Specialty Analytical

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LANDAU ASSOCIATES Received NOV 17 2003

November 07, 2003

Kevin Murphy
Time Oil Co.
2737 West Commodore Way
Seattle, WA 981991233

TEL: 206-286-6443
FAX (206) 285-7833

RE: PHIII Well Install / 231009.31

Dear Kevin Murphy:

Order No.: 0310041

Specialty Analytical received 3 samples on 10/3/2003 for the analyses presented in the following report.

REVISED REPORT VERSION 1 . Please see case narrative for information on revision.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

Ned Engleson
Project Manager

Technical Review

CC:
Rebekah Brooks @ Landau Associates

☒ Seattle (Edmonds) (425) 778-0907
☐ Tacoma (253) 926-2493
☐ Spokane (509) 327-9737
☐ Portland (Lake Oswego) (503) 443-5010
☐ _____

Landau Associates

03-10041

Date 10/2/03
Page 1 of 1

Chain-of-Custody Record

Project Name Time Oil Pt III Well Installs Project No. 231009.31
Project Location/Event NW Terminal
Sampler's Name Christy Johnson
Project Contact Stacey Fischer
Send Results To Rebecca Brookshire Morrow (Time Oil)

Testing Parameters

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

Sample I.D.	Date	Time	Matrix	No. of Containers	Nutrient DX	Nutrient Pt	Bx	Pt	Mtl	Lead	Cu	Zn	Observations/Comments
LW0335 (13.5-14.5)	10/2/03	755	Soil	2	/	/	/	/	/	/	/	/	A-Archive
LW0332d (13.5-14.5)	↓	1005	↓	2	/	/	/	/	/	/	/	/	
LW0332d (0.1-0.2)	↓	1010	↓	1	Archive								

Special Shipment/Handling or Storage Requirements STORED ON ICE

Method of Shipment Hand Delivered

Relinquished by	Received by	Relinquished by	Received by
Signature: Christy Johnson	Signature: Cindy Hillyard	Signature	Signature
Printed Name: Christy Johnson	Printed Name: Cindy Hillyard	Printed Name	Printed Name
Company: Landau Assoc	Company: Specialty	Company	Company
Date 10/3/03 Time 1700	Date 10/3/03 Time 17:00	Date Time	Date Time

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative

Rev 4/01

BZTO104(e)020002

Specialty Analytical **Date:** *10-Nov-03*

CLIENT: Time Oil Co.
Project: PHIII Well Install / 231009.31
Lab Order: 0310041

CASE NARRATIVE

REPORT REVISION 1.0

This report revision includes results for PAHs, which were not included, by lab error, in the original workorder. The samples were extracted and analyzed outside the method specified hold times.

BZTO104(e)020003

Specialty Analytical

Date: *07-Nov-03*

CLIENT:	Time Oil Co.	**Client Sample ID:**	LW033s (13.5-14.5)
Lab Order:	0310041	**Collection Date:**	10/2/2003 7:55:00 AM
Project:	PHIII Well Install / 231009.31		
Lab ID:	0310041-01	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX		**NWTPH-DX**				Analyst: **btf**
Diesel	82.4	18.9		mg/Kg-dry	1	10/7/2003
Lube Oil	175	63.1		mg/Kg-dry	1	10/7/2003
Surr: o-Terphenyl	82.6	50-150		%REC	1	10/7/2003
NWTPH-GX		**NWTPH-GX**				Analyst: **btf**
Gasoline	ND	3.16		mg/Kg-dry	1	10/9/2003
Surr: 4-Bromofluorobenzene	52.1	50-150		%REC	1	10/9/2003
TOTAL METALS BY ICP		**E6010**				Analyst: **tlf**
Lead	ND	2.25		mg/Kg	1	10/9/2003 11:26:45 AM
PAH'S BY GC/MS-OARSIM		**8270SIM**				Analyst: **bda**
Acenaphthene	ND	6.67	HT	µg/Kg	1	11/4/2003 3:59:00 PM
Acenaphthylene	7.33	6.67	HT	µg/Kg	1	11/4/2003 3:59:00 PM
Anthracene	129	6.67	HT	µg/Kg	1	11/4/2003 3:59:00 PM
Benz(a)anthracene	45.3	6.67	HT	µg/Kg	1	11/4/2003 3:59:00 PM
Benzo(a)pyrene	67.3	6.67	HT	µg/Kg	1	11/4/2003 3:59:00 PM
Benzo(b)fluoranthene	65.3	6.67	HT	µg/Kg	1	11/4/2003 3:59:00 PM
Benzo(g,h,i)perylene	47.3	6.67	HT	µg/Kg	1	11/4/2003 3:59:00 PM
Benzo(k)fluoranthene	22.7	6.67	HT	µg/Kg	1	11/4/2003 3:59:00 PM
Chrysene	48.0	6.67	HT	µg/Kg	1	11/4/2003 3:59:00 PM
Dibenz(a,h)anthracene	ND	6.67	HT	µg/Kg	1	11/4/2003 3:59:00 PM
Fluoranthene	148	6.67	HT	µg/Kg	1	11/4/2003 3:59:00 PM
Fluorene	7.33	6.67	HT	µg/Kg	1	11/4/2003 3:59:00 PM
Indeno(1,2,3-cd)pyrene	30.7	6.67	HT	µg/Kg	1	11/4/2003 3:59:00 PM
Naphthalene	ND	6.67	HT	µg/Kg	1	11/4/2003 3:59:00 PM
Phenanthrene	107	6.67	HT	µg/Kg	1	11/4/2003 3:59:00 PM
Pyrene	165	6.67	HT	µg/Kg	1	11/4/2003 3:59:00 PM
Surr: 2-Fluorobiphenyl	83.4	42.6-128		%REC	1	11/4/2003 3:59:00 PM
Surr: Nitrobenzene-d5	108	21.7-155		%REC	1	11/4/2003 3:59:00 PM
Surr: p-Terphenyl-d14	102	44.9-155		%REC	1	11/4/2003 3:59:00 PM
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
1,2,4-Trimethylbenzene	ND	10.0		µg/Kg	1	10/10/2003 7:38:00 PM
1,2-Dibromoethane	ND	10.0		µg/Kg	1	10/10/2003 7:38:00 PM
1,2-Dichloroethane	ND	10.0		µg/Kg	1	10/10/2003 7:38:00 PM
1,3,5-Trimethylbenzene	ND	10.0		µg/Kg	1	10/10/2003 7:38:00 PM
Benzene	ND	10.0		µg/Kg	1	10/10/2003 7:38:00 PM
Ethylbenzene	ND	10.0		µg/Kg	1	10/10/2003 7:38:00 PM
Isopropylbenzene	ND	10.0		µg/Kg	1	10/10/2003 7:38:00 PM
m,p-Xylene	ND	20.0		µg/Kg	1	10/10/2003 7:38:00 PM
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	10/10/2003 7:38:00 PM
n-Propylbenzene	ND	10.0		µg/Kg	1	10/10/2003 7:38:00 PM

BZTO104(e)020004

Specialty Analytical

Date: *07-Nov-03*

CLIENT:	Time Oil Co.	**Client Sample ID:**	LW033s (13.5-14.5)
Lab Order:	0310041	**Collection Date:**	10/2/2003 7:55:00 AM
Project:	PHIII Well Install / 231009.31		
Lab ID:	0310041-01	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
o-Xylene	ND	10.0		µg/Kg	1	10/10/2003 7:38:00 PM
Toluene	ND	10.0		µg/Kg	1	10/10/2003 7:38:00 PM
Surr: 1,2-Dichloroethane-d4	77.3	71.5-112		%REC	1	10/10/2003 7:38:00 PM
Surr: 4-Bromofluorobenzene	102	75.7-122		%REC	1	10/10/2003 7:38:00 PM
Surr: Dibromofluoromethane	95.5	64.3-124		%REC	1	10/10/2003 7:38:00 PM
Surr: Toluene-d8	109	74.9-120		%REC	1	10/10/2003 7:38:00 PM

BZTO104(e)020005

Specialty Analytical

Date: *07-Nov-03*

CLIENT:	Time Oil Co.	**Client Sample ID:**	LW032d (13.5-14.5)
Lab Order:	0310041	**Collection Date:**	10/2/2003 10:05:00 AM
Project:	PHIII Well Install / 231009.31		
Lab ID:	0310041-02	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX		**NWTPH-DX**				Analyst: **btf**
Diesel	6450	17.3		mg/Kg-dry	1	10/7/2003
Lube Oil	ND	57.6		mg/Kg-dry	1	10/7/2003
Surr: o-Terphenyl	143	50-150		%REC	1	10/7/2003
NWTPH-GX		**NWTPH-GX**				Analyst: **btf**
Gasoline	4200	57.6		mg/Kg-dry	20	10/9/2003
Surr: 4-Bromofluorobenzene	246	50-150	S,D	%REC	20	10/9/2003
TOTAL METALS BY ICP		**E6010**				Analyst: **tlf**
Lead	ND	1.67		mg/Kg	1	10/9/2003 11:32:13 AM
PAH'S BY GC/MS-OARSIM		**8270SIM**				Analyst: **bda**
Acenaphthene	251	6.67	HT	µg/Kg	1	11/4/2003 4:31:00 PM
Acenaphthylene	105	6.67	HT	µg/Kg	1	11/4/2003 4:31:00 PM
Anthracene	42.7	6.67	HT	µg/Kg	1	11/4/2003 4:31:00 PM
Benz(a)anthracene	7.33	6.67	HT	µg/Kg	1	11/4/2003 4:31:00 PM
Benzo(a)pyrene	8.00	6.67	HT	µg/Kg	1	11/4/2003 4:31:00 PM
Benzo(b)fluoranthene	8.67	6.67	HT	µg/Kg	1	11/4/2003 4:31:00 PM
Benzo(g,h,i)perylene	ND	6.67	HT	µg/Kg	1	11/4/2003 4:31:00 PM
Benzo(k)fluoranthene	ND	6.67	HT	µg/Kg	1	11/4/2003 4:31:00 PM
Chrysene	7.33	6.67	HT	µg/Kg	1	11/4/2003 4:31:00 PM
Dibenz(a,h)anthracene	ND	6.67	HT	µg/Kg	1	11/4/2003 4:31:00 PM
Fluoranthene	22.7	6.67	HT	µg/Kg	1	11/4/2003 4:31:00 PM
Fluorene	349	6.67	HT	µg/Kg	1	11/4/2003 4:31:00 PM
Indeno(1,2,3-cd)pyrene	ND	6.67	HT	µg/Kg	1	11/4/2003 4:31:00 PM
Naphthalene	2240	33.3	HT	µg/Kg	5	11/5/2003 9:35:00 AM
Phenanthrene	288	6.67	HT	µg/Kg	1	11/4/2003 4:31:00 PM
Pyrene	37.3	6.67	HT	µg/Kg	1	11/4/2003 4:31:00 PM
Surr: 2-Fluorobiphenyl	153	42.6-128	S,MI	%REC	1	11/4/2003 4:31:00 PM
Surr: Nitrobenzene-d5	49.5	21.7-155	MI	%REC	1	11/4/2003 4:31:00 PM
Surr: p-Terphenyl-d14	100	44.9-155		%REC	1	11/4/2003 4:31:00 PM
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
1,2,4-Trimethylbenzene	ND	10.0		µg/Kg	1	10/11/2003 6:57:00 AM
1,2-Dibromoethane	ND	10.0		µg/Kg	1	10/11/2003 6:57:00 AM
1,2-Dichloroethane	ND	10.0		µg/Kg	1	10/11/2003 6:57:00 AM
1,3,5-Trimethylbenzene	860	100		µg/Kg	10	10/11/2003 3:34:00 AM
Benzene	ND	10.0		µg/Kg	1	10/11/2003 6:57:00 AM
Ethylbenzene	ND	10.0		µg/Kg	1	10/11/2003 6:57:00 AM
Isopropylbenzene	773	100		µg/Kg	10	10/11/2003 3:34:00 AM
m,p-Xylene	ND	20.0		µg/Kg	1	10/11/2003 6:57:00 AM
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	10/11/2003 6:57:00 AM
n-Propylbenzene	1750	100		µg/Kg	10	10/11/2003 3:34:00 AM

BZTO104(e)020006

Specialty Analytical

Date: *07-Nov-03*

CLIENT:	Time Oil Co.	**Client Sample ID:**	LW032d (13.5-14.5)
Lab Order:	0310041	**Collection Date:**	10/2/2003 10:05:00 AM
Project:	PHIII Well Install / 231009.31		
Lab ID:	0310041-02	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
o-Xylene	ND	10.0		µg/Kg	1	10/11/2003 6:57:00 AM
Toluene	13.6	10.0		µg/Kg	1	10/11/2003 6:57:00 AM
Surr: 1,2-Dichloroethane-d4	75.4	71.5-112		%REC	1	10/11/2003 6:57:00 AM
Surr: 4-Bromofluorobenzene	272	75.7-122	S,E,MI	%REC	1	10/11/2003 6:57:00 AM
Surr: Dibromofluoromethane	75.6	64.3-124		%REC	1	10/11/2003 6:57:00 AM
Surr: Toluene-d8	115	74.9-120		%REC	1	10/11/2003 6:57:00 AM

BZTO104(e)020007

Specialty Analytical

Date: *07-Nov-03*

CLIENT:	Time Oil Co.	**Client Sample ID:**	LW032d (0.1-0.2)
Lab Order:	0310041	**Collection Date:**	10/2/2003 10:10:00 AM
Project:	PHIII Well Install / 231009.31		
Lab ID:	0310041-03	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
HOLD PER CLIENT REQUEST		**PER CLIENT**				Analyst: **ADM**
Hold	HOLD				1	10/13/2003

BZTO104(e)020008

KEY TO FLAGS

A. This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards.

A1. This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.

A2. This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against lube oil calibration standards.

A3. Results determined to be non detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.

B. The blank exhibited a positive result greater than the reporting limit for this compound.

C. The result confirmed by secondary column or GC/MS analysis.

CN. See case narrative.

CR. Result for this analyte maybe biased due to interferences. Confirmation by GC/MS or other technique is recommended.

D. Surrogate was diluted outside reporting range.

E. Result exceeds the calibration range for the compound. The result should be considered an estimate.

F. The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.

G. Result may be biased high due to biogenic interferences. Silica gel clean-up recommended.

H. Sample was analyzed outside recommended holding times.

HT. At clients request, sample was analyzed outside method recommended holding time.

J. The result for this analyte is between the MDL and the PQL, and should be considered an estimated concentration.

K. Diesel result is biased high due to amount of oil contained in the sample.

L. Diesel result is biased high due to amount of gasoline contained in the sample.

M. Oil result is biased high due to amount of diesel contained in the sample.

MC. Sample concentration is greater than 4x the spiked value; the spiked value is considered insignificant.

MI. Outside control limits due to Matrix Interference.

MSA. Value determined by Method of Standard Addition.

N. Sample appears to contain biogenic material biasing quantification.

O. Laboratory Control Standard (LCS) exceeded laboratory control limits, meets CCV criteria. Data meets EPA requirements.

P. Detected levels of Methylene Chloride may be due to laboratory contamination, due to previous analysis or background levels.

Q. Detection limits elevated due to sample matrix.

R. RPD control limits were exceeded.

RF. Duplicate failed, due to result being at or near method reporting limit.

RP. Matrix spike values exceed established QC limits, post digestion spike is in control.

S. Recovery outside control limits.

*. The result for this parameter was greater than the maximum contaminant level or the TCLP regulatory limit.

rev. October 23, 2001

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHIII Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID	MBLK-9710	SampType:	MBLK	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	10/8/2003	Run ID:	TJA IRIS_031009B
Client ID:	ZZZZZ	Batch ID:	9710	TestNo:	E6010			Analysis Date:	10/9/2003	SeqNo:	217669

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	2.00									
Arsenic	ND	2.00									
Beryllium	ND	0.100									
Cadmium	ND	0.100									
Chromium	ND	0.500									
Copper	ND	1.00									
Lead	1.17	2.00									J
Nickel	ND	0.500									
Selenium	ND	2.00									
Silver	ND	2.00									
Thallium	ND	2.50									
Zinc	0.29	1.00									J

Sample ID	ICB	SampType:	MBLK	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	10/8/2003	Run ID:	TJA IRIS_031010A
Client ID:	ZZZZZ	Batch ID:	9710	TestNo:	E6010			Analysis Date:	10/10/2003	SeqNo:	217891

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	1.05	2.00									J
Zinc	ND	1.00									

Sample ID	LCS-9710	SampType:	LCS	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	10/8/2003	Run ID:	TJA IRIS_031009B
Client ID:	ZZZZZ	Batch ID:	9710	TestNo:	E6010			Analysis Date:	10/9/2003	SeqNo:	217670

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	47.7	2.00	50	0	95.4	86.7	111	0	0		
Arsenic	95.02	2.00	100	0	95	87.6	110	0	0		
Beryllium	4.97	0.100	5	0	99.4	89.2	112	0	0		
Cadmium	4.83	0.100	5	0	96.6	90.8	109	0	0		
Chromium	24.98	0.500	25	0	99.9	91.7	114	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

BZTO104(e)020010

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHIII Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: LCS-9710	SampType: LCS	TestCode: 6010_S	Units: mg/Kg	Prep Date: 10/8/2003	Run ID: TJA IRIS_031009B
Client ID: ZZZZZ	Batch ID: 9710	TestNo: E6010		Analysis Date: 10/9/2003	SeqNo: 217670

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	48.83	1.00	50	0	97.7	91.3	111	0	0		
Lead	96.74	2.00	100	1.17	95.6	92.9	109	0	0		
Nickel	24.2	0.500	25	0	96.8	91.8	109	0	0		
Selenium	98.12	2.00	100	0	98.1	90.2	112	0	0		
Silver	47.89	2.00	50	0	95.8	85.1	108	0	0		
Thallium	116	2.50	125	0	92.8	87.1	108	0	0		
Zinc	49.89	1.00	50	0.29	99.2	88.1	111	0	0		

Sample ID: 0310040-01AMS	SampType: MS	TestCode: 6010_S	Units: mg/Kg	Prep Date: 10/8/2003	Run ID: TJA IRIS_031009B
Client ID: ZZZZZ	Batch ID: 9710	TestNo: E6010		Analysis Date: 10/9/2003	SeqNo: 217674

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	85.83	1.79	89.29	0	96.1	86.1	109	0	0		
Beryllium	5.346	0.0893	4.464	0.93	98.9	84.3	112	0	0		
Cadmium	4.652	0.0893	4.464	0.1083	102	86.4	113	0	0		
Chromium	41.32	0.446	22.32	16.48	111	75	121	0	0		
Copper	58.55	0.893	44.64	32.16	59.1	75.1	126	0	0		S
Lead	88.9	1.79	89.29	37.81	57.2	92.1	104	0	0		S
Nickel	35.29	0.446	22.32	10.23	112	89.3	105	0	0		S
Selenium	89.73	1.79	89.29	0	101	77.7	116	0	0		
Silver	43.33	1.79	44.64	0	97.1	75	123	0	0		
Thallium	112.9	2.23	111.6	0	101	75	112	0	0		
Zinc	202.8	0.893	44.64	142.8	134	86.2	113	0	0		SE

Sample ID: 0310040-01AMS	SampType: MS	TestCode: 6010_S	Units: mg/Kg	Prep Date: 10/8/2003	Run ID: TJA IRIS_031010A
Client ID: ZZZZZ	Batch ID: 9710	TestNo: E6010		Analysis Date: 10/10/2003	SeqNo: 217894

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zinc	212.5	4.46	44.64	146.8	147	86.2	113	0	0		S

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

BZTO104(e)020011

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHIII Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID	0310040-01AMS	SampType:	MS	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	10/8/2003	Run ID:	TJA IRIS_031010A
Client ID:	ZZZZZ	Batch ID:	9710	TestNo:	E6010			Analysis Date:	10/10/2003	SeqNo:	217898

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	21.63	1.79	44.64	3.692	40.2	75	125	0	0		S

Sample ID	0310040-01AMSD	SampType:	MSD	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	10/8/2003	Run ID:	TJA IRIS_031009B
Client ID:	ZZZZZ	Batch ID:	9710	TestNo:	E6010			Analysis Date:	10/9/2003	SeqNo:	217675

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	18.78	1.72	43.1	4.242	33.7	75	125	22.77	19.2	20	S
Arsenic	84.66	1.72	86.21	0	98.2	86.1	109	85.83	1.38	20	
Beryllium	5.314	0.0862	4.31	0.93	102	84.3	112	5.346	0.596	20	
Cadmium	4.414	0.0862	4.31	0.1083	99.9	86.4	113	4.652	5.25	20	
Chromium	43.07	0.431	21.55	16.48	123	75	121	41.32	4.14	20	S
Copper	55.68	0.862	43.1	32.16	54.5	75.1	126	58.55	5.03	20	S
Lead	99.4	1.72	86.21	37.81	71.4	92.1	104	88.9	11.1	20	S
Nickel	35.81	0.431	21.55	10.23	119	89.3	105	35.29	1.45	20	S
Selenium	84.55	1.72	86.21	0	98.1	77.7	116	89.73	5.94	20	
Silver	39.62	1.72	43.1	0	91.9	75	123	43.33	8.94	20	
Thallium	117	2.16	107.8	0	109	75	112	112.9	3.51	20	
Zinc	166.2	0.862	43.1	142.8	54.4	86.2	113	202.8	19.8	20	SE

Sample ID	0310040-01AMSD	SampType:	MSD	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	10/8/2003	Run ID:	TJA IRIS_031010A
Client ID:	ZZZZZ	Batch ID:	9710	TestNo:	E6010			Analysis Date:	10/10/2003	SeqNo:	217895

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zinc	171.3	4.31	43.1	146.8	56.9	86.2	113	212.5	21.5	20	SR

Sample ID	0310040-01AMSD	SampType:	MSD	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	10/8/2003	Run ID:	TJA IRIS_031010A
Client ID:	ZZZZZ	Batch ID:	9710	TestNo:	E6010			Analysis Date:	10/10/2003	SeqNo:	217899

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	17.66	1.72	43.1	3.692	32.4	75	125	21.63	20.3	20	SR

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020012

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHIII Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID 0310040-01ADUP	SampType: DUP	TestCode: 6010_S	Units: mg/Kg	Prep Date: 10/8/2003	Run ID: TJA IRIS_031009B
Client ID: ZZZZZ	Batch ID: 9710	TestNo: E6010		Analysis Date: 10/9/2003	SeqNo: 217673

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.7581	1.61	0	0	0	0	0	0	0	20	J
Beryllium	0.8169	0.0806	0	0	0	0	0	0.93	12.9	20	
Cadmium	0.1613	0.0806	0	0	0	0	0	0.1083	39.3	20	RF
Chromium	15.93	0.403	0	0	0	0	0	16.48	3.38	20	
Copper	24.2	0.806	0	0	0	0	0	32.16	28.2	20	RF
Lead	15.99	1.61	0	0	0	0	0	37.81	81.1	20	R
Nickel	9.726	0.403	0	0	0	0	0	10.23	5.00	20	
Selenium	ND	1.61	0	0	0	0	0	0	0	20	
Silver	ND	1.61	0	0	0	0	0	0	0	20	
Thallium	1.524	2.02	0	0	0	0	0	0	0	20	J

Sample ID 0310040-01ADUP	SampType: DUP	TestCode: 6010_S	Units: mg/Kg	Prep Date: 10/8/2003	Run ID: TJA IRIS_031010A
Client ID: ZZZZZ	Batch ID: 9710	TestNo: E6010		Analysis Date: 10/10/2003	SeqNo: 217893

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zinc	147.7	4.03	0	0	0	0	0	146.8	0.591	20	

Sample ID 0310040-01ADUP	SampType: DUP	TestCode: 6010_S	Units: mg/Kg	Prep Date: 10/8/2003	Run ID: TJA IRIS_031010A
Client ID: ZZZZZ	Batch ID: 9710	TestNo: E6010		Analysis Date: 10/10/2003	SeqNo: 217897

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	2.032	1.61	0	0	0	0	0	3.692	58.0	20	RF

Sample ID CCV	SampType: CCV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 10/8/2003	Run ID: TJA IRIS_031009B
Client ID ZZZZZ	Batch ID: 9710	TestNo: E6010		Analysis Date: 10/9/2003	SeqNo: 217671

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	49.1	2.00	50	0	98.2	90	110	0	0		
Arsenic	98.53	2.00	100	0	98.5	90	110	0	0		
Beryllium	5.099	0.100	5	0	102	90	110	0	0		
Cadmium	4.85	0.100	5	0	97	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

BZTO104(e)020013

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHIII Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID CCV	SampType: CCV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 10/8/2003	Run ID: TJA IRIS_031009B
Client ID: ZZZZZ	Batch ID: 9710	TestNo: E6010		Analysis Date: 10/9/2003	SeqNo: 217671

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	24.56	0.500	25	0	98.2	90	110	0	0		
Copper	50.58	1.00	50	0	101	90	110	0	0		
Lead	101.2	2.00	100	0	101	90	110	0	0		
Nickel	24.92	0.500	25	0	99.7	90	110	0	0		
Selenium	101.8	2.00	100	0	102	90	110	0	0		
Silver	50.17	2.00	50	0	100	90	110	0	0		
Thallium	118.6	2.50	125	0	94.9	90	110	0	0		
Zinc	50.61	1.00	50	0	101	90	110	0	0		

Sample ID CCV	SampType: CCV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 10/8/2003	Run ID: TJA IRIS_031009B
Client ID: ZZZZZ	Batch ID: 9710	TestNo: E6010		Analysis Date: 10/9/2003	SeqNo: 217682

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	90.67	2.00	100	0	90.7	90	110	0	0		
Beryllium	4.762	0.100	5	0	95.2	90	110	0	0		
Cadmium	4.79	0.100	5	0	95.8	90	110	0	0		
Chromium	23.83	0.500	25	0	95.3	90	110	0	0		
Copper	45.47	1.00	50	0	90.9	90	110	0	0		
Lead	100.6	2.00	100	0	101	90	110	0	0		
Nickel	24.03	0.500	25	0	96.1	90	110	0	0		
Selenium	93.86	2.00	100	0	93.9	90	110	0	0		
Silver	48.29	2.00	50	0	96.6	90	110	0	0		
Thallium	121.1	2.50	125	0	96.9	90	110	0	0		
Zinc	47.26	1.00	50	0	94.5	90	110	0	0		

Sample ID CCV	SampType: CCV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 10/8/2003	Run ID: TJA IRIS_031009B
Client ID: ZZZZZ	Batch ID: 9710	TestNo: E6010		Analysis Date: 10/9/2003	SeqNo: 217686

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	100	2.00	100	0	100	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020014

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHIII Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID CCV	SampType: CCV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 10/8/2003	Run ID: TJA IRIS_031010A
Client ID: ZZZZZ	Batch ID: 9710	TestNo: E6010		Analysis Date: 10/10/2003	SeqNo: 217902

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	49.32	2.00	50	0	98.6	90	110	0	0		
Zinc	49.35	1.00	50	0	98.7	90	110	0	0		

Sample ID CCV	SampType: CCV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 10/8/2003	Run ID: TJA IRIS_031010A
Client ID: ZZZZZ	Batch ID: 9710	TestNo: E6010		Analysis Date: 10/10/2003	SeqNo: 217910

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	48.14	2.00	50	0	96.3	90	110	0	0		
Zinc	47.72	1.00	50	0	95.4	90	110	0	0		

Sample ID ICV	SampType: ICV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 10/8/2003	Run ID: TJA IRIS_031009B
Client ID: ZZZZZ	Batch ID: 9710	TestNo: E6010		Analysis Date: 10/9/2003	SeqNo: 217668

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	47.94	2.00	50	0	95.9	90	110	0	0		
Arsenic	95.93	2.00	100	0	95.9	90	110	0	0		
Beryllium	4.964	0.100	5	0	99.3	90	110	0	0		
Cadmium	4.99	0.100	5	0	99.8	90	110	0	0		
Chromium	23.98	0.500	25	0	95.9	90	110	0	0		
Copper	49.27	1.00	50	0	98.5	90	110	0	0		
Lead	98.11	2.00	100	0	98.1	90	110	0	0		
Nickel	24.23	0.500	25	0	96.9	90	110	0	0		
Selenium	98.51	2.00	100	0	98.5	90	110	0	0		
Silver	49.1	2.00	50	0	98.2	90	110	0	0		
Thallium	121.1	2.50	125	0	96.9	90	110	0	0		
Zinc	49.55	1.00	50	0	99.1	90	110	0	0		

Sample ID ICV	SampType: ICV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 10/8/2003	Run ID: TJA IRIS_031010A
Client ID: ZZZZZ	Batch ID: 9710	TestNo: E6010		Analysis Date: 10/10/2003	SeqNo: 217890

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

BZTO104(e)020015

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHIII Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: ICV	SampType: ICV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 10/8/2003	Run ID: TJA IRIS_031010A
Client ID: ZZZZZ	Batch ID: 9710	TestNo: E6010		Analysis Date: 10/10/2003	SeqNo: 217890

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	47.72	2.00	50	0	95.4	90	110	0	0		
Zinc	48.98	1.00	50	0	98	90	110	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020016

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHIII Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_S

Sample ID: MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg	Prep Date: 10/10/2003	Run ID: 5973J_031010C
Client ID: ZZZZZ	Batch ID: 9743	TestNo: SW8260B		Analysis Date: 10/10/2003	SeqNo: 218571

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	10.0									
1,1,1-Trichloroethane	ND	10.0									
1,1,2,2-Tetrachloroethane	ND	10.0									
1,1,2-Trichloroethane	ND	10.0									
1,1-Dichloroethane	ND	10.0									
1,1-Dichloroethene	ND	10.0									
1,1-Dichloropropene	ND	10.0									
1,2,3-Trichlorobenzene	ND	10.0									
1,2,3-Trichloropropane	ND	10.0									
1,2,4-Trichlorobenzene	ND	10.0									
1,2,4-Trimethylbenzene	ND	10.0									
1,2-Dibromo-3-chloropropane	ND	10.0									
1,2-Dibromoethane	ND	10.0									
1,2-Dichlorobenzene	ND	10.0									
1,2-Dichloroethane	ND	10.0									
1,2-Dichloropropane	ND	10.0									
1,3,5-Trimethylbenzene	ND	10.0									
1,3-Dichlorobenzene	ND	10.0									
1,3-Dichloropropane	ND	10.0									
1,4-Dichlorobenzene	ND	10.0									
2,2-Dichloropropane	ND	10.0									
2-Butanone	ND	40.0									
2-Chlorotoluene	ND	10.0									
2-Hexanone	ND	20.0									
4-Chlorotoluene	ND	10.0									
4-Isopropyltoluene	ND	10.0									
4-Methyl-2-pentanone	ND	40.0									
Acetone	ND	100									
Benzene	ND	10.0									
Bromobenzene	ND	10.0									
Bromochloromethane	ND	10.0									

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020017

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHIII Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_S

Sample ID: MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg	Prep Date: 10/10/2003	Run ID: 5973J_031010C
Client ID: ZZZZZ	Batch ID: 9743	TestNo: SW8260B		Analysis Date: 10/10/2003	SeqNo: 218571

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bromodichloromethane	ND	10.0									
Bromoform	ND	10.0									
Bromomethane	ND	10.0									
Carbon disulfide	ND	10.0									
Carbon tetrachloride	ND	10.0									
Chlorobenzene	ND	10.0									
Chloroethane	ND	10.0									
Chloroform	ND	10.0									
Chloromethane	1.09	10.0									J
cis-1,2-Dichloroethene	ND	10.0									
cis-1,3-Dichloropropene	ND	10.0									
Dibromochloromethane	ND	10.0									
Dibromomethane	ND	10.0									
Dichlorodifluoromethane	ND	10.0									
Ethylbenzene	ND	10.0									
Hexachlorobutadiene	ND	10.0									
Isopropylbenzene	ND	10.0									
m,p-Xylene	ND	20.0									
Methyl tert-butyl ether	ND	10.0									
Methylene chloride	13.75	50.0									J
n-Butylbenzene	ND	10.0									
n-Propylbenzene	ND	10.0									
Naphthalene	ND	10.0									
o-Xylene	ND	10.0									
sec-Butylbenzene	ND	10.0									
Styrene	ND	10.0									
tert-Butylbenzene	ND	10.0									
Tetrachloroethene	ND	10.0									
Toluene	ND	10.0									
trans-1,2-Dichloroethene	ND	10.0									
trans-1,3-Dichloropropene	ND	10.0									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020018

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHIII Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_S

Sample ID MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg	Prep Date: 10/10/2003	Run ID: 5973J_031010C
Client ID: ZZZZZ	Batch ID: 9743	TestNo: SW8260B		Analysis Date: 10/10/2003	SeqNo: 218571

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Trichloroethene	ND	10.0									
Trichlorofluoromethane	ND	10.0									
Vinyl chloride	ND	10.0									
Surr: 1,2-Dichloroethane-d4	70.14	1.00	100	0	70.1	71.5	112	0	0		S
Surr: 4-Bromofluorobenzene	99.73	1.00	100	0	99.7	75.7	122	0	0		
Surr: Dibromofluoromethane	84.18	1.00	100	0	84.2	64.3	124	0	0		
Surr: Toluene-d8	107.6	1.00	100	0	108	74.9	120	0	0		

Sample ID LCS	SampType: LCS	TestCode: 8260_S	Units: µg/Kg	Prep Date: 10/10/2003	Run ID: 5973J_031010C
Client ID: ZZZZZ	Batch ID: 9743	TestNo: SW8260B		Analysis Date: 10/10/2003	SeqNo: 218570

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	96.32	10.0	80	0	120	65.4	133	0	0		
Benzene	79.21	10.0	80	0	99	78	123	0	0		
Chlorobenzene	97.26	10.0	80	0	122	79.5	125	0	0		
Toluene	81.77	10.0	80	0	102	77.5	132	0	0		
Trichloroethene	94.65	10.0	80	0	118	72.4	124	0	0		

Sample ID 0310041-01BMS	SampType: MS	TestCode: 8260_S	Units: µg/Kg	Prep Date: 10/10/2003	Run ID: 5973J_031010C
Client ID: LW033s (13.5-14.5)	Batch ID: 9743	TestNo: SW8260B		Analysis Date: 10/10/2003	SeqNo: 218578

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	36.95	10.0	40	0	92.4	69.2	158	0	0		
Benzene	29.46	10.0	40	0	73.6	71.7	147	0	0		
Chlorobenzene	47.58	10.0	40	0	119	85.6	148	0	0		
Toluene	34.46	10.0	40	0	86.2	75.8	153	0	0		
Trichloroethene	34.18	10.0	40	1.53	81.6	77.1	138	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

BZTO104(e)020019

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHH Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_S

Sample ID 0310041-01BMSD	SampType: MSD	TestCode: 8260_S	Units: µg/Kg	Prep Date: 10/10/2003	Run ID: 5973J_031010C
Client ID: LW033s (13.5-14.5)	Batch ID: 9743	TestNo: SW8260B		Analysis Date: 10/10/2003	SeqNo: 218579

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	39.11	10.0	40	0	97.8	69.2	158	36.95	5.68	20	
Benzene	34.02	10.0	40	0	85	71.7	147	29.46	14.4	20	
Chlorobenzene	45.79	10.0	40	0	114	85.6	148	47.58	3.83	20	
Toluene	36.29	10.0	40	0	90.7	75.8	153	34.46	5.17	20	
Trichloroethene	39.79	10.0	40	1.53	95.7	77.1	138	34.18	15.2	20	

Sample ID CCV	SampType: CCV	TestCode: 8260_S	Units: µg/Kg	Prep Date: 10/10/2003	Run ID: 5973J_031010C
Client ID: ZZZZZ	Batch ID: 9743	TestNo: SW8260B		Analysis Date: 10/10/2003	SeqNo: 218569

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	49.34	10.0	60	0	82.2	80	120	0	0		
1,2-Dichloropropane	54.98	10.0	60	0	91.6	80	120	0	0		
Chloroform	50.62	10.0	60	0	84.4	80	120	0	0		
Ethylbenzene	53.86	10.0	60	0	89.8	80	120	0	0		
Toluene	49.79	10.0	60	0	83	80	120	0	0		
Vinyl chloride	62.66	10.0	60	0	104	80	120	0	0		

Sample ID CCV	SampType: CCV	TestCode: 8260_S	Units: µg/Kg	Prep Date: 10/10/2003	Run ID: 5973J_031010C
Client ID: ZZZZZ	Batch ID: 9743	TestNo: SW8260B		Analysis Date: 10/11/2003	SeqNo: 218584

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	30.92	10.0	30	0	103	80	120	0	0		
1,2-Dichloropropane	35.43	10.0	30	0	118	80	120	0	0		
Chloroform	31.91	10.0	30	0	106	80	120	0	0		
Ethylbenzene	27.41	10.0	30	0	91.4	80	120	0	0		
Toluene	27.76	10.0	30	0	92.5	80	120	0	0		
Vinyl chloride	34.19	10.0	30	0	114	80	120	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

BZTO104(e)020020

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHII Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHDX_S

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 10/6/2003	Run ID: GC-M_031006A
Client ID: ZZZZZ	Batch ID: 9697	TestNo: NWTPH-Dx		Analysis Date: 10/6/2003	SeqNo: 217160

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	27.63	1.00	33.33	0	82.9	50	150	0	0		

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 10/6/2003	Run ID: GC-M_031007A
Client ID: ZZZZZ	Batch ID: 9697	TestNo: NWTPH-Dx		Analysis Date: 10/7/2003	SeqNo: 217218

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	27.8	1.00	33.33	0	83.4	50	150	0	0		

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 10/6/2003	Run ID: GC-M_031007B
Client ID: ZZZZZ	Batch ID: 9697	TestNo: NWTPH-Dx		Analysis Date: 10/7/2003	SeqNo: 217381

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	27.97	1.00	33.33	0	83.9	50	150	0	0		

Sample ID LCS	SampType: LCS	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 10/6/2003	Run ID: GC-M_031006A
Client ID: ZZZZZ	Batch ID: 9697	TestNo: NWTPH-Dx		Analysis Date: 10/6/2003	SeqNo: 217161

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	150.3	15.0	167.6	0	89.6	76.3	122	0	0		
Lube Oil	172.6	50.0	167.6	0	103	69.9	127	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020021

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHIII Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHDX_S

Sample ID 0310004-01ADUP	SampType: DUP	TestCode: NWTPHDX_S	Units: mg/Kg-dry	Prep Date: 10/6/2003	Run ID: GC-M_031006A
Client ID: ZZZZZ	Batch ID: 9697	TestNo: NWTPH-Dx		Analysis Date: 10/6/2003	SeqNo: 217170

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	20.1	0	0	0	0	0	0	0	20	
Lube Oil	ND	67.0	0	0	0	0	0	0	0	20	

Sample ID 0310011-01ADUP	SampType: DUP	TestCode: NWTPHDX_S	Units: mg/Kg-dry	Prep Date: 10/6/2003	Run ID: GC-M_031007A
Client ID: ZZZZZ	Batch ID: 9697	TestNo: NWTPH-Dx		Analysis Date: 10/7/2003	SeqNo: 217223

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	17770	183	0	0	0	0	0	13720	25.7	20	R,D
Lube Oil	ND	611	0	0	0	0	0	0	0	20	A3

Sample ID CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 10/6/2003	Run ID: GC-M_031006A
Client ID: ZZZZZ	Batch ID: 9697	TestNo: NWTPH-Dx		Analysis Date: 10/6/2003	SeqNo: 217162

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	310.4	15.0	333.6	0	93	85	115	0	0		
Lube Oil	347	50.0	339	0	102	85	115	0	0		

Sample ID CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 10/6/2003	Run ID: GC-M_031007A
Client ID: ZZZZZ	Batch ID: 9697	TestNo: NWTPH-Dx		Analysis Date: 10/7/2003	SeqNo: 217219

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	148.9	15.0	166.8	0	89.3	85	115	0	0		
Lube Oil	176.8	50.0	169.5	0	104	85	115	0	0		

Sample ID CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 10/6/2003	Run ID: GC-M_031007B
Client ID: ZZZZZ	Batch ID: 9697	TestNo: NWTPH-Dx		Analysis Date: 10/7/2003	SeqNo: 217382

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	151.3	15.0	166.8	0	90.7	85	115	0	0		
Lube Oil	175.5	50.0	169.5	0	104	85	115	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020022

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHIII Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHGX_S

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHGX_S	Units: mg/Kg	Prep Date: 10/9/2003	Run ID: GC-I_031009A
Client ID: ZZZZZ	Batch ID: 9723	TestNo: NWTPH-Gx		Analysis Date: 10/9/2003	SeqNo: 217741

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	2.50									
Surr: 4-Bromofluorobenzene	58.7	1.00	100	0	58.7	50	150	0	0		

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHGX_S	Units: mg/Kg	Prep Date: 10/9/2003	Run ID: GC-I_031010A
Client ID: ZZZZZ	Batch ID: 9723	TestNo: NWTPH-Gx		Analysis Date: 10/10/2003	SeqNo: 218018

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	2.50									
Surr: 4-Bromofluorobenzene	51.1	1.00	100	0	51.1	50	150	0	0		

Sample ID LCS	SampType: LCS	TestCode: NWTPHGX_S	Units: mg/Kg	Prep Date: 10/9/2003	Run ID: GC-I_031009A
Client ID: ZZZZZ	Batch ID: 9723	TestNo: NWTPH-Gx		Analysis Date: 10/9/2003	SeqNo: 217742

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	21.4	2.50	30	0	71.3	53.5	101	0	0		

Sample ID 0309162-12ADUP	SampType: DUP	TestCode: NWTPHGX_S	Units: mg/Kg-dry	Prep Date: 10/9/2003	Run ID: GC-I_031009A
Client ID: ZZZZZ	Batch ID: 9723	TestNo: NWTPH-Gx		Analysis Date: 10/9/2003	SeqNo: 217747

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	3.48	0	0	0	0	0	0	0	20	

Sample ID 0310081-11ADUP	SampType: DUP	TestCode: NWTPHGX_S	Units: mg/Kg-dry	Prep Date: 10/9/2003	Run ID: GC-I_031010A
Client ID: ZZZZZ	Batch ID 9723	TestNo: NWTPH-Gx		Analysis Date: 10/10/2003	SeqNo: 218025

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	5818	149	0	0	0	0	0	5114	12.9	20	

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

BZTO104(e)020023

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHII Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHGX_S

Sample ID	CCV	SampType:	CCV	TestCode:	NWTPHGX_S	Units:	mg/Kg	Prep Date:	10/9/2003	Run ID:	GC-I_031009A
Client ID:	ZZZZZ	Batch ID:	9723	TestNo:	NWTPH-Gx			Analysis Date:	10/9/2003	SeqNo:	217743

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	1327	2.50	1500	0	88.5	80	120	0	0		

Sample ID	CCV	SampType:	CCV	TestCode:	NWTPHGX_S	Units:	mg/Kg	Prep Date:	10/9/2003	Run ID:	GC-I_031010A
Client ID:	ZZZZZ	Batch ID:	9723	TestNo:	NWTPH-Gx			Analysis Date:	10/10/2003	SeqNo:	218019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	785.4	2.50	750	0	105	80	120	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020024

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHIII Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: PAHLL_S

Sample ID MB-9898	SampType: MBLK	TestCode: PAHLL_S	Units: µg/Kg	Prep Date: 11/3/2003	Run ID: 5973G_031104B
Client ID: ZZZZZ	Batch ID: 9898	TestNo: 8270SIM		Analysis Date: 11/4/2003	SeqNo: 222873

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	6.67									
Acenaphthylene	ND	6.67									
Anthracene	ND	6.67									
Benz(a)anthracene	ND	6.67									
Benzo(a)pyrene	ND	6.67									
Benzo(b)fluoranthene	ND	6.67									
Benzo(g,h,i)perylene	ND	6.67									
Benzo(k)fluoranthene	ND	6.67									
Chrysene	ND	6.67									
Dibenz(a,h)anthracene	ND	6.67									
Fluoranthene	ND	6.67									
Fluorene	ND	6.67									
Indeno(1,2,3-cd)pyrene	ND	6.67									
Naphthalene	ND	6.67									
Phenanthrene	ND	6.67									
Pyrene	ND	6.67									
Surr: 2-Fluorobiphenyl	6184	0	6667	0	92.8	42.6	128	0	0		
Surr: Nitrobenzene-d5	6963	0	6667	0	104	21.7	155	0	0		
Surr: p-Terphenyl-d14	7098	0	6667	0	106	44.9	155	0	0		

Sample ID LCS-9898	SampType: LCS	TestCode: PAHLL_S	Units: µg/Kg	Prep Date: 11/3/2003	Run ID: 5973G_031104B
Client ID: ZZZZZ	Batch ID: 9898	TestNo: 8270SIM		Analysis Date: 11/4/2003	SeqNo: 222874

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	122.7	6.67	166.7	0	73.6	40.4	107	0	0		
Benzo(g,h,i)perylene	139.3	6.67	166.7	0	83.6	44.6	125	0	0		
Chrysene	143.3	6.67	166.7	0	86	59.9	121	0	0		
Naphthalene	114.7	6.67	166.7	0	68.8	33.5	96.1	0	0		
Phenanthrene	131.3	6.67	166.7	0	78.8	52.2	108	0	0		
Pyrene	142	6.67	166.7	0	85.2	53.8	120	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

BZTO104(e)020025

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHIII Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: PAHLL_S

Sample ID 0310184-06BMS	SampType: MS	TestCode: PAHLL_S	Units: µg/Kg	Prep Date: 11/3/2003	Run ID: 5973G_031104B
Client ID: ZZZZZ	Batch ID: 9898	TestNo: 8270SIM		Analysis Date: 11/4/2003	SeqNo: 222878

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	188	6.67	166.7	26	97.2	33.7	107	0	0		
Benzo(g,h,i)perylene	79.33	6.67	166.7	9.333	42	15	128	0	0		
Chrysene	157.3	6.67	166.7	16	84.8	37.5	125	0	0		
Naphthalene	112	6.67	166.7	6	63.6	27.7	108	0	0		
Phenanthrene	540	6.67	166.7	336	122	20.2	139	0	0		
Pyrene	264.7	6.67	166.7	84.67	108	26.8	134	0	0		

Sample ID 0310184-06BMSD	SampType: MSD	TestCode: PAHLL_S	Units: µg/Kg	Prep Date: 11/3/2003	Run ID: 5973G_031104B
Client ID: ZZZZZ	Batch ID: 9898	TestNo: 8270SIM		Analysis Date: 11/4/2003	SeqNo: 222879

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	197.3	6.67	166.7	26	103	33.7	107	188	4.84	20	
Benzo(g,h,i)perylene	62.67	6.67	166.7	9.333	32	15	128	79.33	23.5	20	R
Chrysene	130	6.67	166.7	16	68.4	37.5	125	157.3	19.0	20	
Naphthalene	112	6.67	166.7	6	63.6	27.7	108	112	0	20	
Phenanthrene	484	6.67	166.7	336	88.8	20.2	139	540	10.9	20	
Pyrene	208.7	6.67	166.7	84.67	74.4	26.8	134	264.7	23.7	20	R

Sample ID CCV-9898	SampType: CCV	TestCode: PAHLL_S	Units: µg/Kg	Prep Date:	Run ID: 5973G_031104B
Client ID: ZZZZZ	Batch ID: 9898	TestNo: 8270SIM		Analysis Date: 11/4/2003	SeqNo: 222872

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	71.33	6.67	66.67	0	107	70	130	0	0		
Acenaphthylene	71.33	6.67	66.67	0	107	70	130	0	0		
Anthracene	76.67	6.67	66.67	0	115	70	130	0	0		
Benz(a)anthracene	71.33	6.67	66.67	0	107	70	130	0	0		
Benzo(a)pyrene	80	6.67	66.67	0	120	70	130	0	0		
Benzo(b)fluoranthene	74	6.67	66.67	0	111	70	130	0	0		
Benzo(g,h,i)perylene	71.33	6.67	66.67	0	107	70	130	0	0		
Benzo(k)fluoranthene	86	6.67	66.67	0	129	70	130	0	0		
Chrysene	72.67	6.67	66.67	0	109	70	130	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

BZTO104(e)020026

CLIENT: Time Oil Co.
Work Order: 0310041
Project: PHIII Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: PAHLL_S

Sample ID CCV-9898	SampType: CCV	TestCode: PAHLL_S	Units: µg/Kg	Prep Date:	Run ID: 5973G_031104B
Client ID: ZZZZZ	Batch ID: 9898	TestNo 8270SIM		Analysis Date: 11/4/2003	SeqNo: 222872

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dibenz(a,h)anthracene	70	6.67	66.67	0	105	70	130	0	0		
Fluoranthene	79.33	6.67	66.67	0	119	70	130	0	0		
Fluorene	73.33	6.67	66.67	0	110	70	130	0	0		
Indeno(1,2,3-cd)pyrene	72	6.67	66.67	0	108	70	130	0	0		
Naphthalene	66.67	6.67	66.67	0	100	70	130	0	0		
Phenanthrene	71.33	6.67	66.67	0	107	70	130	0	0		
Pyrene	73.33	6.67	66.67	0	110	70	130	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020027

Specialty Analytical

19761 S.W. 95th Place
Tualatin, OR 97062
(503) 612-9007
Fax (503) 612-8572
1 (877) 612-9007

LANDAU ASSOCIATES Received NOV 12 2003

November 07, 2003

Kevin Murphy
Time Oil Co.
2737 West Commodore Way
Seattle, WA 981991233

TEL: 206-286-6443
FAX (206) 285-7833

RE: NW Terminal Well Install / 231009.31

Dear Kevin Murphy:

Order No.: 0310149

Specialty Analytical received 3 samples on 10/22/2003 for the analyses presented in the following report.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Ned Engleson
Project Manager

Technical Review

CC:
Rebekah Brooks @ Landau Associates

BZTO104(e)020028

☒ Seattle (Edmonds) (425) 778-0907
☐ Tacoma (253) 926-2493
☐ Spokane (509) 327-9737
☐ Portland (Tigard) (503) 443-6010
☐ _____

LANDAU ASSOCIATES

0310149

10/21/03
Date _____

Page 1 of 1

Chain-of-Custody Record

Project Name: Time Oil Part III Well Installs
Project No.: 031009.31
Project Location/Event: NW Terminal Portland
Sampler's Name: Christy Johnson
Project Contact: Stacy Fischer
Send Results To: Rebekah Brooks & Kevin Murphy (Time)

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

Testing Parameters

Sample I.D.	Date	Time	Matrix	No. of Containers	NWTPH-DX	NWTPH-G	BEX	PAH	MTBE	LEAD	EDB	EDC			Observations/Comments
LW25d (28-29)	10/20/03	1045	Soil	2	/	/	/	/	/	/	/	/			
LW24d (26-27)	10/20/03	1420	↓	↓	/	/	/	/	/	/	/	/			
LW21S (13.5-14.5)	10/21/03	935	↓	↓	/	/	/	/	/	/	/	/			

Special Shipment/Handling or Storage Requirements: STORED ONICE

Method of Shipment: HAND DELIVERED

Relinquished by	Received by	Relinquished by	Received by
Signature	Signature: Amy Dvorak	Signature	Signature: Amy Dvorak
Printed Name	Printed Name: Amy Dvorak	Printed Name	Printed Name: AMY DVORAK
Company	Company: Specialty Analytical	Company	Company: Specialty
Date _____ Time _____	Date 10/22/03 Time 1:00pm	Date _____ Time _____	Date 10/22/03 Time 1:15p

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative

Rev. 6/02

BZTO104(e)020029

Specialty Analytical

Date: *07-Nov-03*

CLIENT: Time Oil Co.
Client Sample ID: LW25d (28-29)
Lab Order: 0310149
Collection Date: 10/20/2003 10:45:00 AM
Project: NW Terminal Well Install / 231009.31
Lab ID: 0310149-01
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX		**NWTPH-DX**				Analyst: **btf**
Diesel	ND	18.7		mg/Kg-dry	1	10/28/2003
Lube Oil	ND	62.4		mg/Kg-dry	1	10/28/2003
Surr: o-Terphenyl	104	50-150		%REC	1	10/28/2003
NWTPH-GX		**NWTPH-GX**				Analyst: **btf**
Gasoline	ND	3.12		mg/Kg-dry	1	10/27/2003
Surr: 4-Bromofluorobenzene	62.9	50-150		%REC	1	10/27/2003
TOTAL METALS BY ICP		**E6010**				Analyst: **tlf**
Lead	ND	1.79		mg/Kg	1	10/24/2003 4:07:42 PM
PAH'S BY GC/MS-OARSIM		**8270SIM**				Analyst: **bda**
Acenaphthene	ND	6.67		µg/Kg	1	10/27/2003 3:51:00 PM
Acenaphthylene	11.3	6.67		µg/Kg	1	10/27/2003 3:51:00 PM
Anthracene	43.3	6.67		µg/Kg	1	10/27/2003 3:51:00 PM
Benz(a)anthracene	115	6.67		µg/Kg	1	10/27/2003 3:51:00 PM
Benzo(a)pyrene	101	6.67		µg/Kg	1	10/27/2003 3:51:00 PM
Benzo(b)fluoranthene	88.7	6.67		µg/Kg	1	10/27/2003 3:51:00 PM
Benzo(g,h,i)perylene	43.3	6.67		µg/Kg	1	10/27/2003 3:51:00 PM
Benzo(k)fluoranthene	40.0	6.67		µg/Kg	1	10/27/2003 3:51:00 PM
Chrysene	118	6.67		µg/Kg	1	10/27/2003 3:51:00 PM
Dibenz(a,h)anthracene	13.3	6.67		µg/Kg	1	10/27/2003 3:51:00 PM
Fluoranthene	169	6.67		µg/Kg	1	10/27/2003 3:51:00 PM
Fluorene	ND	6.67		µg/Kg	1	10/27/2003 3:51:00 PM
Indeno(1,2,3-cd)pyrene	38.0	6.67		µg/Kg	1	10/27/2003 3:51:00 PM
Naphthalene	ND	6.67		µg/Kg	1	10/27/2003 3:51:00 PM
Phenanthrene	136	6.67		µg/Kg	1	10/27/2003 3:51:00 PM
Pyrene	233	6.67		µg/Kg	1	10/27/2003 3:51:00 PM
Surr: 2-Fluorobiphenyl	63.7	42.6-128		%REC	1	10/27/2003 3:51:00 PM
Surr: Nitrobenzene-d5	69.6	21.7-155		%REC	1	10/27/2003 3:51:00 PM
Surr: p-Terphenyl-d14	82.6	44.9-155		%REC	1	10/27/2003 3:51:00 PM
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
1,2,4-Trimethylbenzene	ND	10.0		µg/Kg	1	10/27/2003 5:11:00 PM
1,2-Dibromoethane	ND	10.0		µg/Kg	1	10/27/2003 5:11:00 PM
1,2-Dichloroethane	ND	10.0		µg/Kg	1	10/27/2003 5:11:00 PM
1,3,5-Trimethylbenzene	ND	10.0		µg/Kg	1	10/27/2003 5:11:00 PM
Benzene	ND	10.0		µg/Kg	1	10/27/2003 5:11:00 PM
Ethylbenzene	ND	10.0		µg/Kg	1	10/27/2003 5:11:00 PM
Isopropylbenzene	ND	10.0		µg/Kg	1	10/27/2003 5:11:00 PM
m,p-Xylene	ND	20.0		µg/Kg	1	10/27/2003 5:11:00 PM
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	10/27/2003 5:11:00 PM
n-Propylbenzene	ND	10.0		µg/Kg	1	10/27/2003 5:11:00 PM

BZTO104(e)020030

Specialty Analytical

Date: *07-Nov-03*

CLIENT: Time Oil Co.
Client Sample ID: LW25d (28-29)
Lab Order: 0310149
Collection Date: 10/20/2003 10:45:00 AM
Project: NW Terminal Well Install / 231009.31
Lab ID: 0310149-01
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
o-Xylene	ND	10.0		µg/Kg	1	10/27/2003 5:11:00 PM
Toluene	ND	10.0		µg/Kg	1	10/27/2003 5:11:00 PM
Surr: 1,2-Dichloroethane-d4	55.2	71.5-112	S,MI	%REC	1	10/27/2003 5:11:00 PM
Surr: 4-Bromofluorobenzene	103	75.7-122		%REC	1	10/27/2003 5:11:00 PM
Surr: Dibromofluoromethane	57.1	64.3-124	S,MI	%REC	1	10/27/2003 5:11:00 PM
Surr: Toluene-d8	112	74.9-120		%REC	1	10/27/2003 5:11:00 PM

BZTO104(e)020031

Specialty Analytical

Date: *07-Nov-03*

CLIENT: Time Oil Co.
Client Sample ID: LW24d (26-27)
Lab Order: 0310149
Collection Date: 10/20/2003 2:20:00 PM
Project: NW Terminal Well Install / 231009.31
Lab ID: 0310149-02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX		**NWTPH-DX**				Analyst: **btf**
Diesel	20.2	19.3		mg/Kg-dry	1	10/28/2003
Lube Oil	ND	64.4		mg/Kg-dry	1	10/28/2003
Surr: o-Terphenyl	124	50-150		%REC	1	10/28/2003
NWTPH-GX		**NWTPH-GX**				Analyst: **btf**
Gasoline	ND	3.22		mg/Kg-dry	1	10/28/2003
Surr: 4-Bromofluorobenzene	77.0	50-150		%REC	1	10/28/2003
TOTAL METALS BY ICP		**E6010**				Analyst: **tlf**
Lead	ND	1.67		mg/Kg	1	10/24/2003 4:40:21 PM
PAH'S BY GC/MS-OARSIM		**8270SIM**				Analyst: **bda**
Acenaphthene	ND	6.67		µg/Kg	1	10/27/2003 4:24:00 PM
Acenaphthylene	ND	6.67		µg/Kg	1	10/27/2003 4:24:00 PM
Anthracene	10.7	6.67		µg/Kg	1	10/27/2003 4:24:00 PM
Benz(a)anthracene	21.3	6.67		µg/Kg	1	10/27/2003 4:24:00 PM
Benzo(a)pyrene	20.0	6.67		µg/Kg	1	10/27/2003 4:24:00 PM
Benzo(b)fluoranthene	17.3	6.67		µg/Kg	1	10/27/2003 4:24:00 PM
Benzo(g,h,i)perylene	9.33	6.67		µg/Kg	1	10/27/2003 4:24:00 PM
Benzo(k)fluoranthene	7.33	6.67		µg/Kg	1	10/27/2003 4:24:00 PM
Chrysene	20.0	6.67		µg/Kg	1	10/27/2003 4:24:00 PM
Dibenz(a,h)anthracene	ND	6.67		µg/Kg	1	10/27/2003 4:24:00 PM
Fluoranthene	30.7	6.67		µg/Kg	1	10/27/2003 4:24:00 PM
Fluorene	ND	6.67		µg/Kg	1	10/27/2003 4:24:00 PM
Indeno(1,2,3-cd)pyrene	8.00	6.67		µg/Kg	1	10/27/2003 4:24:00 PM
Naphthalene	ND	6.67		µg/Kg	1	10/27/2003 4:24:00 PM
Phenanthrene	21.3	6.67		µg/Kg	1	10/27/2003 4:24:00 PM
Pyrene	41.3	6.67		µg/Kg	1	10/27/2003 4:24:00 PM
Surr: 2-Fluorobiphenyl	47.1	42.6-128		%REC	1	10/27/2003 4:24:00 PM
Surr: Nitrobenzene-d5	53.7	21.7-155		%REC	1	10/27/2003 4:24:00 PM
Surr: p-Terphenyl-d14	70.4	44.9-155		%REC	1	10/27/2003 4:24:00 PM
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
1,2,4-Trimethylbenzene	ND	10.0		µg/Kg	1	10/25/2003 4:14:00 AM
1,2-Dibromoethane	ND	10.0		µg/Kg	1	10/25/2003 4:14:00 AM
1,2-Dichloroethane	ND	10.0		µg/Kg	1	10/25/2003 4:14:00 AM
1,3,5-Trimethylbenzene	ND	10.0		µg/Kg	1	10/25/2003 4:14:00 AM
Benzene	ND	10.0		µg/Kg	1	10/25/2003 4:14:00 AM
Ethylbenzene	ND	10.0		µg/Kg	1	10/25/2003 4:14:00 AM
Isopropylbenzene	ND	10.0		µg/Kg	1	10/25/2003 4:14:00 AM
m,p-Xylene	ND	20.0		µg/Kg	1	10/25/2003 4:14:00 AM
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	10/25/2003 4:14:00 AM
n-Propylbenzene	ND	10.0		µg/Kg	1	10/25/2003 4:14:00 AM

BZTO104(e)020032

Specialty Analytical

Date: *07-Nov-03*

CLIENT: Time Oil Co.
Client Sample ID: LW24d (26-27)
Lab Order: 0310149
Collection Date: 10/20/2003 2:20:00 PM
Project: NW Terminal Well Install / 231009.31
Lab ID: 0310149-02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
o-Xylene	ND	10.0		µg/Kg	1	10/25/2003 4:14:00 AM
Toluene	ND	10.0		µg/Kg	1	10/25/2003 4:14:00 AM
Surr: 1,2-Dichloroethane-d4	73.0	71.5-112		%REC	1	10/25/2003 4:14:00 AM
Surr: 4-Bromofluorobenzene	95.3	75.7-122		%REC	1	10/25/2003 4:14:00 AM
Surr: Dibromofluoromethane	74.0	64.3-124		%REC	1	10/25/2003 4:14:00 AM
Surr: Toluene-d8	104	74.9-120		%REC	1	10/25/2003 4:14:00 AM

BZTO104(e)020033

Specialty Analytical

Date: *07-Nov-03*

CLIENT: Time Oil Co.
Client Sample ID: LW21s (13.5-14.5)
Lab Order: 0310149
Collection Date: 10/21/2003 9:35:00 AM
Project: NW Terminal Well Install / 231009.31
Lab ID: 0310149-03
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX		**NWTPH-DX**				Analyst: **btf**
Diesel	6290	193		mg/Kg-dry	10	10/28/2003
Lube Oil	ND	642	A3	mg/Kg-dry	10	10/28/2003
Surr: o-Terphenyl	157	50-150	S,D	%REC	10	10/28/2003
NWTPH-GX		**NWTPH-GX**				Analyst: **btf**
Gasoline	8920	321		mg/Kg-dry	100	10/27/2003
Surr: 4-Bromofluorobenzene	10.0	50-150	S,D	%REC	100	10/27/2003
TOTAL METALS BY ICP		**E6010**				Analyst: **tlf**
Lead	ND	1.61		mg/Kg	1	10/24/2003 4:45:49 PM
PAH'S BY GC/MS-OARSIM		**8270SIM**				Analyst: **bda**
Acenaphthene	399	6.67		µg/Kg	1	10/27/2003 4:57:00 PM
Acenaphthylene	125	6.67		µg/Kg	1	10/27/2003 4:57:00 PM
Anthracene	175	6.67		µg/Kg	1	10/27/2003 4:57:00 PM
Benz(a)anthracene	138	6.67		µg/Kg	1	10/27/2003 4:57:00 PM
Benzo(a)pyrene	132	6.67		µg/Kg	1	10/27/2003 4:57:00 PM
Benzo(b)fluoranthene	119	6.67		µg/Kg	1	10/27/2003 4:57:00 PM
Benzo(g,h,i)perylene	56.0	6.67		µg/Kg	1	10/27/2003 4:57:00 PM
Benzo(k)fluoranthene	46.0	6.67		µg/Kg	1	10/27/2003 4:57:00 PM
Chrysene	136	6.67		µg/Kg	1	10/27/2003 4:57:00 PM
Dibenz(a,h)anthracene	16.0	6.67		µg/Kg	1	10/27/2003 4:57:00 PM
Fluoranthene	139	6.67		µg/Kg	1	10/27/2003 4:57:00 PM
Fluorene	813	6.67		µg/Kg	1	10/27/2003 4:57:00 PM
Indeno(1,2,3-cd)pyrene	48.7	6.67		µg/Kg	1	10/27/2003 4:57:00 PM
Naphthalene	6220	33.3		µg/Kg	5	10/28/2003 9:30:00 AM
Phenanthrene	1300	6.67		µg/Kg	1	10/27/2003 4:57:00 PM
Pyrene	255	6.67		µg/Kg	1	10/27/2003 4:57:00 PM
Surr: 2-Fluorobiphenyl	80.0	42.6-128		%REC	1	10/27/2003 4:57:00 PM
Surr: Nitrobenzene-d5	124	21.7-155		%REC	1	10/27/2003 4:57:00 PM
Surr: p-Terphenyl-d14	63.9	44.9-155		%REC	1	10/27/2003 4:57:00 PM
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
1,2,4-Trimethylbenzene	73800	10000		µg/Kg	1000	10/30/2003 11:21:00 AM
1,2-Dibromoethane	ND	100	Q	µg/Kg	10	10/25/2003 4:48:00 AM
1,2-Dichloroethane	ND	100	Q	µg/Kg	10	10/25/2003 4:48:00 AM
1,3,5-Trimethylbenzene	6830	5000		µg/Kg	500	10/29/2003 6:41:00 PM
Benzene	254	100		µg/Kg	10	10/25/2003 4:48:00 AM
Ethylbenzene	16500	5000		µg/Kg	500	10/29/2003 6:41:00 PM
Isopropylbenzene	7880	5000		µg/Kg	500	10/29/2003 6:41:00 PM
m,p-Xylene	68800	10000		µg/Kg	500	10/29/2003 6:41:00 PM
Methyl tert-butyl ether	ND	100	Q	µg/Kg	10	10/25/2003 4:48:00 AM
n-Propylbenzene	17800	5000		µg/Kg	500	10/29/2003 6:41:00 PM

BZTO104(e)020034

Specialty Analytical

Date: *07-Nov-03*

CLIENT:	Time Oil Co.	**Client Sample ID:**	LW21s (13.5-14.5)
Lab Order:	0310149	**Collection Date:**	10/21/2003 9:35:00 AM
Project:	NW Terminal Well Install / 231009.31		
Lab ID:	0310149-03	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
o-Xylene	16200	5000		µg/Kg	500	10/29/2003 6:41:00 PM
Toluene	676	100		µg/Kg	10	10/25/2003 4:48:00 AM
Surr: 1,2-Dichloroethane-d4	47.2	71.5-112	S	%REC	10	10/25/2003 4:48:00 AM
Surr: 4-Bromofluorobenzene	259	75.7-122	SE	%REC	10	10/25/2003 4:48:00 AM
Surr: Dibromofluoromethane	45.6	64.3-124	S	%REC	10	10/25/2003 4:48:00 AM
Surr: Toluene-d8	132	74.9-120	S	%REC	10	10/25/2003 4:48:00 AM

BZTO104(e)020035

KEY TO FLAGS

A. This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards.

A1. This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.

A2. This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against lube oil calibration standards.

A3. Results determined to be non detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.

B. The blank exhibited a positive result greater than the reporting limit for this compound.

C. The result confirmed by secondary column or GC/MS analysis.

CN. See case narrative.

CR. Result for this analyte maybe biased due to interferences. Confirmation by GC/MS or other technique is recommended.

D. Surrogate was diluted outside reporting range.

E. Result exceeds the calibration range for the compound. The result should be considered an estimate.

F. The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.

G. Result may be biased high due to biogenic interferences. Silica gel clean-up recommended.

H. Sample was analyzed outside recommended holding times.

HT. At clients request, sample was analyzed outside method recommended holding time.

J. The result for this analyte is between the MDL and the PQL, and should be considered an estimated concentration.

K. Diesel result is biased high due to amount of oil contained in the sample.

L. Diesel result is biased high due to amount of gasoline contained in the sample.

M. Oil result is biased high due to amount of diesel contained in the sample.

MC. Sample concentration is greater than 4x the spiked value; the spiked value is considered insignificant.

MI. Outside control limits due to Matrix Interference.

MSA. Value determined by Method of Standard Addition.

N. Sample appears to contain biogenic material biasing quantification.

O. Laboratory Control Standard (LCS) exceeded laboratory control limits, meets CCV criteria. Data meets EPA requirements.

P. Detected levels of Methylene Chloride may be due to laboratory contamination, due to previous analysis or background levels.

Q. Detection limits elevated due to sample matrix.

R. RPD control limits were exceeded.

RF. Duplicate failed, due to result being at or near method reporting limit.

RP. Matrix spike values exceed established QC limits, post digestion spike is in control.

S. Recovery outside control limits.

*. The result for this parameter was greater than the maximum contaminant level or the TCLP regulatory limit.

rev. October 23, 2001

Specialty Analytical

Date: *07-Nov-03*

CLIENT: Time Oil Co.
Work Order: 0310149
Project: NW Terminal Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID	MBLK-9825	SampType:	MBLK	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	10/23/2003	Run ID:	TJA IRIS_031024D
Client ID:	ZZZZZ	Batch ID:	9825	TestNo	E6010			Analysis Date:	10/24/2003	SeqNo:	221101

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	2.00									

Sample ID	LCS-9825	SampType:	LCS	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	10/23/2003	Run ID:	TJA IRIS_031024D
Client ID:	ZZZZZ	Batch ID:	9825	TestNo:	E6010			Analysis Date:	10/24/2003	SeqNo:	221102

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	99.36	2.00	100	0	99.4	92.9	109	0	0		

Sample ID	0310149-01BMS	SampType:	MS	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	10/23/2003	Run ID:	TJA IRIS_031024D
Client ID:	LW25d (28-29)	Batch ID:	9825	TestNo:	E6010			Analysis Date:	10/24/2003	SeqNo:	221105

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	85.17	1.67	83.33	0	102	92.1	104	0	0		

Sample ID	0310149-01BMSD	SampType:	MSD	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	10/23/2003	Run ID:	TJA IRIS_031024D
Client ID:	LW25d (28-29)	Batch ID:	9825	TestNo:	E6010			Analysis Date:	10/24/2003	SeqNo:	221106

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	90.09	1.72	86.21	0	104	92.1	104	85.17	5.61	20	S

Sample ID	0310149-01BDUP	SampType:	DUP	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	10/23/2003	Run ID:	TJA IRIS_031024D
Client ID:	LW25d (28-29)	Batch ID:	9825	TestNo:	E6010			Analysis Date:	10/24/2003	SeqNo:	221104

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	1.85	0	0	0	0	0	0	0	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020037

CLIENT: Time Oil Co.
Work Order: 0310149
Project: NW Terminal Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID CCV	SampType: CCV	TestCode: 6010_S	Units: mg/Kg	Prep Date:	Run ID: TJA IRIS_031024D
Client ID: ZZZZZ	Batch ID: 9825	TestNo: E6010		Analysis Date: 10/24/2003	SeqNo: 221099

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	93.76	2.00	100	0	93.8	90	110	0	0		

Sample ID CCV	SampType: CCV	TestCode: 6010_S	Units: mg/L	Prep Date:	Run ID: TJA IRIS_031024D
Client ID: ZZZZZ	Batch ID: 9825	TestNo: E6010		Analysis Date: 10/24/2003	SeqNo: 221100

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	93.07	0.0200	100	0	93.1	90	110	0	0		

Sample ID CCV	SampType: CCV	TestCode: 6010_S	Units: mg/Kg	Prep Date:	Run ID: TJA IRIS_031024D
Client ID: ZZZZZ	Batch ID: 9825	TestNo: E6010		Analysis Date: 10/24/2003	SeqNo: 221111

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	95.97	2.00	100	0	96	90	110	0	0		

Sample ID ICV	SampType: ICV	TestCode: 6010_S	Units: mg/Kg	Prep Date:	Run ID: TJA IRIS_031024D
Client ID: ZZZZZ	Batch ID: 9825	TestNo: E6010		Analysis Date: 10/24/2003	SeqNo: 221098

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	96.46	2.00	100	0	96.5	90	110	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020038

CLIENT: Time Oil Co.
Work Order: 0310149
Project: NW Terminal Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_S

Sample ID: MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg	Prep Date: 10/24/2003	Run ID: 5973J_031024A
Client ID: ZZZZZ	Batch ID: 9852	TestNo: SW8260B		Analysis Date: 10/24/2003	SeqNo: 221123

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	10.0									
1,1,1-Trichloroethane	ND	10.0									
1,1,2,2-Tetrachloroethane	ND	10.0									
1,1,2-Trichloroethane	ND	10.0									
1,1-Dichloroethane	ND	10.0									
1,1-Dichloroethene	ND	10.0									
1,1-Dichloropropene	ND	10.0									
1,2,3-Trichlorobenzene	5.25	10.0									J
1,2,3-Trichloropropane	ND	10.0									
1,2,4-Trichlorobenzene	5.89	10.0									J
1,2,4-Trimethylbenzene	0.68	10.0									J
1,2-Dibromo-3-chloropropane	ND	10.0									
1,2-Dibromoethane	ND	10.0									
1,2-Dichlorobenzene	ND	10.0									
1,2-Dichloroethane	ND	10.0									
1,2-Dichloropropane	ND	10.0									
1,3,5-Trimethylbenzene	ND	10.0									
1,3-Dichlorobenzene	ND	10.0									
1,3-Dichloropropane	ND	10.0									
1,4-Dichlorobenzene	ND	10.0									
2,2-Dichloropropane	ND	10.0									
2-Butanone	6.99	40.0									J
2-Chlorotoluene	ND	10.0									
2-Hexanone	ND	20.0									
4-Chlorotoluene	ND	10.0									
4-Isopropyltoluene	ND	10.0									
4-Methyl-2-pentanone	ND	40.0									
Acetone	ND	100									
Benzene	ND	10.0									
Bromobenzene	ND	10.0									
Bromochloromethane	ND	10.0									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020039

CLIENT: Time Oil Co.
Work Order: 0310149
Project: NW Terminal Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_S

Sample ID: MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg	Prep Date: 10/24/2003	Run ID: 5973J_031024A
Client ID: ZZZZZ	Batch ID: 9852	TestNo: SW8260B		Analysis Date: 10/24/2003	SeqNo: 221123

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bromodichloromethane	ND	10.0									
Bromoform	ND	10.0									
Bromomethane	ND	10.0									
Carbon disulfide	1.14	10.0									J
Carbon tetrachloride	ND	10.0									
Chlorobenzene	ND	10.0									
Chloroethane	ND	10.0									
Chloroform	ND	10.0									
Chloromethane	ND	10.0									
cis-1,2-Dichloroethene	ND	10.0									
cis-1,3-Dichloropropene	ND	10.0									
Dibromochloromethane	ND	10.0									
Dibromomethane	ND	10.0									
Dichlorodifluoromethane	ND	10.0									
Ethylbenzene	ND	10.0									
Hexachlorobutadiene	ND	10.0									
Isopropylbenzene	ND	10.0									
m,p-Xylene	ND	20.0									
Methyl tert-butyl ether	ND	10.0									
Methylene chloride	ND	50.0									
n-Butylbenzene	3.51	10.0									J
n-Propylbenzene	ND	10.0									
Naphthalene	7.4	10.0									J
o-Xylene	2.23	10.0									J
sec-Butylbenzene	ND	10.0									
Styrene	ND	10.0									
tert-Butylbenzene	ND	10.0									
Tetrachloroethene	ND	10.0									
Toluene	0.78	10.0									J
trans-1,2-Dichloroethene	ND	10.0									
trans-1,3-Dichloropropene	ND	10.0									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020040

CLIENT: Time Oil Co.
Work Order: 0310149
Project: NW Terminal Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_S

Sample ID **MB**	SampType: **MBLK**	TestCode: **8260_S**	Units: **µg/Kg**	Prep Date: **10/24/2003**	Run ID: **5973J_031024A**
Client ID: **ZZZZZ**	Batch ID: **9852**	TestNo: **SW8260B**		Analysis Date: **10/24/2003**	SeqNo: **221123**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Trichloroethene	ND	10.0									
Trichlorofluoromethane	ND	10.0									
Vinyl chloride	ND	10.0									
Surr: 1,2-Dichloroethane-d4	77.48	1.00	100	0	77.5	71.5	112	0	0		
Surr: 4-Bromofluorobenzene	96.12	1.00	100	0	96.1	75.7	122	0	0		
Surr: Dibromofluoromethane	76.57	1.00	100	0	76.6	64.3	124	0	0		
Surr: Toluene-d8	104.7	1.00	100	0	105	74.9	120	0	0		

Sample ID **LCS**	SampType: **LCS**	TestCode: **8260_S**	Units: **µg/Kg**	Prep Date: **10/24/2003**	Run ID: **5973J_031024A**
Client ID: **ZZZZZ**	Batch ID: **9852**	TestNo: **SW8260B**		Analysis Date: **10/24/2003**	SeqNo: **221122**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	95.45	10.0	80	0	119	65.4	133	0	0		
Benzene	69.33	10.0	80	0	86.7	78	123	0	0		
Chlorobenzene	81.84	10.0	80	0	102	79.5	125	0	0		
Toluene	68.97	10.0	80	0.78	85.2	77.5	132	0	0		
Trichloroethene	73.33	10.0	80	0	91.7	72.4	124	0	0		

Sample ID **0310147-04BMS**	SampType: **MS**	TestCode: **8260_S**	Units: **µg/Kg**	Prep Date: **10/24/2003**	Run ID: **5973J_031024A**
Client ID: **ZZZZZ**	Batch ID: **9852**	TestNo: **SW8260B**		Analysis Date: **10/25/2003**	SeqNo: **221126**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	37.67	10.0	40	0	94.2	69.2	158	0	0		
Benzene	427.8	10.0	40	378.4	123	71.7	147	0	0		E
Chlorobenzene	33.01	10.0	40	0	82.5	85.6	148	0	0		S
Toluene	768.4	10.0	40	694.2	185	75.8	153	0	0		SE
Trichloroethene	31.39	10.0	40	0	78.5	77.1	138	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020041

CLIENT: Time Oil Co.
Work Order: 0310149
Project: NW Terminal Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_S

Sample ID 0310147-04BMSD	SampType: MSD	TestCode: 8260_S	Units: µg/Kg	Prep Date: 10/24/2003	Run ID: 5973J_031024A
Client ID: ZZZZZ	Batch ID: 9852	TestNo: SW8260B		Analysis Date: 10/25/2003	SeqNo: 221127

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	37.55	10.0	40	0	93.9	69.2	158	37.67	0.319	20	
Benzene	454.3	10.0	40	378.4	190	71.7	147	427.8	6.01	20	SE
Chlorobenzene	29.49	10.0	40	0	73.7	85.6	148	33.01	11.3	20	S
Toluene	877.7	10.0	40	694.2	459	75.8	153	768.4	13.3	20	SE
Trichloroethene	31.06	10.0	40	0	77.7	77.1	138	31.39	1.06	20	

Sample ID CCV	SampType: CCV	TestCode: 8260_S	Units: µg/Kg	Prep Date: 10/24/2003	Run ID: 5973J_031024A
Client ID: ZZZZZ	Batch ID: 9852	TestNo: SW8260B		Analysis Date: 10/24/2003	SeqNo: 221121

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	62.84	10.0	60	0	105	80	120	0	0		
1,2-Dichloropropane	66.38	10.0	60	0	111	80	120	0	0		
Chloroform	65.62	10.0	60	0	109	80	120	0	0		
Ethylbenzene	58.78	10.0	60	0	98	80	120	0	0		
Toluene	60.66	10.0	60	0	101	80	120	0	0		
Vinyl chloride	57.69	10.0	60	0	96.2	80	120	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

BZTO104(e)020042

CLIENT: Time Oil Co.
Work Order: 0310149
Project: NW Terminal Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHDX_S

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 10/23/2003	Run ID: GC-M_031027A
Client ID: ZZZZZ	Batch ID: 9818	TestNo: NWTPH-Dx		Analysis Date: 10/27/2003	SeqNo: 221311

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	25.7	1.00	33.33	0	77.1	50	150	0	0		

Sample ID MBLK	SampType MBLK	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 10/23/2003	Run ID: GC-M_031028E
Client ID: ZZZZZ	Batch ID: 9818	TestNo: NWTPH-Dx		Analysis Date: 10/28/2003	SeqNo: 221696

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	27.2	1.00	33.33	0	81.6	50	150	0	0		

Sample ID LCS	SampType: LCS	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 10/23/2003	Run ID: GC-M_031027A
Client ID: ZZZZZ	Batch ID: 9818	TestNo: NWTPH-Dx		Analysis Date: 10/27/2003	SeqNo: 221312

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	163.9	15.0	167.6	0	97.8	76.3	122	0	0		
Lube Oil	190	50.0	167.6	0	113	69.9	127	0	0		

Sample ID 0310151-01ADUP	SampType: DUP	TestCode: NWTPHDX_S	Units: mg/Kg-dry	Prep Date: 10/23/2003	Run ID: GC-M_031027A
Client ID: ZZZZZ	Batch ID: 9818	TestNo: NWTPH-Dx		Analysis Date: 10/27/2003	SeqNo: 221322

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	1988	16.2	0	0	0	0	0	2575	25.7	20	R
Lube Oil	ND	53.9	0	0	0	0	0	0	0	20	

Sample ID 0310149-01ADUP	SampType: DUP	TestCode: NWTPHDX_S	Units: mg/Kg-dry	Prep Date: 10/23/2003	Run ID: GC-M_031028E
Client ID: LW25d (28-29)	Batch ID: 9818	TestNo: NWTPH-Dx		Analysis Date: 10/28/2003	SeqNo: 221702

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020043

CLIENT: Time Oil Co.
Work Order: 0310149
Project: NW Terminal Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHDX_S

Sample ID 0310149-01ADUP	SampType: DUP	TestCode: NWTPHDX_S	Units: mg/Kg-dry	Prep Date: 10/23/2003	Run ID: GC-M_031028E
Client ID: LW25d (28-29)	Batch ID: 9818	TestNo: NWTPH-Dx		Analysis Date: 10/28/2003	SeqNo: 221702

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	18.7	0	0	0	0	0	0	0	20	
Lube Oil	ND	62.4	0	0	0	0	0	0	0	20	

Sample ID CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 10/23/2003	Run ID: GC-M_031027A
Client ID: ZZZZZ	Batch ID: 9818	TestNo: NWTPH-Dx		Analysis Date: 10/27/2003	SeqNo: 221313

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	595	15.0	667.2	0	89.2	85	115	0	0		
Lube Oil	152.9	50.0	169.5	0	90.1	85	115	0	0		

Sample ID CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 10/23/2003	Run ID: GC-M_031028E
Client ID: ZZZZZ	Batch ID: 9818	TestNo: NWTPH-Dx		Analysis Date: 10/28/2003	SeqNo: 221697

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	592.6	15.0	667.2	0	88.8	85	115	0	0		
Lube OI	256.9	50.0	250.6	0	103	85	115	0	0		

Sample ID CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 10/23/2003	Run ID: GC-M_031028E
Client ID: ZZZZZ	Batch ID: 9818	TestNo: NWTPH-Dx		Analysis Date: 10/28/2003	SeqNo: 221698

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	144.3	15.0	166.8	0	86.5	85	115	0	0		
Lube Oil	166.3	50.0	169.5	0	98.1	85	115	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

BZTO104(e)020044

CLIENT: Time Oil Co.
Work Order: 0310149
Project: NW Terminal Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHGX_S

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHGX_S	Units: mg/Kg	Prep Date: 10/23/2003	Run ID: GC-I_031024B
Client ID: ZZZZZ	Batch ID: 9834	TestNo: NWTPH-Gx		Analysis Date: 10/24/2003	SeqNo: 221012

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	2.50									
Surr: 4-Bromofluorobenzene	86	1.00	100	0	86	50	150	0	0		

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHGX_S	Units: mg/Kg	Prep Date:	Run ID: GC-I_031023B
Client ID: ZZZZZ	Batch ID: 9834	TestNo: NWTPH-Gx		Analysis Date: 10/23/2003	SeqNo: 221025

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	2.50									
Surr: 4-Bromofluorobenzene	85.2	1.00	100	0	85.2	50	150	0	0		

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHGX_S	Units: mg/Kg	Prep Date: 10/23/2003	Run ID: GC-I_031027B
Client ID: ZZZZZ	Batch ID: 9834	TestNo: NWTPH-Gx		Analysis Date: 10/27/2003	SeqNo: 221192

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	2.50									
Surr: 4-Bromofluorobenzene	85.2	1.00	100	0	85.2	50	150	0	0		

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHGX_S	Units: mg/Kg	Prep Date: 10/23/2003	Run ID: GC-I_031028C
Client ID: ZZZZZ	Batch ID: 9834	TestNo: NWTPH-Gx		Analysis Date: 10/28/2003	SeqNo: 221472

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	2.50									
Surr: 4-Bromofluorobenzene	72.1	1.00	100	0	72.1	50	150	0	0		

Sample ID LCS	SampType: LCS	TestCode: NWTPHGX_S	Units: mg/Kg	Prep Date:	Run ID: GC-I_031023B
Client ID: ZZZZZ	Batch ID: 9834	TestNo: NWTPH-Gx		Analysis Date: 10/23/2003	SeqNo: 221026

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	25.9	2.50	30	0	86.3	53.5	101	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

BZTO104(e)020045

CLIENT: Time Oil Co.
Work Order: 0310149
Project: NW Terminal Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHGX_S

Sample ID	0310151-01ADUP	SampType:	DUP	TestCode:	NWTPHGX_S	Units:	mg/Kg-dry	Prep Date:		Run ID:	GC-I_031024B	
Client ID:	ZZZZZ	Batch ID:	9834	TestNo:	NWTPH-Gx			Analysis Date:	10/24/2003	SeqNo:	221024	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Gasoline	500.6	27.0	0	0	0	0	0	555.7	10.4	20		

Sample ID	0310148-01ADUP	SampType:	DUP	TestCode:	NWTPHGX_S	Units:	mg/Kg	Prep Date:	10/23/2003	Run ID:	GC-I_031027B	
Client ID:	ZZZZZ	Batch ID:	9834	TestNo:	NWTPH-Gx			Analysis Date:	10/27/2003	SeqNo:	221197	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Gasoline	ND	2.50	0	0	0	0	0	0	0	20		

Sample ID	CCV	SampType:	CCV	TestCode:	NWTPHGX_S	Units:	mg/Kg	Prep Date:	10/23/2003	Run ID:	GC-I_031024B	
Client ID:	ZZZZZ	Batch ID:	9834	TestNo:	NWTPH-Gx			Analysis Date:	10/24/2003	SeqNo:	221013	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Gasoline	2009	2.50	2000	0	100	80	120	0	0			

Sample ID	CCV	SampType:	CCV	TestCode:	NWTPHGX_S	Units:	mg/Kg	Prep Date:		Run ID:	GC-I_031023B	
Client ID:	ZZZZZ	Batch ID:	9834	TestNo:	NWTPH-Gx			Analysis Date:	10/23/2003	SeqNo:	221027	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Gasoline	2248	2.50	2500	0	89.9	80	120	0	0			

Sample ID	CCV	SampType:	CCV	TestCode:	NWTPHGX_S	Units:	mg/Kg	Prep Date:	10/23/2003	Run ID:	GC-I_031027B	
Client ID:	ZZZZZ	Batch ID:	9834	TestNo:	NWTPH-Gx			Analysis Date:	10/27/2003	SeqNo:	221193	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Gasoline	1419	2.50	1500	0	94.6	80	120	0	0			

Sample ID	CCV	SampType:	CCV	TestCode:	NWTPHGX_S	Units:	mg/Kg	Prep Date:	10/23/2003	Run ID:	GC-I_031027B	
Client ID:	ZZZZZ	Batch ID:	9834	TestNo:	NWTPH-Gx			Analysis Date:	10/27/2003	SeqNo:	221198	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

BZTO104(e)020046

CLIENT: Time Oil Co.
Work Order: 0310149
Project: NW Terminal Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHGX_S

Sample ID	CCV	SampType:	CCV	TestCode:	NWTPHGX_S	Units:	mg/Kg	Prep Date:	10/23/2003	Run ID:	GC-I_031027B
Client ID:	ZZZZZ	Batch ID:	9834	TestNo:	NWTPH-Gx			Analysis Date:	10/27/2003	SeqNo:	221198

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	2196	2.50	2500	0	87.9	80	120	0	0		

Sample ID	CCV	SampType:	CCV	TestCode:	NWTPHGX_S	Units:	mg/Kg	Prep Date:	10/23/2003	Run ID:	GC-I_031028C
Client ID:	ZZZZZ	Batch ID:	9834	TestNo:	NWTPH-Gx			Analysis Date:	10/28/2003	SeqNo:	221473

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	850.6	2.50	1000	0	85.1	80	120	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020047

CLIENT: Time Oil Co.
Work Order: 0310149
Project: NW Terminal Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: PAHLL_S

Sample ID MB-9838	SampType: MBLK	TestCode: PAHLL_S	Units: µg/Kg	Prep Date: 10/24/2003	Run ID: 5973G_031027B
Client ID: ZZZZZ	Batch ID: 9838	TestNo: 8270SIM		Analysis Date: 10/27/2003	SeqNo: 221154

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	6.67									
Acenaphthylene	ND	6.67									
Anthracene	ND	6.67									
Benz(a)anthracene	ND	6.67									
Benzo(a)pyrene	ND	6.67									
Benzo(b)fluoranthene	ND	6.67									
Benzo(g,h,i)perylene	ND	6.67									
Benzo(k)fluoranthene	ND	6.67									
Chrysene	ND	6.67									
Dibenz(a,h)anthracene	ND	6.67									
Fluoranthene	ND	6.67									
Fluorene	ND	6.67									
Indeno(1,2,3-cd)pyrene	ND	6.67									
Naphthalene	6	6.67									J
Phenanthrene	ND	6.67									
Pyrene	ND	6.67									
Surr: 2-Fluorobiphenyl	7057	0	6667	0	106	42.6	128	0	0		
Surr: Nitrobenzene-d5	6721	0	6667	0	101	21.7	155	0	0		
Surr: p-Terphenyl-d14	6579	0	6667	0	98.7	44.9	155	0	0		

Sample ID LCS-9838	SampType: LCS	TestCode: PAHLL_S	Units: µg/Kg	Prep Date: 10/24/2003	Run ID: 5973G_031027B
Client ID: ZZZZZ	Batch ID: 9838	TestNo: 8270SIM		Analysis Date: 10/27/2003	SeqNo: 221155

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	104.7	6.67	166.7	0	62.8	40.4	107	0	0		
Benzo(g,h,i)perylene	134.7	6.67	166.7	0	80.8	44.6	125	0	0		
Chrysene	135.3	6.67	166.7	0	81.2	59.9	121	0	0		
Naphthalene	100.7	6.67	166.7	6	56.8	33.5	96.1	0	0		
Phenanthrene	115.3	6.67	166.7	0	69.2	52.2	108	0	0		
Pyrene	130.7	6.67	166.7	0	78.4	53.8	120	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

BZTO104(e)020048

CLIENT: Time Oil Co.
Work Order: 0310149
Project: NW Terminal Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: PAHLL_S

Sample ID 0310149-01BMS	SampType: MS	TestCode: PAHLL_S	Units: µg/Kg	Prep Date: 10/24/2003	Run ID: 5973G_031027B
Client ID: LW25d (28-29)	Batch ID: 9838	TestNo: 8270SIM		Analysis Date: 10/27/2003	SeqNo: 221159

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	60.67	6.67	166.7	0	36.4	33.7	107	0	0		
Benzo(g,h,i)perylene	114.7	6.67	166.7	43.33	42.8	15	128	0	0		
Chrysene	116	6.67	166.7	118	-1.2	37.5	125	0	0		S
Naphthalene	57.33	6.67	166.7	4	32	27.7	108	0	0		
Phenanthrene	84.67	6.67	166.7	136	-30.8	20.2	139	0	0		S
Pyrene	112.7	6.67	166.7	233.3	-72.4	26.8	134	0	0		S

Sample ID 0310149-01BMSD	SampType: MSD	TestCode: PAHLL_S	Units: µg/Kg	Prep Date: 10/24/2003	Run ID: 5973G_031027B
Client ID: LW25d (28-29)	Batch ID: 9838	TestNo: 8270SIM		Analysis Date: 10/27/2003	SeqNo: 221160

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	64.67	6.67	166.7	0	38.8	33.7	107	60.67	6.38	20	
Benzo(g,h,i)perylene	132.7	6.67	166.7	43.33	53.6	15	128	114.7	14.6	20	
Chrysene	157.3	6.67	166.7	118	23.6	37.5	125	116	30.2	20	SR
Naphthalene	74	6.67	166.7	4	42	27.7	108	57.33	25.4	20	R
Phenanthrene	106.7	6.67	166.7	136	-17.6	20.2	139	84.67	23.0	20	SR
Pyrene	164	6.67	166.7	233.3	-41.6	26.8	134	112.7	37.1	20	SR

Sample ID CCV-9838	SampType: CCV	TestCode: PAHLL_S	Units: µg/Kg	Prep Date:	Run ID: 5973G_031027B
Client ID: ZZZZZ	Batch ID: 9838	TestNo: 8270SIM		Analysis Date: 10/27/2003	SeqNo: 221153

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	156	6.67	166.7	0	93.6	70	130	0	0		
Acenaphthylene	178	6.67	166.7	0	107	70	130	0	0		
Anthracene	199.3	6.67	166.7	0	120	70	130	0	0		
Benz(a)anthracene	168	6.67	166.7	0	101	70	130	0	0		
Benzo(a)pyrene	192.7	6.67	166.7	0	116	70	130	0	0		
Benzo(b)fluoranthene	179.3	6.67	166.7	0	108	70	130	0	0		
Benzo(g,h,i)perylene	189.3	6.67	166.7	0	114	70	130	0	0		
Benzo(k)fluoranthene	183.3	6.67	166.7	0	110	70	130	0	0		
Chrysene	174.7	6.67	166.7	0	105	70	130	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020049

CLIENT: Time Oil Co.
Work Order: 0310149
Project: NW Terminal Well Install / 231009.31

