ____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1st Volume:	1129	mod	lt brn	N	5.6	15.5	288	____
2nd Volume:	1131	mod	lt brn	N	5.5	15.3	286	____
3rd Volume:	~~1133~~	____	____	____	____	____	____	____
4th Volume:	____	Purged dry	at	0.75 gal		____	____	____
Addl. Volumes:	____	____	____	____	____	____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: 0.75 gal
PURGE WATER STORED/DISPOSED OF WHERE/HOW: Drummed onsite

SAMPLES COLLECTED: Depth to Water at time of sample collection: >80%

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
MW14-101499	1420	1x1L amber	

COMMENTS:

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: ____
Original Water Column: ____ x 0.80 = --( )
Collect sample when Depth to Water measures Less than or equal to: ____

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.0P480.001 DATE: 10/14,15/99 WELL NO. MW16

FACILITY NAME: Crowley TEMPERATURE: 60 (F) or °C

FIELD PERSONNEL: TJV/DEC WEATHER: sunshine

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 11.50 (FT.) or IN.

B. Thickness of Free Product, if present: 0 Inches

C. Total Depth of well (TD) from top of casing/piezometer: 16.50 (FT.) or IN.

D. Height of Water Column in casing (h = TD - SWL): 5.00 (FT.) or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
(2") diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____	=	2.50 PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____	=	____ PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____	=	____ PV (gallons)

PURGING METHOD: Bailer DURATION: ~5 min

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp. °C	Conduct.	SWL
1st Volume:	1043	low	lt green	N	6.9	17.3	288	____
2nd Volume:	1045	low	lt green	N	6.8	17.8	292	____
3rd Volume:	1047	low	lt green	N	6.8	17.8	288	____
4th Volume:	____	____	____	____	____	____	____	____
Addl. Volumes:	____	____	____	____	____	____	____	____

TOTAL VOLUME OF WATER PURGED FROM WELL: 2.50 gal

PURGE WATER STORED/DISPOSED OF WHERE/HOW: Drummed onsite

SAMPLES COLLECTED: Depth to Water at time of sample collection: >80%

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
MW16-101499	1406	1x 1L amber	

COMMENTS:

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: ____

Original Water Column: ____ x 0.80 = ____

Collect sample when Depth to Water measures Less than or equal to: ____

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16.75
2.50
19.25

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.0P480.001 DATE: 10/14,15/99 WELL NO. MW19

FACILITY NAME: Crowley TEMPERATURE: 60 °F or °C

FIELD PERSONNEL: TJV/DEC WEATHER: Clear

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 15.43 FT. or IN.
B. Thickness of Free Product, if present: 0.02 ~~Inches~~ Ft.
C. Total Depth of well (TD) from top of casing/piezometer: 22.00 FT. or IN.
D. Height of Water Column in casing (h = TD - SWL): 6.57 FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
2" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water ____	=	____ PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water ____	=	____ PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water ____	=	____ PV (gallons)

PURGING METHOD: ~~Bailer~~ No purge DURATION: ____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp.	Conduct.	SWL
1st Volume:	____	____	____	____	____	____	____	____
2nd Volume:	____	No purge, product in well.						
3rd Volume:	____	Sample collected 1' below product/H_2O interface						
4th Volume:	____	at approx 16.50' below TOC using a						
Addl. Volumes:	____	peristaltic pump and polyethylene tubing						

TOTAL VOLUME OF WATER PURGED FROM WELL: NP
PURGE WATER STORED/DISPOSED OF WHERE/HOW: Drummed onsite

SAMPLES COLLECTED: Depth to Water at time of sample collection: >80%

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
MW19-101599	1100	1x 1L amber	HCl

COMMENTS:
500 mL pumped through tubing to insure no product collects in sample.

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: ____
Original Water Column: ____ x 0.80 = ____
Collect sample when Depth to Water measures
Less than or equal to: ____

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NORTH CREEK ANALYTICAL
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9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 906-9200 FAX 906-9210

CHAIN OF CUSTODY REPORT

Work Order #

REPORT TO: SECOR
ATTENTION: Katy Westersund
ADDRESS: 7730 SW Mohawk St.
Tualatin, OR
PHONE: 503-691-2030 FAX: 503-692-7074
PROJECT NAME: Crowley
PROJECT NUMBER: 015.08480.001
SAMPLED BY: TJV/DEC

INVOICE TO:
ATTENTION: Same
ADDRESS:
P.O. NUMBER: NCA QUOTE #:

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 (Standard) | 7 | 5 | 4 | 3 | 2 | 1 | Same Day
Fuels & Hydrocarbon Analyses: 5 (Standard) | 3-4 | 2 | 1 | Same Day
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	Analysis Request: TPHdx	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1. MW1-101499	10/14/99 1443		X	W	1	HCL
2. MW2-101499	1436					
3. MW3-101499	1427					
4. MW4-101499	1435					
5. MW5-101499	1405					
6. MW6-101499	1409					
7. MW7-101499	1450					
8. MW8-101599	10/15/99 1012					
9. MW9-101499	10/14/99 1440					
~~10. MW10-101499~~						

RELINQUISHED BY (Signature): T. Vanek DATE:
PRINT NAME: T. Vanek FIRM: SECOR TIME:
RELINQUISHED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:
RECEIVED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

PAGE OF

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

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CHAIN OF CUSTODY REPORT

Work Order #

REPORT TO: SECOR
ATTENTION: Katy Westersund
ADDRESS: 7730 SW Mohawk St.
Tualatin, OR
PHONE: 503-691-2030 FAX: 503-692-7074
PROJECT NAME: Crowley
PROJECT NUMBER: 015.0F480.001
SAMPLED BY: TJV/DEC

INVOICE TO:
ATTENTION: Same
ADDRESS:
P.O. NUMBER: NCA QUOTE #:

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 Standard | 7 | 5 | 4 | 3 | 2 | 1 | Same Day
Fuels & Hydrocarbon Analyses: 5 Standard | 3-4 | 2 | 1 | Same Day
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	Analysis Request: TPHdx	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1.	MW11-101499	1426		X	W	1	HCL
2.	MW12-101499	1410					
3.	MW13-101499	1417					
4.	MW14-101499	1420					
5.	MW16-101499	1406					
6.	MW19-101599	10/15/99 1100					
7.							
8.							
9.							
10.							

RELINQUISHED BY (Signature): T. Vanek DATE:
PRINT NAME: T. Vanek FIRM: SECOR TIME:
RELINQUISHED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:
RECEIVED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

PAGE OF

APPENDIX D
LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

Additional Subsurface Investigation Report
Former Columbia Marine Lines Facility
6305 Lower River Road
Vancouver, Washington
SECOR PN: 015.08480.006
December 3, 1999

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Seattle 18939 120th Avenue NE, Suite 101, Bothell, WA 98011-9508
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541.383.9310 fax 541.382.7588

Secor	Project:	Crowley - Vancouver, WA	Sampled:	10/14/99 to 10/15/99
P.O. Box 1508	Project Number:	015.08480.001	Received:	10/19/99
Tualatin, OR 97062	Project Manager:	Katy Westersund	Reported:	11/3/99 11:32

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW1-101499	P910349-01	Water	10/14/99
MW2-101499	P910349-02	Water	10/14/99
MW3-101499	P910349-03	Water	10/14/99
MW4-101499	P910349-04	Water	10/14/99
MW5-101499	P910349-05	Water	10/14/99
MW6-101499	P910349-06	Water	10/14/99
MW7-101499	P910349-07	Water	10/14/99
MW8-101599	P910349-08	Water	10/15/99
MW9-101599	P910349-09	Water	10/15/99

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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.

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Portland 9405 SW Nimbus Avenue Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
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Secor	Project:	Crowley - Vancouver, WA	Sampled: 10/14/99 to 10/15/99
P.O. Box 1508	Project Number:	015.08480.001	Received: 10/19/99
Tualatin, OR 97062	Project Manager:	Katy Westersund	Reported: 11/3/99 11:32

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

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW1-101499			**P910349-01**				Water	
Diesel Range Hydrocarbons	1090609	10/21/99	10/21/99		0.250	**10.4**	mg/l	1
Heavy Oil Range Hydrocarbons	"	"	"		0.500	**2.85**	"	2
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*76.0*	%	
MW2-101499			**P910349-02**				Water	
Diesel Range Hydrocarbons	1090609	10/21/99	10/21/99		0.250	**9.06**	mg/l	1
Heavy Oil Range Hydrocarbons	"	"	"		0.500	**3.46**	"	3
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*89.1*	%	
MW3-101499			**P910349-03**				Water	
Diesel Range Hydrocarbons	1090609	10/21/99	10/21/99		0.250	**15.5**	mg/l	1
Heavy Oil Range Hydrocarbons	"	"	"		0.500	**4.89**	"	2
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*102*	%	
MW4-101499			**P910349-04**				Water	
Diesel Range Hydrocarbons	1090609	10/21/99	10/21/99		0.250	**17.2**	mg/l	1
Heavy Oil Range Hydrocarbons	"	"	"		0.500	**5.18**	"	3
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*113*	%	
MW5-101499			**P910349-05**				Water	
Diesel Range Hydrocarbons	1090609	10/21/99	10/21/99		0.250	**2.38**	mg/l	1
Heavy Oil Range Hydrocarbons	"	"	"		0.500	**0.680**	"	3
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*88.0*	%	
MW6-101499			**P910349-06**				Water	
Diesel Range Hydrocarbons	1090609	10/21/99	10/22/99		0.250	**19.7**	mg/l	4
Heavy Oil Range Hydrocarbons	"	"	"		0.500	**2.81**	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*114*	%	
MW7-101499			**P910349-07**				Water	
Diesel Range Hydrocarbons	1090609	10/21/99	10/21/99		0.250	**25.8**	mg/l	4
Heavy Oil Range Hydrocarbons	"	"	"		0.500	**3.95**	"	3
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*118*	%	
MW8-101599			**P910349-08**				Water	
Diesel Range Hydrocarbons	1090609	10/21/99	10/21/99		0.250	**19.5**	mg/l	4
Heavy Oil Range Hydrocarbons	"	"	"		0.500	**2.40**	"	2
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*111*	%	

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

Lisa Domenighini, Project Manager

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503.906.9200 fax 503.906.9210
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Secor	Project:	Crowley - Vancouver, WA	Sampled: 10/14/99 to 10/15/99
P.O. Box 1508	Project Number:	015.08480.001	Received: 10/19/99
Tualatin, OR 97062	Project Manager:	Katy Westersund	Reported: 11/3/99 11:32

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

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW9-101599			P910349-09				Water	
Diesel Range Hydrocarbons	1090609	10/21/99	10/22/99		0.250	4.25	mg/l	5
Heavy Oil Range Hydrocarbons	"	"	"		0.500	2.33	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*88.5*	*%*	

North Creek Analytical - Portland

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

Lisa Domenighini, Project Manager

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Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

Secor	Project:	Crowley - Vancouver, WA	Sampled: 10/14/99 to 10/15/99
P.O. Box 1508	Project Number:	015.08480.001	Received: 10/19/99
Tualatin, OR 97062	Project Manager:	Katy Westersund	Reported: 11/3/99 11:32

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) per WTPH-D (extended) with Silica Gel Clean-up
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW9-101599			**P910349-09**				**Water**	
Diesel Range Hydrocarbons	1090609	10/21/99	11/1/99		0.250	**0.446**	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.500	**0.811**	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*102*	%	

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

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

Secor	Project:	Crowley - Vancouver, WA	Sampled: 10/14/99 to 10/15/99
P.O. Box 1508	Project Number:	015.08480.001	Received: 10/19/99
Tualatin, OR 97062	Project Manager:	Katy Westersund	Reported: 11/3/99 11:32

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

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 1090609	**Date Prepared: 10/21/99**					**Extraction Method: TPH-D Extraction**				
Blank	**1090609-BLK1**									
Diesel Range Hydrocarbons	10/21/99			**ND**	mg/l	**0.250**				
Heavy Oil Range Hydrocarbons	"			**ND**	"	**0.500**				
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.0920*	"	*50.0-150*	*92.0*			
LCS	**1090609-BS1**									
Diesel Range Hydrocarbons	10/21/99	2.55		2.43	mg/l	50.0-150	95.3			
Heavy Oil Range Hydrocarbons	"	1.32		1.12	"	50.0-150	84.8			
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.0925*	"	*50.0-150*	*92.5*			
LCS Dup	**1090609-BSD1**									
Diesel Range Hydrocarbons	10/21/99	2.55		2.47	mg/l	50.0-150	96.9	50.0	1.66	
Heavy Oil Range Hydrocarbons	"	1.32		1.15	"	50.0-150	87.1	50.0	2.68	
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.0955*	"	*50.0-150*	*95.5*			

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509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

Secor	Project:	Crowley - Vancouver, WA	Sampled: 10/14/99 to 10/15/99
P.O. Box 1508	Project Number:	015.08480.001	Received: 10/19/99
Tualatin, OR 97062	Project Manager:	Katy Westersund	Reported: 11/3/99 11:32

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) per WTPH-D (extended) with Silica Gel Clean-up/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 1090609	**Date Prepared: 10/21/99**					**Extraction Method: TPH-D Extraction**				
Blank	1090609-BLK1									
Diesel Range Hydrocarbons	10/22/99			ND	mg/l	0.250				
Heavy Oil Range Hydrocarbons	"			ND	"	0.500				
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.103*	"	*50.0-150*	*103*			
LCS	1090609-BS1									
Diesel Range Hydrocarbons	10/22/99	2.55		2.31	mg/l	50.0-150	90.6			
Heavy Oil Range Hydrocarbons	"	1.32		1.26	"	50.0-150	95.5			
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.0995*	"	*50.0-150*	*99.5*			
LCS Dup	1090609-BSD1									
Diesel Range Hydrocarbons	10/22/99	2.55		2.41	mg/l	50.0-150	94.5	50.0	4.21	
Heavy Oil Range Hydrocarbons	"	1.32		1.30	"	50.0-150	98.5	50.0	3.09	
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.101*	"	*50.0-150*	*101*			

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 10/14/99 to 10/15/99
P.O. Box 1508	Project Number:	015.08480.001	Received: 10/19/99
Tualatin, OR 97062	Project Manager:	Katy Westersund	Reported: 11/3/99 11:32

Notes and Definitions

#	Note
1	Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel.
2	Detected hydrocarbons in the heavy/oil range appear to be due to overlap of diesel range hydrocarbons.
3	The detected hydrocarbons appear to be mainly to the overlap of the diesel range, but there also seems to be a straight chain alkane such as paraffin or similar substance
4	Hydrocarbon pattern and range are consistent with weathered diesel.
5	Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.
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 - Portland

Lisa Domenighini, Project Manager

dig: 0.7°C

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CHAIN OF CUSTODY REPORT

Work Order # P910349

REPORT TO: SECOR
ATTENTION: Katy Westersund
ADDRESS: 7730 SW Mohawk St.
Tualatin, OR
PHONE: 503-691-2030 FAX: 503-692-7074
PROJECT NAME: Crowley
PROJECT NUMBER: 015.08480.001
SAMPLED BY: TJV/DEC

INVOICE TO:
ATTENTION: Same
ADDRESS:
P.O. NUMBER: NCA QUOTE #:

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 Standard | 7 | 5 | 4 | 3 | 2 | 1 | Same Day
Fuels & Hydrocarbon Analyses: 5 Standard | 3-4 | 2 | 1 | Same Day
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	Analysis Request: TPHdx	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1. MW1-101499	10/14/99 1443		X	W	1	HCL
2. MW2-101499	1436					
3. MW3-101499	1427					
4. MW4-101499	1435					
5. MW5-101499	1405					
6. MW6-101499	1409					
7. MW7-101499	1450					
8. MW8-101599	10/15/99 1012					
9. MW9-101499	10/14/99 1440					
~~10. MW10-101499~~						

RELINQUISHED BY (Signature): T. Vanek DATE: 10-15-99
PRINT NAME: T. Vanek FIRM: SECOR TIME: 1215
RELINQUISHED BY (Signature): DATE: 10-19-99
PRINT NAME: Gary Spangler FIRM: NCA TIME:

RECEIVED BY (Signature): DATE: 10-19-99
PRINT NAME: Gary Taylor FIRM: NCA TIME: 105
RECEIVED BY (Signature): DATE: 10/19/99
PRINT NAME: Bob Fabis for JL FIRM: NCA TIME: 0950

ADDITIONAL REMARKS:

PAGE 1 OF 1

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 10/14/99 to 10/15/99
P.O. Box 1508	Project Number:	015.08480.001	Received: 10/19/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/3/99 12:48

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW11-101499	P910350-01	Water	10/14/99
MW12-101499	P910350-02	Water	10/14/99
MW13-101499	P910350-03	Water	10/14/99
MW14-101499	P910350-04	Water	10/14/99
MW16-101499	P910350-05	Water	10/14/99
MW19-101599	P910350-06	Water	10/15/99

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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.

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 10/14/99 to 10/15/99
P.O. Box 1508	Project Number:	015.08480.001	Received: 10/19/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/3/99 12:48

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

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW11-101499			P910350-01				Water	
Diesel Range Hydrocarbons	1090609	10/21/99	10/21/99		0.250	**3.16**	mg/l	1
Heavy Oil Range Hydrocarbons	"	"	"		0.500	ND	"	2
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*87.1*	%	
MW12-101499			P910350-02				Water	
Diesel Range Hydrocarbons	1090609	10/21/99	10/21/99		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.500	ND	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*91.5*	%	
MW13-101499			P910350-03				Water	
Diesel Range Hydrocarbons	1090609	10/21/99	10/21/99		0.250	**1.50**	mg/l	1
Heavy Oil Range Hydrocarbons	"	"	"		0.500	**0.854**	"	2
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*83.0*	%	
MW14-101499			P910350-04				Water	
Diesel Range Hydrocarbons	1090609	10/21/99	10/21/99		0.250	**3.82**	mg/l	1
Heavy Oil Range Hydrocarbons	"	"	"		0.500	**1.81**	"	2
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*66.1*	%	
MW16-101499			P910350-05				Water	
Diesel Range Hydrocarbons	1090609	10/21/99	10/21/99		0.250	**12.3**	mg/l	1
Heavy Oil Range Hydrocarbons	"	"	"		0.500	**2.65**	"	2
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*116*	%	
MW19-101599			P910350-06				Water	
Diesel Range Hydrocarbons	1090609	10/21/99	10/22/99		0.250	**35.0**	mg/l	1
Heavy Oil Range Hydrocarbons	"	"	"		0.500	**4.28**	"	2
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*138*	%	

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 10/14/99 to 10/15/99
P.O. Box 1508	Project Number:	015.08480.001	Received: 10/19/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/3/99 12:48

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) per WTPH-D (extended) with Silica Gel Clean-up
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW11-101499			**P910350-01**				**Water**	
Diesel Range Hydrocarbons	1090609	10/21/99	11/1/99		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.500	ND	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*106*	%	
MW13-101499			**P910350-03**				**Water**	
Diesel Range Hydrocarbons	1090609	10/21/99	11/1/99		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.500	ND	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*109*	%	
MW14-101499			**P910350-04**				**Water**	
Diesel Range Hydrocarbons	1090609	10/21/99	11/1/99		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.500	ND	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*89.5*	%	
MW16-101499			**P910350-05**				**Water**	
Diesel Range Hydrocarbons	1090609	10/21/99	11/1/99		0.250	**1.19**	mg/l	3
Heavy Oil Range Hydrocarbons	"	"	"		0.500	ND	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*106*	%	
MW19-101599			**P910350-06**				**Water**	
Diesel Range Hydrocarbons	1090609	10/21/99	11/1/99		0.250	**5.28**	mg/l	3
Heavy Oil Range Hydrocarbons	"	"	"		0.500	ND	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*112*	%	

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 10/14/99 to 10/15/99
P.O. Box 1508	Project Number:	015.08480.001	Received: 10/19/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/3/99 12:48

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

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 1090609	**Date Prepared: 10/21/99**					**Extraction Method: TPH-D Extraction**				
Blank	**1090609-BLK1**									
Diesel Range Hydrocarbons	10/21/99			**ND**	mg/l	**0.250**				
Heavy Oil Range Hydrocarbons	"			**ND**	"	**0.500**				
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.0920*	"	*50.0-150*	*92.0*			
LCS	**1090609-BS1**									
Diesel Range Hydrocarbons	10/21/99	2.55		2.43	mg/l	50.0-150	95.3			
Heavy Oil Range Hydrocarbons	"	1.32		1.12	"	50.0-150	84.8			
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.0925*	"	*50.0-150*	*92.5*			
LCS Dup	**1090609-BSD1**									
Diesel Range Hydrocarbons	10/21/99	2.55		2.47	mg/l	50.0-150	96.9	50.0	1.66	
Heavy Oil Range Hydrocarbons	"	1.32		1.15	"	50.0-150	87.1	50.0	2.68	
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.0955*	"	*50.0-150*	*95.5*			

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 10/14/99 to 10/15/99
P.O. Box 1508	Project Number:	015.08480.001	Received: 10/19/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/3/99 12:48

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) per WTPH-D (extended) with Silica Gel Clean-up/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 1090609	**Date Prepared: 10/21/99**					**Extraction Method: TPH-D Extraction**				
Blank	**1090609-BLK1**									
Diesel Range Hydrocarbons	10/22/99			**ND**	mg/l	**0.250**				
Heavy Oil Range Hydrocarbons	"			**ND**	"	**0.500**				
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.103*	"	*50.0-150*	*103*			
LCS	**1090609-BS1**									
Diesel Range Hydrocarbons	10/22/99	2.55		2.31	mg/l	50.0-150	90.6			
Heavy Oil Range Hydrocarbons	"	1.32		1.26	"	50.0-150	95.5			
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.0995*	"	*50.0-150*	*99.5*			
LCS Dup	**1090609-BSD1**									
Diesel Range Hydrocarbons	10/22/99	2.55		2.41	mg/l	50.0-150	94.5	50.0	4.21	
Heavy Oil Range Hydrocarbons	"	1.32		1.30	"	50.0-150	98.5	50.0	3.09	
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.101*	"	*50.0-150*	*101*			

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 10/14/99 to 10/15/99
P.O. Box 1508	Project Number:	015.08480.001	Received: 10/19/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/3/99 12:48

Notes and Definitions

#	Note
1	Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.
2	Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.
3	The detected hydrocarbons appear to be due to a lighter diesel range product such as kerosene.
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 - Portland

Lisa Domenighini, Project Manager

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CHAIN OF CUSTODY REPORT

Work Order # P910350

REPORT TO: SECOR
ATTENTION: Katy Westersund
ADDRESS: 7730 SW Mohawk St.
Tualatin, OR
PHONE: 503-691-2030 FAX: 503-692-7074
PROJECT NAME: Crowley
PROJECT NUMBER: 015.0f480.001
SAMPLED BY: TJV/DEC

INVOICE TO:
ATTENTION: Same
ADDRESS:
P.O. NUMBER: NCA QUOTE #:

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 (Standard) | 7 | 5 | 4 | 3 | 2 | 1 | Same Day
Fuels & Hydrocarbon Analyses: 5 (Standard) | 3-4 | 2 | 1 | Same Day
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	Analysis Request: TPHdx	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1.	MW11-101499	1426		X	W	1	HCL
2.	MW12-101499	1410					
3.	MW13-101499	1417					
4.	MW14-101499	1420					
5.	MW16-101499	1406					
6.	MW19-101599	10/15/99 1100					
7.							
8.							
9.							
10.							