ANALYTICAL QC SUMMARY REPORT

TestCode: PAHLL_S

Sample ID CCV-9838	SampType: CCV	TestCode: PAHLL_S	Units: µg/Kg	Prep Date:	Run ID: 5973G_031027B
Client ID: ZZZZZ	Batch ID: 9838	TestNo: 8270SIM		Analysis Date: 10/27/2003	SeqNo: 221153

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dibenz(a,h)anthracene	185.3	6.67	166.7	0	111	70	130	0	0		
Fluoranthene	172.7	6.67	166.7	0	104	70	130	0	0		
Fluorene	169.3	6.67	166.7	0	102	70	130	0	0		
Indeno(1,2,3-cd)pyrene	192	6.67	166.7	0	115	70	130	0	0		
Naphthalene	154	6.67	166.7	0	92.4	70	130	0	0		
Phenanthrene	163.3	6.67	166.7	0	98	70	130	0	0		
Pyrene	171.3	6.67	166.7	0	103	70	130	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

BZTO104(e)020050

APPENDIX G

Laboratory Data Packets

APPENDIX H

Electronic Cumulative Detected Groundwater Data

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2
4			S177C		T176O		U235I		V224S		W371J		Y336B		Z225N		Z960F		AH49A		AU36B		BC27M		BH96P		BR55J
5			4/1/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/21/99		12/8/99		2/16/00		5/23/00
7	1	**CHLORINATED PHENOLS (µg/L)**																									
8	2	**EPA Method SW8040**																									
9	3	Pentachlorophenol	0.25	U	**0.17**	J1	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
16	10																										
17	11	**SEMIVOLATILES (µg/L)**																									
18	12	**EPA Method SW8270**																									
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.0**		1.0	U	**0.6**	J1	1.0	U	1.0
33	27																										
34	28	**VOLATILES (µg/L)**																									
35	29	**EPA Method SW8260**																									
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**5.6**		5.0	U	5.0	U	5.0	U	5.0	U	5.0
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56	49																										
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																									
58	51	**Method OR-DEQ**																									
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.48**		0.25	U	0.25	U	**0.36**		**0.28**
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62	55																										
63	56	**PRIORITY POLLUTANT**																									
64	57	**METALS (mg/L)**																									
65	58	Arsenic (7060)	**0.008**		**0.008**		0.05	U	0.05	U	**0.014**		**0.022**		**0.010**		**0.026**		**0.010**		**0.012**		**0.012**		**0.017**		**0.012**

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2	
4			CB68B		CL03J		CT67G		DE68K		DM30N		DW37C		ED23B		EM75K		ES04H		EY88D		FF88P		FL41G		FU50D	
5			8/29/00		11/10/00		2/15/01		6/5/01		8/14/01		11/28/01		2/26/02		6/25/02		08/28/02		11/11/02		2/13/03		5/7/03		8/29/03	
7	**CHLORINATED PHENOLS (µg/L)**																											
8	**EPA Method SW8040**																											
9	Pentachlorophenol	UJ	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.27	U	0.25	U	0.26	U	0.25	U	0.5	U
10	2,4,6-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																												
17	**SEMIVOLATILES (µg/L)**																											
18	**EPA Method SW8270**																											
19	Phenol	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.1	U	2.2	U	2	U	2	U	2	U
20	4-Methylphenol	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U
21	Isophorone	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U
22	2,4-Dimethylphenol	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.2	U	3.3	U	3.1	U	3	U	3	U
23	Benzoic Acid	U	10	U	10	U	10	U	10	U	10	U	50	U	50	U	50	U	53	U	56	U	51	U	50	U	50	U
24	Naphthalene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U
25	2-Methylnaphthalene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U
26	2,4,6-Trichlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5.6	U	5.1	U	5	U	5	U
27	2,4,5-Trichlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5.6	U	5.1	U	5	U	5	U
28	Acenaphthene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U
29	Dibenzofuran	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U
30	Fluorene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U
31	Pentachlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5.6	U	5.1	U	5	U	5	U
32	bis(2-Ethylhexyl)phthalate	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	4.0	U	4.0	U	4.0	U	4.3	U	4.4	U	1	U	1	U	**6.1**	
33																												
34	**VOLATILES (µg/L)**																											
35	**EPA Method SW8260**																											
36	Acetone	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**7.2**		5.0	U	5.0	U	5	U	5	U	5	U	**12**		5	U
37	Carbon Disulfide	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U
39	Benzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
40	Bromoform	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
42	Ethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
43	Styrene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
45	o-Xylene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
49	n-Propylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
50	tert-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
52	4-Isopropyltoluene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
54	Naphthalene	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																												
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																											
58	**Method OR-DEQ**																											
59	**TPH-Diesel**		0.25	U	0.25	U	0.25	U	NA		NA		NA		0.25	U	NA		NA		NA		0.25	U	NA		NA	
60	**TPH-D Motor Oil**		NA		0.50	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																												
63	**PRIORITY POLLUTANT**																											
64	**METALS (mg/L)**																											
65	Arsenic (7060)		**0.015**		**0.006**		**0.006**		**0.005**		**0.010**		**0.009**		**0.011**		**0.010**		**0.013**		0.05	U	**0.027**		**0.048**		**0.01**	

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD
1			
2			
3		B2	
4		FY64E	
5		10/20/03	
6			
7	**CHLORINATED PHENOLS (µg/L)**		
8	**EPA Method SW8040**		
9	Pentachlorophenol	0.5	U
10	2,4,6-Trichlorophenol	NA	
11	2,3,6-Trichlorophenol	NA	
12	2,4,5-Trichlorophenol	NA	
13	2,3,4-Trichlorophenol	NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	2,3,4,5-Tetrachlorophenol	NA	
16			
17	**SEMIVOLATILES (µg/L)**		
18	**EPA Method SW8270**		
19	Phenol	2	U
20	4-Methylphenol	1	U
21	Isophorone	1	U
22	2,4-Dimethylphenol	3	U
23	Benzoic Acid	10	U
24	Naphthalene	1	U
25	2-Methylnaphthalene	1	U
26	2,4,6-Trichlorophenol	5	U
27	2,4,5-Trichlorophenol	5	U
28	Acenaphthene	1	U
29	Dibenzofuran	1	U
30	Fluorene	1	U
31	Pentachlorophenol	5	U
32	bis(2-Ethylhexyl)phthalate	1	U
33			
34	**VOLATILES (µg/L)**		
35	**EPA Method SW8260**		
36	Acetone	5	U
37	Carbon Disulfide	1	U
38	2-Butanone	5	U
39	Benzene	1	U
40	Bromoform	1	U
41	Toluene	1	U
42	Ethylbenzene	1	U
43	Styrene	1	U
44	m,p-Xylene	1	U
45	o-Xylene	1	U
46	1,3,5-Trimethylbenzene	1	U
47	1,2,4-Trimethylbenzene	1	U
48	Isopropylbenzene	1	U
49	n-Propylbenzene	1	U
50	tert-Butylbenzene	1	U
51	sec-Butylbenzene	1	U
52	4-Isopropyltoluene	1	U
53	n-Butylbenzene	1	U
54	Naphthalene	5	U
55	Methyl tert-butyl ether	NA	
56			
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	**Method OR-DEQ**		
59	**TPH-Diesel**	NA	
60	**TPH-D Motor Oil**	NA	
61	**TPH-Gasoline**	NA	
62			
63	**PRIORITY POLLUTANT**		
64	**METALS (mg/L)**		
65	Arsenic (7060)	**0.002**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2
4			S177C		T176O		U235I		V224S		W371J		Y336B		Z225N		Z960F		AH49A		AU36B		BC27M		BH96P		BR55J
5			4/1/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/21/99		12/8/99		2/16/00		5/23/00
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005
67	60	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002
68	61	Lead (7421)	0.001	U	0.001	U	0.02	U	0.02	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01
70	63	Zinc (6010)	0.004	U	0.004	U	**0.013**		0.004	U	0.004	U	**0.005**		0.004	U	**0.007**	J	**0.006**		**0.005**		0.006	U	**0.007**		**0.011**
71	64																										
72	65	**MAJOR IONS AND CONVENTIONALS**																									
73	66	Calcium (mg/L) (6010)	**66.1**		**65.6**		**40.1**		**41.8**		NA		NA		NA		**38.8**		NA		NA		NA		NA		NA
74	67	Magnesium (mg/L) (6010)	**45.2**		**47**		**14.4**		**13.5**		NA		NA		NA		**11.9**		NA		NA		NA		NA		NA
75	68	Potassium (mg/L) (6010)	**2.0**		**1.9**		**4.7**		**4.5**		NA		NA		NA		**4.5**		NA		NA		NA		NA		NA
76	69	Sodium (mg/L) (6010)	**18.8**		**19.6**		**11.5**		**9.59**		NA		NA		NA		**9.03**		NA		NA		NA		NA		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**370**		**380**	J2	**38**		**190**		NA		NA		NA		**170**		NA		NA		NA		NA		NA
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		NA		NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**370**		**380**	J2	**38**		**190**		NA		NA		NA		**170**		NA		NA		NA		NA		NA
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**420**	J2	**210**		**190**		**180**		**200**		**230**		**180**		**170**		**210**		**160**		**180**		**190**
81	74	Chloride (mg/L) (EPA 325.2)	**7.6**		**9.1**		**2.6**		**1.9**		**3.4**		**1.6**		**2.7**		**1.0**		**3.9**		**2.7**		**3.9**		**3.6**		**2.8**
82	75	N-Nitrate (mg-N/L) (Calculated)	0.010	U	0.010	U	**0.027**		**0.018**	J2	NA		NA		NA		**0.012**		NA		NA		NA		NA		NA
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	0.02	J	**0.028**	J2	**0.32**		0.010	UJ	NA		NA		NA		**0.019**		NA		NA		NA		NA		NA
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.019**		0.010	U	**0.35**		**0.018**	J2	NA		NA		NA		**0.031**		NA		NA		NA		NA		NA
85	78	Sulfate (mg/L) (EPA 375.2)	2.5	U	2.5	U	2.5	U	2.5	U	NA		NA		NA		**3.8**		NA		NA		NA		NA		NA
86	79																										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2	
4			CB68B		CL03J		CT67G		DE68K		DM30N		DW37C		ED23B		EM75K		ES04H		EY88D		FF88P		FL41G		FU50D	
5			8/29/00		11/10/00		2/15/01		6/5/01		8/14/01		11/28/01		2/26/02		6/25/02		08/28/02		11/11/02		2/13/03		5/7/03		8/29/03	
66	Chromium (6010)	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U
68	Lead (7421)	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.02	U	0.001	U	0.001	U	0.001	U
69	Nickel (6010)	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)		**0.011**		0.006	U	0.006	U	**0.009**		0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	**0.01**		**0.016**	J	0.006	U
72	**MAJOR IONS AND CONVENTIONALS**																											
73	Calcium (mg/L) (6010)		NA		NA		**43.6**		**48.0**		**42.0**		**56.4**	J	**43.3**		NA		NA		NA		**46.7**		NA		NA	
74	Magnesium (mg/L) (6010)		NA		NA		**19.4**		**23.8**		**18.3**		**32.6**	J	**14.5**		NA		NA		NA		**20.5**		NA		NA	
75	Potassium (mg/L) (6010)		NA		NA		**3.4**		**3.4**		**3.9**		**2.4**		**5.2**		NA		NA		NA		**3.9**		NA		NA	
76	Sodium (mg/L) (6010)		NA		NA		**11.0**		**12.1**		**11.4**		**15.0**		**9.84**		NA		NA		NA		**11.3**		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		NA		**200**		NA		NA		NA		**240**		NA		NA		NA		**270**		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		1.0	U	NA		NA		NA		**1.0**	U	NA		NA		NA		1	U	NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		**200**		NA		NA		NA		**240**		NA		NA		NA		**270**		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**220**		**240**		**260**		**260**		**270**		**280**		**240**		**190**		**210**		**360**		**250**		**220**		**240**	
81	Chloride (mg/L) (EPA 325.2)		**2.5**		**3.2**		**3.9**	J	**3.2**		**6.1**		**3.9**		**3.3**		**5.1**		**5.2**		**4.3**		**5.9**		**3.5**		**2.9**	
82	N-Nitrate (mg-N/L) (Calculated)		NA		NA		**0.81**		NA		NA		NA		**0.73**		NA		NA		NA		**0.2**		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		NA		0.010	J	NA		NA		NA		**0.021**		NA		NA		NA		**0.023**		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		NA		**0.81**		NA		NA		NA		**0.75**	J	NA		NA		NA		**0.22**		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		NA		**4.1**		NA		NA		NA		**2.6**		NA		NA		NA		**3**		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD
1			
2			
3		B2	
4		FY64E	
5		10/20/03	
66	Chromium (6010)	0.005	U
67	Copper (6010)	0.002	U
68	Lead (7421)	0.001	U
69	Nickel (6010)	0.01	U
70	Zinc (6010)	0.006	U
71			
72	**MAJOR IONS AND CONVENTIONALS**		
73	Calcium (mg/L) (6010)	NA	
74	Magnesium (mg/L) (6010)	NA	
75	Potassium (mg/L) (6010)	NA	
76	Sodium (mg/L) (6010)	NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**250**	
81	Chloride (mg/L) (EPA 325.2)	**3.1**	
82	N-Nitrate (mg-N/L) (Calculated)	NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	Sulfate (mg/L) (EPA 375.2)	NA	
86			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2
4			S177C		T176O		U235I		V224S		W371J		Y336B		Z225N		Z960F		AH49A		AU36B		BC27M		BH96P		BR55J
5			4/1/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/21/99		12/8/99		2/16/00		5/23/00
87	80	**FIELD PARAMETERS**																									
88	81	pH (avg)	6.75		6.73		7.28		6.96		6.61		6.43		6.48		7.16		6.27		6.61		6.88		6.70		6.51
89	82	Temperature (° C) (avg)	13.4		16.3		13.9		14.4		13.0		15.5		12.9		13.3		14.1		15.0		12.6		13.4		16.1
90	83	Conductivity (um/hos)	769		675		297		385		494		643		234		357		253		285		305		653		665
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		1.44		1.50		3.24		3.13		1.53		2.93		1.98		1.09		0.67
92	85																										
93	86	**DIOXINS AND FURANS (ng/L)**																									
94	87	**Method 8290**																									
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120	113																										
121																											
122																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2																												
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2	
4			CB68B		CL03J		CT67G		DE68K		DM30N		DW37C		ED23B		EM75K		ES04H		EY88D		FF88P		FL41G		FU50D	
5			8/29/00		11/10/00		2/15/01		6/5/01		8/14/01		11/28/01		2/26/02		6/25/02		08/28/02		11/11/02		2/13/03		5/7/03		8/29/03	
87	**FIELD PARAMETERS**																											
88	pH (avg)		7.00		5.53		6.97		6.80		6.96		6.71		6.90		7.01		7.21		6.8		7.06		7.25		6.96	
89	Temperature (° C) (avg)		15.6		13.3		13.5		14.0		16.3		12.8		13.1		15.3		15.9		14.1		14.4		15.2		14.9	
90	Conductivity (um/hos)		346		319		315		611		608		384		362		272		272		595		598		319		340	
91	Dissolved oxygen (mg/L) (avg)		1.16		2.17		1.81		1.59		1.98		4.27		7.72		4.80		1.09		2.52		0		4.22		1.75	
92																												
93	**DIOXINS AND FURANS (ng/L)**																											
94	**Method 8290**																											
95	2,3,7,8-TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD
1			
2			
3		B2	
4		FY64E	
5		10/20/03	
87	**FIELD PARAMETERS**		
88	pH (avg)	6.71	
89	Temperature (° C) (avg)	14.9	
90	Conductivity (um/hos)	560	
91	Dissolved oxygen (mg/L) (avg)	0.56	
92			
93	**DIOXINS AND FURANS (ng/L)**		
94	**Method 8290**		
95	2,3,7,8-TCDF	NA	
96	Total TCDF	NA	
97	2,3,7,8-TCDD	NA	
98	Total TCDD	NA	
99	1,2,3,7,8-PeCDF	NA	
100	2,3,4,7,8-PeCDF	NA	
101	Total PeCDF	NA	
102	1,2,3,7,8-PeCDD	NA	
103	Total PeCDD	NA	
104	1,2,3,4,7,8-HxCDF	NA	
105	1,2,3,6,7,8-HxCDF	NA	
106	2,3,4,6,7,8-HxCDF	NA	
107	1,2,3,7,8,9-HxCDF	NA	
108	Total HxCDF	NA	
109	1,2,3,4,7,8-HxCDD	NA	
110	1,2,3,6,7,8-HxCDD	NA	
111	1,2,3,7,8,9-HxCDD	NA	
112	Total HxCDD	NA	
113	1,2,3,4,6,7,8-HpCDF	NA	
114	1,2,3,4,7,8,9-HpCDF	NA	
115	Total HpCDF	NA	
116	1,2,3,4,6,7,8-HpCDD	NA	
117	Total HpCDD	NA	
118	OCDF	NA	
119	OCDD	NA	
120			
121			
122			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2
4			S177C		T176O		U235I		V224S		W371J		Y336B		Z225N		Z960F		AH49A		AU36B		BC27M		BH96P		BR55J
5			4/1/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/21/99		12/8/99		2/16/00		5/23/00
123	114	**PAHs (µg/L)**																									
124	115	**EPA Method SW8270 SIM**																									
125	116	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126	117	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127	118	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128	119	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129	120	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130	121	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131	122	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2																												
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2	
4			CB68B		CL03J		CT67G		DE68K		DM30N		DW37C		ED23B		EM75K		ES04H		EY88D		FF88P		FL41G		FU50D	
5			8/29/00		11/10/00		2/15/01		6/5/01		8/14/01		11/28/01		2/26/02		6/25/02		08/28/02		11/11/02		2/13/03		5/7/03		8/29/03	
123	**PAHs (µg/L)**																											
124	**EPA Method SW8270 SIM**																											
125	Naphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD
1			
2			
3		B2	
4		FY64E	
5		10/20/03	
123	**PAHs (µg/L)**		
124	**EPA Method SW8270 SIM**		
125	Naphthalene	NA	
126	2-Methylnaphthalene	NA	
127	Acenaphthylene	NA	
128	Acenaphthene	NA	
129	Fluorene	NA	
130	Anthracene	NA	
131	Dibenzofuran	NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
2									Dup of G1A				Dup of G1A													
3			G1A		G1A		G1A		G1B		G1A		S		G1A		G1A		G1A		G1A		G1A		G1A	
4			S177E		T176H		U258C		U258A		V224T		V224L		W391G		Y313D		Z225C		Z960O		AH27J		AU45F	
5			4/2/97		7/15/97		10/23/97		10/23/97		1/29/98		1/29/98		5/20/98		8/17/98		11/13/98		2/17/99		5/17/99		9/22/99	
7	1	**CHLORINATED PHENOLS (µg/L)**																								
8	2	**EPA Method SW8040**																								
9	3	Pentachlorophenol	**66**		**170**		**25**		**21**		**99**		**96**		**0.16**	J1	**0.37**		0.25	U	**0.28**		0.25	U	0.25	U
10	4	2,4,6-Trichlorophenol	**0.25**		**5.1**		**0.58**		**0.59**		**1.8**	J2	**1.3**	J2	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
11	5	2,3,6-Trichlorophenol	**0.40**		0.91	U	0.25	U	0.25	U	**0.26**		**0.20**	J1	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
12	6	2,4,5-Trichlorophenol	0.49	U	1.7	U	0.35	U	1.0	U	**1.1**		**0.86**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**3.4**		**21**		**2.5**		**2.3**		**5.4**		**5.1**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
15	9	2,3,4,5-Tetrachlorophenol	**0.49**		**3.6**		**0.50**		**0.49**		**0.50**		**0.41**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
16	10																									
17	11	**SEMIVOLATILES (µg/L)**																								
18	12	**EPA Method SW8270**																								
19	13	Phenol	2.0	U	**7.5**		3.4	U	2.5	U	2.0	U	2.0	U	**2.3**		**6.0**		2.0	U	2.0	U	**3.2**		**10**	
20	14	4-Methylphenol	1.0	U	**2.2**		1.7	U	1.2	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**15**		1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.7	U	1.2	U	**1.2**		**1.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	5.2	U	3.8	U	3.0	U	**3.3**		**11**	J2	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	17	U	12	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	**16**	
24	18	Naphthalene	**9.7**		**14**		**11**		**11**		30	J2	**23**	J2	**8.4**	J2	**9.0**		**1.6**		**2.4**		**15**		**6.4**	
25	19	2-Methylnaphthalene	**29**		**37**		**33**		**35**		**44**	J2	**30**	J2	**19**	J2	**25**		**7.2**		**14**		**23**		**16**	
26	20	2,4,6-Trichlorophenol	5.0	U	**9.6**		8.6	U	6.2	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	**5.6**		8.6	U	6.2	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.7	U	1.2	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.7	U	1.2	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.7	U	1.2	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	**65**		**180**		**34**		**37**		**4.3**	J1	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.7	U	**2.1**		1.0	U	**1.8**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
33	27																									
34	28	**VOLATILES (µg/L)**																								
35	29	**EPA Method SW8260**																								
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**6.8**		5.0	U	5.0	U	5.0	U	**14**		**16**	M
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	150	J	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**36**		**22**	
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**2.7**	
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	**1.2**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.3**		1.0	U
42	36	Ethylbenzene	31		**49**		**74**	J2	**59**	J2	**28**		**32**		**34**		**42**		**3.1**		1.0	U	**81**		**7.4**	
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	**51**		**74**		**160**	J2	**120**	J2	**74**		**89**		**74**		**93**		**5.7**		**2.0**		**120**		**24**	
45	39	o-Xylene	**3.4**		**5.2**		**10**		**8.3**		**4.1**		**4.1**		1.0	U	**2.5**		1.0	U	1.0	U	**5.6**		1.0	U
46	40	1,3,5-Trimethylbenzene	**36**		**58**		**120**	J2	**85**	J2	**59**		**60**		**38**		**52**		**3.2**		**4.2**		**35**		**20**	
47	41	1,2,4-Trimethylbenzene	**130**		**150**		**350**	J2	**250**	J2	140		**160**		**120**		**99**		**8.8**		**9.9**		**110**		**57**	
48	42	Isopropylbenzene	**180**		**200**		**310**	J2	**240**	J2	**130**		**140**		**200**	E	**180**		**170**		**170**		**190**		**96**	
49	43	n-Propylbenzene	**200**		**220**		**340**	J2	**270**	J2	**140**		**160**		**210**	E	**180**		**170**		**160**		**220**		**93**	
50	44	tert-Butylbenzene	**3.6**		**5.1**	J2	**6.9**		**5.7**		**3.6**		**4.0**		**5.3**	M	**6.9**		**4.6**		**4.1**		**3.9**		**3.7**	
51	45	sec-Butylbenzene	**18**		**25**		**33**		**27**		**14**		**17**		**24**		**30**	J2	**23**		**18**		**20**		**19**	
52	46	4-Isopropyltoluene	**2.8**		**3.6**		**9.2**	J2	**6.2**	J2	**4.8**		**5.6**		**4.0**		**6.5**		1.0	U	1.0	U	**2.9**		**1.3**	
53	47	n-Butylbenzene	**14**	M	**19**		**26**		**22**		**12**		**14**		**19**		**23**		**15**		**11**		**15**		14	U
54	48	Naphthalene	**20**		**32**		**73**	J2	**50**	J2	**22**		**78**		**36**		**41**		**5.2**		**5.3**		**28**		**18**	
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	51	**Method OR-DEQ**																								
59	52	**TPH-Diesel**	**4.0**		**3.9**		**3.5**		**3.6**		**3.3**		**3.5**		**3.0**		**2.6**		**2.7**		**2.5**		**2.6**		**2.6**	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																									
63	56	**PRIORITY POLLUTANT**																								
64	57	**METALS (mg/L)**																								
65	58	Arsenic (7060)	**0.031**		**0.034**		0.05	U	0.05	U	0.05	U	0.05	U	**0.039**		**0.039**		**0.10**		**0.041**		**0.032**		**0.040**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
3		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4		BC27E		BH96J		BR64I		CB85G		CL03E		CT55A		DE87L		DM30A		DW37F		ED23I		EM85J		ER93D		EZ03D	
5		12/7/99		2/17/00		5/24/00		8/30/00		11/8/00		2/13/01		6/6/01		8/13/01		11/28/01		2/26/02		6/26/02		08/26/02		11/12/02	
7	**CHLORINATED PHENOLS (µg/L)**																										
8	**EPA Method SW8040**																										
9	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.26	U	0.25	U
10	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA	
16																											
17	**SEMIVOLATILES (µg/L)**																										
18	**EPA Method SW8270**																										
19	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.1	U	2.2	U
20	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1.1	U
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1.1	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.1	U	3.3	U
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	50	U	50	U	50	U	52	U	54	U
24	Naphthalene	**3.0**		**6.7**		**3.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1.1	U
25	2-Methylnaphthalene	**12**		**24**		**14**		**7.7**		**4.1**		**1.6**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1.1	U
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.2	U	5.4	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.2	U	5.4	U
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1.1	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1.1	U
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1.1	U
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.2	U	5.4	U
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	**1.7**		1.0	U	1.0	U	1.0	U	1.0	U	4.0	U	4.0	U	4.0	U	4.2	U	4.3	U
33																											
34	**VOLATILES (µg/L)**																										
35	**EPA Method SW8260**																										
36	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U		R	5.0	U	**5.6**		5.0	U	5.0	U	**7.8**		5	U	5	U
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
38	2-Butanone	5.0	U	5.0	U	**9.0**		21	U	**21**		5.0	U	**6.2**		**13**		**6.4**		**7.5**		5.0	U	**11**	M	5	U
39	Benzene	1.0	U	**4.4**		**1.7**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
41	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
42	Ethylbenzene	**2.3**		1.0	U	**1.9**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.3**		1	U	1	U
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
44	m,p-Xylene	**1.5**		1.0	U	1.0	U	1.0	U	**1.0**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
45	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
46	1,3,5-Trimethylbenzene	**11**		**1.6**		**7.9**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
47	1,2,4-Trimethylbenzene	**14**		**17**		**11**		**3.8**		2.4	M	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
48	Isopropylbenzene	**66**		**140**		**95**		**100**		**140**		**120**		**150**		**130**		**200**		**140**		**170**		**140**		**150**	
49	n-Propylbenzene	**64**		**130**		**90**		**92**		**130**		**110**		**140**		**120**		**190**		**120**		**150**		**110**		**130**	
50	tert-Butylbenzene	**1.7**		**4.8**		**2.6**		**4.0**		**3.7**		**3.2**		**4.5**		**3.2**		**4.9**		**3.6**		**4.7**		**3.8**		**3.7**	
51	sec-Butylbenzene	**6.9**		**24**		**9.6**		**20**		**19**		**16**		**20**		**17**		**23**		**16**		**23**		**18**		**18**	
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**7.9**		1.0	U	1.0	U	1	U	1	U
53	n-Butylbenzene	1.0	U	**17**		**6.2**	M	**14**	M	**12**		**10**		14	U	**11**		**14**	M	**12**		**13**	M	**11**	M	**11**	M
54	Naphthalene	5.0	U	**13**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																											
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	**Method OR-DEQ**																										
59	**TPH-Diesel**	**2.3**		**2.3**		**3.2**		**2.1**		**2.2**		**3.4**		**2.3**		**3.3**		**4.5**		**4.3**		**5.0**		**4.8**		**4.4**	
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																											
63	**PRIORITY POLLUTANT**																										
64	**METALS (mg/L)**																										
65	Arsenic (7060)	**0.039**		**0.036**		**0.036**		**0.036**		**0.033**		**0.035**		**0.036**		**0.040**		**0.034**		**0.035**		**0.037**		**0.039**		0.05	U

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH
3		G1A		G1A		G1A		G1A	
4		FF76E		FL66D		FU50F		FY82N	
5		2/12/03		5/9/03		8/29/03		10/24/03	
7	**CHLORINATED PHENOLS (µg/L)**								
8	**EPA Method SW8040**								
9	Pentachlorophenol	**0.39**		0.25	U	0.51	U	0.5	U
10	2,4,6-Trichlorophenol	NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA	
16									
17	**SEMIVOLATILES (µg/L)**								
18	**EPA Method SW8270**								
19	Phenol	2.1	U	2	U	2	U	2	U
20	4-Methylphenol	1	U	1	U	1	U	1	U
21	Isophorone	1	U	1	U	1	U	1	U
22	2,4-Dimethylphenol	3.1	U	3	U	3	U	3	U
23	Benzoic Acid	52	U	50	U	51	U	10	U
24	Naphthalene	1	U	1	U	1	U	1	U
25	2-Methylnaphthalene	1	U	1	U	1	U	1	U
26	2,4,6-Trichlorophenol	5.2	U	5	U	5.1	U	5	U
27	2,4,5-Trichlorophenol	5.2	U	5	U	5.1	U	5	U
28	Acenaphthene	1	U	1	U	1	U	1	U
29	Dibenzofuran	1	U	1	U	1	U	1	U
30	Fluorene	1	U	1	U	1	U	1	U
31	Pentachlorophenol	5.2	U	5	U	5.1	U	5	U
32	bis(2-Ethylhexyl)phthalate	1	U	1	U	**2.8**		1	U
33									
34	**VOLATILES (µg/L)**								
35	**EPA Method SW8260**								
36	Acetone	5	U	**5.6**	M	**9.3**	M	**7.3**	M
37	Carbon Disulfide	1	U	1	U	1	U	1	U
38	2-Butanone	5	U	5	U	**10**	M	**6.7**	M
39	Benzene	1	U	1	U	1	U	1	U
40	Bromoform	1	U	1	U	1	U	1	U
41	Toluene	1	U	1	U	1	U	1	U
42	Ethylbenzene	1	U	1	U	1	U	1	U
43	Styrene	1	U	1	U	1	U	1	U
44	m,p-Xylene	1	U	1	U	1	U	1	U
45	o-Xylene	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U
48	Isopropylbenzene	**180**		**65**		**180**		**150**	
49	n-Propylbenzene	**150**		**49**		**160**		**130**	
50	tert-Butylbenzene	**4.7**		**2.6**		**5.1**		**3.5**	
51	sec-Butylbenzene	**22**		**7.2**		**23**		**17**	
52	4-Isopropyltoluene	1	U	1	U	1	U	1	U
53	n-Butylbenzene	**14**	M	**4.3**	M	**14**		**10**	
54	Naphthalene	5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA	
56									
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**								
58	**Method OR-DEQ**								
59	**TPH-Diesel**	**4.4**		**3.3**		**3.7**		**2.2**	
60	**TPH-D Motor Oil**	NA		NA		NA		0.5	U
61	**TPH-Gasoline**	NA		NA		NA		NA	
62									
63	**PRIORITY POLLUTANT**								
64	**METALS (mg/L)**								
65	Arsenic (7060)	**0.024**		**0.028**		**0.036**		**0.035**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2									Dup of G1A				Dup of G1A													
3			G1A		G1A		G1A		G1B		G1A		S		G1A		G1A		G1A		G1A		G1A		G1A	
4			S177E		T176H		U258C		U258A		V224T		V224L		W391G		Y313D		Z225C		Z960O		AH27J		AU45F	
5			4/2/97		7/15/97		10/23/97		10/23/97		1/29/98		1/29/98		5/20/98		8/17/98		11/13/98		2/17/99		5/17/99		9/22/99	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.008**	
67	60	Copper (6010)	0.002	U	0.002	U	**0.002**		**0.003**		**0.004**		**0.004**		0.002	U	**0.004**		**0.004**		0.002	U	0.002	U	**0.009**	
68	61	Lead (7421)	0.001	U	0.001	U	0.02	U	0.02	U	0.02	U	0.02	U	**0.001**		**0.005**		**0.002**		0.001	U	**0.003**		**0.007**	
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.02	U
70	63	Zinc (6010)	0.004	U	0.004	U	**0.024**		**0.024**		**0.008**		**0.010**		**0.005**	J2	**0.013**		**0.012**		**0.011**	J	0.009	U	**0.020**	
71	64																									
72	65	**MAJOR IONS AND CONVENTIONALS**																								
73	66	Calcium (mg/L) (6010)	**59.1**		**51**		**53.5**		**53.0**		**46.7**		**46.4**		NA		NA		NA		**55.5**		NA		NA	
74	67	Magnesium (mg/L) (6010)	**21.6**		**19.1**		**17.9**		**17.6**		**15.8**		**15.7**		NA		NA		NA		**19.5**		NA		NA	
75	68	Potassium (mg/L) (6010)	**0.8**		**0.7**		**6.8**		**7.6**		**1.5**		**1.5**		NA		NA		NA		**1.0**		NA		NA	
76	69	Sodium (mg/L) (6010)	**11.5**		**10.5**		**15.2**		**15.4**		**10.4**		**10.2**		NA		NA		NA		**11.0**		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**260**		**230**		**210**		**210**		**250**		**210**		NA		NA		NA		**240**		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**260**		**230**		**210**		**210**		**250**		**210**		NA		NA		NA		**240**		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**300**	J2	**270**		**260**		**230**		**270**		**300**		**290**		**260**		**340**		**670**		**580**	
81	74	Chloride (mg/L) (EPA 325.2)	**13**		**14**		**14**		**13**		**13**		**12**		**12**		**11**		**12**		**12**		**9.1**		**11**	
82	75	N-Nitrate (mg-N/L) (Calculated)	0.010	U	0.010	U	0.010	U	0.010	U	**0.022**	J2	**0.024**	J2	NA		NA		NA		**0.010**		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	**0.036**	J	**0.042**	J2	**0.013**		**0.019**		**0.011**	J2	0.010	UJ	NA		NA		NA		**0.015**		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.024**		0.010	U	**0.020**		**0.020**		**0.033**	J2	**0.024**	J2	NA		NA		NA		**0.025**		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	3.7		NA		NA		NA		**4.7**		NA		NA	
86	79																									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																											
3		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4		BC27E		BH96J		BR64I		CB85G		CL03E		CT55A		DE87L		DM30A		DW37F		ED23I		EM85J		ER93D		EZ03D	
5		12/7/99		2/17/00		5/24/00		8/30/00		11/8/00		2/13/01		6/6/01		8/13/01		11/28/01		2/26/02		6/26/02		08/26/02		11/12/02	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	**0.005**		0.005	U	0.005	U	0.005	U	**0.013**		**0.005**		**0.005**		0.005	U	0.005	U	**0.008**	
67	Copper (6010)	**0.003**		0.002	U	0.002	U	**0.015**		**0.004**		0.002	U	**0.003**		**0.017**		**0.005**	J	**0.005**		**0.002**		**0.004**		**0.01**	
68	Lead (7421)	**0.001**		0.001	U	**0.001**		**0.004**		**0.003**		**0.002**		**0.001**		**0.008**		**0.004**		**0.002**		0.001	U	**0.003**		0.02	U
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	**0.01**		0.01	U	0.01	U	0.01	U	**0.01**		0.01	U	0.01	U	0.01	U	0.01	U	**0.01**	
70	Zinc (6010)	0.008	U	0.006	U	0.006	U	**0.014**		**0.009**		**0.008**		**0.009**		**0.033**		**0.015**	J	**0.008**		**0.008**		**0.034**		**0.02**	
71																											
72	**MAJOR IONS AND CONVENTIONALS**																										
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		**65.6**		**60.3**		**67.9**		**56.9**	J	**62.8**		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		**21.6**		**20.2**		**24.9**		**18.7**	J	**21.1**		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		**1.8**		**3.4**		**2.4**		**3.6**		**3.2**		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		**11.2**		**12.1**		**13.5**		**13.4**		**13.0**		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		**310**		NA		NA		NA		**290**		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		**310**		NA		NA		NA		**290**		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**420**		**450**		**390**		**460**		**380**		**350**	J	**340**	J	**330**	J	**330**		**380**		**320**		**330**		**430**	
81	Chloride (mg/L) (EPA 325.2)	**9.3**		**18**		**8.4**		**6.7**		**8.2**		**8.8**		**8.2**		**10**		**3.3**		**26**		**5.1**		**5**		**4.8**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		**0.010**		NA		NA		NA		0.010	U	NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.074**		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		**0.010**		NA		NA		NA		**0.057**	J	NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		**4.7**		NA		NA		NA		**2.5**		NA		NA		NA	
86																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH
1									
2									
3		G1A		G1A		G1A		G1A	
4		FF76E		FL66D		FU50F		FY82N	
5		2/12/03		5/9/03		8/29/03		10/24/03	
66	Chromium (6010)	0.005	U	0.005	U	**0.006**		**0.01**	
67	Copper (6010)	**0.01**		0.002	U	**0.004**		**0.007**	
68	Lead (7421)	0.001	U	0.001	U	0.001	U	**0.003**	
69	Nickel (6010)	0.01	U	0.01	U	**0.05**		**0.08**	
70	Zinc (6010)	**0.013**		**0.011**		**0.009**		**0.021**	
71									
72	**MAJOR IONS AND CONVENTIONALS**								
73	Calcium (mg/L) (6010)	**61.7**		NA		NA		NA	
74	Magnesium (mg/L) (6010)	**22**		NA		NA		NA	
75	Potassium (mg/L) (6010)	**7**		NA		NA		NA	
76	Sodium (mg/L) (6010)	**17**		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	**300**		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1	U	NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**300**		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**350**		**350**		**400**		**310**	
81	Chloride (mg/L) (EPA 325.2)	**3.6**		**6**		**7.3**		**8.4**	
82	N-Nitrate (mg-N/L) (Calculated)	**0.045**		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	**0.023**		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.068**		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	2.5	U	NA		NA		NA	
86									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

2								Dup of G1A				Dup of G1A												
3			G1A		G1A		G1A		G1B		G1A		S		G1A		G1A		G1A		G1A		G1A	
4			S177E		T176H		U258C		U258A		V224T		V224L		W391G		Y313D		Z225C		Z960O		AH27J		AU45F	
5			4/2/97		7/15/97		10/23/97		10/23/97		1/29/98		1/29/98		5/20/98		8/17/98		11/13/98		2/17/99		5/17/99		9/22/99	
87	80	**FIELD PARAMETERS**																								
88	81	pH (avg)	6.77		6.67		6.82		6.82		6.73		6.70		6.43		6.50		6.30		6.87		5.75		6.67	
89	82	Temperature (° C) (avg)	14.1		16.0		14.5		14.5		14.2		14.0		13.8		15.2		12.6		13.0		15.5		17.9	
90	83	Conductivity (um/hos)	625		585		496		496		473		480		444		680		127		559		825		850	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		NA		NA		2.18		0.93		1.58		1.54		1.83		0.68	
92	85																									
93	86	**DIOXINS AND FURANS (ng/L)**																								
94	87	**Method 8290**																								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																										
121																										
122																										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																											
3		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4		BC27E		BH96J		BR64I		CB85G		CL03E		CT55A		DE87L		DM30A		DW37F		ED23I		EM85J		ER93D		EZ03D	
5		12/7/99		2/17/00		5/24/00		8/30/00		11/8/00		2/13/01		6/6/01		8/13/01		11/28/01		2/26/02		6/26/02		08/26/02		11/12/02	
87	**FIELD PARAMETERS**																										
88	pH (avg)	6.45		6.68		6.47		5.92		5.84		6.42		6.83		6.79		6.58		6.64		6.48		6.69		6.76	
89	Temperature (° C) (avg)	13.0		13.9		17.2		15.0		13.7		15.2		14.4		15.5		13.4		14.3		17.5		17.7		13.7	
90	Conductivity (um/hos)	742		828		796		799		679		645		651		614		586		578		592		513		665	
91	Dissolved oxygen (mg/L) (avg)	2.00		0.86		0.31		0.67		0.64		1.76		1.84		1.41		4.16		7.50		2.72		0.69		1.06	
92																											
93	**DIOXINS AND FURANS (ng/L)**																										
94	**Method 8290**																										
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																											
121																											
122																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH
1									
2									
3		G1A		G1A		G1A		G1A	
4		FF76E		FL66D		FU50F		FY82N	
5		2/12/03		5/9/03		8/29/03		10/24/03	
87	**FIELD PARAMETERS**								
88	pH (avg)	7.18		6.92		6.69		6.64	
89	Temperature (° C) (avg)	14.4		14.9		15		14.7	
90	Conductivity (um/hos)	682		566		588		603	
91	Dissolved oxygen (mg/L) (avg)	1.68		2.83		1.35		2.92	
92									
93	**DIOXINS AND FURANS (ng/L)**								
94	**Method 8290**								
95	2,3,7,8-TCDF	NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA	
120									
121									
122									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2									Dup of G1A				Dup of G1A													
3			G1A		G1A		G1A		G1B		G1A		S		G1A		G1A		G1A		G1A		G1A		G1A	
4			S177E		T176H		U258C		U258A		V224T		V224L		W391G		Y313D		Z225C		Z960O		AH27J		AU45F	
5			4/2/97		7/15/97		10/23/97		10/23/97		1/29/98		1/29/98		5/20/98		8/17/98		11/13/98		2/17/99		5/17/99		9/22/99	
123		**PAHs (µg/L)**																								
124		**EPA Method SW8270 SIM**																								
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		**2.5**		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		**16**		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.23**	M	NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.16**	M	NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																											
3		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4		BC27E		BH96J		BR64I		CB85G		CL03E		CT55A		DE87L		DM30A		DW37F		ED23I		EM85J		ER93D		EZ03D	
5		12/7/99		2/17/00		5/24/00		8/30/00		11/8/00		2/13/01		6/6/01		8/13/01		11/28/01		2/26/02		6/26/02		08/26/02		11/12/02	
123	**PAHs (µg/L)**																										
124	**EPA Method SW8270 SIM**																										
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH
1									
2									
3		G1A		G1A		G1A		G1A	
4		FF76E		FL66D		FU50F		FY82N	
5		2/12/03		5/9/03		8/29/03		10/24/03	
123	**PAHs (µg/L)**								
124	**EPA Method SW8270 SIM**								
125	Naphthalene	NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
3			J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2	
4			S177J		T176Q		U235K		V224P		W371L		Y314J		Z225P		Z960D		AH49D		AU22I		BC27L		BH96S		BR64E	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/20/99		12/8/99		2/16/00		5/24/00	
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	**0.15**	J	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.36**		0.25	U	0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	**2.8**		2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.1	U	**1.7**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
37	31	Carbon Disulfide	1.0	U	1.0	U	**44**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.36**		0.25	U	0.25	U	**0.28**		**0.31**		**0.28**		**0.30**		**0.38**	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	**0.011**		**0.012**		0.05	U	0.05	U	**0.010**		**0.008**		**0.008**		**0.009**		**0.006**		**0.010**		**0.010**		**0.012**		**0.006**	

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC
3		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2
4		CB49H		CL03I		CT55E		DE68J		DM52A		DW48D		ED23D		EM85E		ES04E		EZ03L		FF76I		FL58J		FU31B		FY64I
5		8/29/00		11/10/00		2/14/01		6/5/01		8/14/01		11/29/01		2/26/02		6/26/02		08/28/02		11/12/02		2/12/03		5/8/03		8/27/03		10/21/03
7	**CHLORINATED PHENOLS (µg/L)**																											
8	**EPA Method SW8040**																											
9	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.33**		0.25	U	0.25	U	0.28	U	0.25	U	0.26	U	0.25	U	0.5	U	0.5
10	2,4,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
11	2,3,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
12	2,4,5-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
13	2,3,4-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
15	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
16																												
17	**SEMIVOLATILES (µg/L)**																											
18	**EPA Method SW8270**																											
19	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.2	U	2.2	U	2	U	2	U	2	U	2
20	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.3	U	3.3	U	3.1	U	3	U	3	U	3
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U	56	U	56	U	51	U	50	U	50	U	10
24	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1
25	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5.6	U	5.1	U	5	U	5	U	5
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5.6	U	5.1	U	5	U	5	U	5
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5.6	U	5.1	U	5	U	5	U	5
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	**1.0**		1.0	U	1.0	U	1.0	U	4.0	U	4.0	U	4.4	U	4.4	U	1	U	1	U	1	U	1
33																												
34	**VOLATILES (µg/L)**																											
35	**EPA Method SW8260**																											
36	Acetone	5.0	U	5.0	U		R	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
38	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5
39	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
41	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
42	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
44	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
45	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
46	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
47	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
48	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
49	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
50	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
51	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
53	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
54	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56																												
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																											
58	**Method OR-DEQ**																											
59	**TPH-Diesel**	**0.26**		**0.40**		**0.35**		NA		NA		NA		**0.41**		NA		NA		NA		**0.39**		NA		NA		NA
60	**TPH-D Motor Oil**	NA		0.50	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62																												
63	**PRIORITY POLLUTANT**																											
64	**METALS (mg/L)**																											
65	Arsenic (7060)	**0.004**		**0.008**		**0.008**		**0.010**		**0.010**		**0.008**		**0.012**		**0.005**		**0.008**		0.05	U	**0.008**		**0.005**		**0.005**		**0.004**

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BD
1		
2		
3		
4		
5		
6		
7	**CHLORINATED PHENOLS (µg/L)**	
8	**EPA Method SW8040**	
9	Pentachlorophenol	U
10	2,4,6-Trichlorophenol	
11	2,3,6-Trichlorophenol	
12	2,4,5-Trichlorophenol	
13	2,3,4-Trichlorophenol	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	
15	2,3,4,5-Tetrachlorophenol	
16		
17	**SEMIVOLATILES (µg/L)**	
18	**EPA Method SW8270**	
19	Phenol	U
20	4-Methylphenol	U
21	Isophorone	U
22	2,4-Dimethylphenol	U
23	Benzoic Acid	U
24	Naphthalene	U
25	2-Methylnaphthalene	U
26	2,4,6-Trichlorophenol	U
27	2,4,5-Trichlorophenol	U
28	Acenaphthene	U
29	Dibenzofuran	U
30	Fluorene	U
31	Pentachlorophenol	U
32	bis(2-Ethylhexyl)phthalate	U
33		
34	**VOLATILES (µg/L)**	
35	**EPA Method SW8260**	
36	Acetone	U
37	Carbon Disulfide	U
38	2-Butanone	U
39	Benzene	U
40	Bromoform	U
41	Toluene	U
42	Ethylbenzene	U
43	Styrene	U
44	m,p-Xylene	U
45	o-Xylene	U
46	1,3,5-Trimethylbenzene	U
47	1,2,4-Trimethylbenzene	U
48	Isopropylbenzene	U
49	n-Propylbenzene	U
50	tert-Butylbenzene	U
51	sec-Butylbenzene	U
52	4-Isopropyltoluene	U
53	n-Butylbenzene	U
54	Naphthalene	U
55	Methyl tert-butyl ether	
56		
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**	
58	**Method OR-DEQ**	
59	**TPH-Diesel**	
60	**TPH-D Motor Oil**	
61	**TPH-Gasoline**	
62		
63	**PRIORITY POLLUTANT**	
64	**METALS (mg/L)**	
65	Arsenic (7060)	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2	
4			S177J		T176Q		U235K		V224P		W371L		Y314J		Z225P		Z960D		AH49D		AU22I		BC27L		BH96S		BR64E	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/20/99		12/8/99		2/16/00		5/24/00	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U
68	61	Lead (7421)	0.001	U	0.001	U	0.02	U	0.02	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	0.004	U	0.004	U	**0.012**		0.004	U	**0.005**	J2	**0.008**		0.004	U	**0.017**	J	**0.004**		**0.005**		0.006	U	0.006	U	**0.008**	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	**63.6**		**63**		**61.6**		**57.8**		NA		NA		NA		**59.4**		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**43.1**		**43.9**		**39.7**		**37.1**		NA		NA		NA		**38.5**		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**2.4**		**2.1**		**2.5**		**2.2**		NA		NA		NA		**4.0**		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**17.7**		**17.7**		**18.1**		**17.1**		NA		NA		NA		**18.3**		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**350**		**360**	J2	**170**		**380**		NA		NA		NA		**350**		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**350**		**360**	J2	**170**		**380**		NA		NA		NA		**350**		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**410**	J2	**360**		**410**		**360**		**390**		**360**		**380**		**350**		**380**		**360**		**330**		**320**	
81	74	Chloride (mg/L) (EPA 325.2)	**7.3**		**7.0**		**9.0**		**8.0**		**8.2**		**7.7**		**8.1**		**8.0**		**6.9**		**6.3**		**7.2**		**7.7**		**5.6**	
82	75	N-Nitrate (mg-N/L) (Calculated)	0.010	U	0.010	U	**0.028**		**0.027**	J2	NA		NA		NA		0.010	U	NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	**0.022**	J	**0.019**	J2	**0.015**		**0.013**	J2	NA		NA		NA		**0.022**		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.015**		0.010	U	**0.043**		**0.040**	J2	NA		NA		NA		**0.016**		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	2.5	U	2.5	U	2.5	U	2.5	U	NA		NA		NA		**5.7**		NA		NA		NA		NA		NA	
86	79																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC
3		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2
4		CB49H		CL03I		CT55E		DE68J		DM52A		DW48D		ED23D		EM85E		ES04E		EZ03L		FF76I		FL58J		FU31B		FY64I
5		8/29/00		11/10/00		2/14/01		6/5/01		8/14/01		11/29/01		2/26/02		6/26/02		08/28/02		11/12/02		2/12/03		5/8/03		8/27/03		10/21/03
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005
67	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.002**		0.002	U	**0.003**		0.002	U	0.002	U	0.002	U	0.002	U	**0.004**
68	Lead (7421)	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	0.02	U	**0.001**		0.001	U	0.001	U	0.001
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01
70	Zinc (6010)	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	**0.011**		**0.009**		**0.007**		**0.008**		**0.006**		**0.006**
71																												
72	**MAJOR IONS AND CONVENTIONALS**																											
73	Calcium (mg/L) (6010)	NA		NA		**53.0**		**57.1**		**49.5**		**53.9**		**55.8**		NA		NA		NA		**54.1**		NA		NA		NA
74	Magnesium (mg/L) (6010)	NA		NA		**31.3**		**33.2**		**30.0**		**28.8**		**31.7**		NA		NA		NA		**29.2**		NA		NA		NA
75	Potassium (mg/L) (6010)	NA		NA		**1.8**		**2.1**		**2.1**		**2.6**		**2.8**		NA		NA		NA		**2.8**		NA		NA		NA
76	Sodium (mg/L) (6010)	NA		NA		**14.5**		**15.2**		**14.8**		**14.9**		**15.9**		NA		NA		NA		**15**		NA		NA		NA
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		**330**		NA		NA		NA		**370**		NA		NA		NA		**310**		NA		NA		NA
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		1	U	NA		NA		NA
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		**330**		NA		NA		NA		**370**		NA		NA		NA		**310**		NA		NA		NA
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**380**		**340**		**370**		**370**		**350**		**350**		**340**		**290**		**330**		**360**		**330**		**320**		**360**		**340**
81	Chloride (mg/L) (EPA 325.2)	**4.4**		**5.1**		**5.0**		**4.2**		**5.9**		**4.3**		**5.3**		**4.8**		**4.1**		**4.6**		**4.5**		**4.6**		**3.9**		**4.1**
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		0.010	U	NA		NA		NA		0.010	U	NA		NA		NA		**0.046**		NA		NA		NA
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		0.010	U	NA		NA		NA		**0.013**		NA		NA		NA		**0.012**		NA		NA		NA
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		0.010	U	NA		NA		NA		**0.019**	J	NA		NA		NA		**0.058**		NA		NA		NA
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		**5.6**		NA		NA		NA		**3.5**		NA		NA		NA		**5.9**		NA		NA		NA
86																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BD
1		
2		
3		
4		
5		
66	Chromium (6010)	U
67	Copper (6010)	
68	Lead (7421)	U
69	Nickel (6010)	U
70	Zinc (6010)	
71		
72	**MAJOR IONS AND CONVENTIONALS**	
73	Calcium (mg/L) (6010)	
74	Magnesium (mg/L) (6010)	
75	Potassium (mg/L) (6010)	
76	Sodium (mg/L) (6010)	
77	Alkalinity (mg/L CaCO3) (SM 2320)	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	
81	Chloride (mg/L) (EPA 325.2)	
82	N-Nitrate (mg-N/L) (Calculated)	
83	N-Nitrite (mg-N/L) (EPA 354.1)	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	
85	Sulfate (mg/L) (EPA 375.2)	
86		

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB		
1																														
2																														
3			J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2			
4			S177J		T176Q		U235K		V224P		W371L		Y314J		Z225P		Z960D		AH49D		AU22I		BC27L		BH96S		BR64E			
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/20/99		12/8/99		2/16/00		5/24/00			
87	80	**FIELD PARAMETERS**																												
88	81	pH (avg)	6.76		6.74		6.91		6.76		6.49		6.37		6.35		6.89		5.95		6.30		6.56		6.69		6.49			
89	82	Temperature (° C) (avg)	13.9		16.8		13.8		14.3		13.0		16.5		12.7		14.1		14.7		14.9		12.1		13.6		16.1			
90	83	Conductivity (um/hos)	721		650		551		646		663		756		399		683		565		587		631		657		637			
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		0.73		0.77		2.50		2.54		1.96		2.18		2.42		1.12		0.90			
92	85																													
93	86	**DIOXINS AND FURANS (ng/L)**																												
94	87	**Method 8290**																												
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
120																														
121																														
122																														

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC
1																												
2																												
3		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2
4		CB49H		CL03I		CT55E		DE68J		DM52A		DW48D		ED23D		EM85E		ES04E		EZ03L		FF76I		FL58J		FU31B		FY64I
5		8/29/00		11/10/00		2/14/01		6/5/01		8/14/01		11/29/01		2/26/02		6/26/02		08/28/02		11/12/02		2/12/03		5/8/03		8/27/03		10/21/03
87	**FIELD PARAMETERS**																											
88	pH (avg)	6.71		5.46		6.27		6.72		6.91		6.61		6.62		6.58		6.93		6.61		7.06		6.87		6.73		6.93
89	Temperature (° C) (avg)	14.7		12.8		13.9		13.7		15.7		13.4		13.8		15.3		15.5		14.1		14		14.5		15.1		16.1
90	Conductivity (um/hos)	584		578		574		619		594		584		592		467		416		456		654		464		523		457
91	Dissolved oxygen (mg/L) (avg)	1.10		1.02		0.62		1.12		1.30		3.69		6.76		3.17		1.32		1.19		0		2.73		1.76		3.09
92																												
93	**DIOXINS AND FURANS (ng/L)**																											
94	**Method 8290**																											
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BD
1		
2		
3		
4		
5		
87	**FIELD PARAMETERS**	
88	pH (avg)	
89	Temperature (° C) (avg)	
90	Conductivity (um/hos)	
91	Dissolved oxygen (mg/L) (avg)	
92		
93	**DIOXINS AND FURANS (ng/L)**	
94	**Method 8290**	
95	2,3,7,8-TCDF	
96	Total TCDF	
97	2,3,7,8-TCDD	
98	Total TCDD	
99	1,2,3,7,8-PeCDF	
100	2,3,4,7,8-PeCDF	
101	Total PeCDF	
102	1,2,3,7,8-PeCDD	
103	Total PeCDD	
104	1,2,3,4,7,8-HxCDF	
105	1,2,3,6,7,8-HxCDF	
106	2,3,4,6,7,8-HxCDF	
107	1,2,3,7,8,9-HxCDF	
108	Total HxCDF	
109	1,2,3,4,7,8-HxCDD	
110	1,2,3,6,7,8-HxCDD	
111	1,2,3,7,8,9-HxCDD	
112	Total HxCDD	
113	1,2,3,4,6,7,8-HpCDF	
114	1,2,3,4,7,8,9-HpCDF	
115	Total HpCDF	
116	1,2,3,4,6,7,8-HpCDD	
117	Total HpCDD	
118	OCDF	
119	OCDD	
120		
121		
122		

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2	
4			S177J		T176Q		U235K		V224P		W371L		Y314J		Z225P		Z960D		AH49D		AU22I		BC27L		BH96S		BR64E	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/20/99		12/8/99		2/16/00		5/24/00	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC
1																												
2																												
3		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2
4		CB49H		CL03I		CT55E		DE68J		DM52A		DW48D		ED23D		EM85E		ES04E		EZ03L		FF76I		FL58J		FU31B		FY64I
5		8/29/00		11/10/00		2/14/01		6/5/01		8/14/01		11/29/01		2/26/02		6/26/02		08/28/02		11/12/02		2/12/03		5/8/03		8/27/03		10/21/03
123	**PAHs (µg/L)**																											
124	**EPA Method SW8270 SIM**																											
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BD
1		
2		
3		
4		
5		
123	**PAHs (µg/L)**	
124	**EPA Method SW8270 SIM**	
125	Naphthalene	
126	2-Methylnaphthalene	
127	Acenaphthylene	
128	Acenaphthene	
129	Fluorene	
130	Anthracene	
131	Dibenzofuran	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D
4			S167L		T176F		U235U		V208G		W371H		Y336H		Z225D		Z960H		AH27H		AU45K		BC21AC		BH75H		BR55F
5			4/1/97		7/15/97		10/23/97		1/28/98		5/18/98		8/19/98		11/13/98		2/17/99		5/17/99		9/23/99		12/6/99		2/15/00		5/23/00
6																											
7	1	**CHLORINATED PHENOLS (µg/L)**																									
8	2	**EPA Method SW8040**																									
9	3	Pentachlorophenol	**0.60**		0.25	U	0.25	U	0.25	U	0.25	U	**0.16**	J1	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
16	10																										
17	11	**SEMIVOLATILES (µg/L)**																									
18	12	**EPA Method SW8270**																									
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
21	15	Isophorone	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10
24	18	Naphthalene	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
25	19	2-Methylnaphthalene	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
28	22	Acenaphthene	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
29	23	Dibenzofuran	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
30	24	Fluorene	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
32	26	bis(2-Ethylhexyl)phthalate	1.0	UJ	1.0	UJ	3.5	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.0**		**6.5**		1.0	U	1.0	U	1.0
33	27																										
34	28	**VOLATILES (µg/L)**																									
35	29	**EPA Method SW8260**																									
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
37	31	Carbon Disulfide	1.0	U	1.0	U	**1.4**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56	49																										
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																									
58	51	**Method OR-DEQ**																									
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.36**		0.25	U	0.25	U	0.25	U	**0.67**		0.25	U	0.25	U	0.25
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62	55																										
63	56	**PRIORITY POLLUTANT**																									
64	57	**METALS (mg/L)**																									
65	58	Arsenic (7060)	**0.004**		**0.006**		0.05	U	0.05	U	**0.006**		**0.006**		**0.007**		**0.007**		**0.005**		**0.006**		**0.006**		**0.008**		**0.006**

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
3			LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D	
4			CB49B		CK77E		CT37C		DE68E		DM52D		DW48L		ED16I		EM75H		ER92D		EY88F		FF88L		FL41E		FU31D	
5			8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/29/01		2/25/02		6/25/02		08/26/02		11/11/02		2/13/03		5/7/03		8/27/03	
7	**CHLORINATED PHENOLS (µg/L)**																											
8	**EPA Method SW8040**																											
9	Pentachlorophenol	UJ	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.26**		**0.26**		0.25	U	0.27	U	0.25	U	0.25	U	0.25	U	0.6	U
10	2,4,6-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																												
17	**SEMIVOLATILES (µg/L)**																											
18	**EPA Method SW8270**																											
19	Phenol	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.1	U	2	U	2	U	2	U	2.4	U
20	4-Methylphenol	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.2	U
21	Isophorone	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.2	U
22	2,4-Dimethylphenol	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.2	U	3	U	3	U	3	U	3.6	U
23	Benzoic Acid	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U	53	U	50	U	50	U	50	U	60	U
24	Naphthalene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.2	U
25	2-Methylnaphthalene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.2	U
26	2,4,6-Trichlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5	U	5	U	5	U	6	U
27	2,4,5-Trichlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5	U	5	U	5	U	6	U
28	Acenaphthene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.2	U
29	Dibenzofuran	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.2	U
30	Fluorene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.2	U
31	Pentachlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5	U	5	U	5	U	6	U
32	bis(2-Ethylhexyl)phthalate	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	4.0	U	4.0	U	4.3	U	4	U	1	U	1	U	1.2	U
33																												
34	**VOLATILES (µg/L)**																											
35	**EPA Method SW8260**																											
36	Acetone	U	5.0	U	5.0	U	7.6	U	5.0	U	5.0	U	**20**		**6.9**		**6.4**		**16**		5	U	5	U	**6.3**		5	U
37	Carbon Disulfide	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U
39	Benzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
40	Bromoform	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
42	Ethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
43	Styrene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
45	o-Xylene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
49	n-Propylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
50	tert-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
52	4-Isopropyltoluene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
54	Naphthalene	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																												
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																											
58	**Method OR-DEQ**																											
59	**TPH-Diesel**	U	0.25	U	0.25	U	**0.27**		NA		NA		NA		0.25	U	NA		NA		NA		0.25	U	NA		NA	
60	**TPH-D Motor Oil**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																												
63	**PRIORITY POLLUTANT**																											
64	**METALS (mg/L)**																											
65	Arsenic (7060)		**0.006**		**0.005**		**0.006**		**0.005**		**0.006**		**0.006**		**0.006**		**0.005**		**0.006**		0.05	U	**0.006**		**0.006**		**0.006**	

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD
1			
2			
3		LW1D	
4		FY64K	
5		10/21/03	
6			
7	**CHLORINATED PHENOLS (µg/L)**		
8	**EPA Method SW8040**		
9	Pentachlorophenol	0.5	U
10	2,4,6-Trichlorophenol	NA	
11	2,3,6-Trichlorophenol	NA	
12	2,4,5-Trichlorophenol	NA	
13	2,3,4-Trichlorophenol	NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	2,3,4,5-Tetrachlorophenol	NA	
16			
17	**SEMIVOLATILES (µg/L)**		
18	**EPA Method SW8270**		
19	Phenol	2	U
20	4-Methylphenol	1	U
21	Isophorone	1	U
22	2,4-Dimethylphenol	3	U
23	Benzoic Acid	10	U
24	Naphthalene	1	U
25	2-Methylnaphthalene	1	U
26	2,4,6-Trichlorophenol	5	U
27	2,4,5-Trichlorophenol	5	U
28	Acenaphthene	1	U
29	Dibenzofuran	1	U
30	Fluorene	1	U
31	Pentachlorophenol	5	U
32	bis(2-Ethylhexyl)phthalate	1	U
33			
34	**VOLATILES (µg/L)**		
35	**EPA Method SW8260**		
36	Acetone	**5.1**	
37	Carbon Disulfide	1	U
38	2-Butanone	5	U
39	Benzene	1	U
40	Bromoform	1	U
41	Toluene	1	U
42	Ethylbenzene	1	U
43	Styrene	1	U
44	m,p-Xylene	1	U
45	o-Xylene	1	U
46	1,3,5-Trimethylbenzene	1	U
47	1,2,4-Trimethylbenzene	1	U
48	Isopropylbenzene	1	U
49	n-Propylbenzene	1	U
50	tert-Butylbenzene	1	U
51	sec-Butylbenzene	1	U
52	4-Isopropyltoluene	1	U
53	n-Butylbenzene	1	U
54	Naphthalene	5	U
55	Methyl tert-butyl ether	NA	
56			
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	**Method OR-DEQ**		
59	**TPH-Diesel**	NA	
60	**TPH-D Motor Oil**	NA	
61	**TPH-Gasoline**	NA	
62			
63	**PRIORITY POLLUTANT**		
64	**METALS (mg/L)**		
65	Arsenic (7060)	**0.006**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D
4			S167L		T176F		U235U		V208G		W371H		Y336H		Z225D		Z960H		AH27H		AU45K		BC21AC		BH75H		BR55F
5			4/1/97		7/15/97		10/23/97		1/28/98		5/18/98		8/19/98		11/13/98		2/17/99		5/17/99		9/23/99		12/6/99		2/15/00		5/23/00
66	59	Chromium (6010)	0.005	U	**0.007**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.007**		**0.006**		0.005	U	0.005
67	60	Copper (6010)	0.002	U	**0.009**		**0.004**		**0.003**		0.002	U	0.004		0.002	U	0.002	U	0.002	U	**0.007**		**0.003**		**0.003**		0.002
68	61	Lead (7421)	0.001	U	**0.002**		0.02	U	0.02	U	0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	**0.003**		**0.001**		**0.002**		**0.001**
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01
70	63	Zinc (6010)	0.004	U	**0.019**	J2	**0.021**		**0.010**		**0.008**	J2	**0.014**		**0.006**		**0.009**	J	0.007	U	**0.021**		**0.012**		**0.017**		**0.007**
71	64																										
72	65	**MAJOR IONS AND CONVENTIONALS**																									
73	66	Calcium (mg/L) (6010)	**69.1**		**71.1**		**72.9**		**65.8**		NA		NA		NA		**63.4**		NA		NA		NA		NA		NA
74	67	Magnesium (mg/L) (6010)	**40.5**		**42.6**		**43.1**		**37.0**		NA		NA		NA		**38.6**		NA		NA		NA		NA		NA
75	68	Potassium (mg/L) (6010)	**1.9**		**2.0**		**2.0**		**1.1**		NA		NA		NA		**1.5**		NA		NA		NA		NA		NA
76	69	Sodium (mg/L) (6010)	**15.3**		**16.4**		**16.3**		**15.9**		NA		NA		NA		**15.1**		NA		NA		NA		NA		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**360**		**350**		**360**		**370**		NA		NA		NA		**360**		NA		NA		NA		NA		NA
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		NA		NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**360**		**350**		**360**		**370**		NA		NA		NA		**360**		NA		NA		NA		NA		NA
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**400**	J2	**400**		**370**	J2	**310**		**350**		**310**		**340**		**340**		**360**		**360**		**360**		**350**
81	74	Chloride (mg/L) (EPA 325.2)	**3.2**	J	**3.0**		**3.5**		**3.3**		**3.9**		**2.0**		**2.8**		**3.6**		**1.6**		**3.2**		**3.7**		**3.5**		**10**
82	75	N-Nitrate (mg-N/L) (Calculated)	**0.012**	J	0.010	U	**0.017**		**0.021**		NA		NA		NA		0.010	U	NA		NA		NA		NA		NA
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	0.010	U	0.010	U	0.010	U	0.010	U	NA		NA		NA		**0.020**		NA		NA		NA		NA		NA
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.012**	J	0.010	U	**0.017**		**0.021**		NA		NA		NA		**0.020**		NA		NA		NA		NA		NA
85	78	Sulfate (mg/L) (EPA 375.2)	**3.4**	J	2.5	U	2.5	U	2.5	U	NA		NA		NA		**7.2**		NA		NA		NA		NA		NA
86	79																										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
3			LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D	
4			CB49B		CK77E		CT37C		DE68E		DM52D		DW48L		ED16I		EM75H		ER92D		EY88F		FF88L		FL41E		FU31D	
5			8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/29/01		2/25/02		6/25/02		08/26/02		11/11/02		2/13/03		5/7/03		8/27/03	
66	Chromium (6010)	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	U	0.002	U	**0.002**	J2	0.002	U	0.002	U	0.002	U	0.003	U	**0.005**		0.002	U	**0.005**		**0.003**		**0.004**		0.002	U	**0.002**	
68	Lead (7421)		0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	**0.002**		0.001	U	**0.005**		**0.002**		0.02	U	0.001	U	0.001	U	0.001	U
69	Nickel (6010)	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)		**0.011**		**0.007**		**0.007**		0.006	U	0.006	U	**0.01**		**0.011**		**0.006**		**0.011**		**0.009**		**0.014**		**0.01**	J	**0.012**	
71																												
72	**MAJOR IONS AND CONVENTIONALS**																											
73	Calcium (mg/L) (6010)		NA		NA		**51.5**		**53.8**		**50.2**		**45.3**		**51.6**		NA		NA		NA		**48.2**		NA		NA	
74	Magnesium (mg/L) (6010)		NA		NA		**32.5**		**33.0**		**32.0**		**29.2**		**34.0**		NA		NA		NA		**30.9**		NA		NA	
75	Potassium (mg/L) (6010)		NA		NA		**1.1**		**1.3**		**1.4**		**1.3**		**1.8**		NA		NA		NA		**1.4**		NA		NA	
76	Sodium (mg/L) (6010)		NA		NA		**13.0**		**12.9**		**13.3**		**12.4**		**14.4**		NA		NA		NA		**13.6**		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		NA		**300**		NA		NA		NA		**280**		NA		NA		NA		**270**		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		1	U	NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		**300**		NA		NA		NA		**280**		NA		NA		NA		**270**		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**380**		**360**		**380**		**360**		**360**		**320**		**320**		**300**		**340**		**320**		**280**		**300**		**320**	
81	Chloride (mg/L) (EPA 325.2)		**3.2**		**3.2**		**3.0**		**3.2**		**3.1**		**2.6**		**3.0**		**1.6**		**2.6**		**2.7**		**4.9**		**3.1**		**2.2**	
82	N-Nitrate (mg-N/L) (Calculated)		NA		NA		0.010	U	NA		NA		NA		0.010	U	NA		NA		NA		**0.031**		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		NA		0.010	U	NA		NA		NA		**0.010**		NA		NA		NA		0.01	U	NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		NA		0.010	UJ	NA		NA		NA		**0.017**		NA		NA		NA		**0.031**		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		NA		**11**		NA		NA		NA		**6.1**		NA		NA		NA		**4.6**		NA		NA	
86																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD
1			
2			
3		LW1D	
4		FY64K	
5		10/21/03	
66	Chromium (6010)	**0.005**	
67	Copper (6010)	**0.005**	
68	Lead (7421)	**0.036**	
69	Nickel (6010)	0.01	U
70	Zinc (6010)	**0.019**	
71			
72	**MAJOR IONS AND CONVENTIONALS**		
73	Calcium (mg/L) (6010)	NA	
74	Magnesium (mg/L) (6010)	NA	
75	Potassium (mg/L) (6010)	NA	
76	Sodium (mg/L) (6010)	NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**330**	
81	Chloride (mg/L) (EPA 325.2)	**2.9**	
82	N-Nitrate (mg-N/L) (Calculated)	NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	Sulfate (mg/L) (EPA 375.2)	NA	
86			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D
4			S167L		T176F		U235U		V208G		W371H		Y336H		Z225D		Z960H		AH27H		AU45K		BC21AC		BH75H		BR55F
5			4/1/97		7/15/97		10/23/97		1/28/98		5/18/98		8/19/98		11/13/98		2/17/99		5/17/99		9/23/99		12/6/99		2/15/00		5/23/00
87	80	**FIELD PARAMETERS**																									
88	81	pH (avg)	6.91		6.99		7.14		6.94		6.64		6.61		6.45		6.97		6.05		6.90		6.36		6.88		6.65
89	82	Temperature (° C) (avg)	14.1		16.5		14.4		14.1		12.7		16.0		13.8		14.6		16.4		15.9		14.1		14.7		14.7
90	83	Conductivity (um/hos)	678		654		576		594		522		633		137		586		459		488		536		521		482
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		NA		0.95		2.22		2.43		2.41		0.76		3.26		1.89		0.97
92	85																										
93	86	**DIOXINS AND FURANS (ng/L)**																									
94	87	**Method 8290**																									
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120																											
121																											
122																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2																												
3			LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D	
4			CB49B		CK77E		CT37C		DE68E		DM52D		DW48L		ED16I		EM75H		ER92D		EY88F		FF88L		FL41E		FU31D	
5			8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/29/01		2/25/02		6/25/02		08/26/02		11/11/02		2/13/03		5/7/03		8/27/03	
87	**FIELD PARAMETERS**																											
88	pH (avg)		6.55		5.47		6.64		6.96		7.11		6.86		6.36		6.86		6.96		7.03		7.12		7.31		7.05	
89	Temperature (° C) (avg)		15.2		14.0		15.0		15.6		16.3		14.3		14.1		16.0		16.0		14.9		15.5		14.6		16.7	
90	Conductivity (um/hos)		553		481		476		484		503		467		445		451		389		495		508		411		388	
91	Dissolved oxygen (mg/L) (avg)		1.78		2.23		1.51		1.99		1.34		4.23		4.78		5.36		1.91		2.59		0		4.2		1.54	
92																												
93	**DIOXINS AND FURANS (ng/L)**																											
94	**Method 8290**																											
95	2,3,7,8-TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD
1			
2			
3		LW1D	
4		FY64K	
5		10/21/03	
87	**FIELD PARAMETERS**		
88	pH (avg)	7.07	
89	Temperature (° C) (avg)	17.1	
90	Conductivity (um/hos)	381	
91	Dissolved oxygen (mg/L) (avg)	2.51	
92			
93	**DIOXINS AND FURANS (ng/L)**		
94	**Method 8290**		
95	2,3,7,8-TCDF	NA	
96	Total TCDF	NA	
97	2,3,7,8-TCDD	NA	
98	Total TCDD	NA	
99	1,2,3,7,8-PeCDF	NA	
100	2,3,4,7,8-PeCDF	NA	
101	Total PeCDF	NA	
102	1,2,3,7,8-PeCDD	NA	
103	Total PeCDD	NA	
104	1,2,3,4,7,8-HxCDF	NA	
105	1,2,3,6,7,8-HxCDF	NA	
106	2,3,4,6,7,8-HxCDF	NA	
107	1,2,3,7,8,9-HxCDF	NA	
108	Total HxCDF	NA	
109	1,2,3,4,7,8-HxCDD	NA	
110	1,2,3,6,7,8-HxCDD	NA	
111	1,2,3,7,8,9-HxCDD	NA	
112	Total HxCDD	NA	
113	1,2,3,4,6,7,8-HpCDF	NA	
114	1,2,3,4,7,8,9-HpCDF	NA	
115	Total HpCDF	NA	
116	1,2,3,4,6,7,8-HpCDD	NA	
117	Total HpCDD	NA	
118	OCDF	NA	
119	OCDD	NA	
120			
121			
122			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D
4			S167L		T176F		U235U		V208G		W371H		Y336H		Z225D		Z960H		AH27H		AU45K		BC21AC		BH75H		BR55F
5			4/1/97		7/15/97		10/23/97		1/28/98		5/18/98		8/19/98		11/13/98		2/17/99		5/17/99		9/23/99		12/6/99		2/15/00		5/23/00
123		**PAHs (µg/L)**																									
124		**EPA Method SW8270 SIM**																									
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2																												
3			LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D	
4			CB49B		CK77E		CT37C		DE68E		DM52D		DW48L		ED16I		EM75H		ER92D		EY88F		FF88L		FL41E		FU31D	
5			8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/29/01		2/25/02		6/25/02		08/26/02		11/11/02		2/13/03		5/7/03		8/27/03	
123	**PAHs (µg/L)**																											
124	**EPA Method SW8270 SIM**																											
125	Naphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD
1			
2			
3		LW1D	
4		FY64K	
5		10/21/03	
123	**PAHs (µg/L)**		
124	**EPA Method SW8270 SIM**		
125	Naphthalene	NA	
126	2-Methylnaphthalene	NA	
127	Acenaphthylene	NA	
128	Acenaphthene	NA	
129	Fluorene	NA	
130	Anthracene	NA	
131	Dibenzofuran	NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
3			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D
4			S177F		T176V		U235S		V224M		W391H		Y336C		Z225H		Z960M		AH76I		AU36C		BC27B		BH96K		BR55I
5			4/2/97		7/16/97		10/23/97		1/29/98		5/20/98		8/18/98		11/13/98		2/18/99		5/19/99		9/21/99		12/7/99		2/18/00		5/23/00
7	1	**CHLORINATED PHENOLS (µg/L)**																									
8	2	**EPA Method SW8040**																									
9	3	Pentachlorophenol	**0.23**	J	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
16	10																										
17	11	**SEMIVOLATILES (µg/L)**																									
18	12	**EPA Method SW8270**																									
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.2**		1.0	U	1.0
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	**5.3**	J2	5.4	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
33	27																										
34	28	**VOLATILES (µg/L)**																									
35	29	**EPA Method SW8260**																									
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
37	31	Carbon Disulfide	1.0	U	1.0	U	**4.0**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
40	34	Bromoform	1.0	U	**1.6**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.0**		1.0	U	1.0	U	1.0
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56	49																										
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																									
58	51	**Method OR-DEQ**																									
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.38**		**0.32**
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62	55																										
63	56	**PRIORITY POLLUTANT**																									
64	57	**METALS (mg/L)**																									
65	58	Arsenic (7060)	**0.010**		**0.009**		0.05	U	0.05	U	**0.018**		**0.014**		**0.015**		**0.017**		**0.017**		**0.017**		**0.017**		**0.021**		**0.019**

BZTO104(e)020101

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
3			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D	
4			CB49E		CK77G		CT55C		DE68H		DM52C		DW48A		ED34F		EM85A		ES04B		EZ03A		FF88B		FL66J		FU50A	
5			8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/28/02		6/26/02		08/28/02		11/12/02		2/13/03		5/9/03		8/29/03	
7	**CHLORINATED PHENOLS (µg/L)**																											
8	**EPA Method SW8040**																											
9	Pentachlorophenol	UJ	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**3.0**		**0.76**		0.25	U	0.29	U	0.25	U	**0.28**		0.25	U	0.55	U
10	2,4,6-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																												
17	**SEMIVOLATILES (µg/L)**																											
18	**EPA Method SW8270**																											
19	Phenol	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.3	U	2.2	U	2	U	2	U	2.2	U
20	4-Methylphenol	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U
21	Isophorone	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U
22	2,4-Dimethylphenol	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.5	U	3.3	U	3	U	3	U	3.3	U
23	Benzoic Acid	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U	58	U	54	U	50	U	50	U	55	U
24	Naphthalene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U
25	2-Methylnaphthalene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U
26	2,4,6-Trichlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.8	U	5.4	U	5	U	5	U	5.5	U
27	2,4,5-Trichlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.8	U	5.4	U	5	U	5	U	5.5	U
28	Acenaphthene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U
29	Dibenzofuran	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U
30	Fluorene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U
31	Pentachlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**26**		5.0	U	5.8	U	5.4	U	5	U	5	U	5.5	U
32	bis(2-Ethylhexyl)phthalate	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.0**		4.0	U	4.0	U	4.7	U	4.3	U	1	U	1	U	1.1	U
33																												
34	**VOLATILES (µg/L)**																											
35	**EPA Method SW8260**																											
36	Acetone	U	5.0	U	**15**			R	**23**		**38**		**80**		**10**		**50**		**13**		5	U	**12**		**24**		**17**	
37	Carbon Disulfide	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U
39	Benzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
40	Bromoform	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
42	Ethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
43	Styrene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
45	o-Xylene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
49	n-Propylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
50	tert-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
52	4-Isopropyltoluene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
54	Naphthalene	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																												
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																											
58	**Method OR-DEQ**																											
59	**TPH-Diesel**		0.25	U	0.25	U	**0.28**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	**TPH-D Motor Oil**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																												
63	**PRIORITY POLLUTANT**																											
64	**METALS (mg/L)**																											
65	Arsenic (7060)		**0.017**		**0.016**		**0.015**		**0.016**		**0.018**		**0.020**		**0.016**		**0.019**		**0.016**		0.05	U	**0.014**		**0.016**		**0.018**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD
1			
2			
3		LW3D	
4		FY82I	
5		10/24/03	
6			
7	**CHLORINATED PHENOLS (µg/L)**		
8	**EPA Method SW8040**		
9	Pentachlorophenol	**0.62**	
10	2,4,6-Trichlorophenol	NA	
11	2,3,6-Trichlorophenol	NA	
12	2,4,5-Trichlorophenol	NA	
13	2,3,4-Trichlorophenol	NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	2,3,4,5-Tetrachlorophenol	NA	
16			
17	**SEMIVOLATILES (µg/L)**		
18	**EPA Method SW8270**		
19	Phenol	2.2	U
20	4-Methylphenol	1.1	U
21	Isophorone	1.1	U
22	2,4-Dimethylphenol	3.3	U
23	Benzoic Acid	11	U
24	Naphthalene	1.1	U
25	2-Methylnaphthalene	1.1	U
26	2,4,6-Trichlorophenol	5.5	U
27	2,4,5-Trichlorophenol	5.5	U
28	Acenaphthene	1.1	U
29	Dibenzofuran	1.1	U
30	Fluorene	1.1	U
31	Pentachlorophenol	5.5	U
32	bis(2-Ethylhexyl)phthalate	1.1	U
33			
34	**VOLATILES (µg/L)**		
35	**EPA Method SW8260**		
36	Acetone	**64**	
37	Carbon Disulfide	1	U
38	2-Butanone	5	U
39	Benzene	1	U
40	Bromoform	1	U
41	Toluene	1	U
42	Ethylbenzene	1	U
43	Styrene	1	U
44	m,p-Xylene	1	U
45	o-Xylene	1	U
46	1,3,5-Trimethylbenzene	1	U
47	1,2,4-Trimethylbenzene	1	U
48	Isopropylbenzene	1	U
49	n-Propylbenzene	1	U
50	tert-Butylbenzene	1	U
51	sec-Butylbenzene	1	U
52	4-Isopropyltoluene	1	U
53	n-Butylbenzene	1	U
54	Naphthalene	5	U
55	Methyl tert-butyl ether	NA	
56			
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	**Method OR-DEQ**		
59	**TPH-Diesel**	NA	
60	**TPH-D Motor Oil**	NA	
61	**TPH-Gasoline**	NA	
62			
63	**PRIORITY POLLUTANT**		
64	**METALS (mg/L)**		
65	Arsenic (7060)	**0.018**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D
4			S177F		T176V		U235S		V224M		W391H		Y336C		Z225H		Z960M		AH76I		AU36C		BC27B		BH96K		BR55I
5			4/2/97		7/16/97		10/23/97		1/29/98		5/20/98		8/18/98		11/13/98		2/18/99		5/19/99		9/21/99		12/7/99		2/18/00		5/23/00
66	59	Chromium (6010)	0.005	U	**0.164**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005
67	60	Copper (6010)	**0.003**		**0.164**		0.002	U	**0.004**		0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002
68	61	Lead (7421)	0.001	U	**0.062**		0.02	U	0.02	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001
69	62	Nickel (6010)	0.01	U	**0.12**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01
70	63	Zinc (6010)	**0.021**		**0.464**		**0.016**		**0.015**		**0.009**	J2	**0.011**		**0.007**		**0.012**	J	**0.009**		**0.012**		0.010	U	**0.011**		0.006
71	64																										
72	65	**MAJOR IONS AND CONVENTIONALS**																									
73	66	Calcium (mg/L) (6010)	**54.4**		**82.6**		**58.7**		**61.3**		NA		NA		NA		**62.7**		NA		NA		NA		NA		NA
74	67	Magnesium (mg/L) (6010)	**26.1**		**55.4**		**27.7**		**28.4**		NA		NA		NA		**29.0**		NA		NA		NA		NA		NA
75	68	Potassium (mg/L) (6010)	**3.4**		**11.5**		**3.9**		**3.7**		NA		NA		NA		**3.5**		NA		NA		NA		NA		NA
76	69	Sodium (mg/L) (6010)	**51.0**		**92.1**		**35.7**		**27.8**		NA		NA		NA		**17.8**		NA		NA		NA		NA		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**370**		**340**	J2	**340**		**360**		NA		NA		NA		**350**		NA		NA		NA		NA		NA
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		NA		NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**370**		**340**	J2	**340**		**360**		NA		NA		NA		**350**		NA		NA		NA		NA		NA
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**360**	J2	**350**		**360**		**380**		**340**		**330**		**380**		**340**		**340**		**360**		**360**		**360**
81	74	Chloride (mg/L) (EPA 325.2)	**4.8**		**4.3**		**4.9**		**3.9**		**4.7**		**3.1**		**3.5**		**5.3**		**3.5**		**3.4**		**4.5**		**4.3**		**4.4**
82	75	N-Nitrate (mg-N/L) (Calculated)	**0.012**		0.010	U	**0.026**		**0.023**	J2	NA		NA		NA		0.010	U	NA		NA		NA		NA		NA
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	**0.012**	J	**0.012**	J2	**0.014**		0.010	UJ	NA		NA		NA		**0.021**		NA		NA		NA		NA		NA
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.024**		0.010	U	**0.040**		**0.023**	J2	NA		NA		NA		**0.020**		NA		NA		NA		NA		NA
85	78	Sulfate (mg/L) (EPA 375.2)	**12**	J	**4.3**		2.5	U	**2.6**		NA		NA		NA		**5.4**		NA		NA		NA		NA		NA
86	79																										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
3			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D	
4			CB49E		CK77G		CT55C		DE68H		DM52C		DW48A		ED34F		EM85A		ES04B		EZ03A		FF88B		FL66J		FU50A	
5			8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/28/02		6/26/02		08/28/02		11/12/02		2/13/03		5/9/03		8/29/03	
66	Chromium (6010)	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.010**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	U	0.002	U	**0.004**	J2	0.002	U	0.002	U	0.002	U	0.002	U	**0.004**		**0.002**		**0.003**		**0.002**		0.002	U	**0.003**		**0.003**	
68	Lead (7421)	U	0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	**0.002**		0.001	U	0.001	U	0.001	U	0.02	U	**0.002**		**0.001**		0.001	U
69	Nickel (6010)	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)	U	**0.015**		**0.017**		**0.007**		0.006	U	**0.012**		**0.013**		**0.008**		**0.008**		**0.014**		0.006	U	0.006	U	**1.1**		**0.008**	
71																												
72	**MAJOR IONS AND CONVENTIONALS**																											
73	Calcium (mg/L) (6010)		NA		NA		**61.4**		**62.1**		**55.1**		**57.3**		**60.9**		NA		NA		NA		**57.8**		NA		NA	
74	Magnesium (mg/L) (6010)		NA		NA		**27.5**		**28.4**		**25.4**		**26.3**		**27.6**		NA		NA		NA		**27.7**		NA		NA	
75	Potassium (mg/L) (6010)		NA		NA		**3.2**		**3.5**		**3.4**		**3.2**		**3.9**		NA		NA		NA		**3.6**		NA		NA	
76	Sodium (mg/L) (6010)		NA		NA		**13.4**		**13.4**		**12.6**		**13.2**		**14.5**		NA		NA		NA		**13.7**		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		NA		**330**		NA		NA		NA		**350**		NA		NA		NA		**310**		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		1	U	NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		**330**		NA		NA		NA		**350**		NA		NA		NA		**310**		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**410**		**350**		**360**		**370**		**310**		**330**		**390**		**310**		**380**		**380**		**350**		**330**		**330**	
81	Chloride (mg/L) (EPA 325.2)		**3.5**		**6.9**		**3.3**		**6.2**		**4.5**		**3.4**		**3.7**		**3.4**		**3.4**		**3.5**		**4.7**		**3.3**		**2.6**	
82	N-Nitrate (mg-N/L) (Calculated)		NA		NA		**0.012**		NA		NA		NA		NA		NA		NA		NA		**0.031**		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		NA		0.010	U	NA		NA		NA		NA		NA		NA		NA		**0.032**		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		NA		**0.012**		NA		NA		NA		NA		NA		NA		NA		**0.063**		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		NA		**6.5**		NA		NA		NA		**5.5**		NA		NA		NA		**4.1**		NA		NA	
86																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD
1			
2			
3		LW3D	
4		FY82I	
5		10/24/03	
66	Chromium (6010)	**0.006**	
67	Copper (6010)	**0.004**	
68	Lead (7421)	**0.001**	
69	Nickel (6010)	0.01	U
70	Zinc (6010)	**0.013**	
71			
72	**MAJOR IONS AND CONVENTIONALS**		
73	Calcium (mg/L) (6010)	NA	
74	Magnesium (mg/L) (6010)	NA	
75	Potassium (mg/L) (6010)	NA	
76	Sodium (mg/L) (6010)	NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**290**	
81	Chloride (mg/L) (EPA 325.2)	**3.6**	
82	N-Nitrate (mg-N/L) (Calculated)	NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	Sulfate (mg/L) (EPA 375.2)	NA	
86			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D
4			S177F		T176V		U235S		V224M		W391H		Y336C		Z225H		Z960M		AH76I		AU36C		BC27B		BH96K		BR55I
5			4/2/97		7/16/97		10/23/97		1/29/98		5/20/98		8/18/98		11/13/98		2/18/99		5/19/99		9/21/99		12/7/99		2/18/00		5/23/00
87	80	**FIELD PARAMETERS**																									
88	81	pH (avg)	6.76		6.74		6.59		6.87		6.48		6.40		6.21		6.58		6.08		6.44		6.31		6.30		6.55
89	82	Temperature (° C) (avg)	12.7		16.2		13.4		16.5		13.3		14.2		13.3		12.4		13.9		15.5		12.2		12.3		16.0
90	83	Conductivity (um/hos)	706		646		627		668		504		673		159		695		635		588		657		667		627
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		2.21		1.60		2.22		2.47		1.99		2.10		2.44		2.05		1.49
92	85																										
93	86	**DIOXINS AND FURANS (ng/L)**																									
94	87	**Method 8290**																									
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120																											
121																											
122																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2																												
3			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D	
4			CB49E		CK77G		CT55C		DE68H		DM52C		DW48A		ED34F		EM85A		ES04B		EZ03A		FF88B		FL66J		FU50A	
5			8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/28/02		6/26/02		08/28/02		11/12/02		2/13/03		5/9/03		8/29/03	
87	**FIELD PARAMETERS**																											
88	pH (avg)		5.92		5.58		6.29		6.56		6.54		6.47		6.50		6.30		6.45		6.39		6.8		6.87		6.52	
89	Temperature (° C) (avg)		14.0		12.7		12.4		13.6		14.4		12.7		12.5		14.4		15.2		13.3		13.1		14.5		15.1	
90	Conductivity (um/hos)		629		624		638		655		628		628		617		629		595		664		826		534		525	
91	Dissolved oxygen (mg/L) (avg)		1.04		1.28		0.60		0.92		11.14		3.61		7.98		4.43		1.20		1.94		0		4.28		1.13	
92																												
93	**DIOXINS AND FURANS (ng/L)**																											
94	**Method 8290**																											
95	2,3,7,8-TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD
1			
2			
3		LW3D	
4		FY82I	
5		10/24/03	
87	**FIELD PARAMETERS**		
88	pH (avg)	6.33	
89	Temperature (° C) (avg)	13.0	
90	Conductivity (um/hos)	543	
91	Dissolved oxygen (mg/L) (avg)	2.00	
92			
93	**DIOXINS AND FURANS (ng/L)**		
94	**Method 8290**		
95	2,3,7,8-TCDF	NA	
96	Total TCDF	NA	
97	2,3,7,8-TCDD	NA	
98	Total TCDD	NA	
99	1,2,3,7,8-PeCDF	NA	
100	2,3,4,7,8-PeCDF	NA	
101	Total PeCDF	NA	
102	1,2,3,7,8-PeCDD	NA	
103	Total PeCDD	NA	
104	1,2,3,4,7,8-HxCDF	NA	
105	1,2,3,6,7,8-HxCDF	NA	
106	2,3,4,6,7,8-HxCDF	NA	
107	1,2,3,7,8,9-HxCDF	NA	
108	Total HxCDF	NA	
109	1,2,3,4,7,8-HxCDD	NA	
110	1,2,3,6,7,8-HxCDD	NA	
111	1,2,3,7,8,9-HxCDD	NA	
112	Total HxCDD	NA	
113	1,2,3,4,6,7,8-HpCDF	NA	
114	1,2,3,4,7,8,9-HpCDF	NA	
115	Total HpCDF	NA	
116	1,2,3,4,6,7,8-HpCDD	NA	
117	Total HpCDD	NA	
118	OCDF	NA	
119	OCDD	NA	
120			
121			
122			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D
4			S177F		T176V		U235S		V224M		W391H		Y336C		Z225H		Z960M		AH76I		AU36C		BC27B		BH96K		BR55I
5			4/2/97		7/16/97		10/23/97		1/29/98		5/20/98		8/18/98		11/13/98		2/18/99		5/19/99		9/21/99		12/7/99		2/18/00		5/23/00
123		**PAHs (µg/L)**																									
124		**EPA Method SW8270 SIM**																									
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2																												
3			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D	
4			CB49E		CK77G		CT55C		DE68H		DM52C		DW48A		ED34F		EM85A		ES04B		EZ03A		FF88B		FL66J		FU50A	
5			8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/28/02		6/26/02		08/28/02		11/12/02		2/13/03		5/9/03		8/29/03	
123	**PAHs (µg/L)**																											
124	**EPA Method SW8270 SIM**																											
125	Naphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD
1			
2			
3		LW3D	
4		FY82I	
5		10/24/03	
123	**PAHs (µg/L)**		
124	**EPA Method SW8270 SIM**		
125	Naphthalene	NA	
126	2-Methylnaphthalene	NA	
127	Acenaphthylene	NA	
128	Acenaphthene	NA	
129	Fluorene	NA	
130	Anthracene	NA	
131	Dibenzofuran	NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
2							Dup of LW4D										Dup of LW4D				Dup of LW4D			
3			LW4D		LW4D		LW40D		LW4D		LW4D		LW4D (a)		LW4D		LW40D		LW4D		LW40D		LW4D	
4			S167I		T176M		T176L		U235N		V232F		B802035-02		W391E		W391I		Y314E		Y314B		Z225J	
5			4/1/97		7/16/97		7/16/97		10/22/97		1/30/98		1/30/98		5/20/98		5/20/98		8/17/98		8/17/98		11/14/98	
7	1	**CHLORINATED PHENOLS (µg/L)**																						
8	2	**EPA Method SW8040**																						
9	3	Pentachlorophenol	**450**		**8200**		**7200**		**8700**		**14000**		**16500**		**4300**		**4400**		**3300**		**3300**		**2400**	
10	4	2,4,6-Trichlorophenol	**0.44**		**4.0**		**3.7**		**4.8**		**8.8**		NA		**5.3**		**5.4**		**6.3**		**6.5**		**20**	J2
11	5	2,3,6-Trichlorophenol	0.29	U	1.8	U	1.8	U	0.73	U	0.25	U	NA		0.25	U	0.25	U	0.82	U	0.90	U	0.46	U
12	6	2,4,5-Trichlorophenol	11	U	39	U	30	U	76	U	**39**		NA		**90**		**90**		51	U	51	U	60	U
13	7	2,3,4-Trichlorophenol	0.28	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**20**		**880**		**770**		**600**		**940**		**746**		**240**		**250**		**270**		**280**		**210**	J2
15	9	2,3,4,5-Tetrachlorophenol	**6.1**		**29**		**26**		**19**		**20**		NA		50	U	50	U	**16**		**14**		**8.4**	
16	10																							
17	11	**SEMIVOLATILES (µg/L)**																						
18	12	**EPA Method SW8270**																						
19	13	Phenol	**150**		**180**		**200**		**58**		**30**		100	U	**16**		**17**		**10**		**8.1**		**7.7**	
20	14	4-Methylphenol	**11**		**33**		**32**		1.0	U	**8.7**		100	U	**16**		**15**		1.0	U	1.0	U	**10**	
21	15	Isophorone	1.0	U	1.0	U	1.0	U	**1.8**		**2.3**		NA		1.0	U	1.0	U	**1.1**		1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	200	U	**17**	J2	**18**	J2	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	**22**		**28**	J2	**47**	J2	10	U	10	U	NA		10	U	10	U	10	U	10	U	10	U
24	18	Naphthalene	**35**		**44**		**46**		**36**		**30**		NA		**16**	J2	**21**	J2	**18**	J2	**23**	J2	**28**	
25	19	2-Methylnaphthalene	**52**		**67**		**74**		**45**		**44**		NA		**24**	J2	**32**	J2	**42**		**49**		**57**	
26	20	2,4,6-Trichlorophenol	5.0	U	**8.0**		**9.4**		**7.5**		**9.3**		100	U	**7.3**	J2	**9.4**	J2	5.0	U	5.0	U	**18**	J2
27	21	2,4,5-Trichlorophenol	**14**		**43**		**49**		**69**		**78**		100	U	**57**		**60**		**7.4**		**6.7**		**69**	
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	**390**		**10000**		**12000**		**18000**		**16000**		**13500**		**5300**		**5200**		**3100**		**2900**		**4600**	
32	26	bis(2-Ethylhexyl)phthalate	10	UJ	1.0	U	1.0	U	**2.0**		1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
33	27																							
34	28	**VOLATILES (µg/L)**																						
35	29	**EPA Method SW8260**																						
36	30	Acetone	**16**		**42**		**43**		**25**		**29**		NA		**17**		**17**		**11**		**9.2**		**12**	
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	**12**		**12**		5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	**10**		**6.4**		**6.3**		**17**		**11**		NA		**5.4**		**5.4**		**10**		**9.6**		**5.7**	
42	36	Ethylbenzene	**140**		**190**		**190**		**180**		**130**		NA		**12**		**13**		**100**		**95**		**93**	
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	**390**		**580**		**600**		**730**		**500**		NA		**450**		**450**		**320**		**320**		**340**	
45	39	o-Xylene	**77**		**140**		**140**		**150**		**100**		NA		**110**		**110**		**120**		**95**		**94**	
46	40	1,3,5-Trimethylbenzene	**170**		**190**		**180**		**330**		**140**		NA		**160**		**150**		**180**		**170**		**120**	
47	41	1,2,4-Trimethylbenzene	**580**		**630**		720		**1100**	J2	**560**		NA		**480**		**550**		**590**		**570**		**460**	J2
48	42	Isopropylbenzene	**110**		**120**		**120**		**140**	J2	**81**		NA		**7.5**		**7.4**		**100**		**85**		**54**	
49	43	n-Propylbenzene	**140**		**160**		**150**		**190**		**110**		NA		**7.6**		**7.3**		**120**		**110**		**78**	
50	44	tert-Butylbenzene	1.0	U	1.0	U	**4.1**	J2	**3.8**		**2.6**		NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	**15**		**20**		**18**		**18**	J2	**12**		NA		1.0	U	1.0	U	**22**	J2	1.0	UJ	1.0	U
52	46	4-Isopropyltoluene	**10**		**15**		**14**		**14**	J2	**10**		NA		**5.4**		**5.4**		**15**		**12**		**8.5**	
53	47	n-Butylbenzene	**14**		**20**		**18**		**17**	J2	**13**		NA		4.4	U	4.2	U	**21**	J2	**16**	J2	**12**	J2
54	48	Naphthalene	**54**		**87**		**84**		**92**	J2	**78**		NA		**41**		**41**		**50**		**48**		**28**	
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																							
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																						
58	51	**Method OR-DEQ**																						
59	52	**TPH-Diesel**	**7.2**		**12**		**12**		**15**		**11**		NA		**7.2**		**6.8**		**6.5**	J2	**8.2**	J2	**4.6**	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																							
63	56	**PRIORITY POLLUTANT**																						
64	57	**METALS (mg/L)**																						
65	58	Arsenic (7060)	**0.024**		**0.025**		**0.025**		0.05	U	0.05	U	NA		**0.028**		**0.028**		**0.028**		**0.029**		**0.028**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU
2		Dup of LW4D				Dup of LW4D						Dup of LW4D				Dup of LW4D								
3		LW40D		LW4D		LW40D		LW4D		LW4D		LW40D		LW4D		LW40D		LW4D		LW4D		LW4D		LW4D
4		Z225L		Z960P		Z960K		AH49H		AU45G		AU45I		BC21J		BC27P		BH96E		BR55D		CB68D		CL03G
5		11/14/98		2/17/99		2/17/99		5/18/99		9/22/99		9/22/99		12/9/99		12/9/99		2/17/00		5/22/00		8/30/00		11/9/00
7	**CHLORINATED PHENOLS (µg/L)**																							
8	**EPA Method SW8040**																							
9	Pentachlorophenol	**2300**		**2300**		**2400**		**2.5**		**0.85**	J2	**0.58**	J2	**1.5**	J2	**3.4**	J2	**0.60**		**0.41**	J2	**0.30**		0.25
10	2,4,6-Trichlorophenol	**16**	J2	**9.6**	J	**13**	J	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
11	2,3,6-Trichlorophenol	0.47	U	1.2	U	1.1	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
12	2,4,5-Trichlorophenol	26	U	80	U	48	U	0.39	U	0.25	U	0.25	U	0.34	U	0.69	U	0.25	U	0.25	U	0.41	U	0.25
13	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**160**	J2	**130**		**140**		**0.26**		0.25	U	0.25	U	**1.4**	J2	**3.0**	J2	0.25	U	0.25	U	0.25	U	0.25
15	2,3,4,5-Tetrachlorophenol	**8.4**		**67**	J	**42**	J	**0.49**		0.25	U	0.25	U	0.25	U	**0.19**	J1	0.25	U	0.25	U	0.25	U	0.25
16																								
17	**SEMIVOLATILES (µg/L)**																							
18	**EPA Method SW8270**																							
19	Phenol	**7.6**		**23**		**25**		2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	**110**		2.0
20	4-Methylphenol	**9.4**		**7.5**		**7.7**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	**11**		10
24	Naphthalene	**28**		**23**		**25**		1.0	U	**27**	J2	**14**	J2	**19**		**19**		**24**		**10**		**11**		**5.4**
25	2-Methylnaphthalene	**58**		**64**		**65**		1.0	U	**41**	J2	**22**	J2	**30**		**30**		**30**		**18**		**18**		**11**
26	2,4,6-Trichlorophenol	**20**	J2	**12**		**11**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
27	2,4,5-Trichlorophenol	**66**		**59**		**55**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
31	Pentachlorophenol	**3800**		**4000**		**3700**		**6.5**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**8.9**		5.0
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**0.7**	J1	**0.7**	J1	1.0	U	1.0	U	1.0	U	2.8
33																								
34	**VOLATILES (µg/L)**																							
35	**EPA Method SW8260**																							
36	Acetone	**13**		**16**		**15**		**16**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	25	U	17
37	Carbon Disulfide	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U	1.0
38	2-Butanone	5.0	U	15	U	**7.4**		**8.2**		**28**		**32**		5.0	U	5.0	U	5.0	U	5.0	U	25	U	**14**
39	Benzene	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.2**		5.0	U	1.0
40	Bromoform	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U	1.0
41	Toluene	**5.0**		**6.0**		**6.5**		**11**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.4**		5.0	U	1.0
42	Ethylbenzene	**80**		**52**		**62**		**220**		**39**		**38**		**21**		**21**		**18**		**22**		**39**		**1.3**
43	Styrene	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U	1.0
44	m,p-Xylene	**300**		**320**		**320**		**720**		**110**		**110**		**88**		**90**		**76**		**100**		**120**		**3.6**
45	o-Xylene	**78**		**84**		**95**		**130**		**5.4**		**4.5**		**20**		**20**		**8.1**		**11**		**13**		1.0
46	1,3,5-Trimethylbenzene	**99**		**170**		**140**		**160**		**70**		**70**		**94**		**96**		**90**		**70**		**50**		**12**
47	1,2,4-Trimethylbenzene	**590**	J2	**550**		**520**		**700**		**320**		**310**		**260**		**280**		**290**		**300**		**270**		**240**
48	Isopropylbenzene	**46**		**42**		**43**		**92**		**65**		**68**		**40**		**39**		**79**		**54**		**62**		**56**
49	n-Propylbenzene	**65**		**51**		**54**		**130**		**69**		**71**		**45**		**45**		**87**		**61**		**76**		**60**
50	tert-Butylbenzene	1.0	U	**3.0**		**2.9**		**4.3**		1.0	U	1.0	U	**2.0**		**2.0**		**4.2**		**2.6**		5.0	U	**2.9**
51	sec-Butylbenzene	1.0	U	**8.3**		**9.2**		**16**		**14**		**14**		**7.3**		**7.3**		**15**		**9.8**		**11**		**9.1**
52	4-Isopropyltoluene	**6.8**		**8.3**		**8.1**		**11**		**7.6**		**6.9**		**7.3**		**7.5**		**6.6**		**4.3**		**7.6**		1.0
53	n-Butylbenzene	**8.9**	J2	**9.7**		**10**		**16**		12	U	12	U	8.0	U	8.3	U	**14**		9.2	U	9.7	U	**7.0**
54	Naphthalene	**28**		**41**		**44**		**57**		**34**		**33**		**28**		**30**		**50**		**34**		**26**		**12**
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56																								
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																							
58	**Method OR-DEQ**																							
59	**TPH-Diesel**	**4.6**		**6.9**		**7.3**		**5.0**		**4.2**	J2	**3.2**	J2	**3.1**		**2.9**		**3.8**		**2.8**		**3.3**		**5.4**
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.50
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62																								
63	**PRIORITY POLLUTANT**																							
64	**METALS (mg/L)**																							
65	Arsenic (7060)	**0.030**		**0.030**		**0.029**		**0.029**		**0.030**		**0.033**		**0.024**		**0.025**		**0.030**		**0.025**		**0.029**		**0.028**

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TIME OIL - NORTHWEST TERMINAL

	B	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT
3			LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D	
4			CT67D		DE87K		DM30D		DW29G		ED30H		EN00H		ER93L		EZ17F		FF65G		FL58E		FU45N		FY82L	
5			2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/13/02		2/11/03		5/8/03		8/28/03		10/24/03	
7	**CHLORINATED PHENOLS (µg/L)**																									
8	**EPA Method SW8040**																									
9	Pentachlorophenol	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.3	U	0.25	U	0.26	U	0.26	U	**1**	J	0.5	U
10	2,4,6-Trichlorophenol	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																										
17	**SEMIVOLATILES (µg/L)**																									
18	**EPA Method SW8270**																									
19	Phenol	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.4	U	2.3	U	2.1	U	2	U	2	U	2	U
20	4-Methylphenol	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1	U	1	U
21	Isophorone	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1	U	1	U
22	2,4-Dimethylphenol	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.6	U	3.4	U	3.1	U	3.1	U	3.1	U	3	U
23	Benzoic Acid	U	10	U	10	U	10	U	30	U	50	U	50	U	60	U	57	U	52	U	51	U	51	U	10	U
24	Naphthalene		**2.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1	U	1	U
25	2-Methylnaphthalene		**11**		**3.6**		**3.3**		**1.4**		**1.8**		**1.6**		1.2	U	1.1	U	1	U	1	U	1	U	1	U
26	2,4,6-Trichlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6	U	5.7	U	5.2	U	5.1	U	5.1	U	5	U
27	2,4,5-Trichlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6	U	5.7	U	5.2	U	5.1	U	5.1	U	5	U
28	Acenaphthene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1	U	1	U
29	Dibenzofuran	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1	U	1	U
30	Fluorene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1	U	1	U
31	Pentachlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6	U	5.7	U	5.2	U	5.1	U	5.1	U	5	U
32	bis(2-Ethylhexyl)phthalate	U	1.0	U	1.0	U	1.0	U	1.0	U	4.0	U	4.0	U	4.8	U	4.5	U	1	U	1	U	1	U	1	U
33																										
34	**VOLATILES (µg/L)**																									
35	**EPA Method SW8260**																									
36	Acetone	U	5.0	U	**22**		**42**		**77**		**14**		20	U	**8.2**		9	U	**96**		**11**	M	**12**	J	**6.6**	M
37	Carbon Disulfide	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone		**26**		**14**		5.0	U	5.0	U	**14**		5.0	U	**13**	M	5	U	5	U	5	U	**13**	M	**9.1**	M
39	Benzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
40	Bromoform	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
42	Ethylbenzene		**1.3**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
43	Styrene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene		**3.0**		**1.4**		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
45	o-Xylene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene		**14**		**13**		**3.4**		**1.4**		**2.4**		**1.1**		1	U	1	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene		**120**		**84**		**49**		**7.2**		**48**		**9.5**		**15**		1	U	**3**		**5.5**		1	U	**1.4**	
48	Isopropylbenzene		**58**		**31**		**14**		**3.9**		**14**		**5.0**		**5.7**		**4.2**		**3.7**		**7**		**2.6**		**1.9**	
49	n-Propylbenzene		**60**		**39**		**16**		**5.2**		**14**		**5.1**		**4.9**		**4.2**		**2.9**		**5.3**		**1.6**		**1.6**	
50	tert-Butylbenzene		**2.8**		**1.7**		**1.3**	M	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene		**9.8**		**7.4**		**4.1**		**1.6**		**2.8**		**1.7**		**1.8**		**1.3**		1	U	**1.6**		1	U	1	U
52	4-Isopropyltoluene	U	1.0	U	**2.3**		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene		**7.8**		**6.2**		**3.4**	M	1.7	U	**2.3**		1.6	U	**1.6**		**1.1**	M	1	U	**1.2**		1	U	1	U
54	Naphthalene		**8.9**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																										
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																									
58	**Method OR-DEQ**																									
59	**TPH-Diesel**		**4.4**		**3.5**		**3.4**		**1.8**		**4.0**		**2.8**		**3.2**		**2.4**		**3**		**2.6**		**1.8**		**1.6**	
60	**TPH-D Motor Oil**	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.5	U
61	**TPH-Gasoline**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																										
63	**PRIORITY POLLUTANT**																									
64	**METALS (mg/L)**																									
65	Arsenic (7060)		**0.03**		**0.028**		**0.032**		**0.022**		**0.040**		**0.027**		**0.028**		0.05	U	**0.03**		**0.04**		**0.04**		**0.028**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1																								
2							Dup of LW4D										Dup of LW4D				Dup of LW4D			
3			LW4D		LW4D		LW40D		LW4D		LW4D		LW4D (a)		LW4D		LW40D		LW4D		LW40D		LW4D	
4			S167I		T176M		T176L		U235N		V232F		B802035-02		W391E		W391I		Y314E		Y314B		Z225J	
5			4/1/97		7/16/97		7/16/97		10/22/97		1/30/98		1/30/98		5/20/98		5/20/98		8/17/98		8/17/98		11/14/98	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	NA		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	**0.003**		**0.004**		**0.003**		**0.002**		**0.005**		NA		**0.002**		**0.002**		**0.003**		**0.003**		0.002	U
68	61	Lead (7421)	0.001	U	0.001	U	0.001	U	0.02	U	0.02	U	NA		0.001	U	0.001	U	**0.001**		**0.001**		0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	NA		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	0.004	U	**0.008**	J2	**0.005**	J2	**0.023**		**0.014**		NA		0.004	U	**0.010**	J2	**0.006**		**0.010**		**0.007**	
71	64																							
72	65	**MAJOR IONS AND CONVENTIONALS**																						
73	66	Calcium (mg/L) (6010)	**49.9**		**49.7**		**51**		**45.6**		**42.2**		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**21.9**		**21.7**		**22.3**		**19.4**		**17.7**		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**1.2**		**1.0**		**1.0**		**1.2**		**1.0**		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**10.9**		**10.4**		**10.6**		**10.1**		**9.60**		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**240**		**200**		**200**		**200**		**140**		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**240**		**200**		**200**		**200**		**140**		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**240**	J2	**340**	J2	**260**		**250**	J2	NA		**240**		**230**		**240**		**270**		**270**	
81	74	Chloride (mg/L) (EPA 325.2)	**19**	J	**15**		**15**		**16**		**15**		NA		**13**		**12**		**13**		**12**		**11**	
82	75	N-Nitrate (mg-N/L) (Calculated)	0.010	U	0.010	U	0.010	U	**0.025**		0.010	UJ	NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	**0.026**	J	**0.032**	J2	**0.025**	J2	**0.010**		**0.019**	J2	NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.019**	J	**0.01**		**0.01**		**0.035**		**0.010**	J2	NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	**3.2**	J	2.5	U	**2.5**	U	2.5	U	2.5	U	NA		NA		NA		NA		NA		NA	
86	79																							

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU
2		Dup of LW4D				Dup of LW4D						Dup of LW4D				Dup of LW4D								
3		LW40D		LW4D		LW40D		LW4D		LW4D		LW40D		LW4D		LW40D		LW4D		LW4D		LW4D		LW4D
4		Z225L		Z960P		Z960K		AH49H		AU45G		AU45I		BC21J		BC27P		BH96E		BR55D		CB68D		CL03G
5		11/14/98		2/17/99		2/17/99		5/18/99		9/22/99		9/22/99		12/9/99		12/9/99		2/17/00		5/22/00		8/30/00		11/9/00
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.007**		**0.008**		0.005	U	0.005	U	0.005	U	0.005
67	Copper (6010)	0.002	U	**0.005**		**0.005**		0.002	U	**0.004**		**0.003**		**0.011**		**0.012**		**0.007**		0.002	U	**0.002**		**0.004**
68	Lead (7421)	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	**0.002**		**0.002**		**0.001**		0.001	U	0.001
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.01**		0.01	U	0.01	U	0.01
70	Zinc (6010)	**0.006**		**0.009**	J	**0.008**	J	**0.005**		**0.007**	J2	**0.016**	J2	0.020	U	0.021	U	**0.019**		**0.008**		**0.020**		**0.013**
71																								
72	**MAJOR IONS AND CONVENTIONALS**																							
73	Calcium (mg/L) (6010)	NA		**50.4**		**51.7**		NA		NA		NA		NA		NA		NA		NA		NA		NA
74	Magnesium (mg/L) (6010)	NA		**21.6**		**22.0**		NA		NA		NA		NA		NA		NA		NA		NA		NA
75	Potassium (mg/L) (6010)	NA		**0.7**	J	**0.9**	J	NA		NA		NA		NA		NA		NA		NA		NA		NA
76	Sodium (mg/L) (6010)	NA		**10.6**		**10.9**		NA		NA		NA		NA		NA		NA		NA		NA		NA
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		**210**		**210**		NA		NA		NA		NA		NA		NA		NA		NA		NA
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		**210**		**210**		NA		NA		NA		NA		NA		NA		NA		NA		NA
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**280**		**360**		**320**		**310**		**300**		**270**		**260**		**290**		**270**		**270**		**360**		**370**
81	Chloride (mg/L) (EPA 325.2)	**13**		**17**		**18**		**12**		**12**		**12**		**13**		**14**		**12**		**12**		**9.8**		**16**
82	N-Nitrate (mg-N/L) (Calculated)	NA		**0.010**		0.010	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		**0.015**	J	**0.023**	J	NA		NA		NA		NA		NA		NA		NA		NA		NA
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		**0.025**	J	**0.018**	J	NA		NA		NA		NA		NA		NA		NA		NA		NA
85	Sulfate (mg/L) (EPA 375.2)	NA		**6.1**	J	**8.8**	J	NA		NA		NA		NA		NA		NA		NA		NA		NA
86																								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT
1																										
2																										
3			LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D	
4			CT67D		DE87K		DM30D		DW29G		ED30H		EN00H		ER93L		EZ17F		FF65G		FL58E		FU45N		FY82L	
5			2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/13/02		2/11/03		5/8/03		8/28/03		10/24/03	
66	Chromium (6010)	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.009**	
67	Copper (6010)		**0.005**		**0.003**		**0.004**		**0.003**		**0.004**		**0.003**		**0.004**		**0.004**		**0.002**		**0.002**		**0.005**		**0.006**	
68	Lead (7421)	U	0.001	U	0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	**0.002**		0.02	U	0.001	U	**0.002**		0.001	U	0.001	U
69	Nickel (6010)	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.02**		0.01	U
70	Zinc (6010)		**0.016**		**0.011**		0.012		**0.011**		**0.010**	J	**0.009**		**0.009**		**0.011**		**0.021**		**0.009**		**0.006**		**0.017**	
71																										
72	**MAJOR IONS AND CONVENTIONALS**																									
73	Calcium (mg/L) (6010)		**71.3**		**74.5**		**81.3**		**57.1**		**67.1**		**65.9**		NA		NA		**56.5**		NA		NA		NA	
74	Magnesium (mg/L) (6010)		**30.1**		**31.0**		**35.2**		**25.2**		**31.9**		**29.4**		NA		NA		**25.9**		NA		NA		NA	
75	Potassium (mg/L) (6010)		**1.6**		**1.4**		**1.5**		**1.8**		**1.0**		**1.3**		NA		NA		**1.4**		NA		NA		NA	
76	Sodium (mg/L) (6010)		**14.5**		**14.5**		**16.5**		**16.4**		**15.9**		**18.2**		NA		NA		**16.1**		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		**360**		NA		NA		NA		**430**		NA		NA		NA		**330**		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		1	U	NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		**360**		NA		NA		NA		**430**		NA		NA		NA		**330**		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**430**		**460**	J	**430**	J	**350**		**400**		**360**		**430**		**390**		**360**		**400**		**390**		**340**	
81	Chloride (mg/L) (EPA 325.2)		**24**	J	**18**		**18**		**12**		**14**	J	**15**		**13**		**15**		**15**		**11**		**7.8**		**11**	
82	N-Nitrate (mg-N/L) (Calculated)		0.010	U	NA		NA		NA		**0.012**		NA		NA		NA		0.01	U	NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		**0.037**	J	NA		NA		NA		**0.012**		NA		NA		NA		**0.052**		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		**0.045**		NA		NA		NA		**0.024**		NA		NA		NA		**0.045**		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		**8.6**		NA		NA		NA		**9.5**		NA		NA		NA		**8.5**		NA		NA		NA	
86																										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
2							Dup of LW4D										Dup of LW4D				Dup of LW4D			
3			LW4D		LW4D		LW40D		LW4D		LW4D		LW4D (a)		LW4D		LW40D		LW4D		LW40D		LW4D	
4			S167I		T176M		T176L		U235N		V232F		B802035-02		W391E		W391I		Y314E		Y314B		Z225J	
5			4/1/97		7/16/97		7/16/97		10/22/97		1/30/98		1/30/98		5/20/98		5/20/98		8/17/98		8/17/98		11/14/98	
87	80	**FIELD PARAMETERS**																						
88	81	pH (avg)	6.65		6.67		6.67		6.94		6.84		6.84		6.51		6.51		6.49		6.48		6.39	
89	82	Temperature (° C) (avg)	12.9		15.1		14.9		13.6		13.5		13.5		13.3		13.3		18.1		18.3		13.5	
90	83	Conductivity (um/hos)	559		491		490		375		381		381		368		367		557		560		120	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		NA		NA		1.74		1.74		1.00		1.00		1.44	
92	85																							
93	86	**DIOXINS AND FURANS (ng/L)**																						
94	87	**Method 8290**																						
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		0.0027	U	NA		NA		NA		0.0049	U	NA		0.0023	U
96	89	Total TCDF	NA		NA		NA		NA		0.0027	U	NA		NA		NA		0.0049	U	NA		0.0023	U
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		0.0029	U	NA		NA		NA		0.0063	U	NA		0.0045	U
98	91	Total TCDD	NA		NA		NA		NA		0.0029	U	NA		NA		NA		0.0063	U	NA		0.0045	U
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		0.0018	U	NA		NA		NA		0.0035	U	NA		**0.0012**	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		0.0019	U	NA		NA		NA		0.0050	U	NA		0.0034	U
101	94	Total PeCDF	NA		NA		NA		NA		0.0019	U	NA		NA		NA		0.0043	U	NA		**0.0012**	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		0.0052	U	NA		NA		NA		0.0071	U	NA		0.0072	U
103	96	Total PeCDD	NA		NA		NA		NA		0.0052	U	NA		NA		NA		**0.019**		NA		0.0072	U
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		0.0024	U	NA		NA		NA		0.0880	U	NA		0.0059	U
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		0.0026	U	NA		NA		NA		0.0390	U	NA		0.0020	U
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		0.0049	U	NA		NA		NA		0.0088	U	NA		0.0049	U
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		0.0052	U	NA		NA		NA		**0.066**		NA		0.0036	U
108	101	Total HxCDF	NA		NA		NA		NA		0.0110	U	NA		NA		NA		**0.210**		NA		0.0041	U
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		0.0032	U	NA		NA		NA		0.0140	U	NA		0.0056	U
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		0.0044	U	NA		NA		NA		0.0097	U	NA		0.0043	U
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		0.0031	U	NA		NA		NA		0.0048	U	NA		0.0040	U
112	105	Total HxCDD	NA		NA		NA		NA		0.0036	U	NA		NA		NA		**0.043**		NA		0.0046	U
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		0.0140	U	NA		NA		NA		0.0140	U	NA		0.0038	U
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		0.0030	U	NA		NA		NA		0.0062	U	NA		0.0022	U
115	108	Total HpCDF	NA		NA		NA		NA		0.0220	U	NA		NA		NA		**0.022**		NA		0.0030	U
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		**0.0240**		NA		NA		NA		**0.031**		NA		**0.0095**	
117	110	Total HpCDD	NA		NA		NA		NA		**0.0400**		NA		NA		NA		**0.045**		NA		**0.0160**	
118	111	OCDF	NA		NA		NA		NA		**0.0140**		NA		NA		NA		**0.032**		NA		**0.0088**	
119	112	OCDD	NA		NA		NA		NA		**0.1500**		NA		NA		NA		**0.300**		NA		**0.0720**	
120																								
121																								
122																								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU
2		Dup of LW4D				Dup of LW4D						Dup of LW4D				Dup of LW4D								
3		LW40D		LW4D		LW40D		LW4D		LW4D		LW40D		LW4D		LW40D		LW4D		LW4D		LW4D		LW4D
4		Z225L		Z960P		Z960K		AH49H		AU45G		AU45I		BC21J		BC27P		BH96E		BR55D		CB68D		CL03G
5		11/14/98		2/17/99		2/17/99		5/18/99		9/22/99		9/22/99		12/9/99		12/9/99		2/17/00		5/22/00		8/30/00		11/9/00
87	**FIELD PARAMETERS**																							
88	pH (avg)	6.37		6.86		6.85		5.88		5.99		6.60		6.68		6.65		6.72		6.66		6.02		5.96
89	Temperature (° C) (avg)	13.3		13.3		13.2		14.7		18.8		16.3		12.8		12.9		16.4		16.5		14.4		13.3
90	Conductivity (um/hos)	120		500		500		462		491		359		436		424		548		437		526		656
91	Dissolved oxygen (mg/L) (avg)	1.80		2.39		2.57		2.40		1.35		1.42		1.76		1.86		0.12		1.00		1.39		0.31
92																								
93	**DIOXINS AND FURANS (ng/L)**																							
94	**Method 8290**																							
95	2,3,7,8-TCDF	NA		0.0017	U	NA		0.0011	U	0.0018	U	NA		0.00068	U	NA		0.0034	U	NA		NA		NA
96	Total TCDF	NA		0.0017	U	NA		0.0011	U	0.0018	U	NA		0.00068	U	NA		0.0034	U	NA		NA		NA
97	2,3,7,8-TCDD	NA		0.0043	U	NA		0.0016	U	0.0031	U	NA		0.00130	U	NA		0.0058	U	NA		NA		NA
98	Total TCDD	NA		0.0043	U	NA		0.0016	U	0.0031	U	NA		0.00130	U	NA		0.0058	U	NA		NA		NA
99	1,2,3,7,8-PeCDF	NA		0.0028	U	NA		0.0021	U	0.0031	U	NA		0.00120	U	NA		0.0025	U	NA		NA		NA
100	2,3,4,7,8-PeCDF	NA		0.0036	U	NA		0.0027	U	0.0032	U	NA		0.00088	U	NA		0.0033	U	NA		NA		NA
101	Total PeCDF	NA		0.0032	U	NA		0.0024	U	0.0032	U	NA		0.00110	U	NA		0.0029	U	NA		NA		NA
102	1,2,3,7,8-PeCDD	NA		0.0046	U	NA		0.0023	U	0.0048	U	NA		0.00094	U	NA		0.0051	U	NA		NA		NA
103	Total PeCDD	NA		0.0046	U	NA		0.0023	U	0.0048	U	NA		0.00094	U	NA		0.0051	U	NA		NA		NA
104	1,2,3,4,7,8-HxCDF	NA		**0.0013**		NA		0.0035	U	0.0024	U	NA		0.00150	U	NA		0.0031	U	NA		NA		NA
105	1,2,3,6,7,8-HxCDF	NA		0.0024	U	NA		**0.0014**		0.0019	U	NA		0.00150	U	NA		0.0029	U	NA		NA		NA
106	2,3,4,6,7,8-HxCDF	NA		0.0036	U	NA		**0.0032**		**0.0024**		NA		0.0025	U	NA		0.0034	U	NA		NA		NA
107	1,2,3,7,8,9-HxCDF	NA		0.0044	U	NA		0.0039	U	0.0021	U	NA		0.00170	U	NA		0.0036	U	NA		NA		NA
108	Total HxCDF	NA		**0.0013**		NA		**0.0046**		**0.0024**		NA		0.0025	U	NA		0.0033	U	NA		NA		NA
109	1,2,3,4,7,8-HxCDD	NA		0.0054	U	NA		0.0051	U	0.0039	U	NA		0.00150	U	NA		0.0050	U	NA		NA		NA
110	1,2,3,6,7,8-HxCDD	NA		0.0037	U	NA		0.0052	U	0.0035	U	NA		0.00170	U	NA		0.0037	U	NA		NA		NA
111	1,2,3,7,8,9-HxCDD	NA		0.0036	U	NA		0.0039	U	0.0025	U	NA		0.00150	U	NA		0.0034	U	NA		NA		NA
112	Total HxCDD	NA		0.0042	U	NA		0.0047	U	0.0033	U	NA		0.00160	U	NA		0.0040	U	NA		NA		NA
113	1,2,3,4,6,7,8-HpCDF	NA		0.0026	U	NA		0.0039	U	0.0022	U	NA		0.0015	U	NA		0.0024	U	NA		NA		NA
114	1,2,3,4,7,8,9-HpCDF	NA		0.0045	U	NA		**0.0036**	U	0.0060	U	NA		0.00200	U	NA		0.0065	U	NA		NA		NA
115	Total HpCDF	NA		0.0036	U	NA		**0.0051**		0.0041	U	NA		**0.0036**	J1	NA		0.0044	U	NA		NA		NA
116	1,2,3,4,6,7,8-HpCDD	NA		**0.0055**		NA		**0.0110**		**0.0044**		NA		**0.0090**	J1	NA		0.0059	U	NA		NA		NA
117	Total HpCDD	NA		**0.0055**		NA		**0.0160**		**0.0044**		NA		**0.0160**	J1	NA		0.0040	U	NA		NA		NA
118	OCDF	NA		**0.0100**		NA		**0.0100**		0.0042	U	NA		**0.0058**	J1	NA		0.0048	U	NA		NA		NA
119	OCDD	NA		0.0420	U	NA		**0.0770**		**0.0440**		NA		0.0660	U	NA		**0.044**	J1	NA		NA		NA
120																								
121																								
122																								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT
1																										
2																										
3			LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D	
4			CT67D		DE87K		DM30D		DW29G		ED30H		EN00H		ER93L		EZ17F		FF65G		FL58E		FU45N		FY82L	
5			2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/13/02		2/11/03		5/8/03		8/28/03		10/24/03	
87	**FIELD PARAMETERS**																									
88	pH (avg)		6.49		6.91		6.94		6.61		6.48		6.65		7.04		6.31		7		6.97		7		6.79	
89	Temperature (° C) (avg)		13.8		14.7		15.4		13.3		14.2		14.4		15.8		14		14.1		14.1		17.3		14.6	
90	Conductivity (um/hos)		673		778		757		592		705		624		613		564		704		599		526		523	
91	Dissolved oxygen (mg/L) (avg)		0.19		0.48		0.98		4.41		7.10		4.00		1.24		0.37		0.76		1.68		1.66		2.57	
92																										
93	**DIOXINS AND FURANS (ng/L)**																									
94	**Method 8290**																									
95	2,3,7,8-TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																										
121																										
122																										

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PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1																								
2							Dup of LW4D										Dup of LW4D				Dup of LW4D			
3			LW4D		LW4D		LW40D		LW4D		LW4D		LW4D (a)		LW4D		LW40D		LW4D		LW40D		LW4D	
4			S167I		T176M		T176L		U235N		V232F		B802035-02		W391E		W391I		Y314E		Y314B		Z225J	
5			4/1/97		7/16/97		7/16/97		10/22/97		1/30/98		1/30/98		5/20/98		5/20/98		8/17/98		8/17/98		11/14/98	
123		**PAHs (µg/L)**																						
124		**EPA Method SW8270 SIM**																						
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU
1																								
2		Dup of LW4D				Dup of LW4D						Dup of LW4D				Dup of LW4D								
3		LW40D		LW4D		LW40D		LW4D		LW4D		LW40D		LW4D		LW40D		LW4D		LW4D		LW4D		LW4D
4		Z225L		Z960P		Z960K		AH49H		AU45G		AU45I		BC21J		BC27P		BH96E		BR55D		CB68D		CL03G
5		11/14/98		2/17/99		2/17/99		5/18/99		9/22/99		9/22/99		12/9/99		12/9/99		2/17/00		5/22/00		8/30/00		11/9/00
123	**PAHs (µg/L)**																							
124	**EPA Method SW8270 SIM**																							
125	Naphthalene	NA		**22**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126	2-Methylnaphthalene	NA		**60**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127	Acenaphthylene	NA		0.10	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128	Acenaphthene	NA		**0.44**	M	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129	Fluorene	NA		0.10	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130	Anthracene	NA		0.10	U	NA		NA		NA		NA				NA		NA		NA		NA		NA
131	Dibenzofuran	NA		**0.34**	M	NA		NA		NA		NA				NA		NA		NA		NA		NA

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT
1																										
2																										
3			LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D	
4			CT67D		DE87K		DM30D		DW29G		ED30H		EN00H		ER93L		EZ17F		FF65G		FL58E		FU45N		FY82L	
5			2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/13/02		2/11/03		5/8/03		8/28/03		10/24/03	
123	**PAHs (µg/L)**																									
124	**EPA Method SW8270 SIM**																									
125	Naphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4			S167G		T176I		U235R		V208I		W391D		Y314C		Z225B		Z960G		AH27I		AU45D		BC27F		BH96I	
5			3/31/97		7/15/97		10/22/97		1/28/98		5/20/98		8/17/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/17/00	
6																										
7	1	**CHLORINATED PHENOLS (µg/L)**																								
8	2	**EPA Method SW8040**																								
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.42**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
16	10																									
17	11	**SEMIVOLATILES (µg/L)**																								
18	12	**EPA Method SW8270**																								
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.0	UJ	**1.1**	J2	**1.3**		**1.2**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**4.6**	
33	27																									
34	28	**VOLATILES (µg/L)**																								
35	29	**EPA Method SW8260**																								
36	30	Acetone	5.0	U	5.0	U	**5.1**		5.0	U	**7.1**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	**2.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
48	42	Isopropylbenzene	**41**		**61**		**78**	J2	**76**		**56**		**96**		**93**		**32**		**31**		**52**		**43**		**68**	
49	43	n-Propylbenzene	**14**		**28**		**40**		**36**		**20**		**44**		**32**		**8.9**		**9.3**		**14**		**7.7**		**10**	
50	44	tert-Butylbenzene	**2.4**		**2.7**	J2	**2.8**		**2.3**		**2.8**		**3.8**		**3.2**		**2.0**		**2.4**		**3.5**		**3.0**		**4.1**	
51	45	sec-Butylbenzene	**5.7**		**8.3**		**8.5**	J2	**7.1**		**7.8**		**14**	J2	**9.7**		**3.6**		**5.4**		**10**		**8.2**		**12**	
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
53	47	n-Butylbenzene	**1.6**		**2.8**		**2.8**	J2	**2.9**		2.7	U	**5.0**		**3.2**		**1.2**		**2.1**		3.0	U	2.3	U	**3.6**	
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	51	**Method OR-DEQ**																								
59	52	**TPH-Diesel**	**1.0**		**1.0**		**1.2**		**0.80**		**0.86**		**1.3**		**1.0**		**0.62**		**0.92**		**1.4**		**1.0**		**1.0**	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																									
63	56	**PRIORITY POLLUTANT**																								
64	57	**METALS (mg/L)**																								
65	58	Arsenic (7060)	**0.013**		**0.015**		0.05	U	0.05	U	**0.017**		**0.011**		**0.016**		**0.014**		**0.018**		**0.016**		**0.016**		**0.016**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
3		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4		BR64J		CB85E		CL03C		CT55B		DE87G		DM30B		DW29H		ED23H		EM85I		ER93C		EZ03E		FF76F		FL66E	
5		5/24/00		8/30/00		11/8/00		2/13/01		6/5/01		8/13/01		11/27/01		2/26/02		6/26/02		08/26/02		11/12/02		2/12/03		5/9/03	
7	**CHLORINATED PHENOLS (µg/L)**																										
8	**EPA Method SW8040**																										
9	Pentachlorophenol	0.25	U	0.25	U	0.25	U	**0.46**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.3	U	0.25	U	0.25	U	**0.47**	
10	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																											
17	**SEMIVOLATILES (µg/L)**																										
18	**EPA Method SW8270**																										
19	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.4	U	2.2	U	2	U	2	U
20	4-Methylphenol	**1.0**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.6	U	3.3	U	3	U	3	U
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U	60	U	54	U	50	U	50	U
24	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U
25	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6	U	5.4	U	5	U	5	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6	U	5.4	U	5	U	5	U
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6	U	5.4	U	5	U	5	U
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	4.0	U	4.0	U	4.8	U	4.3	U	**13**		1	U
33																											
34	**VOLATILES (µg/L)**																										
35	**EPA Method SW8260**																										
36	Acetone	5.0	U	5.0	U	5.0	U		R	5.0	U	5.0	U	5.0	U	5.0	U	**6.8**		5	U	**16**		5	U	**9.6**	
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
38	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U
39	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
41	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
42	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
45	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	**24**		**16**		**24**		**14**		**10**		**8.8**		**2.6**		**7.0**		**2.6**		**7.5**		**3.4**		**4**		**2.7**	
49	n-Propylbenzene	**4.4**		1.0	U	**2.8**		**1.4**		**1.1**		**1.4**		1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
50	tert-Butylbenzene	**2.3**		**3.5**		**2.8**		**2.8**		**3.4**		**2.8**		**3.1**		**3.1**		**1.8**		**3.4**		**3.2**		**3.1**		**2**	
51	sec-Butylbenzene	**4.4**		**6.0**		**6.4**		**5.3**		**4.7**		**4.3**		**2.4**		**3.4**		**1.7**		**3.3**		**2.2**		**2.5**		**1.8**	
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	**1.7**	M	1.2	U	1.0	U	**1.3**	M	1.3	U	1.4	U	1.0	U	**1.2**	M	1.0	U	1	U	1	U	1	U	1	U
54	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																											
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	**Method OR-DEQ**																										
59	**TPH-Diesel**	**1.1**		**1.2**		**1.2**		**1.8**		**1.4**		**1.7**		**1.8**		**1.9**		**1.6**		**2.6**		**2.2**		**2.3**		**2.2**	
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																											
63	**PRIORITY POLLUTANT**																										
64	**METALS (mg/L)**																										
65	Arsenic (7060)	**0.012**		**0.018**		**0.015**		**0.015**		**0.017**		**0.020**		**0.021**		**0.016**		**0.016**		**0.02**		0.05	U	**0.011**		**0.017**	

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD
1					
2					
3		LW6D		LW6D	
4		FU45R		FY82O	
5		8/28/03		10/24/03	
6					
7	**CHLORINATED PHENOLS (µg/L)**				
8	**EPA Method SW8040**				
9	Pentachlorophenol	**0.6**	J	**1.1**	
10	2,4,6-Trichlorophenol	NA		NA	
11	2,3,6-Trichlorophenol	NA		NA	
12	2,4,5-Trichlorophenol	NA		NA	
13	2,3,4-Trichlorophenol	NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA	
16					
17	**SEMIVOLATILES (µg/L)**				
18	**EPA Method SW8270**				
19	Phenol	2.1	U	2	U
20	4-Methylphenol	1	U	1	U
21	Isophorone	1	U	1	U
22	2,4-Dimethylphenol	3.1	U	3.1	U
23	Benzoic Acid	52	U	10	U
24	Naphthalene	1	U	1	U
25	2-Methylnaphthalene	1	U	1	U
26	2,4,6-Trichlorophenol	5.2	U	5.1	U
27	2,4,5-Trichlorophenol	5.2	U	5.1	U
28	Acenaphthene	1	U	1	U
29	Dibenzofuran	1	U	1	U
30	Fluorene	1	U	1	U
31	Pentachlorophenol	5.2	U	5.1	U
32	bis(2-Ethylhexyl)phthalate	1	U	1	U
33					
34	**VOLATILES (µg/L)**				
35	**EPA Method SW8260**				
36	Acetone	**6.2**	J	5	U
37	Carbon Disulfide	1	U	1	U
38	2-Butanone	5	U	5	U
39	Benzene	1	U	1	U
40	Bromoform	1	U	1	U
41	Toluene	1	U	1	U
42	Ethylbenzene	1	U	1	U
43	Styrene	1	U	1	U
44	m,p-Xylene	1	U	1	U
45	o-Xylene	1	U	1	U
46	1,3,5-Trimethylbenzene	1	U	1	U
47	1,2,4-Trimethylbenzene	1	U	1	U
48	Isopropylbenzene	**3.5**		**4.2**	
49	n-Propylbenzene	1	U	1	U
50	tert-Butylbenzene	**2.3**		**2.9**	
51	sec-Butylbenzene	**2.1**		**2.1**	
52	4-Isopropyltoluene	1	U	1	U
53	n-Butylbenzene	1	U	1	U
54	Naphthalene	5	U	5	U
55	Methyl tert-butyl ether	NA		NA	
56					
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**				
58	**Method OR-DEQ**				
59	**TPH-Diesel**	**1.9**		**1.1**	
60	**TPH-D Motor Oil**	NA		0.5	U
61	**TPH-Gasoline**	NA		NA	
62					
63	**PRIORITY POLLUTANT**				
64	**METALS (mg/L)**				
65	Arsenic (7060)	**0.014**		**0.016**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4			S167G		T176I		U235R		V208I		W391D		Y314C		Z225B		Z960G		AH27I		AU45D		BC27F		BH96I	
5			3/31/97		7/15/97		10/22/97		1/28/98		5/20/98		8/17/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/17/00	
66	59	Chromium (6010)	0.005	U	0.005	U	**0.011**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	**0.004**		**0.003**		**0.014**		**0.002**		**0.003**		0.002	U	0.002	U	0.002	U	0.002	U	**0.002**		0.002	U	0.002	U
68	61	Lead (7421)	**0.001**		**0.002**		0.02	U	0.02	U	**0.001**		0.001	U	**0.002**		0.001	U	0.001	U	0.001	U	**0.001**		0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U	**0.01**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	**0.006**		**0.009**	J2	**0.045**		**0.011**		**0.017**	J2	**0.006**		**0.009**		**0.008**	J	0.007	U	**0.009**		**0.011**	U	**0.010**	
71	64																									
72	65	**MAJOR IONS AND CONVENTIONALS**																								
73	66	Calcium (mg/L) (6010)	**47.2**		**44.2**		**49.1**		**41.8**		NA		NA		NA		**42.9**		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**19.9**		**19**		**20.3**		**16.3**		NA		NA		NA		**17.6**		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**3.0**		**2.7**		**3.5**		**2.4**		NA		NA		NA		**2.3**		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**15.6**		**13.9**		**14.1**		**12.1**		NA		NA		NA		**11.6**		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**250**		**190**		**210**		**200**		NA		NA		NA		**210**		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**250**		**190**		**210**		**200**		NA		NA		NA		**210**		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**260**	J2	**260**		**230**		**220**		**240**		**240**		**260**		**240**		**240**		**250**		**240**	
81	74	Chloride (mg/L) (EPA 325.2)	**8.4**	J	**4.1**		**3.9**		**2.7**		**3.3**		**2.0**		**2.6**		**4.2**		1.0	U	**3.1**		**4.3**		**2.8**	
82	75	N-Nitrate (mg-N/L) (Calculated)	**0.016**	J	0.010	U	**0.013**		0.010	U	NA		NA		NA		0.010	U	NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	**0.025**	J	**0.014**		**0.010**		**0.014**		NA		NA		NA		**0.018**		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.041**	J	0.010	U	**0.023**		**0.016**		NA		NA		NA		**0.017**		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	**4.7**	J	2.5	U	2.5	U	2.5	U	NA		NA		NA		**5.5**		NA		NA		NA		NA	
86	79																									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																											
3		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4		BR64J		CB85E		CL03C		CT55B		DE87G		DM30B		DW29H		ED23H		EM85I		ER93C		EZ03E		FF76F		FL66E	
5		5/24/00		8/30/00		11/8/00		2/13/01		6/5/01		8/13/01		11/27/01		2/26/02		6/26/02		08/26/02		11/12/02		2/12/03		5/9/03	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	0.002	U	**0.002**		**0.006**		0.002	U	**0.003**		**0.003**		0.002	U	0.002	U	0.002	U	**0.002**		0.002	U	**0.005**		0.002	U
68	Lead (7421)	**0.001**		**0.002**		**0.002**		**0.001**		**0.002**		**0.002**		0.001	U	0.001	U	0.001	U	0.001	U	0.02	U	0.001	U	**0.001**	
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)	0.006	U	**0.007**		**0.008**		**0.007**		**0.008**		**0.009**		0.006	U	**0.008**		0.006	U	**0.007**		0.006	U	**0.01**		**0.007**	
71																											
72	**MAJOR IONS AND CONVENTIONALS**																										
73	Calcium (mg/L) (6010)	NA		NA		NA		**40.8**		**44.2**		**40.8**		**40.9**		**42.5**		NA		NA		NA		**39.5**		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		**16.1**		**18.4**		**16.8**		**16.5**		**17.6**		NA		NA		NA		**16.7**		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		**2.1**		**3.2**		**2.6**		**2.0**		**2.7**		NA		NA		NA		**1.9**		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		**10.3**		**11.5**		**10.4**		**10.3**		**11.1**		NA		NA		NA		**9.6**		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		**200**		NA		NA		NA		**220**		NA		NA		NA		**300**		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		1	U	NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		**200**		NA		NA		NA		**220**		NA		NA		NA		**300**		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**230**		**240**		**220**		**290**	J	**240**	J	**220**	J	**250**		**260**		**240**		**270**		**310**		**280**		**260**	
81	Chloride (mg/L) (EPA 325.2)	**2.1**		**1.4**		**2.2**		**1.8**		**2.2**		**3.8**		**2.1**		**2.8**		**2.5**		**2.2**		**2.8**		**4.2**		**1.8**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		0.010	U	NA		NA		NA		**0.010**		NA		NA		NA		**0.048**		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		0.010	U	NA		NA		NA		**0.023**		NA		NA		NA		**0.015**		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		0.010	U	NA		NA		NA		**0.033**	J	NA		NA		NA		**0.063**		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		**3.3**		NA		NA		NA		2.5	U	NA		NA		NA		2.5	U	NA	
86																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD
1					
2					
3		LW6D		LW6D	
4		FU45R		FY82O	
5		8/28/03		10/24/03	
66	Chromium (6010)	0.005	U	**0.008**	
67	Copper (6010)	**0.004**		**0.005**	
68	Lead (7421)	0.001	U	**0.003**	
69	Nickel (6010)	0.01	U	0.01	U
70	Zinc (6010)	**0.007**		**0.013**	
71					
72	**MAJOR IONS AND CONVENTIONALS**				
73	Calcium (mg/L) (6010)	NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA	
75	Potassium (mg/L) (6010)	NA		NA	
76	Sodium (mg/L) (6010)	NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**290**		**250**	
81	Chloride (mg/L) (EPA 325.2)	**1.6**		**2.9**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA	
86					

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4			S167G		T176I		U235R		V208I		W391D		Y314C		Z225B		Z960G		AH27I		AU45D		BC27F		BH96I	
5			3/31/97		7/15/97		10/22/97		1/28/98		5/20/98		8/17/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/17/00	
87	80	**FIELD PARAMETERS**																								
88	81	pH (avg)	6.53		6.63		6.84		6.65		6.35		6.34		6.17		6.78		5.66		6.64		6.38		6.57	
89	82	Temperature (° C) (avg)	12.2		15.7		13.2		13.5		13.0		17.9		13.1		13.7		14.6		15.5		12.8		13.5	
90	83	Conductivity (um/hos)	504		501		377		431		369		559		134		448		360		398		409		420	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		1.85		NA		1.58		2.77		1.60		1.96		1.86		0.82	
92	85																									
93	86	**DIOXINS AND FURANS (ng/L)**																								
94	87	**Method 8290**																								
95	88	2,3,7,8-TCDF	NA		0.0027	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		0.0011-0.0028	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		0.0013	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		0.0011-0.0029	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		0.0035	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		0.0029	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		0.0013-0.0045	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		0.0052	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		0.0019-0.0061	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		0.0030	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		0.0032	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		0.0041	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		0.0047	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		0.0041	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		0.0051	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		0.0076	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		0.0041	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		0.0024-0.0089	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		0.0047	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		0.0054	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		0.0017-0.0069	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		**0.0250**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		**0.0360**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		**0.0350**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		**0.2400**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																										
121																										
122																										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																											
3		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4		BR64J		CB85E		CL03C		CT55B		DE87G		DM30B		DW29H		ED23H		EM85I		ER93C		EZ03E		FF76F		FL66E	
5		5/24/00		8/30/00		11/8/00		2/13/01		6/5/01		8/13/01		11/27/01		2/26/02		6/26/02		08/26/02		11/12/02		2/12/03		5/9/03	
87	**FIELD PARAMETERS**																										
88	pH (avg)	6.42		5.85		5.73		6.32		6.58		6.72		6.58		6.54		6.41		6.58		6.73		6.96		6.81	
89	Temperature (° C) (avg)	17.1		15.1		13.8		16.6		14.1		15.7		13.4		15.7		16.6		17.3		13.7		14.5		14.5	
90	Conductivity (um/hos)	421		398		360		408		428		413		410		381		331		373		499		494		354	
91	Dissolved oxygen (mg/L) (avg)	0.48		1.36		1.20		2.16		2.06		1.50		3.91		7.27		3.07		1.39		1.14		1.68		2.47	
92																											
93	**DIOXINS AND FURANS (ng/L)**																										
94	**Method 8290**																										
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																											
121																											
122																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD
2					
3		LW6D		LW6D	
4		FU45R		FY82O	
5		8/28/03		10/24/03	
87	**FIELD PARAMETERS**				
88	pH (avg)	6.87		6.57	
89	Temperature (° C) (avg)	16.3		14.7	
90	Conductivity (um/hos)	364		375	
91	Dissolved oxygen (mg/L) (avg)	2.1		2.86	
92					
93	**DIOXINS AND FURANS (ng/L)**				
94	**Method 8290**				
95	2,3,7,8-TCDF	NA		NA	
96	Total TCDF	NA		NA	
97	2,3,7,8-TCDD	NA		NA	
98	Total TCDD	NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA	
101	Total PeCDF	NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA	
103	Total PeCDD	NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA	
108	Total HxCDF	NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA	
112	Total HxCDD	NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA	
115	Total HpCDF	NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA	
117	Total HpCDD	NA		NA	
118	OCDF	NA		NA	
119	OCDD	NA		NA	
120					
121					
122					

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4			S167G		T176I		U235R		V208I		W391D		Y314C		Z225B		Z960G		AH27I		AU45D		BC27F		BH96I	
5			3/31/97		7/15/97		10/22/97		1/28/98		5/20/98		8/17/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/17/00	
123		**PAHs (µg/L)**																								
124		**EPA Method SW8270 SIM**																								
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																											
3		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4		BR64J		CB85E		CL03C		CT55B		DE87G		DM30B		DW29H		ED23H		EM85I		ER93C		EZ03E		FF76F		FL66E	
5		5/24/00		8/30/00		11/8/00		2/13/01		6/5/01		8/13/01		11/27/01		2/26/02		6/26/02		08/26/02		11/12/02		2/12/03		5/9/03	
123	**PAHs (µg/L)**																										
124	**EPA Method SW8270 SIM**																										
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD
1					
2					
3		LW6D		LW6D	
4		FU45R		FY82O	
5		8/28/03		10/24/03	
123	**PAHs (µg/L)**				
124	**EPA Method SW8270 SIM**				
125	Naphthalene	NA		NA	
126	2-Methylnaphthalene	NA		NA	
127	Acenaphthylene	NA		NA	
128	Acenaphthene	NA		NA	
129	Fluorene	NA		NA	
130	Anthracene	NA		NA	
131	Dibenzofuran	NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4			AH76Q		AU45E		BC27G		BH96Q		BR64M		CB85F		CL03D		CT67B		DE87H		DM30F		DW29B		ED34J		EM85H	
5			5/19/99		9/22/99		12/7/99		2/16/00		5/25/00		8/30/00		11/8/00		2/14/01		6/5/01		8/14/01		11/27/01		2/28/02		6/26/02	
6																												
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	**17**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.2	U	**2.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.1**		1.0	U	1.0	U	**3.1**		4.0	U	4.0	U
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**6.1**		5.0	U	**6.7**		**37**		**14**	
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
48	42	Isopropylbenzene	**10**		**5.5**		**8.5**		**1.1**		**3.0**		**3.0**		1.0	U	**2.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
49	43	n-Propylbenzene	**8.4**		**8.7**		**3.8**		1.0	U	**1.2**		**2.7**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	1.0	U	**2.3**		**1.4**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
53	47	n-Butylbenzene	1.0	U	**1.6**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.25**		0.25	U	**0.35**		0.25	U	**0.26**	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.50	U	NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.25	U	NA		NA	
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	**0.025**		**0.030**		**0.022**		**0.028**		**0.028**		**0.032**		**0.030**		**0.037**		**0.033**		**0.044**		**0.042**		**0.030**		**0.033**	

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
3		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4		ER93M		EZ03F		FF76K		FL66H		FU45P		FY82M	
5		08/27/02		11/12/02		2/12/03		5/9/03		8/28/03		10/24/03	
7	**CHLORINATED PHENOLS (µg/L)**												
8	**EPA Method SW8040**												
9	Pentachlorophenol	0.28	U	0.25	U	0.26	U	0.25	U	**0.55**	J	0.51	U
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA	
16													
17	**SEMIVOLATILES (µg/L)**												
18	**EPA Method SW8270**												
19	Phenol	2.2	U	2.3	U	2.1	U	2	U	2.1	U	2	U
20	4-Methylphenol	1.1	U	1.1	U	1	U	1	U	1	U	1	U
21	Isophorone	1.1	U	1.1	U	1	U	1	U	1	U	1	U
22	2,4-Dimethylphenol	3.3	U	3.4	U	3.1	U	3	U	3.1	U	3.1	U
23	Benzoic Acid	56	U	57	U	52	U	50	U	52	U	10	U
24	Naphthalene	1.1	U	1.1	U	1	U	1	U	1	U	1	U
25	2-Methylnaphthalene	1.1	U	1.1	U	1	U	1	U	1	U	1	U
26	2,4,6-Trichlorophenol	5.6	U	5.7	U	5.2	U	5	U	5.2	U	5.1	U
27	2,4,5-Trichlorophenol	5.6	U	5.7	U	5.2	U	5	U	5.2	U	5.1	U
28	Acenaphthene	1.1	U	1.1	U	1	U	1	U	1	U	1	U
29	Dibenzofuran	1.1	U	1.1	U	1	U	1	U	1	U	1	U
30	Fluorene	1.1	U	1.1	U	1	U	1	U	1	U	1	U
31	Pentachlorophenol	5.6	U	5.7	U	5.2	U	5	U	5.2	U	5.1	U
32	bis(2-Ethylhexyl)phthalate	4.4	U	4.6	U	1	U	1	U	1	U	1	U
33													
34	**VOLATILES (µg/L)**												
35	**EPA Method SW8260**												
36	Acetone	5	U	5	U	5	U	5	U	5	U	5	U
37	Carbon Disulfide	1	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	5	U	5	U	5	U	5	U	5	U	5	U
39	Benzene	1	U	1	U	1	U	1	U	1	U	1	U
40	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	1	U	1	U	1	U	1	U	1	U	1	U
42	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
43	Styrene	1	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	1	U	1	U	1	U	1	U	1	U	1	U
45	o-Xylene	1	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	1	U	1	U	**3.3**		1	U	**14**		**12**	
49	n-Propylbenzene	1	U	1	U	1		1	U	**7.8**		**5.4**	
50	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	1	U	1	U	1	U	1	U	**1.6**		**1.3**	
52	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
54	Naphthalene	5	U	5	U	5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA	
56													
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**												
58	**Method OR-DEQ**												
59	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	**0.34**		0.25	U
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		0.5	U
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA	
62													
63	**PRIORITY POLLUTANT**												
64	**METALS (mg/L)**												
65	Arsenic (7060)	**0.033**		0.05	U	**0.021**		**0.03**		**0.03**		**0.038**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4			AH76Q		AU45E		BC27G		BH96Q		BR64M		CB85F		CL03D		CT67B		DE87H		DM30F		DW29B		ED34J		EM85H	
5			5/19/99		9/22/99		12/7/99		2/16/00		5/25/00		8/30/00		11/8/00		2/14/01		6/5/01		8/14/01		11/27/01		2/28/02		6/26/02	
66	59	Chromium (6010)	**0.025**		**0.020**		**0.009**		**0.014**		0.005	U	**0.013**		**0.010**		**0.012**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	**0.027**		**0.019**		**0.011**		**0.016**		**0.004**		**0.013**		**0.015**		**0.014**		**0.009**		**0.002**		**0.005**		**0.004**		**0.002**	
68	61	Lead (7421)	**0.006**		**0.006**		**0.004**		**0.003**		**0.002**		**0.005**		**0.003**		**0.006**		0.001	U	0.001	U	**0.003**		0.001	U	0.001	U
69	62	Nickel (6010)	**0.02**		0.02	U	0.01	U	**0.02**		0.01	U	**0.01**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	**0.070**		**0.052**		**0.032**	U	**0.042**		**0.013**		**0.033**		**0.028**		**0.039**		**0.012**		0.006	U	**0.019**		**0.009**		**0.011**	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**28.8**		**37.0**		**39.8**		**39.3**		**40.0**		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**11.0**	J	**13.2**		**13.8**		**13.7**		**13.8**		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**2.0**		**1.9**		**1.8**		**1.6**		**2.0**		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**5.18**		**5.47**		**5.76**		**6.14**		**7.23**		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**150**		NA		NA		NA		**180**		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**150**		NA		NA		NA		**180**		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**130**		**120**		**130**		**110**		**140**		**150**		**170**		**190**		**210**	J	**200**		**220**		**260**		**220**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.4**		**2.6**		**2.7**		**3.1**		**2.6**		**2.4**		**2.1**		**2.9**	J	**2.1**		**3.3**		**1.8**		**2.4**		**3.0**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		0.010	U	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		**0.011**	J	NA		NA		NA		**0.018**		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		**0.018**		NA		NA		NA		**0.025**		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		**4.6**		NA		NA		NA		**5.3**		NA	
86	79																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1													
2													
3		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4		ER93M		EZ03F		FF76K		FL66H		FU45P		FY82M	
5		08/27/02		11/12/02		2/12/03		5/9/03		8/28/03		10/24/03	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.012**	
67	Copper (6010)	0.002	U	0.002	U	**0.002**		0.002	U	**0.004**		**0.011**	
68	Lead (7421)	**0.002**		0.02	U	0.001	U	0.001	U	0.001	U	**0.002**	
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)	**0.012**		**0.008**		**0.008**		0.006	U	**0.008**		**0.027**	
71													
72	**MAJOR IONS AND CONVENTIONALS**												
73	Calcium (mg/L) (6010)	NA		NA		**34.3**		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		**11.8**		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		**1.6**		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		**5.3**		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		**130**		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		1	U	NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		**130**		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**190**		**210**		**250**		**180**		**180**		**160**	
81	Chloride (mg/L) (EPA 325.2)	**2.5**		**2.2**		**1.9**		**2**		1	U	**1.2**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		**0.11**		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		**0.019**		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		**0.13**		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		**16**		NA		NA		NA	
86													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4			AH76Q		AU45E		BC27G		BH96Q		BR64M		CB85F		CL03D		CT67B		DE87H		DM30F		DW29B		ED34J		EM85H	
5			5/19/99		9/22/99		12/7/99		2/16/00		5/25/00		8/30/00		11/8/00		2/14/01		6/5/01		8/14/01		11/27/01		2/28/02		6/26/02	
87	80	**FIELD PARAMETERS**																										
88	81	pH (avg)	6.35		6.71		6.62		6.90		6.69		6.05		5.91		6.35		6.81		6.97		6.72		6.52		6.41	
89	82	Temperature (° C) (avg)	14.5		14.9		13.1		13.7		14.8		14.7		13.4		14.3		14.3		14.6		13.0		14.1		16.9	
90	83	Conductivity (um/hos)	171		160		166		198		198		227		242		259		330		324		345		361		310	
91	84	Dissolved oxygen (mg/L) (avg)	3.18		1.73		1.57		1.39		0.48		1.67		1.06		0.75		1.67		1.80		132		7.46		3.30	
92	85																											
93	86	**DIOXINS AND FURANS (ng/L)**																										
94	87	**Method 8290**																										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1													
2													
3		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4		ER93M		EZ03F		FF76K		FL66H		FU45P		FY82M	
5		08/27/02		11/12/02		2/12/03		5/9/03		8/28/03		10/24/03	
87	**FIELD PARAMETERS**												
88	pH (avg)	6.89		6.91		7.02		6.83		6.95		6.69	
89	Temperature (° C) (avg)	15.6		14.3		14.7		15		16.4		14.9	
90	Conductivity (um/hos)	249		314		281		171		205		255	
91	Dissolved oxygen (mg/L) (avg)	0.99		1		2.04		4.56		1.03		2.91	
92													
93	**DIOXINS AND FURANS (ng/L)**												
94	**Method 8290**												
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA	
120													
121													
122													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4			AH76Q		AU45E		BC27G		BH96Q		BR64M		CB85F		CL03D		CT67B		DE87H		DM30F		DW29B		ED34J		EM85H	
5			5/19/99		9/22/99		12/7/99		2/16/00		5/25/00		8/30/00		11/8/00		2/14/01		6/5/01		8/14/01		11/27/01		2/28/02		6/26/02	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1													
2													
3		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4		ER93M		EZ03F		FF76K		FL66H		FU45P		FY82M	
5		08/27/02		11/12/02		2/12/03		5/9/03		8/28/03		10/24/03	
123	**PAHs (µg/L)**												
124	**EPA Method SW8270 SIM**												
125	Naphthalene	NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB		
1																														
2																														
3			LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D			
4			AH76P		AU45H		BC27D		BH96H		BR64L		CB85H		CL03O		CT67A		DE87I		DM30E		DW29D		ED30C		EN00C			
5			5/19/99		9/22/99		12/7/99		2/17/00		5/25/00		8/31/00		11/9/00		2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02			
6																														
7	1	**CHLORINATED PHENOLS (µg/L)**																												
8	2	**EPA Method SW8040**																												
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U		
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA			
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA			
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA			
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA			
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA			
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA			
16	10																													
17	11	**SEMIVOLATILES (µg/L)**																												
18	12	**EPA Method SW8270**																												
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U		
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U		
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U		
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U		
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U		
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U		
32	26	bis(2-Ethylhexyl)phthalate	3.2	U	**1.3**		1.0	U	**1.1**		**1.7**		1.0	U	**2.7**		**1.2**		1.0	U	**2.0**		1.0	U	4.0	U	4.0	U			
33	27																													
34	28	**VOLATILES (µg/L)**																												
35	29	**EPA Method SW8260**																												
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**11**		5.0	U	5.0	U			
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U		
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U		
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
56	49																													
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																												
58	51	**Method OR-DEQ**																												
59	52	**TPH-Diesel**	0.25	U	**0.32**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U		
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		0.50	U	NA		NA		NA		NA		NA		NA			
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
62	55																													
63	56	**PRIORITY POLLUTANT**																												
64	57	**METALS (mg/L)**																												
65	58	Arsenic (7060)	**0.038**		**0.038**		**0.022**		**0.032**		**0.025**		**0.037**		**0.022**		**0.025**		**0.023**		**0.027**		**0.017**		**0.019**		**0.031**				

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
3		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4		ER93E		EZ17I		FF76C		FL41N		FU45K		FY82B	
5		08/27/02		11/13/02		2/12/03		5/7/03		8/28/03		10/23/03	
7	**CHLORINATED PHENOLS (µg/L)**												
8	**EPA Method SW8040**												
9	Pentachlorophenol	0.27	U	**0.47**		0.25	U	**0.36**		**4**	J	**0.94**	
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA	
16													
17	**SEMIVOLATILES (µg/L)**												
18	**EPA Method SW8270**												
19	Phenol	2.2	U	2.1	U	2	U	2	U	2	U	2	U
20	4-Methylphenol	1.1	U	1.1	U	1	U	1	U	1	U	1	U
21	Isophorone	1.1	U	1.1	U	1	U	1	U	1	U	1	U
22	2,4-Dimethylphenol	3.3	U	3.2	U	3	U	3	U	3.1	U	3	U
23	Benzoic Acid	54	U	53	U	50	U	50	U	51	U	10	U
24	Naphthalene	1.1	U	1.1	U	1	U	1	U	1	U	1	U
25	2-Methylnaphthalene	1.1	U	1.1	U	1	U	1	U	1	U	1	U
26	2,4,6-Trichlorophenol	5.4	U	5.3	U	5	U	5	U	5.1	U	5	U
27	2,4,5-Trichlorophenol	5.4	U	5.3	U	5	U	5	U	5.1	U	5	U
28	Acenaphthene	1.1	U	1.1	U	1	U	1	U	1	U	1	U
29	Dibenzofuran	1.1	U	1.1	U	1	U	1	U	1	U	1	U
30	Fluorene	1.1	U	1.1	U	1	U	1	U	1	U	1	U
31	Pentachlorophenol	5.4	U	5.3	U	5	U	5	U	5.1	U	5	U
32	bis(2-Ethylhexyl)phthalate	4.3	U	4.3	U	1	U	1	U	1	U	1	U
33													
34	**VOLATILES (µg/L)**												
35	**EPA Method SW8260**												
36	Acetone	5	U	5	U	5	U	5	U	5	U	5	U
37	Carbon Disulfide	1	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	5	U	5	U	5	U	5	U	5	U	5	U
39	Benzene	1	U	1	U	1	U	1	U	1	U	1	U
40	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	1	U	1	U	1	U	1	U	1	U	1	U
42	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
43	Styrene	1	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	1	U	1	U	1	U	1	U	1	U	1	U
45	o-Xylene	1	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
49	n-Propylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
50	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
52	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
54	Naphthalene	5	U	5	U	5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA	
56													
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**												
58	**Method OR-DEQ**												
59	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
60	**TPH-D Motor Oil**	NA		0.5	U	NA		NA		NA		0.5	U
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA	
62													
63	**PRIORITY POLLUTANT**												
64	**METALS (mg/L)**												
65	Arsenic (7060)	**0.026**		0.05	U	**0.011**		**0.008**		**0.026**		**0.024**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4			AH76P		AU45H		BC27D		BH96H		BR64L		CB85H		CL03O		CT67A		DE87I		DM30E		DW29D		ED30C		EN00C	
5			5/19/99		9/22/99		12/7/99		2/17/00		5/25/00		8/31/00		11/9/00		2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02	
66	59	Chromium (6010)	0.005	U	**0.021**		**0.006**		0.005	U	0.005	U	**0.034**		**0.013**		**0.011**		**0.008**		**0.019**		**0.010**		0.005	U	0.005	U
67	60	Copper (6010)	**0.003**		**0.028**		**0.011**		0.002	U	**0.005**		**0.045**		**0.021**		**0.015**		**0.009**		**0.024**		**0.012**		**0.009**		**0.004**	
68	61	Lead (7421)	**0.001**		**0.008**		**0.003**		0.001	U	**0.002**		**0.012**		**0.006**		**0.006**		**0.003**		**0.008**		**0.004**		**0.002**		0.001	U
69	62	Nickel (6010)	0.01	U	0.02	U	0.01	U	0.01	U	0.01	U	**0.03**		0.01	U	0.01	U	0.01	U	**0.01**		0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	**0.018**		**0.046**		0.022	U	**0.010**		**0.010**		**0.076**		**0.030**		**0.031**		**0.018**		**0.039**		**0.022**		**0.015**	J	**0.010**	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**19.2**		**20.4**		**22.5**		**21.0**		**19.0**		**19.1**	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**9.95**		**10.3**		**12.1**		**10.3**		**9.55**		**9.37**	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**1.1**		**1.2**		**1.5**		**0.9**		**1.0**		**0.7**	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**8.31**		**9.80**		**9.09**		**9.65**		**9.06**		**8.77**	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**110**		NA		NA		NA		**100**		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**110**		NA		NA		NA		**100**		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**180**		**180**		**170**		**150**		**150**		**170**		**160**		**150**		**150**	J	**160**	J	**150**		**100**		**140**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.7**		**1.9**		**2.1**		**3.5**		**2.3**		**14**		**2.0**		**2.6**	J	**1.9**		**4.1**		**1.7**		**1.3**	J	**2.1**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.012**		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.013**		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.025**		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		**6.2**		NA		NA		NA		**7.5**		NA	
86	79																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1													
2													
3		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4		ER93E		EZ17I		FF76C		FL41N		FU45K		FY82B	
5		08/27/02		11/13/02		2/12/03		5/7/03		8/28/03		10/23/03	
66	Chromium (6010)	**0.007**		**0.009**		0.005	U	0.005	U	0.005	U	**0.012**	
67	Copper (6010)	**0.009**		**0.012**		**0.004**	J	**0.003**		**0.004**		**0.011**	
68	Lead (7421)	**0.004**		0.02	U	0.001	U	**0.001**		0.001	U	**0.003**	
69	Nickel (6010)	0.01	U	**0.01**		0.01	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)	**0.018**		**0.026**		**0.01**		**0.019**		0.006	U	**0.024**	
71													
72	**MAJOR IONS AND CONVENTIONALS**												
73	Calcium (mg/L) (6010)	NA		NA		**14.1**		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		**5.88**		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		**1.2**		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		**8.5**		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		**96**		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		1	U	NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		**96**		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**150**		**170**		**130**		**88**		**120**	J	**120**	
81	Chloride (mg/L) (EPA 325.2)	**2.2**		**2.5**		**1.9**		**1.6**		**1.4**		**1.5**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		**0.025**		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		0.01	U	NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		**0.025**		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		**7.4**		NA		NA		NA	
86													

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4			AH76P		AU45H		BC27D		BH96H		BR64L		CB85H		CL03O		CT67A		DE87I		DM30E		DW29D		ED30C		EN00C	
5			5/19/99		9/22/99		12/7/99		2/17/00		5/25/00		8/31/00		11/9/00		2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02	
87	80	**FIELD PARAMETERS**																										
88	81	pH (avg)	6.44		6.49		6.79		6.86		6.90		6.71		6.10		6.72		6.88		7.03		6.80		6.50		6.56	
89	82	Temperature (° C) (avg)	14.7		17.1		12.6		15.8		13.9		13.8		13.0		13.7		13.7		16.2		14.1		13.5		14.1	
90	83	Conductivity (um/hos)	195		233		220		246		255		208		203		204		228		216		216		164		189	
91	84	Dissolved oxygen (mg/L) (avg)	2.03		1.29		2.53		0.52		0.72		1.47		1.09		0.52		2.70		0.63		3.97		7.74		5.59	
92	85																											
93	86	**DIOXINS AND FURANS (ng/L)**																										
94	87	**Method 8290**																										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
2													
3		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4		ER93E		EZ17I		FF76C		FL41N		FU45K		FY82B	
5		08/27/02		11/13/02		2/12/03		5/7/03		8/28/03		10/23/03	
87	**FIELD PARAMETERS**												
88	pH (avg)	6.67		6.35		7.14		7.18		7.07		6.48	
89	Temperature (° C) (avg)	14.3		13.7		13.6		13.4		15.8		17.9	
90	Conductivity (um/hos)	180		188		178		93		122		164	
91	Dissolved oxygen (mg/L) (avg)	0.95		1.22		1.47		5.73		2.33		5.66	
92													
93	**DIOXINS AND FURANS (ng/L)**												
94	**Method 8290**												
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA	
120													
121													
122													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4			AH76P		AU45H		BC27D		BH96H		BR64L		CB85H		CL03O		CT67A		DE87I		DM30E		DW29D		ED30C		EN00C	
5			5/19/99		9/22/99		12/7/99		2/17/00		5/25/00		8/31/00		11/9/00		2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1													
2													
3		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4		ER93E		EZ17I		FF76C		FL41N		FU45K		FY82B	
5		08/27/02		11/13/02		2/12/03		5/7/03		8/28/03		10/23/03	
123	**PAHs (µg/L)**												
124	**EPA Method SW8270 SIM**												
125	Naphthalene	NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4			AH76H		AU45C		BC27I		BH96L		BR64G		CB49F		CK77H		CT55D		DE68B		DM52G		DW48B		ED34E		EM85C	
5			5/20/99		9/22/99		12/8/99		2/18/00		5/24/00		8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/28/02		6/26/02	
6																												
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	**46**		**8.1**		**1.1**		**0.36**		0.25	U	0.25	U	0.25	U	**1.6**		0.25	U	0.25	U	**0.62**		**0.76**		0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	0.57	U	1.3	U	0.39	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**2.2**		**1.5**		**0.36**		**0.12**	J1	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	**2.2**		**1.1**		**0.27**		0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.6**		1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U
24	18	Naphthalene	**1.3**		1.0	U	**0.9**	J1	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	**0.6**	J1	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	**55**		**5.0**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	3.5	U	1.0	U	**2.6**		**2.7**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.9**		4.0	U	4.0	U
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	**8.9**		**16**		5.0	U	5.0	U	5.0	U	**8.4**		**12**			R	**35**		**10**		**130**		5.0	U	**54**	
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	22	U	5.9	U	5.0	U	**5.4**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
42	36	Ethylbenzene	**16**		**7.2**		**3.2**		**1.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	**22**		**7.4**		**2.1**		**1.3**		**1.6**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
45	39	o-Xylene	**21**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
46	40	1,3,5-Trimethylbenzene	**34**		**26**		**10**		**7.5**		**8.0**		**4.4**		**3.1**		**4.2**		**3.4**		**2.2**		**1.1**		1.0	U	1.0	U
47	41	1,2,4-Trimethylbenzene	**97**		**40**		**12**		**9.0**		**12**		**6.7**		**5.6**		**7.0**		**5.7**		**3.6**		**1.7**		1.0	U	**1.4**	
48	42	Isopropylbenzene	**12**		**11**		**6.9**		**4.0**		**2.4**		**1.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
49	43	n-Propylbenzene	**18**		**20**		**13**		**7.5**		**4.8**		**2.8**		**1.6**		**1.3**		**1.2**		**1.2**		1.0	U	1.0	U	1.0	U
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	**4.6**		**5.3**		**4.8**		**3.7**		**2.7**		**2.2**		**1.7**		**1.2**		**1.2**		**1.4**		**1.2**		1.0	U	1.0	U
52	46	4-Isopropyltoluene	**6.7**		**5.0**		**2.0**		**1.6**		**1.9**		**1.7**		1.0	U	**1.0**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
53	47	n-Butylbenzene	**5.8**		4.1	U	2.3	U	**2.3**		**2.2**	M	**2.4**	M	**1.5**		**1.4**	M	**1.5**		**1.5**		1.0	U	1.0	U	1.0	U
54	48	Naphthalene	**5.3**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	**0.68**		**1.4**		**0.76**		**0.60**		**0.74**		**0.88**		**0.70**		**1.1**		**1.0**		**0.88**		**0.98**		**0.87**		**1.1**	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	**0.006**		**0.008**		**0.006**		**0.007**		**0.007**		**0.007**		**0.007**		**0.006**		**0.007**		**0.009**		**0.009**		**0.007**		**0.007**	

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
3		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4		ES04C		EZ03B		FF88D		FL66I		FU50B		FY82J	
5		08/28/02		11/12/02		2/13/03		5/9/03		8/29/03		10/24/03	
7	**CHLORINATED PHENOLS (µg/L)**												
8	**EPA Method SW8040**												
9	Pentachlorophenol	0.26	U	0.25	U	0.26	U	0.26	U	**5.6**		0.55	U
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA	
16													
17	**SEMIVOLATILES (µg/L)**												
18	**EPA Method SW8270**												
19	Phenol	2	U	2.2	U	2	U	2	U	2.1	U	2.2	U
20	4-Methylphenol	1	U	1.1	U	1	U	1	U	1	U	1.1	U
21	Isophorone	1	U	1.1	U	1	U	1	UJ	1	U	1.1	U
22	2,4-Dimethylphenol	3.1	U	3.3	U	3.1	U	3.1	U	3.1	U	3.3	U
23	Benzoic Acid	51	U	54	U	51	U	51	U	52	U	11	U
24	Naphthalene	1	U	1.1	U	1	U	1	UJ	1	U	1.1	U
25	2-Methylnaphthalene	1	U	1.1	U	1	U	1	UJ	1	U	1.1	U
26	2,4,6-Trichlorophenol	5.1	U	5.4	U	5.1	U	5.1	U	5.2	U	5.5	U
27	2,4,5-Trichlorophenol	5.1	U	5.4	U	5.1	U	5.1	U	5.2	U	5.5	U
28	Acenaphthene	1	U	1.1	U	1	U	1	UJ	1	U	1.1	U
29	Dibenzofuran	1	U	1.1	U	1	U	1	UJ	1	U	1.1	U
30	Fluorene	1	U	1.1	U	1	U	1	UJ	1	U	1.1	U
31	Pentachlorophenol	5.1	U	5.4	U	5.1	U	5.1	U	5.2	U	5.5	U
32	bis(2-Ethylhexyl)phthalate	4.1	U	4.3	U	**1.9**		1	UJ	**1.9**		**1.5**	
33													
34	**VOLATILES (µg/L)**												
35	**EPA Method SW8260**												
36	Acetone	**27**		**31**		**26**		**140**		**11**		**71**	
37	Carbon Disulfide	1	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	5	U	5	U	5	U	5	U	5	U	5	U
39	Benzene	1	U	1	U	1	U	1	U	1	U	1	U
40	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	1	U	1	U	1	U	1	U	1	U	1	U
42	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
43	Styrene	1	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	1	U	1	U	1	U	1	U	1	U	1	U
45	o-Xylene	1	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
49	n-Propylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
50	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
52	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U
54	Naphthalene	5	U	5	U	5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA	
56													
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**												
58	**Method OR-DEQ**												
59	**TPH-Diesel**	**0.97**		**0.8**		**0.74**		**0.91**		**1.1**		**0.66**	
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		0.5	U
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA	
62													
63	**PRIORITY POLLUTANT**												
64	**METALS (mg/L)**												
65	Arsenic (7060)	**0.005**		0.05	U	**0.008**		**0.007**		**0.005**		**0.005**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4			AH76H		AU45C		BC27I		BH96L		BR64G		CB49F		CK77H		CT55D		DE68B		DM52G		DW48B		ED34E		EM85C	
5			5/20/99		9/22/99		12/8/99		2/18/00		5/24/00		8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/28/02		6/26/02	
66	59	Chromium (6010)	**0.008**		**0.053**		**0.015**		**0.011**		**0.013**		**0.018**		**0.016**		0.005	U	0.005	U	**0.024**		0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	**0.005**		**0.051**		**0.016**		**0.013**		**0.014**		**0.017**		**0.018**	J2	**0.005**		**0.002**		**0.024**		0.004	U	**0.007**		**0.003**	
68	61	Lead (7421)	**0.002**		**0.018**		**0.007**		**0.004**		**0.008**		**0.006**		**0.008**		**0.002**		**0.002**		**0.008**		**0.004**		**0.002**		0.001	U
69	62	Nickel (6010)	0.01	U	0.04	U	0.01	U	**0.01**		0.01	U	**0.02**		**0.01**		0.01	U	0.01	U	**0.02**		0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	**0.030**		**0.142**		**0.047**		**0.042**		**0.040**		**0.052**		**0.058**		**0.023**		**0.018**		**0.064**		**0.022**		**0.022**		**0.013**	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**54.9**		**61.5**		**55.9**		**58.6**		**60.0**		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**26.4**		**31.0**		**27.6**		**28.6**		**31.3**		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**1.7**		**1.9**		**2.9**		**2.1**		**2.2**		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**15.6**		**16.6**		**17.5**		**16.2**		**17.6**		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**350**		NA		NA		NA		**370**		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**350**		NA		NA		NA		**370**		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**420**		**310**		**310**		**290**		**350**		**380**		**380**		**360**		**370**		**300**		**340**		**340**		**410**	
81	74	Chloride (mg/L) (EPA 325.2)	**9.2**		**10**		**11**		**11**		**10**		**10**		**14**		**7.7**		**8.8**		**8.3**		**7.5**		**9.8**		**12**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.024**		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.025**		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.049**		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		**6.3**		NA		NA		NA		**7.6**		NA	
86	79																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1													
2													
3		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4		ES04C		EZ03B		FF88D		FL66I		FU50B		FY82J	
5		08/28/02		11/12/02		2/13/03		5/9/03		8/29/03		10/24/03	
66	Chromium (6010)	**0.02**		**0.032**		0.005	U	0.005	U	**0.007**		**0.016**	
67	Copper (6010)	**0.02**		**0.034**		**0.007**		**0.004**		**0.008**		**0.015**	
68	Lead (7421)	**0.007**		0.02	U	**0.002**		**0.002**		**0.002**		**0.004**	
69	Nickel (6010)	**0.01**		**0.05**		**0.05**		**0.01**		**0.01**		**0.02**	
70	Zinc (6010)	**0.053**		**0.096**		**0.024**		**0.019**		**0.025**		**0.041**	
71													
72	**MAJOR IONS AND CONVENTIONALS**												
73	Calcium (mg/L) (6010)	NA		NA		**70.4**		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		**31.7**		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		**2.6**		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		**17.5**		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		**310**		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		1	U	NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		**310**		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**390**		**470**		**380**		**320**		**260**		**290**	
81	Chloride (mg/L) (EPA 325.2)	**9.8**		**7.4**		**7.8**		**6.7**		**4.6**		**5.8**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		**0.02**		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		0.01	U	NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		**0.02**		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		**96**		NA		NA		NA	
86													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4			AH76H		AU45C		BC27I		BH96L		BR64G		CB49F		CK77H		CT55D		DE68B		DM52G		DW48B		ED34E		EM85C	
5			5/20/99		9/22/99		12/8/99		2/18/00		5/24/00		8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/28/02		6/26/02	
87	80	**FIELD PARAMETERS**																										
88	81	pH (avg)	6.51		6.75		6.54		6.44		6.63		6.35		5.75		6.38		6.75		7.80		6.68		6.52		6.56	
89	82	Temperature (° C) (avg)	15.5		15.3		12.1		12.0		17.0		15.0		12.8		12.3		13.3		14.7		12.6		12.8		14.9	
90	83	Conductivity (um/hos)	630		487		617		551		643		523		544		454		493		488		473		576		694	
91	84	Dissolved oxygen (mg/L) (avg)	1.96		1.53		1.33		1.86		1.53		1.49		1.23		1.14		1.45		1.43		3.48		8.44		3.33	
92	85																											
93	86	**DIOXINS AND FURANS (ng/L)**																										
94	87	**Method 8290**																										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1													
2													
3		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4		ES04C		EZ03B		FF88D		FL66I		FU50B		FY82J	
5		08/28/02		11/12/02		2/13/03		5/9/03		8/29/03		10/24/03	
87	**FIELD PARAMETERS**												
88	pH (avg)	6.44		6.2		6.96		6.81		6.7		6.48	
89	Temperature (° C) (avg)	15.7		14		13.6		14.3		14.4		13.3	
90	Conductivity (um/hos)	466		642		704		419		334		376	
91	Dissolved oxygen (mg/L) (avg)	1.30		0.48		0		2.57		2.31		2.80	
92													
93	**DIOXINS AND FURANS (ng/L)**												
94	**Method 8290**												
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA	
120													
121													
122													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4			AH76H		AU45C		BC27I		BH96L		BR64G		CB49F		CK77H		CT55D		DE68B		DM52G		DW48B		ED34E		EM85C	
5			5/20/99		9/22/99		12/8/99		2/18/00		5/24/00		8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/28/02		6/26/02	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1													
2													
3		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4		ES04C		EZ03B		FF88D		FL66I		FU50B		FY82J	
5		08/28/02		11/12/02		2/13/03		5/9/03		8/29/03		10/24/03	
123	**PAHs (µg/L)**												
124	**EPA Method SW8270 SIM**												
125	Naphthalene	NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
2					Dup of LW14D																							
3			LW14D		W		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D	
4			BR64R		BR64Q		CT67N		DE87E		DM30Q		DW29J		ED30E		EN00E		ER93F		EZ17C		FF65E		FL58D		FU45L	
5			5/25/00		5/25/00		2/14/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/13/02		2/11/03		5/8/03		8/28/03	
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.27	U	0.25	U	0.25	U	0.25	U	**2.3**	J
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
20	14	4-Methylphenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
21	15	Isophorone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
22	16	2,4-Dimethylphenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
23	17	Benzoic Acid	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
24	18	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
25	19	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
26	20	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
27	21	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
28	22	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
29	23	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
30	24	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
31	25	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
37	31	Carbon Disulfide	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
38	32	2-Butanone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
39	33	Benzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
40	34	Bromoform	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
41	35	Toluene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
42	36	Ethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
43	37	Styrene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
44	38	m,p-Xylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
45	39	o-Xylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
46	40	1,3,5-Trimethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
47	41	1,2,4-Trimethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
48	42	Isopropylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
49	43	n-Propylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
50	44	tert-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
51	45	sec-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
52	46	4-Isopropyltoluene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
53	47	n-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
54	48	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD
1			
2			
3		LW14D	
4		FY82C	
5		10/23/03	
6			
7	**CHLORINATED PHENOLS (µg/L)**		
8	**EPA Method SW8040**		
9	Pentachlorophenol	0.5	U
10	2,4,6-Trichlorophenol	NA	
11	2,3,6-Trichlorophenol	NA	
12	2,4,5-Trichlorophenol	NA	
13	2,3,4-Trichlorophenol	NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	2,3,4,5-Tetrachlorophenol	NA	
16			
17	**SEMIVOLATILES (µg/L)**		
18	**EPA Method SW8270**		
19	Phenol	NA	
20	4-Methylphenol	NA	
21	Isophorone	NA	
22	2,4-Dimethylphenol	NA	
23	Benzoic Acid	NA	
24	Naphthalene	NA	
25	2-Methylnaphthalene	NA	
26	2,4,6-Trichlorophenol	NA	
27	2,4,5-Trichlorophenol	NA	
28	Acenaphthene	NA	
29	Dibenzofuran	NA	
30	Fluorene	NA	
31	Pentachlorophenol	NA	
32	bis(2-Ethylhexyl)phthalate	NA	
33			
34	**VOLATILES (µg/L)**		
35	**EPA Method SW8260**		
36	Acetone	NA	
37	Carbon Disulfide	NA	
38	2-Butanone	NA	
39	Benzene	NA	
40	Bromoform	NA	
41	Toluene	NA	
42	Ethylbenzene	NA	
43	Styrene	NA	
44	m,p-Xylene	NA	
45	o-Xylene	NA	
46	1,3,5-Trimethylbenzene	NA	
47	1,2,4-Trimethylbenzene	NA	
48	Isopropylbenzene	NA	
49	n-Propylbenzene	NA	
50	tert-Butylbenzene	NA	
51	sec-Butylbenzene	NA	
52	4-Isopropyltoluene	NA	
53	n-Butylbenzene	NA	
54	Naphthalene	NA	
55	Methyl tert-butyl ether	NA	
56			
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	**Method OR-DEQ**		
59	**TPH-Diesel**	NA	
60	**TPH-D Motor Oil**	NA	
61	**TPH-Gasoline**	NA	
62			
63	**PRIORITY POLLUTANT**		
64	**METALS (mg/L)**		
65	Arsenic (7060)	NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2					Dup of LW14D																							
3			LW14D		W		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D	
4			BR64R		BR64Q		CT67N		DE87E		DM30Q		DW29J		ED30E		EN00E		ER93F		EZ17C		FF65E		FL58D		FU45L	
5			5/25/00		5/25/00		2/14/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/13/02		2/11/03		5/8/03		8/28/03	
66	59	Chromium (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
67	60	Copper (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
68	61	Lead (7421)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
69	62	Nickel (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
70	63	Zinc (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86	79																											