RELINQUISHED BY (Signature): T. Vanek DATE: 10-18-99
PRINT NAME: T. Vanek FIRM: SECOR TIME: 1015
RELINQUISHED BY (Signature): DATE: 10-18-99
PRINT NAME: Larry Spangler FIRM: NCA TIME:

RECEIVED BY (Signature): DATE: 10-18-99
PRINT NAME: Larry Spangler FIRM: NCA TIME: 1015
RECEIVED BY (Signature): DATE: 10/19/99
PRINT NAME: Bob Fellstedt FIRM: NCA TIME: 0950

ADDITIONAL REMARKS:

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 8/24/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 8/24/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

ANALYTICAL REPORT FOR SAMPLES:

REVISED REPORT: 11/10/99

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW7-082499	P908454-01	Water	8/24/99
MW16-082499	P908454-02	Water	8/24/99
TB-082499	P908454-03	Water	8/24/99

North Creek Analytical - Portland

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Lisa Domenighini, Project Manager

North Creek Analytical, Inc.
Environmental Laboratory Network

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 8/24/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 8/24/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW7-082499			**P908454-01**				Water	
Diesel Range Organics	0890806	8/30/99	8/30/99		5.00	**35.8**	mg/l	1
Heavy Oil Range Hydrocarbons	"	"	"		10.0	ND	"	1
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*NR*	%	2
MW16-082499			**P908454-02**				Water	
Diesel Range Organics	0890806	8/30/99	8/30/99		0.250	**9.90**	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.500	**2.13**	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*109*	%	

North Creek Analytical - Portland

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

Lisa Domenighini, Project Manager

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 8/24/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 8/24/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method with Acid/Silica Gel Cleanup
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW7-082499			**P908454-01**				**Water**	
Diesel Range Organics	0890806	8/30/99	8/30/99		2.50	28.9	mg/l	1
Heavy Oil Range Hydrocarbons	"	"	"		5.00	ND	"	1
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*87.0*	*%*	
MW16-082499			**P908454-02**				**Water**	
Diesel Range Organics	0890806	8/30/99	8/30/99		0.250	**0.842**	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.500	ND	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*99.0*	*%*	

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 8/24/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 8/24/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

Volatile Organic Compounds per EPA Method 8260B
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW7-082499			P908454-01				Water	3
Acetone	0990149	9/7/99	9/8/99		50.0	ND	ug/l	
Benzene	"	"	"		2.00	ND	"	
Bromobenzene	"	"	"		2.00	ND	"	
Bromochloromethane	"	"	"		2.00	ND	"	
Bromodichloromethane	"	"	"		2.00	ND	"	
Bromoform	"	"	"		2.00	ND	"	
Bromomethane	"	"	"		20.0	ND	"	
2-Butanone	"	"	"		50.0	ND	"	
n-Butylbenzene	"	"	"		2.00	ND	"	
sec-Butylbenzene	"	"	"		2.00	ND	"	
tert-Butylbenzene	"	"	"		2.00	ND	"	
Carbon disulfide	"	"	"		20.0	ND	"	
Carbon tetrachloride	"	"	"		4.00	ND	"	
Chlorobenzene	"	"	"		2.00	ND	"	
Chloroethane	"	"	"		4.00	ND	"	
Chloroform	"	"	"		2.00	ND	"	
Chloromethane	"	"	"		10.0	ND	"	
2-Chlorotoluene	"	"	"		2.00	ND	"	
4-Chlorotoluene	"	"	"		2.00	ND	"	
1,2-Dibromo-3-chloropropane	"	"	"		2.00	ND	"	
Dibromochloromethane	"	"	"		2.00	ND	"	
1,2-Dibromoethane	"	"	"		2.00	ND	"	
Dibromomethane	"	"	"		2.00	ND	"	
1,2-Dichlorobenzene	"	"	"		2.00	ND	"	
1,3-Dichlorobenzene	"	"	"		2.00	ND	"	
1,4-Dichlorobenzene	"	"	"		2.00	ND	"	
Dichlorodifluoromethane	"	"	"		10.0	ND	"	
1,1-Dichloroethane	"	"	"		2.00	ND	"	
1,2-Dichloroethane	"	"	"		2.00	ND	"	
1,1-Dichloroethene	"	"	"		2.00	ND	"	
cis-1,2-Dichloroethene	"	"	"		2.00	ND	"	
trans-1,2-Dichloroethene	"	"	"		2.00	ND	"	
1,2-Dichloropropane	"	"	"		2.00	ND	"	
1,3-Dichloropropane	"	"	"		2.00	ND	"	
2,2-Dichloropropane	"	"	"		2.00	ND	"	
1,1-Dichloropropene	"	"	"		2.00	ND	"	
cis-1,3-Dichloropropene	"	"	"		2.00	ND	"	
trans-1,3-Dichloropropene	"	"	"		2.00	ND	"	

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 8/24/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 8/24/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

Volatile Organic Compounds per EPA Method 8260B
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW7-082499 (continued)			P908454-01				Water	3
Ethylbenzene	0990149	9/7/99	9/8/99		2.00	ND	ug/l	
Hexachlorobutadiene	"	"	"		4.00	ND	"	
2-Hexanone	"	"	"		20.0	ND	"	
Isopropylbenzene	"	"	"		2.00	**8.18**	"	
p-Isopropyltoluene	"	"	"		2.00	ND	"	
4-Methyl-2-pentanone	"	"	"		10.0	ND	"	
Methylene chloride	"	"	"		10.0	ND	"	
Naphthalene	"	"	"		2.00	ND	"	
n-Propylbenzene	"	"	"		2.00	**10.9**	"	
Styrene	"	"	"		2.00	ND	"	
1,1,1,2-Tetrachloroethane	"	"	"		2.00	ND	"	
1,1,2,2-Tetrachloroethane	"	"	"		2.00	ND	"	
Tetrachloroethene	"	"	"		2.00	ND	"	
Toluene	"	"	"		2.00	ND	"	
1,2,3-Trichlorobenzene	"	"	"		2.00	ND	"	
1,2,4-Trichlorobenzene	"	"	"		2.00	ND	"	
1,1,1-Trichloroethane	"	"	"		2.00	ND	"	
1,1,2-Trichloroethane	"	"	"		2.00	ND	"	
Trichloroethene	"	"	"		2.00	ND	"	
Trichlorofluoromethane	"	"	"		2.00	ND	"	
1,2,3-Trichloropropane	"	"	"		2.00	ND	"	
1,2,4-Trimethylbenzene	"	"	"		2.00	ND	"	
1,3,5-Trimethylbenzene	"	"	"		2.00	ND	"	
Vinyl chloride	"	"	"		2.00	ND	"	
o-Xylene	"	"	"		2.00	ND	"	
m,p-Xylene	"	"	"		4.00	ND	"	
Surrogate: 4-BFB	"	"	"	*75.0-135*		*105*	*%*	
Surrogate: 1,2-DCA-d4	"	"	"	*70.0-135*		*101*	"	
Surrogate: Dibromofluoromethane	"	"	"	*80.0-125*		*94.5*	"	
Surrogate: Toluene-d8	"	"	"	*80.0-120*		*101*	"	

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 8/24/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 8/24/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

Volatile Organic Compounds per EPA Method 8260B
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
TB-082499			P908454-03				Water	
Acetone	0990008	9/1/99	9/1/99		25.0	ND	ug/l	
Benzene	"	"	"		1.00	ND	"	
Bromobenzene	"	"	"		1.00	ND	"	
Bromochloromethane	"	"	"		1.00	ND	"	
Bromodichloromethane	"	"	"		1.00	ND	"	
Bromoform	"	"	"		1.00	ND	"	
Bromomethane	"	"	"		10.0	ND	"	
2-Butanone	"	"	"		25.0	ND	"	
n-Butylbenzene	"	"	"		1.00	ND	"	
sec-Butylbenzene	"	"	"		1.00	ND	"	
tert-Butylbenzene	"	"	"		1.00	ND	"	
Carbon disulfide	"	"	"		10.0	ND	"	
Carbon tetrachloride	"	"	"		2.00	ND	"	
Chlorobenzene	"	"	"		1.00	ND	"	
Chloroethane	"	"	"		2.00	ND	"	
Chloroform	"	"	"		1.00	ND	"	
Chloromethane	"	"	"		5.00	ND	"	
2-Chlorotoluene	"	"	"		1.00	ND	"	
4-Chlorotoluene	"	"	"		1.00	ND	"	
1,2-Dibromo-3-chloropropane	"	"	"		1.00	ND	"	
Dibromochloromethane	"	"	"		1.00	ND	"	
1,2-Dibromoethane	"	"	"		1.00	ND	"	
Dibromomethane	"	"	"		1.00	ND	"	
1,2-Dichlorobenzene	"	"	"		1.00	ND	"	
1,3-Dichlorobenzene	"	"	"		1.00	ND	"	
1,4-Dichlorobenzene	"	"	"		1.00	ND	"	
Dichlorodifluoromethane	"	"	"		5.00	ND	"	
1,1-Dichloroethane	"	"	"		1.00	ND	"	
1,2-Dichloroethane	"	"	"		1.00	ND	"	
1,1-Dichloroethene	"	"	"		1.00	ND	"	
cis-1,2-Dichloroethene	"	"	"		1.00	ND	"	
trans-1,2-Dichloroethene	"	"	"		1.00	ND	"	
1,2-Dichloropropane	"	"	"		1.00	ND	"	
1,3-Dichloropropane	"	"	"		1.00	ND	"	
2,2-Dichloropropane	"	"	"		1.00	ND	"	
1,1-Dichloropropene	"	"	"		1.00	ND	"	
cis-1,3-Dichloropropene	"	"	"		1.00	ND	"	
trans-1,3-Dichloropropene	"	"	"		1.00	ND	"	

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Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

Volatile Organic Compounds per EPA Method 8260B
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
TB-082499 (continued)			P908454-03				Water	
Ethylbenzene	0990008	9/1/99	9/1/99		1.00	ND	ug/l	
Hexachlorobutadiene	"	"	"		2.00	ND	"	
2-Hexanone	"	"	"		10.0	ND	"	
Isopropylbenzene	"	"	"		1.00	ND	"	
p-Isopropyltoluene	"	"	"		1.00	ND	"	
4-Methyl-2-pentanone	"	"	"		5.00	ND	"	
Methylene chloride	"	"	"		5.00	ND	"	
Naphthalene	"	"	"		1.00	ND	"	
n-Propylbenzene	"	"	"		1.00	ND	"	
Styrene	"	"	"		1.00	ND	"	
1,1,1,2-Tetrachloroethane	"	"	"		1.00	ND	"	
1,1,2,2-Tetrachloroethane	"	"	"		1.00	ND	"	
Tetrachloroethene	"	"	"		1.00	ND	"	
Toluene	"	"	"		1.00	ND	"	
1,2,3-Trichlorobenzene	"	"	"		1.00	ND	"	
1,2,4-Trichlorobenzene	"	"	"		1.00	ND	"	
1,1,1-Trichloroethane	"	"	"		1.00	ND	"	
1,1,2-Trichloroethane	"	"	"		1.00	ND	"	
Trichloroethene	"	"	"		1.00	ND	"	
Trichlorofluoromethane	"	"	"		1.00	ND	"	
1,2,3-Trichloropropane	"	"	"		1.00	ND	"	
1,2,4-Trimethylbenzene	"	"	"		1.00	ND	"	
1,3,5-Trimethylbenzene	"	"	"		1.00	ND	"	
Vinyl chloride	"	"	"		1.00	ND	"	
o-Xylene	"	"	"		1.00	ND	"	
m,p-Xylene	"	"	"		2.00	ND	"	
Surrogate: 4-BFB	"	"	"	*75.0-135*		*107*	*%*	
Surrogate: 1,2-DCA-d4	"	"	"	*70.0-135*		*109*	"	
Surrogate: Dibromofluoromethane	"	"	"	*80.0-125*		*103*	"	
Surrogate: Toluene-d8	"	"	"	*80.0-120*		*96.0*	"	

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 8/24/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 8/24/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

Conventional Chemistry Parameters per APHA/EPA Methods
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
MW7-082499			P908454-01				Water	
Total Dissolved Solids	0990028	8/31/99	9/1/99	EPA 160.1	10.0	342	mg/l	

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 8/24/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 8/24/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0890806	**Date Prepared: 8/30/99**					**Extraction Method: TPH-D Extraction**				
Blank	**0890806-BLK1**									
Diesel Range Organics	8/30/99			**ND**	mg/l	**0.250**				
Heavy Oil Range Hydrocarbons	"			**ND**	"	**0.500**				
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.105*	"	*50.0-150*	*105*			
LCS	**0890806-BS1**									
Diesel Range Organics	8/30/99	2.51		1.86	mg/l	50.0-150	74.1			
Heavy Oil Range Hydrocarbons	"	1.03		0.770	"	50.0-150	74.8			
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.100*	"	*50.0-150*	*100*			
LCS Dup	**0890806-BSD1**									
Diesel Range Organics	8/30/99	2.51		2.31	mg/l	50.0-150	92.0	50.0	21.6	
Heavy Oil Range Hydrocarbons	"	1.03		0.995	"	50.0-150	96.6	50.0	25.4	
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.103*	"	*50.0-150*	*103*			

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 8/24/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 8/24/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method with Acid/Silica Gel Cleanup/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes
Batch: 0890806	**Date Prepared: 8/30/99**					**Extraction Method: TPH-D Extraction**				
Blank	**0890806-BLK1**									
Diesel Range Organics	8/30/99			**ND**	mg/l	**0.250**				
Heavy Oil Range Hydrocarbons	"			**ND**	"	**0.500**				
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.112*	"	*50.0-150*	*112*			
LCS	**0890806-BS1**									
Diesel Range Organics	8/30/99	2.51		1.90	mg/l	50.0-150	75.7			
Heavy Oil Range Hydrocarbons	"	1.03		0.810	"	50.0-150	78.6			
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.107*	"	*50.0-150*	*107*			
LCS Dup	**0890806-BSD1**									
Diesel Range Organics	8/30/99	2.51		2.33	mg/l	50.0-150	92.8	50.0	20.3	
Heavy Oil Range Hydrocarbons	"	1.03		1.05	"	50.0-150	102	50.0	25.9	
Surrogate: 1-Chlorooctadecane	"	*0.100*		*0.110*	"	*50.0-150*	*110*			

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 8/24/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 8/24/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

Volatile Organic Compounds per EPA Method 8260B/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes
Batch: 0990008	**Date Prepared: 9/1/99**					**Extraction Method: EPA 5030**				
Blank	0990008-BLK1									
Methyl tert-butyl ether	9/1/99			ND	ug/l	1.00				
Acetone	"			ND	"	25.0				
Benzene	"			ND	"	1.00				
Bromobenzene	"			ND	"	1.00				
Bromochloromethane	"			ND	"	1.00				
Bromodichloromethane	"			ND	"	1.00				
Bromoform	"			ND	"	1.00				
Bromomethane	"			ND	"	10.0				
2-Butanone	"			ND	"	25.0				
n-Butylbenzene	"			ND	"	1.00				
sec-Butylbenzene	"			ND	"	1.00				
tert-Butylbenzene	"			ND	"	1.00				
Carbon disulfide	"			ND	"	10.0				
Carbon tetrachloride	"			ND	"	2.00				
Chlorobenzene	"			ND	"	1.00				
Chloroethane	"			ND	"	2.00				
Chloroform	"			ND	"	1.00				
Chloromethane	"			ND	"	5.00				
2-Chlorotoluene	"			ND	"	1.00				
4-Chlorotoluene	"			ND	"	1.00				
1,2-Dibromo-3-chloropropane	"			ND	"	1.00				
Dibromochloromethane	"			ND	"	1.00				
1,2-Dibromoethane	"			ND	"	1.00				
Dibromomethane	"			ND	"	1.00				
1,2-Dichlorobenzene	"			ND	"	1.00				
1,3-Dichlorobenzene	"			ND	"	1.00				
1,4-Dichlorobenzene	"			ND	"	1.00				
Dichlorodifluoromethane	"			ND	"	5.00				
1,1-Dichloroethane	"			ND	"	1.00				
1,2-Dichloroethane	"			ND	"	1.00				
1,1-Dichloroethene	"			ND	"	1.00				
cis-1,2-Dichloroethene	"			ND	"	1.00				
trans-1,2-Dichloroethene	"			ND	"	1.00				
1,2-Dichloropropane	"			ND	"	1.00				
1,3-Dichloropropane	"			ND	"	1.00				
2,2-Dichloropropane	"			ND	"	1.00				
1,1-Dichloropropene	"			ND	"	1.00				

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Lisa Domenighini, Project Manager

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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

Secor	Project:	Crowley - Vancouver, WA	Sampled: 8/24/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 8/24/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

Volatile Organic Compounds per EPA Method 8260B/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Blank (continued)	0990008-BLK1									
cis-1,3-Dichloropropene	9/1/99			ND	ug/l	1.00				
trans-1,3-Dichloropropene	"			ND	"	1.00				
Ethylbenzene	"			ND	"	1.00				
Hexachlorobutadiene	"			ND	"	2.00				
2-Hexanone	"			ND	"	10.0				
Isopropylbenzene	"			ND	"	1.00				
p-Isopropyltoluene	"			ND	"	1.00				
4-Methyl-2-pentanone	"			ND	"	5.00				
Methylene chloride	"			ND	"	5.00				
Naphthalene	"			ND	"	1.00				
n-Propylbenzene	"			ND	"	1.00				
Styrene	"			ND	"	1.00				
1,1,1,2-Tetrachloroethane	"			ND	"	1.00				
1,1,2,2-Tetrachloroethane	"			ND	"	1.00				
Tetrachloroethene	"			ND	"	1.00				
Toluene	"			ND	"	1.00				
1,2,3-Trichlorobenzene	"			ND	"	1.00				
1,2,4-Trichlorobenzene	"			ND	"	1.00				
1,1,1-Trichloroethane	"			ND	"	1.00				
1,1,2-Trichloroethane	"			ND	"	1.00				
Trichloroethene	"			ND	"	1.00				
Trichlorofluoromethane	"			ND	"	1.00				
1,2,3-Trichloropropane	"			ND	"	1.00				
1,2,4-Trimethylbenzene	"			ND	"	1.00				
1,3,5-Trimethylbenzene	"			ND	"	1.00				
Vinyl chloride	"			ND	"	1.00				
o-Xylene	"			ND	"	1.00				
m,p-Xylene	"			ND	"	2.00				
Surrogate: 4-BFB	"	*20.0*		*21.0*	"	*75.0-135*	*105*			
Surrogate: 1,2-DCA-d4	"	*20.0*		*21.0*	"	*70.0-135*	*105*			
Surrogate: Dibromofluoromethane	"	*20.0*		*19.7*	"	*80.0-125*	*98.5*			
Surrogate: Toluene-d8	"	*20.0*		*20.4*	"	*80.0-120*	*102*			
LCS	0990008-BS1									
Benzene	9/1/99	20.0		20.2	ug/l	80.0-125	101			
Chlorobenzene	"	20.0		20.6	"	80.0-125	103			
1,1-Dichloroethene	"	20.0		21.2	"	70.0-135	106			
Toluene	"	20.0		19.9	"	80.0-125	99.5			

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Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
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Secor	Project:	Crowley - Vancouver, WA	Sampled: 8/24/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 8/24/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

Volatile Organic Compounds per EPA Method 8260B/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes
LCS (continued)	**0990008-BS1**									
Trichloroethene	9/1/99	20.0		19.4	ug/l	70.0-130	97.0			
Surrogate: 4-BFB	"	*20.0*		*20.3*	"	*75.0-135*	*101*			
Surrogate: 1,2-DCA-d4	"	*20.0*		*21.1*	"	*70.0-135*	*106*			
Surrogate: Dibromofluoromethane	"	*20.0*		*19.8*	"	*80.0-125*	*99.0*			
Surrogate: Toluene-d8	"	*20.0*		*20.9*	"	*80.0-120*	*104*			
LCS Dup	**0990008-BSD1**									
Benzene	9/1/99	20.0		19.9	ug/l	80.0-125	99.5	25.0	1.50	
Chlorobenzene	"	20.0		20.6	"	80.0-125	103	25.0	0	
1,1-Dichloroethene	"	20.0		22.0	"	70.0-135	110	25.0	3.70	
Toluene	"	20.0		20.6	"	80.0-125	103	25.0	3.46	
Trichloroethene	"	20.0		18.8	"	70.0-130	94.0	25.0	3.14	
Surrogate: 4-BFB	"	*20.0*		*21.1*	"	*75.0-135*	*106*			
Surrogate: 1,2-DCA-d4	"	*20.0*		*21.1*	"	*70.0-135*	*106*			
Surrogate: Dibromofluoromethane	"	*20.0*		*19.9*	"	*80.0-125*	*99.5*			
Surrogate: Toluene-d8	"	*20.0*		*19.3*	"	*80.0-120*	*96.5*			
Matrix Spike	**0990008-MS1**		**P908562-01**							
Benzene	9/1/99	100	ND	100	ug/l	80.0-125	**100**			
Chlorobenzene	"	100	ND	104	"	80.0-125	**104**			
1,1-Dichloroethene	"	100	ND	97.5	"	70.0-135	**97.5**			
Toluene	"	100	ND	103	"	80.0-125	**103**			
Trichloroethene	"	100	ND	95.1	"	70.0-130	**95.1**			
Surrogate: 4-BFB	"	*20.0*		*21.8*	"	*75.0-135*	*109*			
Surrogate: 1,2-DCA-d4	"	*20.0*		*21.1*	"	*70.0-135*	*106*			
Surrogate: Dibromofluoromethane	"	*20.0*		*19.9*	"	*80.0-125*	*99.5*			
Surrogate: Toluene-d8	"	*20.0*		*20.3*	"	*80.0-120*	*101*			
Matrix Spike	**0990008-MS2**		**P908562-01**							
Benzene	9/9/99	20.0	ND	20.4	ug/l	80.0-125	**102**			
Chlorobenzene	"	20.0	ND	21.4	"	80.0-125	**107**			
1,1-Dichloroethene	"	20.0	ND	21.5	"	70.0-135	**108**			
Toluene	"	20.0	ND	21.2	"	80.0-125	**106**			
Trichloroethene	"	20.0	ND	20.5	"	70.0-130	**103**			
Surrogate: 4-BFB	"	*20.0*		*21.3*	"	*75.0-135*	*106*			
Surrogate: 1,2-DCA-d4	"	*20.0*		*20.1*	"	*70.0-135*	*101*			
Surrogate: Dibromofluoromethane	"	*20.0*		*19.2*	"	*80.0-125*	*96.0*			
Surrogate: Toluene-d8	"	*20.0*		*19.9*	"	*80.0-120*	*99.5*			

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 8/24/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 8/24/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

Volatile Organic Compounds per EPA Method 8260B/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes
Matrix Spike Dup	0990008-MSD1		P908562-01							
Benzene	9/1/99	100	ND	101	ug/l	80.0-125	**101**	25.0	**0.995**	
Chlorobenzene	"	100	ND	101	"	80.0-125	**101**	25.0	**2.93**	
1,1-Dichloroethene	"	100	ND	107	"	70.0-135	**107**	25.0	**9.29**	
Toluene	"	100	ND	101	"	80.0-125	**101**	25.0	**1.96**	
Trichloroethene	"	100	ND	95.3	"	70.0-130	**95.3**	25.0	**0.210**	
Surrogate: 4-BFB	"	*20.0*		*20.5*	"	*75.0-135*	*103*			
Surrogate: 1,2-DCA-d4	"	*20.0*		*21.7*	"	*70.0-135*	*109*			
Surrogate: Dibromofluoromethane	"	*20.0*		*20.6*	"	*80.0-125*	*103*			
Surrogate: Toluene-d8	"	*20.0*		*19.6*	"	*80.0-120*	*98.0*			
Matrix Spike Dup	0990008-MSD2		P908562-01							
Benzene	9/9/99	20.0	ND	22.8	ug/l	80.0-125	**114**	25.0	**11.1**	
Chlorobenzene	"	20.0	ND	22.4	"	80.0-125	**112**	25.0	**4.57**	
1,1-Dichloroethene	"	20.0	ND	22.9	"	70.0-135	**114**	25.0	**5.41**	
Toluene	"	20.0	ND	22.1	"	80.0-125	**111**	25.0	**4.61**	
Trichloroethene	"	20.0	ND	22.7	"	70.0-130	**114**	25.0	**10.1**	
Surrogate: 4-BFB	"	*20.0*		*21.9*	"	*75.0-135*	*109*			
Surrogate: 1,2-DCA-d4	"	*20.0*		*21.5*	"	*70.0-135*	*108*			
Surrogate: Dibromofluoromethane	"	*20.0*		*21.6*	"	*80.0-125*	*108*			
Surrogate: Toluene-d8	"	*20.0*		*20.4*	"	*80.0-120*	*102*			