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD
1			
2			
3		LW14D	
4		FY82C	
5		10/23/03	
66	Chromium (6010)	NA	
67	Copper (6010)	NA	
68	Lead (7421)	NA	
69	Nickel (6010)	NA	
70	Zinc (6010)	NA	
71			
72	**MAJOR IONS AND CONVENTIONALS**		
73	Calcium (mg/L) (6010)	NA	
74	Magnesium (mg/L) (6010)	NA	
75	Potassium (mg/L) (6010)	NA	
76	Sodium (mg/L) (6010)	NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	NA	
81	Chloride (mg/L) (EPA 325.2)	NA	
82	N-Nitrate (mg-N/L) (Calculated)	NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	Sulfate (mg/L) (EPA 375.2)	NA	
86			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2					Dup of LW14D																							
3			LW14D		W		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D	
4			BR64R		BR64Q		CT67N		DE87E		DM30Q		DW29J		ED30E		EN00E		ER93F		EZ17C		FF65E		FL58D		FU45L	
5			5/25/00		5/25/00		2/14/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/13/02		2/11/03		5/8/03		8/28/03	
87	80	**FIELD PARAMETERS**																										
88	81	pH (avg)	6.64		6.64		6.15		6.65		6.81		6.61		6.35		6.64		6.73		6.22		7.05		6.69		6.98	
89	82	Temperature (° C) (avg)	14.1		14.2		12.9		13.5		14.1		12.4		13.6		13.9		14.8		13.4		14.3		13.3		16.1	
90	83	Conductivity (um/hos)	312		312		345		371		296		362		356		487		434		477		426		258		224	
91	84	Dissolved oxygen (mg/L) (avg)	4.54		4.52		0.12		1.17		0.83		4.12		7.36		5.08		2.09		0.77		2.48		3.06		1.54	
92	85																											
93	86	**DIOXINS AND FURANS (ng/L)**																										
94	87	**Method 8290**																										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD
1			
2			
3		LW14D	
4		FY82C	
5		10/23/03	
87	**FIELD PARAMETERS**		
88	pH (avg)	6.56	
89	Temperature (° C) (avg)	14.2	
90	Conductivity (um/hos)	238	
91	Dissolved oxygen (mg/L) (avg)	2.29	
92			
93	**DIOXINS AND FURANS (ng/L)**		
94	**Method 8290**		
95	2,3,7,8-TCDF	NA	
96	Total TCDF	NA	
97	2,3,7,8-TCDD	NA	
98	Total TCDD	NA	
99	1,2,3,7,8-PeCDF	NA	
100	2,3,4,7,8-PeCDF	NA	
101	Total PeCDF	NA	
102	1,2,3,7,8-PeCDD	NA	
103	Total PeCDD	NA	
104	1,2,3,4,7,8-HxCDF	NA	
105	1,2,3,6,7,8-HxCDF	NA	
106	2,3,4,6,7,8-HxCDF	NA	
107	1,2,3,7,8,9-HxCDF	NA	
108	Total HxCDF	NA	
109	1,2,3,4,7,8-HxCDD	NA	
110	1,2,3,6,7,8-HxCDD	NA	
111	1,2,3,7,8,9-HxCDD	NA	
112	Total HxCDD	NA	
113	1,2,3,4,6,7,8-HpCDF	NA	
114	1,2,3,4,7,8,9-HpCDF	NA	
115	Total HpCDF	NA	
116	1,2,3,4,6,7,8-HpCDD	NA	
117	Total HpCDD	NA	
118	OCDF	NA	
119	OCDD	NA	
120			
121			
122			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2					Dup of LW14D																							
3			LW14D		W		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D	
4			BR64R		BR64Q		CT67N		DE87E		DM30Q		DW29J		ED30E		EN00E		ER93F		EZ17C		FF65E		FL58D		FU45L	
5			5/25/00		5/25/00		2/14/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/13/02		2/11/03		5/8/03		8/28/03	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD
1			
2			
3		LW14D	
4		FY82C	
5		10/23/03	
123	**PAHs (µg/L)**		
124	**EPA Method SW8270 SIM**		
125	Naphthalene	NA	
126	2-Methylnaphthalene	NA	
127	Acenaphthylene	NA	
128	Acenaphthene	NA	
129	Fluorene	NA	
130	Anthracene	NA	
131	Dibenzofuran	NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D	
4			CB85A		CL03R		CT67L		DE87C		DM30P		DW48H		ED34B		EN00J		ER93N		EZ03H		FF88H		FL66F		FU45S	
5			8/31/00		11/8/00		2/14/01		6/5/01		8/13/01		11/29/01		2/28/02		6/27/02		08/27/02		11/12/02		2/13/03		5/9/03		8/28/03	
6																												
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	0.25	U	0.25	U	**0.56**		0.25	U	0.25	U	0.25	U	**6.8**		0.25	U	0.28	U	0.25	U	**0.33**		0.25	U	0.5	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
20	14	4-Methylphenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
21	15	Isophorone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
22	16	2,4-Dimethylphenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
23	17	Benzoic Acid	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
24	18	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
25	19	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
26	20	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
27	21	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
28	22	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
29	23	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
30	24	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
31	25	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
37	31	Carbon Disulfide	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
38	32	2-Butanone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
39	33	Benzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
40	34	Bromoform	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
41	35	Toluene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
42	36	Ethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
43	37	Styrene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
44	38	m,p-Xylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
45	39	o-Xylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
46	40	1,3,5-Trimethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
47	41	1,2,4-Trimethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
48	42	Isopropylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
49	43	n-Propylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
50	44	tert-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
51	45	sec-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
52	46	4-Isopropyltoluene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
53	47	n-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
54	48	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD
1			
2			
3		LW17D	
4		FY82G	
5		10/23/03	
6			
7	**CHLORINATED PHENOLS (µg/L)**		
8	**EPA Method SW8040**		
9	Pentachlorophenol	0.51	U
10	2,4,6-Trichlorophenol	NA	
11	2,3,6-Trichlorophenol	NA	
12	2,4,5-Trichlorophenol	NA	
13	2,3,4-Trichlorophenol	NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	2,3,4,5-Tetrachlorophenol	NA	
16			
17	**SEMIVOLATILES (µg/L)**		
18	**EPA Method SW8270**		
19	Phenol	NA	
20	4-Methylphenol	NA	
21	Isophorone	NA	
22	2,4-Dimethylphenol	NA	
23	Benzoic Acid	NA	
24	Naphthalene	NA	
25	2-Methylnaphthalene	NA	
26	2,4,6-Trichlorophenol	NA	
27	2,4,5-Trichlorophenol	NA	
28	Acenaphthene	NA	
29	Dibenzofuran	NA	
30	Fluorene	NA	
31	Pentachlorophenol	NA	
32	bis(2-Ethylhexyl)phthalate	NA	
33			
34	**VOLATILES (µg/L)**		
35	**EPA Method SW8260**		
36	Acetone	NA	
37	Carbon Disulfide	NA	
38	2-Butanone	NA	
39	Benzene	NA	
40	Bromoform	NA	
41	Toluene	NA	
42	Ethylbenzene	NA	
43	Styrene	NA	
44	m,p-Xylene	NA	
45	o-Xylene	NA	
46	1,3,5-Trimethylbenzene	NA	
47	1,2,4-Trimethylbenzene	NA	
48	Isopropylbenzene	NA	
49	n-Propylbenzene	NA	
50	tert-Butylbenzene	NA	
51	sec-Butylbenzene	NA	
52	4-Isopropyltoluene	NA	
53	n-Butylbenzene	NA	
54	Naphthalene	NA	
55	Methyl tert-butyl ether	NA	
56			
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	**Method OR-DEQ**		
59	**TPH-Diesel**	NA	
60	**TPH-D Motor Oil**	NA	
61	**TPH-Gasoline**	NA	
62			
63	**PRIORITY POLLUTANT**		
64	**METALS (mg/L)**		
65	Arsenic (7060)	NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D	
4			CB85A		CL03R		CT67L		DE87C		DM30P		DW48H		ED34B		EN00J		ER93N		EZ03H		FF88H		FL66F		FU45S	
5			8/31/00		11/8/00		2/14/01		6/5/01		8/13/01		11/29/01		2/28/02		6/27/02		08/27/02		11/12/02		2/13/03		5/9/03		8/28/03	
66	59	Chromium (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
67	60	Copper (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
68	61	Lead (7421)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
69	62	Nickel (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
70	63	Zinc (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86	79																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD
1			
2			
3		LW17D	
4		FY82G	
5		10/23/03	
66	Chromium (6010)	NA	
67	Copper (6010)	NA	
68	Lead (7421)	NA	
69	Nickel (6010)	NA	
70	Zinc (6010)	NA	
71			
72	**MAJOR IONS AND CONVENTIONALS**		
73	Calcium (mg/L) (6010)	NA	
74	Magnesium (mg/L) (6010)	NA	
75	Potassium (mg/L) (6010)	NA	
76	Sodium (mg/L) (6010)	NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	NA	
81	Chloride (mg/L) (EPA 325.2)	NA	
82	N-Nitrate (mg-N/L) (Calculated)	NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	Sulfate (mg/L) (EPA 375.2)	NA	
86			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D	
4			CB85A		CL03R		CT67L		DE87C		DM30P		DW48H		ED34B		EN00J		ER93N		EZ03H		FF88H		FL66F		FU45S	
5			8/31/00		11/8/00		2/14/01		6/5/01		8/13/01		11/29/01		2/28/02		6/27/02		08/27/02		11/12/02		2/13/03		5/9/03		8/28/03	
87	80	**FIELD PARAMETERS**																										
88	81	pH (avg)	6.14		5.95		6.15		6.53		6.67		6.44		6.49		6.68		6.41		6.64		6.9		6.75		6.74	
89	82	Temperature (° C) (avg)	13.8		13.5		14.4		14.0		15.3		14		13.7		14.2		16.1		13.7		15.2		13.8		17.4	
90	83	Conductivity (um/hos)	305		79		440		488		544		529		62		196		399		457		401		349		431	
91	84	Dissolved oxygen (mg/L) (avg)	2.10		1.21		0.47		2.27		1.69		3.81		7.82		4.92		1.31		0.94		0		2.33		1.01	
92	85																											
93	86	**DIOXINS AND FURANS (ng/L)**																										
94	87	**Method 8290**																										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD
1			
2			
3		LW17D	
4		FY82G	
5		10/23/03	
87	**FIELD PARAMETERS**		
88	pH (avg)	6.47	
89	Temperature (° C) (avg)	15.8	
90	Conductivity (um/hos)	434	
91	Dissolved oxygen (mg/L) (avg)	3.72	
92			
93	**DIOXINS AND FURANS (ng/L)**		
94	**Method 8290**		
95	2,3,7,8-TCDF	NA	
96	Total TCDF	NA	
97	2,3,7,8-TCDD	NA	
98	Total TCDD	NA	
99	1,2,3,7,8-PeCDF	NA	
100	2,3,4,7,8-PeCDF	NA	
101	Total PeCDF	NA	
102	1,2,3,7,8-PeCDD	NA	
103	Total PeCDD	NA	
104	1,2,3,4,7,8-HxCDF	NA	
105	1,2,3,6,7,8-HxCDF	NA	
106	2,3,4,6,7,8-HxCDF	NA	
107	1,2,3,7,8,9-HxCDF	NA	
108	Total HxCDF	NA	
109	1,2,3,4,7,8-HxCDD	NA	
110	1,2,3,6,7,8-HxCDD	NA	
111	1,2,3,7,8,9-HxCDD	NA	
112	Total HxCDD	NA	
113	1,2,3,4,6,7,8-HpCDF	NA	
114	1,2,3,4,7,8,9-HpCDF	NA	
115	Total HpCDF	NA	
116	1,2,3,4,6,7,8-HpCDD	NA	
117	Total HpCDD	NA	
118	OCDF	NA	
119	OCDD	NA	
120			
121			
122			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D	
4			CB85A		CL03R		CT67L		DE87C		DM30P		DW48H		ED34B		EN00J		ER93N		EZ03H		FF88H		FL66F		FU45S	
5			8/31/00		11/8/00		2/14/01		6/5/01		8/13/01		11/29/01		2/28/02		6/27/02		08/27/02		11/12/02		2/13/03		5/9/03		8/28/03	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD
1			
2			
3		LW17D	
4		FY82G	
5		10/23/03	
123	**PAHs (µg/L)**		
124	**EPA Method SW8270 SIM**		
125	Naphthalene	NA	
126	2-Methylnaphthalene	NA	
127	Acenaphthylene	NA	
128	Acenaphthene	NA	
129	Fluorene	NA	
130	Anthracene	NA	
131	Dibenzofuran	NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
3			LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D	
4			CB85B		CL03S		CT67M		DE87D		DM30O		DW48G		ED34C		EN00I		ER93O		EZ03G		FF76D		FL66G		FU45Q	
5			8/31/00		11/9/00		2/14/01		6/5/01		8/13/01		11/29/01		2/28/02		6/27/02		08/27/02		11/12/02		2/12/03		5/9/03		8/28/03	
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.26**		**0.44**		0.25	U	0.3	U	0.25	U	0.25	U	0.25	U	**0.58**	J
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
20	14	4-Methylphenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
21	15	Isophorone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
22	16	2,4-Dimethylphenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
23	17	Benzoic Acid	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
24	18	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
25	19	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
26	20	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
27	21	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
28	22	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
29	23	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
30	24	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
31	25	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
37	31	Carbon Disulfide	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
38	32	2-Butanone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
39	33	Benzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
40	34	Bromoform	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
41	35	Toluene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
42	36	Ethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
43	37	Styrene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
44	38	m,p-Xylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
45	39	o-Xylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
46	40	1,3,5-Trimethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
47	41	1,2,4-Trimethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
48	42	Isopropylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
49	43	n-Propylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
50	44	tert-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
51	45	sec-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
52	46	4-Isopropyltoluene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
53	47	n-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
54	48	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD
1			
2			
3		LW18D	
4		FY82F	
5		10/23/03	
6			
7	**CHLORINATED PHENOLS (µg/L)**		
8	**EPA Method SW8040**		
9	Pentachlorophenol	**0.58**	
10	2,4,6-Trichlorophenol	NA	
11	2,3,6-Trichlorophenol	NA	
12	2,4,5-Trichlorophenol	NA	
13	2,3,4-Trichlorophenol	NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	2,3,4,5-Tetrachlorophenol	NA	
16			
17	**SEMIVOLATILES (µg/L)**		
18	**EPA Method SW8270**		
19	Phenol	NA	
20	4-Methylphenol	NA	
21	Isophorone	NA	
22	2,4-Dimethylphenol	NA	
23	Benzoic Acid	NA	
24	Naphthalene	NA	
25	2-Methylnaphthalene	NA	
26	2,4,6-Trichlorophenol	NA	
27	2,4,5-Trichlorophenol	NA	
28	Acenaphthene	NA	
29	Dibenzofuran	NA	
30	Fluorene	NA	
31	Pentachlorophenol	NA	
32	bis(2-Ethylhexyl)phthalate	NA	
33			
34	**VOLATILES (µg/L)**		
35	**EPA Method SW8260**		
36	Acetone	NA	
37	Carbon Disulfide	NA	
38	2-Butanone	NA	
39	Benzene	NA	
40	Bromoform	NA	
41	Toluene	NA	
42	Ethylbenzene	NA	
43	Styrene	NA	
44	m,p-Xylene	NA	
45	o-Xylene	NA	
46	1,3,5-Trimethylbenzene	NA	
47	1,2,4-Trimethylbenzene	NA	
48	Isopropylbenzene	NA	
49	n-Propylbenzene	NA	
50	tert-Butylbenzene	NA	
51	sec-Butylbenzene	NA	
52	4-Isopropyltoluene	NA	
53	n-Butylbenzene	NA	
54	Naphthalene	NA	
55	Methyl tert-butyl ether	NA	
56			
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	**Method OR-DEQ**		
59	**TPH-Diesel**	NA	
60	**TPH-D Motor Oil**	NA	
61	**TPH-Gasoline**	NA	
62			
63	**PRIORITY POLLUTANT**		
64	**METALS (mg/L)**		
65	Arsenic (7060)	NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D	
4			CB85B		CL03S		CT67M		DE87D		DM30O		DW48G		ED34C		EN00I		ER93O		EZ03G		FF76D		FL66G		FU45Q	
5			8/31/00		11/9/00		2/14/01		6/5/01		8/13/01		11/29/01		2/28/02		6/27/02		08/27/02		11/12/02		2/12/03		5/9/03		8/28/03	
66	59	Chromium (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
67	60	Copper (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
68	61	Lead (7421)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
69	62	Nickel (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
70	63	Zinc (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86	79																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD
1			
2			
3		LW18D	
4		FY82F	
5		10/23/03	
66	Chromium (6010)	NA	
67	Copper (6010)	NA	
68	Lead (7421)	NA	
69	Nickel (6010)	NA	
70	Zinc (6010)	NA	
71			
72	**MAJOR IONS AND CONVENTIONALS**		
73	Calcium (mg/L) (6010)	NA	
74	Magnesium (mg/L) (6010)	NA	
75	Potassium (mg/L) (6010)	NA	
76	Sodium (mg/L) (6010)	NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	NA	
81	Chloride (mg/L) (EPA 325.2)	NA	
82	N-Nitrate (mg-N/L) (Calculated)	NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	Sulfate (mg/L) (EPA 375.2)	NA	
86			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D	
4			CB85B		CL03S		CT67M		DE87D		DM30O		DW48G		ED34C		EN00I		ER93O		EZ03G		FF76D		FL66G		FU45Q	
5			8/31/00		11/9/00		2/14/01		6/5/01		8/13/01		11/29/01		2/28/02		6/27/02		08/27/02		11/12/02		2/12/03		5/9/03		8/28/03	
87	80	**FIELD PARAMETERS**																										
88	81	pH (avg)	6.48		6.12		6.08		6.38		6.60		6.44		6.26		6.45		6.64		6.57		6.83		6.62		6.79	
89	82	Temperature (° C) (avg)	14.1		12.8		13.9		14.7		15.2		13.8		14.5		15.5		16.0		14.6		14.4		15.1		18.8	
90	83	Conductivity (um/hos)	338		265		523		486		623		435		422		393		455		511		544		315		379	
91	84	Dissolved oxygen (mg/L) (avg)	2.14		1.25		0.37		0.69		1.82		3.27		7.60		4.42		0.82		0.69		0.88		1.78		0.98	
92	85																											
93	86	**DIOXINS AND FURANS (ng/L)**																										
94	87	**Method 8290**																										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD
1			
2			
3		LW18D	
4		FY82F	
5		10/23/03	
87	**FIELD PARAMETERS**		
88	pH (avg)	6.53	
89	Temperature (° C) (avg)	17.9	
90	Conductivity (um/hos)	425	
91	Dissolved oxygen (mg/L) (avg)	4.38	
92			
93	**DIOXINS AND FURANS (ng/L)**		
94	**Method 8290**		
95	2,3,7,8-TCDF	NA	
96	Total TCDF	NA	
97	2,3,7,8-TCDD	NA	
98	Total TCDD	NA	
99	1,2,3,7,8-PeCDF	NA	
100	2,3,4,7,8-PeCDF	NA	
101	Total PeCDF	NA	
102	1,2,3,7,8-PeCDD	NA	
103	Total PeCDD	NA	
104	1,2,3,4,7,8-HxCDF	NA	
105	1,2,3,6,7,8-HxCDF	NA	
106	2,3,4,6,7,8-HxCDF	NA	
107	1,2,3,7,8,9-HxCDF	NA	
108	Total HxCDF	NA	
109	1,2,3,4,7,8-HxCDD	NA	
110	1,2,3,6,7,8-HxCDD	NA	
111	1,2,3,7,8,9-HxCDD	NA	
112	Total HxCDD	NA	
113	1,2,3,4,6,7,8-HpCDF	NA	
114	1,2,3,4,7,8,9-HpCDF	NA	
115	Total HpCDF	NA	
116	1,2,3,4,6,7,8-HpCDD	NA	
117	Total HpCDD	NA	
118	OCDF	NA	
119	OCDD	NA	
120			
121			
122			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D	
4			CB85B		CL03S		CT67M		DE87D		DM30O		DW48G		ED34C		EN00I		ER93O		EZ03G		FF76D		FL66G		FU45Q	
5			8/31/00		11/9/00		2/14/01		6/5/01		8/13/01		11/29/01		2/28/02		6/27/02		08/27/02		11/12/02		2/12/03		5/9/03		8/28/03	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD
1			
2			
3		LW18D	
4		FY82F	
5		10/23/03	
123	**PAHs (µg/L)**		
124	**EPA Method SW8270 SIM**		
125	Naphthalene	NA	
126	2-Methylnaphthalene	NA	
127	Acenaphthylene	NA	
128	Acenaphthene	NA	
129	Fluorene	NA	
130	Anthracene	NA	
131	Dibenzofuran	NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW20D	
4			FZ04N	
5			10/28/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2	U
20	14	4-Methylphenol	1	U
21	15	Isophorone	1	U
22	16	2,4-Dimethylphenol	3	U
23	17	Benzoic Acid	10	U
24	18	Naphthalene	1	U
25	19	2-Methylnaphthalene	1	U
26	20	2,4,6-Trichlorophenol	5	U
27	21	2,4,5-Trichlorophenol	5	U
28	22	Acenaphthene	1	U
29	23	Dibenzofuran	1	U
30	24	Fluorene	1	U
31	25	Pentachlorophenol	5	U
32	26	bis(2-Ethylhexyl)phthalate	**3.9**	
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	**6**	M
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	1	U
40	34	Bromoform	1	U
41	35	Toluene	1	U
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	1	U
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	1	U
49	43	n-Propylbenzene	1	U
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	1	U
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	1	U
54	48	Naphthalene	5	U
55		Methyl tert-butyl ether	**1.5**	
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	**0.4**	
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	0.25	U
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.021**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW20D	
4			FZ04N	
5			10/28/03	
66	59	Chromium (6010)	0.005	U
67	60	Copper (6010)	**0.004**	
68	61	Lead (7421)	0.001	U
69	62	Nickel (6010)	0.01	U
70	63	Zinc (6010)	**0.015**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**220**	
81	74	Chloride (mg/L) (EPA 325.2)	**5.6**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW20D	
4			FZ04N	
5			10/28/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.62	
89	82	Temperature (° C) (avg)	15.8	
90	83	Conductivity (um/hos)	347	
91	84	Dissolved oxygen (mg/L) (avg)	2.04	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121				
122				

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW20D	
4			FZ04N	
5			10/28/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.1	U
126		2-Methylnaphthalene	0.1	U
127		Acenaphthylene	0.1	U
128		Acenaphthene	0.1	U
129		Fluorene	0.1	U
130		Anthracene	0.1	U
131		Dibenzofuran	0.1	U

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW22D	
4			FZ04A	
5			10/27/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	**4.1**	
20	14	4-Methylphenol	1.4	U
21	15	Isophorone	1.4	U
22	16	2,4-Dimethylphenol	4.2	U
23	17	Benzoic Acid	14	U
24	18	Naphthalene	1.4	U
25	19	2-Methylnaphthalene	1.4	U
26	20	2,4,6-Trichlorophenol	7	U
27	21	2,4,5-Trichlorophenol	7	U
28	22	Acenaphthene	1.4	U
29	23	Dibenzofuran	1.4	U
30	24	Fluorene	1.4	U
31	25	Pentachlorophenol	7	U
32	26	bis(2-Ethylhexyl)phthalate	1.4	U
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	**5.2**	M
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	**2.9**	
40	34	Bromoform	1	U
41	35	Toluene	**1.6**	
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	**1.6**	
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	**14**	
49	43	n-Propylbenzene	**12**	
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	**1.5**	
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	1	U
54	48	Naphthalene	5	U
55		Methyl tert-butyl ether	**1.9**	M
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	**2**	
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	**0.54**	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.023**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW22D	
4			FZ04A	
5			10/27/03	
66	59	Chromium (6010)	**0.15**	
67	60	Copper (6010)	**0.199**	
68	61	Lead (7421)	**0.056**	
69	62	Nickel (6010)	**0.14**	
70	63	Zinc (6010)	**0.4**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**280**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.7**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW22D	
4			FZ04A	
5			10/27/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.65	
89	82	Temperature (° C) (avg)	17.2	
90	83	Conductivity (um/hos)	498	
91	84	Dissolved oxygen (mg/L) (avg)	4.51	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121				
122				

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW22D	
4			FZ04A	
5			10/27/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.14	U
126		2-Methylnaphthalene	0.14	U
127		Acenaphthylene	0.14	U
128		Acenaphthene	1	
129		Fluorene	0.35	
130		Anthracene	0.14	U
131		Dibenzofuran	0.14	U

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW23D	
4			FZ04B	
5			10/27/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2	U
20	14	4-Methylphenol	1	U
21	15	Isophorone	1	U
22	16	2,4-Dimethylphenol	3	U
23	17	Benzoic Acid	10	U
24	18	Naphthalene	1	U
25	19	2-Methylnaphthalene	1	U
26	20	2,4,6-Trichlorophenol	5	U
27	21	2,4,5-Trichlorophenol	5	U
28	22	Acenaphthene	1	U
29	23	Dibenzofuran	1	U
30	24	Fluorene	1	U
31	25	Pentachlorophenol	5	U
32	26	bis(2-Ethylhexyl)phthalate	**6.8**	
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	**19**	
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	**40**	
40	34	Bromoform	1	U
41	35	Toluene	**1.2**	
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	**1.2**	
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	**16**	
49	43	n-Propylbenzene	**8.6**	
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	**3.3**	
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	**1.6**	
54	48	Naphthalene	5	U
55		Methyl tert-butyl ether	**33**	
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	**2.9**	
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	**0.88**	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.021**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW23D	
4			FZ04B	
5			10/27/03	
66	59	Chromium (6010)	**0.135**	
67	60	Copper (6010)	**0.201**	
68	61	Lead (7421)	**0.068**	
69	62	Nickel (6010)	**0.11**	
70	63	Zinc (6010)	**0.348**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**330**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.4**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW23D	
4			FZ04B	
5			10/27/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.78	
89	82	Temperature (° C) (avg)	15.8	
90	83	Conductivity (um/hos)	547	
91	84	Dissolved oxygen (mg/L) (avg)	0.35	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121				
122				

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW23D	
4			FZ04B	
5			10/27/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.1	U
126		2-Methylnaphthalene	0.1	U
127		Acenaphthylene	0.1	U
128		Acenaphthene	0.61	
129		Fluorene	0.31	
130		Anthracene	0.11	
131		Dibenzofuran	0.1	U

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW24D	
4			FZ04U	
5			10/28/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2	U
20	14	4-Methylphenol	1	U
21	15	Isophorone	1	U
22	16	2,4-Dimethylphenol	3	U
23	17	Benzoic Acid	10	U
24	18	Naphthalene	1	U
25	19	2-Methylnaphthalene	1	U
26	20	2,4,6-Trichlorophenol	5	U
27	21	2,4,5-Trichlorophenol	5	U
28	22	Acenaphthene	1	U
29	23	Dibenzofuran	1	U
30	24	Fluorene	1	U
31	25	Pentachlorophenol	5	U
32	26	bis(2-Ethylhexyl)phthalate	**5.6**	
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	5	U
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	1	U
40	34	Bromoform	1	U
41	35	Toluene	1	U
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	1	U
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	**2.2**	
49	43	n-Propylbenzene	1	U
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	**1.3**	
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	1	U
54	48	Naphthalene	5	U
55		Methyl tert-butyl ether	1	U
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	**2.5**	
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	**0.92**	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.009**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW24D	
4			FZ04U	
5			10/28/03	
66	59	Chromium (6010)	**0.125**	
67	60	Copper (6010)	**0.163**	
68	61	Lead (7421)	**0.058**	
69	62	Nickel (6010)	**0.11**	
70	63	Zinc (6010)	**0.327**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**340**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.2**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW24D	
4			FZ04U	
5			10/28/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.87	
89	82	Temperature (° C) (avg)	16.9	
90	83	Conductivity (um/hos)	494	
91	84	Dissolved oxygen (mg/L) (avg)	0.57	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121				
122				

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW24D	
4			FZ04U	
5			10/28/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.1	U
126		2-Methylnaphthalene	0.1	U
127		Acenaphthylene	0.1	U
128		Acenaphthene	0.91	
129		Fluorene	0.7	
130		Anthracene	0.43	
131		Dibenzofuran	0.1	U

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW25D	
4			FZ04V	
5			10/28/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2.3	U
20	14	4-Methylphenol	1.2	U
21	15	Isophorone	1.2	U
22	16	2,4-Dimethylphenol	3.5	U
23	17	Benzoic Acid	12	U
24	18	Naphthalene	1.2	U
25	19	2-Methylnaphthalene	1.2	U
26	20	2,4,6-Trichlorophenol	5.8	U
27	21	2,4,5-Trichlorophenol	5.8	U
28	22	Acenaphthene	1.2	U
29	23	Dibenzofuran	1.2	U
30	24	Fluorene	1.2	U
31	25	Pentachlorophenol	5.8	U
32	26	bis(2-Ethylhexyl)phthalate	1.2	U
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	5	U
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	1	U
40	34	Bromoform	1	U
41	35	Toluene	1	U
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	**1.6**	
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	**5.6**	
49	43	n-Propylbenzene	**2**	
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	**1.2**	
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	1	U
54	48	Naphthalene	5	U
55		Methyl tert-butyl ether	1	U
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	**1.3**	
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	**0.43**	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.032**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW25D	
4			FZ04V	
5			10/28/03	
66	59	Chromium (6010)	**0.31**	
67	60	Copper (6010)	**0.373**	
68	61	Lead (7421)	**0.15**	
69	62	Nickel (6010)	**0.28**	
70	63	Zinc (6010)	**0.83**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**210**	
81	74	Chloride (mg/L) (EPA 325.2)	**12**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW25D	
4			FZ04V	
5			10/28/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.55	
89	82	Temperature (° C) (avg)	18.1	
90	83	Conductivity (um/hos)	290	
91	84	Dissolved oxygen (mg/L) (avg)	2.68	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121				
122				

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW25D	
4			FZ04V	
5			10/28/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.12	U
126		2-Methylnaphthalene	0.12	U
127		Acenaphthylene	0.12	U
128		Acenaphthene	0.45	
129		Fluorene	0.57	
130		Anthracene	0.12	U
131		Dibenzofuran	0.12	U

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW26D	
4			FZ04T	
5			10/28/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2.2	U
20	14	4-Methylphenol	1.1	U
21	15	Isophorone	1.1	U
22	16	2,4-Dimethylphenol	3.3	U
23	17	Benzoic Acid	11	U
24	18	Naphthalene	1.1	U
25	19	2-Methylnaphthalene	1.1	U
26	20	2,4,6-Trichlorophenol	5.5	U
27	21	2,4,5-Trichlorophenol	5.5	U
28	22	Acenaphthene	1.1	U
29	23	Dibenzofuran	1.1	U
30	24	Fluorene	1.1	U
31	25	Pentachlorophenol	5.5	U
32	26	bis(2-Ethylhexyl)phthalate	1.1	U
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	**11**	
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	1	U
40	34	Bromoform	1	U
41	35	Toluene	1	U
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	1	U
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	1	U
49	43	n-Propylbenzene	1	U
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	1	U
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	1	U
54	48	Naphthalene	5	U
55		Methyl tert-butyl ether	**1.2**	
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	**1.1**	
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	**0.35**	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.007**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW26D	
4			FZ04T	
5			10/28/03	
66	59	Chromium (6010)	**0.012**	
67	60	Copper (6010)	**0.016**	
68	61	Lead (7421)	**0.006**	
69	62	Nickel (6010)	**0.01**	
70	63	Zinc (6010)	**0.036**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**300**	
81	74	Chloride (mg/L) (EPA 325.2)	**18**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW26D	
4			FZ04T	
5			10/28/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.8	
89	82	Temperature (° C) (avg)	19.0	
90	83	Conductivity (um/hos)	509	
91	84	Dissolved oxygen (mg/L) (avg)	2.65	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121				
122				

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW26D	
4			FZ04T	
5			10/28/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.11	U
126		2-Methylnaphthalene	0.11	U
127		Acenaphthylene	0.11	U
128		Acenaphthene	0.11	U
129		Fluorene	0.11	U
130		Anthracene	0.11	U
131		Dibenzofuran	0.11	U

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW27D	
4			FZ04S	
5			10/28/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2.2	U
20	14	4-Methylphenol	1.1	U
21	15	Isophorone	1.1	U
22	16	2,4-Dimethylphenol	3.2	U
23	17	Benzoic Acid	11	U
24	18	Naphthalene	1.1	U
25	19	2-Methylnaphthalene	1.1	U
26	20	2,4,6-Trichlorophenol	5.4	U
27	21	2,4,5-Trichlorophenol	5.4	U
28	22	Acenaphthene	1.1	U
29	23	Dibenzofuran	1.1	U
30	24	Fluorene	1.1	U
31	25	Pentachlorophenol	5.4	U
32	26	bis(2-Ethylhexyl)phthalate	1.1	U
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	**7.9**	
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	1	U
40	34	Bromoform	1	U
41	35	Toluene	1	U
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	1	U
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	1	U
49	43	n-Propylbenzene	1	U
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	1	U
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	1	U
54	48	Naphthalene	5	U
55		Methyl tert-butyl ether	1	U
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	**0.54**	
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	0.25	U
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.006**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW27D	
4			FZ04S	
5			10/28/03	
66	59	Chromium (6010)	**0.009**	
67	60	Copper (6010)	**0.02**	
68	61	Lead (7421)	**0.014**	
69	62	Nickel (6010)	**0.01**	
70	63	Zinc (6010)	**0.047**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**240**	
81	74	Chloride (mg/L) (EPA 325.2)	**24**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW27D	
4			FZ04S	
5			10/28/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.84	
89	82	Temperature (° C) (avg)	15.0	
90	83	Conductivity (um/hos)	329	
91	84	Dissolved oxygen (mg/L) (avg)	1.07	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121				
122				

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW27D	
4			FZ04S	
5			10/28/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.11	U
126		2-Methylnaphthalene	0.11	U
127		Acenaphthylene	0.11	U
128		Acenaphthene	0.11	U
129		Fluorene	0.11	U
130		Anthracene	0.11	U
131		Dibenzofuran	0.11	U

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW29D	
4			FZ04D	
5			10/27/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2.1	U
20	14	4-Methylphenol	1	U
21	15	Isophorone	1	U
22	16	2,4-Dimethylphenol	3.1	U
23	17	Benzoic Acid	10	U
24	18	Naphthalene	1	U
25	19	2-Methylnaphthalene	1	U
26	20	2,4,6-Trichlorophenol	5.2	U
27	21	2,4,5-Trichlorophenol	5.2	U
28	22	Acenaphthene	1	U
29	23	Dibenzofuran	1	U
30	24	Fluorene	1	U
31	25	Pentachlorophenol	5.2	U
32	26	bis(2-Ethylhexyl)phthalate	1	U
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	5	U
37	31	Carbon Disulfide	**1.1**	
38	32	2-Butanone	5	U
39	33	Benzene	1	U
40	34	Bromoform	1	U
41	35	Toluene	1	U
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	1	U
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	1	U
49	43	n-Propylbenzene	1	U
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	1	U
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	1	U
54	48	Naphthalene	5	U
55		Methyl tert-butyl ether	1	U
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	0.25	U
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	0.25	U
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.004**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW29D	
4			FZ04D	
5			10/27/03	
66	59	Chromium (6010)	**0.019**	
67	60	Copper (6010)	**0.019**	
68	61	Lead (7421)	**0.006**	
69	62	Nickel (6010)	**0.02**	
70	63	Zinc (6010)	**0.04**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**370**	
81	74	Chloride (mg/L) (EPA 325.2)	**30**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW29D	
4			FZ04D	
5			10/27/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.69	
89	82	Temperature (° C) (avg)	16.0	
90	83	Conductivity (um/hos)	569	
91	84	Dissolved oxygen (mg/L) (avg)	3.36	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121				
122				

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW29D	
4			FZ04D	
5			10/27/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.1	U
126		2-Methylnaphthalene	0.1	U
127		Acenaphthylene	0.1	U
128		Acenaphthene	0.1	U
129		Fluorene	0.1	U
130		Anthracene	0.1	U
131		Dibenzofuran	0.1	U

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW30D	
4			FZ04F	
5			10/27/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2.2	U
20	14	4-Methylphenol	1.1	U
21	15	Isophorone	1.1	U
22	16	2,4-Dimethylphenol	3.3	U
23	17	Benzoic Acid	11	U
24	18	Naphthalene	1.1	U
25	19	2-Methylnaphthalene	1.1	U
26	20	2,4,6-Trichlorophenol	5.6	U
27	21	2,4,5-Trichlorophenol	5.6	U
28	22	Acenaphthene	1.1	U
29	23	Dibenzofuran	1.1	U
30	24	Fluorene	1.1	U
31	25	Pentachlorophenol	5.6	U
32	26	bis(2-Ethylhexyl)phthalate	1.1	U
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	**5.1**	
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	1	U
40	34	Bromoform	1	U
41	35	Toluene	1	U
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	1	U
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	1	U
49	43	n-Propylbenzene	1	U
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	1	U
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	1	U
54	48	Naphthalene	5	U
55		Methyl tert-butyl ether	1	U
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	0.25	U
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	0.25	U
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.01**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW30D	
4			FZ04F	
5			10/27/03	
66	59	Chromium (6010)	**0.026**	
67	60	Copper (6010)	**0.04**	
68	61	Lead (7421)	**0.008**	
69	62	Nickel (6010)	**0.03**	
70	63	Zinc (6010)	**0.07**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**270**	
81	74	Chloride (mg/L) (EPA 325.2)	**7.3**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW30D	
4			FZ04F	
5			10/27/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.65	
89	82	Temperature (° C) (avg)	13.8	
90	83	Conductivity (um/hos)	426	
91	84	Dissolved oxygen (mg/L) (avg)	1.96	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121				
122				

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW30D	
4			FZ04F	
5			10/27/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.11	U
126		2-Methylnaphthalene	0.11	U
127		Acenaphthylene	0.11	U
128		Acenaphthene	0.11	U
129		Fluorene	0.11	U
130		Anthracene	0.11	U
131		Dibenzofuran	0.11	U

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW32D	
4			FZ04I	
5			10/27/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2.1	U
20	14	4-Methylphenol	1.1	U
21	15	Isophorone	1.1	U
22	16	2,4-Dimethylphenol	3.2	U
23	17	Benzoic Acid	11	U
24	18	Naphthalene	1.1	U
25	19	2-Methylnaphthalene	1.1	U
26	20	2,4,6-Trichlorophenol	5.3	U
27	21	2,4,5-Trichlorophenol	5.3	U
28	22	Acenaphthene	1.1	U
29	23	Dibenzofuran	1.1	U
30	24	Fluorene	1.1	U
31	25	Pentachlorophenol	5.3	U
32	26	bis(2-Ethylhexyl)phthalate	**2.2**	
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	5	U
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	1	U
40	34	Bromoform	1	U
41	35	Toluene	1	U
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	1	U
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	1	U
49	43	n-Propylbenzene	1	U
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	1	U
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	1	U
54	48	Naphthalene	5	U
55		Methyl tert-butyl ether	1	U
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	**0.35**	
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	0.25	U
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.004**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW32D	
4			FZ04I	
5			10/27/03	
66	59	Chromium (6010)	**0.063**	
67	60	Copper (6010)	**0.082**	
68	61	Lead (7421)	**0.018**	
69	62	Nickel (6010)	**0.05**	
70	63	Zinc (6010)	**0.146**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**270**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.7**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW32D	
4			FZ04I	
5			10/27/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.80	
89	82	Temperature (° C) (avg)	15.8	
90	83	Conductivity (um/hos)	436	
91	84	Dissolved oxygen (mg/L) (avg)	5.75	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121				
122				

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW32D	
4			FZ04I	
5			10/27/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.11	U
126		2-Methylnaphthalene	0.11	U
127		Acenaphthylene	0.11	U
128		Acenaphthene	0.11	U
129		Fluorene	0.11	U
130		Anthracene	0.11	U
131		Dibenzofuran	0.11	U

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW35D	
4			FZ04K	
5			10/27/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2.9	U
20	14	4-Methylphenol	1.4	U
21	15	Isophorone	1.4	U
22	16	2,4-Dimethylphenol	4.3	U
23	17	Benzoic Acid	14	U
24	18	Naphthalene	1.4	U
25	19	2-Methylnaphthalene	1.4	U
26	20	2,4,6-Trichlorophenol	7.1	U
27	21	2,4,5-Trichlorophenol	7.1	U
28	22	Acenaphthene	1.4	U
29	23	Dibenzofuran	1.4	U
30	24	Fluorene	1.4	U
31	25	Pentachlorophenol	7.1	U
32	26	bis(2-Ethylhexyl)phthalate	**2.7**	
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	**7.9**	M
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	1	U
40	34	Bromoform	1	U
41	35	Toluene	1	U
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	1	U
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	**2.2**	
49	43	n-Propylbenzene	1	U
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	1	U
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	1	U
54	48	Naphthalene	5	U
55		Methyl tert-butyl ether	**1.5**	
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	**3.1**	
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	0.25	U
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.018**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW35D	
4			FZ04K	
5			10/27/03	
66	59	Chromium (6010)	**0.35**	
67	60	Copper (6010)	**0.37**	
68	61	Lead (7421)	**0.12**	
69	62	Nickel (6010)	**0.32**	
70	63	Zinc (6010)	**0.93**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**240**	
81	74	Chloride (mg/L) (EPA 325.2)	**3.2**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW35D	
4			FZ04K	
5			10/27/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.51	
89	82	Temperature (° C) (avg)	14.9	
90	83	Conductivity (um/hos)	526	
91	84	Dissolved oxygen (mg/L) (avg)	0.58	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121			NA	
122				

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW35D	
4			FZ04K	
5			10/27/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.14	U
126		2-Methylnaphthalene	0.14	U
127		Acenaphthylene	0.14	U
128		Acenaphthene	0.14	U
129		Fluorene	0.14	U
130		Anthracene	0.14	U
131		Dibenzofuran	0.14	U

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
3			O		O		O		O		O		O		O		O		O		O		O		O		O	
4			S177M		T176J		U235P		V208J		W391L		Y314M		Z225S		Z960Y		AH27A		AU45O		BC30B		BH96A		BR64A	
5			4/1/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/16/00		5/23/00	
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	**8.9**		**20**		**2.8**		2.0	U	2.0	U	2.0	U	**4.1**		2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.6**		**1.0**		1.0	U	**1.2**		1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	**2.2**		**2.0**		1.0	U	1.0	U	**1.6**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**2.2**		1.0	U	1.0	U	**1.9**		1.0	U	1.0	U	**1.7**	
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	**1.0**	J2	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	5.0	U	**6.2**		**9.4**		**6.0**		8.5	U	**7.0**		**27**		5.0	U	5.0	U	**17**		5.0	U	17	U	**6.7**	M
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**7.1**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
39	33	Benzene	**180**		**690**		**94**		1.0	U	1.0	U	**34**		**39**		**2.3**		**37**		**28**		1.0	U	1.0	U	1.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	**1.1**		**1.6**		1.0	U	1.0	U	**6.3**		**5.3**		1.0	U	1.0	U	**2.5**		1.0	U	**1.5**		1.0	U
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	1.0	U	1.0	U	**1.5**		1.0	U	1.0	U	**5.0**		**3.8**		1.0	U	1.0	U	**1.6**		1.0	U	**1.1**		1.0	U
45	39	o-Xylene	1.0	U	**1.3**		1.0	U	1.0	U	1.0	U	**1.6**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	**1.0**	J2	1.0	U	1.0	U	**2.2**		**4.7**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
48	42	Isopropylbenzene	1.0	U	**15**		**22**	J2	**1.2**		**18**		**28**		**71**		1.0	U	**2.2**		**20**		**7.8**		**27**		**6.0**	
49	43	n-Propylbenzene	1.0	U	**9.8**		**7.2**		1.0	U	1.0	U	**14**		**51**		1.0	U	**2.0**		**15**		**2.3**		**12**		**3.0**	
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.0**	J1	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	1.0	U	**7.7**		**6.1**	J2	**1.3**		**5.2**		**10**	J2	**7.4**		**8.5**		**7.9**		**6.4**		**1.6**		**4.3**		**6.9**	
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
53	47	n-Butylbenzene	1.0	U	**1.9**		**1.2**	J2	1.0	U	1.0	U	**2.9**		**3.7**		**1.4**		**2.9**		**2.7**		1.0	U	**1.1**		**1.0**	
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
3		O		O		O		O		O		O		O		O		O		O		O		O		O		O	
4		CB85C		CL03P		CT55I		DE87A		DM30S		DW48E		ED23F		EM75L		ER93A		EY88A		FF88I		FL66B		FU45T		FY82Q	
5		8/30/00		11/8/00		2/13/01		6/5/01		8/14/01		11/29/01		2/26/02		6/25/02		08/26/02		11/11/02		2/13/03		5/9/03		8/28/03		10/24/03	
7	**CHLORINATED PHENOLS (µg/L)**																												
8	**EPA Method SW8040**																												
9	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																													
17	**SEMIVOLATILES (µg/L)**																												
18	**EPA Method SW8270**																												
19	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.2	U	2.2	U	2	U	2	U	2.3	U	2.1	U
20	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1.1	U	1	U
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1.1	U	1	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.3	U	3.3	U	3.1	U	3	U	3.4	U	3.1	U
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U	56	U	54	U	51	U	50	U	57	U	10	U
24	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1.1	U	1	U
25	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1.1	U	1	U
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5.4	U	5.1	U	5	U	5.7	U	5.2	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5.4	U	5.1	U	5	U	5.7	U	5.2	U
28	Acenaphthene	**1.9**		**1.8**		1.0	U	1.0	U	**1.3**		1.0	U	1.0	U	1.0	U	1.1	U	**1.7**		1	U	1	U	1.1	U	**1.2**	
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1.1	U	1	U
30	Fluorene	**2.9**		**3.5**		**2.0**		**1.6**		**1.6**		1.0	U	1.0	U	1.0	U	1.1	U	**2.1**		1	U	1	U	1.1	U	**1.8**	
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5.4	U	5.1	U	5	U	5.7	U	5.2	U
32	bis(2-Ethylhexyl)phthalate	1.0	U	**2.2**		1.0	U	**1.1**		**2.0**		1.0	U	4.0	U	4.0	U	4.4	U	4.3	U	1	U	1	U	1.1	U	1	U
33																													
34	**VOLATILES (µg/L)**																												
35	**EPA Method SW8260**																												
36	Acetone	**45**		**11**			R	**8.7**		5.0	U	5.0	U	5.0	U	**11**		**5.7**		5	U	5	U	5	U	**11**	J	**11**	
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5	U
39	Benzene	**18**		**7.7**		1.0	U	1.0	U	1.0	U	**1.0**		1.0	U	1.0	U	**2.6**		**40**		1	U	1	U	1	U	**1.5**	
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	**1.8**		**3.0**		**2.3**		**1.6**		**1.1**		**2.4**		1.0	U	1.0	U	1	U	**2.5**		1	U	1	U	**1.4**		**1.4**	
42	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	**1.3**		**2.6**		**2.6**		**1.9**		**1.1**		**2.5**		1.0	U	1.0	U	1	U	**2.1**		1	U	1	U	1	U	1	U
45	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	1.0	U	**1.4**		1.0	U	**1.4**		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	**26**		**33**		**26**		**37**		**32**		**64**		**31**		**30**		**5.6**		**46**		1	U	**3.4**		**27**		**27**	
49	n-Propylbenzene	**15**		**18**		**15**		**22**		**13**		**36**		**19**		**7.3**		**4.1**		**46**		1	U	**3.3**		**35**		**29**	
50	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	**5.1**		**6.7**		**4.4**		**5.7**		**5.0**		**6.3**		**6.6**		**5.5**		**5.9**		**7.7**		**1.5**		**5.4**		**8**		**5.6**	
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	**2.0**		**2.5**		**1.6**		**2.2**		**2.0**		**2.8**		**2.9**		**1.8**		**1.2**		**5.3**		1	U	1	U	**4.1**		**3**	
54	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																													
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																												
58	**Method OR-DEQ**																												
59	**TPH-Diesel**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																													
63	**PRIORITY POLLUTANT**																												
64	**METALS (mg/L)**																												
65	Arsenic (7060)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			O		O		O		O		O		O		O		O		O		O		O		O		O	
4			S177M		T176J		U235P		V208J		W391L		Y314M		Z225S		Z960Y		AH27A		AU45O		BC30B		BH96A		BR64A	
5			4/1/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/16/00		5/23/00	
66	59	Chromium (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
67	60	Copper (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
68	61	Lead (7421)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
69	62	Nickel (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
70	63	Zinc (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**330**	J2	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86	79																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
1																													
2																													
3		O		O		O		O		O		O		O		O		O		O		O		O		O		O	
4		CB85C		CL03P		CT55I		DE87A		DM30S		DW48E		ED23F		EM75L		ER93A		EY88A		FF88I		FL66B		FU45T		FY82Q	
5		8/30/00		11/8/00		2/13/01		6/5/01		8/14/01		11/29/01		2/26/02		6/25/02		08/26/02		11/11/02		2/13/03		5/9/03		8/28/03		10/24/03	
66	Chromium (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
67	Copper (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
68	Lead (7421)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
69	Nickel (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
70	Zinc (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
71																													
72	**MAJOR IONS AND CONVENTIONALS**																												
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
81	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86																													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			O		O		O		O		O		O		O		O		O		O		O		O		O	
4			S177M		T176J		U235P		V208J		W391L		Y314M		Z225S		Z960Y		AH27A		AU45O		BC30B		BH96A		BR64A	
5			4/1/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/16/00		5/23/00	
87	80	**FIELD PARAMETERS**																										
88	81	pH (avg)	6.77		6.82		6.86		6.79		6.43		6.39		6.32		6.62		5.57		6.70		6.27		6.62		6.39	
89	82	Temperature (° C) (avg)	12.3		15.7		13.6		14.2		14.1		15.0		13.3		14.6		15.0		17.8		13.0		15.0		15.6	
90	83	Conductivity (um/hos)	413		412		389		471		437		531		183		366		391		441		337		427		413	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		3.36		1.68		1.41		2.44		1.85		1.93		1.58		1.58		1.82	
92	85																											
93	86	**DIOXINS AND FURANS (ng/L)**																										
94	87	**Method 8290**																										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
1																													
2																													
3		O		O		O		O		O		O		O		O		O		O		O		O		O		O	
4		CB85C		CL03P		CT55I		DE87A		DM30S		DW48E		ED23F		EM75L		ER93A		EY88A		FF88I		FL66B		FU45T		FY82Q	
5		8/30/00		11/8/00		2/13/01		6/5/01		8/14/01		11/29/01		2/26/02		6/25/02		08/26/02		11/11/02		2/13/03		5/9/03		8/28/03		10/24/03	
87	**FIELD PARAMETERS**																												
88	pH (avg)	5.85		5.70		6.27		6.43		6.80		6.62		6.27		6.43		6.18		6.79		6.67		6.39		6.85		6.62	
89	Temperature (° C) (avg)	15.9		13.4		16.5		14.5		15.9		12.5		15.3		17.3		17.3		14.0		14.7		14		17.9		14.9	
90	Conductivity (um/hos)	409		437		445		510		563		536		500		471		464		592		431		327		514		467	
91	Dissolved oxygen (mg/L) (avg)	1.16		0.39		2.15		2.40		1.89		4.34		7.41		4.16		2.18		1.93		0		2.01		0.88		3.07	
92																													
93	**DIOXINS AND FURANS (ng/L)**																												
94	**Method 8290**																												
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																													
121																													
122																													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			O		O		O		O		O		O		O		O		O		O		O		O		O	
4			S177M		T176J		U235P		V208J		W391L		Y314M		Z225S		Z960Y		AH27A		AU45O		BC30B		BH96A		BR64A	
5			4/1/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/16/00		5/23/00	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		**0.47**		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		**0.31**		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		**0.92**		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		**0.28**	M	NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
1																													
2																													
3		O		O		O		O		O		O		O		O		O		O		O		O		O		O	
4		CB85C		CL03P		CT55I		DE87A		DM30S		DW48E		ED23F		EM75L		ER93A		EY88A		FF88I		FL66B		FU45T		FY82Q	
5		8/30/00		11/8/00		2/13/01		6/5/01		8/14/01		11/29/01		2/26/02		6/25/02		08/26/02		11/11/02		2/13/03		5/9/03		8/28/03		10/24/03	
123	**PAHs (µg/L)**																												
124	**EPA Method SW8270 SIM**																												
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
3			R		R		R		R		R		R		R		R		R		R		R		R		R	
4			S177N		T176K		U235Q		V208K		W391M		Y314N		Z225T		Z960Z		AH27B		AU45P		BC30C		BH96Y		BR64B	
5			4/1/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/16/00		5/23/00	
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	**18**		**8.4**		2.0	U	2.0	U	2.0	U	**6.1**		**22**		**16**		**3.8**		**6.3**		2.0	U	2.0	U	2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.6**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	**4.0**	J2	**2.8**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.0**		1.0	U	1.0	U		
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	5.0	U	**13**		**6.9**		5.0	U	**11**		**8.9**		**17**		15	U	**7.5**		5.0	U	5.0	U	14	U	5.0	U
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	15	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
39	33	Benzene	**410**		**990**		**4.7**		1.0	U	**2.5**		**160**		**120**		**740**		**57**		**120**		1.0	U	**2.1**		**9.3**	
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	2.9		1.0	U	1.0	U	1.0	U	**6.0**		**3.5**		3.0	U	1.0	U	**6.0**		1.0	U	**1.2**		1.0	U
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**14**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	1.0	U	2.9		1.0	U	1.0	U	1.0	U	**6.4**		**2.1**		**4.9**		1.0	U	**6.9**		1.0	U	1.0	U	1.0	U
45	39	o-Xylene	1.0	U	1.8		1.0	U	1.0	U	1.0	U	**1.2**		1.0	U	3.0	U	1.0	U	**1.1**		1.0	U	1.0	U	1.0	U
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.5**		**1.4**		**15**		1.0	U	**1.4**		1.0	U	1.0	U	1.0	U
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**3.5**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
48	42	Isopropylbenzene	**2.6**		**16**		**5.1**	J2	1.0	U	**12**		**43**		**37**		**46**		**11**		**43**		1.0	U	**8.4**		**4.8**	
49	43	n-Propylbenzene	**1.7**		**3.7**		**1.6**		1.0	U	**2.4**		**19**		**19**		**51**		**3.9**		19	U	1.0	U	**5.4**		**1.2**	
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3.0		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	**2.7**		**5.4**		**2.0**	J2	1.0	U	**3.2**		**5.1**	J2	**5.0**		**4.8**		**3.2**		**6.0**		1.0	U	**2.5**		**3.0**	
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
53	47	n-Butylbenzene	1.0	U	3.0		1.0	U	1.0	U	1.0	U	**2.3**		**1.4**		**16**		**1.0**		2.5	U	1.0	U	1.0	U	1.0	U
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	15	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
3		R		R		R		R		R		R		R		R		R		R		R		R		R		R	
4		CB85D		CL03Q		CT55J		DE87B		DM30T		DW48F		ED23G		EM75M		ER93B		EY88B		FF88J		FL66C		FU45U		FY82R	
5		8/30/00		11/8/00		2/13/01		6/5/01		8/14/01		11/29/01		2/26/02		6/25/02		08/26/02		11/11/02		2/13/03		5/9/03		8/28/03		10/24/03	
7	**CHLORINATED PHENOLS (µg/L)**																												
8	**EPA Method SW8040**																												
9	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																													
17	**SEMIVOLATILES (µg/L)**																												
18	**EPA Method SW8270**																												
19	Phenol	**8.4**		**6.4**		2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.1	U	2.2	U	2	U	2	U	2	U	2	U
20	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1	U
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.2	U	3.3	U	3	U	3	U	3	U	3	U
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U	53	U	54	U	50	U	50	U	50	U	10	U
24	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1	U
25	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1	U
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5.4	U	5	U	5	U	5	U	5	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5.4	U	5	U	5	U	5	U	5	U
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1	U
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1	U
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5.4	U	5	U	5	U	5	U	5	U
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	**1.6**		1.0	U	**5.4**		1.0	U	4.0	U	4.0	U	4.3	U	4.3	U	1	U	1	U	1	U	1	U
33																													
34	**VOLATILES (µg/L)**																												
35	**EPA Method SW8260**																												
36	Acetone	**22**		**12**			R	5.0	U	**10**		**5.0**		5.0	U	**11**		**14**		5	U	**7.4**		5	U	**18**	J	**16**	
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	5.0	U	**5.0**	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5	U
39	Benzene	**120**		**77**		**36**		**3.1**		**13**		1.0	U	**41**		1.0	U	**32**		**7.7**		1	U	1	U	1	U	1	U
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	**6.3**		**3.6**		**3.0**		**2.9**		**2.8**		**1.5**		1.0	U	1.0	U	**2.9**		**1.6**		1	U	1	U	**2.4**		**2.5**	
42	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	**14**		**3.8**	
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	**5.8**		**2.4**		**1.8**		**4.1**		**3.4**		**1.6**		1.0	U	1.0	U	**3.5**		**1.4**		1	U	1	U	**26**	J	**9.4**	
45	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	**1.1**		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	**33**		**24**		**11**		**26**		**30**		**17**		**2.6**		**7.3**		**36**		**34**		**8.8**		1	U	**46**		**43**	
49	n-Propylbenzene	**18**		**14**		**5.1**		**9.1**		**16**		**6.8**		1.0	U	1.0	U	**14**		**20**		**3.3**		1	U	**37**		**20**	
50	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	**5.6**		**4.4**		**3.4**		**4.7**		**3.8**		**2.9**		**2.3**		**2.2**		**5.4**		**4.7**		**2**		**1.4**		**6.8**		**4.3**	
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	2.0	U	1.3	U	1.0	U	1.4	U	1.0	U	1.0	U	1.0	U	1.0	U	2.2	U	**2**		1	U	1	U	**3.9**		**1.7**	
54	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																													
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																												
58	**Method OR-DEQ**																												
59	**TPH-Diesel**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																													
63	**PRIORITY POLLUTANT**																												
64	**METALS (mg/L)**																												
65	Arsenic (7060)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			R		R		R		R		R		R		R		R		R		R		R		R		R	
4			S177N		T176K		U235Q		V208K		W391M		Y314N		Z225T		Z960Z		AH27B		AU45P		BC30C		BH96Y		BR64B	
5			4/1/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/16/00		5/23/00	
66	59	Chromium (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
67	60	Copper (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
68	61	Lead (7421)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
69	62	Nickel (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
70	63	Zinc (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**340**	J2	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86	79																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
1																													
2																													
3		R		R		R		R		R		R		R		R		R		R		R		R		R		R	
4		CB85D		CL03Q		CT55J		DE87B		DM30T		DW48F		ED23G		EM75M		ER93B		EY88B		FF88J		FL66C		FU45U		FY82R	
5		8/30/00		11/8/00		2/13/01		6/5/01		8/14/01		11/29/01		2/26/02		6/25/02		08/26/02		11/11/02		2/13/03		5/9/03		8/28/03		10/24/03	
66	Chromium (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
67	Copper (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
68	Lead (7421)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
69	Nickel (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
70	Zinc (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
71																													
72	**MAJOR IONS AND CONVENTIONALS**																												
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
81	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86																													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			R		R		R		R		R		R		R		R		R		R		R		R		R	
4			S177N		T176K		U235Q		V208K		W391M		Y314N		Z225T		Z960Z		AH27B		AU45P		BC30C		BH96Y		BR64B	
5			4/1/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/16/00		5/23/00	
87	80	**FIELD PARAMETERS**																										
88	81	pH (avg)	6.66		6.78		6.72		6.84		6.60		6.55		6.36		6.06		5.72		6.87		6.86		6.75		6.42	
89	82	Temperature (° C) (avg)	12.8		15.8		14.1		14.3		14.8		15.0		13.5		14.4		15.2		16.5		15.7		14.1		15.8	
90	83	Conductivity (um/hos)	503		629		1007		319		510		591		179		246		471		566		578		533		502	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		3.54		1.35		1.16		2.27		1.61		2.26		1.33		0.93		2.10	
92	85																											
93	86	**DIOXINS AND FURANS (ng/L)**																										
94	87	**Method 8290**																										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
1																													
2																													
3		R		R		R		R		R		R		R		R		R		R		R		R		R		R	
4		CB85D		CL03Q		CT55J		DE87B		DM30T		DW48F		ED23G		EM75M		ER93B		EY88B		FF88J		FL66C		FU45U		FY82R	
5		8/30/00		11/8/00		2/13/01		6/5/01		8/14/01		11/29/01		2/26/02		6/25/02		08/26/02		11/11/02		2/13/03		5/9/03		8/28/03		10/24/03	
87	**FIELD PARAMETERS**																												
88	pH (avg)	6.10		5.91		6.43		6.88		7.00		6.68		5.95		6.64		6.75		NM		6.88		6.23		7.01		6.75	
89	Temperature (° C) (avg)	15.0		13.5		15.4		14.5		15.1		14.2		14.5		15.2		15.8		NM		14.6		13.7		17		15.5	
90	Conductivity (um/hos)	560		571		661		694		628		600		170		591		631		NM		598		244		630		644	
91	Dissolved oxygen (mg/L) (avg)	1.90		0.69		2.01		1.49		1.26		4.02		7.80		4.86		1.19		NM		0		3.12		0.44		3.62	
92																													
93	**DIOXINS AND FURANS (ng/L)**																												
94	**Method 8290**																												
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																													
121																													
122																													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			R		R		R		R		R		R		R		R		R		R		R		R		R	
4			S177N		T176K		U235Q		V208K		W391M		Y314N		Z225T		Z960Z		AH27B		AU45P		BC30C		BH96Y		BR64B	
5			4/1/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/16/00		5/23/00	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
1																													
2																													
3		R		R		R		R		R		R		R		R		R		R		R		R		R		R	
4		CB85D		CL03Q		CT55J		DE87B		DM30T		DW48F		ED23G		EM75M		ER93B		EY88B		FF88J		FL66C		FU45U		FY82R	
5		8/30/00		11/8/00		2/13/01		6/5/01		8/14/01		11/29/01		2/26/02		6/25/02		08/26/02		11/11/02		2/13/03		5/9/03		8/28/03		10/24/03	
123	**PAHs (µg/L)**																												
124	**EPA Method SW8270 SIM**																												
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			OX8D	
4			FY72F	
5			10/22/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	**0.62**	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	NA	
20	14	4-Methylphenol	NA	
21	15	Isophorone	NA	
22	16	2,4-Dimethylphenol	NA	
23	17	Benzoic Acid	NA	
24	18	Naphthalene	NA	
25	19	2-Methylnaphthalene	NA	
26	20	2,4,6-Trichlorophenol	NA	
27	21	2,4,5-Trichlorophenol	NA	
28	22	Acenaphthene	NA	
29	23	Dibenzofuran	NA	
30	24	Fluorene	NA	
31	25	Pentachlorophenol	NA	
32	26	bis(2-Ethylhexyl)phthalate	NA	
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	NA	
37	31	Carbon Disulfide	NA	
38	32	2-Butanone	NA	
39	33	Benzene	NA	
40	34	Bromoform	NA	
41	35	Toluene	NA	
42	36	Ethylbenzene	NA	
43	37	Styrene	NA	
44	38	m,p-Xylene	NA	
45	39	o-Xylene	NA	
46	40	1,3,5-Trimethylbenzene	NA	
47	41	1,2,4-Trimethylbenzene	NA	
48	42	Isopropylbenzene	NA	
49	43	n-Propylbenzene	NA	
50	44	tert-Butylbenzene	NA	
51	45	sec-Butylbenzene	NA	
52	46	4-Isopropyltoluene	NA	
53	47	n-Butylbenzene	NA	
54	48	Naphthalene	NA	
55		Methyl tert-butyl ether	NA	
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	NA	
60	53	**TPH-D Motor Oil**	NA	
61	54	**TPH-Gasoline**	NA	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			OX8D	
4			FY72F	
5			10/22/03	
66	59	Chromium (6010)	NA	
67	60	Copper (6010)	NA	
68	61	Lead (7421)	NA	
69	62	Nickel (6010)	NA	
70	63	Zinc (6010)	NA	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			OX8D	
4			FY72F	
5			10/22/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	7.00	
89	82	Temperature (° C) (avg)	15.5	
90	83	Conductivity (um/hos)	406	
91	84	Dissolved oxygen (mg/L) (avg)	1.24	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121				
122				

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			OX8D	
4			FY72F	
5			10/22/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	NA	
126		2-Methylnaphthalene	NA	
127		Acenaphthylene	NA	
128		Acenaphthene	NA	
129		Fluorene	NA	
130		Anthracene	NA	
131		Dibenzofuran	NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
2															Dup of RW2				Dup of RW2				Dup of RW2			
3			RW2		RW2		RW2		RW2		RW2		RW2		X		RW2		X		RW2		X		RW2	
4			AH76G		AU45N		BC30E		BH96F		BR64P		CD97A		CD97B		CL03N		CL03M		CT37L		CT37M		DE87P	
5			5/20/99		9/23/99		12/7/99		2/17/00		5/25/00		9/13/00		9/13/00		11/9/00		11/9/00		2/13/01		2/13/01		6/6/01	
7	1	**CHLORINATED PHENOLS (µg/L)**																								
8	2	**EPA Method SW8040**																								
9	3	Pentachlorophenol	**210**		**7.7**		0.25	U	**300**		**46**		**580**		**630**		**45**		**38**		**21**	J	**19**	J	0.25	U
10	4	2,4,6-Trichlorophenol	**1.9**		0.25	U	0.25	U	**3.1**		0.25	U	**2.3**		**2.5**		0.25	U	0.25	U	NA		NA		NA	
11	5	2,3,6-Trichlorophenol	**0.31**		0.25	U	0.25	U	**0.45**		0.25	U	0.48	U	0.51	U	0.25	U	0.25	U	NA		NA		NA	
12	6	2,4,5-Trichlorophenol	5.2	U	0.70	U	0.53	U	13	U	1.2	U	10	U	11	U	1.2	U	**1.1**		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**15**		**0.71**		**0.33**		**18**		**8.0**		**42**		**45**		**3.6**		**3.5**		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	**1.8**		**0.91**		0.25	U	**3.4**		**1.3**		**7.0**		**7.8**		**1.3**		**1.2**		NA		NA		NA	
16	10																									
17	11	**SEMIVOLATILES (µg/L)**																								
18	12	**EPA Method SW8270**																								
19	13	Phenol	2.0	U	**13**		2.0	U	2.0	U	2.0	U	**170**	J2	**150**	J2	**85**		**97**		**8.1**		**8.0**		2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**6.0**	J2	**5.3**	J2	**14**		**18**		**2.9**		**2.7**		1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	**21**		**22**		10	U	10	U	10	U
24	18	Naphthalene	**1.3**		**18**		**3.8**		**9.7**		**3.7**		**16**		**16**		**13**		**14**		**2.5**		**2.2**		1.0	U
25	19	2-Methylnaphthalene	1.0	U	**33**		**1.8**		**20**		**23**		**44**		**41**		**31**		**32**		**10**		**9.1**		**2.0**	
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	**4.5**	J1	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	**25**		5.0	U	**16**	J	**14**	J	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	**140**		**9.6**		5.0	U	**680**		**51**		**490**	J2	**440**	J2	**77**		**95**		**26**	J	**30**	J	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.5	U	**1.7**		**1.1**		**1.0**		1.0	U	1.0	U	**2.9**	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
33	27																									
34	28	**VOLATILES (µg/L)**																								
35	29	**EPA Method SW8260**																								
36	30	Acetone	15	U	**17**	M	5.0	U	10	U	5.0	U	**24**	M	**27**	M	**20**		**17**		14	U	13	U	5.0	U
37	31	Carbon Disulfide	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	2.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	15	U	**22**	M	5.0	U	**23**	M	5.0	U	**24**		**28**		**30**		**24**		5.0	U	5.0	U	5.0	U
39	33	Benzene	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**2.8**		**2.7**		**1.2**		**1.2**		1.0	U
40	34	Bromoform	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	2.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	3.0	U	**2.6**		1.0	U	1.0	U	1.0	U	**2.1**		**2.2**		2.0	U	**1.5**		1.0	U	1.0	U	1.0	U
42	36	Ethylbenzene	**25**		**45**		**13**		**22**		**3.9**		**28**		**27**		**27**		**29**		**4.8**		**4.3**		1.0	U
43	37	Styrene	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	2.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	**61**		**120**		**25**		**53**		**8.2**		**78**		**76**		**78**		**81**		**10**		**9.6**		1.0	U
45	39	o-Xylene	**20**		**37**		**11**		**26**		**2.6**		**28**		**28**		**15**		**15**		**2.1**		**2.2**		1.0	U
46	40	1,3,5-Trimethylbenzene	**100**		**91**		**42**		**120**		**49**		**100**		**100**		**58**		**66**		**12**		**11**		1.0	U
47	41	1,2,4-Trimethylbenzene	**370**		**330**		**110**		**360**		**150**		**180**	M	**190**	M	**200**		**220**		**42**		**40**		**3.6**	
48	42	Isopropylbenzene	**78**		**65**		**29**		**79**		**52**		**70**		**73**		**57**		**68**		**30**		**29**		**11**	
49	43	n-Propylbenzene	**130**		**77**		**38**		**110**		**86**		**88**		**90**		**75**		**90**		**37**		**34**		**12**	
50	44	tert-Butylbenzene	**4.0**		**3.1**		1.0	U	**3.5**		**3.3**		**3.2**		**3.4**		**2.1**		**2.8**		**1.2**		**1.3**		1.0	U
51	45	sec-Butylbenzene	**18**		**17**		**5.5**		**21**		**16**		**15**		**16**		**11**		**14**		**4.9**		**4.7**		**1.6**	
52	46	4-Isopropyltoluene	**19**		**13**		**4.6**		**20**		**7.7**		**11**		**12**		**5.7**		**7.6**		1.0	U	1.0	U	1.0	U
53	47	n-Butylbenzene	**20**		17.0	U	5.2	U	**24**		**15**	M	**16**	M	**17**	M	**11**		14	U	**3.5**		**3.4**		1.2	U
54	48	Naphthalene	**18**		**30**		**8.3**		**25**		**7.0**		**28**		**30**		**22**		**25**		5.0	U	5.0	U	5.0	U
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	51	**Method OR-DEQ**																								
59	52	**TPH-Diesel**	**2.2**		**2.6**		**1.2**		**2.4**		**1.5**		**3.4**		**3.8**		**5.2**		**5.0**		**1.7**		**1.7**		**0.86**	
60	53	**TPH-D Motor Oil**	0.50	U	0.50	U	0.50	U	NA		0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
61	54	**TPH-Gasoline**	**5.7**		**10**		**1.9**		NA		**5.1**		**7.7**		**7.7**		**4.6**		**5.0**		**1.8**		**1.7**		**0.60**	
62	55																									
63	56	**PRIORITY POLLUTANT**																								
64	57	**METALS (mg/L)**																								
65	58	Arsenic (7060)	**0.034**		**0.025**		**0.022**		**0.032**		**0.036**		**0.022**		**0.022**		**0.021**		**0.021**		**0.016**		**0.016**		**0.017**	

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW
2		Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2		
3		X		RW2		W		RW2		W		RW2		W		RW2		W		RW2		W		RW2
4		DE87O		DM30I		DM30H		DW29E		DW29C		ED30D		ED30A		EN00D		EN00A		ER93G		ER93I		EZ17D
5		6/6/01		8/13/01		8/13/01		11/27/01		11/27/01		2/27/02		2/27/02		6/27/02		6/27/02		08/27/02		08/27/02		11/13/02
7	**CHLORINATED PHENOLS (µg/L)**																							
8	**EPA Method SW8040**																							
9	Pentachlorophenol	**0.68**		**5.0**		**5.0**		**1.7**		**1.8**		NA		NA		NA		NA		NA		NA		NA
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
16																								
17	**SEMIVOLATILES (µg/L)**																							
18	**EPA Method SW8270**																							
19	Phenol	2.0	U	2.0	U	2.0	U	2.0	UJ	2.0	U	**10**		**10**		2.0	U	**5.9**	J	**15**		**13**		2.2
20	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**3.8**	J	1.0	UJ	1.0	U	**1.1**		**1.8**		**1.5**		1.1
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1.1
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.8	U	3.3	U	3.3
23	Benzoic Acid	10	U	10	U	10	U	30	U	30	U	50	U	50	U	50	U	50	U	62	U	54	U	54
24	Naphthalene	1.0	U	**1.6**		**1.8**		**1.8**	J	**1.8**	J	**7.4**		**7.0**		**5.2**	J	**6.4**	J	**5.9**		**5.6**		**4.1**
25	2-Methylnaphthalene	**2.0**		**6.5**		**6.4**		**5.7**	J	**7.0**	J	**18**		**17**		**11**	J	**14**	J	**15**		**13**		**11**
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6.2	U	5.4	U	5.4
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6.2	U	5.4	U	5.4
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1.1
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1.1
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1.1
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	UJ	5.0	U	**8.6**		**8.2**		**76**		**75**		**26**	J	**36**	J	**37**
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	4.0	U	4.0	U	4.0	U	4.0	U	5	U	4.3	U	4.3
33																								
34	**VOLATILES (µg/L)**																							
35	**EPA Method SW8260**																							
36	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.1	U	**5.2**		**6.4**		5
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1
38	2-Butanone	5.0	U	**5.2**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5
39	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**2.5**		**2.5**		**2.3**		**2.2**		**3.4**		**3.3**		**3.4**
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1
41	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.6**		**1.7**		1.0	U	1.0	U	1	U	1	U	1
42	Ethylbenzene	1.0	U	**3.1**		**3.4**		**1.5**		**1.4**		**27**		**28**		**15**		**15**		**13**		**13**		**7.9**
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1
44	m,p-Xylene	1.0	U	**6.8**		**7.8**		**3.0**		**2.6**		**59**		**62**		**32**		**33**		**38**		**34**		**17**
45	o-Xylene	1.0	U	1.0	U	**1.6**		1.0	U	1.0	U	**14**		**14**		1.0	U	1.0	U	**6.5**		**5.9**		**2.3**
46	1,3,5-Trimethylbenzene	1.0	U	**6.5**		**6.7**		**3.9**		**3.7**		**44**		**44**		**21**		**23**		**27**		**24**		**9.8**
47	1,2,4-Trimethylbenzene	**3.8**		**23**		**26**		**13**		**12**		**150**		**150**		**62**		**62**		**84**		**78**		**37**
48	Isopropylbenzene	**11**		**24**		**25**		**30**		**30**		**54**		**51**		**46**		**44**		**44**		**45**		**37**
49	n-Propylbenzene	**12**		**28**		**29**		**36**		**37**		**76**		**73**		**58**		**57**		**58**		**59**		**46**
50	tert-Butylbenzene	1.0	U	**1.1**	M	**1.0**		**1.1**		**1.1**		**2.0**		**1.9**		**1.6**		**1.4**		**1.7**		**1.8**		**1.6**
51	sec-Butylbenzene	**1.7**		**3.9**		**4.1**		**4.7**		**4.7**		**9.6**		**9.5**		**8.4**		**8.2**		**8.3**		**8.4**		**6.7**
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**4.4**		**4.3**		**2.1**		**2.0**		**2.6**		**2.6**		**1.3**
53	n-Butylbenzene	1.2	U	**3.0**	M	**3.3**		**3.7**	M	**3.9**	M	**9.0**		**9.0**		6.5	U	6.1	U	7.6	U	7	U	**4.9**
54	Naphthalene	5.0	U	5.0	U	**5.0**		5.0	U	5.0	U	**15**		**16**		**8.7**		**8.5**		**10**		**9.9**		**6.3**
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56																								
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																							
58	**Method OR-DEQ**																							
59	**TPH-Diesel**	**0.88**		**1.4**		**1.2**		**1.4**		**1.4**		**1.9**	J	**0.89**	J	**1.8**		**1.9**		**1.7**		**1.6**		**1.3**
60	**TPH-D Motor Oil**	0.50	U	0.50	U	0.50	U	0.50	U	NA		0.50	U	0.50	U	0.50	U	0.50	U	0.5	U	0.5	U	0.5
61	**TPH-Gasoline**	**0.66**		**1.3**		**1.3**		**1.2**		NA		**4.0**	J	**3.8**		**2.6**		**2.6**		**2.9**		**3**		**2.1**
62																								
63	**PRIORITY POLLUTANT**																							
64	**METALS (mg/L)**																							
65	Arsenic (7060)	**0.016**		**0.019**		**0.020**		**0.018**		**0.022**		**0.020**		**0.022**		**0.019**		**0.020**		**0.021**		**0.021**		0.05

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP
2			Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2	
3			W		RW2		W		RW2		W		RW2		W		RW2		W	
4			EZ17B		FF65I		FF65K		FL41O		FL41Q		FU31F		FU31E		FY82D		FY82A	
5			11/13/02		2/11/03		2/11/03		5/7/03		5/7/03		8/27/03		8/27/03		10/23/03		10/23/03	
7	**CHLORINATED PHENOLS (µg/L)**																			
8	**EPA Method SW8040**																			
9	Pentachlorophenol		NA		NA		NA		NA		NA		**10**		NA		NA		NA	
10	2,4,6-Trichlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																				
17	**SEMIVOLATILES (µg/L)**																			
18	**EPA Method SW8270**																			
19	Phenol	U	2.2	U	2	U	2	U	2	U	2	U	2.1	U	2.1	U	2	U	2	U
20	4-Methylphenol	U	1.1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
21	Isophorone	U	1.1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
22	2,4-Dimethylphenol	U	3.3	U	3	U	3	U	3	U	3.1	U	3.1	U	3.1	U	3	U	3	U
23	Benzoic Acid	U	54	U	50	U	50	U	50	U	51	U	52	U	52	U	10	U	10	U
24	Naphthalene		**3.7**		**4.9**		**5.3**		**4.2**		**4**		**1.3**		**1.7**		**1.8**		**1.3**	
25	2-Methylnaphthalene		**9.6**		**13**		**14**		**13**		**12**		**4.8**	J	**6.2**	J	**7.2**	J	**5.4**	J
26	2,4,6-Trichlorophenol	U	5.4	U	5	U	5	U	5	U	5.1	U	5.2	U	5.2	U	5	U	5	U
27	2,4,5-Trichlorophenol	U	5.4	U	5	U	5	U	5	U	5.1	U	5.2	U	5.2	U	5	U	5	U
28	Acenaphthene	U	1.1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
29	Dibenzofuran	U	1.1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
30	Fluorene	U	1.1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
31	Pentachlorophenol		**35**		**28**		**33**		**12**		**12**		**5.5**		**6.9**		**8.1**		**6.4**	
32	bis(2-Ethylhexyl)phthalate	U	4.3	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
33																				
34	**VOLATILES (µg/L)**																			
35	**EPA Method SW8260**																			
36	Acetone	U	5	U	5	U	5	U	5	U	**6.2**	M	5	U	5	U	5	U	5	U
37	Carbon Disulfide	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
39	Benzene		**3.1**		**2.4**		**2.4**		**3.4**		**3.8**		**5.1**		**5.4**		**3.6**		**3.4**	
40	Bromoform	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
42	Ethylbenzene		**7.3**		**8.2**		**8.1**		**9.5**		**10**		**4.2**		**4.2**		**2.6**		**2.7**	
43	Styrene	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene		**16**		**15**		**14**		**12**		**13**		**7**		**7.4**		**4.3**		**4.5**	
45	o-Xylene		**2.2**		**2.4**		**2.2**		1	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene		**9.6**		**14**		**13**		**19**		**19**		**8.6**		**8.5**		**4.4**		**5.1**	
47	1,2,4-Trimethylbenzene		**36**		**46**		**44**		**59**		**62**		**28**		**29**		**16**		**17**	
48	Isopropylbenzene		**36**		**50**		**51**		**41**		**45**		**30**		**29**		**28**		**29**	
49	n-Propylbenzene		**45**		**60**		**62**		**56**		**60**		**40**		**39**		**35**		**36**	
50	tert-Butylbenzene		**1.5**		**1.7**		**1.8**		**1.8**		**2**		**1.4**		**1.3**		**1.2**		**1.2**	
51	sec-Butylbenzene		**6.3**		**8**		**8.1**		**8.2**		**8.8**		**5.9**		**5.7**		**5.1**		**5.4**	
52	4-Isopropyltoluene		**1.2**		**1.5**		**1.4**		**1.9**		**2**		**1**		**1**		1	U	1	U
53	n-Butylbenzene	M	**4.8**	M	**6**	M	**6**	M	**6.5**		**6.8**		**4.4**		**4.2**		**3.6**		**3.9**	
54	Naphthalene		**5.7**		**6.2**		**6.3**		**6.9**		**7.5**		5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																				
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																			
58	**Method OR-DEQ**																			
59	**TPH-Diesel**		**1.3**		**1.7**		**1.8**		**1.5**		**1.5**		**1.1**		**1**		**0.73**		**0.72**	
60	**TPH-D Motor Oil**	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
61	**TPH-Gasoline**		**2.4**		**2.5**		**2.6**		**2.2**		**2.4**		**1.6**		**1.6**		**1.2**		**1.2**	
62																				
63	**PRIORITY POLLUTANT**																			
64	**METALS (mg/L)**																			
65	Arsenic (7060)	U	0.05	U	**0.019**		**0.018**		**0.019**		**0.019**		**0.018**		**0.019**		**0.019**		**0.018**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2															Dup of RW2				Dup of RW2				Dup of RW2			
3			RW2		RW2		RW2		RW2		RW2		RW2		X		RW2		X		RW2		X		RW2	
4			AH76G		AU45N		BC30E		BH96F		BR64P		CD97A		CD97B		CL03N		CL03M		CT37L		CT37M		DE87P	
5			5/20/99		9/23/99		12/7/99		2/17/00		5/25/00		9/13/00		9/13/00		11/9/00		11/9/00		2/13/01		2/13/01		6/6/01	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.005**		**0.007**		0.002	U	**0.004**		0.002	U	0.002	U	**0.003**	
68	61	Lead (7421)	**0.001**		**0.001**		0.001	U	0.001	U	0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	**0.016**		**0.042**		**0.025**		**0.031**		**0.016**		**0.022**	J2	**0.030**	J2	**0.116**		**0.122**		**0.022**		**0.022**		**0.058**	J
71	64																									
72	65	**MAJOR IONS AND CONVENTIONALS**																								
73	66	Calcium (mg/L) (6010)	**30.0**		NA		NA		NA		NA		NA		NA		NA		NA		**39.8**		**36.8**		**36.5**	
74	67	Magnesium (mg/L) (6010)	**9.90**		NA		NA		NA		NA		NA		NA		NA		NA		**17.1**		**15.8**		**17.2**	
75	68	Potassium (mg/L) (6010)	**2.5**		NA		NA		NA		NA		NA		NA		NA		NA		**2.4**		**2.1**		**3.1**	
76	69	Sodium (mg/L) (6010)	**7.68**		NA		NA		NA		NA		NA		NA		NA		NA		**12.6**		**11.7**		**12.6**	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**140**		NA		NA		NA		NA		NA		NA		NA		NA		**220**		**220**		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		1.0	U	1.0	U	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**140**		NA		NA		NA		NA		NA		NA		NA		NA		**220**		**220**		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**190**		**190**		**160**		**150**		**160**		**390**		**360**		**320**		**310**		**290**		**280**		**300**	J
81	74	Chloride (mg/L) (EPA 325.2)	**4.7**		**8.8**		**6.7**		**6.6**		**4.2**		**9.1**	J2	**7.4**	J2	**4.7**		**5.0**		**8.9**		**8.5**		**7.7**	
82	75	N-Nitrate (mg-N/L) (Calculated)	**0.017**		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U	0.010	U	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	0.010	U	NA		NA		NA		NA		NA		NA		NA		NA		**0.018**		**0.016**		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.017**		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U	0.010	U	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	**9.3**		NA		NA		NA		NA		NA		NA		NA		NA		**5.2**		**4.3**		NA	
86	79																									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW
1																								
2		Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2		
3		X		RW2		W		RW2		W		RW2		W		RW2		W		RW2		W		RW2
4		DE87O		DM30I		DM30H		DW29E		DW29C		ED30D		ED30A		EN00D		EN00A		ER93G		ER93I		EZ17D
5		6/6/01		8/13/01		8/13/01		11/27/01		11/27/01		2/27/02		2/27/02		6/27/02		6/27/02		08/27/02		08/27/02		11/13/02
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005
67	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.008**
68	Lead (7421)	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	**0.001**		**0.001**		0.02
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01
70	Zinc (6010)	**0.189**	J	**0.020**	J	**0.028**	J	**0.010**		**0.013**		**0.043**	J	**0.016**	J	**0.015**	J	**0.037**	J	**0.034**	J	**0.02**	J	**0.022**
71																								
72	**MAJOR IONS AND CONVENTIONALS**																							
73	Calcium (mg/L) (6010)	**40.7**		**39.0**		**41.0**		**39.4**		**41.6**		**38.9**		**37.5**		**42.3**		**43.3**		NA		NA		NA
74	Magnesium (mg/L) (6010)	**19.1**		**17.1**		**17.8**		**16.4**		**17.5**		**16.2**		**15.3**		**17.0**		**17.5**		NA		NA		NA
75	Potassium (mg/L) (6010)	**3.0**		**2.8**		**2.8**		**2.4**		**2.4**		**2.5**		**2.2**		**2.3**		**2.3**		NA		NA		NA
76	Sodium (mg/L) (6010)	**13.6**		**12.3**		**12.9**		**11.7**		**12.4**		**11.2**		**10.9**		**12.0**		**12.3**		NA		NA		NA
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		**220**		**200**		NA		NA		NA		NA		NA
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		1.0	U	1.0	U	NA		NA		NA		NA		NA
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		**220**		**200**		NA		NA		NA		NA		NA
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**290**	J	**270**	J	**290**	J	**260**		**280**		**270**		**290**		**250**		**270**		**270**		**270**		**270**
81	Chloride (mg/L) (EPA 325.2)	**7.4**		**8.9**		**8.2**		**5.5**		**5.7**		**24**	J	**4.1**	J	**6.1**		**5.8**		**4.6**		**5.1**		**4.8**
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		**0.019**		0.010	U	NA		NA		NA		NA		NA
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		**0.014**	J	**0.038**	J	NA		NA		NA		NA		NA
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		**0.033**		**0.028**		NA		NA		NA		NA		NA
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		**6.3**	J	**9.8**	J	NA		NA		NA		NA		NA
86																								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP
2			Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2	
3			W		RW2		W		RW2		W		RW2		W		RW2		W	
4			EZ17B		FF65I		FF65K		FL41O		FL41Q		FU31F		FU31E		FY82D		FY82A	
5			11/13/02		2/11/03		2/11/03		5/7/03		5/7/03		8/27/03		8/27/03		10/23/03		10/23/03	
66	Chromium (6010)	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	J	0.002	UJ	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U
68	Lead (7421)	U	0.02	U	0.001	U	0.001	U	0.001	U	**0.002**		0.001	U	0.001	U	0.001	U	0.001	U
69	Nickel (6010)	U	0.01	U	**0.01**		0.01	U	**0.01**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)		**0.017**		**0.013**	J	**0.016**	J	**0.067**		**0.064**		**0.013**		**0.014**		**0.062**	J	**0.008**	J
71																				
72	**MAJOR IONS AND CONVENTIONALS**																			
73	Calcium (mg/L) (6010)		NA		**41.8**		**41.3**		NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)		NA		**16.4**		**16.2**		NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)		NA		**2.5**		**2.6**		NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)		NA		**11.7**		**11.7**		NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		**240**		**240**		NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		1	U	1	U	NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		**240**		**240**		NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**270**		**260**		**260**		**270**		**270**		**290**		**280**		**230**		**250**	
81	Chloride (mg/L) (EPA 325.2)		**4.6**		**4.4**		**4.4**		**4.4**		**4.4**		**4.3**		**4.2**		**5.2**		**4.9**	
82	N-Nitrate (mg-N/L) (Calculated)		NA		0.01	U	**0.015**		NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		**0.041**		**0.043**		NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		**0.037**	J	**0.058**	J	NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		**3**		2.5	U	NA		NA		NA		NA		NA		NA	
86																				

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
2															Dup of RW2				Dup of RW2				Dup of RW2			
3			RW2		RW2		RW2		RW2		RW2		RW2		X		RW2		X		RW2		X		RW2	
4			AH76G		AU45N		BC30E		BH96F		BR64P		CD97A		CD97B		CL03N		CL03M		CT37L		CT37M		DE87P	
5			5/20/99		9/23/99		12/7/99		2/17/00		5/25/00		9/13/00		9/13/00		11/9/00		11/9/00		2/13/01		2/13/01		6/6/01	
87	80	**FIELD PARAMETERS**																								
88	81	pH (avg)	6.63		6.65		6.58		6.67		6.56		6.19		6.19		5.55		5.54		6.33		6.33		6.66	
89	82	Temperature (° C) (avg)	14.2		14.7		13.1		14.4		15.0		15.6		15.6		12.7		12.7		12.6		12.7		13.6	
90	83	Conductivity (um/hos)	294		292		260		278		365		463		463		513		513		475		479		573	
91	84	Dissolved oxygen (mg/L) (avg)	1.61		1.37		2.46		0.68		0.74		11.94		11.94		0.53		0.55		0.90		0.95		0.83	
92	85																									
93	86	**DIOXINS AND FURANS (ng/L)**																								
94	87	**Method 8290**																								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																										
121																										
122																										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW
1																								
2		Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2		
3		X		RW2		W		RW2		W		RW2		W		RW2		W		RW2		W		RW2
4		DE87O		DM30I		DM30H		DW29E		DW29C		ED30D		ED30A		EN00D		EN00A		ER93G		ER93I		EZ17D
5		6/6/01		8/13/01		8/13/01		11/27/01		11/27/01		2/27/02		2/27/02		6/27/02		6/27/02		08/27/02		08/27/02		11/13/02
87	**FIELD PARAMETERS**																							
88	pH (avg)	6.65		6.70		6.68		6.50		6.5		6.27		6.27		6.47		6.47		6.52		6.56		6.19
89	Temperature (° C) (avg)	13.6		15.7		15.6		13.1		13.1		13.5		13.5		14.5		14.5		13.9		13.9		13.6
90	Conductivity (um/hos)	573		455		454		458		458		422		422		450		448		408		409		461
91	Dissolved oxygen (mg/L) (avg)	0.82		0.52		0.37		3.34		3.22		7.06		7.05		4.87		4.72		0.60		0.31		0.55
92																								
93	**DIOXINS AND FURANS (ng/L)**																							
94	**Method 8290**																							
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120																								
121																								
122																								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP
2			Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2	
3			W		RW2		W		RW2		W		RW2		W		RW2		W	
4			EZ17B		FF65I		FF65K		FL41O		FL41Q		FU31F		FU31E		FY82D		FY82A	
5			11/13/02		2/11/03		2/11/03		5/7/03		5/7/03		8/27/03		8/27/03		10/23/03		10/23/03	
87	**FIELD PARAMETERS**																			
88	pH (avg)		6.17		6.84		6.84		6.87		6.86		6.69		6.71		6.52		6.53	
89	Temperature (° C) (avg)		13.6		13.9		13.9		13.6		13.5		15.5		15.7		13.8		13.8	
90	Conductivity (um/hos)		461		542		542		392		390		414		411		392		392	
91	Dissolved oxygen (mg/L) (avg)		0.34		2.24		2.24		3215		3318		0.98		0.82		2.37		2.15	
92																				
93	**DIOXINS AND FURANS (ng/L)**																			
94	**Method 8290**																			
95	2,3,7,8-TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																				
121																				
122																				

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2															Dup of RW2				Dup of RW2				Dup of RW2			
3			RW2		RW2		RW2		RW2		RW2		RW2		X		RW2		X		RW2		X		RW2	
4			AH76G		AU45N		BC30E		BH96F		BR64P		CD97A		CD97B		CL03N		CL03M		CT37L		CT37M		DE87P	
5			5/20/99		9/23/99		12/7/99		2/17/00		5/25/00		9/13/00		9/13/00		11/9/00		11/9/00		2/13/01		2/13/01		6/6/01	
123		**PAHs (µg/L)**																								
124		**EPA Method SW8270 SIM**																								
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
132																										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW
1																								
2		Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2		
3		X		RW2		W		RW2		W		RW2		W		RW2		W		RW2		W		RW2
4		DE87O		DM30I		DM30H		DW29E		DW29C		ED30D		ED30A		EN00D		EN00A		ER93G		ER93I		EZ17D
5		6/6/01		8/13/01		8/13/01		11/27/01		11/27/01		2/27/02		2/27/02		6/27/02		6/27/02		08/27/02		08/27/02		11/13/02
123	**PAHs (µg/L)**																							
124	**EPA Method SW8270 SIM**																							
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
132																				NA		NA		

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP
1																				
2			Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2	
3			W		RW2		W		RW2		W		RW2		W		RW2		W	
4			EZ17B		FF65I		FF65K		FL41O		FL41Q		FU31F		FU31E		FY82D		FY82A	
5			11/13/02		2/11/03		2/11/03		5/7/03		5/7/03		8/27/03		8/27/03		10/23/03		10/23/03	
123	**PAHs (µg/L)**																			
124	**EPA Method SW8270 SIM**																			
125	Naphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran		NA		NA		NA		NA		NA		NA		NA		NA		NA	
132																				

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			J3		J3		J3		J3		J3		J3		J3	
4			S177K		T176R		U235L		V224Q		W371M		Y314K		Z225Q	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98	
7	1	**CHLORINATED PHENOLS (µg/L)**														
8	2	**EPA Method SW8040**														
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	UJ	**0.36**		0.25	U	0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	UJ	0.25	U	0.25	U	0.25	U
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	UJ	0.25	U	0.25	U	0.25	U
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	UJ	0.25	U	0.25	U	0.25	U
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	UJ	0.25	U	0.25	U	0.25	U
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	UJ	0.25	U	0.25	U	0.25	U
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	UJ	0.25	U	0.25	U	0.25	U
16	10															
17	11	**SEMIVOLATILES (µg/L)**														
18	12	**EPA Method SW8270**														
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U
24	18	Naphthalene	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
25	19	2-Methylnaphthalene	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
33	27															
34	28	**VOLATILES (µg/L)**														
35	29	**EPA Method SW8260**														
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
37	31	Carbon Disulfide	1.0	U	1.0	U	**110**		1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA	
56	49															
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**														
58	51	**Method OR-DEQ**														
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA	
62	55															
63	56	**PRIORITY POLLUTANT**														
64	57	**METALS (mg/L)**														
65	58	Arsenic (7060)	**0.010**		**0.012**		0.05	U	0.05	U	**0.011**		**0.014**		**0.017**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			J3		J3		J3		J3		J3		J3		J3	
4			S177K		T176R		U235L		V224Q		W371M		Y314K		Z225Q	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	**0.014**		**0.018**		**0.012**	
67	60	Copper (6010)	0.002	U	**0.005**		0.002	U	**0.005**		**0.017**		**0.020**		**0.013**	
68	61	Lead (7421)	0.001	U	**0.002**		0.02	U	0.02	U	**0.006**		**0.007**		**0.003**	
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	**0.01**		**0.01**		**0.01**	
70	63	Zinc (6010)	0.004	U	**0.013**		**0.018**		**0.010**		**0.034**	J2	**0.048**		**0.036**	
71	64															
72	65	**MAJOR IONS AND CONVENTIONALS**														
73	66	Calcium (mg/L) (6010)	**94.6**		**101**		**103**		**90.2**		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**51.7**		**56.1**		**56.1**		**50.6**		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**1.8**		**1.9**		**2.0**		**1.6**		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**22.5**		**23.5**		**23.8**		**22.1**		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**470**		**460**	J2	**510**		**470**		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**470**		**460**	J2	**510**		**470**		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**580**	J2	**480**		**510**		**480**		**540**		**470**	
81	74	Chloride (mg/L) (EPA 325.2)	**9.9**		**9.3**		**11**		**12**		**12**		**13**		**12**	
82	75	N-Nitrate (mg-N/L) (Calculated)	0.010	U	0.010	U	**0.013**		**0.016**	J2	NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	**0.012**	J	**0.012**	J2	0.010	U	0.010	UJ	NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.014**		0.010	U	**0.013**		**0.016**	J2	NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	**2.8**	J	2.5	U	2.5	U	2.5	U	NA		NA		NA	
86	79															

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			J3		J3		J3		J3		J3		J3		J3	
4			S177K		T176R		U235L		V224Q		W371M		Y314K		Z225Q	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98	
87	80	**FIELD PARAMETERS**														
88	81	pH (avg)	6.78		6.80		6.85		6.70		6.53		6.46		6.43	
89	82	Temperature (° C) (avg)	13.9		16.3		13.7		13.4		13.4		14.9		11.9	
90	83	Conductivity (um/hos)	859		765		673		771		788		916		422	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		0.74		3.45		2.45	
92	85															
93	86	**DIOXINS AND FURANS (ng/L)**														
94	87	**Method 8290**														
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA	
120																
121																
122																