Batch: 0990149 — Date Prepared: 9/7/99 — Extraction Method: EPA 5030

Blank	0990149-BLK1				
Acetone	9/7/99	**ND**	ug/l	**25.0**	
Benzene	"	**ND**	"	**1.00**	
Bromobenzene	"	**ND**	"	**1.00**	
Bromochloromethane	"	**ND**	"	**1.00**	
Bromodichloromethane	"	**ND**	"	**1.00**	
Bromoform	"	**ND**	"	**1.00**	
Bromomethane	"	**ND**	"	**10.0**	
2-Butanone	"	**ND**	"	**25.0**	
n-Butylbenzene	"	**ND**	"	**1.00**	
sec-Butylbenzene	"	**ND**	"	**1.00**	
tert-Butylbenzene	"	**ND**	"	**1.00**	
Carbon disulfide	"	**ND**	"	**10.0**	
Carbon tetrachloride	"	**ND**	"	**2.00**	
Chlorobenzene	"	**ND**	"	**1.00**	
Chloroethane	"	**ND**	"	**2.00**	

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 8/24/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 8/24/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

Volatile Organic Compounds per EPA Method 8260B/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes
Blank (continued)	0990149-BLK1									
Chloroform	9/7/99			ND	ug/l	1.00				
Chloromethane	"			ND	"	5.00				
2-Chlorotoluene	"			ND	"	1.00				
4-Chlorotoluene	"			ND	"	1.00				
1,2-Dibromo-3-chloropropane	"			ND	"	1.00				
Dibromochloromethane	"			ND	"	1.00				
1,2-Dibromoethane	"			ND	"	1.00				
Dibromomethane	"			ND	"	1.00				
1,2-Dichlorobenzene	"			ND	"	1.00				
1,3-Dichlorobenzene	"			ND	"	1.00				
1,4-Dichlorobenzene	"			ND	"	1.00				
Dichlorodifluoromethane	"			ND	"	5.00				
1,1-Dichloroethane	"			ND	"	1.00				
1,2-Dichloroethane	"			ND	"	1.00				
1,1-Dichloroethene	"			ND	"	1.00				
cis-1,2-Dichloroethene	"			ND	"	1.00				
trans-1,2-Dichloroethene	"			ND	"	1.00				
1,2-Dichloropropane	"			ND	"	1.00				
1,3-Dichloropropane	"			ND	"	1.00				
2,2-Dichloropropane	"			ND	"	1.00				
1,1-Dichloropropene	"			ND	"	1.00				
cis-1,3-Dichloropropene	"			ND	"	1.00				
trans-1,3-Dichloropropene	"			ND	"	1.00				
Ethylbenzene	"			ND	"	1.00				
Hexachlorobutadiene	"			ND	"	2.00				
2-Hexanone	"			ND	"	10.0				
Isopropylbenzene	"			ND	"	1.00				
p-Isopropyltoluene	"			ND	"	1.00				
4-Methyl-2-pentanone	"			ND	"	5.00				
Methylene chloride	"			ND	"	5.00				
Naphthalene	"			ND	"	1.00				
n-Propylbenzene	"			ND	"	1.00				
Styrene	"			ND	"	1.00				
1,1,1,2-Tetrachloroethane	"			ND	"	1.00				
1,1,2,2-Tetrachloroethane	"			ND	"	1.00				
Tetrachloroethene	"			ND	"	1.00				
Toluene	"			ND	"	1.00				
1,2,3-Trichlorobenzene	"			ND	"	1.00				

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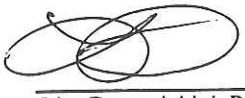

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Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

Volatile Organic Compounds per EPA Method 8260B/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Blank (continued)	0990149-BLK1									
1,2,4-Trichlorobenzene	9/7/99			ND	ug/l	1.00				
1,1,1-Trichloroethane	"			ND	"	1.00				
1,1,2-Trichloroethane	"			ND	"	1.00				
Trichloroethene	"			ND	"	1.00				
Trichlorofluoromethane	"			ND	"	1.00				
1,2,3-Trichloropropane	"			ND	"	1.00				
1,2,4-Trimethylbenzene	"			ND	"	1.00				
1,3,5-Trimethylbenzene	"			ND	"	1.00				
Vinyl chloride	"			ND	"	1.00				
o-Xylene	"			ND	"	1.00				
m,p-Xylene	"			ND	"	2.00				
Surrogate: 4-BFB	"	*20.0*		*20.3*	"	*75.0-135*	*101*			
Surrogate: 1,2-DCA-d4	"	*20.0*		*20.3*	"	*70.0-135*	*101*			
Surrogate: Dibromofluoromethane	"	*20.0*		*19.3*	"	*80.0-125*	*96.5*			
Surrogate: Toluene-d8	"	*20.0*		*19.5*	"	*80.0-120*	*97.5*			
LCS	0990149-BS1									
Benzene	9/7/99	20.0		19.9	ug/l	80.0-125	99.5			
Chlorobenzene	"	20.0		19.5	"	80.0-125	97.5			
1,1-Dichloroethene	"	20.0		21.3	"	70.0-135	106			
Toluene	"	20.0		20.0	"	80.0-125	100			
Trichloroethene	"	20.0		19.5	"	70.0-130	97.5			
Surrogate: 4-BFB	"	*20.0*		*19.5*	"	*75.0-135*	*97.5*			
Surrogate: 1,2-DCA-d4	"	*20.0*		*20.9*	"	*70.0-135*	*104*			
Surrogate: Dibromofluoromethane	"	*20.0*		*19.5*	"	*80.0-125*	*97.5*			
Surrogate: Toluene-d8	"	*20.0*		*19.2*	"	*80.0-120*	*96.0*			
LCS Dup	0990149-BSD1									
Benzene	9/7/99	20.0		19.7	ug/l	80.0-125	98.5	25.0	1.01	
Chlorobenzene	"	20.0		20.9	"	80.0-125	104	25.0	6.45	
1,1-Dichloroethene	"	20.0		20.1	"	70.0-135	101	25.0	4.83	
Toluene	"	20.0		20.0	"	80.0-125	100	25.0	0	
Trichloroethene	"	20.0		18.7	"	70.0-130	93.5	25.0	4.19	
Surrogate: 4-BFB	"	*20.0*		*20.7*	"	*75.0-135*	*104*			
Surrogate: 1,2-DCA-d4	"	*20.0*		*20.5*	"	*70.0-135*	*103*			
Surrogate: Dibromofluoromethane	"	*20.0*		*19.0*	"	*80.0-125*	*95.0*			
Surrogate: Toluene-d8	"	*20.0*		*19.7*	"	*80.0-120*	*98.5*			

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 8/24/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 8/24/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

Volatile Organic Compounds per EPA Method 8260B/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Matrix Spike	0990149-MS1		P909058-01							
Benzene	9/7/99	20.0	ND	20.7	ug/l	80.0-125	**104**			
Chlorobenzene	"	20.0	4.58	26.2	"	80.0-125	**108**			
1,1-Dichloroethene	"	20.0	ND	20.7	"	70.0-135	**104**			
Toluene	"	20.0	ND	21.1	"	80.0-125	**106**			
Trichloroethene	"	20.0	ND	19.5	"	70.0-130	**97.5**			
Surrogate: 4-BFB	"	*20.0*		*21.0*	"	*75.0-135*	*105*			
Surrogate: 1,2-DCA-d4	"	*20.0*		*20.5*	"	*70.0-135*	*103*			
Surrogate: Dibromofluoromethane	"	*20.0*		*19.5*	"	*80.0-125*	*97.5*			
Surrogate: Toluene-d8	"	*20.0*		*20.0*	"	*80.0-120*	*100*			
Matrix Spike Dup	0990149-MSD1		P909058-01							
Benzene	9/7/99	20.0	ND	20.7	ug/l	80.0-125	**104**	25.0	**0**	
Chlorobenzene	"	20.0	4.58	22.9	"	80.0-125	**91.6**	25.0	**16.4**	
1,1-Dichloroethene	"	20.0	ND	22.6	"	70.0-135	**113**	25.0	**8.29**	
Toluene	"	20.0	ND	20.2	"	80.0-125	**101**	25.0	**4.83**	
Trichloroethene	"	20.0	ND	18.7	"	70.0-130	**93.5**	25.0	**4.19**	
Surrogate: 4-BFB	"	*20.0*		*21.8*	"	*75.0-135*	*109*			
Surrogate: 1,2-DCA-d4	"	*20.0*		*20.9*	"	*70.0-135*	*104*			
Surrogate: Dibromofluoromethane	"	*20.0*		*19.1*	"	*80.0-125*	*95.5*			
Surrogate: Toluene-d8	"	*20.0*		*18.3*	"	*80.0-120*	*91.5*			

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

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Lisa Domenighini, Project Manager

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Seattle 18939 120th Avenue NE, Suite 101, Bothell, WA 98011-9508
425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
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Secor	Project:	Crowley - Vancouver, WA	Sampled: 8/24/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 8/24/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 11/10/99 16:41

Conventional Chemistry Parameters per APHA/EPA Methods/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0990028	**Date Prepared: 9/1/99**					**Extraction Method: Wet Chem**				
Blank	0990028-BLK1									
Total Dissolved Solids	9/1/99			ND	mg/l	10.0				
LCS	0990028-BS1									
Total Dissolved Solids	9/1/99	100		99.0	mg/l	80.0-120	99.0			
Duplicate	0990028-DUP1		P908464-05							
Total Dissolved Solids	9/1/99		486	523	mg/l			20.0	7.33	

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Lisa Domenighini, Project Manager

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509.924.9200 fax 509.924.9290
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Secor	Project: Crowley - Vancouver, WA	Sampled: 8/24/99
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Tualatin, OR 97062	Project Manager: Brian Pletcher	Reported: 11/10/99 16:41

Notes and Definitions

#	Note
1	Reporting limits raised due to dilution necessary for analysis.
2	The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.
3	Reporting limit raised due to dilution necessary for analysis. Reporting limit adjusted to report quantitation below the MRL, but within the calibration range.
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

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Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
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Secor	Project: Crowley - Vancouver, WA	Sampled: 9/10/99
P.O. Box 1508	Project Number: F0319-001-01	Received: 9/15/99
Tualatin, OR 97062	Project Manager: Brian Pletcher	Reported: 10/15/99 16:43

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
GP1A-11.0	P909283-03	Soil	9/10/99
GP2A-11.0	P909283-06	Soil	9/10/99
GP3A-13.0	P909283-09	Soil	9/10/99
GP4A-12.0	P909283-12	Soil	9/10/99
GP5A-12.0	P909283-15	Soil	9/10/99
GP8A-12.0	P909283-18	Soil	9/10/99
GP9A-12.0	P909283-21	Soil	9/10/99
GP10A-13.0	P909283-24	Soil	9/10/99

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The results in this report apply to the samples analyzed in accordance with the chain of custody document
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Portland 9405 SW Nimbus Avenue Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
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Secor	Project:	Crowley - Vancouver, WA	Sampled: 9/10/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 9/15/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 10/15/99 16:43

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
GP1A-11.0			**P909283-03**				**Soil**	
Diesel Range Organics	0990561	9/20/99	9/21/99		125	4940	mg/kg dry	1,2
Heavy Oil Range Hydrocarbons	"	"	"		250	371	"	2
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*106*	*%*	
GP2A-11.0			**P909283-06**				**Soil**	
Diesel Range Organics	0990571	9/20/99	9/21/99		25.0	78.1	mg/kg dry	3
Heavy Oil Range Hydrocarbons	"	"	"		50.0	112	"	4
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*108*	*%*	
GP3A-13.0			**P909283-09**				**Soil**	
Diesel Range Organics	0990571	9/20/99	9/21/99		125	13300	mg/kg dry	2,5
Heavy Oil Range Hydrocarbons	"	"	"		250	626	"	2
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*126*	*%*	
GP4A-12.0			**P909283-12**				**Soil**	
Diesel Range Organics	0990571	9/20/99	9/21/99		25.0	154	mg/kg dry	
Heavy Oil Range Hydrocarbons	"	"	"		50.0	81.7	"	4
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*106*	*%*	
GP5A-12.0			**P909283-15**				**Soil**	
Diesel Range Organics	0990571	9/20/99	9/22/99		125	11600	mg/kg dry	2
Heavy Oil Range Hydrocarbons	"	"	"		250	863	"	2,4
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*76.3*	*%*	
GP8A-12.0			**P909283-18**				**Soil**	
Diesel Range Organics	0990571	9/20/99	9/21/99		25.0	41.3	mg/kg dry	
Heavy Oil Range Hydrocarbons	"	"	"		50.0	ND	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*130*	*%*	
GP9A-12.0			**P909283-21**				**Soil**	
Diesel Range Organics	0990571	9/20/99	9/21/99		250	6670	mg/kg dry	2,5
Heavy Oil Range Hydrocarbons	"	"	"		500	ND	"	2
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*96.9*	*%*	
GP10A-13.0			**P909283-24**				**Soil**	
Diesel Range Organics	0990571	9/20/99	9/21/99		500	17200	mg/kg dry	2
Heavy Oil Range Hydrocarbons	"	"	"		1000	ND	"	2
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*140*	*%*	

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Lisa Domenighini, Project Manager

Seattle 18939 120th Avenue NE, Suite 101, Bothell, WA 98011-3508
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
Portland
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Secor	Project:	Crowley - Vancouver, WA	Sampled: 9/10/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 9/15/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 10/15/99 16:43

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method with Acid/Silica Gel Cleanup
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
GP2A-11.0			**P909283-06**				**Soil**	
Diesel Range Organics	0990571	9/20/99	9/28/99		25.0	**68.0**	mg/kg dry	
Heavy Oil Range Hydrocarbons	"	"	"		50.0	**99.8**	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*101*	%	
GP3A-13.0			**P909283-09**				**Soil**	
Diesel Range Organics	0990571	10/14/99	10/14/99		125	**13500**	mg/kg dry	2
Heavy Oil Range Hydrocarbons	"	"	"		250	**476**	"	2,6
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*146*	%	
GP4A-12.0			**P909283-12**				**Soil**	
Diesel Range Organics	0990571	9/20/99	9/29/99		25.0	**138**	mg/kg dry	
Heavy Oil Range Hydrocarbons	"	"	"		50.0	**53.4**	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*105*	%	
GP5A-12.0			**P909283-15**				**Soil**	
Diesel Range Organics	0990571	9/20/99	9/29/99		250	**11200**	mg/kg dry	2
Heavy Oil Range Hydrocarbons	"	"	"		250	**581**	"	2
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*87.1*	%	
GP10A-13.0			**P909283-24**				**Soil**	
Diesel Range Organics	0990571	10/14/99	10/14/99		250	**17400**	mg/kg dry	2
Heavy Oil Range Hydrocarbons	"	"	"		500	ND	"	2
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*145*	%	

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Lisa Domenighini, Project Manager

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425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008
503.906.9200 fax 503.906.9210
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Secor	Project:	Crowley - Vancouver, WA	Sampled: 9/10/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 9/15/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 10/15/99 16:43

Grain Size by PSEP Recommended Guidelines
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
GP5A-3.0			P909283-13				Soil	
% Passing Sieve #4 (<4750µm)	1090238	10/7/99	10/12/99	PSEP Grain Size	0	100	% by Weight	
% Passing Sieve #10 (<2000µm)	"	"	"	PSEP Grain Size	0	100	"	
% Passing Sieve #20 (<850µm)	"	"	"	PSEP Grain Size	0	97.3	"	
% Passing Sieve #40 (<425µm)	"	"	"	PSEP Grain Size	0	76.9	"	
% Passing Sieve #60 (<250µm)	"	"	"	PSEP Grain Size	0	28.0	"	
% Passing Sieve #140 (<106µm)	"	"	"	PSEP Grain Size	0	4.50	"	
% Passing Sieve #200 (<75µm)	"	"	"	PSEP Grain Size	0	3.50	"	
% Passing Sieve #230 (<62.5µm)	"	"	"	PSEP Grain Size	0	3.20	"	
% Passing phi 4 (<62.5µm)	"	"	"	PSEP Grain Size	0	5.10	"	
% Passing phi 5 (<31.2µm)	"	"	"	PSEP Grain Size	0	5.10	"	
% Passing phi 6 (<15.6µm)	"	"	"	PSEP Grain Size	0	5.10	"	
% Passing phi 7 (<7.8µm)	"	"	"	PSEP Grain Size	0	5.10	"	
% Passing phi 8 (<3.9µm)	"	"	"	PSEP Grain Size	0	5.10	"	
% Passing phi 9 (<1.95µm)	"	"	"	PSEP Grain Size	0	5.10	"	
% Passing phi 10 (<0.98µm)	"	"	"	PSEP Grain Size	0	0	"	
Fractional % Sieve #4 (>4750µm)	"	"	"	PSEP Grain Size	0	0	"	
Fractional % Sieve #10 (2000-4750µm)	"	"	"	PSEP Grain Size	0	0	"	
Fractional % Sieve #20 (850-2000µm)	"	"	"	PSEP Grain Size	0	2.70	"	
Fractional % Sieve #40 (425-850µm)	"	"	"	PSEP Grain Size	0	20.4	"	
Fractional % Sieve #60 (250-425µm)	"	"	"	PSEP Grain Size	0	48.9	"	
Fractional % Sieve #140 106-250µm)	"	"	"	PSEP Grain Size	0	23.5	"	
Fractional % Sieve #200 (75-106µm)	"	"	"	PSEP Grain Size	0	0.900	"	
Fractional % Sieve #230 (62.5-75µm)	"	"	"	PSEP Grain Size	0	0.400	"	
Fractional % phi 4-5 (31.2-62.5µm)	"	"	"	PSEP Grain Size	0	0	"	
Fractional % phi 5-6 (15.6-31.2µm)	"	"	"	PSEP Grain Size	0	0	"	
Fractional % phi 6-7 (7.8-15.6µm)	"	"	"	PSEP Grain Size	0	0	"	
Fractional % phi 7-8 (3.9-7.8µm)	"	"	"	PSEP Grain Size	0	0	"	
Fractional % phi 8-9 (1.95-3.9µm)	"	"	"	PSEP Grain Size	0	0	"	
Fractional % phi 9-10 (0.98-1.95µm)	"	"	"	PSEP Grain Size	0	0	"	
Fractional % phi 10+ (<0.98µm)	"	"	"	PSEP Grain Size	0	5.10	"	

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Lisa Domenighini, Project Manager

www.ncalabs.com

Seattle 19939 120th Avenue NE Suite 101 Bothell, WA 98011-9508
425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery Suite B Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue Beaverton, OR 97008
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541.383.9310 fax 541.382.7588

Secor	Project:	Crowley - Vancouver, WA	Sampled: 9/10/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 9/15/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 10/15/99 16:43

Dry Weight Determination
North Creek Analytical - Portland

Sample Name	Lab ID	Matrix	Result	Units
GP1A-11.0	P909283-03	Soil	69.3	%
GP2A-11.0	P909283-06	Soil	72.4	%
GP3A-13.0	P909283-09	Soil	85.0	%
GP4A-12.0	P909283-12	Soil	71.6	%
GP5A-12.0	P909283-15	Soil	86.9	%
GP8A-12.0	P909283-18	Soil	75.1	%
GP9A-12.0	P909283-21	Soil	69.7	%
GP10A-13.0	P909283-24	Soil	79.4	%

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Lisa Domenighini, Project Manager

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Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
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541.383.9310 fax 541.382.7588

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P.O. Box 1508	Project Number:	F0319-001-01	Received: 9/15/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 10/15/99 16:43

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0990561	**Date Prepared: 9/20/99**					**Extraction Method: TPH-D Extraction**				
Blank	**0990561-BLK1**									
Diesel Range Organics	9/20/99			ND	mg/kg dry	**25.0**				
Heavy Oil Range Hydrocarbons	"			ND	"	**50.0**				
Surrogate: 1-Chlorooctadecane	"	*5.00*		*6.25*	"	*50.0-150*	*125*			
LCS	**0990561-BS1**									
Diesel Range Organics	9/20/99	126		111	mg/kg dry	50.0-150	88.1			
Heavy Oil Range Hydrocarbons	"	51.4		60.5	"	50.0-150	118			
Surrogate: 1-Chlorooctadecane	"	*5.00*		*5.13*	"	*50.0-150*	*103*			
Duplicate	**0990561-DUP1**	**P909331-01**								
Diesel Range Organics	9/21/99		ND	ND	mg/kg dry			50.0		
Heavy Oil Range Hydrocarbons	"		17200	24900	"			50.0	**36.6**	
Surrogate: 1-Chlorooctadecane	"	*5.09*		*ND*	"	*50.0-150*	*NR*			7
Duplicate	**0990561-DUP2**	**P909241-03**								
Diesel Range Organics	9/21/99		ND	ND	mg/kg dry			50.0		
Heavy Oil Range Hydrocarbons	"		212	401	"			50.0	**61.7**	8
Surrogate: 1-Chlorooctadecane	"	*6.19*		*3*	"	*50.0-150*	*119*			
Batch: 0990571	**Date Prepared: 9/20/99**					**Extraction Method: TPH-D Extraction**				
Blank	**0990571-BLK1**									
Diesel Range Organics	9/20/99			ND	mg/kg dry	**25.0**				
Heavy Oil Range Hydrocarbons	"			ND	"	**50.0**				
Surrogate: 1-Chlorooctadecane	"	*5.00*		*6.30*	"	*50.0-150*	*126*			
LCS	**0990571-BS1**									
Diesel Range Organics	9/20/99	126		134	mg/kg dry	50.0-150	106			
Heavy Oil Range Hydrocarbons	"	51.4		58.0	"	50.0-150	113			
Surrogate: 1-Chlorooctadecane	"	*5.00*		*5.18*	"	*50.0-150*	*104*			
Duplicate	**0990571-DUP1**	**P909283-06**								
Diesel Range Organics	9/21/99		78.1	60.1	mg/kg dry			50.0	**26.0**	
Heavy Oil Range Hydrocarbons	"		112	99.5	"			50.0	**11.8**	
Surrogate: 1-Chlorooctadecane	"	*6.91*		*7.46*	"	*50.0-150*	*108*			
Duplicate	**0990571-DUP2**	**P909292-01**								
Diesel Range Organics	9/22/99		1770	2290	mg/kg dry			50.0	**25.6**	

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

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Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
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Secor	Project:	Crowley - Vancouver, WA	Sampled: 9/10/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 9/15/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 10/15/99 16:43

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Duplicate (continued)	**0990571-DUP2**		**P909292-01**							
Heavy Oil Range Hydrocarbons	9/22/99		1000	1350	mg/kg dry			50.0	**29.8**	
Surrogate: 1-Chlorooctadecane	"	*5.90*		*8.49*	"	*50.0-150*	*144*			

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509 921 9200 fax 509 921 9206
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008
503 906 9200 fax 503 906 9210
Bend 1600 SE Emerson Avenue, Suite 104, Bend, OR 97702
541 383 9310 fax 541 382 7588

Secor	Project:	Crowley - Vancouver, WA	Sampled: 9/10/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 9/15/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 10/15 99 16:43

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method with Acid/Silica Gel Cleanup/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0990571	**Date Prepared: 9/20/99**					**Extraction Method: TPH-D Extraction**				
Blank	**0990571-BLK1**									
Diesel Range Organics	9/24/99			**ND**	mg/kg dry	**25.0**				
Heavy Oil Range Hydrocarbons	"			**ND**	"	**50.0**				
Surrogate: 1-Chlorooctadecane	"	*5.00*		*5.35*	"	*50.0-150*	*107*			
LCS	**0990571-BS1**									
Diesel Range Organics	9/28/99	126		124	mg/kg dry	50.0-150	98.4			
Heavy Oil Range Hydrocarbons	"	51.4		59.3	"	50.0-150	115			
Surrogate: 1-Chlorooctadecane	"	*5.00*		*5.30*	"	*50.0-150*	*106*			
Duplicate	**0990571-DUP1**		**P909283-06**							
Diesel Range Organics	9/29/99		68.0	51.8	mg/kg dry			50.0	**27.0**	
Heavy Oil Range Hydrocarbons	"		99.8	86.0	"			50.0	**14.9**	
Surrogate: 1-Chlorooctadecane	"	*6.91*		*7.11*	"	*50.0-150*	*103*			7
Duplicate	**0990571-DUP2**		**P909292-01**							
Diesel Range Organics	9/22/99		1770	2290	mg/kg dry			50.0	**25.6**	
Heavy Oil Range Hydrocarbons	"		1000	1350	"			50.0	**29.8**	
Surrogate: 1-Chlorooctadecane	"	*5.90*		*8.49*	"	*50.0-150*	*144*			