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			J3		J3		J3		J3		J3		J3		J3	
4			S177K		T176R		U235L		V224Q		W371M		Y314K		Z225Q	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98	
123		**PAHs (µg/L)**														
124		**EPA Method SW8270 SIM**														
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
2					Dup of LW-12D1								Dup of LW12D1													
3			LW12D1		LW120D1		LW12D1		LW12D1		LW12D1		Y		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1	
4			AH76C		AH76A		AU45L		BC27S		BH96M		BH96O		BR55B		CB85I		CL03K		CT67E		DE87M		DM52H	
5			5/20/99		5/20/99		9/23/99		12/9/99		2/18/00		2/18/00		5/22/00		8/31/00		11/10/00		2/15/01		6/6/01		8/15/01	
7	1	**CHLORINATED PHENOLS (µg/L)**																								
8	2	**EPA Method SW8040**																								
9	3	Pentachlorophenol	**28**		**32**		**1.4**		**200**		**0.28**		**0.23**	J1	0.25	UJ	0.25	U	0.25	U	**0.62**		0.25	U	0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	**1.1**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA	
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA	
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	1.2	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**1.2**		**1.4**		**0.13**	J1	**6.2**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	**1.0**		**1.0**		**0.36**		**8.0**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA	
16	10																									
17	11	**SEMIVOLATILES (µg/L)**																								
18	12	**EPA Method SW8270**																								
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	**2.2**	J1	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	**1.7**	J1	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	**110**	J2	**81**	J2	5.0	U	**380**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	**1.0**	J1	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.0**		1.0	U
33	27																									
34	28	**VOLATILES (µg/L)**																								
35	29	**EPA Method SW8260**																								
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	**7.6**		5.0	U	**12**	M	5.0	U	5.0	U	5.0	U	5.0	U	9.5	U	**8.4**		5.0	U	5.0	U	**5.7**	
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.2**		1.0	U	1.0	U
46	40	1,3,5-Trimethylbenzene	**11**		**9.7**		**3.6**		**1.5**		1.0	U	1.0	U	**2.4**		**3.3**		**4.8**		**4.4**		**1.9**		**1.5**	
47	41	1,2,4-Trimethylbenzene	**46**		**46**		**15**		**4.8**		**5.1**		**4.9**		**15**		**17**		**22**		**23**		**13**		**7.5**	
48	42	Isopropylbenzene	**2.6**		**2.6**		**1.7**		**1.1**		1.0	U	1.0	U	1.0	U	**1.3**		**1.4**		**1.6**		1.0	U
49	43	n-Propylbenzene	**3.9**		**3.8**		**2.4**		**1.3**		1.0	U	1.0	U	**1.5**		**1.5**		**2.2**		**2.5**		**2.0**		1.0	U
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	**1.7**		**1.7**		**1.0**		1.0	U	1.0	U	1.0	U	1.0	U	**1.2**		**1.6**		**1.9**		**1.3**		1.0	U
52	46	4-Isopropyltoluene	**2.0**		**2.0**		**1.3**		1.0	U	1.0	U	1.0	U	1.0	U	**1.1**		**1.6**		**1.9**		1.0	U	1.0	U
53	47	n-Butylbenzene	**1.7**		**1.7**	M	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.4	U	**1.7**	M	1.0	U	1.0	U
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	51	**Method OR-DEQ**																								
59	52	**TPH-Diesel**	**0.96**		**0.86**		**0.98**		**0.88**		**0.66**		**0.66**		**0.82**		**0.64**		**0.78**		**0.83**		**0.77**		**0.81**	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		0.50	U	NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																									
63	56	**PRIORITY POLLUTANT**																								
64	57	**METALS (mg/L)**																								
65	58	Arsenic (7060)	**0.017**		**0.017**		**0.039**		**0.034**		**0.020**		**0.020**		**0.030**		**0.033**		**0.019**		**0.022**		**0.020**		**0.017**	

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF
1							
2							
3		LW12D1		LW12D1		LW12D1	
4		DW48J		ED34H		EN00K	
5		11/29/01		2/28/02		6/27/02	
6							
7	**CHLORINATED PHENOLS (µg/L)**						
8	**EPA Method SW8040**						
9	Pentachlorophenol	0.25	U	0.25	U	**1.6**	
10	2,4,6-Trichlorophenol	NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA	
16							
17	**SEMIVOLATILES (µg/L)**						
18	**EPA Method SW8270**						
19	Phenol	2.0	U	2.0	U	2.0	U
20	4-Methylphenol	1.0	U	1.0	U	1.0	U
21	Isophorone	1.0	U	1.0	U	1.0	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U
23	Benzoic Acid	30	U	50	U	50	U
24	Naphthalene	1.0	U	1.0	U	1.0	U
25	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U
28	Acenaphthene	1.0	U	1.0	U	1.0	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	U
30	Fluorene	1.0	U	1.0	U	1.0	U
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U
32	bis(2-Ethylhexyl)phthalate	1.0	U	4.0	U	4.0	U
33							
34	**VOLATILES (µg/L)**						
35	**EPA Method SW8260**						
36	Acetone	5.0	U	5.0	U	5.0	U
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U
38	2-Butanone	**5.6**		**8.6**		5.0	U
39	Benzene	1.0	U	1.0	U	1.0	U
40	Bromoform	1.0	U	1.0	U	1.0	U
41	Toluene	1.0	U	1.0	U	1.0	U
42	Ethylbenzene	1.0	U	1.0	U	1.0	U
43	Styrene	1.0	U	1.0	U	1.0	U
44	m,p-Xylene	1.0	U	1.0	U	1.0	U
45	o-Xylene	1.0	U	1.0	U	1.0	U
46	1,3,5-Trimethylbenzene	**3.4**		**1.5**		1.0	U
47	1,2,4-Trimethylbenzene	**21**		**8.5**		**4.7**	
48	Isopropylbenzene	**1.6**		1.0	U	1.0	U
49	n-Propylbenzene	**2.8**		**1.1**		**1.3**	
50	tert-Butylbenzene	1.0	U	1.0	U	1.0	U
51	sec-Butylbenzene	**2.8**		1.0	U	**1.1**	
52	4-Isopropyltoluene	**2.2**		1.0	U	1.0	U
53	n-Butylbenzene	2.0	U	1.0	U	1.0	U
54	Naphthalene	5.0	U	5.0	U	5.0	U
55	Methyl tert-butyl ether	NA		NA		NA	
56							
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**						
58	**Method OR-DEQ**						
59	**TPH-Diesel**	**0.97**		**1.2**		**1.0**	
60	**TPH-D Motor Oil**	NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA	
62							
63	**PRIORITY POLLUTANT**						
64	**METALS (mg/L)**						
65	Arsenic (7060)	**0.014**		**0.016**		**0.028**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2					Dup of LW-12D1								Dup of LW12D1													
3			LW12D1		LW120D1		LW12D1		LW12D1		LW12D1		Y		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1	
4			AH76C		AH76A		AU45L		BC27S		BH96M		BH96O		BR55B		CB85I		CL03K		CT67E		DE87M		DM52H	
5			5/20/99		5/20/99		9/23/99		12/9/99		2/18/00		2/18/00		5/22/00		8/31/00		11/10/00		2/15/01		6/6/01		8/15/01	
66	59	Chromium (6010)	**0.007**		**0.007**		**0.035**		**0.091**		**0.017**		**0.019**		0.005	U	**0.006**		**0.010**		**0.008**		**0.012**		**0.032**	
67	60	Copper (6010)	**0.008**		**0.008**		**0.036**		**0.122**		**0.022**		**0.024**		**0.007**		**0.007**		**0.016**		**0.012**		**0.015**		**0.038**	
68	61	Lead (7421)	**0.002**		**0.002**		**0.011**		**0.030**		**0.005**		**0.005**		**0.003**		**0.002**		**0.006**		**0.003**		**0.013**		**0.012**	
69	62	Nickel (6010)	0.01	U	0.01	U	0.03	U	**0.07**		**0.02**		**0.02**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.03**	
70	63	Zinc (6010)	**0.026**		**0.030**		**0.079**		**0.212**		**0.047**		**0.053**		**0.016**		**0.024**		**0.037**		**0.033**		**0.029**		**0.074**	
71	64																									
72	65	**MAJOR IONS AND CONVENTIONALS**																								
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**54.8**		**60.5**		**53.1**	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**26.2**		**29.5**		**29.0**	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.9**		**1.8**		**1.9**	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**10.9**		**12.3**		**11.5**	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**320**		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		1.0	U	NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**320**		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**360**		**360**		**360**		**350**		**350**		**350**		**320**		**320**		**330**		**320**		**340**	J	**320**	
81	74	Chloride (mg/L) (EPA 325.2)	**3.8**		**3.8**		**3.3**		**4.5**		**3.8**		**4.2**		**4.1**		**6.8**		**3.3**		**4.2**	J	**3.7**		**7.8**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**5.8**		NA		NA	
86	79																									

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF
1							
2							
3		LW12D1		LW12D1		LW12D1	
4		DW48J		ED34H		EN00K	
5		11/29/01		2/28/02		6/27/02	
66	Chromium (6010)	**0.009**		**0.015**		**0.006**	
67	Copper (6010)	0.012	U	**0.020**		**0.007**	
68	Lead (7421)	**0.005**		**0.006**		**0.002**	
69	Nickel (6010)	0.01	U	0.01	U	0.01	U
70	Zinc (6010)	**0.021**		**0.032**		**0.022**	
71							
72	**MAJOR IONS AND CONVENTIONALS**						
73	Calcium (mg/L) (6010)	**58.4**		**55.1**		**59.3**	
74	Magnesium (mg/L) (6010)	**29.4**		**25.4**		**28.1**	
75	Potassium (mg/L) (6010)	**1.5**		**1.5**		**1.0**	
76	Sodium (mg/L) (6010)	**12.2**		**12.5**		**12.4**	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		**260**		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		1.0	U	NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		**260**		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**350**		**330**		**300**	
81	Chloride (mg/L) (EPA 325.2)	**3.7**		**5.2**		**3.8**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		**0.027**		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		0.010	U	NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		**0.027**		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		**5.1**		NA	
86							

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2					Dup of LW-12D1								Dup of LW12D1													
3			LW12D1		LW120D1		LW12D1		LW12D1		LW12D1		Y		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1	
4			AH76C		AH76A		AU45L		BC27S		BH96M		BH96O		BR55B		CB85I		CL03K		CT67E		DE87M		DM52H	
5			5/20/99		5/20/99		9/23/99		12/9/99		2/18/00		2/18/00		5/22/00		8/31/00		11/10/00		2/15/01		6/6/01		8/15/01	
87	80	**FIELD PARAMETERS**																								
88	81	pH (avg)	6.96		6.96		7.13		6.96		6.95		6.85		6.95		6.85		5.68		6.82		7.15		7.20	
89	82	Temperature (° C) (avg)	13.2		13.0		14.7		11.9		11.7		11.7		15.0		13.0		12.2		13.1		14.0		14.4	
90	83	Conductivity (um/hos)	486		502		504		346		526		524		495		485		444		454		481		469	
91	84	Dissolved oxygen (mg/L) (avg)	1.86		1.67		1.01		2.36		1.79		1.43		1.26		1.74		0.93		0.13		2.10		1.96	
92	85																									
93	86	**DIOXINS AND FURANS (ng/L)**																								
94	87	**Method 8290**																								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																										
121																										
122																										

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF
1							
2							
3		LW12D1		LW12D1		LW12D1	
4		DW48J		ED34H		EN00K	
5		11/29/01		2/28/02		6/27/02	
87	**FIELD PARAMETERS**						
88	pH (avg)	6.92		6.80		7.07	
89	Temperature (° C) (avg)	13.3		13.8		14.3	
90	Conductivity (um/hos)	434		431		410	
91	Dissolved oxygen (mg/L) (avg)	4.12		7.61		4.73	
92							
93	**DIOXINS AND FURANS (ng/L)**						
94	**Method 8290**						
95	2,3,7,8-TCDF	NA		NA		NA	
96	Total TCDF	NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA	
98	Total TCDD	NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA	
101	Total PeCDF	NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA	
103	Total PeCDD	NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA	
108	Total HxCDF	NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA	
112	Total HxCDD	NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA	
115	Total HpCDF	NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA	
117	Total HpCDD	NA		NA		NA	
118	OCDF	NA		NA		NA	
119	OCDD	NA		NA		NA	
120							
121							
122							

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2					Dup of LW-12D1								Dup of LW12D1													
3			LW12D1		LW120D1		LW12D1		LW12D1		LW12D1		Y		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1	
4			AH76C		AH76A		AU45L		BC27S		BH96M		BH96O		BR55B		CB85I		CL03K		CT67E		DE87M		DM52H	
5			5/20/99		5/20/99		9/23/99		12/9/99		2/18/00		2/18/00		5/22/00		8/31/00		11/10/00		2/15/01		6/6/01		8/15/01	
123		**PAHs (µg/L)**																								
124		**EPA Method SW8270 SIM**																								
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF
1							
2							
3		LW12D1		LW12D1		LW12D1	
4		DW48J		ED34H		EN00K	
5		11/29/01		2/28/02		6/27/02	
123	**PAHs (µg/L)**						
124	**EPA Method SW8270 SIM**						
125	Naphthalene	NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA	
127	Acenaphthylene	NA		NA		NA	
128	Acenaphthene	NA		NA		NA	
129	Fluorene	NA		NA		NA	
130	Anthracene	NA		NA		NA	
131	Dibenzofuran	NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW-12D2		LW-12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2
4			AH76B		AU45M		BC27T		BH96N		BR55A		CB85J		CL03L		CT67F		DE87R		DM52F		DW48I		ED34I		EN00L
5			5/20/99		9/23/99		12/9/99		2/18/00		5/22/00		8/31/00		11/10/00		2/15/01		6/6/01		8/15/01		11/29/01		2/28/02		6/27/02
7	1	**CHLORINATED PHENOLS (µg/L)**																									
8	2	**EPA Method SW8040**																									
9	3	Pentachlorophenol	**0.91**		0.25	U	**3.7**		0.25	U	0.25	UJ	0.25	U	0.25	U	0.25	U	**1.7**		0.25	U	0.25	U	NA		0.25
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	**0.22**	J1	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	**0.50**		0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
16	10																										
17	11	**SEMIVOLATILES (µg/L)**																									
18	12	**EPA Method SW8270**																									
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
31	25	Pentachlorophenol	5.0	U	5.0	U	**2.8**	J1	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	**20**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	4.0	U	**5.4**
33	27																										
34	28	**VOLATILES (µg/L)**																									
35	29	**EPA Method SW8260**																									
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
46	40	1,3,5-Trimethylbenzene	**1.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
47	41	1,2,4-Trimethylbenzene	**3.7**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56	49																										
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																									
58	51	**Method OR-DEQ**																									
59	52	**TPH-Diesel**	0.25	U	0.25	U	**0.32**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		0.25	U	NA
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		0.50	U	NA		NA		NA		NA		NA		NA
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62	55																										
63	56	**PRIORITY POLLUTANT**																									
64	57	**METALS (mg/L)**																									
65	58	Arsenic (7060)	**0.020**		**0.021**		**0.003**		**0.019**		**0.024**		**0.022**		**0.020**		**0.022**		**0.022**		**0.024**		**0.024**		**0.020**		**0.018**

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB
1		
2		
3		
4		
5		
7	**CHLORINATED PHENOLS (µg/L)**	
8	**EPA Method SW8040**	
9	Pentachlorophenol	U
10	2,4,6-Trichlorophenol	
11	2,3,6-Trichlorophenol	
12	2,4,5-Trichlorophenol	
13	2,3,4-Trichlorophenol	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	
15	2,3,4,5-Tetrachlorophenol	
16		
17	**SEMIVOLATILES (µg/L)**	
18	**EPA Method SW8270**	
19	Phenol	U
20	4-Methylphenol	U
21	Isophorone	U
22	2,4-Dimethylphenol	U
23	Benzoic Acid	U
24	Naphthalene	U
25	2-Methylnaphthalene	U
26	2,4,6-Trichlorophenol	U
27	2,4,5-Trichlorophenol	U
28	Acenaphthene	U
29	Dibenzofuran	U
30	Fluorene	U
31	Pentachlorophenol	U
32	bis(2-Ethylhexyl)phthalate	
33		
34	**VOLATILES (µg/L)**	
35	**EPA Method SW8260**	
36	Acetone	U
37	Carbon Disulfide	U
38	2-Butanone	U
39	Benzene	U
40	Bromoform	U
41	Toluene	U
42	Ethylbenzene	U
43	Styrene	U
44	m,p-Xylene	U
45	o-Xylene	U
46	1,3,5-Trimethylbenzene	U
47	1,2,4-Trimethylbenzene	U
48	Isopropylbenzene	U
49	n-Propylbenzene	U
50	tert-Butylbenzene	U
51	sec-Butylbenzene	U
52	4-Isopropyltoluene	U
53	n-Butylbenzene	U
54	Naphthalene	U
55	Methyl tert-butyl ether	
56		
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**	
58	**Method OR-DEQ**	
59	**TPH-Diesel**	
60	**TPH-D Motor Oil**	
61	**TPH-Gasoline**	
62		
63	**PRIORITY POLLUTANT**	
64	**METALS (mg/L)**	
65	Arsenic (7060)	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW-12D2		LW-12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2
4			AH76B		AU45M		BC27T		BH96N		BR55A		CB85J		CL03L		CT67F		DE87R		DM52F		DW48I		ED34I		EN00L
5			5/20/99		9/23/99		12/9/99		2/18/00		5/22/00		8/31/00		11/10/00		2/15/01		6/6/01		8/15/01		11/29/01		2/28/02		6/27/02
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005
67	60	Copper (6010)	0.002	U	0.002	U	**0.005**		0.002	U	0.002	U	0.002	U	**0.004**		0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002
68	61	Lead (7421)	0.001	U	0.001	U	**0.002**		0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	**0.002**		0.001	U	0.001
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01
70	63	Zinc (6010)	**0.007**		0.004	U	**0.306**		**0.009**		0.006	U	0.006	U	0.006	U	**0.009**		0.006	U	0.006	U	0.006	U	0.006	U	0.006
71	64																										
72	65	**MAJOR IONS AND CONVENTIONALS**																									
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**36.1**		**38.3**		**29.4**		**31.9**		**39.1**		**52.5**
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**16.4**		**17.3**		**13.7**		**14.0**		**17.3**		**23.0**
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**2.4**		**2.4**		**2.4**		**2.2**		**2.8**		**3.1**
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**15.0**		**17.6**		**13.5**		**14.0**		**16.8**		**21.7**
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**220**		NA		NA		NA		**230**		NA
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**220**		NA		NA		NA		**230**		NA
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**340**		**270**		**160**		**290**		**320**		**280**		**280**		**240**		**280**	J	**210**		**210**		**330**		**330**
81	74	Chloride (mg/L) (EPA 325.2)	**3.9**		**2.7**		**4.7**		**3.9**		**3.7**		**8.2**		**3.3**		**5.6**	J	**3.2**		**7.9**		**3.1**		**24**		**4.1**
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		0.010	U	NA
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		**0.029**	J	NA		NA		NA		**0.042**		NA
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		**0.031**		NA		NA		NA		**0.048**		NA
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		**7.3**		NA		NA		NA		**6.5**		NA
86	79																										

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB
1		
2		
3		
4		
5		
66	Chromium (6010)	U
67	Copper (6010)	U
68	Lead (7421)	U
69	Nickel (6010)	U
70	Zinc (6010)	U
71		
72	**MAJOR IONS AND CONVENTIONALS**	
73	Calcium (mg/L) (6010)	
74	Magnesium (mg/L) (6010)	
75	Potassium (mg/L) (6010)	
76	Sodium (mg/L) (6010)	
77	Alkalinity (mg/L CaCO3) (SM 2320)	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	
81	Chloride (mg/L) (EPA 325.2)	
82	N-Nitrate (mg-N/L) (Calculated)	
83	N-Nitrite (mg-N/L) (EPA 354.1)	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	
85	Sulfate (mg/L) (EPA 375.2)	
86		

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW-12D2		LW-12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2
4			AH76B		AU45M		BC27T		BH96N		BR55A		CB85J		CL03L		CT67F		DE87R		DM52F		DW48I		ED34I		EN00L
5			5/20/99		9/23/99		12/9/99		2/18/00		5/22/00		8/31/00		11/10/00		2/15/01		6/6/01		8/15/01		11/29/01		2/28/02		6/27/02
87	80	**FIELD PARAMETERS**																									
88	81	pH (avg)	6.69		6.81		6.88		6.75		6.61		6.64		5.48		6.56		6.89		6.96		6.68		6.50		6.66
89	82	Temperature (° C) (avg)	13.8		14.2		11.9		13.0		13.9		13.7		13.3		13.3		13.9		14.0		13.1		13.1		14.2
90	83	Conductivity (um/hos)	514		391		250		475		468		443		442		429		473		356		375		439		528
91	84	Dissolved oxygen (mg/L) (avg)	2.40		0.42		2.80		1.42		0		0.52		0.29		0.00		0.50		0.34		3.45		7.16		4.25
92	85																										
93	86	**DIOXINS AND FURANS (ng/L)**																									
94	87	**Method 8290**																									
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120																											
121																											
122																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB
1		
2		
3		
4		
5		
87	**FIELD PARAMETERS**	
88	pH (avg)	
89	Temperature (° C) (avg)	
90	Conductivity (um/hos)	
91	Dissolved oxygen (mg/L) (avg)	
92		
93	**DIOXINS AND FURANS (ng/L)**	
94	**Method 8290**	
95	2,3,7,8-TCDF	
96	Total TCDF	
97	2,3,7,8-TCDD	
98	Total TCDD	
99	1,2,3,7,8-PeCDF	
100	2,3,4,7,8-PeCDF	
101	Total PeCDF	
102	1,2,3,7,8-PeCDD	
103	Total PeCDD	
104	1,2,3,4,7,8-HxCDF	
105	1,2,3,6,7,8-HxCDF	
106	2,3,4,6,7,8-HxCDF	
107	1,2,3,7,8,9-HxCDF	
108	Total HxCDF	
109	1,2,3,4,7,8-HxCDD	
110	1,2,3,6,7,8-HxCDD	
111	1,2,3,7,8,9-HxCDD	
112	Total HxCDD	
113	1,2,3,4,6,7,8-HpCDF	
114	1,2,3,4,7,8,9-HpCDF	
115	Total HpCDF	
116	1,2,3,4,6,7,8-HpCDD	
117	Total HpCDD	
118	OCDF	
119	OCDD	
120		
121		
122		

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW-12D2		LW-12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2
4			AH76B		AU45M		BC27T		BH96N		BR55A		CB85J		CL03L		CT67F		DE87R		DM52F		DW48I		ED34I		EN00L
5			5/20/99		9/23/99		12/9/99		2/18/00		5/22/00		8/31/00		11/10/00		2/15/01		6/6/01		8/15/01		11/29/01		2/28/02		6/27/02
123		**PAHs (µg/L)**																									
124		**EPA Method SW8270 SIM**																									
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB
1		
2		
3		
4		
5		
123	**PAHs (µg/L)**	
124	**EPA Method SW8270 SIM**	
125	Naphthalene	
126	2-Methylnaphthalene	
127	Acenaphthylene	
128	Acenaphthene	
129	Fluorene	
130	Anthracene	
131	Dibenzofuran	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			LW15D		LW15D	
4			BR64T		CL03T	
5			5/25/00		11/9/00	
6						
7	1	**CHLORINATED PHENOLS (µg/L)**				
8	2	**EPA Method SW8040**				
9	3	Pentachlorophenol	**0.33**		0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U
16	10					
17	11	**SEMIVOLATILES (µg/L)**				
18	12	**EPA Method SW8270**				
19	13	Phenol	NA		NA	
20	14	4-Methylphenol	NA		NA	
21	15	Isophorone	NA		NA	
22	16	2,4-Dimethylphenol	NA		NA	
23	17	Benzoic Acid	NA		NA	
24	18	Naphthalene	NA		NA	
25	19	2-Methylnaphthalene	NA		NA	
26	20	2,4,6-Trichlorophenol	NA		NA	
27	21	2,4,5-Trichlorophenol	NA		NA	
28	22	Acenaphthene	NA		NA	
29	23	Dibenzofuran	NA		NA	
30	24	Fluorene	NA		NA	
31	25	Pentachlorophenol	NA		NA	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA	
33	27					
34	28	**VOLATILES (µg/L)**				
35	29	**EPA Method SW8260**				
36	30	Acetone	NA		NA	
37	31	Carbon Disulfide	NA		NA	
38	32	2-Butanone	NA		NA	
39	33	Benzene	NA		NA	
40	34	Bromoform	NA		NA	
41	35	Toluene	NA		NA	
42	36	Ethylbenzene	NA		NA	
43	37	Styrene	NA		NA	
44	38	m,p-Xylene	NA		NA	
45	39	o-Xylene	NA		NA	
46	40	1,3,5-Trimethylbenzene	NA		NA	
47	41	1,2,4-Trimethylbenzene	NA		NA	
48	42	Isopropylbenzene	NA		NA	
49	43	n-Propylbenzene	NA		NA	
50	44	tert-Butylbenzene	NA		NA	
51	45	sec-Butylbenzene	NA		NA	
52	46	4-Isopropyltoluene	NA		NA	
53	47	n-Butylbenzene	NA		NA	
54	48	Naphthalene	NA		NA	
55		Methyl tert-butyl ether	NA		NA	
56	49					
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**				
58	51	**Method OR-DEQ**				
59	52	**TPH-Diesel**	NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA	
61	54	**TPH-Gasoline**	NA		NA	
62	55					
63	56	**PRIORITY POLLUTANT**				
64	57	**METALS (mg/L)**				
65	58	Arsenic (7060)	NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			LW15D		LW15D	
4			BR64T		CL03T	
5			5/25/00		11/9/00	
66	59	Chromium (6010)	NA		NA	
67	60	Copper (6010)	NA		NA	
68	61	Lead (7421)	NA		NA	
69	62	Nickel (6010)	NA		NA	
70	63	Zinc (6010)	NA		NA	
71	64					
72	65	**MAJOR IONS AND CONVENTIONALS**				
73	66	Calcium (mg/L) (6010)	NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA	
86	79					

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
2						
3			LW15D		LW15D	
4			BR64T		CL03T	
5			5/25/00		11/9/00	
87	80	**FIELD PARAMETERS**				
88	81	pH (avg)	6.69		6.12	
89	82	Temperature (° C) (avg)	14.6		12.8	
90	83	Conductivity (um/hos)	324		265	
91	84	Dissolved oxygen (mg/L) (avg)	0.67		1.25	
92	85					
93	86	**DIOXINS AND FURANS (ng/L)**				
94	87	**Method 8290**				
95	88	2,3,7,8-TCDF	NA		NA	
96	89	Total TCDF	NA		NA	
97	90	2,3,7,8-TCDD	NA		NA	
98	91	Total TCDD	NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA	
101	94	Total PeCDF	NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA	
103	96	Total PeCDD	NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA	
108	101	Total HxCDF	NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA	
112	105	Total HxCDD	NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA	
115	108	Total HpCDF	NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA	
117	110	Total HpCDD	NA		NA	
118	111	OCDF	NA		NA	
119	112	OCDD	NA		NA	
120						
121						
122						

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			LW15D		LW15D	
4			BR64T		CL03T	
5			5/25/00		11/9/00	
123		**PAHs (µg/L)**				
124		**EPA Method SW8270 SIM**				
125		Naphthalene	NA		NA	
126		2-Methylnaphthalene	NA		NA	
127		Acenaphthylene	NA		NA	
128		Acenaphthene	NA		NA	
129		Fluorene	NA		NA	
130		Anthracene	NA		NA	
131		Dibenzofuran	NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW16D	
4			BR64U	
5			5/25/00	
6				
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U
11	5	2,3,6-Trichlorophenol	0.25	U
12	6	2,4,5-Trichlorophenol	0.25	U
13	7	2,3,4-Trichlorophenol	0.25	U
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U
15	9	2,3,4,5-Tetrachlorophenol	0.25	U
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	NA	
20	14	4-Methylphenol	NA	
21	15	Isophorone	NA	
22	16	2,4-Dimethylphenol	NA	
23	17	Benzoic Acid	NA	
24	18	Naphthalene	NA	
25	19	2-Methylnaphthalene	NA	
26	20	2,4,6-Trichlorophenol	NA	
27	21	2,4,5-Trichlorophenol	NA	
28	22	Acenaphthene	NA	
29	23	Dibenzofuran	NA	
30	24	Fluorene	NA	
31	25	Pentachlorophenol	NA	
32	26	bis(2-Ethylhexyl)phthalate	NA	
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	NA	
37	31	Carbon Disulfide	NA	
38	32	2-Butanone	NA	
39	33	Benzene	NA	
40	34	Bromoform	NA	
41	35	Toluene	NA	
42	36	Ethylbenzene	NA	
43	37	Styrene	NA	
44	38	m,p-Xylene	NA	
45	39	o-Xylene	NA	
46	40	1,3,5-Trimethylbenzene	NA	
47	41	1,2,4-Trimethylbenzene	NA	
48	42	Isopropylbenzene	NA	
49	43	n-Propylbenzene	NA	
50	44	tert-Butylbenzene	NA	
51	45	sec-Butylbenzene	NA	
52	46	4-Isopropyltoluene	NA	
53	47	n-Butylbenzene	NA	
54	48	Naphthalene	NA	
55		Methyl tert-butyl ether	NA	NA
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	NA	
60	53	**TPH-D Motor Oil**	NA	
61	54	**TPH-Gasoline**	NA	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW16D	
4			BR64U	
5			5/25/00	
66	59	Chromium (6010)	NA	
67	60	Copper (6010)	NA	
68	61	Lead (7421)	NA	
69	62	Nickel (6010)	NA	
70	63	Zinc (6010)	NA	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW16D	
4			BR64U	
5			5/25/00	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.74	
89	82	Temperature (° C) (avg)	14.3	
90	83	Conductivity (um/hos)	314	
91	84	Dissolved oxygen (mg/L) (avg)	0.71	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121				
122				

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW16D	
4			BR64U	
5			5/25/00	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	NA	
126		2-Methylnaphthalene	NA	
127		Acenaphthylene	NA	
128		Acenaphthene	NA	
129		Fluorene	NA	
130		Anthracene	NA	
131		Dibenzofuran	NA	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1																								
2	**BOLD DETECTS WHEN DATA IS STILL IN ROWS**																							
3	**DATE FORMAT DD/MM/YYYY**			B1		B2		D		G1A		J1		J2		K		LW1D		LW1S		LW3D		LW4D
4	**REMOVE "00" FROM SITE NAMES BEFORE COPY**			FY64D		FY64E		FY82H		FY82N		FY64H		FY64I		FY64G		FY64K		FY64J		FY82I		FY82L
5				10/20/2003		10/20/2003		10/23/2003		10/24/2003		10/21/2003		10/21/2003		10/21/2003		10/21/2003		10/21/2003		10/24/2003		10/24/2003
6																								
7	**CHLORINATED PHENOLS (µg/L)**																							
8	**EPA Method SW8040**																							
9	Pentachlorophenol	Pentachlorophenol	3	0.52	U	0.5	U	**0.61**		0.5	U	**0.65**		0.5	U	NA		0.5	U	0.5	U	**0.62**		0.5
10	2,4,6-Trichlorophenol			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
11	2,3,6-Trichlorophenol			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
12	2,4,5-Trichlorophenol			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
13	2,3,4-Trichlorophenol			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
15	2,3,4,5-Tetrachlorophenol			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
16																								
17	**SEMIVOLATILES (µg/L)**																							
18	**EPA Method SW8270**																							
19	Phenol	Phenol	13	2.1	U	2	U	2	U	2	U	2.1	U	2	U	NA		2	U	2	U	2.2	U	2
20	4-Methylphenol	4-Methylphenol	14	1	U	1	U	1	U	1	U	1.1	U	1	U	NA		1	U	1	U	1.1	U	1
21	Isophorone	Isophorone	15	1	U	1	U	1	U	1	U	1.1	U	1	U	NA		1	U	1	U	1.1	U	1
22	2,4-Dimethylphenol	2,4-Dimethylphenol	16	**4.4**		3	U	3	U	3	U	3.2	U	3	U	NA		3	U	3	U	3.3	U	3
23	Benzoic Acid	Benzoic Acid	17	10	U	10	U	10	U	10	U	11	U	10	U	NA		10	U	10	U	11	U	10
24	Naphthalene	Naphthalene	18	**3.5**		1	U	1	U	1	U	**2.1**		1	U	NA		1	U	1	U	1.1	U	1
25	2-Methylnaphthalene	2-Methylnaphthalene	19	**3**		1	U	1	U	1	U	**1.4**		1	U	NA		1	U	1	U	1.1	U	1
26	2,4,6-Trichlorophenol	2,4,6-Trichlorophenol	20	5.2	U	5	U	5.1	U	5	U	5.3	U	5	U	NA		5	U	5	U	5.5	U	5
27	2,4,5-Trichlorophenol	2,4,5-Trichlorophenol	21	5.2	U	5	U	5.1	U	5	U	5.3	U	5	U	NA		5	U	5	U	5.5	U	5
28	Acenaphthene	Acenaphthene	22	1	U	1	U	1	U	1	U	1.1	U	1	U	NA		1	U	1	U	1.1	U	1
29	Dibenzofuran	Dibenzofuran	23	1	U	1	U	1	U	1	U	1.1	U	1	U	NA		1	U	1	U	1.1	U	1
30	Fluorene	Fluorene	24	1	U	1	U	1	U	1	U	1.1	U	1	U	NA		1	U	1	U	1.1	U	1
31	Pentachlorophenol	Pentachlorophenol	25	5.2	U	5	U	5.1	U	5	U	5.3	U	5	U	NA		5	U	5	U	5.5	U	5
32	bis(2-Ethylhexyl)phthalate	bis(2-Ethylhexyl)phthalate	26	**6.3**		1	U	1	U	1	U	1.1	U	1	U	NA		1	U	1	U	1.1	U	1
33																								
34	**VOLATILES (µg/L)**																							
35	**EPA Method SW8260**																							
36	Acetone	Acetone	30	5	U	5	U	5	U	**7.3**	M	5	U	5	U	NA		**5.1**		5	U	**64**		**6.6**
37	Carbon Disulfide	Carbon Disulfide	31	1	U	1	U	1	U	1	U	1	U	1	U	NA		1	U	1	U	1	U	1
38	2-Butanone	2-Butanone	32	5	U	5	U	5	U	**6.7**	M	5	U	5	U	NA		5	U	5	U	5	U	**9.1**
39	Benzene	Benzene	33	**5.6**		1	U	1	U	1	U	1	U	1	U	NA		1	U	1	U	1	U	1
40	Bromoform	Bromoform	34	1	U	1	U	1	U	1	U	1	U	1	U	NA		1	U	1	U	1	U	1
41	Toluene	Toluene	35	**2.1**		1	U	1	U	1	U	1	U	1	U	NA		1	U	1	U	1	U	1
42	Ethylbenzene	Ethylbenzene	36	**31**		1	U	1	U	1	U	1	U	1	U	NA		1	U	1	U	1	U	1
43	Styrene	Styrene	37	1	U	1	U	1	U	1	U	1	U	1	U	NA		1	U	1	U	1	U	1
44	m,p-Xylene	m,p-Xylene	38	**40**		1	U	1	U	1	U	1	U	1	U	NA		1	U	1	U	1	U	1
45	o-Xylene	o-Xylene	39	**9.2**		1	U	1	U	1	U	1	U	1	U	NA		1	U	1	U	1	U	1
46	1,3,5-Trimethylbenzene	1,3,5-Trimethylbenzene	40	**3.6**		1	U	1	U	1	U	1	U	1	U	NA		1	U	1	U	1	U	1
47	1,2,4-Trimethylbenzene	1,2,4-Trimethylbenzene	41	**12**		1	U	1	U	1	U	1	U	1	U	NA		1	U	1	U	1	U	**1.4**
48	Isopropylbenzene	Isopropylbenzene	42	**3.3**		1	U	**1.1**		**150**		**7.1**		1	U	NA		1	U	1	U	1	U	**1.9**
49	n-Propylbenzene	n-Propylbenzene	43	**4.5**		1	U	1	U	**130**		**11**		1	U	NA		1	U	1	U	1	U	**1.6**
50	tert-Butylbenzene	tert-Butylbenzene	44	1	U	1	U	1	U	**3.5**		1	U	1	U	NA		1	U	1	U	1	U	1
51	sec-Butylbenzene	sec-Butylbenzene	45	1	U	1	U	1	U	**17**		1	U	1	U	NA		1	U	1	U	1	U	1
52	4-Isopropyltoluene	4-Isopropyltoluene	46	1	U	1	U	1	U	1	U	1	U	1	U	NA		1	U	1	U	1	U	1
53	n-Butylbenzene	n-Butylbenzene	47	1	U	1	U	1	U	**10**		1	U	1	U	NA		1	U	1	U	1	U	1
54	Naphthalene	Naphthalene	48	5	U	5	U	5	U	5	U	5	U	5	U	NA		5	U	5	U	5	U	5
55	Methyl tert-butyl ether	Methyl tert-butyl ether	48.5																					
56																								
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																							
58	**Method OR-DEQ**																							
59	**TPH-Diesel**	Diesel Range Hydrocarbons	52	**2.7**		NA		NA		**2.2**		NA		NA		NA		NA		NA		NA		**1.6**
60	**TPH-D Motor Oil**	Motor Oil	53	0.5	U	NA		NA		0.5	U	NA		NA		NA		NA		NA		NA		0.5
61	**TPH-Gasoline**	Gasoline Range Hydrocarbons	54	**1.2**		NA		NA		NA		NA		NA		0.25	U	NA		0.25	U	NA		NA
62																								
63	**PRIORITY POLLUTANT**																							
64	**METALS (mg/L)**																							
65	Arsenic (7060)	Arsenic	58	**0.007**		**0.002**		**0.018**		**0.035**		**0.006**		**0.004**		0.001	U	**0.006**		**0.008**		**0.018**		**0.028**
66	Chromium (6010)	Chromium	59	**0.006**		0.005	U	0.005	U	**0.01**		0.005	U	0.005	U	0.005	U	**0.005**		0.005	U	**0.006**		**0.009**
67	Copper (6010)	Copper	60	**0.015**		0.002	U	0.002	U	**0.007**		**0.002**		**0.004**		**0.006**		**0.005**		**0.003**		**0.004**		**0.006**
68	Lead (7421)	Lead	61	**0.005**		0.001	U	0.001	U	**0.003**		0.001	U	0.001	U	0.001	U	**0.036**		0.001	U	**0.001**		0.001
69	Nickel (6010)	Nickel	62	**0.01**		0.01	U	0.01	U	**0.08**		0.01	U	0.01	U	**0.03**		0.01	U	0.01	U	0.01	U	0.01
70	Zinc (6010)	Zinc	63	**0.018**		0.006	U	0.006	U	**0.021**		0.006	U	**0.006**		**0.014**		**0.019**		**0.007**		**0.013**		**0.017**
71																								
72	**MAJOR IONS AND CONVENTIONALS**																							

	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE
1																																	
2																																	
3		LW4S		LW6D		LW7S		LW8S		LW9D		LW10D		LW11D		LW11S		LW13S		LW14D		LW17D		LW18D		LW19S		LW20D		LW20S		LW21S	
4		FY82K		FY82O		FY64F		FY64L		FY82M		FY82B		FY82J		FY72I		FY82E		FY82C		FY82G		FY82F		FZ04O		FZ04N		FZ04M		FZ04Q	
5		10/24/2003		10/24/2003		10/20/2003		10/21/2003		10/24/2003		10/23/2003		10/24/2003		10/22/2003		10/23/2003		10/23/2003		10/23/2003		10/23/2003		10/28/2003		10/28/2003		10/28/2003		10/28/2003	
6																																	
7																																	
8																																	
9	U	**3.9**		**1.1**		0.5	U	0.55	U	0.51	U	**0.94**		0.55	U	NA		**1.0**		0.5	U	0.51	U	**0.58**		NA		NA		NA		NA	
10		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																																	
17																																	
18																																	
19	U	2	U	2	U	2	U	2.2	U	2	U	2	U	2.2	U	2	U	NA		NA		NA		NA		2	U	2	U	2.2	U	**11**	
20	U	1	U	1	U	1	U	1.1	U	1	U	1	U	1.1	U	1	U	NA		NA		NA		NA		1	U	1	U	1.1	U	1.2	U
21	U	1	U	1	U	1	U	1.1	U	1	U	1	U	1.1	U	1	U	NA		NA		NA		NA		1	U	1	U	1.1	U	1.2	U
22	U	3	U	3.1	U	3	U	3.3	U	3.1	U	3	U	3.3	U	3	U	NA		NA		NA		NA		3	U	3	U	3.3	U	**5.4**	
23	U	10	U	10	U	10	U	11	U	10	U	10	U	11	U	10	U	NA		NA		NA		NA		10	U	10	U	11	U	12	U
24	U	1	U	1	U	**4.4**		**2.2**		1	U	1	U	1.1	U	**3.2**		NA		NA		NA		NA		1	U	1	U	1.1	U	**100**	
25	U	1	U	1	U	**1.9**		**3.1**		1	U	1	U	1.1	U	**2.9**		NA		NA		NA		NA		1	U	1	U	1.1	U	**46**	
26	U	5	U	5.1	U	5	U	5.5	U	5.1	U	5	U	5.5	U	5.1	U	NA		NA		NA		NA		5	U	5	U	5.6	U	6	U
27	U	5	U	5.1	U	5	U	5.5	U	5.1	U	5	U	5.5	U	5.1	U	NA		NA		NA		NA		5	U	5	U	5.6	U	6	U
28	U	1	U	1	U	1	U	1.1	U	1	U	1	U	1.1	U	1	U	NA		NA		NA		NA		**1.1**		1	U	**1.4**		1.2	U
29	U	1	U	1	U	1	U	1.1	U	1	U	1	U	1.1	U	1	U	NA		NA		NA		NA		**1.5**		1	U	1.1	U	1.2	U
30	U	1	U	1	U	1	U	1.1	U	1	U	1	U	1.1	U	1	U	NA		NA		NA		NA		**3.5**		1	U	**3.8**		**1.9**	
31	U	5	U	5.1	U	5	U	5.5	U	5.1	U	5	U	5.5	U	**900**		NA		NA		NA		NA		5	U	5	U	5.6	U	6	U
32	U	1	U	1	U	1	U	1.1	U	1	U	1	U	**1.5**		1	U	NA		NA		NA		NA		1	U	**3.9**		1.1	U	1.2	U
33																																	
34																																	
35																																	
36	M	5	U	5	U	5	U	5	U	5	U	5	U	**71**		**7**	M	NA		NA		NA		NA		**5.1**	M	**6**	M	5	U	5	U
37	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	NA		NA		NA		NA		1	U	1	U	1	U	1	U
38	M	5	U	5	U	**17**	M	5	U	5	U	5	U	5	U	**7.5**	M	NA		NA		NA		NA		5	U	5	U	5	U	5	U
39	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**2.1**		NA		NA		NA		NA		1	U	1	U	1	U	**1600**	
40	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	NA		NA		NA		NA		1	U	1	U	1	U	1	U
41	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	NA		NA		NA		NA		1	U	1	U	1	U	**72**	
42	U	1	U	1	U	**29**		**7.2**		1	U	1	U	1	U	**14**		NA		NA		NA		NA		1	U	1	U	1	U	**940**	
43	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	NA		NA		NA		NA		1	U	1	U	1	U	1	U
44	U	1	U	1	U	**16**		1	U	1	U	1	U	1	U	**20**		NA		NA		NA		NA		1	U	1	U	1	U	**2400**	
45	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**23**		NA		NA		NA		NA		1	U	1	U	1	U	**770**	
46	U	1	U	1	U	**3.3**		1	U	1	U	1	U	1	U	**16**		NA		NA		NA		NA		1	U	1	U	1	U	**120**	
47		**1.4**		1	U	**2.2**		1	U	1	U	1	U	1	U	**73**		NA		NA		NA		NA		1	U	1	U	1	U	**540**	
48		1	U	**4.2**		**42**		**140**		**12**		1	U	1	U	**7.6**		NA		NA		NA		NA		**6.5**		1	U	**7**		**72**	
49		1	U	1	U	**54**		**94**		**5.4**		1	U	1	U	**13**		NA		NA		NA		NA		**8.9**		1	U	**9.2**		**110**	
50	U	1	U	**2.9**		1	U	**7.4**		1	U	1	U	1	U	**1**		NA		NA		NA		NA		1	U	1	U	1	U	1	U
51	U	1	U	**2.1**		**3.7**		**19**		**1.3**		1	U	1	U	**4.7**		NA		NA		NA		NA		**4.7**		1	U	**5.1**		1	U
52	U	1	U	1	U	**1.6**		1	U	1	U	1	U	1	U	**3.2**		NA		NA		NA		NA		1	U	1	U	1	U	1	U
53	U	1	U	1	U	**4.3**		**9**		1	U	1	U	1	U	**3.7**	M	NA		NA		NA		NA		**2.9**	M	1	U	**2.2**		**8**	
54	U	5	U	5	U	**5.5**		5	U	5	U	5	U	5	U	5	U	NA		NA		NA		NA		5	U	5	U	5	U	**190**	
55																																	
56																																	
57																																	
58																																	
59		**0.26**		**1.1**		**0.6**		**3.5**		0.25	U	0.25	U	**0.66**		**2.3**		NA		NA		NA		NA		**4.4**		**0.4**		**5.4**		**4.3**	
60	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	NA		NA		NA		NA		0.5	U	0.5	U	0.5	U	0.5	U
61		NA		NA		**2.1**		**4.6**		NA		NA		NA		**2.8**		NA		NA		NA		NA		**1.1**		0.25	U	**0.96**		**24**	
62																																	
63																																	
64																																	
65		**0.001**		**0.016**		**0.012**		**0.021**		**0.038**		**0.024**		**0.005**		**0.006**		NA		NA		NA		NA		**0.046**		**0.021**		**0.04**		**0.025**	
66		**0.006**		**0.008**		0.005	U	**0.007**		**0.012**		**0.012**		**0.016**		0.005	U	NA		NA		NA		NA		0.005	U	0.005	U	0.005	U	0.005	U
67		**0.006**		**0.005**		**0.003**		**0.007**		**0.011**		**0.011**		**0.015**		**0.002**		NA		NA		NA		NA		0.002	U	**0.004**		0.002	U	**0.005**	
68	U	0.001	U	**0.003**		0.001	U	**0.002**		**0.002**		**0.003**		**0.004**		0.001	U	NA		NA		NA		NA		**0.001**		0.001	U	0.001	U	**0.005**	
69	U	0.01	U	0.01	U	0.01	U	**0.02**		0.01	U	0.01	U	**0.02**		0.01	U	NA		NA		NA		NA		0.01	U	0.01	U	0.01	U	0.01	U
70		**0.009**		**0.013**		0.006	U	**0.027**		**0.027**		**0.024**		**0.041**		0.006	U	NA		NA		NA		NA		0.006	U	**0.015**		**0.01**		**0.012**	
71																																	
72																																	

	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK
1																																
2																							Dup of LW30S									
3	LW22D		LW23D		LW24D		LW25D		LW26D		LW27D		LW27S		LW29D		LW29S		LW30D		LW30S		X		LW31S		LW32D		LW32S		LW34S	
4	FZ04A		FZ04B		FZ04U		FZ04V		FZ04T		FZ04S		FZ04R		FZ04D		FZ04C		FZ04F		FZ04E		FZ04L		FZ04G		FZ04I		FZ04H		FZ04J	
5	10/27/2003		10/27/2003		10/28/2003		10/28/2003		10/28/2003		10/28/2003		10/28/2003		10/27/2003		10/27/2003		10/27/2003		10/27/2003		10/27/2003		10/27/2003		10/27/2003		10/27/2003		10/27/2003	
6																																
7																																
8																																
9	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																																
17																																
18																																
19	**4.1**		2	U	2	U	2.3	U	2.2	U	2.2	U	2.4	U	2.1	U	2	U	2.2	U	2.2	U	2.2	U	2	U	2.1	U	2.1	U	2	U
20	1.4	U	1	U	1	U	1.2	U	1.1	U	1.1	U	1.2	U	1	U	1	U	1.1	U	1.1	U	1.1	U	1	U	1.1	U	1	U	1	U
21	1.4	U	1	U	1	U	1.2	U	1.1	U	1.1	U	1.2	U	1	U	1	U	1.1	U	1.1	U	1.1	U	1	U	1.1	U	1	U	1	U
22	4.2	U	3	U	3	U	3.5	U	3.3	U	3.2	U	3.7	U	3.1	U	3	U	3.3	U	3.3	U	3.3	U	3	U	3.2	U	3.1	U	3.1	U
23	14	U	10	U	10	U	12	U	11	U	11	U	12	U	10	U	10	U	11	U	11	U	11	U	10	U	11	U	10	U	10	U
24	1.4	U	1	U	1	U	1.2	U	1.1	U	1.1	U	1.2	U	1	U	1	U	1.1	U	1.1	U	1.1	U	1	U	1.1	U	1	U	1	U
25	1.4	U	1	U	1	U	1.2	U	1.1	U	1.1	U	1.2	U	1	U	1	U	1.1	U	1.1	U	1.1	U	1	U	1.1	U	1	U	1	U
26	7	U	5	U	5	U	5.8	U	5.5	U	5.4	U	6.1	U	5.2	U	5	U	5.6	U	5.5	U	5.4	U	5.1	U	5.3	U	5.2	U	5.1	U
27	7	U	5	U	5	U	5.8	U	5.5	U	5.4	U	6.1	U	5.2	U	5	U	5.6	U	5.5	U	5.4	U	5.1	U	5.3	U	5.2	U	5.1	U
28	1.4	U	1	U	1	U	1.2	U	1.1	U	1.1	U	**1.2**		1	U	1	U	1.1	U	1.1	U	1.1	U	1	U	1.1	U	1	U	1	U
29	1.4	U	1	U	1	U	1.2	U	1.1	U	1.1	U	1.2	U	1	U	1	U	1.1	U	1.1	U	1.1	U	1	U	1.1	U	1	U	1	U
30	1.4	U	1	U	1	U	1.2	U	1.1	U	1.1	U	**2.3**		1	U	1	U	1.1	U	**1.4**		**1.5**		1	U	1.1	U	1	U	1	U
31	7	U	5	U	5	U	5.8	U	5.5	U	5.4	U	6.1	U	5.2	U	5	U	5.6	U	5.5	U	5.4	U	5.1	U	5.3	U	5.2	U	5.1	U
32	1.4	U	**6.8**		**5.6**		1.2	U	1.1	U	1.1	U	1.2	U	1	U	1	U	1.1	U	1.1	U	**1.7**		**2.4**		**2.2**		**2.1**		**4.9**	
33																																
34																																
35																																
36	**5.2**	M	**19**		5	U	5	U	**11**		**7.9**		**6**		5	U	5	U	**5.1**		5	U	5	U	5	U	5	U	5	U	5	U
37	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**1.1**		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
38	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
39	**2.9**		**40**		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
40	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
41	**1.6**		**1.2**		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
42	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
43	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
44	**1.6**		**1.2**		1	U	**1.6**		1	U	1	U	1	U	1	U	1	U	1	U	1	U	**1**		1	U	1	U	1	U	1	U
45	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
46	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**1.3**		1	U	1	U	1	U	1	U
47	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
48	**14**		**16**		**2.2**		**5.6**		1	U	1	U	**12**		1	U	1	U	1	U	**9.8**		**9.6**		1	U	1	U	**18**		1	U
49	**12**		**8.6**		1	U	**2**		1	U	1	U	**13**		1	U	1	U	1	U	**25**		**23**		1	U	1	U	**20**		1	U
50	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**1**		1	U
51	**1.5**		**3.3**		**1.3**		**1.2**		1	U	1	U	**4**		1	U	1	U	1	U	**2.5**		**2.4**		1	U	1	U	**6.5**		1	U
52	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
53	1	U	**1.6**		1	U	1	U	1	U	1	U	**3.3**		1	U	1	U	1	U	**3.5**		**3.2**	M	1	U	1	U	**6.1**		1	U
54	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
55																																
56																																
57																																
58																																
59	**2**		**2.9**		**2.5**		**1.3**		**1.1**		**0.54**		**4.4**		0.25	U	0.25	U	0.25	U	**0.87**		**0.86**		**0.59**		**0.35**		**3.3**		0.25	U
60	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
61	**0.54**		**0.88**		**0.92**		**0.43**		**0.35**		0.25	U	**1.6**		0.25	U	0.25	U	0.25	U	**0.84**		**0.89**		0.25	U	0.25	U	**1.8**		0.25	U
62																																
63																																
64																																
65	**0.023**		**0.021**		**0.009**		**0.032**		**0.007**		**0.006**		**0.038**		**0.004**		**0.002**		**0.01**		**0.013**		**0.013**		0.001	U	**0.004**		**0.034**		**0.001**	
66	**0.15**		**0.135**		**0.125**		**0.31**		**0.012**		**0.009**		0.005	U	**0.019**		0.005	U	**0.026**		0.005	U	0.005	U	0.005	U	**0.063**		0.005	U	0.005	U
67	**0.199**		**0.201**		**0.163**		**0.373**		**0.016**		**0.02**		**0.002**		**0.019**		0.002	U	**0.04**		0.002	U	0.002	U	0.002	U	**0.082**		0.002	U	0.002	U
68	**0.056**		**0.068**		**0.058**		**0.15**		**0.006**		**0.014**		**0.002**		**0.006**		0.001	U	**0.008**		0.001	U	0.001	U	0.001	U	**0.018**		0.001	U	0.001	U
69	**0.14**		**0.11**		**0.11**		**0.28**		**0.01**		**0.01**		0.01	U	**0.02**		0.01	U	**0.03**		0.01	U	0.01	U	0.01	U	**0.05**		0.01	U	0.01	U
70	**0.4**		**0.348**		**0.327**		**0.83**		**0.036**		**0.047**		**0.008**		**0.04**		**0.007**		**0.07**		0.006	U	**0.007**		**0.008**		**0.146**		**0.008**		**0.009**	
71																																
72																																

	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM
1																												
2																			Dup of OX8S								Dup of RW2	
3	LW35D		O		OX1S		OX3S		OX5S		OX6S		OX7S		OX8D		OX8S		Y		R		RW1		RW2		W	
4	FZ04K		FY82Q		FY72G		FY72H		FY72A		FY72B		FY72C		FY72F		FY72E		FY72D		FY82R		FY72J		FY82D		FY82A	
5	10/27/2003		10/24/2003		10/22/2003		10/22/2003		10/22/2003		10/22/2003		10/22/2003		10/22/2003		10/22/2003		10/22/2003		10/24/2003		10/22/2003		10/23/2003		10/23/2003	
6																												
7																												
8																												
9	NA		NA		**0.69**		**130**		0.5	U	**2100**		**720**		**0.62**		**260**		**300**		NA		NA		NA		NA	
10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																												
17																												
18																												
19	2.9	U	2.1	U	NA		NA		NA		NA		NA		NA		NA		NA		2	U	**3.7**	M	2	U	2	U
20	1.4	U	1	U	NA		NA		NA		NA		NA		NA		NA		NA		1	U	1	U	1	U	1	U
21	1.4	U	1	U	NA		NA		NA		NA		NA		NA		NA		NA		1	U	1	U	1	U	1	U
22	4.3	U	3.1	U	NA		NA		NA		NA		NA		NA		NA		NA		3	U	6.4	U	3	U	3	U
23	14	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA		10	U	10	U	10	U	10	U
24	1.4	U	1	U	NA		NA		NA		NA		NA		NA		NA		NA		1	U	**5.1**		**1.8**		**1.3**	
25	1.4	U	1	U	NA		NA		NA		NA		NA		NA		NA		NA		1	U	1	U	**7.2**	J	**5.4**	J
26	7.1	U	5.2	U	NA		NA		NA		NA		NA		NA		NA		NA		5	U	5.1	U	5	U	5	U
27	7.1	U	5.2	U	NA		NA		NA		NA		NA		NA		NA		NA		5	U	**33**		5	U	5	U
28	1.4	U	**1.2**		NA		NA		NA		NA		NA		NA		NA		NA		1	U	1	U	1	U	1	U
29	1.4	U	1	U	NA		NA		NA		NA		NA		NA		NA		NA		1	U	1	U	1	U	1	U
30	1.4	U	**1.8**		NA		NA		NA		NA		NA		NA		NA		NA		1	U	1	U	1	U	1	U
31	7.1	U	5.2	U	NA		NA		NA		NA		NA		NA		NA		NA		5	U	**350**		**8.1**		**6.4**	
32	**2.7**		1	U	NA		NA		NA		NA		NA		NA		NA		NA		1	U	1	U	1	U	1	U
33																												
34																												
35																												
36	**7.9**	M	**11**		NA		NA		NA		NA		NA		NA		NA		NA		**16**		**15**	M	5	U	5	U
37	1	U	1	U	NA		NA		NA		NA		NA		NA		NA		NA		1	U	1	U	1	U	1	U
38	5	U	5	U	NA		NA		NA		NA		NA		NA		NA		NA		5	U	**46**	M	5	U	5	U
39	1	U	**1.5**		NA		NA		NA		NA		NA		NA		NA		NA		1	U	**4.9**		**3.6**		**3.4**	
40	1	U	1	U	NA		NA		NA		NA		NA		NA		NA		NA		1	U	1	U	1	U	1	U
41	1	U	**1.4**		NA		NA		NA		NA		NA		NA		NA		NA		**2.5**		1	U	1	U	1	U
42	1	U	1	U	NA		NA		NA		NA		NA		NA		NA		NA		**3.8**		**64**		**2.6**		**2.7**	
43	1	U	1	U	NA		NA		NA		NA		NA		NA		NA		NA		1	U	1	U	1	U	1	U
44	1	U	1	U	NA		NA		NA		NA		NA		NA		NA		NA		**9.4**		**62**		**4.3**		**4.5**	
45	1	U	1	U	NA		NA		NA		NA		NA		NA		NA		NA		1	U	**90**		1	U	1	U
46	1	U	1	U	NA		NA		NA		NA		NA		NA		NA		NA		1	U	**31**		**4.4**		**5.1**	
47	1	U	1	U	NA		NA		NA		NA		NA		NA		NA		NA		1	U	**170**		**16**		**17**	
48	**2.2**		**27**		NA		NA		NA		NA		NA		NA		NA		NA		**43**		**34**		**28**		**29**	
49	1	U	**29**		NA		NA		NA		NA		NA		NA		NA		NA		**20**		**40**		**35**		**36**	
50	1	U	1	U	NA		NA		NA		NA		NA		NA		NA		NA		1	U	**2**		**1.2**		**1.2**	
51	1	U	**5.6**		NA		NA		NA		NA		NA		NA		NA		NA		**4.3**		**11**		**5.1**		**5.4**	
52	1	U	1	U	NA		NA		NA		NA		NA		NA		NA		NA		1	U	**3.6**		1	U	1	U
53	1	U	**3**		NA		NA		NA		NA		NA		NA		NA		NA		**1.7**		**4.7**	M	**3.6**		**3.9**	
54	5	U	5	U	NA		NA		NA		NA		NA		NA		NA		NA		5	U	**13**		5	U	5	U
55																												
56																												
57																												
58																												
59	**3.1**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**5.8**		**0.73**		**0.72**	
60	0.5	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.5	U	0.5	U	0.5	U
61	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**7**		**1.2**		**1.2**	
62																												
63																												
64																												
65	**0.018**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.005**		**0.019**		**0.018**	
66	**0.35**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.005	U	0.005	U	0.005	U
67	**0.37**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.005**		0.002	U	0.002	U
68	**0.12**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.001	U	0.001	U	0.001	U
69	**0.32**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.01	U	0.01	U	0.01	U
70	**0.93**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.01**		**0.062**	J	**0.008**	J
71																												
72																												

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
73	Calcium (mg/L) (6010)			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
74	Magnesium (mg/L) (6010)			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
75	Potassium (mg/L) (6010)			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
76	Sodium (mg/L) (6010)			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
77	Alkalinity (mg/L CaCO3) (SM 2320)			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
80	Total Dissolved Solids (mg/L) (EPA 160.1)	Total Dissolved Solids	73	**210**		**250**		**260**		**310**		**190**		**340**		NA		**330**		**200**		**290**		**340**
81	Chloride (mg/L) (EPA 325.2)	Chloride	74	**3**		**3.1**		**2.4**		**8.4**		**2.2**		**4.1**		NA		**2.9**		**3.2**		**3.6**		**11**
82	N-Nitrate (mg-N/L) (Calculated)			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
83	N-Nitrite (mg-N/L) (EPA 354.1)			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
85	Sulfate (mg/L) (EPA 375.2)			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
86																								
87	**FIELD PARAMETERS**																							
88	pH (avg)	pH	81	6.51		6.71		6.71		6.64		6.80		6.93		6.37		7.07		6.77		6.33		6.79
89	Temperature (° C) (avg)	Temperature	82	15.9		14.9		15.0		14.7		17.8		16.1		17.3		17.1		18.3		13.0		14.6
90	Conductivity (um/hos)	Conductivity	83	285		560		382		603		255		457		250		381		237		543		523
91	Dissolved oxygen (mg/L) (avg)	Dissolved oxygen	84	1.48		0.56		1.66		2.92		1.65		3.09		2.57		2.51		1.64		2.00		2.57
92																								
93	**DIOXINS AND FURANS (ng/L)**																							
94	**Method 8290**																							
95	2,3,7,8-TCDF			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	TotalTCDF			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	2,3,7,8-TCDD			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	TotalTCDD			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	1,2,3,7,8-PeCDF			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	2,3,4,7,8-PeCDF			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	TotalPeCDF			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	1,2,3,7,8-PeCDD			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	TotalPeCDD			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	1,2,3,4,7,8-HxCDF			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	1,2,3,6,7,8-HxCDF			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	2,3,4,6,7,8-HxCDF			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	1,2,3,7,8,9-HxCDF			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	TotalHxCDF			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	1,2,3,4,7,8-HxCDD			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	1,2,3,6,7,8-HxCDD			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	1,2,3,7,8,9-HxCDD			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	TotalHxCDD			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	1,2,3,4,6,7,8-HpCDF			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	1,2,3,4,7,8,9-HpCDF			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	TotalHpCDF			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	1,2,3,4,6,7,8-HpCDD			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	TotalHpCDD			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	OCDF			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	OCDD			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120																								
121	**ETHANOL (mg/L)**			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
122																								
123	**PAHs (µg/L)**																							
124	**EPA Method SW8270 SIM**																							
125	Naphthalene	Naphthalene	118	NA		NA		NA		NA		NA		NA		0.1	U	NA		0.1	U	NA		NA
126	2-Methylnaphthalene	2-Methylnaphthalene	119	NA		NA		NA		NA		NA		NA		0.1	U	NA		0.1	U	NA		NA
127	Acenaphthylene	Acenaphthylene	120	NA		NA		NA		NA		NA		NA		0.1	U	NA		0.1	U	NA		NA
128	Acenaphthene	Acenaphthene	121	NA		NA		NA		NA		NA		NA		0.1	U	NA		0.1	U	NA		NA
129	Fluorene	Fluorene	122	NA		NA		NA		NA		NA		NA		0.1	U	NA		0.1	U	NA		NA
130	Anthracene	Anthracene	123	NA		NA		NA		NA		NA		NA		0.1	U	NA		0.1	U	NA		NA
131	Dibenzofuran	Dibenzofuran	124	NA		NA		NA		NA		NA		NA		0.1	U	NA		0.1	U	NA		NA

	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE
73		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80		**140**		**250**		**220**		**260**		**160**		**120**		**290**		**240**		NA		NA		NA		NA		**140**		**220**		**270**		**240**	
81		**3**		**2.9**		**2.9**		**4.8**		**1.2**		**1.5**		**5.8**		**4**		NA		NA		NA		NA		**1.1**		**5.6**		**2**		**2.7**	
82		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86																																	
87																																	
88		6.65		6.57		6.77		6.57		6.69		6.48		6.48		6.65		6.38		6.56		6.47		6.53		6.65		6.62		6.33		6.54	
89		15.2		14.7		15.6		19.0		14.9		17.9		13.3		15.8		14.7		14.2		15.8		17.9		14.4		15.8		16.5		16.4	
90		217		375		308		352		255		164		376		300		119		238		434		425		506		347		445		373	
91		2.95		2.86		1.08		1.03		2.91		5.66		2.80		1.97		5.65		2.29		3.72		4.38		1.72		2.04		1.79		1.25	
92																																	
93																																	
94																																	
95		NA		NA		NA		NA		NA		NA		NA		**6.88**	J	NA		NA		NA		NA		NA		NA		NA		NA	
96		NA		NA		NA		NA		NA		NA		NA		**7.91**		NA		NA		NA		NA		NA		NA		NA		NA	
97		NA		NA		NA		NA		NA		NA		NA		3.08	U	NA		NA		NA		NA		NA		NA		NA		NA	
98		NA		NA		NA		NA		NA		NA		NA		3.08	U	NA		NA		NA		NA		NA		NA		NA		NA	
99		NA		NA		NA		NA		NA		NA		NA		**30.1**		NA		NA		NA		NA		NA		NA		NA		NA	
100		NA		NA		NA		NA		NA		NA		NA		**23.8**	J	NA		NA		NA		NA		NA		NA		NA		NA	
101		NA		NA		NA		NA		NA		NA		NA		**664**		NA		NA		NA		NA		NA		NA		NA		NA	
102		NA		NA		NA		NA		NA		NA		NA		5.19	U	NA		NA		NA		NA		NA		NA		NA		NA	
103		NA		NA		NA		NA		NA		NA		NA		**144**		NA		NA		NA		NA		NA		NA		NA		NA	
104		NA		NA		NA		NA		NA		NA		NA		**185**		NA		NA		NA		NA		NA		NA		NA		NA	
105		NA		NA		NA		NA		NA		NA		NA		**101**		NA		NA		NA		NA		NA		NA		NA		NA	
106		NA		NA		NA		NA		NA		NA		NA		**141**		NA		NA		NA		NA		NA		NA		NA		NA	
107		NA		NA		NA		NA		NA		NA		NA		11	U	NA		NA		NA		NA		NA		NA		NA		NA	
108		NA		NA		NA		NA		NA		NA		NA		**6013**		NA		NA		NA		NA		NA		NA		NA		NA	
109		NA		NA		NA		NA		NA		NA		NA		**31**		NA		NA		NA		NA		NA		NA		NA		NA	
110		NA		NA		NA		NA		NA		NA		NA		**812**		NA		NA		NA		NA		NA		NA		NA		NA	
111		NA		NA		NA		NA		NA		NA		NA		**111**		NA		NA		NA		NA		NA		NA		NA		NA	
112		NA		NA		NA		NA		NA		NA		NA		**2769**		NA		NA		NA		NA		NA		NA		NA		NA	
113		NA		NA		NA		NA		NA		NA		NA		**5015**		NA		NA		NA		NA		NA		NA		NA		NA	
114		NA		NA		NA		NA		NA		NA		NA		**335**		NA		NA		NA		NA		NA		NA		NA		NA	
115		NA		NA		NA		NA		NA		NA		NA		**23730**		NA		NA		NA		NA		NA		NA		NA		NA	
116		NA		NA		NA		NA		NA		NA		NA		**34761**	J	NA		NA		NA		NA		NA		NA		NA		NA	
117		NA		NA		NA		NA		NA		NA		NA		**53330**		NA		NA		NA		NA		NA		NA		NA		NA	
118		NA		NA		NA		NA		NA		NA		NA		**25345**	J	NA		NA		NA		NA		NA		NA		NA		NA	
119		NA		NA		NA		NA		NA		NA		NA		**276444**	J	NA		NA		NA		NA		NA		NA		NA		NA	
120																																	
121		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																																	
123																																	
124																																	
125		NA		NA		**4.1**		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1	U	0.1	U	0.11	U	**100**	
126		NA		NA		**1.6**		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1	U	0.1	U	0.11	U	**46**	
127		NA		NA		0.1	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1	U	0.1	U	0.11	U	0.12	U
128		NA		NA		0.1	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.84**		0.1	U	**1.3**		**0.8**	
129		NA		NA		0.1	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		**2.5**		0.1	U	**3.3**		**2.1**	
130		NA		NA		0.1	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1	U	0.1	U	**0.14**		0.12	U
131		NA		NA		0.1	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.77**		0.1	U	**0.59**		**0.57**	

	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK
73	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	**280**		**330**		**340**		**210**		**300**		**240**		**270**		**370**		**91**		**270**		**130**		**140**		**140**		**270**		**250**		**180**	
81	**1.7**		**2.4**		**2.2**		**12**		**18**		**24**		**1.9**		**30**		**1.8**		**7.3**		**1.3**		**1.3**		**1.7**		**2.7**		**2.8**		**2.9**	
82	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86																																
87																																
88	6.65		6.78		6.87		6.55		6.8		6.84		6.62		6.69		6.56		6.65		6.59		6.59		5.90		6.80		6.35		6.01	
89	17.2		15.8		16.9		18.1		19.0		15.0		14.9		16.0		14.7		13.8		14.7		14.7		14.7		15.8		14.6		15.4	
90	498		547		494		290		509		329		400		569		112		426		192		193		187		436		409		234	
91	4.51		0.35		0.57		2.68		2.65		1.07		1.53		3.36		1.44		1.96		2.46		2.27		3.10		5.75		1.65		2.62	
92																																
93																																
94																																
95	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																																
121	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																																
123																																
124																																
125	0.14	U	0.1	U	0.1	U	0.12	U	0.11	U	0.11	U	0.12	U	0.1	U	0.1	U	0.11	U	0.11	U	0.11	U	0.1	U	0.11	U	0.1	U	0.1	U
126	0.14	U	0.1	U	0.1	U	0.12	U	0.11	U	0.11	U	0.12	U	0.1	U	0.1	U	0.11	U	0.11	U	0.11	U	0.1	U	0.11	U	0.1	U	0.1	U
127	0.14	U	0.1	U	0.1	U	0.12	U	0.11	U	0.11	U	0.12	U	0.1	U	0.1	U	0.11	U	0.11	U	0.11	U	0.1	U	0.11	U	0.1	U	0.1	U
128	**1.0**		**0.61**		**0.91**		**0.45**		0.11	U	0.11	U	**1.1**		0.1	U	0.1	U	0.11	U	**0.84**		**0.84**		0.1	U	0.11	U	**0.52**		0.1	U
129	**0.35**		**0.31**		**0.7**		**0.57**		0.11	U	0.11	U	**2.3**		0.1	U	0.1	U	0.11	U	**1.6**		**1.7**		0.1	U	0.11	U	**0.67**		0.1	U
130	0.14	U	**0.11**		**0.43**		0.12	U	0.11	U	0.11	U	**0.16**		0.1	U	0.1	U	0.11	U	0.11	U	0.11	U	0.1	U	0.11	U	0.1	U	0.1	U
131	0.14	U	0.1	U	0.1	U	0.12	U	0.11	U	0.11	U	**0.71**		0.1	U	0.1	U	0.11	U	**0.8**		**0.82**		0.1	U	0.11	U	**0.38**		0.1	U

	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM
73	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	**240**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**320**		**230**		**250**	
81	**3.2**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**7.8**		**5.2**		**4.9**	
82	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86																												
87																												
88	6.51		6.62		6.57		6.65		6.59		6.67		6.60		7.00		6.65		6.65		6.75		6.73		6.52		6.53	
89	14.9		14.9		15.9		16.2		16.5		16.3		16.1		15.5		16.3		16.3		15.5		17.5		13.8		13.8	
90	526		467		317		318		288		352		326		406		337		337		644		415		392		392	
91	0.58		3.07		1.26		2.14		1.18		2.63		1.76		1.24		2.26		2.3		3.62		2.65		2.37		2.15	
92																												
93																												
94																												
95	NA		NA		NA		NA		NA		NA		NA		NA		3.8	U	NA		NA		3.0	U	NA		NA	
96	NA		NA		NA		NA		NA		NA		NA		NA		3.8	U	NA		NA		3.0	U	NA		NA	
97	NA		NA		NA		NA		NA		NA		NA		NA		3.5	U	NA		NA		4.1	U	NA		NA	
98	NA		NA		NA		NA		NA		NA		NA		NA		3.5	U	NA		NA		2.4	U	NA		NA	
99	NA		NA		NA		NA		NA		NA		NA		NA		2.8	U	NA		NA		2.9	U	NA		NA	
100	NA		NA		NA		NA		NA		NA		NA		NA		2.6	U	NA		NA		2.7	U	NA		NA	
101	NA		NA		NA		NA		NA		NA		NA		NA		2.6	U	NA		NA		2.7	U	NA		NA	
102	NA		NA		NA		NA		NA		NA		NA		NA		3.2	U	NA		NA		2.9	U	NA		NA	
103	NA		NA		NA		NA		NA		NA		NA		NA		3.2	U	NA		NA		**6.5**		NA		NA	
104	NA		NA		NA		NA		NA		NA		NA		NA		2.3	U	NA		NA		2.2	U	NA		NA	
105	NA		NA		NA		NA		NA		NA		NA		NA		2.1	U	NA		NA		1.9	U	NA		NA	
106	NA		NA		NA		NA		NA		NA		NA		NA		2.3	U	NA		NA		2.1	U	NA		NA	
107	NA		NA		NA		NA		NA		NA		NA		NA		2.5	U	NA		NA		2.3	U	NA		NA	
108	NA		NA		NA		NA		NA		NA		NA		NA		**9.2**		NA		NA		**20.2**		NA		NA	
109	NA		NA		NA		NA		NA		NA		NA		NA		2.9	U	NA		NA		2.8	U	NA		NA	
110	NA		NA		NA		NA		NA		NA		NA		NA		2.2	U	NA		NA		3.0	U	NA		NA	
111	NA		NA		NA		NA		NA		NA		NA		NA		2.5	U	NA		NA		2.4	U	NA		NA	
112	NA		NA		NA		NA		NA		NA		NA		NA		2.2	U	NA		NA		**19.9**		NA		NA	
113	NA		NA		NA		NA		NA		NA		NA		NA		**7.5**	J	NA		NA		**18.1**	J	NA		NA	
114	NA		NA		NA		NA		NA		NA		NA		NA		3.8	U	NA		NA		4.3	U	NA		NA	
115	NA		NA		NA		NA		NA		NA		NA		NA		**34**		NA		NA		**86**		NA		NA	
116	NA		NA		NA		NA		NA		NA		NA		NA		**36**		NA		NA		**125**		NA		NA	
117	NA		NA		NA		NA		NA		NA		NA		NA		**57**		NA		NA		**211**		NA		NA	
118	NA		NA		NA		NA		NA		NA		NA		NA		**35**	J	NA		NA		**119**		NA		NA	
119	NA		NA		NA		NA		NA		NA		NA		NA		**230**		NA		NA		**1226**		NA		NA	
120																												
121	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																												
123																												
124																												
125	0.14	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	0.14	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	0.14	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	0.14	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	0.14	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	0.14	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	0.14	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

			B1		B1		B1		B1		B1		B1		B1		B1		B1		B1		B1		B1		B1	
			S177D		T176N		U235H		V224R		W371K		Y336A		Z225M		Z960E		AH49B		AU36A		BC30D		9912050-01A	
			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/21/99		12/8/99		12/8/1999 (d)	
1		**CHLORINATED PHENOLS (µg/L)**																										
2		**EPA Method SW8040**																										
3		Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA	
4		2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA	
5		2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA	
6		2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA	
7		2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA	
8		2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA	
9		2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA	
10																										
11		**SEMIVOLATILES (µg/L)**																								
12		**EPA Method SW8270**																								
13		Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	**3.1**	M	2.0	U	2.0	U	NA	
14		4-Methylphenol	**43**		1.0	U	1.0	U	**24**		**39**		**28**		**31**		**35**		**7.1**		1.0	U	**7.0**		NA	
15		Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA	
16		2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	NA	
17		Benzoic Acid	10	U	10	U	10	U	**10**		10	U	10	U	10	U	10	U	**27**		10	U	10	U	NA	
18		Naphthalene	**16**		**12**		**18**		**16**		**20**	J2	**6.8**		**4.4**		**35**		**26**		1.0	U	**12**		NA	
19		2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	**1.5**	J2	**1.1**		1.0	U	**6.4**		**3.8**		1.0	U	**2.1**		NA	
20		2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	NA	
21		2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	NA	
22		Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA	
23		Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA	
24		Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA	
25		Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	NA	
26		bis(2-Ethylhexyl)phthalate	2.9	U	**2.8**	J2	1.0	U	1.0	U	1.0	U	**2.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA	
27																										
28		**VOLATILES (µg/L)**																								
29		**EPA Method SW8260**																								
30		Acetone	**24**		5.0	U	**6.5**		5.0	U	**75**		5.0	U	5.0	U	36	U	230	U	25	U	25	U	NA	
31		Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	45	U	5.0	U	5.0	U	NA	
32		2-Butanone	5.0	U	5.0	U	5.0	U	**11**		**20**		5.0	U	**51**		**11**		230	U	25	U	25	U	NA	
33		Benzene	1.0	U	1.0	U	1.0	U	**250**		**440**		**190**		**160**		**2400**		**210**		**66**		**190**		NA	
34		Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	45	U	5.0	U	5.0	U	NA	
35		Toluene	**6.4**		1.0	U	1.0	U	**4.4**		**1400**		**450**		**190**		**4000**		**3700**		**920**		**290**		NA	
36		Ethylbenzene	**5.4**		**5.5**		**1.1**		**1.2**		**11**		**19**		**11**		**140**		**220**		**160**		**32**		NA	
37		Styrene	1.0	U	1.0	U	1.0	U	1.0	U	**4.2**		**7.0**		**3.8**		**93**		**130**		5.0	U	**5.0**	U	NA	
38		m,p-Xylene	**1.2**		**2.5**		**1.1**		**1.7**		**22**		**50**		**33**		**450**		**730**		**390**		**100**		NA	
39		o-Xylene	**1.1**		**1.2**		1.0	U	1.0	U	**7.4**		**22**		**14**		**210**		**360**		**200**		**44**		NA	
40		1,3,5-Trimethylbenzene	**2.5**		**3.6**		**12**		**6.4**		**13**		**4.8**		**3.8**		**25**		45	U	**8.8**		**5.2**		NA	
41		1,2,4-Trimethylbenzene	**4.6**		**8.8**		**47**	J2	**36**		**110**		**30**		**19**		**140**		**88**		**44**		**24**		NA	
42		Isopropylbenzene	**7.7**		**9.5**		**34**	J2	**23**		**34**		**11**		**7.4**		**28**		45	U	**9.1**		**6.2**		NA	
43		n-Propylbenzene	**3.1**		**4.9**		**21**		**17**		**29**		**13**		**8.8**		**36**		45	U	**9.7**		**8.2**		NA	
44		tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	45	U	5.0	U	5.0	U	NA	
45		sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	45	U	5.0	U	5.0	U	NA	
46		4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	45	U	5.0	U	5.0	U	NA	
47		n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.2**		1.0	U	**1.0**		45	U	5.0	U	5.0	U	NA	
48		Naphthalene	**25**		**20**	J2	**52**	J2	**23**		**31**		**12**		**11**		**56**		230	U	25	U	25	U	NA	
48.5		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
49																										
50		**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
51		**Method OR-DEQ**																								
52		**TPH-Diesel**	**0.68**		**0.75**		**1.1**		**1.2**		**1.2**		**0.51**		**1.0**		**9.5**		**2.0**		**0.37**		**0.46**		NA	
53		**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
54		**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
55																										
56		**PRIORITY POLLUTANT**																								
57		**METALS (mg/L)**																								
58		Arsenic (7060)	**0.006**		**0.008**		0.05	U	0.05	U	**0.010**		**0.008**		**0.008**		**0.004**		**0.006**		**0.008**		**0.006**		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
2																Dup of B1										Dup of B1	
3		B1		B1		B1		B1		B1		B1		B1		X		B1		B1		B1		B1		X	
4		BH96T		BR55M		CB68E		CL03B		CT67H		DE68L		DM30L		DM30K		DW37B		ED23A		EM75J		ES04G		ES04A	
5		2/16/00		5/23/00		8/29/00		11/10/00		2/15/01		6/5/01		8/14/01		8/14/01		11/28/01		2/26/02		6/25/02		08/28/02		08/28/02	
7	**CHLORINATED PHENOLS (µg/L)**																										
8	**EPA Method SW8040**																										
9	Pentachlorophenol	**0.14**	J1	**0.27**	J2	**0.43**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.65**		**1.0**		0.25	U	0.29	U	0.29	U
10	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																											
17	**SEMIVOLATILES (µg/L)**																										
18	**EPA Method SW8270**																										
19	Phenol	**4.6**		2.0	U	3.0	U	2.0	U	**2.6**		100	UJ	2.0	U	2.0	U	**6.2**		**15**		2.0	U	2.3	U	2.3	U
20	4-Methylphenol	**57**		**20**		**47**		**5.6**		**8.4**		**130**	J	**50**		**54**		**44**		**170**		**46**		1.2	U	**1.3**	
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	50	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.2	U
22	2,4-Dimethylphenol	**7.7**		3.0	U	3.0	U	3.0	U	3.0	U	150	UJ	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	**4.1**		**4.5**	
23	Benzoic Acid	10	U	**160**		**73**		10	U	10	U	500	UJ	10	U	10	U	50	U	50	U	50	U	58	U	58	U
24	Naphthalene	**51**		**34**		**27**		**2.0**		**5.1**		50	UJ	**13**		**14**		1.0	U	**17**		**15**		**2.8**		**3.3**	
25	2-Methylnaphthalene	**19**		**12**		**9.6**		1.0	U	1.0	U	50	UJ	**6.8**		**7.4**		1.0	U	**10**		**5.9**		1.2	U	**1.8**	
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	250	UJ	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.8	U	5.8	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	250	UJ	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.8	U	5.8	U
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	50	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.2	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	50	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.2	U
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	50	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.2	U
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	250	UJ	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.8	U	5.8	U
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	50	UJ	1.0	U	1.0	U	1.0	U	4.0	U	4.0	U	4.7	U	4.7	U
33																											
34	**VOLATILES (µg/L)**																										
35	**EPA Method SW8260**																										
36	Acetone	5.0	U	5.0	U	**410**		5.0	U	**1200**		**1100**		**230**		**280**		37	U	**250**		**18**		25	U	25	U
37	Carbon Disulfide	1.0	U	1.0	U	25	U	1.0	U	30	U	20	U	20	U	20	U	1.0	U	1.0	U	3.0	U	5	U	5	U
38	2-Butanone	55	U	**6.1**		120	U	**28**		**260**		100	U	100	U	**160**		**13**		**54**		15	U	25	U	25	U
39	Benzene	**4700**		**990**		**1100**		**160**		**610**		**560**		**180**	J	**230**	J	**120**		**1000**		**240**		**160**		**130**	
40	Bromoform	1.0	U	1.0	U	25	U	1.0	U	30	U	20	U	20	U	20	U	1.0	U	1.0	U	3.0	U	5	U	5	U
41	Toluene	**4700**		**1800**		**3600**		**1200**		**2000**		**3400**		**1400**	J	**1900**	J	**800**		**2800**		**520**		**210**		**210**	
42	Ethylbenzene	**160**		**110**		**300**		**100**		**160**		**220**		**130**		**150**		**86**		**170**		**97**		**88**		**74**	
43	Styrene	**29**		**8.3**	M	25	U	1.0	U	30	U	20	U	20	U	20	U	1.0	U	**4.3**		3.0	U	5	U	5	U
44	m,p-Xylene	**1000**		**340**		**990**		**320**		**590**		**830**		**450**		**530**		**350**		**290**		**270**		**230**		**210**	
45	o-Xylene	**490**		**180**		**420**		**160**		**240**		**370**		**210**		**250**		**180**		**210**		**150**		**120**		**100**	
46	1,3,5-Trimethylbenzene	**46**		**18**		**37**		**15**		**31**		**37**		**33**		**37**		**29**		**37**		**22**		**18**		**19**	
47	1,2,4-Trimethylbenzene	**150**		**72**		**160**		**61**		**100**		**160**		**110**		**130**		**100**		**94**		**73**		**54**		**56**	
48	Isopropylbenzene	**28**		**10**		25	U	**9.0**		30	U	20	U	20	U	20	U	**11**		**12**		**11**		**7**		**8.5**	
49	n-Propylbenzene	**40**		**17**		**31**		**15**		30	U	**33**		**22**		**24**		**19**		**15**		**16**		**12**		**13**	
50	tert-Butylbenzene	1.0	U	1.0	U	25	U	1.0	U	30	U	20	U	20	U	20	U	1.0	U	1.0	U	3.0	U	5	U	5	U
51	sec-Butylbenzene	**2.8**		**1.4**		25	U	1.0	U	30	U	20	U	20	U	20	U	1.0	U	1.0	U	3.0	U	5	U	5	U
52	4-Isopropyltoluene	**2.7**		**1.1**		25	U	1.0	U	30	U	20	U	20	U	20	U	1.0	U	**1.0**		3.0	U	5	U	5	U
53	n-Butylbenzene	**4.5**		2.0	U	25	U	1.8	U	30	U	20	U	20	U	20	U	3.2	U	**4.0**	M	3.0	U	5	U	5	U
54	Naphthalene	**82**		**36**		120	U	**25**		150	U	100	U	100	U	100	U	**39**		**37**		**24**		25	U	25	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																											
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	**Method OR-DEQ**																										
59	**TPH-Diesel**	**4.8**		**0.44**		**1.4**		**0.37**		**2.1**		**47**		**8.7**	J	**6.9**	J	**0.94**		**12**		**1.3**		**0.64**		**0.9**	
60	**TPH-D Motor Oil**	NA		0.50	U	0.50	U	0.50	U	0.50	U	5.0	U	5.0	U	5.0	U	0.5	U	0.50	U	0.50	U	0.5	U	0.5	U
61	**TPH-Gasoline**	NA		**17**		**36**		**8.8**		**15**		**25**		**19**		**19**		**6.8**		**16**		**7.6**		**4.8**	J	**3.4**	J
62																											
63	**PRIORITY POLLUTANT**																										
64	**METALS (mg/L)**																										
65	Arsenic (7060)	**0.006**		**0.004**		**0.007**		**0.007**		**0.007**		**0.010**		**0.009**		**0.009**		**0.007**		**0.006**		**0.006**		**0.004**	J	**0.006**	J

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ
1											
2											
3		B1		B1		B1		B1		B1	
4		EY88C		FF88O		FL41H		FU50E		FY64D	
5		11/11/02		2/13/03		5/7/03		8/29/03		10/20/03	
6											
7	**CHLORINATED PHENOLS (µg/L)**										
8	**EPA Method SW8040**										
9	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.5	U	0.52	U
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA	
16											
17	**SEMIVOLATILES (µg/L)**										
18	**EPA Method SW8270**										
19	Phenol	2.2	U	2	U	**3.1**	M	2	U	2.1	U
20	4-Methylphenol	1.1	U	**36**		**28**		1	U	1	U
21	Isophorone	1.1	U	1	U	1	U	1	U	1	U
22	2,4-Dimethylphenol	3.3	U	6.7	U	3	U	3	U	**4.4**	
23	Benzoic Acid	54	U	51	U	50	U	50	U	10	U
24	Naphthalene	1.1	U	1	U	**1.8**		**2.7**		**3.5**	
25	2-Methylnaphthalene	1.1	U	1	U	1	U	**1.4**		**3**	
26	2,4,6-Trichlorophenol	5.4	U	5.1	U	5	U	5	U	5.2	U
27	2,4,5-Trichlorophenol	5.4	U	5.1	U	5	U	5	U	5.2	U
28	Acenaphthene	1.1	U	1	U	1	U	1	U	1	U
29	Dibenzofuran	1.1	U	1	U	1	U	1	U	1	U
30	Fluorene	1.1	U	1	U	1	U	1	U	1	U
31	Pentachlorophenol	5.4	U	5.1	U	5	U	5	U	5.2	U
32	bis(2-Ethylhexyl)phthalate	4.3	U	1	U	1	U	1	U	**6.3**	
33											
34	**VOLATILES (µg/L)**										
35	**EPA Method SW8260**										
36	Acetone	5	U	**78**		**61**	M	**28**		5	U
37	Carbon Disulfide	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	5	U	**8.2**	M	**8.1**	M	5	U	5	U
39	Benzene	**19**		**65**		**82**		**20**		**5.6**	
40	Bromoform	1	U	1	U	1	U	1	U	1	U
41	Toluene	**61**		**100**		**100**		**22**		**2.1**	
42	Ethylbenzene	**22**		**51**		**130**	J	**80**		**31**	
43	Styrene	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	**71**		**130**		**110**	J	**99**		**40**	
45	o-Xylene	**26**		**75**		**86**	J	**35**		**9.2**	
46	1,3,5-Trimethylbenzene	**9.3**		**18**		**11**	J	**9.3**		**3.6**	
47	1,2,4-Trimethylbenzene	**30**		**57**		**30**	J	**28**		**12**	
48	Isopropylbenzene	**21**		**9.7**		**6.3**	J	**5.2**		**3.3**	
49	n-Propylbenzene	**26**		**15**		**7.6**	J	**7.3**		**4.5**	
50	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	**2.2**		1	U	**1**	J	**1**		1	U
52	4-Isopropyltoluene	1	U	**1.1**		1	U	1	U	1	U
53	n-Butylbenzene	**2.2**		2.8	U	**1.8**	J	**1.6**	M	1	U
54	Naphthalene	**9.1**		**13**		**5.8**		**7.3**		5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA	
56											
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**										
58	**Method OR-DEQ**										
59	**TPH-Diesel**	**0.84**		**6.8**		**2.4**		**1.6**		**2.7**	
60	**TPH-D Motor Oil**	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
61	**TPH-Gasoline**	**2.4**		**4.6**		**4.8**		**3.0**		**1.2**	
62											
63	**PRIORITY POLLUTANT**										
64	**METALS (mg/L)**										
65	Arsenic (7060)	0.05	U	**0.012**		**0.007**		**0.007**		**0.007**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			B1		B1		B1		B1		B1		B1		B1		B1		B1		B1		B1		B1	
4			S177D		T176N		U235H		V224R		W371K		Y336A		Z225M		Z960E		AH49B		AU36A		BC30D		9912050-01A	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/21/99		12/8/99		12/8/1999 (d)	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	NA	
67	60	Copper (6010)	**0.009**		**0.009**		**0.004**		**0.006**		**0.002**		0.002	U	0.002	U	**0.078**		**0.043**		**0.008**		0.002	U	NA	
68	61	Lead (7421)	0.001	U	**0.001**		0.02	U	0.02	U	**0.003**		0.001	U	0.001	U	**0.002**		**0.002**		0.001	U	0.001	U	NA	
69	62	Nickel (6010)	**0.02**		**0.01**		0.01	U	**0.02**		**0.02**		**0.02**		0.01	U	**0.04**		**0.03**		**0.03**		**0.01**		NA	
70	63	Zinc (6010)	0.004	U	**0.009**		**0.027**		**0.004**		**0.006**	J2	**0.011**		**0.005**		**0.017**	J	**0.006**		**0.009**		0.006	U	NA	
71	64																									
72	65	**MAJOR IONS AND CONVENTIONALS**																								
73	66	Calcium (mg/L) (6010)	**42.2**		**25.7**		**16.3**		**26.7**		NA		NA		NA		**16.5**		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**16.3**		**9.41**		**6.93**		**9.05**		NA		NA		NA		**3.94**		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**4.2**		**3.3**		**3.2**		**3.4**		NA		NA		NA		**2.7**		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**8.65**		**7.49**		**7.88**		**7.63**		NA		NA		NA		**6.29**		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**190**		**140**	J2	**130**		**170**		NA		NA		NA		**43**		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**190**		**140**	J2	**130**		**170**		NA		NA		NA		**43**		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**200**	J2	**190**		**290**		**360**		**430**		**260**		**170**		**210**		**160**		**150**		NA	
81	74	Chloride (mg/L) (EPA 325.2)	**5.1**		**5.9**		**5.6**		**4.3**		**3.5**		**3.4**		**2.4**		**2.0**		**7.9**		**3.8**		**6.6**		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	**0.014**		0.010	U	**0.023**		**0.036**	J2	NA		NA		NA		0.010	U	NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	0.017	J	**0.053**	J2	**0.033**		0.010	UJ	NA		NA		NA		**0.015**		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	0.031		**0.032**	J2	**0.056**		**0.036**	J2	NA		NA		NA		**0.013**		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	2.5	U	2.5	U	**5.3**		2.5	U	NA		NA		NA		**2.8**		NA		NA		NA		NA	
86	79																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																Dup of B1										Dup of B1	
3		B1		B1		B1		B1		B1		B1		B1		X		B1		B1		B1		B1		X	
4		BH96T		BR55M		CB68E		CL03B		CT67H		DE68L		DM30L		DM30K		DW37B		ED23A		EM75J		ES04G		ES04A	
5		2/16/00		5/23/00		8/29/00		11/10/00		2/15/01		6/5/01		8/14/01		8/14/01		11/28/01		2/26/02		6/25/02		08/28/02		08/28/02	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	**0.004**		**0.004**		0.002	U	**0.081**		0.002	U	0.002	U	0.002	U	0.002	U	**0.016**	J	**0.062**		**0.016**		**0.004**		0.002	U
68	Lead (7421)	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	**0.002**		0.001	U	0.001	U	**0.008**		**0.004**		**0.003**		0.001	U	0.001	U
69	Nickel (6010)	**0.06**		**0.03**		**0.01**		0.01	U	0.01	U	**0.12**		0.01	U	0.01	U	0.01	U	0.08		**0.07**		0.01	U	0.01	U
70	Zinc (6010)	**0.020**		0.006	U	0.006	U	0.006	U	**0.006**		**0.054**		0.006	U	0.006	U	**0.015**	J	**0.033**		**0.016**		**0.007**		0.006	U
71																											
72	**MAJOR IONS AND CONVENTIONALS**																										
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		**23.9**		**88.1**		**15.2**		**16.4**		**19.2**	J	**35.7**		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		**9.46**		**40.8**		**6.11**		**6.64**		**7.26**	J	**15.7**		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		**2.6**		**5.1**		**2.1**		**2.5**		**2.4**		**4.6**		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		**8.18**		**13.3**		**6.43**		**6.89**		**7.22**		**12.3**		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		**160**		NA		NA		NA		NA		**140**		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		1.0	U	NA		NA		NA		NA		1.0	U	NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		**160**		NA		NA		NA		NA		**140**		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**250**		**220**		**170**		**140**		**250**		**1400**		**140**		**130**		**150**		**430**		**330**		**140**		**140**	
81	Chloride (mg/L) (EPA 325.2)	**3.8**		**7.2**		**1.7**		**2.5**		**3.4**	J	**2.8**		**8.0**	J	**6.0**	J	**2.2**		**3.2**		**6.2**		**5.1**		**4**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		0.010	U	NA		NA		NA		NA		0.010	U	NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		**0.012**	J	NA		NA		NA		NA		**0.021**		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		**0.015**		NA		NA		NA		NA		**0.020**	J	NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		**2.8**		NA		NA		NA		NA		2.5	U	NA		NA		NA	
86																											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ
1											
2											
3		B1		B1		B1		B1		B1	
4		EY88C		FF88O		FL41H		FU50E		FY64D	
5		11/11/02		2/13/03		5/7/03		8/29/03		10/20/03	
66	Chromium (6010)	**0.03**		**0.017**		**0.008**		0.005	U	**0.006**	
67	Copper (6010)	**0.073**		**0.107**		**0.041**		**0.004**		**0.015**	
68	Lead (7421)	**0.03**		**0.028**		**0.009**		0.001	U	**0.005**	
69	Nickel (6010)	**0.05**		**0.04**		**0.03**		0.01	U	**0.01**	
70	Zinc (6010)	**0.119**		**0.085**		**0.037**	J	**0.007**		**0.018**	
71											
72	**MAJOR IONS AND CONVENTIONALS**										
73	Calcium (mg/L) (6010)	NA		**17.3**		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		**8.66**		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		**3.6**		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		**7.8**		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		**70**		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		1	U	NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		**70**		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**150**		**170**		**140**		**210**		**210**	
81	Chloride (mg/L) (EPA 325.2)	**3**		**6.4**		**2.9**		**2.4**		**3**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		**0.029**		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		**0.03**		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		**0.059**		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		**5.7**		NA		NA		NA	
86											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			B1		B1		B1		B1		B1		B1		B1		B1		B1		B1		B1		B1	
4			S177D		T176N		U235H		V224R		W371K		Y336A		Z225M		Z960E		AH49B		AU36A		BC30D		9912050-01A	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/21/99		12/8/99		12/8/1999 (d)	
87	80	**FIELD PARAMETERS**																								
88	81	pH (avg)	6.59		6.61		6.64		6.41		5.64		5.28		5.37		5.11		5.36		6.18		5.93		NM	
89	82	Temperature (° C) (avg)	13.5		15.3		15.7		14.5		12.6		15.5		14.2		12.8		13.4		15.4		13.0		NM	
90	83	Conductivity (um/hos)	466		359		286		457		392		605		379		363		254		263		306		NM	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		1.29		1.83		1.75		2.18		2.20		2.61		1.81		NM	
92	85																									
93	86	**DIOXINS AND FURANS (ng/L)**																								
94	87	**Method 8290**																								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120	113																									
121	114	**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**4200**	J2	**6300**	J2
122	115																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																Dup of B1										Dup of B1	
3		B1		B1		B1		B1		B1		B1		B1		X		B1		B1		B1		B1		X	
4		BH96T		BR55M		CB68E		CL03B		CT67H		DE68L		DM30L		DM30K		DW37B		ED23A		EM75J		ES04G		ES04A	
5		2/16/00		5/23/00		8/29/00		11/10/00		2/15/01		6/5/01		8/14/01		8/14/01		11/28/01		2/26/02		6/25/02		08/28/02		08/28/02	
87	**FIELD PARAMETERS**																										
88	pH (avg)	4.81		6.02		6.13		4.89		5.53		4.70		6.43		6.49		6.14		4.97		6.50		6.50		6.50	
89	Temperature (° C) (avg)	12.3		14.9		17.7		13.4		13.1		14.0		15.1		15.2		13.0		13.1		16.4		16.7		16.8	
90	Conductivity (um/hos)	335		297		243		222		297		1883		259		248		270		501		718		432		413	
91	Dissolved oxygen (mg/L) (avg)	2.15		1.55		1.51		0.84		1.08		1.42		1.59		1.61		3.58		5.92		4.21		0.79		0.60	
92																											
93	**DIOXINS AND FURANS (ng/L)**																										
94	**Method 8290**																										
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																											
121	**ETHANOL (mg/L)**	**5100**		**16**		5.0	U	5.0	U	**5.0**		NA		NA		NA		NA		NA		NA		NA		NA	
122																											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ
1											
2											
3		B1		B1		B1		B1		B1	
4		EY88C		FF88O		FL41H		FU50E		FY64D	
5		11/11/02		2/13/03		5/7/03		8/29/03		10/20/03	
87	**FIELD PARAMETERS**										
88	pH (avg)	6.8		6.34		6.23		6.52		6.51	
89	Temperature (° C) (avg)	15.8		14.2		14.4		16		15.9	
90	Conductivity (um/hos)	268		274		170		285		285	
91	Dissolved oxygen (mg/L) (avg)	1.64		0		2.54		1.73		1.48	
92											
93	**DIOXINS AND FURANS (ng/L)**										
94	**Method 8290**										
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA	
120											
121	**ETHANOL (mg/L)**	NA		NA		NA		NA		NA	
122											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			B1		B1		B1		B1		B1		B1		B1		B1		B1		B1		B1		B1	
4			S177D		T176N		U235H		V224R		W371K		Y336A		Z225M		Z960E		AH49B		AU36A		BC30D		9912050-01A	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/21/99		12/8/99		12/8/1999 (d)	
123	116	**PAHs (µg/L)**																								
124	117	**EPA Method SW8270 SIM**																								
125	118	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	119	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	120	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	121	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	122	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	123	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	124	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																Dup of B1										Dup of B1	
3		B1		B1		B1		B1		B1		B1		B1		X		B1		B1		B1		B1		X	
4		BH96T		BR55M		CB68E		CL03B		CT67H		DE68L		DM30L		DM30K		DW37B		ED23A		EM75J		ES04G		ES04A	
5		2/16/00		5/23/00		8/29/00		11/10/00		2/15/01		6/5/01		8/14/01		8/14/01		11/28/01		2/26/02		6/25/02		08/28/02		08/28/02	
123	**PAHs (µg/L)**																										
124	**EPA Method SW8270 SIM**																										
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ
1											
2											
3		B1		B1		B1		B1		B1	
4		EY88C		FF88O		FL41H		FU50E		FY64D	
5		11/11/02		2/13/03		5/7/03		8/29/03		10/20/03	
123	**PAHs (µg/L)**										
124	**EPA Method SW8270 SIM**										
125	Naphthalene	NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