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 9/10/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 9/15/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 10/15/99 16:43

Notes and Definitions

#	Note
1	Detected hydrocarbons are slightly emphasized in the light diesel range, suggesting the presence of a light, diesel-range product such as kerosene.
2	Reporting limits raised due to dilution necessary for analysis.
3	Hydrocarbon pattern and range are consistent with weathered diesel with biogenic interference.
4	Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.
5	Detected hydrocarbons in the diesel range appear to be due to a lighter range product such as kerosene.
6	Detected hydrocarbons in the heavy/oil range appear to be due to overlap of diesel range hydrocarbons.
7	The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.
8	The RPD is above the control limit due to a non-homogeneous sample matrix.
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 - Portland

Lisa Domenighini, Project Manager

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COPY

CHAIN OF CUSTODY REPORT

Work Order #:

CLIENT: SECOR
REPORT TO: Brian Pletcher
ADDRESS: 7730 SW Mohawk
Tualatin, Ore
PHONE: FAX:
PROJECT NAME: Crowley Marine
PROJECT NUMBER: F0319-001-01
SAMPLED BY: Warren

INVOICE TO:

P.O. NUMBER:

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 (STD.) 7 5 4 3 2 1 <1
Petroleum Hydrocarbon Analyses: 5 (STD.) 4 3 2 1 <1
OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NWTPH-Dx	[crossed out]	[crossed out]	[crossed out]	[crossed out]	grain size analysis								MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA ID
1. GP1A -	9/9/99 / 9:25	[crossed out]													S	1	Hold	
2. GP1A - 6.0'	9/9/99 / 9:45																Hold	
3. GP1A - 11'	9/10/99 / 9:[illegible]	X																
4. GP2A - 3.0'	9/10/99 / 9[illegible]																	
5. GP2A - 7.0'	9/10/99 / 10:00																	
6. GP2A - 11.0'	9/10/99 / 1015	X															Hold?	
7. GP3A - 3.0	9/10/99 / 1045																Hold?	
8. GP3A - 7.0	9/10/99 / 1050																	
9. GP3A - 13.0	9/10/99 / 1115	X															Hold?	
10. GP4A - 3.0'	9/10/99 / 1155																Hold?	
11. GP4A - 11	9/10/99 / 1205																	
12. GP4A - 12	9/10/99 / 1215	X					X											
13. GP5A - 3.0	9/10/99 / 1240																Hold?	
14. GP5A - 10.0	9/10/99 / 1245																	
15. GP5A - 12.0	9/10/99 / 1250	X																

RELINQUISHED BY: [signature] PRINT NAME: Kirk L Warren FIRM: SECOR DATE: 9-15-99 TIME: 10:15
RECEIVED BY: [signature] PRINT NAME: Gary Spangler FIRM: NCA DATE: 9-15-99 TIME: 1045

RELINQUISHED BY: [signature] PRINT NAME: Gary Spangler FIRM: NCA DATE: 9-15-99 TIME:
RECEIVED BY: Eric Morgan PRINT NAME: Eric Morgan FIRM: NCA DATE: 9/15/99 TIME: 18:30

TEMP: 1.8

ADDITIONAL REMARKS: ... want dx cleanup after results ... analysis

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4

CHAIN OF CUSTODY REPORT

Work Order #:

CLIENT: SECOR
REPORT TO: Brian Pletcher
ADDRESS: 7730 SW Mohawk
Tualatin, Ore
PHONE: FAX:

INVOICE TO:

P.O. NUMBER:

PROJECT NAME: Crowley Marine
PROJECT NUMBER: F0319-001-01
SAMPLED BY: K. Warner

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 | 7 | 5 | 4 | 3 | 2 | 1 | <1
Petroleum Hydrocarbon Analyses: STD. | 5 | 4 | 3 | 2 | 1 | <1
STD. OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	REQUESTED ANALYSES: NW TPH-dx	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA LAB ID
1. GP8A - 3.0'	9/10/99 / 1525		S	1	Hold	
2. GP8A - 10.0'	9/10/99 / 1545		S	1	Hold	
3. GP8A - 12.0'	9/10/99 / 1605	X	S	1		
4. GP9A - 3.0'	9/10/99 / 1350		S	1	Hold	
5. GP9A - 10.0'	9/10/99 / 1415		S	1	Hold	
6. GP9A - 12.0'	9/10/99 / 1450	X	S	1		
7. GP10A - 3.0'	9/10/99 / 1310		S	1	Hold	
8. GP10A - 10.0'	9/10/99 / 1315		S	1	Hold	
9. GP10A - 13.0'	9/10/99 / 1325	X	S	1		
10.						
11.						
12.						
13.						
14.						
15.						

RELINQUISHED BY: K. L. Warner — DATE: 9-15-99
PRINT NAME: Kirk L Warner — FIRM: SECOR — TIME: 1045
RECEIVED BY: — DATE: 9-15-99
PRINT NAME: — FIRM: NCA — TIME: 1045

RELINQUISHED BY: — DATE: 9-15-99
PRINT NAME: — FIRM: NCA — TIME:
RECEIVED BY: — DATE: 9/15/99
PRINT NAME: — FIRM: NCA — TIME: 18:30

ADDITIONAL REMARKS: May do dx cleanup after results of dx analysis.

TEMP: 7 7

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 9/14/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 9/16/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 10/18/99 16:05

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
GP7A-11.0	P909316-02	Soil	9/14/99
GP12A-10.0	P909316-05	Soil	9/14/99
GP13A-10.5	P909316-08	Soil	9/14/99
GP6A-10.0	P909316-10	Soil	9/14/99
GP11A-10.0	P909316-13	Soil	9/14/99
GP-COMP-SLT	P909316-15	Soil	9/10/99

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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.

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 9/14/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 9/16/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 10/18/99 16:05

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
GP7A-11.0			**P909316-02**				**Soil**	
Diesel Range Organics	0990606	9/21/99	9/23/99		500	**9600**	mg/kg dry	1,2
Heavy Oil Range Hydrocarbons	"	"	"		1000	ND	"	1
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*131*	%	
GP12A-10.0			**P909316-05**				**Soil**	
Diesel Range Organics	0990606	9/21/99	9/23/99		250	**5380**	mg/kg dry	1,2
Heavy Oil Range Hydrocarbons	"	"	"		500	ND	"	1
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*100*	%	
GP13A-10.5			**P909316-08**				**Soil**	
Diesel Range Organics	0990606	9/21/99	9/23/99		1250	**32500**	mg/kg dry	1
Heavy Oil Range Hydrocarbons	"	"	"		2500	ND	"	1
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*NR*	%	*3*
GP6A-10.0			**P909316-10**				**Soil**	
Diesel Range Organics	0990606	9/21/99	9/23/99		125	**12000**	mg/kg dry	1,2
Heavy Oil Range Hydrocarbons	"	"	"		250	**671**	"	1
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*NR*	%	*4*
GP11A-10.0			**P909316-13**				**Soil**	
Diesel Range Organics	0990606	9/21/99	9/23/99		25.0	ND	mg/kg dry	
Heavy Oil Range Hydrocarbons	"	"	"		50.0	ND	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*126*	%	

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 9/14/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 9/16/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 10/18/99 16:05

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method with Acid/Silica Gel Cleanup
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
GP7A-11.0			**P909316-02**				**Soil**	
Diesel Range Organics	0990606	9/21/99	10/14/99		250	**9870**	mg/kg dry	1
Heavy Oil Range Hydrocarbons	"	"	"		500	ND	"	1
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*121*	%	
GP13A-10.5			**P909316-08**				**Soil**	
Diesel Range Organics	0990606	10/14/99	10/14/99		250	**31400**	mg/kg dry	1
Heavy Oil Range Hydrocarbons	"	"	"		500	ND	"	1
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*NR*	%	*4*
GP6A-10.0			**P909316-10**				**Soil**	
Diesel Range Organics	0990606	10/14/99	10/14/99		125	**13100**	mg/kg dry	1
Heavy Oil Range Hydrocarbons	"	"	"		250	**513**	"	1
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*NR*	%	*4*

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 9/14/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 9/16/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 10/18/99 16:05

Grain Size by PSEP Recommended Guidelines
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
GP-COMP-SLT			**P909316-15**				Soil	
% Passing Sieve #4 (<4750µm)	1090238	10/7/99	10/12/99	PSEP Grain Size	0	99.4	% by Weight	
% Passing Sieve #10 (<2000µm)	"	"	"	PSEP Grain Size	0	99.1	"	
% Passing Sieve #20 (<850µm)	"	"	"	PSEP Grain Size	0	98.9	"	
% Passing Sieve #40 (<425µm)	"	"	"	PSEP Grain Size	0	98.5	"	
% Passing Sieve #60 (<250µm)	"	"	"	PSEP Grain Size	0	97.5	"	
% Passing Sieve #140 (<106µm)	"	"	"	PSEP Grain Size	0	84.7	"	
% Passing Sieve #200 (<75µm)	"	"	"	PSEP Grain Size	0	75.8	"	
% Passing Sieve #230 (<62.5µm)	"	"	"	PSEP Grain Size	0	74.8	"	
% Passing phi 4 (<62.5µm)	"	"	"	PSEP Grain Size	0	38.8	"	
% Passing phi 5 (<31.2µm)	"	"	"	PSEP Grain Size	0	29.1	"	
% Passing phi 6 (<15.6µm)	"	"	"	PSEP Grain Size	0	19.4	"	
% Passing phi 7 (<7.8µm)	"	"	"	PSEP Grain Size	0	12.9	"	
% Passing phi 8 (<3.9µm)	"	"	"	PSEP Grain Size	0	9.70	"	
% Passing phi 9 (<1.95µm)	"	"	"	PSEP Grain Size	0	3.20	"	
% Passing phi 10 (<0.98µm)	"	"	"	PSEP Grain Size	0	0	"	
Fractional % Sieve #4 (>4750µm)	"	"	"	PSEP Grain Size	0	0.600	"	
Fractional % Sieve #10 (2000-4750µm)	"	"	"	PSEP Grain Size	0	0.400	"	
Fractional % Sieve #20 (850-2000µm)	"	"	"	PSEP Grain Size	0	0.200	"	
Fractional % Sieve #40 (425-850µm)	"	"	"	PSEP Grain Size	0	0.400	"	
Fractional % Sieve #60 (250-425µm)	"	"	"	PSEP Grain Size	0	1.00	"	
Fractional % Sieve #140 106-250µm)	"	"	"	PSEP Grain Size	0	12.9	"	
Fractional % Sieve #200 (75-106µm)	"	"	"	PSEP Grain Size	0	8.80	"	
Fractional % Sieve #230 (62.5-75µm)	"	"	"	PSEP Grain Size	0	1.10	"	
Fractional % phi 4-5 (31.2-62.5µm)	"	"	"	PSEP Grain Size	0	36.0	"	
Fractional % phi 5-6 (15.6-31.2µm)	"	"	"	PSEP Grain Size	0	9.70	"	
Fractional % phi 6-7 (7.8-15.6µm)	"	"	"	PSEP Grain Size	0	9.70	"	
Fractional % phi 7-8 (3.9-7.8µm)	"	"	"	PSEP Grain Size	0	6.50	"	
Fractional % phi 8-9 (1.95-3.9µm)	"	"	"	PSEP Grain Size	0	3.20	"	
Fractional % phi 9-10 (0.98-1.95µm)	"	"	"	PSEP Grain Size	0	6.50	"	
Fractional % phi 10+ (<0.98µm)	"	"	"	PSEP Grain Size	0	3.20	"	

North Creek Analytical - Portland

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

Lisa Domenighini, Project Manager

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Secor	Project:	Crowley - Vancouver, WA	Sampled:	9/14/99
P.O. Box 1508	Project Number:	F0319-001-01	Received:	9/16/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported:	10/18/99 16:05