			D		D		D		D		D		D		D		D		D		D		D		D
			S177L		T176B		U235F		V208H		W391B		Y336D		Z225I		Z960I		AH76J		AU22D		BC27N		9912050-02A
			4/2/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/18/99		5/19/99		9/20/99		12/8/99		12/8/1999 (d)
1																									
2																									
3																									
4																									
5																									
6																									
7	1	**CHLORINATED PHENOLS (µg/L)**																							
8	2	**EPA Method SW8040**																							
9	3	Pentachlorophenol	0.25	U	0.25	U	**0.25**		0.25	U	**0.45**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA
16	10																								
17	11	**SEMIVOLATILES (µg/L)**																							
18	12	**EPA Method SW8270**																							
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	UJ	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	NA
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA
21	15	Isophorone	**3.4**		**5.5**		**5.2**			R	1.0	U	1.0	U	1.0	U	**2.4**		1.0	U	1.0	U	1.0	U	NA
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	UJ	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	NA
23	17	Benzoic Acid	10	U	10	U	10	U	10	UJ	10	U	10	U	10	U	10	U	10	U	10	U	10	U	NA
24	18	Naphthalene	1.0	U	1.0	U	1.0	U		R	1.0	U	1.0	U	1.0	U	**3.1**		1.0	U	1.0	U	**3.2**		NA
25	19	2-Methylnaphthalene	1.2		1.0	U	1.0	U		R	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	NA
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	NA
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U		R	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U		R	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	NA
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**2.4**		1.0	U	NA
33	27																								
34	28	**VOLATILES (µg/L)**																							
35	29	**EPA Method SW8260**																							
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	NA
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	NA
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**3.7**		NA
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.9**		NA
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**2.6**		NA
47	41	1,2,4-Trimethylbenzene	**2.2**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.2**		1.0	U	1.0	U	**15**		NA
48	42	Isopropylbenzene	**1.6**		**2.7**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.7**		1.0	U	1.0	U	**11**		NA
49	43	n-Propylbenzene	**1.7**		**2.5**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**5.6**		NA
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA
51	45	sec-Butylbenzene	**1.6**		**2.1**		1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.5	U	NA
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA
53	47	n-Butylbenzene	1.0	U	**1.0**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	NA
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56	49																								
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																							
58	51	**Method OR-DEQ**																							
59	52	**TPH-Diesel**	**0.82**		**0.82**		**0.55**		0.25	U	**0.34**		**0.35**		0.25	U	**0.52**		0.25	U	0.25	U	**0.56**		NA
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62	55																								
63	56	**PRIORITY POLLUTANT**																							
64	57	**METALS (mg/L)**																							
65	58	Arsenic (7060)	**0.013**		**0.013**		0.05	U	0.05	U	**0.016**		**0.014**		**0.018**		**0.021**		**0.015**		**0.016**		**0.015**		NA

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
3		D		D		D		D		D		D		D		D		D		D		D		D		D	
4		BH96B		BR55E		CB49D		CK77F		CT37F		DE68G		DM30M		DW37E		ED34G		EM85B		ER93P		EZ03C		FF76G	
5		2/17/00		5/22/00		8/28/00		11/7/00		2/12/01		6/4/01		8/14/01		11/28/01		2/28/02		6/26/02		08/27/02		11/12/02		2/12/03	
7	**CHLORINATED PHENOLS (µg/L)**																										
8	**EPA Method SW8040**																										
9	Pentachlorophenol	0.25	U	0.25	UJ	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.55**		**0.32**		**0.38**		0.33	U	0.25	U	0.26	U
10	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																											
17	**SEMIVOLATILES (µg/L)**																										
18	**EPA Method SW8270**																										
19	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.6	U	2.2	U	2.1	U
20	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.3	U	1.1	U	1	U
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.3	U	1.1	U	1	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.9	U	3.3	U	3.1	U
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	50	U	50	U	50	U	66	U	54	U	52	U
24	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**3**		1.0	U	1.3	U	1.1	U	1	U
25	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.3	U	1.1	U	1	U
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6.6	U	5.4	U	5.2	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6.6	U	5.4	U	5.2	U
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.3	U	1.1	U	1	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.3	U	1.1	U	1	U
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.3	U	1.1	U	1	U
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6.6	U	5.4	U	5.2	U
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**12**		4.0	U	4.0	U	5.3	U	4.3	U	1	U
33																											
34	**VOLATILES (µg/L)**																										
35	**EPA Method SW8260**																										
36	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	7.1	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U
38	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U
39	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U
41	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U
42	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.6**		**1.7**		1.0	U	1	U	1	U	1	U
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U
44	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.6**		1.0	U	1.0	U	1	U	1	U	1	U
45	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**2.0**		**1.9**		1.0	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	**1.0**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**23**		**38**		**1.2**		1	U	1	U	1	U
48	Isopropylbenzene	**2.5**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**6.0**		**7.7**		1.0	U	**3**		1	U	1	U
49	n-Propylbenzene	**1.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**2.7**		**7.7**		1.0	U	**3.6**		1	U	1	U
50	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U
51	sec-Butylbenzene	**2.0**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**5.3**		1.0	U	**2.1**		1	U	1	U
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.8**		1.0	U	1	U	1	U	1	U
53	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.5**		1.0	U	1	U	1	U	1	U
54	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	7.5	U	5.0	U	**8.2**		5.0	U	5	U	5	U	5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																											
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	**Method OR-DEQ**																										
59	**TPH-Diesel**	**0.40**		0.25	U	0.25	U	0.25	U	**0.26**		NA		NA		NA		NA		NA		NA		NA		NA	
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																											
63	**PRIORITY POLLUTANT**																										
64	**METALS (mg/L)**																										
65	Arsenic (7060)	**0.019**		**0.019**		**0.016**		**0.014**		**0.016**		**0.016**		**0.018**		**0.021**		**0.014**		**0.013**		**0.017**		0.05	U	**0.016**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF
1							
2							
3		D		D		D	
4		FL58K		FU45C		FY82H	
5		5/8/03		8/28/03		10/23/03	
6							
7	**CHLORINATED PHENOLS (µg/L)**						
8	**EPA Method SW8040**						
9	Pentachlorophenol	0.25	U	**0.86**	J	**0.61**	
10	2,4,6-Trichlorophenol	NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA	
16							
17	**SEMIVOLATILES (µg/L)**						
18	**EPA Method SW8270**						
19	Phenol	2	U	2	U	2	U
20	4-Methylphenol	1	U	1	U	1	U
21	Isophorone	1	U	1	U	1	U
22	2,4-Dimethylphenol	3	U	3	U	3	U
23	Benzoic Acid	50	U	50	U	10	U
24	Naphthalene	1	U	1	U	1	U
25	2-Methylnaphthalene	1	U	1	U	1	U
26	2,4,6-Trichlorophenol	5	U	5	U	5.1	U
27	2,4,5-Trichlorophenol	5	U	5	U	5.1	U
28	Acenaphthene	1	U	1	U	1	U
29	Dibenzofuran	1	U	1	U	1	U
30	Fluorene	1	U	1	U	1	U
31	Pentachlorophenol	5	U	5	U	5.1	U
32	bis(2-Ethylhexyl)phthalate	**150**		1	U	1	U
33							
34	**VOLATILES (µg/L)**						
35	**EPA Method SW8260**						
36	Acetone	5	U	5	U	5	U
37	Carbon Disulfide	1	U	1	U	1	U
38	2-Butanone	5	U	5	U	5	U
39	Benzene	1	U	1	U	1	U
40	Bromoform	1	U	1	U	1	U
41	Toluene	1	U	1	U	1	U
42	Ethylbenzene	1	U	1	U	1	U
43	Styrene	1	U	1	U	1	U
44	m,p-Xylene	1	U	1	U	1	U
45	o-Xylene	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	1	U	1	U	1	U
48	Isopropylbenzene	1	U	**3.4**		**1.1**	
49	n-Propylbenzene	1	U	**2.6**		1	U
50	tert-Butylbenzene	1	U	1	U	1	U
51	sec-Butylbenzene	1	U	**1.2**		1	U
52	4-Isopropyltoluene	1	U	1	U	1	U
53	n-Butylbenzene	1	U	1	U	1	U
54	Naphthalene	5	U	5	U	5	U
55	Methyl tert-butyl ether	NA		NA		NA	
56							
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**						
58	**Method OR-DEQ**						
59	**TPH-Diesel**	NA		NA		NA	
60	**TPH-D Motor Oil**	NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA	
62							
63	**PRIORITY POLLUTANT**						
64	**METALS (mg/L)**						
65	Arsenic (7060)	**0.022**		**0.017**		**0.018**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			D		D		D		D		D		D		D		D		D		D		D		D	
4			S177L		T176B		U235F		V208H		W391B		Y336D		Z225I		Z960I		AH76J		AU22D		BC27N		9912050-02A	
5			4/2/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/18/99		5/19/99		9/20/99		12/8/99		12/8/1999 (d)	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	NA	
67	60	Copper (6010)	**0.003**		0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.004**		0.002	U	0.002	U	0.002	U	NA	
68	61	Lead (7421)	0.001	U	0.001	U	0.02	U	0.02	U	0.001	U	0.001	U	0.001	U	**0.004**		0.001	U	0.001	U	0.001	U	NA	
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	NA	
70	63	Zinc (6010)	0.004	U	0.004	U	0.004	U	0.004	U	**0.007**	J2	0.004	U	0.004	U	**0.020**	J	0.004	U	0.004	U	0.008	U	NA	
71	64																									
72	65	**MAJOR IONS AND CONVENTIONALS**																								
73	66	Calcium (mg/L) (6010)	**45.0**		**42.8**		**52.4**		**58.0**		NA		NA		NA		**49.1**		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**16.2**		**15.4**		**18.8**		**20.9**		NA		NA		NA		**16.9**		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**2.3**		**2.1**		**2.6**		**2.2**		NA		NA		NA		**2.7**		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**8.31**		**7.96**		**9.13**		**9.54**		NA		NA		NA		**9.67**		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**200**		**180**		**220**		**280**		NA		NA		NA		**210**		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**200**		**180**		**220**		**280**		NA		NA		NA		**210**		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**230**	J2	**240**		**300**		**240**		**240**		**230**		**250**		**260**		**280**		**190**		NA	
81	74	Chloride (mg/L) (EPA 325.2)	**11**		**2.0**		**2.4**		**2.4**		**3.2**		**1.4**		**2.1**		**2.8**		**2.0**		**2.8**		**2.8**		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	0.010	U	0.010	U	0.010	U	0.010	U	NA		NA		NA		**0.049**		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	**0.022**	J	0.010	U	0.010	U	**0.011**		NA		NA		NA		**0.015**		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.03**		0.010	U	0.010	U	**0.014**		NA		NA		NA		**0.064**		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	2.5	U	2.5	U	**4.7**		2.5	U	NA		NA		NA		**5.8**		NA		NA		NA		NA	
86	79																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																											
3		D		D		D		D		D		D		D		D		D		D		D		D		D	
4		BH96B		BR55E		CB49D		CK77F		CT37F		DE68G		DM30M		DW37E		ED34G		EM85B		ER93P		EZ03C		FF76G	
5		2/17/00		5/22/00		8/28/00		11/7/00		2/12/01		6/4/01		8/14/01		11/28/01		2/28/02		6/26/02		08/27/02		11/12/02		2/12/03	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.002**		0.002	U	**0.003**		0.002	U	0.002	U
68	Lead (7421)	0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	0.02	U	0.001	U
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	**0.019**		0.006	U	0.006	U	0.006	U	0.006	U
71																											
72	**MAJOR IONS AND CONVENTIONALS**																										
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		**40.6**		**43.4**		**34.3**		**40.1**	J	**32.2**		NA		NA		NA		**75.2**	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		**13.8**		**14.9**		**12.0**		**14.0**	J	**11.3**		NA		NA		NA		**26.1**	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		**1.8**		**2.2**		**1.9**		**2.2**		**2.0**		NA		NA		NA		**3**	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		**7.40**		**7.64**		**6.73**		**7.77**		**7.57**		NA		NA		NA		**10.8**	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		**200**		NA		NA		NA		**140**		NA		NA		NA		**350**	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		1	U
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		**200**		NA		NA		NA		**140**		NA		NA		NA		**350**	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**310**		**290**		**230**		**220**		**240**		**240**		**180**		**220**		**200**		**260**		**320**		**320**		**360**	
81	Chloride (mg/L) (EPA 325.2)	**3.4**		**3.2**		**3.1**		**5.4**		**5.4**		**2.4**		**4.5**		**2.4**		**2.9**		**3.3**		**3**		**3.1**		**4.2**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.020**		NA		NA		NA		**0.19**	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		0.010	U	NA		NA		NA		0.010	U	NA		NA		NA		0.01	U
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		0.010	UJ	NA		NA		NA		**0.020**		NA		NA		NA		**0.19**	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		**6.1**		NA		NA		NA		**12**		NA		NA		NA		**4**	
86																											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF
1							
2							
3		D		D		D	
4		FL58K		FU45C		FY82H	
5		5/8/03		8/28/03		10/23/03	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U
67	Copper (6010)	0.002	U	0.002	U	0.002	U
68	Lead (7421)	**0.002**		0.001	U	0.001	U
69	Nickel (6010)	0.01	U	0.01	U	0.01	U
70	Zinc (6010)	0.006	U	0.006	U	0.006	U
71							
72	**MAJOR IONS AND CONVENTIONALS**						
73	Calcium (mg/L) (6010)	NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**350**		**290**		**260**	
81	Chloride (mg/L) (EPA 325.2)	**3.5**		**1.8**		**2.4**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA	
86							

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			D		D		D		D		D		D		D		D		D		D		D		D	
4			S177L		T176B		U235F		V208H		W391B		Y336D		Z225I		Z960I		AH76J		AU22D		BC27N		9912050-02A	
5			4/2/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/18/99		5/19/99		9/20/99		12/8/99		12/8/1999 (d)	
87	80	**FIELD PARAMETERS**																								
88	81	pH (avg)	6.85		6.68		6.96		6.83		6.44		6.53		6.26		6.74		6.24		6.11		6.53		NM	
89	82	Temperature (° C) (avg)	13.4		14.6		14.7		14.3		14.9		15.1		13.5		12.8		13.1		15.3		13.5		NM	
90	83	Conductivity (um/hos)	391		409		366		487		424		481		415		472		422		414		319		NM	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		2.65		1.70		1.70		1.75		2.08		1.69		2.47		NM	
92	85																									
93	86	**DIOXINS AND FURANS (ng/L)**																								
94	87	**Method 8290**																								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																										
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		10	U
122																										

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																											
3		D		D		D		D		D		D		D		D		D		D		D		D		D	
4		BH96B		BR55E		CB49D		CK77F		CT37F		DE68G		DM30M		DW37E		ED34G		EM85B		ER93P		EZ03C		FF76G	
5		2/17/00		5/22/00		8/28/00		11/7/00		2/12/01		6/4/01		8/14/01		11/28/01		2/28/02		6/26/02		08/27/02		11/12/02		2/12/03	
87	**FIELD PARAMETERS**																										
88	pH (avg)	6.69		6.77		6.47		5.41		6.52		6.65		6.94		6.62		6.58		6.42		6.77		6.63		7.06	
89	Temperature (° C) (avg)	13.7		12.1		15.4		14.3		14.2		14.4		14.5		15.0		11.9		13.8		15.7		14.6		15.6	
90	Conductivity (um/hos)	531		446		357		300		331		344		331		334		260		452		442		532		707	
91	Dissolved oxygen (mg/L) (avg)	5.09		1.99		1.56		2.04		1.29		1.29		1.54		4.01		7.74		4.39		0.69		2.16		0	
92																											
93	**DIOXINS AND FURANS (ng/L)**																										
94	**Method 8290**																										
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																											
121	**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF
1							
2							
3		D		D		D	
4		FL58K		FU45C		FY82H	
5		5/8/03		8/28/03		10/23/03	
87	**FIELD PARAMETERS**						
88	pH (avg)	6.82		6.93		6.71	
89	Temperature (° C) (avg)	14.5		14.9		15.0	
90	Conductivity (um/hos)	495		410		382	
91	Dissolved oxygen (mg/L) (avg)	2.71		1.84		1.66	
92							
93	**DIOXINS AND FURANS (ng/L)**						
94	**Method 8290**						
95	2,3,7,8-TCDF	NA		NA		NA	
96	Total TCDF	NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA	
98	Total TCDD	NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA	
101	Total PeCDF	NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA	
103	Total PeCDD	NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA	
108	Total HxCDF	NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA	
112	Total HxCDD	NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA	
115	Total HpCDF	NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA	
117	Total HpCDD	NA		NA		NA	
118	OCDF	NA		NA		NA	
119	OCDD	NA		NA		NA	
120							
121	**ETHANOL (mg/L)**	NA		NA		NA	
122							

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			D		D		D		D		D		D		D		D		D		D		D		D	
4			S177L		T176B		U235F		V208H		W391B		Y336D		Z225I		Z960I		AH76J		AU22D		BC27N		9912050-02A	
5			4/2/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/18/99		5/19/99		9/20/99		12/8/99		12/8/1999 (d)	
123		**PAHs (µg/L)**																								
124		**EPA Method SW8270 SIM**																								
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																											
3		D		D		D		D		D		D		D		D		D		D		D		D		D	
4		BH96B		BR55E		CB49D		CK77F		CT37F		DE68G		DM30M		DW37E		ED34G		EM85B		ER93P		EZ03C		FF76G	
5		2/17/00		5/22/00		8/28/00		11/7/00		2/12/01		6/4/01		8/14/01		11/28/01		2/28/02		6/26/02		08/27/02		11/12/02		2/12/03	
123	**PAHs (µg/L)**																										
124	**EPA Method SW8270 SIM**																										
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF
1							
2							
3		D		D		D	
4		FL58K		FU45C		FY82H	
5		5/8/03		8/28/03		10/23/03	
123	**PAHs (µg/L)**						
124	**EPA Method SW8270 SIM**						
125	Naphthalene	NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA	
127	Acenaphthylene	NA		NA		NA	
128	Acenaphthene	NA		NA		NA	
129	Fluorene	NA		NA		NA	
130	Anthracene	NA		NA		NA	
131	Dibenzofuran	NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			F	
4			Y314H	
5			8/18/98	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U
11	5	2,3,6-Trichlorophenol	0.25	U
12	6	2,4,5-Trichlorophenol	0.25	U
13	7	2,3,4-Trichlorophenol	0.25	U
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U
15	9	2,3,4,5-Tetrachlorophenol	0.25	U
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2.0	U
20	14	4-Methylphenol	1.0	U
21	15	Isophorone	1.0	U
22	16	2,4-Dimethylphenol	3.0	U
23	17	Benzoic Acid	10	U
24	18	Naphthalene	1.0	U
25	19	2-Methylnaphthalene	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U
28	22	Acenaphthene	1.0	U
29	23	Dibenzofuran	1.0	U
30	24	Fluorene	1.0	U
31	25	Pentachlorophenol	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.0	U
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	5.0	U
37	31	Carbon Disulfide	1.0	U
38	32	2-Butanone	5.0	U
39	33	Benzene	1.0	U
40	34	Bromoform	1.0	U
41	35	Toluene	1.0	U
42	36	Ethylbenzene	1.0	U
43	37	Styrene	1.0	U
44	38	m,p-Xylene	1.0	U
45	39	o-Xylene	1.0	U
46	40	1,3,5-Trimethylbenzene	1.0	U
47	41	1,2,4-Trimethylbenzene	1.0	U
48	42	Isopropylbenzene	1.0	U
49	43	n-Propylbenzene	1.0	U
50	44	tert-Butylbenzene	1.0	U
51	45	sec-Butylbenzene	1.0	UJ
52	46	4-Isopropyltoluene	1.0	U
53	47	n-Butylbenzene	1.0	U
54	48	Naphthalene	5.0	U
55	48.5	Methyl tert-butyl ether	NA	
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	0.25	U
60	53	**TPH-D Motor Oil**	NA	
61	54	**TPH-Gasoline**	NA	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.034**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			F	
4			Y314H	
5			8/18/98	
66	59	Chromium (6010)	**0.042**	
67	60	Copper (6010)	**0.016**	
68	61	Lead (7421)	**0.006**	
69	62	Nickel (6010)	**0.03**	
70	63	Zinc (6010)	**0.047**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**200**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.1**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			F	
4			Y314H	
5			8/18/98	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.37	
89	82	Temperature (° C) (avg)	14.2	
90	83	Conductivity (um/hos)	448	
91	84	Dissolved oxygen (mg/L) (avg)	2.30	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121		**ETHANOL (mg/L)**	NA	
122				

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			F	
4			Y314H	
5			8/18/98	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	NA	
126		2-Methylnaphthalene	NA	
127		Acenaphthylene	NA	
128		Acenaphthene	NA	
129		Fluorene	NA	
130		Anthracene	NA	
131		Dibenzofuran	NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
3			H		H		H		H		H		H		H		H		H		H		H		H		H	
4			S177B		T176D		U235V		V208C		W371F		Y314A		Z225V		Z960X		AH27D		AU22A		BB82E		BH75K		BR55N	
5			4/1/97		7/15/97		10/23/97		1/28/98		5/18/98		8/17/98		11/13/98		2/16/99		5/17/99		9/20/99		12/6/99		2/15/00		5/23/00	
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	0.25	U	**0.16**	J1	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.44**		0.25	U	0.25	U	**0.19**	J1	0.25	U	0.25	UJ
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	**0.013**		**0.019**		0.05	U	0.05	U	**0.013**		**0.013**		**0.015**		**0.023**		**0.023**		**0.020**		**0.012**		**0.020**		**0.019**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH
1							
2							
3		H		H		H	
4		CT37N		ED16K		FF88N	
5		2/12/01		2/25/02		2/13/03	
6							
7	**CHLORINATED PHENOLS (µg/L)**						
8	**EPA Method SW8040**						
9	Pentachlorophenol	0.25	U	0.26	U	0.25	U
10	2,4,6-Trichlorophenol	NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA	
16							
17	**SEMIVOLATILES (µg/L)**						
18	**EPA Method SW8270**						
19	Phenol	NA		NA		NA	
20	4-Methylphenol	NA		NA		NA	
21	Isophorone	NA		NA		NA	
22	2,4-Dimethylphenol	NA		NA		NA	
23	Benzoic Acid	NA		NA		NA	
24	Naphthalene	NA		NA		NA	
25	2-Methylnaphthalene	NA		NA		NA	
26	2,4,6-Trichlorophenol	NA		NA		NA	
27	2,4,5-Trichlorophenol	NA		NA		NA	
28	Acenaphthene	NA		NA		NA	
29	Dibenzofuran	NA		NA		NA	
30	Fluorene	NA		NA		NA	
31	Pentachlorophenol	NA		NA		NA	
32	bis(2-Ethylhexyl)phthalate	NA		NA		NA	
33							
34	**VOLATILES (µg/L)**						
35	**EPA Method SW8260**						
36	Acetone	NA		NA		NA	
37	Carbon Disulfide	NA		NA		NA	
38	2-Butanone	NA		NA		NA	
39	Benzene	NA		NA		NA	
40	Bromoform	NA		NA		NA	
41	Toluene	NA		NA		NA	
42	Ethylbenzene	NA		NA		NA	
43	Styrene	NA		NA		NA	
44	m,p-Xylene	NA		NA		NA	
45	o-Xylene	NA		NA		NA	
46	1,3,5-Trimethylbenzene	NA		NA		NA	
47	1,2,4-Trimethylbenzene	NA		NA		NA	
48	Isopropylbenzene	NA		NA		NA	
49	n-Propylbenzene	NA		NA		NA	
50	tert-Butylbenzene	NA		NA		NA	
51	sec-Butylbenzene	NA		NA		NA	
52	4-Isopropyltoluene	NA		NA		NA	
53	n-Butylbenzene	NA		NA		NA	
54	Naphthalene	NA		NA		NA	
55	Methyl tert-butyl ether	NA		NA		NA	
56							
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**						
58	**Method OR-DEQ**						
59	**TPH-Diesel**	NA		NA		NA	
60	**TPH-D Motor Oil**	NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA	
62							
63	**PRIORITY POLLUTANT**						
64	**METALS (mg/L)**						
65	Arsenic (7060)	**0.015**		**0.021**		**0.017**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			H		H		H		H		H		H		H		H		H		H		H		H		H	
4			S177B		T176D		U235V		V208C		W371F		Y314A		Z225V		Z960X		AH27D		AU22A		BB82E		BH75K		BR55N	
5			4/1/97		7/15/97		10/23/97		1/28/98		5/18/98		8/17/98		11/13/98		2/16/99		5/17/99		9/20/99		12/6/99		2/15/00		5/23/00	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	**0.003**		**0.006**		0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.010**		**0.011**		0.002	U	0.002	U	0.002	U	**0.003**	
68	61	Lead (7421)	0.001	U	**0.001**		0.02	U	0.02	U	0.001	U	0.001	U	0.001	U	0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	0.004	U	**0.014**	J2	**0.010**		**0.005**		**0.004**	J2	**0.006**		0.004	U	**0.012**	J	0.019	U	**0.006**		0.006	U	0.006	U	0.006	U
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	**22.4**		**27.7**		**25.4**		**24.9**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**7.80**		**9.86**		**8.80**		**8.27**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**2.3**		**2.2**		**2.4**		**2.3**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**5.41**		**6.27**		**5.92**		**5.70**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**100**		**110**		**110**		**120**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**100**		**110**		**110**		**120**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**160**	J2	**140**		**150**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	**1.5**		**2.0**		**2.7**		**1.6**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	**0.016**		0.010	U	**0.011**		0.010	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	0.010	U	0.010	U	0.010	U	0.010	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.016**		0.010	U	**0.011**		0.010	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	**4.8**	J	2.5	U	**3.6**		**6.3**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86	79																											

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH
1							
2							
3		H		H		H	
4		CT37N		ED16K		FF88N	
5		2/12/01		2/25/02		2/13/03	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U
67	Copper (6010)	**0.004**		**0.007**		**0.004**	
68	Lead (7421)	0.001	U	**0.001**		0.001	U
69	Nickel (6010)	0.01	U	0.01	U	0.01	U
70	Zinc (6010)	0.006	U	**0.008**		**0.01**	
71							
72	**MAJOR IONS AND CONVENTIONALS**						
73	Calcium (mg/L) (6010)	NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		NA	
81	Chloride (mg/L) (EPA 325.2)	NA		NA		NA	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA	
86							

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

			H		H		H		H		H		H		H		H		H		H		H		H	
			S177B		T176D		U235V		V208C		W371F		Y314A		Z225V		Z960X		AH27D		AU22A		BB82E		BH75K		BR55N	
			4/1/97		7/15/97		10/23/97		1/28/98		5/18/98		8/17/98		11/13/98		2/16/99		5/17/99		9/20/99		12/6/99		2/15/00		5/23/00	
	80	**FIELD PARAMETERS**																										
	81	pH (avg)	6.77		6.85		7.02		6.85		6.37		6.56		6.41		7.07		7.07		7.07		6.26		6.64		6.58	
	82	Temperature (° C) (avg)	13.7		15.1		15.1		14.4		15.0		14.8		14.4		14.3		14.3		14.3		14.5		13.5		14.2	
	83	Conductivity (um/hos)	212		283		225		243		186		251		100		193		193		193		258		223		191	
	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		NA		1.40		1.69		1.60		1.60		1.60		2.34		2.18		2.00	
	85																											
	86	**DIOXINS AND FURANS (ng/L)**																										
	87	**Method 8290**																										
	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
		ETHANOL (mg/L)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH
1							
2							
3		H		H		H	
4		CT37N		ED16K		FF88N	
5		2/12/01		2/25/02		2/13/03	
87	**FIELD PARAMETERS**						
88	pH (avg)	6.54		6.29		7.01	
89	Temperature (° C) (avg)	13.3		13.4		14.9	
90	Conductivity (um/hos)	230		292		369	
91	Dissolved oxygen (mg/L) (avg)	3.06		4.89		0	
92							
93	**DIOXINS AND FURANS (ng/L)**						
94	**Method 8290**						
95	2,3,7,8-TCDF	NA		NA		NA	
96	Total TCDF	NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA	
98	Total TCDD	NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA	
101	Total PeCDF	NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA	
103	Total PeCDD	NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA	
108	Total HxCDF	NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA	
112	Total HxCDD	NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA	
115	Total HpCDF	NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA	
117	Total HpCDD	NA		NA		NA	
118	OCDF	NA		NA		NA	
119	OCDD	NA		NA		NA	
120							
121	**ETHANOL (mg/L)**	NA		NA		NA	
122							

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			H		H		H		H		H		H		H		H		H		H		H		H		H	
4			S177B		T176D		U235V		V208C		W371F		Y314A		Z225V		Z960X		AH27D		AU22A		BB82E		BH75K		BR55N	
5			4/1/97		7/15/97		10/23/97		1/28/98		5/18/98		8/17/98		11/13/98		2/16/99		5/17/99		9/20/99		12/6/99		2/15/00		5/23/00	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH
1							
2							
3		H		H		H	
4		CT37N		ED16K		FF88N	
5		2/12/01		2/25/02		2/13/03	
123	**PAHs (µg/L)**						
124	**EPA Method SW8270 SIM**						
125	Naphthalene	NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA	
127	Acenaphthylene	NA		NA		NA	
128	Acenaphthene	NA		NA		NA	
129	Fluorene	NA		NA		NA	
130	Anthracene	NA		NA		NA	
131	Dibenzofuran	NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1																							
2					Dup of J1								Dup of J1										
3			J1		J1D		J1		J1		J1		J4		J1		J1		J1		J1		J1
4			S177H		S177I		T176P		U235J		V224O		V224K		W371N		Y314I		Z225O		Z960C		AH49C
5			4/2/97		4/2/97		7/16/97		10/22/97		1/29/98		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99
7	1	**CHLORINATED PHENOLS (µg/L)**																					
8	2	**EPA Method SW8040**																					
9	3	Pentachlorophenol	**32**		**33**		**24**		**7.8**		**7.3**		**8.4**		**7.5**		**5.8**		**2.0**		**8.3**		**4.6**
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
12	6	2,4,5-Trichlorophenol	0.4	U	0.25	U	0.27	U	0.67	U	**0.29**		**0.22**	J1	**0.25**		0.25	U	0.25	U	0.25	U	0.25
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**3.4**		**3.4**		**3.0**		**1.8**		**0.98**		**1.1**		**0.51**		**0.33**		0.25	U	**0.43**		0.17
15	9	2,3,4,5-Tetrachlorophenol	**0.94**		**0.70**		**0.5**		**0.28**		**0.23**	J1	**0.20**	J1	**0.16**	J1	**0.23**	J1	0.25	U	0.25	U	0.25
16	10																						
17	11	**SEMIVOLATILES (µg/L)**																					
18	12	**EPA Method SW8270**																					
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10
24	18	Naphthalene	1.0	U	1.0	U	**1.1**		**1.9**		**2.5**		**2.4**		**2.8**	J2	**1.4**		1.0	U	**3.6**		**2.4**
25	19	2-Methylnaphthalene	1.0	U	1.0	U	**1.1**		**1.8**		**2.6**		**2.4**		**2.9**	J2	**1.3**		1.0	U	**3.5**		**2.2**
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
31	25	Pentachlorophenol	**44**		**52**		**20**		**11**		**11**		**8.8**		**10**		**6.5**		5.0	U	**12**		**4.4**
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
33	27																						
34	28	**VOLATILES (µg/L)**																					
35	29	**EPA Method SW8260**																					
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	9.9	U	5.0
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
42	36	Ethylbenzene	**6.5**		**5.9**		**12**		**7.5**		**4.0**		**3.3**		**8.4**		**5.5**		**2.5**		**6.2**		**1.9**
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
44	38	m,p-Xylene	**4.4**		**4.0**		**6.6**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
46	40	1,3,5-Trimethylbenzene	**4.9**		**4.1**		**6.1**		**3.8**		**4.0**	J2	**2.4**	J2	**5.2**		**2.7**		**2.1**		**4.4**		1.0
47	41	1,2,4-Trimethylbenzene	**41**		**36**		**47**		**37**	J2	**26**	J2	**19**	J2	**46**		**29**		**16**		**44**		**8.8**
48	42	Isopropylbenzene	**5.0**		**4.2**		**7.9**		**6.9**	J2	**4.2**	J2	**2.7**	J2	**7.7**		**6.6**		**4.8**		**7.6**		**2.1**
49	43	n-Propylbenzene	**8.7**		**7.2**		**14**		**14**		**8.0**	J2	**5.0**	J2	**14**		**11**		**7.5**		**12**		**3.4**
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
51	45	sec-Butylbenzene	**1.6**		**1.4**		**2.2**		**1.8**	J2	**1.3**		1.0	U	**2.0**		**1.6**	J2	1.0	U	**2.6**		1.0
52	46	4-Isopropyltoluene	1.0	U	1.0	U	**1.0**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
53	47	n-Butylbenzene	**1.3**		**1.1**		**1.9**		**1.7**	J2	**1.1**		1.0	U	**2.0**		**1.3**		1.0	U	**1.2**		1.0
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**5.4**		5.0
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56	49																						
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																					
58	51	**Method OR-DEQ**																					
59	52	**TPH-Diesel**	**0.30**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.52**		0.25
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62	55																						
63	56	**PRIORITY POLLUTANT**																					
64	57	**METALS (mg/L)**																					
65	58	Arsenic (7060)	**0.007**		**0.006**		**0.006**		0.05	U	0.05	U	0.05	U	**0.008**		**0.007**		**0.008**		**0.007**		**0.006**

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW
3			J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1
4			AU22H		BC27K		9912050-03A		BH96R		BR64D		CB49G		CL03H		CT55F		DE68I		DM52B		DW48C		ED23C		EM85D
5			9/20/99		12/8/99		12/8/1999 (d)		2/16/00		5/24/00		8/29/00		11/10/00		2/14/01		6/5/01		8/14/01		11/29/01		2/26/02		6/26/02
7	**CHLORINATED PHENOLS (µg/L)**																										
8	**EPA Method SW8040**																										
9	Pentachlorophenol		**1.7**		**0.94**		NA		**0.81**		**1.7**		0.25	U	0.25	U	**0.50**		**0.36**		0.25	U	**0.25**		NA		**4.4**
10	2,4,6-Trichlorophenol	U	0.25	U	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
11	2,3,6-Trichlorophenol	U	0.25	U	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
12	2,4,5-Trichlorophenol	U	0.25	U	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
13	2,3,4-Trichlorophenol	U	0.25	U	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	J1	0.25	U	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
15	2,3,4,5-Tetrachlorophenol	U	0.25	U	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
16																											
17	**SEMIVOLATILES (µg/L)**																										
18	**EPA Method SW8270**																										
19	Phenol	U	2.0	U	2.0	U	NA		2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0
20	4-Methylphenol	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
21	Isophorone	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
22	2,4-Dimethylphenol	U	3.0	U	3.0	U	NA		3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0
23	Benzoic Acid	U	10	U	10	U	NA		10	U	10	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50
24	Naphthalene		**1.1**		**0.7**	J1	NA		**1.4**		**3.6**		1.0	U	1.0	U	**2.9**		**1.3**		1.0	U	1.0	U	1.0	U	**1.4**
25	2-Methylnaphthalene		**1.2**		**0.5**	J1	NA		**1.2**		**3.3**		1.0	U	1.0	U	**3.0**		**1.5**		1.0	U	1.0	U	1.0	U	1.0
26	2,4,6-Trichlorophenol	U	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
27	2,4,5-Trichlorophenol	U	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
28	Acenaphthene	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
29	Dibenzofuran	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
30	Fluorene	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
31	Pentachlorophenol	J1	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**280**		5.0
32	bis(2-Ethylhexyl)phthalate	U	1.0	U	**0.6**	J1	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**25**		1.0	U	1.0	U	4.0	U	4.0
33																											
34	**VOLATILES (µg/L)**																										
35	**EPA Method SW8260**																										
36	Acetone	U	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	12	U	5.0	U	5.0	U	5.0	U	**10**
37	Carbon Disulfide	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
38	2-Butanone	U	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
39	Benzene	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
40	Bromoform	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
41	Toluene	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
42	Ethylbenzene		**1.5**		1.0	U	NA		1.0	U	**3.4**		1.0	U	1.0	U	**1.2**		**1.2**		1.0	U	1.0	U	1.0	U	**1.1**
43	Styrene	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
44	m,p-Xylene	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.5**		1.0
45	o-Xylene	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**3.0**		1.0
46	1,3,5-Trimethylbenzene	U	**1.4**		1.0	U	NA		1.0	U	**3.0**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**6.4**		1.0
47	1,2,4-Trimethylbenzene		**6.4**		**2.4**		NA		**2.4**		**7.4**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**50**		1.0
48	Isopropylbenzene		**2.4**		**1.2**		NA		**1.3**		**8.2**		**1.5**		**2.5**		**3.3**		**4.7**		1.0	U	**1.3**		**3.5**		**8.4**
49	n-Propylbenzene		**4.4**		**1.9**		NA		**2.0**		**13**		**3.3**		**3.8**		**5.7**		**8.3**		**1.1**		**2.2**		**4.0**		**12**
50	tert-Butylbenzene	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
51	sec-Butylbenzene	U	1.0	U	1.0	U	NA		1.0	U	**1.6**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.0**
52	4-Isopropyltoluene	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.2**		1.0
53	n-Butylbenzene	U	1.0	U	1.0	U	NA		1.0	U	**1.4**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
54	Naphthalene	U	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
55	Methyl tert-butyl ether		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56																											
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	**Method OR-DEQ**																										
59	**TPH-Diesel**	U	0.25	U	0.25	U	NA		0.25	U	0.25	(a)	0.25	U	0.25	U	**0.30**	(d)	NA		NA		NA		**2.1**		NA
60	**TPH-D Motor Oil**		NA		NA		NA		NA		NA		NA		0.50	U	NA		NA		NA		NA		NA		NA
61	**TPH-Gasoline**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62																											
63	**PRIORITY POLLUTANT**																										
64	**METALS (mg/L)**																										
65	Arsenic (7060)		**0.015**		**0.015**		NA		**0.013**		**0.011**		**0.010**		**0.012**		**0.010**		**0.011**		**0.014**		**0.013**		**0.012**		**0.014**

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ
3			J1		J1		J1		J1		J1		J1	
4			ES04F		EZ03K		FF76J		FL58I		FU31A		FY64H	
5			08/28/02		11/12/02		2/12/03		5/8/03		8/27/03		10/21/03	
7	**CHLORINATED PHENOLS (µg/L)**													
8	**EPA Method SW8040**													
9	Pentachlorophenol		**3.1**		**0.57**		**0.35**		**0.73**		**1.3**		**0.65**	
10	2,4,6-Trichlorophenol		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol		NA		NA		NA		NA		NA		NA	
16														
17	**SEMIVOLATILES (µg/L)**													
18	**EPA Method SW8270**													
19	Phenol	U	2.3	U	2	U	2.1	U	2	U	2	U	2.1	U
20	4-Methylphenol	U	1.2	U	1	U	1	U	1	U	1	U	1.1	U
21	Isophorone	U	1.2	U	1	U	1	U	1	U	1	U	1.1	U
22	2,4-Dimethylphenol	U	3.5	U	3	U	3.1	U	3	U	3	U	3.2	U
23	Benzoic Acid	U	58	U	50	U	52	U	50	U	50	U	11	U
24	Naphthalene		1.2	U	**1**		1	U	1	U	**1.5**		**2.1**	
25	2-Methylnaphthalene	U	1.2	U	1	U	1	U	1	U	1	U	**1.4**	
26	2,4,6-Trichlorophenol	U	5.8	U	5	U	5.2	U	5	U	5	U	5.3	U
27	2,4,5-Trichlorophenol	U	5.8	U	5	U	5.2	U	5	U	5	U	5.3	U
28	Acenaphthene	U	1.2	U	1	U	1	U	1	U	1	U	1.1	U
29	Dibenzofuran	U	1.2	U	1	U	1	U	1	U	1	U	1.1	U
30	Fluorene	U	1.2	U	1	U	1	U	1	U	1	U	1.1	U
31	Pentachlorophenol	U	5.8	U	5	U	5.2	U	5	U	5	U	5.3	U
32	bis(2-Ethylhexyl)phthalate	U	4.7	U	4	U	1	U	1	U	1	U	1.1	U
33														
34	**VOLATILES (µg/L)**													
35	**EPA Method SW8260**													
36	Acetone	M	5	U	5	U	5	U	5	U	5	U	5	U
37	Carbon Disulfide	U	1	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	U	5	U	5	U	5	U	5	U	5	U	5	U
39	Benzene	U	1	U	1	U	1	U	1	U	1	U	1	U
40	Bromoform	U	1	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	U	1	U	1	U	1	U	1	U	1	U	1	U
42	Ethylbenzene		1	U	1	U	1	U	1	U	1	U	1	U
43	Styrene	U	1	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	U	1	U	1	U	1	U	1	U	1	U	1	U
45	o-Xylene	U	1	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	U	1	U	1	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	U	1	U	1	U	**4.5**		1	U	1	U	1	U
48	Isopropylbenzene		**5.2**		**3.5**		**5.4**		**1.1**		**14**		**7.1**	
49	n-Propylbenzene		**7.8**		**4.9**		**7.9**		**1.5**		**21**		**11**	
50	tert-Butylbenzene	U	1	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene		1	U	1	U	**1.6**		1	U	**2**		1	U
52	4-Isopropyltoluene	U	1	U	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	U	1	U	1	U	1	U	1	U	**1.7**		1	U
54	Naphthalene	U	5	U	5	U	5	U	5	U	**5**		5	U
55	Methyl tert-butyl ether		NA		NA		NA		NA		NA		NA	
56														
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**													
58	**Method OR-DEQ**													
59	**TPH-Diesel**		NA		NA		**0.4**		NA		NA		NA	
60	**TPH-D Motor Oil**		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**		NA		NA		NA		NA		NA		NA	
62														
63	**PRIORITY POLLUTANT**													
64	**METALS (mg/L)**													
65	Arsenic (7060)		**0.01**		0.05	U	**0.014**		**0.014**		**0.009**		**0.006**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1																							
2					Dup of J1								Dup of J1										
3			J1		J1D		J1		J1		J1		J4		J1		J1		J1		J1		J1
4			S177H		S177I		T176P		U235J		V224O		V224K		W371N		Y314I		Z225O		Z960C		AH49C
5			4/2/97		4/2/97		7/16/97		10/22/97		1/29/98		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005
67	60	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002
68	61	Lead (7421)	0.001	U	0.001	U	0.001	U	0.02	U	0.02	U	0.02	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01
70	63	Zinc (6010)	0.004	U	0.004	U	0.004	U	0.004	U	**0.005**		**0.006**		0.004	U	**0.004**		0.004	U	**0.008**	J	**0.007**
71	64																						
72	65	**MAJOR IONS AND CONVENTIONALS**																					
73	66	Calcium (mg/L) (6010)	**26.4**		**26.7**		**26.1**		**27.5**		**30.8**		**30.5**		NA		NA		NA		**20.2**		NA
74	67	Magnesium (mg/L) (6010)	**10.1**		**10.2**		**9.96**		**10.1**		**10.9**		**10.8**		NA		NA		NA		**6.67**		NA
75	68	Potassium (mg/L) (6010)	**3.1**		**2.8**		**3.2**		**3.4**		**3.5**		**3.4**		NA		NA		NA		**3.1**		NA
76	69	Sodium (mg/L) (6010)	**7.40**		**7.47**		**8.13**		**8.29**		**8.49**		**8.46**		NA		NA		NA		**8.05**		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**120**		**120**		**100**	**J2**	**130**		**140**		**140**		NA		NA		NA		**74**		NA
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**120**		**120**		**100**	J2	**130**		**140**		**140**		NA		NA		NA		**74**		NA
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		NT		**160**	J2	**180**		**170**		**170**		180		170		140		**140**		**150**
81	74	Chloride (mg/L) (EPA 325.2)	**4.3**		**5.4**		**3.4**		**2.5**		**2.3**		**2.2**		3.7		1.0	U	1.8		**3.7**		**3.7**
82	75	N-Nitrate (mg-N/L) (Calculated)	**0.057**		**0.011**		0.010	U	**0.025**		**1.8**	J2	**1.4**	J2	NA		NA		NA		**1.8**		NA
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	0.010	U	**0.01**	J	**0.016**	J2	0.010	U	0.010	UJ	0.010	UJ	NA		NA		NA		0.010	U	NA
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.057**		**0.021**		**0.015**	J2	**0.025**		**1.8**	J2	**1.4**	J2	NA		NA		NA		**1.8**		NA
85	78	Sulfate (mg/L) (EPA 375.2)	**7.0**	J	**26**	J	**10**		**8.6**		**9.0**		**12**		NA		NA		NA		**15**		NA
86	79																						

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW
1																											
2																											
3			J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1
4			AU22H		BC27K		9912050-03A		BH96R		BR64D		CB49G		CL03H		CT55F		DE68I		DM52B		DW48C		ED23C		EM85D
5			9/20/99		12/8/99		12/8/1999 (d)		2/16/00		5/24/00		8/29/00		11/10/00		2/14/01		6/5/01		8/14/01		11/29/01		2/26/02		6/26/02
66	Chromium (6010)	U	0.005	U	0.005	U	NA		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005
67	Copper (6010)	U	0.002	U	0.002	U	NA		0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.003**		0.002
68	Lead (7421)	U	0.001	U	**0.001**		NA		0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	**0.001**		0.001	U	0.001
69	Nickel (6010)	U	0.01	U	0.01	U	NA		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.01**		0.01
70	Zinc (6010)		0.004	U	0.006	U	NA		0.006	U	**0.006**		0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	**0.007**		0.006
71																											
72	**MAJOR IONS AND CONVENTIONALS**																										
73	Calcium (mg/L) (6010)		NA		NA		NA		NA		NA		NA		NA		**20.6**		**20.5**		**22.7**		**21.1**		**29.4**		NA
74	Magnesium (mg/L) (6010)		NA		NA		NA		NA		NA		NA		NA		**7.21**		**7.38**		**8.65**		**7.62**		**10.1**		NA
75	Potassium (mg/L) (6010)		NA		NA		NA		NA		NA		NA		NA		**2.3**		**2.4**		**2.6**		**2.6**		**3.4**		NA
76	Sodium (mg/L) (6010)		NA		NA		NA		NA		NA		NA		NA		**6.48**		**6.15**		**6.58**		**6.56**		**8.36**		NA
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		NA		NA		NA		NA		NA		NA		**100**		NA		NA		NA		**130**		NA
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		NA		NA		NA		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		NA		NA		NA		NA		NA		**100**		NA		NA		NA		**130**		NA
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**170**		**160**		NA		**200**		**160**		**160**		**160**		**150**		**160**		**150**		**140**		**210**		**160**
81	Chloride (mg/L) (EPA 325.2)		**2.6**		**3.1**		NA		**4.3**		**2.5**		**2.0**		**2.3**		**3.0**		**2.6**		**6.2**		**2.6**		**8.8**		**3.6**
82	N-Nitrate (mg-N/L) (Calculated)		NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**2.4**		NA
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.018**		NA
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**2.4**	J	NA
85	Sulfate (mg/L) (EPA 375.2)		NA		NA		NA		NA		NA		NA		NA		**10**		NA		NA		NA		**14**		NA
86																											

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ
1														
2														
3			J1		J1		J1		J1		J1		J1	
4			ES04F		EZ03K		FF76J		FL58I		FU31A		FY64H	
5			08/28/02		11/12/02		2/12/03		5/8/03		8/27/03		10/21/03	
66	Chromium (6010)	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	U	**0.003**		0.002	U	**0.004**		0.002	U	0.002	U	**0.002**	
68	Lead (7421)	U	0.001	U	0.02	U	**0.002**		0.001	U	0.001	U	0.001	U
69	Nickel (6010)	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)	U	**0.007**		**0.006**		**0.007**		0.006	U	0.006	U	0.006	U
71														
72	**MAJOR IONS AND CONVENTIONALS**													
73	Calcium (mg/L) (6010)		NA		NA		**43.2**		NA		NA		NA	
74	Magnesium (mg/L) (6010)		NA		NA		**16.8**		NA		NA		NA	
75	Potassium (mg/L) (6010)		NA		NA		**3.1**		NA		NA		NA	
76	Sodium (mg/L) (6010)		NA		NA		**8.7**		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		NA		**130**		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		1	U	NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		**130**		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**160**		**180**		**260**		**150**		**220**		**190**	
81	Chloride (mg/L) (EPA 325.2)		**3.2**		**3.5**		**2.9**		**3.8**		**2.3**		**2.2**	
82	N-Nitrate (mg-N/L) (Calculated)		NA		NA		**0.039**		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		NA		**0.015**		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		NA		**0.054**		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		NA		**110**		NA		NA		NA	
86														

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1																							
2					Dup of J1								Dup of J1										
3			J1		J1D		J1		J1		J1		J4		J1		J1		J1		J1		J1
4			S177H		S177I		T176P		U235J		V224O		V224K		W371N		Y314I		Z225O		Z960C		AH49C
5			4/2/97		4/2/97		7/16/97		10/22/97		1/29/98		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99
87	80	**FIELD PARAMETERS**																					
88	81	pH (avg)	6.75		6.75		6.62		6.75		6.66		6.65		6.56		6.35		6.17		6.43		5.77
89	82	Temperature (° C) (avg)	12.8		12.8		14.7		15.3		14.5		14.5		12.6		15.5		15.0		13.1		12.9
90	83	Conductivity (um/hos)	319		319		256		239		314		315		289		330		138		207		241
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		NA		NA		2.85		2.20		1.82		1.84		2.33
92	85																						
93	86	**DIOXINS AND FURANS (ng/L)**																					
94	87	**Method 8290**																					
95	88	2,3,7,8-TCDF	0.0057	U	0.0017	U	0.0023	U	0.0038	U	NA		NA		0.0017	U	0.0019	U	0.0019	U	0.0035	U	0.0011
96	89	Total TCDF	**0.0110**		0.0012-0.0034	U	0.0010-0.0058	U	0.0018-0.0064	U	NA		NA		0.0017	U	0.0019	U	0.0019	U	**0.0024**		0.0011
97	90	2,3,7,8-TCDD	0.0054	U	0.0028	U	0.0029	U	0.0053	U	NA		NA		0.0022	U	0.0050	U	0.0034	U	0.0057	U	0.0044
98	91	Total TCDD	0.0037-0.0087	U	0.0015-0.0049	U	0.0015-0.0050	U	0.0024-0.0087	U	NA		NA		0.0022	U	0.0050	U	**0.0016**		0.0057	U	0.0044
99	92	1,2,3,7,8-PeCDF	0.0029	U	0.0032	U	0.0051	U	0.0031	U	NA		NA		0.0019	U	0.0035	U	0.0020	U	0.0049	U	0.0021
100	93	2,3,4,7,8-PeCDF	0.0035	U	0.0031	U	0.0024	U	0.0046	U	NA		NA		0.0023	U	0.0037	U	0.0027	U	0.0042	U	0.0020
101	94	Total PeCDF	0.0029-0.0064	U	0.0013-0.0047	U	0.0036-0.0067	U	**0.0022**		NA		NA		0.0021	U	0.0036	U	0.0024	U	0.0046	U	0.0021
102	95	1,2,3,7,8-PeCDD	0.0080	U	0.0088	U	0.0048	U	0.0068	U	NA		NA		0.0041	U	0.0046	U	0.0022	U	0.0095	U	0.0027
103	96	Total PeCDD	0.0057-0.016	U	0.0033-0.010	U	0.0027-0.010	U	0.0039-0.012	U	NA		NA		0.0041	U	0.0046	U	0.0022	U	0.0095	U	0.0027
104	97	1,2,3,4,7,8-HxCDF	0.0054	U	0.0025	U	0.0048	U	0.0017	U	NA		NA		**0.0018**		0.0039	U	0.0018	U	0.0059	U	0.0024
105	98	1,2,3,6,7,8-HxCDF	0.0042	U	0.0042	U	0.0020	U	0.0035	U	NA		NA		0.0025	U	0.0036	U	0.0180	U	0.0024	U	**0.0015**
106	99	2,3,4,6,7,8-HxCDF	0.0052	U	0.0050	U	0.0038	U	0.0036	U	NA		NA		0.0041	U	0.0066	U	**0.0031**		0.0044	U	**0.0028**
107	100	1,2,3,7,8,9-HxCDF	0.0044	U	0.0040	U	0.0023	U	0.0026	U	NA		NA		0.0037	U	0.0032	U	0.0025	U	0.0056	U	0.0030
108	101	Total HxCDF	0.0052	U	0.0022-0.0063	U	0.0018-0.0071	U	0.0036	U	NA		NA		0.0072	U	**0.0031**		**0.0047**		0.0046	U	**0.0130**
109	102	1,2,3,4,7,8-HxCDD	0.0100	U	0.0058	U	0.0046	U	0.0072	U	NA		NA		0.0047	U	0.0032	U	0.0017	U	0.0085	U	0.0027
110	103	1,2,3,6,7,8-HxCDD	0.0100	U	0.0084	U	0.0068	U	0.0051	U	NA		NA		0.0039	U	0.0046	U	0.0015	U	0.0071	U	0.0031
111	104	1,2,3,7,8,9-HxCDD	0.0080	U	0.0073	U	0.0044	U	0.0041	U	NA		NA		0.0042	U	0.0037	U	0.0027	U	0.0041	U	0.0015
112	105	Total HxCDD	0.0047-0.014	U	0.0031-0.011	U	0.0025-0.011	U	0.0028-0.015	U	NA		NA		0.0043	U	0.0038	U	0.0020	U	0.0066	U	0.0024
113	106	1,2,3,4,6,7,8-HpCDF	0.0080	U	**0.0050**		**0.0031**		0.0021	U	NA		NA		0.0037	U	0.0180	U	0.0033	U	0.0023	U	**0.0018**
114	107	1,2,3,4,7,8,9-HpCDF	0.0089	U	0.0190	U	0.0063	U	0.0035	U	NA		NA		0.0055	U	0.0077	U	0.0039	U	0.0039	U	0.0023
115	108	Total HpCDF	0.0042-0.015	U	**0.0050**		**0.0110**		0.0011-0.0052	U	NA		NA		0.0046	U	0.0129	U	**0.0055**		0.0031	U	**0.0120**
116	109	1,2,3,4,6,7,8-HpCDD	0.0280	U	0.0250	U	**0.0089**		**0.0100**		NA		NA		0.0067	U	**0.0580**		**0.0067**		**0.0120**		**0.0070**
117	110	Total HpCDD	**0.0410**		0.0250	U	**0.0089**		**0.0100**		NA		NA		0.0067	U	**0.0058**		**0.0150**		**0.0250**		**0.0094**
118	111	OCDF	**0.0320**		**0.0300**		**0.0160**		0.0075	U	NA		NA		0.0110	U	**0.0074**		0.0110	U	**0.0180**		**0.0056**
119	112	OCDD	**0.2500**		**0.2300**		**0.0840**		0.0420	U	NA		NA		0.0210	U	**0.0490**		**0.0580**		**0.1600**		0.0530
120	113																						
121	114	**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
122	115																						

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW
1																											
2																											
3			J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1
4			AU22H		BC27K		9912050-03A		BH96R		BR64D		CB49G		CL03H		CT55F		DE68I		DM52B		DW48C		ED23C		EM85D
5			9/20/99		12/8/99		12/8/1999 (d)		2/16/00		5/24/00		8/29/00		11/10/00		2/14/01		6/5/01		8/14/01		11/29/01		2/26/02		6/26/02
87	**FIELD PARAMETERS**																										
88	pH (avg)		6.33		6.57		NM		6.59		6.38		6.58		5.27		6.17		6.64		6.85		6.60		6.42		6.52
89	Temperature (° C) (avg)		16.6		12.4		NM		14.3		14.8		15.6		14.4		14.3		13.6		15.8		14.6		13.6		15.4
90	Conductivity (um/hos)		222		245		NM		272		291		248		212		202		226		278		241		284		224
91	Dissolved oxygen (mg/L) (avg)		2.24		2.78		NM		1.57		1.74		1.62		1.09		0.57		1.51		1.44		3.88		6.41		4.98
92																											
93	**DIOXINS AND FURANS (ng/L)**																										
94	**Method 8290**																										
95	2,3,7,8-TCDF	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	Total TCDF	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	2,3,7,8-TCDD	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	Total TCDD	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	1,2,3,7,8-PeCDF	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	2,3,4,7,8-PeCDF	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	Total PeCDF	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	1,2,3,7,8-PeCDD	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	Total PeCDD	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	1,2,3,4,7,8-HxCDF	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	1,2,3,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	2,3,4,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	1,2,3,7,8,9-HxCDF	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	Total HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	1,2,3,4,7,8-HxCDD	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	1,2,3,6,7,8-HxCDD	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	1,2,3,7,8,9-HxCDD	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	Total HxCDD	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	1,2,3,4,6,7,8-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	1,2,3,4,7,8,9-HpCDF	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	Total HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	1,2,3,4,6,7,8-HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	Total HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	OCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	OCDD	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120																											
121	**ETHANOL (mg/L)**		NA		NA		10	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
122																											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ
1														
2														
3			J1		J1		J1		J1		J1		J1	
4			ES04F		EZ03K		FF76J		FL58I		FU31A		FY64H	
5			08/28/02		11/12/02		2/12/03		5/8/03		8/27/03		10/21/03	
87	**FIELD PARAMETERS**													
88	pH (avg)		6.79		6.4		6.9		6.6		6.46		6.80	
89	Temperature (° C) (avg)		15.7		15.6		13.7		13.7		15.8		17.8	
90	Conductivity (um/hos)		241		232		474		223		343		255	
91	Dissolved oxygen (mg/L) (avg)		1.34		3.21		0		3.1		2.23		1.65	
92														
93	**DIOXINS AND FURANS (ng/L)**													
94	**Method 8290**													
95	2,3,7,8-TCDF		NA		NA		NA		NA		NA		NA	
96	Total TCDF		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD		NA		NA		NA		NA		NA		NA	
98	Total TCDD		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF		NA		NA		NA		NA		NA		NA	
101	Total PeCDF		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD		NA		NA		NA		NA		NA		NA	
103	Total PeCDD		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF		NA		NA		NA		NA		NA		NA	
108	Total HxCDF		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD		NA		NA		NA		NA		NA		NA	
112	Total HxCDD		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF		NA		NA		NA		NA		NA		NA	
115	Total HpCDF		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD		NA		NA		NA		NA		NA		NA	
117	Total HpCDD		NA		NA		NA		NA		NA		NA	
118	OCDF		NA		NA		NA		NA		NA		NA	
119	OCDD		NA		NA		NA		NA		NA		NA	
120														
121	**ETHANOL (mg/L)**		NA		NA		NA		NA		NA		NA	
122														

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1																							
2					Dup of J1								Dup of J1										
3			J1		J1D		J1		J1		J1		J4		J1		J1		J1		J1		J1
4			S177H		S177I		T176P		U235J		V224O		V224K		W371N		Y314I		Z225O		Z960C		AH49C
5			4/2/97		4/2/97		7/16/97		10/22/97		1/29/98		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99
123	116	**PAHs (µg/L)**																					
124	117	**EPA Method SW8270 SIM**																					
125	118	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126	119	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127	120	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128	121	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129	122	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130	123	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131	124	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW
1																											
2																											
3			J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1
4			AU22H		BC27K		9912050-03A		BH96R		BR64D		CB49G		CL03H		CT55F		DE68I		DM52B		DW48C		ED23C		EM85D
5			9/20/99		12/8/99		12/8/1999 (d)		2/16/00		5/24/00		8/29/00		11/10/00		2/14/01		6/5/01		8/14/01		11/29/01		2/26/02		6/26/02
123	**PAHs (µg/L)**																										
124	**EPA Method SW8270 SIM**																										
125	Naphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126	2-Methylnaphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127	Acenaphthylene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128	Acenaphthene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129	Fluorene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130	Anthracene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131	Dibenzofuran		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ
1														
2														
3			J1		J1		J1		J1		J1		J1	
4			ES04F		EZ03K		FF76J		FL58I		FU31A		FY64H	
5			08/28/02		11/12/02		2/12/03		5/8/03		8/27/03		10/21/03	
123	**PAHs (µg/L)**													
124	**EPA Method SW8270 SIM**													
125	Naphthalene		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene		NA		NA		NA		NA		NA		NA	
128	Acenaphthene		NA		NA		NA		NA		NA		NA	
129	Fluorene		NA		NA		NA		NA		NA		NA	
130	Anthracene		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2													Dup of K								Dup of K						
3			K		K		K		K		K		W		K		K		K		Z		K		K		K
4			S177A		T176U		U235X		V208E		W391J		W391K		Y314L		Z225U		Z960W		Z960V		AH27C		BB82B		BH75J
5			4/1/97		7/16/97		10/23/97		1/28/98		5/19/98		5/19/98		8/17/98		11/13/98		2/16/99		2/16/99		5/17/99		12/6/99		2/15/00
7	1	**CHLORINATED PHENOLS (µg/L)**																									
8	2	**EPA Method SW8040**																									
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
16	10																										
17	11	**SEMIVOLATILES (µg/L)**																									
18	12	**EPA Method SW8270**																									
19	13	Phenol	2.0	UJ	2.0	U	2.0	U	2.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
20	14	4-Methylphenol	1.0	UJ	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
21	15	Isophorone	1.0	UJ	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
22	16	2,4-Dimethylphenol	3.0	UJ	3.0	U	3.0	U	3.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
23	17	Benzoic Acid	10	UJ	10	U	10	U	10	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
24	18	Naphthalene	1.0	UJ	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
25	19	2-Methylnaphthalene	1.0	UJ	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
26	20	2,4,6-Trichlorophenol	5.0	UJ	5.0	U	5.0	U	5.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
27	21	2,4,5-Trichlorophenol	5.0	UJ	5.0	U	5.0	U	5.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
28	22	Acenaphthene	1.0	UJ	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
29	23	Dibenzofuran	1.0	UJ	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
30	24	Fluorene	1.0	UJ	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
31	25	Pentachlorophenol	5.0	UJ	5.0	U	5.0	U	5.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
32	26	bis(2-Ethylhexyl)phthalate	1.0	UJ	1.0	U	3.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
33	27																										
34	28	**VOLATILES (µg/L)**																									
35	29	**EPA Method SW8260**																									
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA				NA		NA
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56	49																										
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																									
58	51	**Method OR-DEQ**																									
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62	55																										
63	56	**PRIORITY POLLUTANT**																									
64	57	**METALS (mg/L)**																									
65	58	Arsenic (7060)	0.001	U	**0.001**		0.05	U	0.05	U	**0.001**		0.001	U	0.001	U	0.001	U	0.001	U	**0.001**		0.001	U	**0.004**		**0.010**

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
3			K		K		K		K		K		K		K		K		K		K		K		K		K	
4			BR55O		CB49K		CK77L		CT37O		DE68D		DM52K		DW29I		ED16H		EM75F		ER92B		EZ03J		FF88G		FL41C	
5			5/23/00		8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/27/01		2/25/02		6/25/02		08/26/02		11/12/02		2/13/03		5/7/03	
7	**CHLORINATED PHENOLS (µg/L)**																											
8	**EPA Method SW8040**																											
9	Pentachlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
10	2,4,6-Trichlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																												
17	**SEMIVOLATILES (µg/L)**																											
18	**EPA Method SW8270**																											
19	Phenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
20	4-Methylphenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
21	Isophorone		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
22	2,4-Dimethylphenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
23	Benzoic Acid		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
24	Naphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
25	2-Methylnaphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
26	2,4,6-Trichlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
27	2,4,5-Trichlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
28	Acenaphthene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
29	Dibenzofuran		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
30	Fluorene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
31	Pentachlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
32	bis(2-Ethylhexyl)phthalate		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
33																												
34	**VOLATILES (µg/L)**																											
35	**EPA Method SW8260**																											
36	Acetone		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
37	Carbon Disulfide		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
38	2-Butanone		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
39	Benzene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
40	Bromoform		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
41	Toluene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
42	Ethylbenzene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
43	Styrene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
44	m,p-Xylene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
45	o-Xylene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
46	1,3,5-Trimethylbenzene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
47	1,2,4-Trimethylbenzene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
48	Isopropylbenzene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
49	n-Propylbenzene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
50	tert-Butylbenzene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
51	sec-Butylbenzene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
52	4-Isopropyltoluene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
53	n-Butylbenzene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
54	Naphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
55	Methyl tert-butyl ether		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																												
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																											
58	**Method OR-DEQ**																											
59	**TPH-Diesel**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	**TPH-D Motor Oil**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																												
63	**PRIORITY POLLUTANT**																											
64	**METALS (mg/L)**																											
65	Arsenic (7060)		0.001	U	0.001	U	0.001	U	**0.001**		0.001	U	**0.001**		0.001	U	**0.001**		**0.002**		0.001	U	0.05	U	0.001	U	**0.001**	

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD	BE	BF
1					
2					
3		K		K	
4		FU45B		FY64G	
5		8/28/03		10/21/03	
6					
7	**CHLORINATED PHENOLS (µg/L)**				
8	**EPA Method SW8040**				
9	Pentachlorophenol	NA		NA	
10	2,4,6-Trichlorophenol	NA		NA	
11	2,3,6-Trichlorophenol	NA		NA	
12	2,4,5-Trichlorophenol	NA		NA	
13	2,3,4-Trichlorophenol	NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA	
16					
17	**SEMIVOLATILES (µg/L)**				
18	**EPA Method SW8270**				
19	Phenol	NA		NA	
20	4-Methylphenol	NA		NA	
21	Isophorone	NA		NA	
22	2,4-Dimethylphenol	NA		NA	
23	Benzoic Acid	NA		NA	
24	Naphthalene	NA		NA	
25	2-Methylnaphthalene	NA		NA	
26	2,4,6-Trichlorophenol	NA		NA	
27	2,4,5-Trichlorophenol	NA		NA	
28	Acenaphthene	NA		NA	
29	Dibenzofuran	NA		NA	
30	Fluorene	NA		NA	
31	Pentachlorophenol	NA		NA	
32	bis(2-Ethylhexyl)phthalate	NA		NA	
33					
34	**VOLATILES (µg/L)**				
35	**EPA Method SW8260**				
36	Acetone	NA		NA	
37	Carbon Disulfide	NA		NA	
38	2-Butanone	NA		NA	
39	Benzene	NA		NA	
40	Bromoform	NA		NA	
41	Toluene	NA		NA	
42	Ethylbenzene	NA		NA	
43	Styrene	NA		NA	
44	m,p-Xylene	NA		NA	
45	o-Xylene	NA		NA	
46	1,3,5-Trimethylbenzene	NA		NA	
47	1,2,4-Trimethylbenzene	NA		NA	
48	Isopropylbenzene	NA		NA	
49	n-Propylbenzene	NA		NA	
50	tert-Butylbenzene	NA		NA	
51	sec-Butylbenzene	NA		NA	
52	4-Isopropyltoluene	NA		NA	
53	n-Butylbenzene	NA		NA	
54	Naphthalene	NA		NA	
55	Methyl tert-butyl ether	NA		1	U
56					
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**				
58	**Method OR-DEQ**				
59	**TPH-Diesel**	NA		NA	
60	**TPH-D Motor Oil**	NA		NA	
61	**TPH-Gasoline**	NA		0.25	U
62					
63	**PRIORITY POLLUTANT**				
64	**METALS (mg/L)**				
65	Arsenic (7060)	**0.002**		0.001	U

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2													Dup of K								Dup of K						
3			K		K		K		K		K		W		K		K		K		Z		K		K		K
4			S177A		T176U		U235X		V208E		W391J		W391K		Y314L		Z225U		Z960W		Z960V		AH27C		BB82B		BH75J
5			4/1/97		7/16/97		10/23/97		1/28/98		5/19/98		5/19/98		8/17/98		11/13/98		2/16/99		2/16/99		5/17/99		12/6/99		2/15/00
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.028**		**0.117**
67	60	Copper (6010)	**0.006**		**0.008**		0.002	U	**0.013**		**0.005**		**0.005**		**0.003**		0.002	U	**0.007**		**0.006**		**0.004**		**0.011**		**0.042**
68	61	Lead (7421)	0.001	U	0.001	U	0.02	U	0.02	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	**0.007**		**0.010**
69	62	Nickel (6010)	**0.03**		**0.04**		**0.13**		**0.10**		**0.04**		0.03		**0.01**		**0.07**		**0.06**		**0.06**		**0.03**		**0.27**		**0.17**
70	63	Zinc (6010)	**0.025**		**0.042**		**0.051**		**0.128**		**0.045**	J2	**0.045**	J2	**0.008**		**0.036**		**0.052**		**0.053**		0.020	U	**0.111**		**0.155**
71	64																										
72	65	**MAJOR IONS AND CONVENTIONALS**																									
73	66	Calcium (mg/L) (6010)	NA		NA		NA		**36.6**		NA		NA		NA		NA		NA		NA		NA		NA		NA
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		**8.47**		NA		NA		NA		NA		NA		NA		NA		NA		NA
75	68	Potassium (mg/L) (6010)	NA		NA		NA		**5.4**		NA		NA		NA		NA		NA		NA		NA		NA		NA
76	69	Sodium (mg/L) (6010)	NA		NA		NA		**5.50**		NA		NA		NA		NA		NA		NA		NA		NA		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		**370**		NA		NA		NA		NA		NA		NA		NA		NA		NA
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**130**	J2	**650**		**370**		NA		NA		NA		NA		NA		NA		NA		NA		NA
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
86	79																										

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2																												
3			K		K		K		K		K		K		K		K		K		K		K		K		K	
4			BR55O		CB49K		CK77L		CT37O		DE68D		DM52K		DW29I		ED16H		EM75F		ER92B		EZ03J		FF88G		FL41C	
5			5/23/00		8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/27/01		2/25/02		6/25/02		08/26/02		11/12/02		2/13/03		5/7/03	
66	Chromium (6010)		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.009**		0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)		**0.002**		**0.004**		**0.004**	J2	**0.002**		0.002	U	**0.002**		**0.003**		**0.012**		**0.010**		**0.004**		**0.006**		**0.003**		**0.007**	
68	Lead (7421)		0.001	U	0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	0.001	U	**0.001**		**0.003**		0.001	U	0.02	U	0.001	U	0.001	U
69	Nickel (6010)		**0.01**		**0.01**		**0.03**		**0.03**		**0.02**		**0.03**		**0.05**		**0.03**		**0.08**		**0.02**		**0.05**		**0.1**		**0.04**	
70	Zinc (6010)		**0.014**		**0.006**		**0.009**		**0.009**		**0.006**		**0.007**		**0.013**		**0.029**		**0.040**		**0.009**		**0.01**		**0.059**		**0.05**	J
71																												
72	**MAJOR IONS AND CONVENTIONALS**																											
73	Calcium (mg/L) (6010)		NA		NA		NA		NA		**65.3**		**40.3**		**79.8**		NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)		NA		NA		NA		NA		**16.0**		**13.7**		**18.2**		NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)		NA		NA		NA		NA		**6.9**		**4.4**		**7.6**		NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)		NA		NA		NA		NA		**11.2**		**8.24**		**12.2**		NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
81	Chloride (mg/L) (EPA 325.2)		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
82	N-Nitrate (mg-N/L) (Calculated)		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86																												

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD	BE	BF
1					
2					
3		K		K	
4		FU45B		FY64G	
5		8/28/03		10/21/03	
66	Chromium (6010)	**0.006**		0.005	U
67	Copper (6010)	**0.012**		**0.006**	
68	Lead (7421)	**0.005**		0.001	U
69	Nickel (6010)	**0.04**		**0.03**	
70	Zinc (6010)	**0.029**		**0.014**	
71					
72	**MAJOR IONS AND CONVENTIONALS**				
73	Calcium (mg/L) (6010)	NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA	
75	Potassium (mg/L) (6010)	NA		NA	
76	Sodium (mg/L) (6010)	NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA	
81	Chloride (mg/L) (EPA 325.2)	NA		NA	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA	
86					

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2													Dup of K								Dup of K						
3			K		K		K		K		K		W		K		K		K		Z		K		K		K
4			S177A		T176U		U235X		V208E		W391J		W391K		Y314L		Z225U		Z960W		Z960V		AH27C		BB82B		BH75J
5			4/1/97		7/16/97		10/23/97		1/28/98		5/19/98		5/19/98		8/17/98		11/13/98		2/16/99		2/16/99		5/17/99		12/6/99		2/15/00
87	80	**FIELD PARAMETERS**																									
88	81	pH (avg)	5.70		5.88		5.68		5.22		5.14		5.15		5.37		5.23		4.89		4.87		4.86		4.91		5.40
89	82	Temperature (° C) (avg)	12.0		17.4		16.8		12.7		13.9		13.8		17.6		15.2		12.1		11.9		14.1		14.7		11.9
90	83	Conductivity (um/hos)	157		155		677		382		187		185		130		175		184		187		114		1790		259
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		3.50		3.50		2.23		2.20		2.79		2.79		2.38		2.90		5.01
92	85																										
93	86	**DIOXINS AND FURANS (ng/L)**																									
94	87	**Method 8290**																									
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120																											
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
122																											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2																												
3			K		K		K		K		K		K		K		K		K		K		K		K		K	
4			BR55O		CB49K		CK77L		CT37O		DE68D		DM52K		DW29I		ED16H		EM75F		ER92B		EZ03J		FF88G		FL41C	
5			5/23/00		8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/27/01		2/25/02		6/25/02		08/26/02		11/12/02		2/13/03		5/7/03	
87	**FIELD PARAMETERS**																											
88	pH (avg)		5.34		5.63		5.05		6.09		6.22		6.92		5.98		5.05		5.83		5.77		6.21		6.35		6.05	
89	Temperature (° C) (avg)		14.0		16.0		15.3		13.0		13.6		15.4		14.6		11.1		15.2		15.8		16		13.9		13.3	
90	Conductivity (um/hos)		157		161		323		694		531		350		645		78		199		157		325		835		143	
91	Dissolved oxygen (mg/L) (avg)		1.99		1.78		2.36		3.15		1.80		3.01		3.35		5.92		4.91		0.91		0.66		0		4.61	
92																												
93	**DIOXINS AND FURANS (ng/L)**																											
94	**Method 8290**																											
95	2,3,7,8-TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121	**ETHANOL (mg/L)**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																												

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD	BE	BF
1					
2					
3		K		K	
4		FU45B		FY64G	
5		8/28/03		10/21/03	
87	**FIELD PARAMETERS**				
88	pH (avg)	6.25		6.37	
89	Temperature (° C) (avg)	15.9		17.3	
90	Conductivity (um/hos)	193		250	
91	Dissolved oxygen (mg/L) (avg)	2.26		2.57	
92					
93	**DIOXINS AND FURANS (ng/L)**				
94	**Method 8290**				
95	2,3,7,8-TCDF	NA		NA	
96	Total TCDF	NA		NA	
97	2,3,7,8-TCDD	NA		NA	
98	Total TCDD	NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA	
101	Total PeCDF	NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA	
103	Total PeCDD	NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA	
108	Total HxCDF	NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA	
112	Total HxCDD	NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA	
115	Total HpCDF	NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA	
117	Total HpCDD	NA		NA	
118	OCDF	NA		NA	
119	OCDD	NA		NA	
120					
121	**ETHANOL (mg/L)**	NA		NA	
122					

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2													Dup of K								Dup of K						
3			K		K		K		K		K		W		K		K		K		Z		K		K		K
4			S177A		T176U		U235X		V208E		W391J		W391K		Y314L		Z225U		Z960W		Z960V		AH27C		BB82B		BH75J
5			4/1/97		7/16/97		10/23/97		1/28/98		5/19/98		5/19/98		8/17/98		11/13/98		2/16/99		2/16/99		5/17/99		12/6/99		2/15/00
123		**PAHs (µg/L)**																									
124		**EPA Method SW8270 SIM**																									
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2																												
3			K		K		K		K		K		K		K		K		K		K		K		K		K	
4			BR55O		CB49K		CK77L		CT37O		DE68D		DM52K		DW29I		ED16H		EM75F		ER92B		EZ03J		FF88G		FL41C	
5			5/23/00		8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/27/01		2/25/02		6/25/02		08/26/02		11/12/02		2/13/03		5/7/03	
123	**PAHs (µg/L)**																											
124	**EPA Method SW8270 SIM**																											
125	Naphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD	BE	BF
1					
2					
3		K		K	
4		FU45B		FY64G	
5		8/28/03		10/21/03	
123	**PAHs (µg/L)**				
124	**EPA Method SW8270 SIM**				
125	Naphthalene	NA		0.1	U
126	2-Methylnaphthalene	NA		0.1	U
127	Acenaphthylene	NA		0.1	U
128	Acenaphthene	NA		0.1	U
129	Fluorene	NA		0.1	U
130	Anthracene	NA		0.1	U
131	Dibenzofuran	NA		0.1	U

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
3			L		L		L		L		L		L		L		L		L		L		L		L		L
4			S167H		T176A		U258B		V232H		W371E		Y336F		Z225F		Z960B		AH49E		AU22C		BC27A		BH75I		BR64H
5			4/1/97		7/15/97		10/23/97		1/30/98		5/18/98		8/18/98		11/13/98		2/16/99		5/18/99		9/20/99		12/7/99		2/15/00		5/24/00
7	1	**CHLORINATED PHENOLS (µg/L)**																									
8	2	**EPA Method SW8040**																									
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
16	10																										
17	11	**SEMIVOLATILES (µg/L)**																									
18	12	**EPA Method SW8270**																									
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
32	26	bis(2-Ethylhexyl)phthalate	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
33	27																										
34	28	**VOLATILES (µg/L)**																									
35	29	**EPA Method SW8260**																									
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	**2.0**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56	49																										
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																									
58	51	**Method OR-DEQ**																									
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62	55																										
63	56	**PRIORITY POLLUTANT**																									
64	57	**METALS (mg/L)**																									
65	58	Arsenic (7060)	0.001	U	0.001	U	0.05	U	0.05	U	0.001	U	0.001	U	**0.007**		0.001	U	0.001	U	**0.003**		0.001	U	**0.001**		0.001

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH
1								
2								
3			L		L		L	
4			CT37D		ED16E		FF88K	
5			2/12/01		2/25/02		2/13/03	
7	**CHLORINATED PHENOLS (µg/L)**							
8	**EPA Method SW8040**							
9	Pentachlorophenol	U	0.25	U	0.25	U	0.26	U
10	2,4,6-Trichlorophenol	U	NA		NA		NA	
11	2,3,6-Trichlorophenol	U	NA		NA		NA	
12	2,4,5-Trichlorophenol	U	NA		NA		NA	
13	2,3,4-Trichlorophenol	U	NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	U	NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	U	NA		NA		NA	
16								
17	**SEMIVOLATILES (µg/L)**							
18	**EPA Method SW8270**							
19	Phenol	U	2.0	U	2.0	U	2	U
20	4-Methylphenol	U	1.0	U	1.0	U	1	U
21	Isophorone	U	1.0	U	1.0	U	1	U
22	2,4-Dimethylphenol	U	3.0	U	3.0	U	3.1	U
23	Benzoic Acid	U	10	U	50	U	51	U
24	Naphthalene	U	1.0	U	1.0	U	1	U
25	2-Methylnaphthalene	U	1.0	U	1.0	U	1	U
26	2,4,6-Trichlorophenol	U	5.0	U	5.0	U	5.1	U
27	2,4,5-Trichlorophenol	U	5.0	U	5.0	U	5.1	U
28	Acenaphthene	U	1.0	U	1.0	U	1	U
29	Dibenzofuran	U	1.0	U	1.0	U	1	U
30	Fluorene	U	1.0	U	1.0	U	1	U
31	Pentachlorophenol	U	5.0	U	5.0	U	5.1	U
32	bis(2-Ethylhexyl)phthalate	U	1.0	U	4.0	U	1	U
33								
34	**VOLATILES (µg/L)**							
35	**EPA Method SW8260**							
36	Acetone	U	6.1	U	5.0	U	5	U
37	Carbon Disulfide	U	1.0	U	1.0	U	1	U
38	2-Butanone	U	5.0	U	5.0	U	5	U
39	Benzene	U	1.0	U	1.0	U	1	U
40	Bromoform	U	1.0	U	1.0	U	1	U
41	Toluene	U	1.0	U	1.0	U	1	U
42	Ethylbenzene	U	1.0	U	1.0	U	1	U
43	Styrene	U	1.0	U	1.0	U	1	U
44	m,p-Xylene	U	1.0	U	1.0	U	1	U
45	o-Xylene	U	1.0	U	1.0	U	1	U
46	1,3,5-Trimethylbenzene	U	1.0	U	1.0	U	1	U
47	1,2,4-Trimethylbenzene	U	1.0	U	1.0	U	1	U
48	Isopropylbenzene	U	1.0	U	1.0	U	1	U
49	n-Propylbenzene	U	1.0	U	1.0	U	1	U
50	tert-Butylbenzene	U	1.0	U	1.0	U	1	U
51	sec-Butylbenzene	U	1.0	U	1.0	U	1	U
52	4-Isopropyltoluene	U	1.0	U	1.0	U	1	U
53	n-Butylbenzene	U	1.0	U	1.0	U	1	U
54	Naphthalene	U	5.0	U	5.0	U	5	U
55	Methyl tert-butyl ether		NA		NA		NA	
56								
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**							
58	**Method OR-DEQ**							
59	**TPH-Diesel**	U	0.25	U	0.25	U	0.25	U
60	**TPH-D Motor Oil**		NA		NA		NA	
61	**TPH-Gasoline**		NA		NA		NA	
62								
63	**PRIORITY POLLUTANT**							
64	**METALS (mg/L)**							
65	Arsenic (7060)	U	0.001	U	0.001	U	**0.001**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			L		L		L		L		L		L		L		L		L		L		L		L		L
4			S167H		T176A		U258B		V232H		W371E		Y336F		Z225F		Z960B		AH49E		AU22C		BC27A		BH75I		BR64H
5			4/1/97		7/15/97		10/23/97		1/30/98		5/18/98		8/18/98		11/13/98		2/16/99		5/18/99		9/20/99		12/7/99		2/15/00		5/24/00
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.009**		0.005
67	60	Copper (6010)	**0.003**		**0.003**		**0.003**		0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.008**		**0.003**		**0.002**
68	61	Lead (7421)	**0.001**		0.001	U	0.02	U	0.02	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	**0.002**		0.001	U	0.001
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.01**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01
70	63	Zinc (6010)	**0.004**		**0.004**	J2	**0.005**		**0.005**		**0.005**	J2	**0.005**		**0.004**		**0.051**		**0.004**		**0.008**		0.012	U	0.006	U	0.006
71	64																										
72	65	**MAJOR IONS AND CONVENTIONALS**																									
73	66	Calcium (mg/L) (6010)	**2.77**		**3.56**		**4.93**		**3.76**		NA		NA		NA		**3.24**		NA		NA		NA		NA		NA
74	67	Magnesium (mg/L) (6010)	**0.99**		**1.56**		**1.98**		**1.35**		NA		NA		NA		**1.18**		NA		NA		NA		NA		NA
75	68	Potassium (mg/L) (6010)	**1.2**		**0.8**		**1.6**		**1.1**		NA		NA		NA		**1.0**		NA		NA		NA		NA		NA
76	69	Sodium (mg/L) (6010)	**4.58**		**5.81**		**8.14**		**3.34**		NA		NA		NA		**3.61**		NA		NA		NA		NA		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**16**		**30**		**28**		**21**		NA		NA		NA		**16**		NA		NA		NA		NA		NA
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		NA		NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**16**		**30**		**28**		**21**		NA		NA		NA		**16**		NA		NA		NA		NA		NA
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**100**	J2	**57**		**60**	J2	46		74		130		**36**		**57**		**92**		**77**		**65**		**56**
81	74	Chloride (mg/L) (EPA 325.2)	1.0	U	**3.8**		**1.9**		**1.0**		1.0		1.0	U	1.7		1.0	U	**1.5**		**1.5**		**3.4**		**2.0**		**1.8**
82	75	N-Nitrate (mg-N/L) (Calculated)	**0.34**	J	**0.01**		**0.84**		**0.31**	J2	NA		NA		NA		**0.24**	J	NA		NA		NA		NA		NA
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	0.010	U	0.010	U	0.010	U	0.010	UJ	NA		NA		NA		0.010	UJ	NA		NA		NA		NA		NA
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.34**	J	**0.01**		**0.84**		**0.31**	J2	NA		NA		NA		**0.24**	J	NA		NA		NA		NA		NA
85	78	Sulfate (mg/L) (EPA 375.2)	**2.7**	J	**4.8**		**4.0**		**2.8**		NA		NA		NA		**3.6**		NA		NA		NA		NA		NA
86	79																										

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH
1								
2								
3			L		L		L	
4			CT37D		ED16E		FF88K	
5			2/12/01		2/25/02		2/13/03	
66	Chromium (6010)	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)		0.002	U	0.002	U	**0.004**	
68	Lead (7421)	U	0.001	U	0.001	U	**0.001**	
69	Nickel (6010)	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)	U	0.006	U	0.006	U	**0.009**	
71								
72	**MAJOR IONS AND CONVENTIONALS**							
73	Calcium (mg/L) (6010)		**11.5**		**3.20**		**2.61**	
74	Magnesium (mg/L) (6010)		**4.04**		**1.34**		**1.19**	
75	Potassium (mg/L) (6010)		**1.4**		**0.8**		**0.7**	
76	Sodium (mg/L) (6010)		**8.26**		**3.29**		**2.5**	
77	Alkalinity (mg/L CaCO3) (SM 2320)		**64**		**21**		**16**	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		1.0	U	1.0	U	1	U
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		**64**		**21**		**16**	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**120**		**57**		**66**	
81	Chloride (mg/L) (EPA 325.2)		**1.4**		**2.4**		**1**	
82	N-Nitrate (mg-N/L) (Calculated)		**0.47**		**0.36**		**0.45**	
83	N-Nitrite (mg-N/L) (EPA 354.1)		0.010	U	0.010	U	0.01	U
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		**0.47**	J	**0.36**		**0.45**	
85	Sulfate (mg/L) (EPA 375.2)		**4.4**		**3.6**		2.5	U
86								