Dry Weight Determination
North Creek Analytical - Portland

Sample Name	Lab ID	Matrix	Result	Units
GP7A-11.0	P909316-02	Soil	73.0	%
GP12A-10.0	P909316-05	Soil	83.6	%
GP13A-10.5	P909316-08	Soil	72.3	%
GP6A-10.0	P909316-10	Soil	83.5	%
GP11A-10.0	P909316-13	Soil	83.9	%

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 9/14/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 9/16/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 10/18/99 16:05

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0990606	**Date Prepared: 9/21/99**					**Extraction Method: TPH-D Extraction**				
Blank	**0990606-BLK1**									
Diesel Range Organics	9/22/99			**ND**	mg/kg dry	**25.0**				
Heavy Oil Range Hydrocarbons	"			**ND**	"	**50.0**				
Surrogate: 1-Chlorooctadecane	"	*5.00*		*6.00*	"	*50.0-150*	*120*			
LCS	**0990606-BS1**									
Diesel Range Organics	9/22/99	126		127	mg/kg dry	50.0-150	101			
Heavy Oil Range Hydrocarbons	"	51.4		64.5	"	50.0-150	125			
Surrogate: 1-Chlorooctadecane	"	*5.00*		*5.28*	"	*50.0-150*	*106*			
Duplicate	**0990606-DUP1**		**P909316-02**							
Diesel Range Organics	9/23/99		9600	9600	mg/kg dry			50.0	0	
Heavy Oil Range Hydrocarbons	"		ND	ND	"			50.0		
Surrogate: 1-Chlorooctadecane	"	*6.85*		*8.43*	"	*50.0-150*	*123*			
Duplicate	**0990606-DUP2**		**P909325-03**							
Diesel Range Organics	9/23/99		ND	ND	mg/kg dry			50.0		5
Heavy Oil Range Hydrocarbons	"		ND	ND	"			50.0		
Surrogate: 1-Chlorooctadecane	"	*5.36*		*6.78*	"	*50.0-150*	*126*			

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Secor	Project:	Crowley - Vancouver, WA	Sampled: 9/14/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 9/16/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 10/18/99 16:05

Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method with Acid/Silica Gel Cleanup/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0990606	**Date Prepared: 9/21/99**					**Extraction Method: TPH-D Extraction**				
Blank	**0990606-BLK1**									
Diesel Range Organics	10/14/99			ND	mg/kg dry	**25.0**				
Heavy Oil Range Hydrocarbons	"			ND	"	**50.0**				
Surrogate: 1-Chlorooctadecane	"	*5.00*		*5.50*	"	*50.0-150*	*110*			
LCS	**0990606-BS1**									
Diesel Range Organics	10/14/99	126		121	mg/kg dry	50.0-150	96.0			
Heavy Oil Range Hydrocarbons	"	51.4		61.5	"	50.0-150	120			
Surrogate: 1-Chlorooctadecane	"	*5.00*		*4.93*	"	*50.0-150*	*98.6*			
Duplicate	**0990606-DUP1**		**P909316-02**							
Diesel Range Organics	10/14/99		9870	10100	mg/kg dry			50.0	**2.30**	1
Heavy Oil Range Hydrocarbons	"		ND	ND	"			50.0		1
Surrogate: 1-Chlorooctadecane	"	*6.85*		*8.98*	"	*50.0-150*	*131*			
Duplicate	**0990606-DUP2**		**P909325-03**							
Diesel Range Organics	10/14/99		ND	ND	mg/kg dry			50.0		5
Heavy Oil Range Hydrocarbons	"		ND	ND	"			50.0		
Surrogate: 1-Chlorooctadecane	"	*5.36*		*6.78*	"	*50.0-150*	*126*			

North Creek Analytical - Portland

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

Lisa Domenighini, Project Manager

Seattle 18939 120th Avenue NE, Suite 101, Bothell, WA 98011-9508
425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

Secor	Project:	Crowley - Vancouver, WA	Sampled: 9/14/99
P.O. Box 1508	Project Number:	F0319-001-01	Received: 9/16/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported: 10/18/99 16:05

Grain Size by PSEP Recommended Guidelines/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 1090238	**Date Prepared: 10/7/99**					**Extraction Method: General Preparation**				
Duplicate	**1090238-DUP1**	**P909316-15**								
% Passing Sieve #4 (<4750µm)	10/14/99		99.4	99.4	% by Weight			200	**0**	
% Passing Sieve #10 (<2000µm)	"		99.1	98.8	"			200	**0.303**	
% Passing Sieve #20 (<850µm)	"		98.9	98.5	"			200	**0.405**	
% Passing Sieve #40 (<425µm)	"		98.5	97.5	"			200	**1.02**	
% Passing Sieve #60 (<250µm)	"		97.5	95.3	"			200	**2.28**	
% Passing Sieve #140 (<106µm)	"		84.7	77.0	"			200	**9.52**	
% Passing Sieve #200 (<75µm)	"		75.8	66.4	"			200	**13.2**	
% Passing Sieve #230 (<62.5µm)	"		74.8	61.0	"			200	**20.3**	
% Passing phi 4 (<62.5µm)	"		38.8	29.5	"			200	**27.2**	
% Passing phi 5 (<31.2µm)	"		29.1	14.8	"			200	**65.1**	
% Passing phi 6 (<15.6µm)	"		19.4	7.40	"			200	**89.6**	
% Passing phi 7 (<7.8µm)	"		12.9	7.40	"			200	**54.2**	
% Passing phi 8 (<3.9µm)	"		9.70	3.70	"			200	**89.6**	
% Passing phi 9 (<1.95µm)	"		3.20	0	"			200		
% Passing phi 10 (<0.98µm)	"		0	0	"			200		
Fractional % Sieve #4 (>4750µm)	"		0.600	0.600	"			200	**0**	
Fractional % Sieve #10 (2000-4750µm)	"		0.400	0.600	"			200	**40.0**	
Fractional % Sieve #20 (850-2000µm)	"		0.200	0.300	"			200	**40.0**	
Fractional % Sieve #40 (425-850µm)	"		0.400	1.00	"			200	**85.7**	
Fractional % Sieve #60 (250-425µm)	"		1.00	2.10	"			200	**71.0**	
Fractional % Sieve #140 106-250µm)	"		12.9	18.3	"			200	**34.6**	
Fractional % Sieve #200 (75-106µm)	"		8.80	10.6	"			200	**18.6**	
Fractional % Sieve #230 (62.5-75µm)	"		1.10	5.40	"			200	**132**	
Fractional % phi 4-5 (31.2-62.5µm)	"		36.0	31.4	"			200	**13.6**	
Fractional % phi 5-6 (15.6-31.2µm)	"		9.70	14.8	"			200	**41.6**	
Fractional % phi 6-7 (7.8-15.6µm)	"		9.70	7.40	"			200	**26.9**	
Fractional % phi 7-8 (3.9-7.8µm)	"		6.50	0	"			200		
Fractional % phi 8-9 (1.95-3.9µm)	"		3.20	3.70	"			200	**14.5**	
Fractional % phi 9-10 (0.98-1.95µm)	"		6.50	3.70	"			200	**54.9**	
Fractional % phi 10+ (<0.98µm)	"		3.20	0	"			200		

North Creek Analytical - Portland

Refer to end of report for text of notes and definitions

Lisa Domenighini, Project Manager

www.ncalabs.com

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425.420.9200 fax 425.420.9210
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Secor	Project:	Crowley - Vancouver, WA	Sampled:	9/14/99
P.O. Box 1508	Project Number:	F0319-001-01	Received:	9/16/99
Tualatin, OR 97062	Project Manager:	Brian Pletcher	Reported:	10/18/99 16:05

Notes and Definitions

#	Note
1	Reporting limits raised due to dilution necessary for analysis.
2	Detected hydrocarbons have an emphasis in the light diesel range, suggesting the presence of kerosene or similar light, diesel-range product.
3	The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.
4	Unable to calculate surrogate recovery due to high analyte concentration.
5	RPD is not applicable for analyte concentrations less than 5 times the MRL.
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 - Portland

Lisa Domenighini, Project Manager

2.5 C

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (425) 420-9200 FAX 420-9210
East 11115 Montgomery, Suite B, Spokane, WA 99206-4779 (509) 924-9200 FAX 924-9290
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CHAIN OF CUSTODY REPORT

Work Order # P909316

REPORT TO:	SECOR
ATTENTION:	Brian Plethcher
ADDRESS:	2730 SW Mohawk St. Tualatin Oregon
PHONE:	691-2030 FAX:
PROJECT NAME:	Crowley Marine
PROJECT NUMBER:	F6319-001-01
SAMPLED BY:	K. Warner

INVOICE TO:	
ATTENTION:	
ADDRESS:	
P.O. NUMBER:	NCA QUOTE #:

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: 10 (Standard) | 7 | 5 | 4 | 3 | 2 | 1 | Same Day

Fuels & Hydrocarbon Analyses: 5 (Standard) | 3-4 | 2 | 1 | Same Day

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	Analysis Request: NWTPH-Dx	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1	GP7A - 3.0	9/14/99 1220			S	1	Hold
2	GP7A - 11.0	9/14/99 1345		X	S	1	
3	GP7A - 12.0	9/14/99 1400			S	1	Hold
4	GP12A - 3.0	9/14/99 1435			S	1	Hold
5	GP12A - 10.0	9/14/99 1505		X	S	1	
6	GP12A - 11.0	9/14/99 1520			S	1	Hold
7	GP13A - 3.0	9/14/99 1600			S	1	Hold
8	GP13A - 10.5	9/14/99 1610		X	S	1	
9	GP8A - 3.0	9/14/99 1635			S	1	Hold
10	GP6A - 10.0	9/14/99 1645		X	S	1	

RELINQUISHED BY (Signature):	KW	DATE:	9-16-99
PRINT NAME:	Kurt L Warner	FIRM: SECOR	TIME: 1040
RECEIVED BY (Signature):		DATE:	9-16-99
PRINT NAME:	Larry Spangler	FIRM: NCA	TIME: 1040
RELINQUISHED BY (Signature):		DATE:	9-16-99
PRINT NAME:	Larry Spangler	FIRM: NCA	TIME:
RECEIVED BY (Signature):		DATE:	9/16
PRINT NAME:	Bob Fahlstrom	FIRM: NCA	TIME: 18:30

ADDITIONAL REMARKS: may want Dx cleanup after results of analysis

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

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CHAIN OF CUSTODY REPORT

Work Order # 909316

REPORT TO: SECOR
ATTENTION: Brian Fletcher
ADDRESS: 7730 SW Mohawk St.
Tualatin Oregon
PHONE: 691-2030 FAX:
PROJECT NAME: Crowley Marine
PROJECT NUMBER: F0319-001-01
SAMPLED BY: K. Warner

INVOICE TO:
ATTENTION:
ADDRESS:
P.O. NUMBER: NCA QUOTE #:

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 Standard | 7 | 5 | 4 | 3 | 2 | 1 | Same Day
Fuels & Hydrocarbon Analyses: 5 Standard | 3-4 | 2 | 1 | Same Day
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	Analysis Request: NWTPH-Dx	Grain Size analysis	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1.	GP6A - 12.0'	9/14/99/1650				S	1	Hold
2.	GP11A - 3.0'	9/14/99/1725				S	1	Hold
3.	GP11A - 10'	9/14/99/1735		X	~~X~~	S	1	
4.	GP11A - 12'	9/14/99/1745				S	1	Hold
5.	GP-Comp-SLT	9/10/99/1200			X	S	1	
6.								
7.								
8.								
9.								
10.								

RELINQUISHED BY (Signature): K L Warner DATE: 9-16-99
PRINT NAME: Kurt L Warner FIRM: SECOR TIME: 1040

RECEIVED BY (Signature): DATE: 9-16-99
PRINT NAME: Larry Spangler FIRM: NCA TIME: 1040

RELINQUISHED BY (Signature): DATE: 9-16-99
PRINT NAME: Larry Spangler FIRM: NCA TIME:

RECEIVED BY (Signature): DATE: 9/16
PRINT NAME: Bob Fakkema FIRM: NCA TIME: 18:30

ADDITIONAL REMARKS: may want Dx cleanup after results of analysis