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			L		L		L		L		L		L		L		L		L		L		L		L		L
4			S167H		T176A		U258B		V232H		W371E		Y336F		Z225F		Z960B		AH49E		AU22C		BC27A		BH75I		BR64H
5			4/1/97		7/15/97		10/23/97		1/30/98		5/18/98		8/18/98		11/13/98		2/16/99		5/18/99		9/20/99		12/7/99		2/15/00		5/24/00
87	80	**FIELD PARAMETERS**																									
88	81	pH (avg)	6.02		6.18		6.24		7.10		5.49		5.87		5.84		6.26		5.54		5.41		5.72		6.16		5.94
89	82	Temperature (° C) (avg)	9.8		15.5		16.4		9.6		13.1		15.7		13.8		8.9		13.1		15.5		13.0		10.8		13.1
90	83	Conductivity (um/hos)	41		68		81		55		60		95		89		39		42		101		75		50		63
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		4.51		2.60		1.87		5.67		2.93		2.16		4.48		4.25		3.14
92	85																										
93	86	**DIOXINS AND FURANS (ng/L)**																									
94	87	**Method 8290**																									
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120																											
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
122																											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH
1								
2								
3			L		L		L	
4			CT37D		ED16E		FF88K	
5			2/12/01		2/25/02		2/13/03	
87	**FIELD PARAMETERS**							
88	pH (avg)		6.07		5.89		7.12	
89	Temperature (° C) (avg)		13.2		8.5		11.2	
90	Conductivity (um/hos)		104		37		41	
91	Dissolved oxygen (mg/L) (avg)		2.56		7.55		0	
92								
93	**DIOXINS AND FURANS (ng/L)**							
94	**Method 8290**							
95	2,3,7,8-TCDF		NA		NA		NA	
96	Total TCDF		NA		NA		NA	
97	2,3,7,8-TCDD		NA		NA		NA	
98	Total TCDD		NA		NA		NA	
99	1,2,3,7,8-PeCDF		NA		NA		NA	
100	2,3,4,7,8-PeCDF		NA		NA		NA	
101	Total PeCDF		NA		NA		NA	
102	1,2,3,7,8-PeCDD		NA		NA		NA	
103	Total PeCDD		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF		NA		NA		NA	
108	Total HxCDF		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD		NA		NA		NA	
112	Total HxCDD		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF		NA		NA		NA	
115	Total HpCDF		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD		NA		NA		NA	
117	Total HpCDD		NA		NA		NA	
118	OCDF		NA		NA		NA	
119	OCDD		NA		NA		NA	
120								
121	**ETHANOL (mg/L)**		NA		NA		NA	
122								

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			L		L		L		L		L		L		L		L		L		L		L		L		L
4			S167H		T176A		U258B		V232H		W371E		Y336F		Z225F		Z960B		AH49E		AU22C		BC27A		BH75I		BR64H
5			4/1/97		7/15/97		10/23/97		1/30/98		5/18/98		8/18/98		11/13/98		2/16/99		5/18/99		9/20/99		12/7/99		2/15/00		5/24/00
123		**PAHs (µg/L)**																									
124		**EPA Method SW8270 SIM**																									
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH
1								
2								
3			L		L		L	
4			CT37D		ED16E		FF88K	
5			2/12/01		2/25/02		2/13/03	
123	**PAHs (µg/L)**							
124	**EPA Method SW8270 SIM**							
125	Naphthalene		NA		NA		NA	
126	2-Methylnaphthalene		NA		NA		NA	
127	Acenaphthylene		NA		NA		NA	
128	Acenaphthene		NA		NA		NA	
129	Fluorene		NA		NA		NA	
130	Anthracene		NA		NA		NA	
131	Dibenzofuran		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
3			LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S	
4			S167K		T176E		U235T		V208F		W371G		Y336I		Z225E		Z960A		AH27G		AU45J		BB82C		BH75G		BR55G	
5			4/1/97		7/15/97		10/23/97		1/28/98		5/18/98		8/19/98		11/13/98		2/17/99		5/17/99		9/23/99		12/6/99		2/15/00		5/23/00	
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	UJ
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	**0.008**		**0.008**		0.05	U	0.05	U	**0.011**		**0.011**		**0.012**		**0.010**		**0.008**		**0.014**		**0.011**		**0.013**		**0.010**	

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC
3		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S
4		CB49C		CK77D		CT37B		DE68F		DM52E		DW48M		ED16J		EM75G		ER92C		EY88E		FF88M		FL41F		FU31C		FY64J
5		8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/29/01		2/25/02		6/25/02		08/26/02		11/11/02		2/13/03		5/7/03		8/27/03		10/21/03
7	**CHLORINATED PHENOLS (µg/L)**																											
8	**EPA Method SW8040**																											
9	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.28	U	0.25	U	0.25	U	0.26	U	0.54	U	0.5
10	2,4,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
11	2,3,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
12	2,4,5-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
13	2,3,4-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
15	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
16																												
17	**SEMIVOLATILES (µg/L)**																											
18	**EPA Method SW8270**																											
19	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.2	U	2	U	2	U	2	U	2.2	U	2
20	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.1	U	1
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.1	U	1
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.3	U	3	U	3	U	3.1	U	3.3	U	3
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U	56	U	50	U	50	U	51	U	54	U	10
24	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.1	U	1
25	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.1	U	1
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5	U	5	U	5.1	U	5.4	U	5
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5	U	5	U	5.1	U	5.4	U	5
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.1	U	1
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.1	U	1
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.1	U	1
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5	U	5	U	5.1	U	5.4	U	5
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	4.0	U	4.0	U	4.4	U	4	U	1	U	1	U	1.1	U	1
33																												
34	**VOLATILES (µg/L)**																											
35	**EPA Method SW8260**																											
36	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
38	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5
39	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
41	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
42	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
44	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
45	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
46	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
47	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
48	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
49	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
50	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
51	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
53	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
54	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		1
56																												
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																											
58	**Method OR-DEQ**																											
59	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	NA		NA		NA		0.25	U	NA		NA		NA		0.25	U	NA		NA		NA
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.25
62																												
63	**PRIORITY POLLUTANT**																											
64	**METALS (mg/L)**																											
65	Arsenic (7060)	**0.010**		**0.011**		**0.010**		**0.009**		**0.011**		**0.012**		**0.023**		**0.010**		**0.011**		0.05	U	**0.014**		**0.007**		**0.009**		**0.008**

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BD
1		
2		
3		
4		
5		
7	**CHLORINATED PHENOLS (µg/L)**	
8	**EPA Method SW8040**	
9	Pentachlorophenol	U
10	2,4,6-Trichlorophenol	
11	2,3,6-Trichlorophenol	
12	2,4,5-Trichlorophenol	
13	2,3,4-Trichlorophenol	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	
15	2,3,4,5-Tetrachlorophenol	
16		
17	**SEMIVOLATILES (µg/L)**	
18	**EPA Method SW8270**	
19	Phenol	U
20	4-Methylphenol	U
21	Isophorone	U
22	2,4-Dimethylphenol	U
23	Benzoic Acid	U
24	Naphthalene	U
25	2-Methylnaphthalene	U
26	2,4,6-Trichlorophenol	U
27	2,4,5-Trichlorophenol	U
28	Acenaphthene	U
29	Dibenzofuran	U
30	Fluorene	U
31	Pentachlorophenol	U
32	bis(2-Ethylhexyl)phthalate	U
33		
34	**VOLATILES (µg/L)**	
35	**EPA Method SW8260**	
36	Acetone	U
37	Carbon Disulfide	U
38	2-Butanone	U
39	Benzene	U
40	Bromoform	U
41	Toluene	U
42	Ethylbenzene	U
43	Styrene	U
44	m,p-Xylene	U
45	o-Xylene	U
46	1,3,5-Trimethylbenzene	U
47	1,2,4-Trimethylbenzene	U
48	Isopropylbenzene	U
49	n-Propylbenzene	U
50	tert-Butylbenzene	U
51	sec-Butylbenzene	U
52	4-Isopropyltoluene	U
53	n-Butylbenzene	U
54	Naphthalene	U
55	Methyl tert-butyl ether	U
56		
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**	
58	**Method OR-DEQ**	
59	**TPH-Diesel**	
60	**TPH-D Motor Oil**	
61	**TPH-Gasoline**	U
62		
63	**PRIORITY POLLUTANT**	
64	**METALS (mg/L)**	
65	Arsenic (7060)	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S	
4			S167K		T176E		U235T		V208F		W371G		Y336I		Z225E		Z960A		AH27G		AU45J		BB82C		BH75G		BR55G	
5			4/1/97		7/15/97		10/23/97		1/28/98		5/18/98		8/19/98		11/13/98		2/17/99		5/17/99		9/23/99		12/6/99		2/15/00		5/23/00	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U
68	61	Lead (7421)	0.001	U	0.001	U	0.02	U	0.02	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	0.004	U	**0.005**	J2	**0.011**		0.004	U	**0.008**	J2	**0.012**		0.004	U	**0.010**	J	0.012	U	**0.005**		0.006	U	**0.007**		0.006	U
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	**16.7**		**19.5**		**20.2**		**20.1**		NA		NA		NA		**18.4**		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**5.95**		**6.73**		**7.53**		**7.23**		NA		NA		NA		**6.09**		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**2.9**		**3.3**		**2.6**		**2.4**		NA		NA		NA		**2.8**		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**7.70**		**9.08**		**7.22**		**8.08**		NA		NA		NA		**8.54**		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**80**		**77**		**88**		**94**		NA		NA		NA		**87**		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**80**		**77**		**88**		**94**		NA		NA		NA		**87**		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**140**	J2	**130**		**140**		110		99		140		**120**		**130**		**140**		**150**		**140**		**130**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.1**	J	**2.3**		**2.5**		**2.4**		2.3		1.0	U	1.8		**1.2**		**1.2**		**2.4**		**3.7**		**2.9**		**3.4**	
82	75	N-Nitrate (mg-N/L) (Calculated)	**0.58**	J	**1.3**		**0.11**		**0.48**		NA		NA		NA		**0.12**		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	0.010	U	0.010	U	0.010	U	0.010	U	NA		NA		NA		0.010	U	NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.58**	J	**1.3**		**0.11**		**0.48**		NA		NA		NA		**0.12**		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	**9.3**	J	**13**		**5.5**		**5.1**		NA		NA		NA		**7.2**		NA		NA		NA		NA		NA	
86	79																											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC
1																												
2																												
3		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S
4		CB49C		CK77D		CT37B		DE68F		DM52E		DW48M		ED16J		EM75G		ER92C		EY88E		FF88M		FL41F		FU31C		FY64J
5		8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/29/01		2/25/02		6/25/02		08/26/02		11/11/02		2/13/03		5/7/03		8/27/03		10/21/03
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.007**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005
67	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.009**		0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.003**
68	Lead (7421)	0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	0.001	U	**0.004**		0.001	U	0.001	U	0.02	U	0.001	U	0.001	U	0.001	U	0.001
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01
70	Zinc (6010)	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	**0.030**		0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	**0.007**
71																												
72	**MAJOR IONS AND CONVENTIONALS**																											
73	Calcium (mg/L) (6010)	NA		NA		**25.5**		**28.4**		**25.8**		**27.3**		**30.4**		NA		NA		NA		**36.9**		NA		NA		NA
74	Magnesium (mg/L) (6010)	NA		NA		**9.47**		**10.6**		**10.2**		**10.4**		**11.7**		NA		NA		NA		**13.6**		NA		NA		NA
75	Potassium (mg/L) (6010)	NA		NA		**2.0**		**2.4**		**2.2**		**2.4**		**3.4**		NA		NA		NA		**3.2**		NA		NA		NA
76	Sodium (mg/L) (6010)	NA		NA		**7.23**		**7.87**		**7.24**		**7.20**		**10.2**		NA		NA		NA		**9.8**		NA		NA		NA
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		**120**		NA		NA		NA		**120**		NA		NA		NA		**150**		NA		NA		NA
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		1	U	NA		NA		NA
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		**120**		NA		NA		NA		**120**		NA		NA		NA		**150**		NA		NA		NA
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**160**		**170**		**170**		**180**		**160**		**170**		**160**		**200**		**210**		**210**		**180**		**190**		**190**		**200**
81	Chloride (mg/L) (EPA 325.2)	**3.5**		**3.6**		**4.1**		**3.1**		**3.7**		**2.6**		**3.2**		**2.7**		**3.1**		**3**		**3.6**		**2.4**		**3**		**3.2**
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		**0.17**		NA		NA		NA		**0.91**		NA		NA		NA		**0.66**		NA		NA		NA
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		0.010	U	NA		NA		NA		0.010	U	NA		NA		NA		0.01	U	NA		NA		NA
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		**0.17**	J	NA		NA		NA		**0.91**		NA		NA		NA		**0.66**		NA		NA		NA
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		**6.8**		NA		NA		NA		**5.7**		NA		NA		NA		**4.2**		NA		NA		NA
86																												

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BD
1		
2		
3		
4		
5		
66	Chromium (6010)	U
67	Copper (6010)	
68	Lead (7421)	U
69	Nickel (6010)	U
70	Zinc (6010)	
71		
72	**MAJOR IONS AND CONVENTIONALS**	
73	Calcium (mg/L) (6010)	
74	Magnesium (mg/L) (6010)	
75	Potassium (mg/L) (6010)	
76	Sodium (mg/L) (6010)	
77	Alkalinity (mg/L CaCO3) (SM 2320)	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	
81	Chloride (mg/L) (EPA 325.2)	
82	N-Nitrate (mg-N/L) (Calculated)	
83	N-Nitrite (mg-N/L) (EPA 354.1)	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	
85	Sulfate (mg/L) (EPA 375.2)	
86		

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

			LW1S S167K 4/1/97	LW1S T176E 7/15/97	LW1S U235T 10/23/97	LW1S V208F 1/28/98	LW1S W371G 5/18/98	LW1S Y336I 8/19/98	LW1S Z225E 11/13/98	LW1S Z960A 2/17/99	LW1S AH27G 5/17/99	LW1S AU45J 9/23/99	LW1S BB82C 12/6/99	LW1S BH75G 2/15/00	LW1S BR55G 5/23/00
87	80	**FIELD PARAMETERS**													
88	81	pH (avg)	6.72	6.83	6.94	6.60	6.32	6.51	6.48	6.84	5.72	6.88	6.24	6.73	6.57
89	82	Temperature (° C) (avg)	13.4	16.9	15.8	15.4	14.8	15.9	14.5	14.5	14.4	16.1	14.9	14.4	14.3
90	83	Conductivity (um/hos)	190	203	154	213	195	193	100	174	146	197	212	206	182
91	84	Dissolved oxygen (mg/L) (avg)	NA	NA	NA	NA	NA	1.73	1.84	3.04	3.91	1.22	2.53	2.34	2.17
92	85														
93	86	**DIOXINS AND FURANS (ng/L)**													
94	87	**Method 8290**													
95	88	2,3,7,8-TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
96	89	Total TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
97	90	2,3,7,8-TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
98	91	Total TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
99	92	1,2,3,7,8-PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
100	93	2,3,4,7,8-PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
101	94	Total PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
102	95	1,2,3,7,8-PeCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
103	96	Total PeCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
104	97	1,2,3,4,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
105	98	1,2,3,6,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
106	99	2,3,4,6,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
107	100	1,2,3,7,8,9-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
108	101	Total HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
109	102	1,2,3,4,7,8-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
110	103	1,2,3,6,7,8-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
111	104	1,2,3,7,8,9-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
112	105	Total HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
113	106	1,2,3,4,6,7,8-HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
114	107	1,2,3,4,7,8,9-HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
115	108	Total HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
116	109	1,2,3,4,6,7,8-HpCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
117	110	Total HpCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
118	111	OCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
119	112	OCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
120															
121		**ETHANOL (mg/L)**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
122															

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC
3		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S
4		CB49C		CK77D		CT37B		DE68F		DM52E		DW48M		ED16J		EM75G		ER92C		EY88E		FF88M		FL41F		FU31C		FY64J
5		8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/29/01		2/25/02		6/25/02		08/26/02		11/11/02		2/13/03		5/7/03		8/27/03		10/21/03
87	**FIELD PARAMETERS**																											
88	pH (avg)	6.49		5.21		6.56		6.75		6.94		6.71		6.22		6.57		6.61		6.62		6.94		6.88		6.86		6.77
89	Temperature (° C) (avg)	16.0		15.2		14.9		14.6		15.8		15.4		14.3		16.1		16.3		16		16		14.9		16.8		18.3
90	Conductivity (um/hos)	196		207		217		250		245		245		257		370		265		367		327		233		228		237
91	Dissolved oxygen (mg/L) (avg)	1.80		1.86		1.90		1.99		1.09		3.75		4.77		5.34		0.77		3.86		0		3.28		2.2		1.64
92																												
93	**DIOXINS AND FURANS (ng/L)**																											
94	**Method 8290**																											
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120																												
121	**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
122																												

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BD
1		
2		
3		
4		
5		
87	**FIELD PARAMETERS**	
88	pH (avg)	
89	Temperature (° C) (avg)	
90	Conductivity (um/hos)	
91	Dissolved oxygen (mg/L) (avg)	
92		
93	**DIOXINS AND FURANS (ng/L)**	
94	**Method 8290**	
95	2,3,7,8-TCDF	
96	Total TCDF	
97	2,3,7,8-TCDD	
98	Total TCDD	
99	1,2,3,7,8-PeCDF	
100	2,3,4,7,8-PeCDF	
101	Total PeCDF	
102	1,2,3,7,8-PeCDD	
103	Total PeCDD	
104	1,2,3,4,7,8-HxCDF	
105	1,2,3,6,7,8-HxCDF	
106	2,3,4,6,7,8-HxCDF	
107	1,2,3,7,8,9-HxCDF	
108	Total HxCDF	
109	1,2,3,4,7,8-HxCDD	
110	1,2,3,6,7,8-HxCDD	
111	1,2,3,7,8,9-HxCDD	
112	Total HxCDD	
113	1,2,3,4,6,7,8-HpCDF	
114	1,2,3,4,7,8,9-HpCDF	
115	Total HpCDF	
116	1,2,3,4,6,7,8-HpCDD	
117	Total HpCDD	
118	OCDF	
119	OCDD	
120		
121	**ETHANOL (mg/L)**	
122		

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S	
4			S167K		T176E		U235T		V208F		W371G		Y336I		Z225E		Z960A		AH27G		AU45J		BB82C		BH75G		BR55G	
5			4/1/97		7/15/97		10/23/97		1/28/98		5/18/98		8/19/98		11/13/98		2/17/99		5/17/99		9/23/99		12/6/99		2/15/00		5/23/00	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC
1																												
2																												
3		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S
4		CB49C		CK77D		CT37B		DE68F		DM52E		DW48M		ED16J		EM75G		ER92C		EY88E		FF88M		FL41F		FU31C		FY64J
5		8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/29/01		2/25/02		6/25/02		08/26/02		11/11/02		2/13/03		5/7/03		8/27/03		10/21/03
123	**PAHs (µg/L)**																											
124	**EPA Method SW8270 SIM**																											
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BD
1		
2		
3		
4		
5		
123	**PAHs (µg/L)**	
124	**EPA Method SW8270 SIM**	
125	Naphthalene	U
126	2-Methylnaphthalene	U
127	Acenaphthylene	U
128	Acenaphthene	U
129	Fluorene	U
130	Anthracene	U
131	Dibenzofuran	U

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																									Dup of LW4S	
3			LW4S		LW4S		LW4S		LW4S		LW4S (a)		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW40S	
4			S167J		T176G		U235O		V232E		B802035-01		W391F		Y314F		Z225K		Z960L		AH49G		AU45B		AU45A	
5			4/1/97		7/15/97		10/22/97		1/30/98		1/30/98		5/20/98		8/17/98		11/14/98		2/18/99		5/18/99		9/22/99		9/22/99	
7	1	**CHLORINATED PHENOLS (µg/L)**																								
8	2	**EPA Method SW8040**																								
9	3	Pentachlorophenol	**5.3**		**1.7**		**1.2**		**0.43**		**0.282**		**5.3**		**5.9**		**3900**		**0.42**		**6.4**		**22**		**23**	
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		0.25	U	0.25	U	**0.85**		0.25	U	0.25	U	0.25	U	0.25	U
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		0.25	U	0.25	U	4.4	U	0.25	U	0.25	U	0.29	U	0.29	U
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**0.32**		**0.16**	J1	0.25	U	0.25	U	0.250	U	**0.92**		**0.73**		**170**		0.25	U	**0.83**		**3.2**		**3.2**	
15	9	2,3,4,5-Tetrachlorophenol	**0.27**		0.25	U	0.25	U	0.25	U	NA		0.25	U	0.25	U	**15**	J1	0.25	U	0.25	U	0.25	U	0.25	U
16	10																									
17	11	**SEMIVOLATILES (µg/L)**																								
18	12	**EPA Method SW8270**																								
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	5.00	U	2.0	U	2.0	U	2.0	U	2.0	U	**170**	J2	2.0	U	2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	5.00	U	1.0	U	1.0	U	1.0	U	1.0	U	**27**		1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	10.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	NA		10	U	10	U	10	U	10	U	**29**		10	U	10	U
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	**39**		1.0	U	1.0	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	**55**		1.0	U	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.00	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.00	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	10.0	U	**5.6**		**8.2**		**4200**		5.0	U	**2.3**	J1	**22**		**21**	
32	26	bis(2-Ethylhexyl)phthalate	**2.0**		**2.8**	J2	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
33	27																									
34	28	**VOLATILES (µg/L)**																								
35	29	**EPA Method SW8260**																								
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**12**		**13**	
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	**1.8**		1.0	U	1.0	U	1.0	U	1.0	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	**3.8**		1.0	U	1.0	U	**1.0**	J1	**1.4**	
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	**20**		1.0	U	**8.1**		**1.4**		**1.9**	
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	**5.7**		1.0	U	1.0	U	1.0	U	1.0	U
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	**77**		1.0	U	1.0	U	**10**	J2	**13**	J2
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	**5.3**		1.0	U	1.0	U	1.0	U	**1.1**	
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	**6.0**		1.0	U	1.0	U	1.0	U	1.0	U
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	UJ	**5.9**		1.0	U	1.0	U	1.0	U	1.0	U
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	**2.5**		1.0	U	1.0	U	1.0	U	1.0	U
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	NA		5.0	U	5.0	U	**7.1**		5.0	U	5.0	U	5.0	U	5.0	U
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	51	**Method OR-DEQ**																								
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	NA		**0.44**		**0.32**		**3.6**		0.25	U	0.25	U	**0.42**		**0.56**	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																									
63	56	**PRIORITY POLLUTANT**																								
64	57	**METALS (mg/L)**																								
65	58	Arsenic (7060)	0.001	U	**0.002**		0.05	U	0.05	U	NA		**0.001**		0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
2				Dup of LW4S																							
3		LW4S		LW40S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S	
4		BC27Q		BC27O		BH96D		BR55C		CB68C		CL03F		CT67C		DE87J		DM30C		DW29F		ED30G		EN00G		ER93K	
5		12/9/99		12/9/99		2/17/00		5/22/00		8/30/00		11/9/00		2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02	
7	**CHLORINATED PHENOLS (µg/L)**																										
8	**EPA Method SW8040**																										
9	Pentachlorophenol	**5.4**		**5.4**		**2.5**		**740**	J2	**7200**		**48**		0.25	U	0.25	U	0.25	U	0.25	U	**2.0**		NA		NA	
10	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	**0.35**	J2	**2.2**		0.25	U	NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	**0.27**	J2	**6.1**		0.25	U	NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	**2.7**	J2	37	U	3.8	U	NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	**2.9**		0.25	U	NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**0.63**		**0.59**		**0.32**		**190**	J2	**730**		**4.1**		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	**1.6**		**130**		**5.9**		NA		NA		NA		NA		NA		NA		NA	
16																											
17	**SEMIVOLATILES (µg/L)**																										
18	**EPA Method SW8270**																										
19	Phenol	2.0	U	2.0	U	2.0	UJ	2.0	U	200	U	**730**		**100**		2.0	U	**3.3**		2.0	U	2.1	U	**56**		**210**	
20	4-Methylphenol	1.0	U	1.0	U	1.0	UJ	1.0	U	**3.6**	M	**120**		**210**		**1.7**		1.0	U	1.0	U	1.1	U	22	U	**50**	
21	Isophorone	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.0	U	1.2	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	UJ	3.0	U	3.0	U	9.0	U	**4.4**		**3.1**		**5.9**		3.0	U	3.2	U	3.0	U	3.8	U
23	Benzoic Acid	10	U	10	U	10	UJ	10	U	**44**		**96**		**200**		10	U	10	U	30	U	53	U	50	U	62	U
24	Naphthalene	1.0	U	1.0	U	1.0	UJ	**15**		**21**		**13**		**8.5**		**19**		**19**		1.0	U	1.1	U	**14**		**5.6**	
25	2-Methylnaphthalene	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	**5.7**		**3.6**		**9.5**		**12**		1.0	U	1.1	U	**7.5**		**2.1**	
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	UJ	5.0	U	5.0	U	15	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	**17**		**7.7**	
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	UJ	5.0	U	5.0	U	15	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	**8.9**		6.2	U
28	Acenaphthene	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.0	U	1.2	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.0	U	1.2	U
30	Fluorene	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.0	U	1.2	U
31	Pentachlorophenol	**4.9**	J1	**4.4**	J1	5.0	UJ	**760**	J2	**9400**	J2	**120**		5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	**2200**		**770**	
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.1	UJ	1.0	U	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**120**		4.0	U	5	U
33																											
34	**VOLATILES (µg/L)**																										
35	**EPA Method SW8260**																										
36	Acetone	5.0	U	5.0	U	5.0	U	**25**		**83**		**49**		**41**		5.0	U	15	U	5.0	U	5.0	U	**120**		**320**	
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	3	U
38	2-Butanone	5.0	U	5.0	U	5.0	U	**18**		25	U	**110**		**100**		5.0	U	15	U	5.0	U	5.0	U	**58**		**27**	
39	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U	**7.4**		**110**		**80**		**78**		1.0	U	1.0	U	**4.1**		3	U
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	3	U
41	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	**9.2**		**19**		**25**		**41**		**6.9**		1.0	U	1.0	U	**7.5**		**10**	
42	Ethylbenzene	1.0	U	1.0	U	1.0	U	**9.8**		**94**		**61**		**79**		**190**		**140**		1.0	U	1.0	U	**68**		**94**	J
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	3	U
44	m,p-Xylene	1.0	U	1.0	U	1.0	U	**17**		**110**		**170**		**240**		**600**		**460**		1.0	U	1.0	U	**95**		**150**	
45	o-Xylene	1.0	U	1.0	U	1.0	U	**140**		**210**		**88**		**120**		**240**		**180**		1.0	U	1.0	U	**180**		**180**	
46	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	**3.2**		**140**		**46**		**58**		**130**		**94**		1.0	U	1.0	U	**58**		**150**	J
47	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	**33**		**500**		**160**		**130**		**350**		**280**		**1.5**		1.0	U	**230**		**540**	J
48	Isopropylbenzene	1.0	U	1.0	U	1.0	U	**28**		**48**		**19**		**28**		**62**		**37**		1.0	U	1.0	U	**38**		**63**	J
49	n-Propylbenzene	1.0	U	1.0	U	1.0	U	**9.8**		**79**		**27**		**36**		**79**		**48**		**1.1**		1.0	U	**43**		**94**	J
50	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	**3.4**		5.0	U	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U	1.0	U	**3.1**		3	U
51	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	**26**		**25**		**7.7**		**7.0**		1.0	U	3.0	U	1.0	U	1.0	U	**16**		**21**	J
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	**19**		**4.8**		**4.9**		**9.9**		**6.7**		1.0	U	1.0	U	**8.8**		**16**	
53	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.6	U	13	U	6.8	U	**6.2**		10	U	7.5	U	1.0	U	1.0	U	7.9		**11**	J
54	Naphthalene	5.0	U	5.0	U	5.0	U	**26**		**31**		**19**		**18**		**48**		**27**		5.0	U	5.0	U	**21**		15	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																											
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	**Method OR-DEQ**																										
59	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	**3.6**		**15**		**19**		**3.4**		**7.9**		**4.1**		0.25	U	**0.34**		**25**		**9.9**	
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		5.0	U	NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																											
63	**PRIORITY POLLUTANT**																										
64	**METALS (mg/L)**																										
65	Arsenic (7060)	0.001	U	0.001	U	0.001	U	**0.001**		**0.004**		**0.006**		**0.009**		**0.008**		**0.010**		**0.002**		0.001	U	**0.002**		**0.006**	

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ
1											
2											
3		LW4S		LW4S		LW4S		LW4S		LW4S	
4		EZ17E		FF65F		FL58F		FU45O		FY82K	
5		11/13/02		2/11/03		5/8/03		8/28/03		10/24/03	
6											
7	**CHLORINATED PHENOLS (µg/L)**										
8	**EPA Method SW8040**										
9	Pentachlorophenol	**1.5**		0.26	U	NA		NA		**3.9**	
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA	
16											
17	**SEMIVOLATILES (µg/L)**										
18	**EPA Method SW8270**										
19	Phenol	2.2	U	2	U	2	U	2	U	2	U
20	4-Methylphenol	1.1	U	1	U	1	U	1	U	1	U
21	Isophorone	1.1	U	1	U	1	U	1	U	1	U
22	2,4-Dimethylphenol	3.3	U	3.1	U	3	U	3	U	3	U
23	Benzoic Acid	54	U	51	U	50	U	50	U	10	U
24	Naphthalene	1.1	U	1	U	**4.8**		1	U	1	U
25	2-Methylnaphthalene	1.1	U	1	U	1	U	1	U	1	U
26	2,4,6-Trichlorophenol	5.4	U	5.1	U	5	U	5	U	5	U
27	2,4,5-Trichlorophenol	5.4	U	5.1	U	5	U	5	U	5	U
28	Acenaphthene	1.1	U	1	U	1	U	1	U	1	U
29	Dibenzofuran	1.1	U	1	U	1	U	1	U	1	U
30	Fluorene	1.1	U	1	U	1	U	1	U	1	U
31	Pentachlorophenol	5.4	U	5.1	U	**1400**		**17**		5	U
32	bis(2-Ethylhexyl)phthalate	4.3	U	1	U	**1**		1	U	1	U
33											
34	**VOLATILES (µg/L)**										
35	**EPA Method SW8260**										
36	Acetone	19	U	5	U	**7.2**	M	5	U	5	U
37	Carbon Disulfide	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	5	U	5	U	5	U	5	U	5	U
39	Benzene	1	U	1	U	**3.2**		1	U	1	U
40	Bromoform	1	U	1	U	1	U	1	U	1	U
41	Toluene	1	U	1	U	1	U	1	U	1	U
42	Ethylbenzene	**4.8**		1	U	**11**		1	U	1	U
43	Styrene	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	**3.8**		1	U	**14**		1	U	1	U
45	o-Xylene	**5.9**		1	U	**59**		1	U	1	U
46	1,3,5-Trimethylbenzene	**1.7**		1	U	**18**		1	U	1	U
47	1,2,4-Trimethylbenzene	**19**		1	U	**210**		**1.2**	J	**1.4**	
48	Isopropylbenzene	**4.5**		1	U	**24**		1	U	1	U
49	n-Propylbenzene	**5.4**		1	U	**27**		1	U	1	U
50	tert-Butylbenzene	1	U	1	U	**1.7**		1	U	1	U
51	sec-Butylbenzene	**2**		1	U	**8.3**		1	U	1	U
52	4-Isopropyltoluene	1	U	1	U	**5.7**		1	U	1	U
53	n-Butylbenzene	1	U	1	U	**5**	M	1	U	1	U
54	Naphthalene	5	U	5	U	**42**		5	U	5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA	
56											
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**										
58	**Method OR-DEQ**										
59	**TPH-Diesel**	**3.2**		0.25	U	**5.3**		**0.36**		**0.26**	
60	**TPH-D Motor Oil**	NA		NA		NA		NA		0.5	U
61	**TPH-Gasoline**	NA		NA		NA		NA		NA	
62											
63	**PRIORITY POLLUTANT**										
64	**METALS (mg/L)**										
65	Arsenic (7060)	0.05	U	0.001	U	0.001	U	**0.002**		**0.001**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																									Dup of LW4S	
3			LW4S		LW4S		LW4S		LW4S		LW4S (a)		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW40S	
4			S167J		T176G		U235O		V232E		B802035-01		W391F		Y314F		Z225K		Z960L		AH49G		AU45B		AU45A	
5			4/1/97		7/15/97		10/22/97		1/30/98		1/30/98		5/20/98		8/17/98		11/14/98		2/18/99		5/18/99		9/22/99		9/22/99	
66	59	Chromium (6010)	0.005	U	**0.015**		0.005	U	0.005	U	NA		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	**0.004**		**0.015**		0.002	U	**0.004**		NA		0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U
68	61	Lead (7421)	0.001	U	**0.006**		0.02	U	0.02	U	NA		0.001	U	0.001	U	0.001	U	0.001	U	**0.002**		0.001	U	0.001	U
69	62	Nickel (6010)	**0.02**		**0.02**		0.01	U	0.01	U	NA		0.01	U	0.01	U	0.01	U	0.01	U	**0.01**		0.01	U	0.01	U
70	63	Zinc (6010)	**0.008**		**0.035**		0.004	U	**0.009**		NA		**0.005**	J2	0.004	U	**0.005**		**0.009**	J2	**0.011**		**0.007**		0.004	U
71	64																									
72	65	**MAJOR IONS AND CONVENTIONALS**																								
73	66	Calcium (mg/L) (6010)	**20.7**		**20.4**		**16.9**		**15.1**		NA		NA		NA		NA		**10.7**		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**5.92**		**7.1**		**4.46**		**4.60**		NA		NA		NA		NA		**2.98**		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**3.9**		**4.5**		**4.2**		**3.5**		NA		NA		NA		NA		**2.6**		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**13.2**		**13.7**		**11.6**		**10.0**		NA		NA		NA		NA		**6.10**		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**75**		**64**		**62**		**64**		NA		NA		NA		NA		**43**		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		1.0	U	NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**75**		**64**		**62**		**64**		NA		NA		NA		NA		**43**		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**140**	J2	**110**		**140**	J2	NA		160		160		180		**110**		**140**		**150**		**160**	
81	74	Chloride (mg/L) (EPA 325.2)	**4.5**	J	**3.1**		**3.5**		**2.1**		NA		4.5		4.3		13		1.0	U	**2.2**		**7.1**		**6.9**	
82	75	N-Nitrate (mg-N/L) (Calculated)	**11**	J	**3.3**		**5.1**		**4.2**	J2	NA		NA		NA		NA		**1.8**		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	0.010	U	0.010	U	0.010	U	**0.021**	J2	NA		NA		NA		NA		0.010	U	NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**11**	J	**3.3**		**5.1**		**4.3**	J2	NA		NA		NA		NA		**1.8**		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	**13**	J	**15**		**4.5**		**6.8**		NA		NA		NA		NA		**6.5**		NA		NA		NA	
86	79																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2				Dup of LW4S																							
3		LW4S		LW40S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S	
4		BC27Q		BC27O		BH96D		BR55C		CB68C		CL03F		CT67C		DE87J		DM30C		DW29F		ED30G		EN00G		ER93K	
5		12/9/99		12/9/99		2/17/00		5/22/00		8/30/00		11/9/00		2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	0.002	U	0.002	U	0.002	U	**0.008**		**0.016**		**0.008**		0.002	U	**0.002**		0.002	U	0.002	U	0.002	U	**0.085**		**0.05**	
68	Lead (7421)	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	**0.001**		**0.002**		0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	**0.001**	
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	**0.01**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.03**		0.01	U
70	Zinc (6010)	0.008	U	0.006	U	0.006	U	0.006	U	0.006	U	**0.009**		0.006	U	0.006	U	**0.007**		0.006	U	0.006	U	0.006	U	**0.011**	
71																											
72	**MAJOR IONS AND CONVENTIONALS**																										
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		**164**		**149**		**144**		**13.9**		**25.8**		**163**		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		**56.0**		**48.2**		**43.6**		**4.06**		**7.66**		**49.6**		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		**5.6**		**5.9**		**6.4**		**2.5**		**3.5**		**7.9**		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		**9.87**		**9.35**		**11.5**		**4.35**		**7.39**		**15.0**		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		**810**		NA		NA		NA		**80**		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		**810**		NA		NA		NA		**80**		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**120**		**120**		**150**		**490**		**420**		**990**		**760**		**720**	J	**580**	J	**95**		**300**		**890**		**380**	
81	Chloride (mg/L) (EPA 325.2)	**4.3**		**4.5**		**3.5**		**9.9**		**4.6**		**7.7**		**7.5**	J	**5.3**		**7.1**		**1.7**		**6.7**	J	**9.4**		**5.2**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**8.4**		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		**0.013**	J	NA		NA		NA		**0.022**		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**8.4**		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		**8.4**		NA		NA		NA		**18**		NA		NA	
86																											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ
1											
2											
3		LW4S		LW4S		LW4S		LW4S		LW4S	
4		EZ17E		FF65F		FL58F		FU45O		FY82K	
5		11/13/02		2/11/03		5/8/03		8/28/03		10/24/03	
66	Chromium (6010)	**0.07**		0.005	U	0.005	U	0.005	U	**0.006**	
67	Copper (6010)	**0.163**		**0.002**		**0.028**		**0.003**		**0.006**	
68	Lead (7421)	**0.04**		0.001	U	0.001	U	0.001	U	0.001	U
69	Nickel (6010)	**0.11**		0.01	U	**0.01**		0.01	U	0.01	U
70	Zinc (6010)	**0.17**		0.006	U	0.006	U	0.006	U	**0.009**	
71											
72	**MAJOR IONS AND CONVENTIONALS**										
73	Calcium (mg/L) (6010)	NA		**7.7**		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		**2.25**		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		**1.8**		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		**4**		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		**36**		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		1	U	NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		**36**		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**320**		**66**		**290**		**200**		**140**	
81	Chloride (mg/L) (EPA 325.2)	**7.3**		1	U	**9.8**		**5.8**		**3**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		**0.76**		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		0.01	U	NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		**0.76**		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		**6.4**		NA		NA		NA	
86											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																									Dup of LW4S	
3			LW4S		LW4S		LW4S		LW4S		LW4S (a)		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW40S	
4			S167J		T176G		U235O		V232E		B802035-01		W391F		Y314F		Z225K		Z960L		AH49G		AU45B		AU45A	
5			4/1/97		7/15/97		10/22/97		1/30/98		1/30/98		5/20/98		8/17/98		11/14/98		2/18/99		5/18/99		9/22/99		9/22/99	
87	80	**FIELD PARAMETERS**																								
88	81	pH (avg)	6.46		6.86		6.76		6.61		6.61		6.08		6.23		6.33		6.31		5.67		6.51		6.49	
89	82	Temperature (° C) (avg)	11.3		17.0		14.9		12.1		12.1		12.6		16.6		14.3		10.0		13.3		15.4		15.4	
90	83	Conductivity (um/hos)	212		212		173		163		163		263		301		111		110		192		229		229	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		NA		2.41		2.15		1.75		4.54		2.58		1.74		1.67	
92	85																									
93	86	**DIOXINS AND FURANS (ng/L)**																								
94	87	**Method 8290**																								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																										
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																										

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2				Dup of LW4S																							
3		LW4S		LW40S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S	
4		BC27Q		BC27O		BH96D		BR55C		CB68C		CL03F		CT67C		DE87J		DM30C		DW29F		ED30G		EN00G		ER93K	
5		12/9/99		12/9/99		2/17/00		5/22/00		8/30/00		11/9/00		2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02	
87	**FIELD PARAMETERS**																										
88	pH (avg)	6.57		6.57		6.48		6.28		5.70		5.74		6.31		6.80		6.75		6.21		5.64		6.23		6.68	
89	Temperature (° C) (avg)	13.0		12.9		13.1		14.5		15.1		14.3		13.5		14.2		16.2		14.6		12.6		14.4		15.8	
90	Conductivity (um/hos)	177		177		209		478		433		884		809		1400		973		129		253		843		477	
91	Dissolved oxygen (mg/L) (avg)	4.58		4.75		0.93		1.91		1.36		0.62		0.00		0.00		0.84		4		7.53		5.19		0.62	
92																											
93	**DIOXINS AND FURANS (ng/L)**																										
94	**Method 8290**																										
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																											
121	**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ
1											
2											
3		LW4S		LW4S		LW4S		LW4S		LW4S	
4		EZ17E		FF65F		FL58F		FU45O		FY82K	
5		11/13/02		2/11/03		5/8/03		8/28/03		10/24/03	
87	**FIELD PARAMETERS**										
88	pH (avg)	6.2		6.59		6.33		6.82		6.65	
89	Temperature (° C) (avg)	16.1		10.9		13		16.1		15.2	
90	Conductivity (um/hos)	465		85		383		231		217	
91	Dissolved oxygen (mg/L) (avg)	2.03		0		2.4		1.86		2.95	
92											
93	**DIOXINS AND FURANS (ng/L)**										
94	**Method 8290**										
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA	
120											
121	**ETHANOL (mg/L)**	NA		NA		NA		NA		NA	
122											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																									Dup of LW4S	
3			LW4S		LW4S		LW4S		LW4S		LW4S (a)		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW40S	
4			S167J		T176G		U235O		V232E		B802035-01		W391F		Y314F		Z225K		Z960L		AH49G		AU45B		AU45A	
5			4/1/97		7/15/97		10/22/97		1/30/98		1/30/98		5/20/98		8/17/98		11/14/98		2/18/99		5/18/99		9/22/99		9/22/99	
123		**PAHs (µg/L)**																								
124		**EPA Method SW8270 SIM**																								
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2				Dup of LW4S																							
3		LW4S		LW40S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S	
4		BC27Q		BC27O		BH96D		BR55C		CB68C		CL03F		CT67C		DE87J		DM30C		DW29F		ED30G		EN00G		ER93K	
5		12/9/99		12/9/99		2/17/00		5/22/00		8/30/00		11/9/00		2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02	
123	**PAHs (µg/L)**																										
124	**EPA Method SW8270 SIM**																										
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ
1											
2											
3		LW4S		LW4S		LW4S		LW4S		LW4S	
4		EZ17E		FF65F		FL58F		FU45O		FY82K	
5		11/13/02		2/11/03		5/8/03		8/28/03		10/24/03	
123	**PAHs (µg/L)**										
124	**EPA Method SW8270 SIM**										
125	Naphthalene	NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z			
2					Dup of LW5S																								
3			LW5S		LW5D		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S				
4			S167E		S167F		T160A		U235G		V232G		W391C		Y336E		Z225G		Z960J		AH49F		AU22E		BC27C				
5			3/31/97		3/31/97		7/14/97		10/22/97		1/30/98		5/19/98		8/18/98		11/13/98		2/18/99		5/18/99		9/20/99		12/7/99				
7	1	**CHLORINATED PHENOLS (µg/L)**																											
8	2	**EPA Method SW8040**																											
9	3	Pentachlorophenol	**0.25**		**0.26**		**0.24**	J1	**0.25**		**0.27**		**0.18**	J1	**0.18**	J1	0.25	U	**0.25**		0.25	U	**0.13**	J1	0.25	U			
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U			
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U			
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U			
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U			
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U			
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U			
16	10																												
17	11	**SEMIVOLATILES (µg/L)**																											
18	12	**EPA Method SW8270**																											
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U			
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U			
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U			
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U			
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U			
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U			
32	26	bis(2-Ethylhexyl)phthalate	1.0	UJ	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
33	27																												
34	28	**VOLATILES (µg/L)**																											
35	29	**EPA Method SW8260**																											
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U			
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U			
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U			
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA				
56	49																												
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																											
58	51	**Method OR-DEQ**																											
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U			
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA				
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA				
62	55																												
63	56	**PRIORITY POLLUTANT**																											
64	57	**METALS (mg/L)**																											
65	58	Arsenic (7060)	**0.001**		**0.002**		**0.002**		0.05	U	0.05	U	**0.003**		**0.003**		**0.003**		**0.008**		**0.003**		**0.003**		**0.002**				

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
3		LW5S		LW5S		LW5S		LW5S		LW5S	
4		BH96C		BR64F		CT37E		ED16F		FF88C	
5		2/17/00		5/24/00		2/12/01		2/25/02		2/13/03	
7	**CHLORINATED PHENOLS (µg/L)**										
8	**EPA Method SW8040**										
9	Pentachlorophenol	**0.18**	J1	0.25	U	0.25	U	0.25	U	0.25	U
10	2,4,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA	
11	2,3,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA	
12	2,4,5-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA	
13	2,3,4-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA	
17	**SEMIVOLATILES (µg/L)**										
18	**EPA Method SW8270**										
19	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2	U
20	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1	U
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3	U
23	Benzoic Acid	10	U	10	U	10	U	50	U	50	U
24	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
25	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5	U
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1	U
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5	U
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	4.0	U	1	U
34	**VOLATILES (µg/L)**										
35	**EPA Method SW8260**										
36	Acetone	5.0	U	5.0	U	6.6	U	5.0	U	5	U
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1	U
38	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5	U
39	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1	U
41	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
42	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
44	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
45	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
46	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
47	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
48	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
49	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
50	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
51	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
53	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1	U
54	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA	
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**										
58	**Method OR-DEQ**										
59	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA		NA	
63	**PRIORITY POLLUTANT**										
64	**METALS (mg/L)**										
65	Arsenic (7060)	**0.003**		**0.003**		**0.002**		**0.003**		**0.003**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2					Dup of LW5S																					
3			LW5S		LW5D		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S	
4			S167E		S167F		T160A		U235G		V232G		W391C		Y336E		Z225G		Z960J		AH49F		AU22E		BC27C	
5			3/31/97		3/31/97		7/14/97		10/22/97		1/30/98		5/19/98		8/18/98		11/13/98		2/18/99		5/18/99		9/20/99		12/7/99	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.028**		0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	**0.004**		**0.004**		0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.027**		0.002	U	0.002	U	0.002	U
68	61	Lead (7421)	**0.004**		**0.003**		**0.002**		0.02	U	0.02	U	0.001	U	0.001	U	0.001	U	**0.036**		0.001	U	0.001	U	0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.02**		0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	**0.008**		**0.011**		**0.004**		**0.005**		**0.004**		**0.008**	J2	0.004	U	**0.006**		**0.081**		0.004	U	0.004	U	0.006	U
71	64																									
72	65	**MAJOR IONS AND CONVENTIONALS**																								
73	66	Calcium (mg/L) (6010)	**18.5**		**18.8**		**16**		**11.5**		**14.2**		NA		NA		NA		**22.3**		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**5.42**		**5.51**		**4.67**		**3.22**		**3.96**		NA		NA		NA		**9.38**		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**3.5**		**3.5**		**2.7**		**2.8**		**3.0**		NA		NA		NA		**4.8**		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**11.6**		**11.8**		**10.3**		**10.2**		**10.3**		NA		NA		NA		**13.4**		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**86**		**82**		**72**		**58**		**77**		NA		NA		NA		**78**		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**86**		**82**		**72**		**58**		**77**		NA		NA		NA		**78**		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		NT		**130**		**100**		**120**	J2	110		97		98		**120**		**160**		**120**		**110**	
81	74	Chloride (mg/L) (EPA 325.2)	1.0	U	**5.6**	J	**1.8**		**1.4**		**1.5**		2.5		1.0	U	1.5		**1.5**		**2.4**		**1.4**		**1.9**	
82	75	N-Nitrate (mg-N/L) (Calculated)	**0.75**	J	0.010	U	**1.3**		**0.40**		**0.044**	J2	NA		NA		NA		**1.0**		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	0.010	U	**0.022**	J	0.010	U	0.010	U	**0.010**	J2	NA		NA		NA		**0.034**		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.75**	J	**0.016**	J	**1.3**		**0.40**		**0.054**	J2	NA		NA		NA		**1.0**		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	**11**	J	**4.0**	J	**10**		**5.7**		**6.7**		NA		NA		NA		**9.5**		NA		NA		NA	
86	79																									

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
1											
2											
3		LW5S		LW5S		LW5S		LW5S		LW5S	
4		BH96C		BR64F		CT37E		ED16F		FF88C	
5		2/17/00		5/24/00		2/12/01		2/25/02		2/13/03	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	**0.013**	
68	Lead (7421)	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)	0.006	U	0.006	U	0.006	U	0.006	U	**0.013**	
71											
72	**MAJOR IONS AND CONVENTIONALS**										
73	Calcium (mg/L) (6010)	NA		NA		**16.3**		**22.4**		**20.5**	
74	Magnesium (mg/L) (6010)	NA		NA		**4.44**		**6.49**		**5.99**	
75	Potassium (mg/L) (6010)	NA		NA		**2.6**		**3.4**		**3**	
76	Sodium (mg/L) (6010)	NA		NA		**9.64**		**11.4**		**10.1**	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		**81**		**100**		**88**	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		1.0	U	1.0	U	1	U
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		**81**		**100**		**88**	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**100**		**97**		**140**		**150**		**140**	
81	Chloride (mg/L) (EPA 325.2)	**1.9**		**1.6**		**6.3**		**1.1**		**2.1**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		**1.2**		**1.6**		**0.73**	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		0.010	U	0.010	U	0.01	U
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		**1.2**	J	**1.6**		**0.73**	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		**9.1**		**9.0**		**10**	
86											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2					Dup of LW5S																					
3			LW5S		LW5D		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S	
4			S167E		S167F		T160A		U235G		V232G		W391C		Y336E		Z225G		Z960J		AH49F		AU22E		BC27C	
5			3/31/97		3/31/97		7/14/97		10/22/97		1/30/98		5/19/98		8/18/98		11/13/98		2/18/99		5/18/99		9/20/99		12/7/99	
87	80	**FIELD PARAMETERS**																								
88	81	pH (avg)	6.56		6.56		6.58		6.74		6.86		6.24		6.33		6.19		6.65		5.79		6.43		6.33	
89	82	Temperature (° C) (avg)	11.7		11.7		14.3		14.7		13.8		13.0		16.0		13.3		14.2		12.8		17.2		13.1	
90	83	Conductivity (um/hos)	175		175		197		125		175		177		171		80		169		200		146		133	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		NA		3.37		1.83		1.86		5.67		2.40		2.38		2.85	
92	85																									
93	86	**DIOXINS AND FURANS (ng/L)**																								
94	87	**Method 8290**																								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																										
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																										

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
1											
2											
3		LW5S		LW5S		LW5S		LW5S		LW5S	
4		BH96C		BR64F		CT37E		ED16F		FF88C	
5		2/17/00		5/24/00		2/12/01		2/25/02		2/13/03	
87	**FIELD PARAMETERS**										
88	pH (avg)	6.49		6.42		6.17		5.91		6.79	
89	Temperature (° C) (avg)	11.8		14.6		13.7		12.4		13.3	
90	Conductivity (um/hos)	149		144		148		221		208	
91	Dissolved oxygen (mg/L) (avg)	2.51		2.85		2.08		5.42		0	
92											
93	**DIOXINS AND FURANS (ng/L)**										
94	**Method 8290**										
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA	
120											
121	**ETHANOL (mg/L)**	NA		NA		NA		NA		NA	
122											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2					Dup of LW5S																					
3			LW5S		LW5D		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S	
4			S167E		S167F		T160A		U235G		V232G		W391C		Y336E		Z225G		Z960J		AH49F		AU22E		BC27C	
5			3/31/97		3/31/97		7/14/97		10/22/97		1/30/98		5/19/98		8/18/98		11/13/98		2/18/99		5/18/99		9/20/99		12/7/99	
123		**PAHs (µg/L)**																								
124		**EPA Method SW8270 SIM**																								
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
1											
2											
3		LW5S		LW5S		LW5S		LW5S		LW5S	
4		BH96C		BR64F		CT37E		ED16F		FF88C	
5		2/17/00		5/24/00		2/12/01		2/25/02		2/13/03	
123	**PAHs (µg/L)**										
124	**EPA Method SW8270 SIM**										
125	Naphthalene	NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z			
2							Dup of LW7S																						
3			LW7S		LW7S		LW7D		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S				
4			S167M		T176S		T176T		U235W		V208D		W371I		Y314G		Z225R		Z960N		AH27E		AU22F		BB82A				
5			4/1/97		7/16/97		7/16/97		10/23/97		1/28/98		5/18/98		8/17/98		11/12/98		2/17/99		5/17/99		9/20/99		12/6/99				
7	1	**CHLORINATED PHENOLS (µg/L)**																											
8	2	**EPA Method SW8040**																											
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U			
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U			
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U			
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U			
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U			
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U			
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U			
16	10																												
17	11	**SEMIVOLATILES (µg/L)**																											
18	12	**EPA Method SW8270**																											
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U			
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U			
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U			
24	18	Naphthalene	**23**		**43**		**42**		**13**		**13**		**19**	J2	**10**		**6.5**		**4.0**		**17**		**19**		**7.8**				
25	19	2-Methylnaphthalene	**6.9**		**16**		**15**		**7.4**		**4.1**		**5.9**	J2	**4.6**		**3.4**		**1.2**		**4.7**		**11**		**7.4**				
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U			
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U			
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U			
32	26	bis(2-Ethylhexyl)phthalate	1.0	UJ	1.0	U	**3.6**	J2	2.7	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
33	27																												
34	28	**VOLATILES (µg/L)**																											
35	29	**EPA Method SW8260**																											
36	30	Acetone	5.0	U	20	U	10	U	5.0	U	57	U	5.0	U	5.0	U	**23**		13	U	**29**		5.0	U	5.0	U			
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
38	32	2-Butanone	**8.8**		**9.0**	J2	**12**	J2	5.0	U	**5.8**		**8.9**		**8.1**		**11**		**10**		**20**		5.0	U	5.0	U			
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
42	36	Ethylbenzene	**160**		**140**		**160**		**86**		**71**		**62**		**69**		**36**		**14**		**56**		**80**		**40**				
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
44	38	m,p-Xylene	**110**		**100**		**120**		**37**		**43**		**30**		**33**		**21**		**8.4**		**22**		**28**		**17**				
45	39	o-Xylene	**4.2**		**3.9**		**4.4**		**1.3**		**1.3**		**1.6**		**1.6**		**1.1**		1.0	U	**1.0**		**1.6**		1.0	U			
46	40	1,3,5-Trimethylbenzene	**15**		**24**		**25**		**21**		**6.4**		**9.1**		**5.9**		**8.0**		**2.0**		**8.3**		**4.4**		**2.4**				
47	41	1,2,4-Trimethylbenzene	**81**		**86**		**100**		**30**	J2	**15**		**9.9**		**7.0**		**2.9**		**3.7**		**17**		**6.3**		**2.5**				
48	42	Isopropylbenzene	**22**		**45**		**42**		**60**	J2	**20**		**29**		**33**		**38**		**7.9**		**27**		**36**		**29**				
49	43	n-Propylbenzene	**31**		**64**		60		**78**		**34**		**43**		**46**		**59**		**13**		**42**		**48**		**41**				
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
51	45	sec-Butylbenzene	**2.4**		**4.9**		**4.6**		**5.7**	J2	**3.6**		**3.6**		**4.1**	J2	**4.5**		**1.8**		**3.1**		**4.0**		**3.4**				
52	46	4-Isopropyltoluene	**2.5**		**4.2**		**4.2**		**3.4**	J2	**1.6**		**2.3**		**2.4**		**2.1**		1.0	U	**2.0**		**2.2**		**1.4**				
53	47	n-Butylbenzene	**3.6**		**7.4**		**7.4**		**6.4**	J2	5.0		**4.4**		**5.2**		**5.3**		**2.5**		**3.4**		**5.2**		**4.3**	M			
54	48	Naphthalene	**64**		**66**	J2	**87**	J2	**35**	J2	**37**		**28**		**32**		**22**		**9.1**		**29**		**41**		**9.6**				
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA				
56	49																												
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																											
58	51	**Method OR-DEQ**																											
59	52	**TPH-Diesel**	**0.48**		**0.54**		**0.48**		**0.56**		0.25	U	**0.40**		**0.28**		0.25	U	0.25	U	**0.27**		**0.54**		**0.40**				
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA				
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA				
62	55																												
63	56	**PRIORITY POLLUTANT**																											
64	57	**METALS (mg/L)**																											
65	58	Arsenic (7060)	**0.014**		**0.017**		**0.017**		0.05	U	0.05	U	**0.015**		**0.015**		**0.017**		**0.016**		**0.010**		**0.018**		**0.016**				

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
3		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S	
4		BH75E		BR55H		CB49A		CK77C		CT37A		DE68A		DM52J		DW29A		ED16G		EM75E		ER92A		EZ03M		FF88E	
5		2/15/00		5/23/00		8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/27/01		2/25/02		6/25/02		08/26/02		11/12/02		2/13/03	
7	**CHLORINATED PHENOLS (µg/L)**																										
8	**EPA Method SW8040**																										
9	Pentachlorophenol	0.25	U	0.25	UJ	0.25	U	0.25	U	0.25	UJ	0.25	U	0.25	U	**0.25**		0.25	U	0.25	U	0.28	U	0.25	U	0.26	U
10	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																											
17	**SEMIVOLATILES (µg/L)**																										
18	**EPA Method SW8270**																										
19	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.2	U	2.3	U	2	U
20	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.3	U	3.4	U	3.1	U
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U	56	U	57	U	51	U
24	Naphthalene	**1.6**		**5.7**		**12**		**5.2**		**3.7**		2.0		**1.8**		**1.3**		1.0	U	**9.0**		**5.2**		**1.8**		**2.1**	
25	2-Methylnaphthalene	1.0	U	**1.2**		**3.7**		**1.6**		**1.4**		1.0	U	1.0	U	1.0	U	1.0	U	**3.0**		**2**		1.1	U	1	U
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5.7	U	5.1	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5.7	U	5.1	U
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5.7	U	5.1	U
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**4.3**		4.0	U	4.0	U	4.4	U	4.5	U	1	U
33																											
34	**VOLATILES (µg/L)**																										
35	**EPA Method SW8260**																										
36	Acetone	5.0	U	5.0	U	56	U	110	U	83	U	5.0	U	5.0	U	5.0	U	21	U	5.0	U	48	U	86	U	20	U
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U
38	2-Butanone	5.0	U	5.0	U	9.3	U	5.0	U	**8.2**		5.0	U	**7.7**		5.0	U	5.0	U	**13**		6.6	U	**21**	M	**9.3**	M
39	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U
41	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U
42	Ethylbenzene	**5.6**		**19**		**40**		**23**		**15**		**4.6**		**18**		**17**		**8.6**		**31**		**42**		**24**		**8.3**	
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U
44	m,p-Xylene	**2.8**		**8.8**		**15**		**19**		**9.1**		**5.4**		**10**		**13**		**3.7**		**15**		**18**		**12**		**6.3**	
45	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	**2.3**		**2.1**		**3.0**		**2.8**		**1.5**		1.0	U	**1.6**		**1.4**		1.0	U	**20**		**4**		**1.4**		**1**	
47	1,2,4-Trimethylbenzene	1.1	U	**4.6**		**3.0**		**1.6**		**1.2**		1.0	U	**2.3**		1.0	U	**1.1**		**6.9**		**4.9**		**1.2**		**2.1**	
48	Isopropylbenzene	**8.1**		**11**		**18**		**22**		**16**		**1.3**		**21**		**20**		**6.1**		**20**		**26**		**26**		**14**	
49	n-Propylbenzene	**15**		**18**		**28**		**33**		**25**		**1.3**		**27**		**27**		**11**		**30**		**40**		**36**		**23**	
50	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U
51	sec-Butylbenzene	**1.7**		**1.4**		**2.3**		**2.6**		**2.3**		1.0	U	**2.2**		**2.3**		1.0	U	**2.6**		**3.3**		**3**		**2.2**	
52	4-Isopropyltoluene	1.0	U	**1.5**		**1.1**		**1.2**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.6**		**2.2**		**1.1**		1	U
53	n-Butylbenzene	2.4	U	1.5	U	**2.8**		**3.2**		**2.6**		1.0	U	**2.8**	M	3.1	U	**1.0**		2.6	U	3.7	U	**3.2**	M	**2.5**	M
54	Naphthalene	5.0	U	**12**		**18**		**13**		**5.7**		5.0	U	**7.0**		5.0	U	5.0	U	**14**		**12**		**5.4**		5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																											
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	**Method OR-DEQ**																										
59	**TPH-Diesel**	0.25	U	0.25	U	**0.32**		**0.32**		**0.32**		**20**		**0.26**		**0.42**		0.25	U	**0.31**		**0.53**		**0.5**		**0.31**	
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.5	U	NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																											
63	**PRIORITY POLLUTANT**																										
64	**METALS (mg/L)**																										
65	Arsenic (7060)	**0.017**		**0.016**		**0.015**		**0.015**		**0.016**		**0.016**		**0.019**		**0.017**		**0.017**		**0.017**		**0.015**		0.05	U	**0.017**	

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF
1							
2							
3		LW7S		LW7S		LW7S	
4		FL41B		FU45A		FY64F	
5		5/7/03		8/28/03		10/20/03	
6							
7	**CHLORINATED PHENOLS (µg/L)**						
8	**EPA Method SW8040**						
9	Pentachlorophenol	0.25	U	0.50	UJ	0.5	U
10	2,4,6-Trichlorophenol	NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA	
16							
17	**SEMIVOLATILES (µg/L)**						
18	**EPA Method SW8270**						
19	Phenol	2	U	2	U	2	U
20	4-Methylphenol	1	U	1	U	1	U
21	Isophorone	1	U	1	U	1	U
22	2,4-Dimethylphenol	3	U	3.1	U	3	U
23	Benzoic Acid	50	U	51	U	10	U
24	Naphthalene	**1.2**		**4.4**		**4.4**	
25	2-Methylnaphthalene	1	U	**1.3**		**1.9**	
26	2,4,6-Trichlorophenol	5	U	5.1	U	5	U
27	2,4,5-Trichlorophenol	5	U	5.1	U	5	U
28	Acenaphthene	1	U	1	U	1	U
29	Dibenzofuran	1	U	1	U	1	U
30	Fluorene	1	U	1	U	1	U
31	Pentachlorophenol	5	U	5.1	U	5	U
32	bis(2-Ethylhexyl)phthalate	1	U	1	U	1	U
33							
34	**VOLATILES (µg/L)**						
35	**EPA Method SW8260**						
36	Acetone	**36**	M	5	U	5	U
37	Carbon Disulfide	1	U	1	U	1	U
38	2-Butanone	**7.6**	M	**18**	M	**17**	M
39	Benzene	1	U	1	U	1	U
40	Bromoform	1	U	1	U	1	U
41	Toluene	1	U	1	U	1	U
42	Ethylbenzene	**10**	J	**42**		**29**	
43	Styrene	1	U	1	U	1	U
44	m,p-Xylene	**5**	J	**20**	J	**16**	
45	o-Xylene	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	1	U	**3.4**		**3.3**	
47	1,2,4-Trimethylbenzene	**1.1**	J	**3.2**	J	**2.2**	
48	Isopropylbenzene	**8.7**	J	**31**		**42**	
49	n-Propylbenzene	**14**	J	**40**		**54**	
50	tert-Butylbenzene	1	U	1	U	1	U
51	sec-Butylbenzene	**1.5**	J	**2.9**		**3.7**	
52	4-Isopropyltoluene	1	U	**1.2**		**1.6**	
53	n-Butylbenzene	**1.8**	J	**3**		**4.3**	
54	Naphthalene	5	U	**6.6**		**5.5**	
55	Methyl tert-butyl ether	NA		NA		1	U
56							
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**						
58	**Method OR-DEQ**						
59	**TPH-Diesel**	0.25	U	**0.54**		**0.6**	
60	**TPH-D Motor Oil**	NA		NA		0.5	U
61	**TPH-Gasoline**	NA		NA		**2.1**	
62							
63	**PRIORITY POLLUTANT**						
64	**METALS (mg/L)**						
65	Arsenic (7060)	**0.015**		**0.013**		**0.012**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2							Dup of LW7S																			
3			LW7S		LW7S		LW7D		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S	
4			S167M		T176S		T176T		U235W		V208D		W371I		Y314G		Z225R		Z960N		AH27E		AU22F		BB82A	
5			4/1/97		7/16/97		7/16/97		10/23/97		1/28/98		5/18/98		8/17/98		11/12/98		2/17/99		5/17/99		9/20/99		12/6/99	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	**0.004**		**0.002**		**0.002**		0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U
68	61	Lead (7421)	**0.003**		**0.005**		**0.005**		0.02	U	0.02	U	0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	**0.001**		0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	**0.015**		**0.005**		**0.005**		0.004	U	**0.004**		**0.007**	J2	**0.008**		0.004	U	**0.007**	J	0.006	U	**0.004**		**0.007**	
71	64																									
72	65	**MAJOR IONS AND CONVENTIONALS**																								
73	66	Calcium (mg/L) (6010)	**24.9**		**27.9**		**26.9**		**31.4**		**30.6**		NA		NA		NA		**29.8**		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**9.15**		**10.2**		**9.94**		**11.6**		**11.0**		NA		NA		NA		**10.8**		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**2.7**		**3.0**		**2.9**		**2.9**		**2.5**		NA		NA		NA		**2.9**		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**8.93**		**9.78**		**9.84**		**9.53**		**9.52**		NA		NA		NA		**9.86**		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**120**		**93**	**J2**	**130**	**J2**	**160**		**150**		NA		NA		NA		**140**		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**120**		**93**	J2	**130**	J2	**160**		**150**		NA		NA		NA		**140**		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**180**	J2	**150**	J2	**170**		**180**		130		130		140		**190**		**200**		**180**		**190**	
81	74	Chloride (mg/L) (EPA 325.2)	**3.6**	J	**3.5**		**3.6**		**3.0**		**2.4**		2.8		1.0	U	1.9		**3.0**		**3.0**		**2.6**		**5.0**	
82	75	N-Nitrate (mg-N/L) (Calculated)	**0.23**	J	0.010	U	0.010	U	**0.023**		**0.010**		NA		NA		NA		**0.24**		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	**0.015**	J	**0.021**	J2	**0.048**	J2	0.010	U	0.010	U	NA		NA		NA		**0.017**		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.25**	J	**0.016**	J2	**0.027**	J2	**0.023**		**0.010**		NA		NA		NA		**0.26**		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	**4.3**	J	**2.8**		**2.7**		2.5	U	2.5	U	NA		NA		NA		**7.7**		NA		NA		NA	
86	79																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
3		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S	
4		BH75E		BR55H		CB49A		CK77C		CT37A		DE68A		DM52J		DW29A		ED16G		EM75E		ER92A		EZ03M		FF88E	
5		2/15/00		5/23/00		8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/27/01		2/25/02		6/25/02		08/26/02		11/12/02		2/13/03	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.008**	
68	Lead (7421)	0.001	U	**0.001**		0.001	U	**0.002**		0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	**0.002**		**0.002**		0.02	U	**0.005**	
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.01**	
70	Zinc (6010)	0.006	U	0.006	U	0.006	U	**0.024**		0.006	U	**0.009**		0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	**0.037**	
71																											
72	**MAJOR IONS AND CONVENTIONALS**																										
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		**29.4**		**37.4**		**41.0**		**36.2**		**35.4**		NA		NA		NA		**47.7**	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		**10.5**		**13.4**		**15.3**		**13.0**		**13.3**		NA		NA		NA		**18.9**	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		**2.5**		**3.1**		**3.2**		**3.4**		**3.5**		NA		NA		NA		**4.1**	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		**13.0**		**15.6**		**18.8**		**18.8**		**19.4**		NA		NA		NA		**17.6**	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		**160**		NA		NA		NA		**180**		NA		NA		NA		**220**	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		1	U
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		**160**		NA		NA		NA		**180**		NA		NA		NA		**220**	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**190**		**160**		**190**		**210**		**200**		**250**		**250**		**230**		**230**		**260**		**290**		**250**		**240**	
81	Chloride (mg/L) (EPA 325.2)	**3.6**		**3.5**		**2.9**		**4.1**		**2.8**		**3.3**		**5.3**		**2.6**		**3.6**		**3.5**		**7.4**		**4.7**		**5.1**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		0.010	U	NA		NA		NA		0.010	U	NA		NA		NA		**0.053**	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		0.010	U	NA		NA		NA		0.010	U	NA		NA		NA		**0.013**	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		0.010	UJ	NA		NA		NA		0.010	U	NA		NA		NA		**0.066**	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		**3.0**		NA		NA		NA		**7.9**		NA		NA		NA		2.5	U
86																											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF
1							
2							
3		LW7S		LW7S		LW7S	
4		FL41B		FU45A		FY64F	
5		5/7/03		8/28/03		10/20/03	
66	Chromium (6010)	**0.016**		0.005	U	0.005	U
67	Copper (6010)	**0.014**		**0.002**		**0.003**	
68	Lead (7421)	**0.006**		**0.001**		0.001	U
69	Nickel (6010)	**0.03**		0.01	U	0.01	U
70	Zinc (6010)	**0.108**	J	0.006	U	0.006	U
71							
72	**MAJOR IONS AND CONVENTIONALS**						
73	Calcium (mg/L) (6010)	NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**230**		**220**		**220**	
81	Chloride (mg/L) (EPA 325.2)	**2.1**		**2.5**		**2.9**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA	
86							

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2							Dup of LW7S																			
3			LW7S		LW7S		LW7D		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S	
4			S167M		T176S		T176T		U235W		V208D		W371I		Y314G		Z225R		Z960N		AH27E		AU22F		BB82A	
5			4/1/97		7/16/97		7/16/97		10/23/97		1/28/98		5/18/98		8/17/98		11/12/98		2/17/99		5/17/99		9/20/99		12/6/99	
87	80	**FIELD PARAMETERS**																								
88	81	pH (avg)	6.76		6.73		6.74		6.91		6.79		6.35		6.51		6.35		6.84		5.72		6.22		6.13	
89	82	Temperature (° C) (avg)	13.7		16.2		16.0		15.4		15.2		14.4		16.6		14.1		13.7		14.5		16.3		13.6	
90	83	Conductivity (um/hos)	278		299		303		310		323		315		308		121		309		293		267		297	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		NA		NA		1.35		1.39		2.13		2.09		1.91		2.84	
92	85																									
93	86	**DIOXINS AND FURANS (ng/L)**																								
94	87	**Method 8290**																								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																										
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																										

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																											
3		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S	
4		BH75E		BR55H		CB49A		CK77C		CT37A		DE68A		DM52J		DW29A		ED16G		EM75E		ER92A		EZ03M		FF88E	
5		2/15/00		5/23/00		8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/27/01		2/25/02		6/25/02		08/26/02		11/12/02		2/13/03	
87	**FIELD PARAMETERS**																										
88	pH (avg)	6.73		6.52		6.36		5.18		6.46		6.70		6.93		6.60		6.21		6.56		6.66		6.6		6.99	
89	Temperature (° C) (avg)	15.5		14.5		15.5		14.9		14.2		14.1		15.2		15.1		14.1		15.1		15.5		15.6		14.7	
90	Conductivity (um/hos)	296		263		299		302		300		419		433		378		351		408		364		352		492	
91	Dissolved oxygen (mg/L) (avg)	1.20		0.87		1.66		2.02		2.78		1.37		1.06		3.24		4.55		5.27		1.46		0.41		0	
92																											
93	**DIOXINS AND FURANS (ng/L)**																										
94	**Method 8290**																										
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																											
121	**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF
1							
2							
3		LW7S		LW7S		LW7S	
4		FL41B		FU45A		FY64F	
5		5/7/03		8/28/03		10/20/03	
87	**FIELD PARAMETERS**						
88	pH (avg)	7.1		6.8		6.77	
89	Temperature (° C) (avg)	14.4		15.7		15.6	
90	Conductivity (um/hos)	320		308		308	
91	Dissolved oxygen (mg/L) (avg)	5.9		2.76		1.08	
92							
93	**DIOXINS AND FURANS (ng/L)**						
94	**Method 8290**						
95	2,3,7,8-TCDF	NA		NA		NA	
96	Total TCDF	NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA	
98	Total TCDD	NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA	
101	Total PeCDF	NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA	
103	Total PeCDD	NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA	
108	Total HxCDF	NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA	
112	Total HxCDD	NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA	
115	Total HpCDF	NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA	
117	Total HpCDD	NA		NA		NA	
118	OCDF	NA		NA		NA	
119	OCDD	NA		NA		NA	
120							
121	**ETHANOL (mg/L)**	NA		NA		NA	
122							

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2							Dup of LW7S																			
3			LW7S		LW7S		LW7D		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S	
4			S167M		T176S		T176T		U235W		V208D		W371I		Y314G		Z225R		Z960N		AH27E		AU22F		BB82A	
5			4/1/97		7/16/97		7/16/97		10/23/97		1/28/98		5/18/98		8/17/98		11/12/98		2/17/99		5/17/99		9/20/99		12/6/99	
123		**PAHs (µg/L)**																								
124		**EPA Method SW8270 SIM**																								
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		**4.0**		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		**1.3**		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																											
3		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S	
4		BH75E		BR55H		CB49A		CK77C		CT37A		DE68A		DM52J		DW29A		ED16G		EM75E		ER92A		EZ03M		FF88E	
5		2/15/00		5/23/00		8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/27/01		2/25/02		6/25/02		08/26/02		11/12/02		2/13/03	
123	**PAHs (µg/L)**																										
124	**EPA Method SW8270 SIM**																										
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF
1							
2							
3		LW7S		LW7S		LW7S	
4		FL41B		FU45A		FY64F	
5		5/7/03		8/28/03		10/20/03	
123	**PAHs (µg/L)**						
124	**EPA Method SW8270 SIM**						
125	Naphthalene	NA		NA		4.1	
126	2-Methylnaphthalene	NA		NA		1.6	
127	Acenaphthylene	NA		NA		0.1	U
128	Acenaphthene	NA		NA		0.1	U
129	Fluorene	NA		NA		0.1	U
130	Anthracene	NA		NA		0.1	U
131	Dibenzofuran	NA		NA		0.1	U

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1																								
2													Dup of LW8S						Dup of LW8S					
3			LW8S		LW8S		LW8S		LW8S		LW8S		Z		LW8S		LW8S		W		LW8S		LW8S	
4			AH27K		AU36D		BC30G		9912050-05A		BH96W		BH96V		BR64N		CB68F		CB68H		CL03A		CT67J	
5			5/17/99		9/21/99		12/8/99		12/8/1999 (d)		2/16/00		2/16/00		5/25/00		8/30/00		8/30/00		11/9/00		2/15/01	
7	1	**CHLORINATED PHENOLS (µg/L)**																						
8	2	**EPA Method SW8040**																						
9	3	Pentachlorophenol	0.25	U	0.25	U	**1.2**		NA		**0.13**	J1,J2	**0.27**	J2	**0.51**		0.25	U	0.25	U	0.25	U	0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA	
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA	
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		**0.14**	J1	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	**0.21**	J1	NA		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA	
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA	
16	10																							
17	11	**SEMIVOLATILES (µg/L)**																						
18	12	**EPA Method SW8270**																						
19	13	Phenol	**2.7**		2.0	U	2.0	U	NA		**3.1**		2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
20	14	4-Methylphenol	**32**		1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	NA		3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	NA		10	U	10	U	10	U	10	U	10	U	10	U	10	U
24	18	Naphthalene	**99**		**74**		**120**		NA		**55**		**54**		**70**		**40**		**38**		**4.3**		**6.7**	
25	19	2-Methylnaphthalene	**76**		**58**		**72**		NA		**71**		**73**		**77**		**30**		**30**		**4.7**		**7.0**	
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	NA		5.0	U	5.0	U	**6.9**		5.0	U	**5.8**		5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	**6.8**		NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
33	27																							
34	28	**VOLATILES (µg/L)**																						
35	29	**EPA Method SW8260**																						
36	30	Acetone	5.0	U	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	12	J2	5.0	U	5.0	U
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	**11**		5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**12**		5.0	U
39	33	Benzene	**110**		**55**		**49**		NA		**62**		**60**		**77**		**29**		**29**		**5.0**		**9.1**	
40	34	Bromoform	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
42	36	Ethylbenzene	**180**		**160**		**170**		NA		**110**		**98**		**140**		**130**		**120**		**8.5**		**22**	
43	37	Styrene	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	**290**		**320**		**260**		NA		**160**		**130**		**180**		**200**		**200**		**2.2**		**4.7**	
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
46	40	1,3,5-Trimethylbenzene	**62**		**120**		**100**		NA		**57**	J2	**45**	J2	**52**		**81**		**81**		1.0	U	**4.1**	
47	41	1,2,4-Trimethylbenzene	**280**		**180**		**180**		NA		**140**		**120**		**130**		**130**		**120**		**2.6**		**6.4**	
48	42	Isopropylbenzene	**290**		**130**		**160**		NA		**190**		**180**		**250**		**120**		**120**		**100**		**100**	
49	43	n-Propylbenzene	**190**		**110**		**140**		NA		**150**		**150**		**170**		**100**		**98**		**56**		**83**	
50	44	tert-Butylbenzene	**5.7**		**5.6**		**6.6**		NA		**8.8**		**8.7**		**7.3**		**5.5**		**5.5**		**4.9**		**5.7**	
51	45	sec-Butylbenzene	**22**		**23**		**25**		NA		**30**		**29**		**28**		**20**		20		**11**		**14**	
52	46	4-Isopropyltoluene	**5.1**		**10**		**5.4**		NA		**4.2**		**3.4**		**3.9**		1.0	U	1.0	U	1.0	U	1.0	U
53	47	n-Butylbenzene	**12**		**18**		16	U	NA		**15**		**14**		**15**		**14**		13		**4.1**		**6.8**	
54	48	Naphthalene	**150**		**120**		**160**		NA		**180**		**160**		**150**		**110**		**100**		**6.6**		**19**	
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																							
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																						
58	51	**Method OR-DEQ**																						
59	52	**TPH-Diesel**	**1.9**		**2.1**		**2.0**		NA		**2.2**	J2	**3.2**	J2	**2.6**		**1.6**		**1.6**		**2.3**		**3.4**	
60	53	**TPH-D Motor Oil**	0.50	U	0.50	U	0.50	U	NA		0.50	UJ	**1.3**	J2	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
61	54	**TPH-Gasoline**	**9.8**		**9.4**		**10**		NA		**9.5**		**10**		**15**		**13**		**13**		**3.9**		**4.6**	
62	55																							
63	56	**PRIORITY POLLUTANT**																						
64	57	**METALS (mg/L)**																						
65	58	Arsenic (7060)	**0.022**		**0.025**		**0.025**		NA		**0.027**		**0.027**		**0.023**		**0.022**		**0.023**		**0.022**		**0.022**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
2		Dup of LW8S								Dup of LW8S								Dup of LW8S							
3		W		LW8S		LW8S		LW8S		X		LW8S		LW8S		LW8S		X		LW8S		LW8S		LW8S	
4		CT67I		DE68N		DM30J		ED23J		ED23K		EM85G		ER92E		EZ17G		EZ17A		FF65C		FL58B		FU45I	
5		2/15/01		6/4/01		8/14/01		2/26/02		2/26/02		6/26/02		08/26/02		11/13/02		11/13/02		2/11/03		5/8/03		8/28/03	
7	**CHLORINATED PHENOLS (µg/L)**																								
8	**EPA Method SW8040**																								
9	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.27	U	0.25	U	0.25	U	1.2	U	0.26	U	**2.1**	J
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																									
17	**SEMIVOLATILES (µg/L)**																								
18	**EPA Method SW8270**																								
19	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.2	U	2.3	U	2.3	U	2	U	2	UJ	2	U
20	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.2	U	1.1	U	1	U	1	UJ	1	U
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.2	U	1.1	U	1	U	1	UJ	1	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.3	U	3.5	U	3.4	U	3	U	3.1	UJ	3.1	U
23	Benzoic Acid	10	U	10	U	10	U	50	U	50	U	50	U	54	U	58	U	57	U	50	U	51	UJ	51	U
24	Naphthalene	**6.4**		**22**		**2.3**		**54**		**57**		**57**		**62**		**11**		**11**		**44**		**24**	J	**39**	
25	2-Methylnaphthalene	**6.8**		**14**		**2.6**		**69**		**74**		**51**		**44**		**22**		**25**		**47**		**49**	J	**31**	
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.4	U	5.8	U	5.7	U	5	U	5.1	UJ	5.1	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.4	U	5.8	U	5.7	U	5	U	5.1	UJ	5.1	U
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.2	U	1.1	U	1	U	1	UJ	1	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.2	U	1.1	U	1	U	1	UJ	1	U
30	Fluorene	1.0	U	1.0	U	1.0	U	**1.3**		**1.2**		1.0	U	1.1	U	1.2	U	1.1	U	1	U	1	UJ	2	U
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.4	U	5.8	U	5.7	U	5	U	5.1	UJ	5.1	U
32	bis(2-Ethylhexyl)phthalate	1.0	U	**1.5**		1.0	U	**5.0**		4.0	U	4.0	U	4.3	U	4.7	U	4.5	U	1	U	1	UJ	1	U
33																									
34	**VOLATILES (µg/L)**																								
35	**EPA Method SW8260**																								
36	Acetone	5.0	U	5.0	U	8.2	U	5.0	U	5.0	U	**14**	M	15	U	**7.2**		**7.4**	M	**7.7**		**21**	M	**16**	J
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3	U	1	U	1	U	1	U	3	U	3	U
38	2-Butanone	5.0	U	5.0	U	5.3	U	5.0	U	5.0	U	5.9	U	15	U	5	U	5	U	5	U	15	U	15	U
39	Benzene	**9.1**		**9.0**		**2.0**		**30**		**30**		**91**	J	**35**		**2.5**		**2.4**		**15**		**31**		**19**	
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3	U	1	U	1	U	1	U	3	U	3	U
41	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3	U	1	U	1	U	1	U	3	U	3	U
42	Ethylbenzene	**23**		**61**		**11**		**420**	J	**390**		**300**	J	**280**		**37**		**33**		**240**		**270**		**180**	
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3	U	1	U	1	U	1	U	3	U	3	U
44	m,p-Xylene	**5.0**		**17**		1.0	U	**56**		**60**		**44**	J	**37**		**1**		1	U	**4.6**		**8.2**		**11**	J
45	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3	U	1	U	1	U	1	U	3	U	3	U
46	1,3,5-Trimethylbenzene	**5.0**		**15**		**1.7**		**62**		**64**		**67**	J	**68**		**7.7**		**6.3**		**9.1**		**9.6**		**13**	J
47	1,2,4-Trimethylbenzene	**7.1**		**23**		**1.8**		**130**		**140**		**150**	J	**170**		**13**		**11**		**23**		**29**		**28**	J
48	Isopropylbenzene	**130**		**130**		**67**		**240**	J	**240**		**260**	J	**240**		**180**		**170**		**240**		**340**		**260**	
49	n-Propylbenzene	**100**		**110**		**40**		**210**	J	**210**		**250**	J	**220**		**160**		**150**		**200**		**260**		**230**	
50	tert-Butylbenzene	**6.2**		**6.0**		**4.7**		**10**		**10**		**12**	MJ	**8.4**		**7.6**		**7.1**		**9.4**		**12**		**9.1**	
51	sec-Butylbenzene	**15**		**16**		**8.7**		**31**		**32**		**40**	J	**24**		**24**		**23**		**29**		**33**		**28**	
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3	U	1	U	1	U	1	U	3	U	3	U
53	n-Butylbenzene	**7.1**		8.0	U	**3.2**	M	**18**		**18**		**20**	MJ	**16**	M	**14**	M	**13**	M	**13**	M	**14**		**14**	
54	Naphthalene	**20**		**35**		5.0	U	**180**		**100**		**140**		**150**		**19**		**17**		**76**		**51**		**83**	
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																									
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	**Method OR-DEQ**																								
59	**TPH-Diesel**	**3.2**		**4.4**		**4.0**		**7.1**		**7.6**		**4.0**		**4.5**		**4.3**		**4.2**		**11**		**7.4**		**4.3**	
60	**TPH-D Motor Oil**	0.50	U	0.50	U	2.5	U	0.50	U	0.50	U	0.50	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
61	**TPH-Gasoline**	**4.9**		**4.7**		**3.9**		**12**	J	**12**		**11**		**10**		**7.8**		**8.6**		**9.8**		**9.5**	J	**7.4**	
62																									
63	**PRIORITY POLLUTANT**																								
64	**METALS (mg/L)**																								
65	Arsenic (7060)	**0.022**		**0.024**		**0.028**		**0.027**		**0.030**		**0.025**		**0.028**		0.05	U	0.05	U	**0.024**		**0.026**		**0.021**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AW	AX	AY	AZ
1					
2		Dup of LW8S			
3		X		LW8S	
4		FU45H		FY64L	
5		8/28/03		10/21/03	
7	**CHLORINATED PHENOLS (µg/L)**				
8	**EPA Method SW8040**				
9	Pentachlorophenol	**6.3**	J	0.55	U
10	2,4,6-Trichlorophenol	NA		NA	
11	2,3,6-Trichlorophenol	NA		NA	
12	2,4,5-Trichlorophenol	NA		NA	
13	2,3,4-Trichlorophenol	NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA	
16					
17	**SEMIVOLATILES (µg/L)**				
18	**EPA Method SW8270**				
19	Phenol	2.1	U	2.2	U
20	4-Methylphenol	1.1	U	1.1	U
21	Isophorone	1.1	U	1.1	U
22	2,4-Dimethylphenol	3.2	U	3.3	U
23	Benzoic Acid	53	U	11	U
24	Naphthalene	**40**		**2.2**	
25	2-Methylnaphthalene	**34**		**3.1**	
26	2,4,6-Trichlorophenol	5.3	U	5.5	U
27	2,4,5-Trichlorophenol	5.3	U	5.5	U
28	Acenaphthene	1.1	U	1.1	U
29	Dibenzofuran	1.1	U	1.1	U
30	Fluorene	1.6	U	1.1	U
31	Pentachlorophenol	5.3	U	5.5	U
32	bis(2-Ethylhexyl)phthalate	1.1	U	1.1	U
33					
34	**VOLATILES (µg/L)**				
35	**EPA Method SW8260**				
36	Acetone	5	U	5	U
37	Carbon Disulfide	1	U	1	U
38	2-Butanone	5	U	5	U
39	Benzene	**23**		1	U
40	Bromoform	1	U	1	U
41	Toluene	1	U	1	U
42	Ethylbenzene	**220**		**7.2**	
43	Styrene	1	U	1	U
44	m,p-Xylene	**15**	J	1	U
45	o-Xylene	1	U	1	U
46	1,3,5-Trimethylbenzene	**16**	J	1	U
47	1,2,4-Trimethylbenzene	**36**	J	1	U
48	Isopropylbenzene	**280**		**140**	
49	n-Propylbenzene	**260**		**94**	
50	tert-Butylbenzene	**10**		**7.4**	
51	sec-Butylbenzene	**32**		**19**	
52	4-Isopropyltoluene	**2**		1	U
53	n-Butylbenzene	**16**		**9**	
54	Naphthalene	**120**		5	U
55	Methyl tert-butyl ether	NA		NA	
56					
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**				
58	**Method OR-DEQ**				
59	**TPH-Diesel**	**4.2**		**3.5**	
60	**TPH-D Motor Oil**	0.5	U	0.5	U
61	**TPH-Gasoline**	**7.5**		**4.6**	
62					
63	**PRIORITY POLLUTANT**				
64	**METALS (mg/L)**				
65	Arsenic (7060)	**0.024**		**0.021**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1																								
2													Dup of LW8S						Dup of LW8S					
3			LW8S		LW8S		LW8S		LW8S		LW8S		Z		LW8S		LW8S		W		LW8S		LW8S	
4			AH27K		AU36D		BC30G		9912050-05A		BH96W		BH96V		BR64N		CB68F		CB68H		CL03A		CT67J	
5			5/17/99		9/21/99		12/8/99		12/8/1999 (d)		2/16/00		2/16/00		5/25/00		8/30/00		8/30/00		11/9/00		2/15/01	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	NA		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	0.002	U	0.002	U	0.002	U	NA		0.002	U	0.002	U	**0.003**		0.002	U	0.002	U	0.002	U	0.002	U
68	61	Lead (7421)	0.001	U	0.001	U	0.001	U	NA		**0.001**		0.001	U	0.001	U	0.001	U	0.001	U	**0.005**		0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	NA		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	0.008	U	**0.008**		**0.006**		NA		0.006	U	0.006	U	**0.007**		0.006	U	**0.007**		**0.041**		0.006	U
71	64																							
72	65	**MAJOR IONS AND CONVENTIONALS**																						
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**25.5**	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**6.81**	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**2.6**	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**7.52**	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**170**	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		1.0	U
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**170**	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**220**		**200**		**210**		NA		**190**		**210**		**180**		**210**		**210**		**190**		**220**	
81	74	Chloride (mg/L) (EPA 325.2)	**5.4**		**4.1**		**4.6**		NA		**4.1**		**3.4**		**3.7**		**2.2**		**2.3**		**4.2**		**3.4**	J2
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.051**	J2
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.041**	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**2.8**	
86	79																							

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
1																									
2		Dup of LW8S								Dup of LW8S								Dup of LW8S							
3		W		LW8S		LW8S		LW8S		X		LW8S		LW8S		LW8S		X		LW8S		LW8S		LW8S	
4		CT67I		DE68N		DM30J		ED23J		ED23K		EM85G		ER92E		EZ17G		EZ17A		FF65C		FL58B		FU45I	
5		2/15/01		6/4/01		8/14/01		2/26/02		2/26/02		6/26/02		08/26/02		11/13/02		11/13/02		2/11/03		5/8/03		8/28/03	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.017**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.029**		0.002	U	0.002	U	**0.004**		0.002	U	0.002	U
68	Lead (7421)	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	**0.006**		0.02	U	0.02	U	**0.002**		0.001	U	0.001	U
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.04**		0.01	U	0.01	U	**0.01**		0.01	U	0.01	U
70	Zinc (6010)	0.006	U	**0.007**		0.006	U	0.006	U	0.006	U	0.006	U	**0.096**		**0.009**		0.006	U	**0.013**		**0.582**		0.006	U
71																									
72	**MAJOR IONS AND CONVENTIONALS**																								
73	Calcium (mg/L) (6010)	**25.6**		**31.1**		**27.5**		**41.6**		**38.6**		NA		NA		NA		NA		**33.8**		NA		NA	
74	Magnesium (mg/L) (6010)	**6.85**		**8.18**		**7.58**		**9.98**		**9.30**		NA		NA		NA		NA		**8.4**		NA		NA	
75	Potassium (mg/L) (6010)	**2.5**		**2.8**		**2.8**		**4.2**		**4.0**		NA		NA		NA		NA		**3.4**		NA		NA	
76	Sodium (mg/L) (6010)	**7.55**		**8.47**		**7.86**		**9.95**		**9.31**		NA		NA		NA		NA		**7.8**		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	**160**		NA		NA		**220**		**230**		NA		NA		NA		NA		**190**		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	NA		NA		1.0	U	1.0	U	NA		NA		NA		NA		1	U	NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**160**		NA		NA		**220**		**230**		NA		NA		NA		NA		**190**		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**210**		**250**		**200**		**300**		**290**		**240**		**220**		**200**		**200**		**280**		**260**		**250**	
81	Chloride (mg/L) (EPA 325.2)	**4.9**	J	**2.8**		**5.3**		**4.2**		**3.6**		**4.4**		**2.7**		**2.9**		**2.9**		**3.7**		**2.3**		**2.3**	
82	N-Nitrate (mg-N/L) (Calculated)	0.010	U	NA		NA		0.010	U	**0.012**		NA		NA		NA		NA		0.01	U	NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	**0.035**	J	NA		NA		**0.059**		**0.054**		NA		NA		NA		NA		**0.072**		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.035**		NA		NA		**0.044**	J	**0.066**	J	NA		NA		NA		NA		**0.062**		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	2.5	U	NA		NA		2.5	U	**3.2**		NA		NA		NA		NA		**3.8**		NA		NA	
86																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AW	AX	AY	AZ
1					
2		Dup of LW8S			
3		X		LW8S	
4		FU45H		FY64L	
5		8/28/03		10/21/03	
66	Chromium (6010)	0.005	U	**0.007**	
67	Copper (6010)	**0.002**		**0.007**	
68	Lead (7421)	0.001	U	**0.002**	
69	Nickel (6010)	0.01	U	**0.02**	
70	Zinc (6010)	0.006	U	**0.027**	
71					
72	**MAJOR IONS AND CONVENTIONALS**				
73	Calcium (mg/L) (6010)	NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA	
75	Potassium (mg/L) (6010)	NA		NA	
76	Sodium (mg/L) (6010)	NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**250**		**260**	
81	Chloride (mg/L) (EPA 325.2)	**2.2**		**4.8**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA	
86					

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1																								
2													Dup of LW8S						Dup of LW8S					
3			LW8S		LW8S		LW8S		LW8S		LW8S		Z		LW8S		LW8S		W		LW8S		LW8S	
4			AH27K		AU36D		BC30G		9912050-05A		BH96W		BH96V		BR64N		CB68F		CB68H		CL03A		CT67J	
5			5/17/99		9/21/99		12/8/99		12/8/1999 (d)		2/16/00		2/16/00		5/25/00		8/30/00		8/30/00		11/9/00		2/15/01	
87	80	**FIELD PARAMETERS**																						
88	81	pH (avg)	5.55		6.10		6.28		NM		6.57		6.56		6.44		4.89		4.89		5.74		6.26	
89	82	Temperature (° C) (avg)	14.0		17.2		13.0		NM		13.2		13.2		13.4		15.2		15.3		14.7		13.6	
90	83	Conductivity (um/hos)	357		303		328		NM		351		351		354		330		330		352		404	
91	84	Dissolved oxygen (mg/L) (avg)	2.14		2.13		2.06		NM		0.83		0.82		1.55		1.12		1.13		0.53		0.57	
92	85																							
93	86	**DIOXINS AND FURANS (ng/L)**																						
94	87	**Method 8290**																						
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																								
121		**ETHANOL (mg/L)**	NA		NA		NA		10	U	NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
122																								

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
2		Dup of LW8S								Dup of LW8S								Dup of LW8S							
3		W		LW8S		LW8S		LW8S		X		LW8S		LW8S		LW8S		X		LW8S		LW8S		LW8S	
4		CT67I		DE68N		DM30J		ED23J		ED23K		EM85G		ER92E		EZ17G		EZ17A		FF65C		FL58B		FU45I	
5		2/15/01		6/4/01		8/14/01		2/26/02		2/26/02		6/26/02		08/26/02		11/13/02		11/13/02		2/11/03		5/8/03		8/28/03	
87	**FIELD PARAMETERS**																								
88	pH (avg)	6.28		6.49		6.61		6.37		6.37		6.23		6.42		6.17		6.16		6.74		6.58		6.64	
89	Temperature (° C) (avg)	13.6		14.4		15.0		13.6		13.6		15.3		16.1		14.7		14.6		15.2		12.9		16.5	
90	Conductivity (um/hos)	403		402		467		489		490		405		330		353		351		503		397		349	
91	Dissolved oxygen (mg/L) (avg)	0.53		1.58		1.85		6.71		6.75		3.92		0.87		1.82		1.94		1.29		3.35		1.61	
92																									
93	**DIOXINS AND FURANS (ng/L)**																								
94	**Method 8290**																								
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																									
121	**ETHANOL (mg/L)**	5.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AW	AX	AY	AZ
1					
2		Dup of LW8S			
3		X		LW8S	
4		FU45H		FY64L	
5		8/28/03		10/21/03	
87	**FIELD PARAMETERS**				
88	pH (avg)	6.65		6.57	
89	Temperature (° C) (avg)	16.5		19.0	
90	Conductivity (um/hos)	348		352	
91	Dissolved oxygen (mg/L) (avg)	1.57		1.03	
92					
93	**DIOXINS AND FURANS (ng/L)**				
94	**Method 8290**				
95	2,3,7,8-TCDF	NA		NA	
96	Total TCDF	NA		NA	
97	2,3,7,8-TCDD	NA		NA	
98	Total TCDD	NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA	
101	Total PeCDF	NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA	
103	Total PeCDD	NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA	
108	Total HxCDF	NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA	
112	Total HxCDD	NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA	
115	Total HpCDF	NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA	
117	Total HpCDD	NA		NA	
118	OCDF	NA		NA	
119	OCDD	NA		NA	
120					
121	**ETHANOL (mg/L)**	NA		NA	
122					

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1																								
2													Dup of LW8S						Dup of LW8S					
3			LW8S		LW8S		LW8S		LW8S		LW8S		Z		LW8S		LW8S		W		LW8S		LW8S	
4			AH27K		AU36D		BC30G		9912050-05A		BH96W		BH96V		BR64N		CB68F		CB68H		CL03A		CT67J	
5			5/17/99		9/21/99		12/8/99		12/8/1999 (d)		2/16/00		2/16/00		5/25/00		8/30/00		8/30/00		11/9/00		2/15/01	
123		**PAHs (µg/L)**																						
124		**EPA Method SW8270 SIM**																						
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
1																									
2		Dup of LW8S								Dup of LW8S								Dup of LW8S							
3		W		LW8S		LW8S		LW8S		X		LW8S		LW8S		LW8S		X		LW8S		LW8S		LW8S	
4		CT67I		DE68N		DM30J		ED23J		ED23K		EM85G		ER92E		EZ17G		EZ17A		FF65C		FL58B		FU45I	
5		2/15/01		6/4/01		8/14/01		2/26/02		2/26/02		6/26/02		08/26/02		11/13/02		11/13/02		2/11/03		5/8/03		8/28/03	
123	**PAHs (µg/L)**																								
124	**EPA Method SW8270 SIM**																								
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AW	AX	AY	AZ
1					
2		Dup of LW8S			
3		X		LW8S	
4		FU45H		FY64L	
5		8/28/03		10/21/03	
123	**PAHs (µg/L)**				
124	**EPA Method SW8270 SIM**				
125	Naphthalene	NA		NA	
126	2-Methylnaphthalene	NA		NA	
127	Acenaphthylene	NA		NA	
128	Acenaphthene	NA		NA	
129	Fluorene	NA		NA	
130	Anthracene	NA		NA	
131	Dibenzofuran	NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1																		
2																		
3			LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S	
4			AH76O		BC30A		BH96G		BR64K		ED30B		EN00B		FF76B		FL41M	
5			5/19/99		12/8/99		2/17/00		5/25/00		2/27/02		6/27/02		2/12/03		5/7/03	
6																		
7	1	**CHLORINATED PHENOLS (µg/L)**																
8	2	**EPA Method SW8040**																
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.33**	
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA	
16	10																	
17	11	**SEMIVOLATILES (µg/L)**																
18	12	**EPA Method SW8270**																
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2	U	2	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3	U	3	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	50	U	50	U	50	U	50	U
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	**22**		1.0	U	1.0	U	4.0	U	4.0	U	1	U	1	U
33	27																	
34	28	**VOLATILES (µg/L)**																
35	29	**EPA Method SW8260**																
36	30	Acetone	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U
37	31	Carbon Disulfide	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
38	32	2-Butanone	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U
39	33	Benzene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
40	34	Bromoform	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
41	35	Toluene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
42	36	Ethylbenzene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
43	37	Styrene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
44	38	m,p-Xylene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
45	39	o-Xylene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
48	42	Isopropylbenzene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
49	43	n-Propylbenzene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
50	44	tert-Butylbenzene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
51	45	sec-Butylbenzene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
52	46	4-Isopropyltoluene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
53	47	n-Butylbenzene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
54	48	Naphthalene	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA	
56	49																	
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																
58	51	**Method OR-DEQ**																
59	52	**TPH-Diesel**	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA	
62	55																	
63	56	**PRIORITY POLLUTANT**																
64	57	**METALS (mg/L)**																
65	58	Arsenic (7060)	0.001	U	NA		**0.004**		**0.001**		**0.002**		**0.001**		0.001	U	0.001	U

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1																		
2																		
3			LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S	
4			AH76O		BC30A		BH96G		BR64K		ED30B		EN00B		FF76B		FL41M	
5			5/19/99		12/8/99		2/17/00		5/25/00		2/27/02		6/27/02		2/12/03		5/7/03	
66	59	Chromium (6010)	0.005	U	NA		0.005	U	0.005	U	0.005	U	**0.007**		0.005	U	0.005	U
67	60	Copper (6010)	0.002	U	NA		**0.004**		0.002	U	0.002	U	**0.012**		**0.003**		0.002	U
68	61	Lead (7421)	0.001	U	NA		**0.003**		**0.001**		**0.001**		**0.001**		0.001	U	0.001	U
69	62	Nickel (6010)	0.01	U	NA		0.01	U	0.01	U	0.01	U	**0.02**		0.01	U	0.01	U
70	63	Zinc (6010)	**0.004**		NA		**0.016**		**0.007**		**0.008**	J	**0.043**		**0.01**		0.006	U
71	64																	
72	65	**MAJOR IONS AND CONVENTIONALS**																
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		**11.1**		**26.2**		**9.5**		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		**3.27**		**9.50**		**2.58**		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		**2.5**		**3.9**		**2.5**		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		**5.27**		**8.31**		**6**		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		**34**		NA		**36**		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		1.0	U	NA		1	U	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		**34**		NA		**36**		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**84**		NA		**100**		**90**		**100**		**120**		**74**		**74**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.3**		NA		**3.2**		**2.2**		**1.4**	J	**2.3**		**1.2**		**1.6**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		**3.4**		NA		**2.1**		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		**0.014**		NA		0.01	U	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		**3.4**		NA		**2.1**		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		**12**		NA		**5.6**		NA	
86	79																	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1																		
2																		
3			LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S	
4			AH76O		BC30A		BH96G		BR64K		ED30B		EN00B		FF76B		FL41M	
5			5/19/99		12/8/99		2/17/00		5/25/00		2/27/02		6/27/02		2/12/03		5/7/03	
87	80	**FIELD PARAMETERS**																
88	81	pH (avg)	6.01		NM		6.66		6.45		6.09		6.44		7.19		6.78	
89	82	Temperature (° C) (avg)	13.6		NM		13.4		13.0		12.6		14.3		11.9		13	
90	83	Conductivity (um/hos)	93		NM		111		129		109		149		110		88	
91	84	Dissolved oxygen (mg/L) (avg)	5.76		NM		2.87		4.30		8.85		7.22		7.33		9.77	
92	85																	
93	86	**DIOXINS AND FURANS (ng/L)**																
94	87	**Method 8290**																
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA	
120																		
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA	
122																		

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1																		
2																		
3			LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S	
4			AH76O		BC30A		BH96G		BR64K		ED30B		EN00B		FF76B		FL41M	
5			5/19/99		12/8/99		2/17/00		5/25/00		2/27/02		6/27/02		2/12/03		5/7/03	
123		**PAHs (µg/L)**																
124		**EPA Method SW8270 SIM**																
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
2					Dup of LW11S												Dup of LW11S							
3			LW11S		LW110S		LW11S		LW11S		LW11S		LW11S		LW11S		X		LW11S		LW11S		LW11S	
4			AH76E		AH76D		AU36F		BC27J		9912050-06A		BH96U		BR55L		BR55K		CB49J		CK77K		CT55H	
5			5/20/99		5/20/99		9/21/99		12/8/99		12/8/1999 (d)		2/17/00		5/23/00		5/23/00		8/28/00		11/8/00		2/14/01	
7	1	**CHLORINATED PHENOLS (µg/L)**																						
8	2	**EPA Method SW8040**																						
9	3	Pentachlorophenol	**15000**		**15000**		**9400**		**7200**		NA		**9700**		**7700**	J2	**7600**	J2	**3900**		NA		**320**	J
10	4	2,4,6-Trichlorophenol	**2.9**		**2.8**		**1.3**		**1.0**		NA		**1.8**		**1.4**		**1.2**		**0.68**		NA		NA	
11	5	2,3,6-Trichlorophenol	**0.13**	J1	0.25	U	0.25	U	**0.12**	J1	NA		**0.13**	J1	0.25	U	0.25	U	0.25	U	NA		NA	
12	6	2,4,5-Trichlorophenol	1.0	U	0.25	U	**0.32**		0.25	U	NA		**0.61**		**0.96**		**0.95**		0.72	U	NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.32	U	NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**750**		**750**		**450**		**360**		NA		**560**		**940**		**850**		**250**		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	**7.5**		**6.8**		**3.7**		**2.4**		NA		**6.2**		**4.2**		**4.4**		**2.5**		NA		NA	
16	10																							
17	11	**SEMIVOLATILES (µg/L)**																						
18	12	**EPA Method SW8270**																						
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	NA		2.0	U	2.0	U	2.0	U	2.0	U	NA		**10**	
20	14	4-Methylphenol	**3.5**	M	**2.8**	M	1.0	U	**1.4**	MJ1	NA		1.0	U	1.0	U	1.0	U	**3.5**		NA		**3.7**	
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	NA		3.0	U	3.0	U	3.0	U	3.0	U	NA		3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	NA		10	U	10	U	10	U	10	U	NA		10	U
24	18	Naphthalene	**41**		**38**		**20**		**12**		NA		**23**		**22**		**20**		**13**		NA		**5.7**	
25	19	2-Methylnaphthalene	**14**		**13**		**8.9**		**5.7**		NA		**9.0**		**9.0**		**9.4**		**4.9**		NA		**3.9**	
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U
31	25	Pentachlorophenol	**24000**		**20000**		**8000**		**5400**		NA		**11000**		**6800**	J2	**6500**	J2	**3600**		NA		**460**	J
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	**0.8**	J1	NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U
33	27																							
34	28	**VOLATILES (µg/L)**																						
35	29	**EPA Method SW8260**																						
36	30	Acetone	**18**		**21**		5.0	U	**29**		NA		11	U	9.8	U	5.0	U	**11**		NA			R
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		2.0	U
38	32	2-Butanone	**6.1**		**6.3**		**27**		5.0	U	NA		**40**	M	5.0	U	5.0	U	5.0	U	NA		10	U
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		2.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		2.0	U
41	35	Toluene	**51**		**48**		**23**		**14**		NA		**17**		**37**		**36**		**15**		NA		**2.4**	
42	36	Ethylbenzene	**160**		**150**		**86**		**54**		NA		**75**		**110**		**110**		**69**		NA		**24**	
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		2.0	U
44	38	m,p-Xylene	**360**		**350**		**160**		**96**		NA		**140**		**220**		**210**		**120**		NA		**53**	
45	39	o-Xylene	**300**		**290**		**170**		**96**		NA		**130**		**240**		**210**		**120**		NA		**40**	
46	40	1,3,5-Trimethylbenzene	**100**		**92**		**68**		**43**		NA		**62**		**88**		**89**		**53**		NA		**48**	
47	41	1,2,4-Trimethylbenzene	**410**		**430**		**180**		**130**		NA		**200**		**370**		**320**		**180**		NA		**150**	
48	42	Isopropylbenzene	**50**	J2	**40**	J2	**27**		**18**		NA		**27**		**40**		**38**		**22**		NA		**13**	
49	43	n-Propylbenzene	**66**		**56**		**40**		**26**		NA		**42**		**53**		**52**		**32**		NA		**24**	
50	44	tert-Butylbenzene	**2.8**		**2.3**		1.0	U	1.0	U	NA		**1.9**	M	2.3	U	2.2	U	**1.5**	M	NA		2.0	U
51	45	sec-Butylbenzene	**15**		**13**		**10**		**9.1**		NA		**14**		**14**		**13**		**8.8**		NA		**7.5**	
52	46	4-Isopropyltoluene	**11**		**9.9**		1.0	U	1.0	U	NA		**10**		**9.8**		**9.4**		**5.9**		NA		**7.1**	
53	47	n-Butylbenzene	**12**		**10**		**8.0**		5.3	U	NA		**11**		10	U	9.9	U	**7.0**	M	NA		**8.4**	M
54	48	Naphthalene	**46**		**38**		**19**		**15**		NA		**25**		**45**		**44**		**22**		NA		10	U
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																							
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																						
58	51	**Method OR-DEQ**																						
59	52	**TPH-Diesel**	**14**		**13**		**10**		**8.8**		NA		**12**		**10**		**9.6**		**5.9**		NA		**2.2**	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		**1.1**		**0.50**		**0.77**		NA		NA		0.50	U
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		**11**		**24**		**20**		**14**		NA		**4.8**	
62	55																							
63	56	**PRIORITY POLLUTANT**																						
64	57	**METALS (mg/L)**																						
65	58	Arsenic (7060)	**0.007**		**0.008**		**0.006**		**0.007**		NA		**0.007**		**0.008**		**0.008**		**0.007**		NA		**0.007**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
2												Dup of LW11S						Dup of LW11S							
3		LW11S		LW11S		LW11S		LW11S		LW11S		OX005S		LW11S		LW11S		X		LW11S		LW11S		LW11S	
4		DE68M		ED34D		EM66C		ES04D		EX87C		EX87A		EZ03I		FF76H		FF76L		FL58H		FU45D		FY72I	
5		6/4/01		2/28/02		6/24/02		08/28/02		10/29/02		10/29/02		11/12/02		2/12/03		2/12/03		5/8/03		8/28/03		10/22/03	
7	**CHLORINATED PHENOLS (µg/L)**																								
8	**EPA Method SW8040**																								
9	Pentachlorophenol	NA		NA		NA		NA		**3600**		**3700**		NA		NA		NA		NA		NA		NA	
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		**1.3**		**1.3**		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		**0.4**		**0.37**		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		0.58	U	0.6	U	NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		0.25	U	0.29	U	NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		**380**		**380**		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		**3.2**	J	**4.2**	J	NA		NA		NA		NA		NA		NA	
16																									
17	**SEMIVOLATILES (µg/L)**																								
18	**EPA Method SW8270**																								
19	Phenol	**2.6**		2.0	U	2.0	U	2.2	U	NA		NA		2.2	U	2	U	2	U	2	U	2.1	U	2	U
20	4-Methylphenol	**2.3**		**1.9**		**1.0**		1.1	U	NA		NA		1.1	U	**1.2**	M	**1.3**	M	**5.4**		1.1	U	1	U
21	Isophorone	1.0	U	1.0	U	1.0	U	1.1	U	NA		NA		1.1	U	1	U	1	U	1	U	1.1	U	1	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.3	U	NA		NA		3.3	U	3.1	U	3.1	U	3	U	3.2	U	3	U
23	Benzoic Acid	10	U	50	U	50	U	54	U	NA		NA		56	U	51	U	51	U	50	U	53	U	10	U
24	Naphthalene	**3.1**		**5.3**		**6.7**		**4.9**		NA		NA		**4.7**		**4.9**		**5.1**		**10**		**5.6**		**3.2**	
25	2-Methylnaphthalene	**2.0**		**1.7**		**2.6**		**1.7**		NA		NA		**2.8**		**3.6**		**3.7**		**4.5**		**3.7**		**2.9**	
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.4	U	NA		NA		5.6	U	5.1	U	5.1	U	5	U	**8.3**	M	5.1	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.4	U	NA		NA		5.6	U	5.1	U	5.1	U	5	U	5.3	U	5.1	U
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.1	U	NA		NA		1.1	U	1	U	1	U	1	U	1.1	U	1	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.1	U	NA		NA		1.1	U	1	U	1	U	1	U	1.1	U	1	U
30	Fluorene	1.0	U	1.0	U	1.0	U	1.1	U	NA		NA		1.1	U	1	U	1	U	1	U	1.1	U	1	U
31	Pentachlorophenol	**560**		**4700**		**4000**		**2600**		NA		NA		**2200**		**1600**	J	**2000**	J	**3800**		**1700**		**900**	
32	bis(2-Ethylhexyl)phthalate	1.0	U	4.0	U	4.0	U	4.3	U	NA		NA		4.4	U	1	U	1	U	1	U	1.1	U	1	U
33																									
34	**VOLATILES (µg/L)**																								
35	**EPA Method SW8260**																								
36	Acetone	**17**		**28**		5.0	U	11	UJ	**99**	M	**110**		**46**	M	**18**	M	**22**	M	**23**	M	**10**	MJ	**7**	M
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1	UJ	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	5.0	U	**13**		5.0	U	**23**	J	**12**		**14**		**7.4**		5	U	5	U	5	U	**9.5**	M	**7.5**	M
39	Benzene	**1.7**		**6.6**		**12**		**9.1**		**2.9**		**2.6**		**2.7**		**11**	J	**14**	J	**18**		**5.4**		**2.1**	
40	Bromoform	1.0	U	1.0	U	1.0	U	1	UJ	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	**5.3**		**9.1**		**10**		**3.6**	J	**3**		**2.8**		**1.3**		**3.9**	J	**4.8**	J	**6.4**		**1.2**		1	U
42	Ethylbenzene	**33**		**36**		**56**		**44**		**56**		**55**		**25**		**34**		**39**		**75**		**29**		**14**	
43	Styrene	1.0	U	1.0	U	1.0	U	1	UJ	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	**57**		**71**		**100**		**69**	J	**67**		**67**		**26**		**52**		**62**		**120**		**48**	J	**20**	
45	o-Xylene	**50**		**77**		**94**		**68**	J	**88**		**83**		**37**		**48**		**55**		**130**		**50**		**23**	
46	1,3,5-Trimethylbenzene	**32**		**29**		**35**		**28**		**28**	J	**22**	J	**8.3**		**16**		**19**		**46**		**28**		**16**	
47	1,2,4-Trimethylbenzene	**120**		**140**		**150**		**120**		**160**		**150**		**84**		**95**		**110**		**210**		**120**	J	**73**	
48	Isopropylbenzene	**12**		**14**		**16**		**16**		**22**		**18**		**10**		**12**		**14**		**27**		**15**		**7.6**	
49	n-Propylbenzene	**21**		**20**		**24**		**24**		**31**		**27**		**15**		**20**		**23**		**37**		**20**		**13**	
50	tert-Butylbenzene	**1.3**	M	**1.4**		**2.8**	J	**1.8**		**2**		**1.8**		**1.3**	M	**1.5**	M	**1.6**	M	**2.4**		**1.6**		**1**	
51	sec-Butylbenzene	**7.3**		**6.9**		**7.4**		**5.8**		**10**		**9.3**		**5.6**		**7.4**		**7.8**		**11**		**7.9**		**4.7**	
52	4-Isopropyltoluene	**6.6**		**3.9**		**6.0**		**5.8**	J	**7**		**6.4**		**3.2**		**5.2**		**5.8**		**7.4**		**4.6**		**3.2**	
53	n-Butylbenzene	7.6	U	**4.1**		5.0	U	**6.8**	M	**7.6**	M	**7.2**	M	**3.8**	M	**6**	M	**6.6**	M	**8.2**		**5.2**		**3.7**	M
54	Naphthalene	**11**		**12**		**17**		**15**	J	**22**		**19**		**7.8**		**10**		**12**		**22**		**9.4**		5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																									
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	**Method OR-DEQ**																								
59	**TPH-Diesel**	**1.7**		**7.4**		**8.0**		**7.9**		NA		NA		**4.7**		**4.5**		**4.4**		**8.6**		**4**		**2.3**	
60	**TPH-D Motor Oil**	0.50	U	0.50	U	0.50	U	0.5	U	NA		NA		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
61	**TPH-Gasoline**	**2.9**		8.9		**9.7**		**7.3**		NA		NA		**6.1**		**7.1**		**7.7**		**8.6**	J	**4.8**		**2.8**	
62																									
63	**PRIORITY POLLUTANT**																								
64	**METALS (mg/L)**																								
65	Arsenic (7060)	**0.007**		**0.006**		**0.006**		**0.006**		NA		NA		0.05	U	**0.004**		**0.004**		**0.005**		**0.005**		**0.006**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1																								
2					Dup of LW11S												Dup of LW11S							
3			LW11S		LW110S		LW11S		LW11S		LW11S		LW11S		LW11S		X		LW11S		LW11S		LW11S	
4			AH76E		AH76D		AU36F		BC27J		9912050-06A		BH96U		BR55L		BR55K		CB49J		CK77K		CT55H	
5			5/20/99		5/20/99		9/21/99		12/8/99		12/8/1999 (d)		2/17/00		5/23/00		5/23/00		8/28/00		11/8/00		2/14/01	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	NA		0.005	U	0.005	U	0.005	U	0.005	U	NA		0.005	U
67	60	Copper (6010)	**0.002**		**0.003**		0.002	U	0.002	U	NA		**0.005**		0.002	U	0.002	U	0.002	U	NA		0.002	U
68	61	Lead (7421)	0.001	U	0.001	U	0.001	U	0.001	U	NA		**0.002**		0.001	U	0.001	U	0.001	U	NA		0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	NA		0.01	U	0.01	U	0.01	U	0.01	U	NA		0.01	U
70	63	Zinc (6010)	**0.010**		**0.010**		0.004	U	0.006	U	NA		**0.011**		0.006	U	0.006	U	0.006	U	NA		0.006	U
71	64																							
72	65	**MAJOR IONS AND CONVENTIONALS**																						
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**20.3**	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**6.41**	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**1.6**	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**4.03**	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**140**	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		1.0	U
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**140**	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**230**		**240**		**150**		**200**		NA		**160**		**160**		**170**		**220**		NA		**190**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.3**		**2.2**		**3.3**		**5.3**		NA		**5.2**		**5.8**	J2	**12**	J2	**6.5**		NA		**3.1**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**5.6**	
86	79																							

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
1																									
2												Dup of LW11S						Dup of LW11S							
3		LW11S		LW11S		LW11S		LW11S		LW11S		OX005S		LW11S		LW11S		X		LW11S		LW11S		LW11S	
4		DE68M		ED34D		EM66C		ES04D		EX87C		EX87A		EZ03I		FF76H		FF76L		FL58H		FU45D		FY72I	
5		6/4/01		2/28/02		6/24/02		08/28/02		10/29/02		10/29/02		11/12/02		2/12/03		2/12/03		5/8/03		8/28/03		10/22/03	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	NA		NA		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	0.002	U	**0.003**		0.002	U	0.002	U	NA		NA		0.002	U	0.002	UJ	**0.007**	J	**0.002**		**0.004**		**0.002**	
68	Lead (7421)	0.001	U	0.001	U	0.001	U	0.001	U	NA		NA		0.02	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	NA		NA		**0.12**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)	0.006	U	0.006	U	0.006	U	0.006	U	NA		NA		**0.019**		**0.009**		**0.011**		0.006	U	0.006	U	0.006	U
71																									
72	**MAJOR IONS AND CONVENTIONALS**																								
73	Calcium (mg/L) (6010)	**28.6**		**59.0**		NA		NA		NA		NA		NA		**22.5**		**23.1**		NA		NA		NA	
74	Magnesium (mg/L) (6010)	**9.34**		**18.2**		NA		NA		NA		NA		NA		**7.52**		**7.8**		NA		NA		NA	
75	Potassium (mg/L) (6010)	**2.7**		**4.0**		NA		NA		NA		NA		NA		**2.9**		**3**		NA		NA		NA	
76	Sodium (mg/L) (6010)	**6.10**		**8.55**		NA		NA		NA		NA		NA		**12.5**		**12.9**		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		**230**		NA		NA		140		**140**		NA		**120**		**120**		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		1.0	U	NA		NA		1	U	1	U	NA		1	U	1	U	NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		**230**		NA		NA		140		**140**		NA		**120**		**120**		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**190**		**410**		**180**		**160**		NA		NA		**560**		**170**		**160**		**190**		**270**		**240**	
81	Chloride (mg/L) (EPA 325.2)	**3.2**		**58**		**2.7**		**3.8**		NA		NA		**4.7**		**3.1**		**3**		**4.9**		**3.3**		**4**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		0.010	U	NA		NA		NA		NA		NA		**0.042**	J	**0.031**	J	NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		**0.031**		NA		NA		NA		NA		NA		0.01	U	0.01	U	NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		**0.040**		NA		NA		NA		NA		NA		**0.042**	J	**0.031**	J	NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		**13**		NA		NA		NA		NA		NA		**24**		**26**		NA		NA		NA	
86																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1																								
2					Dup of LW11S												Dup of LW11S							
3			LW11S		LW110S		LW11S		LW11S		LW11S		LW11S		LW11S		X		LW11S		LW11S		LW11S	
4			AH76E		AH76D		AU36F		BC27J		9912050-06A		BH96U		BR55L		BR55K		CB49J		CK77K		CT55H	
5			5/20/99		5/20/99		9/21/99		12/8/99		12/8/1999 (d)		2/17/00		5/23/00		5/23/00		8/28/00		11/8/00		2/14/01	
87	80	**FIELD PARAMETERS**																						
88	81	pH (avg)	6.55		6.56		5.83		6.50		NM		6.52		6.52		6.53		6.27		NM		6.25	
89	82	Temperature (° C) (avg)	14.1		14.1		15.0		12.2		NM		15.0		14.0		14.0		15.1		NM		13.2	
90	83	Conductivity (um/hos)	285		286		226		323		NM		291		234		234		346		NM		296	
91	84	Dissolved oxygen (mg/L) (avg)	2.09		2.21		2.45		2.72		NM		0.11		2.02		2.02		1.37		NM		0.61	
92	85																							
93	86	**DIOXINS AND FURANS (ng/L)**																						
94	87	**Method 8290**																						
95	88	2,3,7,8-TCDF	NA		NA		0.0055	U	0.00130	U	NA		0.0025	U	NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		**0.018**		**0.0011**	J1	NA		**0.0064**		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		0.0056	U	0.00130	U	NA		0.0044	U	NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		0.0056	U	0.00130	U	NA		0.0044	U	NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		0.0320	UE	0.00160	U	NA		0.11	U	NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		0.0120	U	0.00130	U	NA		0.0026	U	NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		0.0220	U	0.00140	U	NA		0.0034	U	NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		0.0061	U	0.00160	U	NA		0.0044	U	NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		0.0061	U	0.00160	U	NA		0.0044	U	NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		0.0083	U	0.00120	U	NA		0.54	U	NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		0.0079	U	0.018	U	NA		0.0036	U	NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		0.0067	U	0.0032	U	NA		0.0038	U	NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		0.0130	U	0.00140	U	NA		0.0058	U	NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		**0.015**		0.0170	U	NA		**0.1600**		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		0.0076	U	0.00260	U	NA		0.0069	U	NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		**0.015**		**0.0025**	J1	NA		**0.0230**	J1	NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		0.0100	U	0.00130	U	NA		0.0078	U	NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		**0.035**		**0.0068**	J1	NA		**0.0310**		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		**0.043**		**0.0071**	J1	NA		0.14	U	NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		0.0094	U	0.00200	U	NA		0.0120	U	NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		**0.043**		**0.0320**	J1	NA		**0.3800**		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		**0.270**		**0.0500**	J1	NA		**0.6900**		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		**0.410**		**0.0780**		NA		**1.1000**		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		0.220	U	**0.0280**	J1	NA		**0.5100**		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		**1.900**		**0.2800**		NA		**5.3000**		NA		NA		NA		NA		NA	
120																								
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		10	U	**11**		5.0	U	5.0	U	5.0	U	NA		5.0	U
122																								

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
1																									
2												Dup of LW11S						Dup of LW11S							
3		LW11S		LW11S		LW11S		LW11S		LW11S		OX005S		LW11S		LW11S		X		LW11S		LW11S		LW11S	
4		DE68M		ED34D		EM66C		ES04D		EX87C		EX87A		EZ03I		FF76H		FF76L		FL58H		FU45D		FY72I	
5		6/4/01		2/28/02		6/24/02		08/28/02		10/29/02		10/29/02		11/12/02		2/12/03		2/12/03		5/8/03		8/28/03		10/22/03	
87	**FIELD PARAMETERS**																								
88	pH (avg)	6.50		6.29		6.14		6.44		6.47		6.48		6.21		6.9		6.92		6.6		6.65		6.65	
89	Temperature (° C) (avg)	14.1		13.6		15.6		16.4		16.4		16.4		15.5		14.6		14.7		13.7		14.3		15.8	
90	Conductivity (um/hos)	270		460		205		218		554		554		528		323		324		248		356		300	
91	Dissolved oxygen (mg/L) (avg)	0.96		7.46		4.17		1.31		0		0		0		0		0		2.96		1.61		1.97	
92																									
93	**DIOXINS AND FURANS (ng/L)**																								
94	**Method 8290**																								
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**6.88**	J
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**7.91**	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		3.08	U
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		3.08	U
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**30.1**	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**23.8**	J
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**664**	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		5.19	U
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**144**	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**185**	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**101**	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**141**	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		11	U
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**6013**	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**31**	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**812**	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**111**	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**2769**	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**5015**	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**335**	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**23730**	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**34761**	J
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**53330**	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**25345**	J
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**276444**	J
120																									
121	**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1																								
2					Dup of LW11S												Dup of LW11S							
3			LW11S		LW110S		LW11S		LW11S		LW11S		LW11S		LW11S		X		LW11S		LW11S		LW11S	
4			AH76E		AH76D		AU36F		BC27J		9912050-06A		BH96U		BR55L		BR55K		CB49J		CK77K		CT55H	
5			5/20/99		5/20/99		9/21/99		12/8/99		12/8/1999 (d)		2/17/00		5/23/00		5/23/00		8/28/00		11/8/00		2/14/01	
123		**PAHs (µg/L)**																						
124		**EPA Method SW8270 SIM**																						
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
1																									
2												Dup of LW11S						Dup of LW11S							
3		LW11S		LW11S		LW11S		LW11S		LW11S		OX005S		LW11S		LW11S		X		LW11S		LW11S		LW11S	
4		DE68M		ED34D		EM66C		ES04D		EX87C		EX87A		EZ03I		FF76H		FF76L		FL58H		FU45D		FY72I	
5		6/4/01		2/28/02		6/24/02		08/28/02		10/29/02		10/29/02		11/12/02		2/12/03		2/12/03		5/8/03		8/28/03		10/22/03	
123	**PAHs (µg/L)**																								
124	**EPA Method SW8270 SIM**																								
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																												
2																												Dup of LW13S
3			LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		Y
4			BR64S		CB68A		CL03U		CT67O		DE87F		DM30R		DW29K		ED30F		EN00F		ER93H		EZ03N		FF65H		FF65J
5			5/25/00		8/30/00		11/9/00		2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/12/02		2/11/03		2/11/03
6																												
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	**0.60**		**0.89**		**1.4**		**9.3**		**4.4**		**6.9**		0.25	U	0.26	U	0.25	U	0.26	U	**0.49**		0.25	U	0.25
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
20	14	4-Methylphenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
21	15	Isophorone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
22	16	2,4-Dimethylphenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
23	17	Benzoic Acid	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
24	18	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
25	19	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
26	20	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
27	21	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
28	22	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
29	23	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
30	24	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
31	25	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
37	31	Carbon Disulfide	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
38	32	2-Butanone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
39	33	Benzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
40	34	Bromoform	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
41	35	Toluene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
42	36	Ethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
43	37	Styrene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
44	38	m,p-Xylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
45	39	o-Xylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
46	40	1,3,5-Trimethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
47	41	1,2,4-Trimethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
48	42	Isopropylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
49	43	n-Propylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
50	44	tert-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
51	45	sec-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
52	46	4-Isopropyltoluene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
53	47	n-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
54	48	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH
1								
2								
3			LW13S		LW13S		LW13S	
4			FL58C		FU45M		FY82E	
5			5/8/03		8/28/03		10/23/03	
7	**CHLORINATED PHENOLS (µg/L)**							
8	**EPA Method SW8040**							
9	Pentachlorophenol	U	0.25	U	**1.1**	J	**1.0**	
10	2,4,6-Trichlorophenol		NA		NA		NA	
11	2,3,6-Trichlorophenol		NA		NA		NA	
12	2,4,5-Trichlorophenol		NA		NA		NA	
13	2,3,4-Trichlorophenol		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol		NA		NA		NA	
16								
17	**SEMIVOLATILES (µg/L)**							
18	**EPA Method SW8270**							
19	Phenol		NA		NA		NA	
20	4-Methylphenol		NA		NA		NA	
21	Isophorone		NA		NA		NA	
22	2,4-Dimethylphenol		NA		NA		NA	
23	Benzoic Acid		NA		NA		NA	
24	Naphthalene		NA		NA		NA	
25	2-Methylnaphthalene		NA		NA		NA	
26	2,4,6-Trichlorophenol		NA		NA		NA	
27	2,4,5-Trichlorophenol		NA		NA		NA	
28	Acenaphthene		NA		NA		NA	
29	Dibenzofuran		NA		NA		NA	
30	Fluorene		NA		NA		NA	
31	Pentachlorophenol		NA		NA		NA	
32	bis(2-Ethylhexyl)phthalate		NA		NA		NA	
33								
34	**VOLATILES (µg/L)**							
35	**EPA Method SW8260**							
36	Acetone		NA		NA		NA	
37	Carbon Disulfide		NA		NA		NA	
38	2-Butanone		NA		NA		NA	
39	Benzene		NA		NA		NA	
40	Bromoform		NA		NA		NA	
41	Toluene		NA		NA		NA	
42	Ethylbenzene		NA		NA		NA	
43	Styrene		NA		NA		NA	
44	m,p-Xylene		NA		NA		NA	
45	o-Xylene		NA		NA		NA	
46	1,3,5-Trimethylbenzene		NA		NA		NA	
47	1,2,4-Trimethylbenzene		NA		NA		NA	
48	Isopropylbenzene		NA		NA		NA	
49	n-Propylbenzene		NA		NA		NA	
50	tert-Butylbenzene		NA		NA		NA	
51	sec-Butylbenzene		NA		NA		NA	
52	4-Isopropyltoluene		NA		NA		NA	
53	n-Butylbenzene		NA		NA		NA	
54	Naphthalene		NA		NA		NA	
55	Methyl tert-butyl ether		NA		NA		NA	
56								
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**							
58	**Method OR-DEQ**							
59	**TPH-Diesel**		NA		NA		NA	
60	**TPH-D Motor Oil**		NA		NA		NA	
61	**TPH-Gasoline**		NA		NA		NA	
62								
63	**PRIORITY POLLUTANT**							
64	**METALS (mg/L)**							
65	Arsenic (7060)		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											Dup of LW13S
3			LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		Y
4			BR64S		CB68A		CL03U		CT67O		DE87F		DM30R		DW29K		ED30F		EN00F		ER93H		EZ03N		FF65H		FF65J
5			5/25/00		8/30/00		11/9/00		2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/12/02		2/11/03		2/11/03
66	59	Chromium (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
67	60	Copper (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
68	61	Lead (7421)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
69	62	Nickel (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
70	63	Zinc (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
71	64																										
72	65	**MAJOR IONS AND CONVENTIONALS**																									
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
86	79																										

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH
1								
2								
3			LW13S		LW13S		LW13S	
4			FL58C		FU45M		FY82E	
5			5/8/03		8/28/03		10/23/03	
66	Chromium (6010)		NA		NA		NA	
67	Copper (6010)		NA		NA		NA	
68	Lead (7421)		NA		NA		NA	
69	Nickel (6010)		NA		NA		NA	
70	Zinc (6010)		NA		NA		NA	
71								
72	**MAJOR IONS AND CONVENTIONALS**							
73	Calcium (mg/L) (6010)		NA		NA		NA	
74	Magnesium (mg/L) (6010)		NA		NA		NA	
75	Potassium (mg/L) (6010)		NA		NA		NA	
76	Sodium (mg/L) (6010)		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		NA		NA		NA	
81	Chloride (mg/L) (EPA 325.2)		NA		NA		NA	
82	N-Nitrate (mg-N/L) (Calculated)		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		NA		NA	
86								

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											Dup of LW13S
3			LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		Y
4			BR64S		CB68A		CL03U		CT67O		DE87F		DM30R		DW29K		ED30F		EN00F		ER93H		EZ03N		FF65H		FF65J
5			5/25/00		8/30/00		11/9/00		2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/12/02		2/11/03		2/11/03
87	80	**FIELD PARAMETERS**																									
88	81	pH (avg)	6.22		5.57		5.62		6.34		6.54		6.82		6.56		6.35		6.43		6.32		6.43		6.77		6.76
89	82	Temperature (° C) (avg)	12.0		13.5		10.7		12.2		12.8		15.2		13.8		11.2		12.7		14.1		14.1		12.8		12.8
90	83	Conductivity (um/hos)	128		149		272		149		336		383		214		89		180		146		141		71		71
91	84	Dissolved oxygen (mg/L) (avg)	5.81		3.67		1.47		0.94		2.62		1.49		5.86		9.57		7.00		2.31		2.27		0		0
92	85																										
93	86	**DIOXINS AND FURANS (ng/L)**																									
94	87	**Method 8290**																									
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120																											
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
122																											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH
1								
2								
3			LW13S		LW13S		LW13S	
4			FL58C		FU45M		FY82E	
5			5/8/03		8/28/03		10/23/03	
87	**FIELD PARAMETERS**							
88	pH (avg)		6.36		6.67		6.38	
89	Temperature (° C) (avg)		11.9		15.6		14.7	
90	Conductivity (um/hos)		81		131		119	
91	Dissolved oxygen (mg/L) (avg)		6.14		3.68		5.65	
92								
93	**DIOXINS AND FURANS (ng/L)**							
94	**Method 8290**							
95	2,3,7,8-TCDF		NA		NA		NA	
96	Total TCDF		NA		NA		NA	
97	2,3,7,8-TCDD		NA		NA		NA	
98	Total TCDD		NA		NA		NA	
99	1,2,3,7,8-PeCDF		NA		NA		NA	
100	2,3,4,7,8-PeCDF		NA		NA		NA	
101	Total PeCDF		NA		NA		NA	
102	1,2,3,7,8-PeCDD		NA		NA		NA	
103	Total PeCDD		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF		NA		NA		NA	
108	Total HxCDF		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD		NA		NA		NA	
112	Total HxCDD		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF		NA		NA		NA	
115	Total HpCDF		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD		NA		NA		NA	
117	Total HpCDD		NA		NA		NA	
118	OCDF		NA		NA		NA	
119	OCDD		NA		NA		NA	
120								
121	**ETHANOL (mg/L)**		NA		NA		NA	
122								

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											Dup of LW13S
3			LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		LW13S		Y
4			BR64S		CB68A		CL03U		CT67O		DE87F		DM30R		DW29K		ED30F		EN00F		ER93H		EZ03N		FF65H		FF65J
5			5/25/00		8/30/00		11/9/00		2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/12/02		2/11/03		2/11/03
123		**PAHs (µg/L)**																									
124		**EPA Method SW8270 SIM**																									
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH
1								
2								
3			LW13S		LW13S		LW13S	
4			FL58C		FU45M		FY82E	
5			5/8/03		8/28/03		10/23/03	
123	**PAHs (µg/L)**							
124	**EPA Method SW8270 SIM**							
125	Naphthalene		NA		NA		NA	
126	2-Methylnaphthalene		NA		NA		NA	
127	Acenaphthylene		NA		NA		NA	
128	Acenaphthene		NA		NA		NA	
129	Fluorene		NA		NA		NA	
130	Anthracene		NA		NA		NA	
131	Dibenzofuran		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW19S	
4			FZ04O	
5			10/28/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2	U
20	14	4-Methylphenol	1	U
21	15	Isophorone	1	U
22	16	2,4-Dimethylphenol	3	U
23	17	Benzoic Acid	10	U
24	18	Naphthalene	1	U
25	19	2-Methylnaphthalene	1	U
26	20	2,4,6-Trichlorophenol	5	U
27	21	2,4,5-Trichlorophenol	5	U
28	22	Acenaphthene	**1.1**	
29	23	Dibenzofuran	**1.5**	
30	24	Fluorene	**3.5**	
31	25	Pentachlorophenol	5	U
32	26	bis(2-Ethylhexyl)phthalate	1	U
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	**5.1**	M
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	1	U
40	34	Bromoform	1	U
41	35	Toluene	1	U
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	1	U
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	**6.5**	
49	43	n-Propylbenzene	**8.9**	
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	**4.7**	
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	**2.9**	M
54	48	Naphthalene	5	U
55	48.5	Methyl tert-butyl ether	1	U
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	**4.4**	
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	**1.1**	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.046**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW19S	
4			FZ04O	
5			10/28/03	
66	59	Chromium (6010)	0.005	U
67	60	Copper (6010)	0.002	U
68	61	Lead (7421)	**0.001**	
69	62	Nickel (6010)	0.01	U
70	63	Zinc (6010)	0.006	U
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**140**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.1**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW19S	
4			FZ04O	
5			10/28/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.65	
89	82	Temperature (° C) (avg)	14.4	
90	83	Conductivity (um/hos)	506	
91	84	Dissolved oxygen (mg/L) (avg)	1.72	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121		**ETHANOL (mg/L)**	NA	
122				

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW19S	
4			FZ04O	
5			10/28/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.1	U
126		2-Methylnaphthalene	0.1	U
127		Acenaphthylene	0.1	U
128		Acenaphthene	0.84	
129		Fluorene	2.5	
130		Anthracene	0.1	U
131		Dibenzofuran	0.77	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW20S	
4			FZ04M	
5			10/28/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2.2	U
20	14	4-Methylphenol	1.1	U
21	15	Isophorone	1.1	U
22	16	2,4-Dimethylphenol	3.3	U
23	17	Benzoic Acid	11	U
24	18	Naphthalene	1.1	U
25	19	2-Methylnaphthalene	1.1	U
26	20	2,4,6-Trichlorophenol	5.6	U
27	21	2,4,5-Trichlorophenol	5.6	U
28	22	Acenaphthene	**1.4**	
29	23	Dibenzofuran	1.1	U
30	24	Fluorene	**3.8**	
31	25	Pentachlorophenol	5.6	U
32	26	bis(2-Ethylhexyl)phthalate	1.1	U
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	5	U
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	1	U
40	34	Bromoform	1	U
41	35	Toluene	1	U
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	1	U
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	**7**	
49	43	n-Propylbenzene	**9.2**	
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	**5.1**	
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	**2.2**	
54	48	Naphthalene	5	U
55	48.5	Methyl tert-butyl ether	1	U
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	**5.4**	
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	**0.96**	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.04**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW20S	
4			FZ04M	
5			10/28/03	
66	59	Chromium (6010)	0.005	U
67	60	Copper (6010)	0.002	U
68	61	Lead (7421)	0.001	U
69	62	Nickel (6010)	0.01	U
70	63	Zinc (6010)	**0.01**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**270**	
81	74	Chloride (mg/L) (EPA 325.2)	**2**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW20S	
4			FZ04M	
5			10/28/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.33	
89	82	Temperature (° C) (avg)	16.5	
90	83	Conductivity (um/hos)	445	
91	84	Dissolved oxygen (mg/L) (avg)	1.79	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121		**ETHANOL (mg/L)**	NA	
122				

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW20S	
4			FZ04M	
5			10/28/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.11	U
126		2-Methylnaphthalene	0.11	U
127		Acenaphthylene	0.11	U
128		Acenaphthene	1.3	
129		Fluorene	3.3	
130		Anthracene	0.14	
131		Dibenzofuran	0.59	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW21S	
4			FZ04Q	
5			10/28/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	**11**	
20	14	4-Methylphenol	1.2	U
21	15	Isophorone	1.2	U
22	16	2,4-Dimethylphenol	**5.4**	
23	17	Benzoic Acid	12	U
24	18	Naphthalene	**100**	
25	19	2-Methylnaphthalene	**46**	
26	20	2,4,6-Trichlorophenol	6	U
27	21	2,4,5-Trichlorophenol	6	U
28	22	Acenaphthene	1.2	U
29	23	Dibenzofuran	1.2	U
30	24	Fluorene	**1.9**	
31	25	Pentachlorophenol	6	U
32	26	bis(2-Ethylhexyl)phthalate	1.2	U
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	5	U
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	**1600**	
40	34	Bromoform	1	U
41	35	Toluene	**72**	
42	36	Ethylbenzene	**940**	
43	37	Styrene	1	U
44	38	m,p-Xylene	**2400**	
45	39	o-Xylene	**770**	
46	40	1,3,5-Trimethylbenzene	**120**	
47	41	1,2,4-Trimethylbenzene	**540**	
48	42	Isopropylbenzene	**72**	
49	43	n-Propylbenzene	**110**	
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	1	U
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	**8**	
54	48	Naphthalene	**190**	
55	48.5	Methyl tert-butyl ether	**7.5**	M
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	**4.3**	
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	**24**	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.025**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW21S	
4			FZ04Q	
5			10/28/03	
66	59	Chromium (6010)	0.005	U
67	60	Copper (6010)	**0.005**	
68	61	Lead (7421)	**0.005**	
69	62	Nickel (6010)	0.01	U
70	63	Zinc (6010)	**0.012**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**240**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.7**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW21S	
4			FZ04Q	
5			10/28/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.54	
89	82	Temperature (° C) (avg)	16.4	
90	83	Conductivity (um/hos)	373	
91	84	Dissolved oxygen (mg/L) (avg)	1.25	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121		**ETHANOL (mg/L)**	NA	
122				

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW21S	
4			FZ04Q	
5			10/28/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	100	
126		2-Methylnaphthalene	46	
127		Acenaphthylene	0.12	U
128		Acenaphthene	0.8	
129		Fluorene	2.1	
130		Anthracene	0.12	U
131		Dibenzofuran	0.57	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW27S	
4			FZ04R	
5			10/28/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2.4	U
20	14	4-Methylphenol	1.2	U
21	15	Isophorone	1.2	U
22	16	2,4-Dimethylphenol	3.7	U
23	17	Benzoic Acid	12	U
24	18	Naphthalene	1.2	U
25	19	2-Methylnaphthalene	1.2	U
26	20	2,4,6-Trichlorophenol	6.1	U
27	21	2,4,5-Trichlorophenol	6.1	U
28	22	Acenaphthene	**1.2**	
29	23	Dibenzofuran	1.2	U
30	24	Fluorene	**2.3**	
31	25	Pentachlorophenol	6.1	U
32	26	bis(2-Ethylhexyl)phthalate	1.2	U
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	**6**	
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	1	U
40	34	Bromoform	1	U
41	35	Toluene	1	U
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	1	U
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	**12**	
49	43	n-Propylbenzene	**13**	
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	**4**	
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	**3.3**	
54	48	Naphthalene	5	U
55	48.5	Methyl tert-butyl ether	1	U
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	**4.4**	
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	**1.6**	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.038**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW27S	
4			FZ04R	
5			10/28/03	
66	59	Chromium (6010)	0.005	U
67	60	Copper (6010)	**0.002**	
68	61	Lead (7421)	**0.002**	
69	62	Nickel (6010)	0.01	U
70	63	Zinc (6010)	**0.008**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**270**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.9**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW27S	
4			FZ04R	
5			10/28/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.62	
89	82	Temperature (° C) (avg)	14.9	
90	83	Conductivity (um/hos)	400	
91	84	Dissolved oxygen (mg/L) (avg)	1.53	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121		**ETHANOL (mg/L)**	NA	
122				

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW27S	
4			FZ04R	
5			10/28/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.12	U
126		2-Methylnaphthalene	0.12	U
127		Acenaphthylene	0.12	U
128		Acenaphthene	1.1	
129		Fluorene	2.3	
130		Anthracene	0.16	
131		Dibenzofuran	0.71	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW29S	
4			FZ04C	
5			10/27/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2	U
20	14	4-Methylphenol	1	U
21	15	Isophorone	1	U
22	16	2,4-Dimethylphenol	3	U
23	17	Benzoic Acid	10	U
24	18	Naphthalene	1	U
25	19	2-Methylnaphthalene	1	U
26	20	2,4,6-Trichlorophenol	5	U
27	21	2,4,5-Trichlorophenol	5	U
28	22	Acenaphthene	1	U
29	23	Dibenzofuran	1	U
30	24	Fluorene	1	U
31	25	Pentachlorophenol	5	U
32	26	bis(2-Ethylhexyl)phthalate	1	U
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	5	U
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	1	U
40	34	Bromoform	1	U
41	35	Toluene	1	U
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	1	U
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	1	U
49	43	n-Propylbenzene	1	U
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	1	U
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	1	U
54	48	Naphthalene	5	U
55	48.5	Methyl tert-butyl ether	1	U
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	0.25	U
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	0.25	U
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.002**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW29S	
4			FZ04C	
5			10/27/03	
66	59	Chromium (6010)	0.005	U
67	60	Copper (6010)	0.002	U
68	61	Lead (7421)	0.001	U
69	62	Nickel (6010)	0.01	U
70	63	Zinc (6010)	**0.007**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**91**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.8**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW29S	
4			FZ04C	
5			10/27/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.56	
89	82	Temperature (° C) (avg)	14.7	
90	83	Conductivity (um/hos)	112	
91	84	Dissolved oxygen (mg/L) (avg)	1.44	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121		**ETHANOL (mg/L)**	NA	
122				

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW29S	
4			FZ04C	
5			10/27/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.1	U
126		2-Methylnaphthalene	0.1	U
127		Acenaphthylene	0.1	U
128		Acenaphthene	0.1	U
129		Fluorene	0.1	U
130		Anthracene	0.1	U
131		Dibenzofuran	0.1	U

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2					Dup of LW30S	
3			LW30S		X	
4			FZ04E		FZ04L	
5			10/27/03		10/27/03	
7	1	**CHLORINATED PHENOLS (µg/L)**				
8	2	**EPA Method SW8040**				
9	3	Pentachlorophenol	NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA	
16	10					
17	11	**SEMIVOLATILES (µg/L)**				
18	12	**EPA Method SW8270**				
19	13	Phenol	2.2	U	2.2	U
20	14	4-Methylphenol	1.1	U	1.1	U
21	15	Isophorone	1.1	U	1.1	U
22	16	2,4-Dimethylphenol	3.3	U	3.3	U
23	17	Benzoic Acid	11	U	11	U
24	18	Naphthalene	1.1	U	1.1	U
25	19	2-Methylnaphthalene	1.1	U	1.1	U
26	20	2,4,6-Trichlorophenol	5.5	U	5.4	U
27	21	2,4,5-Trichlorophenol	5.5	U	5.4	U
28	22	Acenaphthene	1.1	U	1.1	U
29	23	Dibenzofuran	1.1	U	1.1	U
30	24	Fluorene	**1.4**		**1.5**	
31	25	Pentachlorophenol	5.5	U	5.4	U
32	26	bis(2-Ethylhexyl)phthalate	1.1	U	**1.7**	
33	27					
34	28	**VOLATILES (µg/L)**				
35	29	**EPA Method SW8260**				
36	30	Acetone	5	U	5	U
37	31	Carbon Disulfide	1	U	1	U
38	32	2-Butanone	5	U	5	U
39	33	Benzene	1	U	1	U
40	34	Bromoform	1	U	1	U
41	35	Toluene	1	U	1	U
42	36	Ethylbenzene	1	U	1	U
43	37	Styrene	1	U	1	U
44	38	m,p-Xylene	1	U	**1**	
45	39	o-Xylene	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	**1.3**	
47	41	1,2,4-Trimethylbenzene	1	U	1	U
48	42	Isopropylbenzene	**9.8**		**9.6**	
49	43	n-Propylbenzene	**25**		**23**	
50	44	tert-Butylbenzene	1	U	1	U
51	45	sec-Butylbenzene	**2.5**		**2.4**	
52	46	4-Isopropyltoluene	1	U	1	U
53	47	n-Butylbenzene	**3.5**		**3.2**	M
54	48	Naphthalene	5	U	5	U
55	48.5	Methyl tert-butyl ether	1	U	1	U
56	49					
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**				
58	51	**Method OR-DEQ**				
59	52	**TPH-Diesel**	**0.87**		**0.86**	
60	53	**TPH-D Motor Oil**	0.5	U	0.5	U
61	54	**TPH-Gasoline**	**0.84**		**0.89**	
62	55					
63	56	**PRIORITY POLLUTANT**				
64	57	**METALS (mg/L)**				
65	58	Arsenic (7060)	**0.013**		**0.013**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2					Dup of LW30S	
3			LW30S		X	
4			FZ04E		FZ04L	
5			10/27/03		10/27/03	
66	59	Chromium (6010)	0.005	U	0.005	U
67	60	Copper (6010)	0.002	U	0.002	U
68	61	Lead (7421)	0.001	U	0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U
70	63	Zinc (6010)	0.006	U	**0.007**	
71	64					
72	65	**MAJOR IONS AND CONVENTIONALS**				
73	66	Calcium (mg/L) (6010)	NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**130**		**140**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.3**		**1.3**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA	
86	79					

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2					Dup of LW30S	
3			LW30S		X	
4			FZ04E		FZ04L	
5			10/27/03		10/27/03	
87	80	**FIELD PARAMETERS**				
88	81	pH (avg)	6.59		6.59	
89	82	Temperature (° C) (avg)	14.7		14.7	
90	83	Conductivity (um/hos)	192		193	
91	84	Dissolved oxygen (mg/L) (avg)	2.46		2.27	
92	85					
93	86	**DIOXINS AND FURANS (ng/L)**				
94	87	**Method 8290**				
95	88	2,3,7,8-TCDF	NA		NA	
96	89	Total TCDF	NA		NA	
97	90	2,3,7,8-TCDD	NA		NA	
98	91	Total TCDD	NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA	
101	94	Total PeCDF	NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA	
103	96	Total PeCDD	NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA	
108	101	Total HxCDF	NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA	
112	105	Total HxCDD	NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA	
115	108	Total HpCDF	NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA	
117	110	Total HpCDD	NA		NA	
118	111	OCDF	NA		NA	
119	112	OCDD	NA		NA	
120						
121		**ETHANOL (mg/L)**	NA		NA	
122						

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2					Dup of LW30S	
3			LW30S		X	
4			FZ04E		FZ04L	
5			10/27/03		10/27/03	
123		**PAHs (µg/L)**				
124		**EPA Method SW8270 SIM**				
125		Naphthalene	0.11	U	0.11	U
126		2-Methylnaphthalene	0.11	U	0.11	U
127		Acenaphthylene	0.11	U	0.11	U
128		Acenaphthene	0.84		0.84	
129		Fluorene	1.6		1.7	
130		Anthracene	0.11	U	0.11	U
131		Dibenzofuran	0.8		0.82	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW31S	
4			FZ04G	
5			10/27/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2	U
20	14	4-Methylphenol	1	U
21	15	Isophorone	1	U
22	16	2,4-Dimethylphenol	3	U
23	17	Benzoic Acid	10	U
24	18	Naphthalene	1	U
25	19	2-Methylnaphthalene	1	U
26	20	2,4,6-Trichlorophenol	5.1	U
27	21	2,4,5-Trichlorophenol	5.1	U
28	22	Acenaphthene	1	U
29	23	Dibenzofuran	1	U
30	24	Fluorene	1	U
31	25	Pentachlorophenol	5.1	U
32	26	bis(2-Ethylhexyl)phthalate	**2.4**	
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	5	U
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	1	U
40	34	Bromoform	1	U
41	35	Toluene	1	U
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	1	U
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	1	U
49	43	n-Propylbenzene	1	U
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	1	U
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	1	U
54	48	Naphthalene	5	U
55	48.5	Methyl tert-butyl ether	1	U
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	**0.59**	
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	0.25	U
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	0.001	U

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW31S	
4			FZ04G	
5			10/27/03	
66	59	Chromium (6010)	0.005	U
67	60	Copper (6010)	0.002	U
68	61	Lead (7421)	0.001	U
69	62	Nickel (6010)	0.01	U
70	63	Zinc (6010)	**0.008**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**140**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.7**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW31S	
4			FZ04G	
5			10/27/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	5.90	
89	82	Temperature (° C) (avg)	14.7	
90	83	Conductivity (um/hos)	187	
91	84	Dissolved oxygen (mg/L) (avg)	3.10	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121		**ETHANOL (mg/L)**	NA	
122				

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW31S	
4			FZ04G	
5			10/27/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.1	U
126		2-Methylnaphthalene	0.1	U
127		Acenaphthylene	0.1	U
128		Acenaphthene	0.1	U
129		Fluorene	0.1	U
130		Anthracene	0.1	U
131		Dibenzofuran	0.1	U

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW32S	
4			FZ04H	
5			10/27/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2.1	U
20	14	4-Methylphenol	1	U
21	15	Isophorone	1	U
22	16	2,4-Dimethylphenol	3.1	U
23	17	Benzoic Acid	10	U
24	18	Naphthalene	1	U
25	19	2-Methylnaphthalene	1	U
26	20	2,4,6-Trichlorophenol	5.2	U
27	21	2,4,5-Trichlorophenol	5.2	U
28	22	Acenaphthene	1	U
29	23	Dibenzofuran	1	U
30	24	Fluorene	1	U
31	25	Pentachlorophenol	5.2	U
32	26	bis(2-Ethylhexyl)phthalate	**2.1**	
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	5	U
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	1	U
40	34	Bromoform	1	U
41	35	Toluene	1	U
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	1	U
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	**18**	
49	43	n-Propylbenzene	**20**	
50	44	tert-Butylbenzene	**1**	
51	45	sec-Butylbenzene	**6.5**	
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	**6.1**	
54	48	Naphthalene	5	U
55	48.5	Methyl tert-butyl ether	1	U
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	**3.3**	
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	**1.8**	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.034**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW32S	
4			FZ04H	
5			10/27/03	
66	59	Chromium (6010)	0.005	U
67	60	Copper (6010)	0.002	U
68	61	Lead (7421)	0.001	U
69	62	Nickel (6010)	0.01	U
70	63	Zinc (6010)	**0.008**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**250**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.8**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW32S	
4			FZ04H	
5			10/27/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.35	
89	82	Temperature (° C) (avg)	14.6	
90	83	Conductivity (um/hos)	409	
91	84	Dissolved oxygen (mg/L) (avg)	1.65	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121		**ETHANOL (mg/L)**		
122				

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW32S	
4			FZ04H	
5			10/27/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.1	U
126		2-Methylnaphthalene	0.1	U
127		Acenaphthylene	0.1	U
128		Acenaphthene	0.52	
129		Fluorene	0.67	
130		Anthracene	0.1	U
131		Dibenzofuran	0.38	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW34S	
4			FZ04J	
5			10/27/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	NA	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	2	U
20	14	4-Methylphenol	1	U
21	15	Isophorone	1	U
22	16	2,4-Dimethylphenol	3.1	U
23	17	Benzoic Acid	10	U
24	18	Naphthalene	1	U
25	19	2-Methylnaphthalene	1	U
26	20	2,4,6-Trichlorophenol	5.1	U
27	21	2,4,5-Trichlorophenol	5.1	U
28	22	Acenaphthene	1	U
29	23	Dibenzofuran	1	U
30	24	Fluorene	1	U
31	25	Pentachlorophenol	5.1	U
32	26	bis(2-Ethylhexyl)phthalate	**4.9**	
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	5	U
37	31	Carbon Disulfide	1	U
38	32	2-Butanone	5	U
39	33	Benzene	1	U
40	34	Bromoform	1	U
41	35	Toluene	1	U
42	36	Ethylbenzene	1	U
43	37	Styrene	1	U
44	38	m,p-Xylene	1	U
45	39	o-Xylene	1	U
46	40	1,3,5-Trimethylbenzene	1	U
47	41	1,2,4-Trimethylbenzene	1	U
48	42	Isopropylbenzene	1	U
49	43	n-Propylbenzene	1	U
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	1	U
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	1	U
54	48	Naphthalene	5	U
55	48.5	Methyl tert-butyl ether	1	U
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	0.25	U
60	53	**TPH-D Motor Oil**	0.5	U
61	54	**TPH-Gasoline**	0.25	U
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.001**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW34S	
4			FZ04J	
5			10/27/03	
66	59	Chromium (6010)	0.005	U
67	60	Copper (6010)	0.002	U
68	61	Lead (7421)	0.001	U
69	62	Nickel (6010)	0.01	U
70	63	Zinc (6010)	**0.009**	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**180**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.9**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW34S	
4			FZ04J	
5			10/27/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.01	
89	82	Temperature (° C) (avg)	15.4	
90	83	Conductivity (um/hos)	234	
91	84	Dissolved oxygen (mg/L) (avg)	2.62	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121		**ETHANOL (mg/L)**	NA	
122				

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			LW34S	
4			FZ04J	
5			10/27/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	0.1	U
126		2-Methylnaphthalene	0.1	U
127		Acenaphthylene	0.1	U
128		Acenaphthene	0.1	U
129		Fluorene	0.1	U
130		Anthracene	0.1	U
131		Dibenzofuran	0.1	U

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3			OX1S		OX1S		OX1S		OX1S		OX1S		OX1S	
4			EM65A		EX87D		FF48G		FL41I		FU45F		FY72G	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		10/22/03	
7	1	**CHLORINATED PHENOLS (µg/L)**												
8	2	**EPA Method SW8040**												
9	3	Pentachlorophenol	NA		**200**		**620**		**67**		**19**	J	**0.69**	
10	4	2,4,6-Trichlorophenol	NA		**1.1**		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		**0.56**		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		25	U	NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		0.25	U	NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		**70**		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		**6.9**		NA		NA		NA		NA	
16	10													
17	11	**SEMIVOLATILES (µg/L)**												
18	12	**EPA Method SW8270**												
19	13	Phenol	NA		NA		NA		NA		NA		NA	
20	14	4-Methylphenol	NA		NA		NA		NA		NA		NA	
21	15	Isophorone	NA		NA		NA		NA		NA		NA	
22	16	2,4-Dimethylphenol	NA		NA		NA		NA		NA		NA	
23	17	Benzoic Acid	NA		NA		NA		NA		NA		NA	
24	18	Naphthalene	NA		NA		NA		NA		NA		NA	
25	19	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA	
26	20	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA	
27	21	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA	
28	22	Acenaphthene	NA		NA		NA		NA		NA		NA	
29	23	Dibenzofuran	NA		NA		NA		NA		NA		NA	
30	24	Fluorene	NA		NA		NA		NA		NA		NA	
31	25	Pentachlorophenol	NA		NA		NA		NA		NA		NA	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA		NA	
33	27													
34	28	**VOLATILES (µg/L)**												
35	29	**EPA Method SW8260**												
36	30	Acetone	**19**		**56**		NA		NA		NA		NA	
37	31	Carbon Disulfide	1.0	U	1	U	NA		NA		NA		NA	
38	32	2-Butanone	6.8	U	**5.4**		NA		NA		NA		NA	
39	33	Benzene	**320**		**65**		NA		NA		NA		NA	
40	34	Bromoform	1.0	U	1	U	NA		NA		NA		NA	
41	35	Toluene	**29**		**3.9**		NA		NA		NA		NA	
42	36	Ethylbenzene	**180**		**43**		NA		NA		NA		NA	
43	37	Styrene	1.0	U	1	U	NA		NA		NA		NA	
44	38	m,p-Xylene	**740**		**110**		NA		NA		NA		NA	
45	39	o-Xylene	**280**		**42**		NA		NA		NA		NA	
46	40	1,3,5-Trimethylbenzene	**160**		**54**		NA		NA		NA		NA	
47	41	1,2,4-Trimethylbenzene	**460**		**160**		NA		NA		NA		NA	
48	42	Isopropylbenzene	**140**		**27**		NA		NA		NA		NA	
49	43	n-Propylbenzene	1.0	U	**38**		NA		NA		NA		NA	
50	44	tert-Butylbenzene	**100**		1	U	NA		NA		NA		NA	
51	45	sec-Butylbenzene	1.0	U	**6.8**		NA		NA		NA		NA	
52	46	4-Isopropyltoluene	**29**		**6.9**		NA		NA		NA		NA	
53	47	n-Butylbenzene	28	U	**6.1**	M	NA		NA		NA		NA	
54	48	Naphthalene	**83**		**15**		NA		NA		NA		NA	
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA	
56	49													
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**												
58	51	**Method OR-DEQ**												
59	52	**TPH-Diesel**	NA		NA		NA		NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA	
62	55													
63	56	**PRIORITY POLLUTANT**												
64	57	**METALS (mg/L)**												
65	58	Arsenic (7060)	**0.02**		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3			OX1S		OX1S		OX1S		OX1S		OX1S		OX1S	
4			EM65A		EX87D		FF48G		FL41I		FU45F		FY72G	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		10/22/03	
66	59	Chromium (6010)	0.005	U	NA		NA		NA		NA		NA	
67	60	Copper (6010)	0.002	U	NA		NA		NA		NA		NA	
68	61	Lead (7421)	0.001	U	NA		NA		NA		NA		NA	
69	62	Nickel (6010)	0.01	U	NA		NA		NA		NA		NA	
70	63	Zinc (6010)	**0.009**		NA		NA		NA		NA		NA	
71	64													
72	65	**MAJOR IONS AND CONVENTIONALS**												
73	66	Calcium (mg/L) (6010)	**32.4**		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**8.55**		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**3.4**		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**7.45**		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**160**		**190**		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1	U	NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**160**		**190**		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**240**		NA		NA		NA		NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA	
86	79													

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3			OX1S		OX1S		OX1S		OX1S		OX1S		OX1S	
4			EM65A		EX87D		FF48G		FL41I		FU45F		FY72G	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		10/22/03	
87	80	**FIELD PARAMETERS**												
88	81	pH (avg)	5.99		6.52		6.53		6.74		6.71		6.57	
89	82	Temperature (° C) (avg)	14.3		16.4		15		13		14.9		15.9	
90	83	Conductivity (um/hos)	302		427		369		274		262		317	
91	84	Dissolved oxygen (mg/L) (avg)	3.97		0.7		0.79		3.39		2.08		1.26	
92	85													
93	86	**DIOXINS AND FURANS (ng/L)**												
94	87	**Method 8290**												
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA	
120														
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA	
122														

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3			OX1S		OX1S		OX1S		OX1S		OX1S		OX1S	
4			EM65A		EX87D		FF48G		FL41I		FU45F		FY72G	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		10/22/03	
123		**PAHs (µg/L)**												
124		**EPA Method SW8270 SIM**												
125		Naphthalene	NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3			OX2S		OX2S		OX2S		OX2S		OX2S	
4			EM65B		EX87B		FF48H		FL58G		FU45E	
5			6/24/02		10/29/02		2/10/03		5/8/03		8/28/03	
6												
7	1	**CHLORINATED PHENOLS (µg/L)**										
8	2	**EPA Method SW8040**										
9	3	Pentachlorophenol	NA		**1200**		**5400**		**6700**		**5800**	J
10	4	2,4,6-Trichlorophenol	NA		0.26	U	NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		**0.28**		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		0.94	U	NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		0.26	U	NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		**110**		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		**6.5**		NA		NA		NA	
16	10											
17	11	**SEMIVOLATILES (µg/L)**										
18	12	**EPA Method SW8270**										
19	13	Phenol	NA		NA		NA		NA		NA	
20	14	4-Methylphenol	NA		NA		NA		NA		NA	
21	15	Isophorone	NA		NA		NA		NA		NA	
22	16	2,4-Dimethylphenol	NA		NA		NA		NA		NA	
23	17	Benzoic Acid	NA		NA		NA		NA		NA	
24	18	Naphthalene	NA		NA		NA		NA		NA	
25	19	2-Methylnaphthalene	NA		NA		NA		NA		NA	
26	20	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA	
27	21	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA	
28	22	Acenaphthene	NA		NA		NA		NA		NA	
29	23	Dibenzofuran	NA		NA		NA		NA		NA	
30	24	Fluorene	NA		NA		NA		NA		NA	
31	25	Pentachlorophenol	NA		NA		NA		NA		NA	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA	
33	27											
34	28	**VOLATILES (µg/L)**										
35	29	**EPA Method SW8260**										
36	30	Acetone	**16**		**22**	M	NA		NA		NA	
37	31	Carbon Disulfide	3.0	U	1	U	NA		NA		NA	
38	32	2-Butanone	15	U	5	U	NA		NA		NA	
39	33	Benzene	3.0	U	**1.1**		NA		NA		NA	
40	34	Bromoform	3.0	U	1	U	NA		NA		NA	
41	35	Toluene	**6.7**		1	U	NA		NA		NA	
42	36	Ethylbenzene	**43**		**24**		NA		NA		NA	
43	37	Styrene	3.0	U	1	U	NA		NA		NA	
44	38	m,p-Xylene	**72**		**29**		NA		NA		NA	
45	39	o-Xylene	**79**		**36**		NA		NA		NA	
46	40	1,3,5-Trimethylbenzene	**46**		**21**		NA		NA		NA	
47	41	1,2,4-Trimethylbenzene	**190**		**110**		NA		NA		NA	
48	42	Isopropylbenzene	**18**		**14**		NA		NA		NA	
49	43	n-Propylbenzene	**28**		**25**		NA		NA		NA	
50	44	tert-Butylbenzene	3.0	U	**1.8**		NA		NA		NA	
51	45	sec-Butylbenzene	3.0	U	**8.4**		NA		NA		NA	
52	46	4-Isopropyltoluene	**5.2**		**6.3**		NA		NA		NA	
53	47	n-Butylbenzene	5.8	U	**6.7**	M	NA		NA		NA	
54	48	Naphthalene	15	U	**11**		NA		NA		NA	
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA	
56	49											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**										
58	51	**Method OR-DEQ**										
59	52	**TPH-Diesel**	NA		NA		NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA	
62	55											
63	56	**PRIORITY POLLUTANT**										
64	57	**METALS (mg/L)**										
65	58	Arsenic (7060)	**0.01**		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3			OX2S		OX2S		OX2S		OX2S		OX2S	
4			EM65B		EX87B		FF48H		FL58G		FU45E	
5			6/24/02		10/29/02		2/10/03		5/8/03		8/28/03	
66	59	Chromium (6010)	0.005	U	NA		NA		NA		NA	
67	60	Copper (6010)	0.002	U	NA		NA		NA		NA	
68	61	Lead (7421)	0.001	U	NA		NA		NA		NA	
69	62	Nickel (6010)	0.01	U	NA		NA		NA		NA	
70	63	Zinc (6010)	**0.009**		NA		NA		NA		NA	
71	64											
72	65	**MAJOR IONS AND CONVENTIONALS**										
73	66	Calcium (mg/L) (6010)	**33**		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**10.7**		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**2.7**		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**6.06**		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**120**		**200**		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1	U	NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**120**		**200**		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**220**		NA		NA		NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA	
86	79											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3			OX2S		OX2S		OX2S		OX2S		OX2S	
4			EM65B		EX87B		FF48H		FL58G		FU45E	
5			6/24/02		10/29/02		2/10/03		5/8/03		8/28/03	
87	80	**FIELD PARAMETERS**										
88	81	pH (avg)	6.15		6.40		6.7		6.49		6.66	
89	82	Temperature (° C) (avg)	15.5		15.9		14.2		13.6		14.9	
90	83	Conductivity (um/hos)	249		599		222		267		263	
91	84	Dissolved oxygen (mg/L) (avg)	4.10		0		1.49		2.21		1.43	
92	85											
93	86	**DIOXINS AND FURANS (ng/L)**										
94	87	**Method 8290**										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA	
120												
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		NA	
122												

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3			OX2S		OX2S		OX2S		OX2S		OX2S	
4			EM65B		EX87B		FF48H		FL58G		FU45E	
5			6/24/02		10/29/02		2/10/03		5/8/03		8/28/03	
123		**PAHs (µg/L)**										
124		**EPA Method SW8270 SIM**										
125		Naphthalene	NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3			OX3S		OX3S		OX3S		OX3S		OX3S		OX3S	
4			EM65C		EX87E		FF48F		FL41J		FU45G		FY72H	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		10/22/03	
7	1	**CHLORINATED PHENOLS (µg/L)**												
8	2	**EPA Method SW8040**												
9	3	Pentachlorophenol	NA		**1200**	J	**5700**		**2600**		**1400**	J	**130**	
10	4	2,4,6-Trichlorophenol	NA		**2.4**	J	NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		**1.3**	J	NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		9.2	UJ	NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		0.25	UJ	NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		**320**	J	NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		**29**	J	NA		NA		NA		NA	
16	10													
17	11	**SEMIVOLATILES (µg/L)**												
18	12	**EPA Method SW8270**												
19	13	Phenol	NA		NA		NA		NA		NA		NA	
20	14	4-Methylphenol	NA		NA		NA		NA		NA		NA	
21	15	Isophorone	NA		NA		NA		NA		NA		NA	
22	16	2,4-Dimethylphenol	NA		NA		NA		NA		NA		NA	
23	17	Benzoic Acid	NA		NA		NA		NA		NA		NA	
24	18	Naphthalene	NA		NA		NA		NA		NA		NA	
25	19	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA	
26	20	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA	
27	21	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA	
28	22	Acenaphthene	NA		NA		NA		NA		NA		NA	
29	23	Dibenzofuran	NA		NA		NA		NA		NA		NA	
30	24	Fluorene	NA		NA		NA		NA		NA		NA	
31	25	Pentachlorophenol	NA		NA		NA		NA		NA		NA	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA		NA	
33	27													
34	28	**VOLATILES (µg/L)**												
35	29	**EPA Method SW8260**												
36	30	Acetone	120	U	**240**		NA		NA		NA		NA	
37	31	Carbon Disulfide	25	U	1	U	NA		NA		NA		NA	
38	32	2-Butanone	120	U	**20**		NA		NA		NA		NA	
39	33	Benzene	**66**		**94**		NA		NA		NA		NA	
40	34	Bromoform	25	U	1	U	NA		NA		NA		NA	
41	35	Toluene	**63**		**31**		NA		NA		NA		NA	
42	36	Ethylbenzene	**280**		**110**		NA		NA		NA		NA	
43	37	Styrene	25	U	1	U	NA		NA		NA		NA	
44	38	m,p-Xylene	**820**		**430**		NA		NA		NA		NA	
45	39	o-Xylene	**370**		**150**		NA		NA		NA		NA	
46	40	1,3,5-Trimethylbenzene	**160**		**120**		NA		NA		NA		NA	
47	41	1,2,4-Trimethylbenzene	**520**		**350**		NA		NA		NA		NA	
48	42	Isopropylbenzene	**57**		**56**		NA		NA		NA		NA	
49	43	n-Propylbenzene	**83**		**75**		NA		NA		NA		NA	
50	44	tert-Butylbenzene	25	U	1	U	NA		NA		NA		NA	
51	45	sec-Butylbenzene	25	U	**13**		NA		NA		NA		NA	
52	46	4-Isopropyltoluene	25	U	**13**		NA		NA		NA		NA	
53	47	n-Butylbenzene	25	U	**11**	M	NA		NA		NA		NA	
54	48	Naphthalene	120	U	**37**		NA		NA		NA		NA	
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA	
56	49													
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**												
58	51	**Method OR-DEQ**												
59	52	**TPH-Diesel**	NA		NA		NA		NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA	
62	55													
63	56	**PRIORITY POLLUTANT**												
64	57	**METALS (mg/L)**												
65	58	Arsenic (7060)	**0.02**		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3			OX3S		OX3S		OX3S		OX3S		OX3S		OX3S	
4			EM65C		EX87E		FF48F		FL41J		FU45G		FY72H	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		10/22/03	
66	59	Chromium (6010)	0.005	U	NA		NA		NA		NA		NA	
67	60	Copper (6010)	**0.002**		NA		NA		NA		NA		NA	
68	61	Lead (7421)	0.001	U	NA		NA		NA		NA		NA	
69	62	Nickel (6010)	0.01	U	NA		NA		NA		NA		NA	
70	63	Zinc (6010)	**0.012**		NA		NA		NA		NA		NA	
71	64													
72	65	**MAJOR IONS AND CONVENTIONALS**												
73	66	Calcium (mg/L) (6010)	**40.2**		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**11**		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**3.8**		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**8.75**		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**160**		**270**		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1	U	NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**160**		**270**		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**270**		NA		NA		NA		NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA	
86	79													

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3			OX3S		OX3S		OX3S		OX3S		OX3S		OX3S	
4			EM65C		EX87E		FF48F		FL41J		FU45G		FY72H	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		10/22/03	
87	80	**FIELD PARAMETERS**												
88	81	pH (avg)	5.94		6.44		6.59		6.73		6.7		6.65	
89	82	Temperature (° C) (avg)	14.4		15.3		15.1		13.5		15.2		16.2	
90	83	Conductivity (um/hos)	342		502		381		340		287		318	
91	84	Dissolved oxygen (mg/L) (avg)	4.34		0		1.24		2.93		2.07		2.14	
92	85													
93	86	**DIOXINS AND FURANS (ng/L)**												
94	87	**Method 8290**												
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA	
120														
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA	
122														

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3			OX3S		OX3S		OX3S		OX3S		OX3S		OX3S	
4			EM65C		EX87E		FF48F		FL41J		FU45G		FY72H	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		10/22/03	
123		**PAHs (µg/L)**												
124		**EPA Method SW8270 SIM**												
125		Naphthalene	NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3			OX4S		OX4S		OX4S		OX4S		OX4S	
4			EM65D		EX87F		FF48I		FL41K		FU45J	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03	
7	1	**CHLORINATED PHENOLS (µg/L)**										
8	2	**EPA Method SW8040**										
9	3	Pentachlorophenol	NA		**1200**	J	**880**		**8300**		**2200**	J
10	4	2,4,6-Trichlorophenol	NA		**2.7**	J	NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		**0.81**	J	NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		11	UJ	NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		0.25	UJ	NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		**320**	J	NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		**32**	J	NA		NA		NA	
16	10											
17	11	**SEMIVOLATILES (µg/L)**										
18	12	**EPA Method SW8270**										
19	13	Phenol	NA		NA		NA		NA		NA	
20	14	4-Methylphenol	NA		NA		NA		NA		NA	
21	15	Isophorone	NA		NA		NA		NA		NA	
22	16	2,4-Dimethylphenol	NA		NA		NA		NA		NA	
23	17	Benzoic Acid	NA		NA		NA		NA		NA	
24	18	Naphthalene	NA		NA		NA		NA		NA	
25	19	2-Methylnaphthalene	NA		NA		NA		NA		NA	
26	20	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA	
27	21	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA	
28	22	Acenaphthene	NA		NA		NA		NA		NA	
29	23	Dibenzofuran	NA		NA		NA		NA		NA	
30	24	Fluorene	NA		NA		NA		NA		NA	
31	25	Pentachlorophenol	NA		NA		NA		NA		NA	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA	
33	27											
34	28	**VOLATILES (µg/L)**										
35	29	**EPA Method SW8260**										
36	30	Acetone	120	U	**12**	M	NA		NA		NA	
37	31	Carbon Disulfide	25	U	**1.3**		NA		NA		NA	
38	32	2-Butanone	120	U	5	U	NA		NA		NA	
39	33	Benzene	25	U	**24**		NA		NA		NA	
40	34	Bromoform	25	U	1	U	NA		NA		NA	
41	35	Toluene	**71**		**23**		NA		NA		NA	
42	36	Ethylbenzene	**440**		**330**		NA		NA		NA	
43	37	Styrene	25	U	1	U	NA		NA		NA	
44	38	m,p-Xylene	**1300**		**820**		NA		NA		NA	
45	39	o-Xylene	**500**		**430**		NA		NA		NA	
46	40	1,3,5-Trimethylbenzene	**220**		**200**		NA		NA		NA	
47	41	1,2,4-Trimethylbenzene	**590**		**580**		NA		NA		NA	
48	42	Isopropylbenzene	**86**		**120**		NA		NA		NA	
49	43	n-Propylbenzene	**110**		**120**		NA		NA		NA	
50	44	tert-Butylbenzene	25	U	1	U	NA		NA		NA	
51	45	sec-Butylbenzene	25	U	**22**		NA		NA		NA	
52	46	4-Isopropyltoluene	25	U	**24**		NA		NA		NA	
53	47	n-Butylbenzene	25	U	**25**	M	NA		NA		NA	
54	48	Naphthalene	120	U	**99**		NA		NA		NA	
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA	
56	49											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**										
58	51	**Method OR-DEQ**										
59	52	**TPH-Diesel**	NA		NA		NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA	
62	55											
63	56	**PRIORITY POLLUTANT**										
64	57	**METALS (mg/L)**										
65	58	Arsenic (7060)	**0.021**		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3			OX4S		OX4S		OX4S		OX4S		OX4S	
4			EM65D		EX87F		FF48I		FL41K		FU45J	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03	
66	59	Chromium (6010)	0.005	U	NA		NA		NA		NA	
67	60	Copper (6010)	0.002	U	NA		NA		NA		NA	
68	61	Lead (7421)	0.001	U	NA		NA		NA		NA	
69	62	Nickel (6010)	0.01	U	NA		NA		NA		NA	
70	63	Zinc (6010)	**0.008**		NA		NA		NA		NA	
71	64											
72	65	**MAJOR IONS AND CONVENTIONALS**										
73	66	Calcium (mg/L) (6010)	**37.9**		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**10.4**		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**3.6**		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**8.42**		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**160**		**240**		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1	U	NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**160**		**240**		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**250**		NA		NA		NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA	
86	79											

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3			OX4S		OX4S		OX4S		OX4S		OX4S	
4			EM65D		EX87F		FF48I		FL41K		FU45J	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03	
87	80	**FIELD PARAMETERS**										
88	81	pH (avg)	6.74		NM		6.39		6.09		6.41	
89	82	Temperature (° C) (avg)	14.5		NM		14.7		14		18	
90	83	Conductivity (um/hos)	326		NM		336		142		262	
91	84	Dissolved oxygen (mg/L) (avg)	4.42		NM		2.19		2.47		2.16	
92	85											
93	86	**DIOXINS AND FURANS (ng/L)**										
94	87	**Method 8290**										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA	
120												
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		NA	
122												

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3			OX4S		OX4S		OX4S		OX4S		OX4S	
4			EM65D		EX87F		FF48I		FL41K		FU45J	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03	
123		**PAHs (µg/L)**										
124		**EPA Method SW8270 SIM**										
125		Naphthalene	NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			OX5S	
4			FY72A	
5			10/22/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	0.5	U
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	NA	
20	14	4-Methylphenol	NA	
21	15	Isophorone	NA	
22	16	2,4-Dimethylphenol	NA	
23	17	Benzoic Acid	NA	
24	18	Naphthalene	NA	
25	19	2-Methylnaphthalene	NA	
26	20	2,4,6-Trichlorophenol	NA	
27	21	2,4,5-Trichlorophenol	NA	
28	22	Acenaphthene	NA	
29	23	Dibenzofuran	NA	
30	24	Fluorene	NA	
31	25	Pentachlorophenol	NA	
32	26	bis(2-Ethylhexyl)phthalate	NA	
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	NA	
37	31	Carbon Disulfide	NA	
38	32	2-Butanone	NA	
39	33	Benzene	NA	
40	34	Bromoform	NA	
41	35	Toluene	NA	
42	36	Ethylbenzene	NA	
43	37	Styrene	NA	
44	38	m,p-Xylene	NA	
45	39	o-Xylene	NA	
46	40	1,3,5-Trimethylbenzene	NA	
47	41	1,2,4-Trimethylbenzene	NA	
48	42	Isopropylbenzene	NA	
49	43	n-Propylbenzene	NA	
50	44	tert-Butylbenzene	NA	
51	45	sec-Butylbenzene	NA	
52	46	4-Isopropyltoluene	NA	
53	47	n-Butylbenzene	NA	
54	48	Naphthalene	NA	
55	48.5	Methyl tert-butyl ether	NA	
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	NA	
60	53	**TPH-D Motor Oil**	NA	
61	54	**TPH-Gasoline**	NA	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			OX5S	
4			FY72A	
5			10/22/03	
66	59	Chromium (6010)	NA	
67	60	Copper (6010)	NA	
68	61	Lead (7421)	NA	
69	62	Nickel (6010)	NA	
70	63	Zinc (6010)	NA	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			OX5S	
4			FY72A	
5			10/22/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.59	
89	82	Temperature (° C) (avg)	16.5	
90	83	Conductivity (um/hos)	288	
91	84	Dissolved oxygen (mg/L) (avg)	1.18	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121		**ETHANOL (mg/L)**	NA	
122				

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			OX5S	
4			FY72A	
5			10/22/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	NA	
126		2-Methylnaphthalene	NA	
127		Acenaphthylene	NA	
128		Acenaphthene	NA	
129		Fluorene	NA	
130		Anthracene	NA	
131		Dibenzofuran	NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			OX6S	
4			FY72B	
5			10/22/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	**2100**	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	NA	
20	14	4-Methylphenol	NA	
21	15	Isophorone	NA	
22	16	2,4-Dimethylphenol	NA	
23	17	Benzoic Acid	NA	
24	18	Naphthalene	NA	
25	19	2-Methylnaphthalene	NA	
26	20	2,4,6-Trichlorophenol	NA	
27	21	2,4,5-Trichlorophenol	NA	
28	22	Acenaphthene	NA	
29	23	Dibenzofuran	NA	
30	24	Fluorene	NA	
31	25	Pentachlorophenol	NA	
32	26	bis(2-Ethylhexyl)phthalate	NA	
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	NA	
37	31	Carbon Disulfide	NA	
38	32	2-Butanone	NA	
39	33	Benzene	NA	
40	34	Bromoform	NA	
41	35	Toluene	NA	
42	36	Ethylbenzene	NA	
43	37	Styrene	NA	
44	38	m,p-Xylene	NA	
45	39	o-Xylene	NA	
46	40	1,3,5-Trimethylbenzene	NA	
47	41	1,2,4-Trimethylbenzene	NA	
48	42	Isopropylbenzene	NA	
49	43	n-Propylbenzene	NA	
50	44	tert-Butylbenzene	NA	
51	45	sec-Butylbenzene	NA	
52	46	4-Isopropyltoluene	NA	
53	47	n-Butylbenzene	NA	
54	48	Naphthalene	NA	
55	48.5	Methyl tert-butyl ether	NA	
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	NA	
60	53	**TPH-D Motor Oil**	NA	
61	54	**TPH-Gasoline**	NA	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			OX6S	
4			FY72B	
5			10/22/03	
66	59	Chromium (6010)	NA	
67	60	Copper (6010)	NA	
68	61	Lead (7421)	NA	
69	62	Nickel (6010)	NA	
70	63	Zinc (6010)	NA	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			OX6S	
4			FY72B	
5			10/22/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.67	
89	82	Temperature (° C) (avg)	16.3	
90	83	Conductivity (um/hos)	352	
91	84	Dissolved oxygen (mg/L) (avg)	2.63	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121		**ETHANOL (mg/L)**	NA	
122				

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			OX6S	
4			FY72B	
5			10/22/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	NA	
126		2-Methylnaphthalene	NA	
127		Acenaphthylene	NA	
128		Acenaphthene	NA	
129		Fluorene	NA	
130		Anthracene	NA	
131		Dibenzofuran	NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			OX7S	
4			FY72C	
5			10/22/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	**720**	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	NA	
20	14	4-Methylphenol	NA	
21	15	Isophorone	NA	
22	16	2,4-Dimethylphenol	NA	
23	17	Benzoic Acid	NA	
24	18	Naphthalene	NA	
25	19	2-Methylnaphthalene	NA	
26	20	2,4,6-Trichlorophenol	NA	
27	21	2,4,5-Trichlorophenol	NA	
28	22	Acenaphthene	NA	
29	23	Dibenzofuran	NA	
30	24	Fluorene	NA	
31	25	Pentachlorophenol	NA	
32	26	bis(2-Ethylhexyl)phthalate	NA	
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	NA	
37	31	Carbon Disulfide	NA	
38	32	2-Butanone	NA	
39	33	Benzene	NA	
40	34	Bromoform	NA	
41	35	Toluene	NA	
42	36	Ethylbenzene	NA	
43	37	Styrene	NA	
44	38	m,p-Xylene	NA	
45	39	o-Xylene	NA	
46	40	1,3,5-Trimethylbenzene	NA	
47	41	1,2,4-Trimethylbenzene	NA	
48	42	Isopropylbenzene	NA	
49	43	n-Propylbenzene	NA	
50	44	tert-Butylbenzene	NA	
51	45	sec-Butylbenzene	NA	
52	46	4-Isopropyltoluene	NA	
53	47	n-Butylbenzene	NA	
54	48	Naphthalene	NA	
55	48.5	Methyl tert-butyl ether	NA	
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	NA	
60	53	**TPH-D Motor Oil**	NA	
61	54	**TPH-Gasoline**	NA	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			OX7S	
4			FY72C	
5			10/22/03	
66	59	Chromium (6010)	NA	
67	60	Copper (6010)	NA	
68	61	Lead (7421)	NA	
69	62	Nickel (6010)	NA	
70	63	Zinc (6010)	NA	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			OX7S	
4			FY72C	
5			10/22/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.60	
89	82	Temperature (° C) (avg)	16.1	
90	83	Conductivity (um/hos)	326	
91	84	Dissolved oxygen (mg/L) (avg)	1.76	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121		**ETHANOL (mg/L)**	NA	
122				

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			OX7S	
4			FY72C	
5			10/22/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	NA	
126		2-Methylnaphthalene	NA	
127		Acenaphthylene	NA	
128		Acenaphthene	NA	
129		Fluorene	NA	
130		Anthracene	NA	
131		Dibenzofuran	NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2					Dup of OX8S	
3			OX8S		Y	
4			FY72E		FY72D	
5			10/22/03		10/22/03	
7	1	**CHLORINATED PHENOLS (µg/L)**				
8	2	**EPA Method SW8040**				
9	3	Pentachlorophenol	**260**		**300**	
10	4	2,4,6-Trichlorophenol	NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA	
16	10					
17	11	**SEMIVOLATILES (µg/L)**				
18	12	**EPA Method SW8270**				
19	13	Phenol	NA		NA	
20	14	4-Methylphenol	NA		NA	
21	15	Isophorone	NA		NA	
22	16	2,4-Dimethylphenol	NA		NA	
23	17	Benzoic Acid	NA		NA	
24	18	Naphthalene	NA		NA	
25	19	2-Methylnaphthalene	NA		NA	
26	20	2,4,6-Trichlorophenol	NA		NA	
27	21	2,4,5-Trichlorophenol	NA		NA	
28	22	Acenaphthene	NA		NA	
29	23	Dibenzofuran	NA		NA	
30	24	Fluorene	NA		NA	
31	25	Pentachlorophenol	NA		NA	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA	
33	27					
34	28	**VOLATILES (µg/L)**				
35	29	**EPA Method SW8260**				
36	30	Acetone	NA		NA	
37	31	Carbon Disulfide	NA		NA	
38	32	2-Butanone	NA		NA	
39	33	Benzene	NA		NA	
40	34	Bromoform	NA		NA	
41	35	Toluene	NA		NA	
42	36	Ethylbenzene	NA		NA	
43	37	Styrene	NA		NA	
44	38	m,p-Xylene	NA		NA	
45	39	o-Xylene	NA		NA	
46	40	1,3,5-Trimethylbenzene	NA		NA	
47	41	1,2,4-Trimethylbenzene	NA		NA	
48	42	Isopropylbenzene	NA		NA	
49	43	n-Propylbenzene	NA		NA	
50	44	tert-Butylbenzene	NA		NA	
51	45	sec-Butylbenzene	NA		NA	
52	46	4-Isopropyltoluene	NA		NA	
53	47	n-Butylbenzene	NA		NA	
54	48	Naphthalene	NA		NA	
55	48.5	Methyl tert-butyl ether	NA		NA	
56	49					
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**				
58	51	**Method OR-DEQ**				
59	52	**TPH-Diesel**	NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA	
61	54	**TPH-Gasoline**	NA		NA	
62	55					
63	56	**PRIORITY POLLUTANT**				
64	57	**METALS (mg/L)**				
65	58	Arsenic (7060)	NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2					Dup of OX8S	
3			OX8S		Y	
4			FY72E		FY72D	
5			10/22/03		10/22/03	
66	59	Chromium (6010)	NA		NA	
67	60	Copper (6010)	NA		NA	
68	61	Lead (7421)	NA		NA	
69	62	Nickel (6010)	NA		NA	
70	63	Zinc (6010)	NA		NA	
71	64					
72	65	**MAJOR IONS AND CONVENTIONALS**				
73	66	Calcium (mg/L) (6010)	NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA	
86	79					

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2					Dup of OX8S	
3			OX8S		Y	
4			FY72E		FY72D	
5			10/22/03		10/22/03	
87	80	**FIELD PARAMETERS**				
88	81	pH (avg)	6.65		6.65	
89	82	Temperature (° C) (avg)	16.3		16.3	
90	83	Conductivity (um/hos)	337		337	
91	84	Dissolved oxygen (mg/L) (avg)	2.26		2.3	
92	85					
93	86	**DIOXINS AND FURANS (ng/L)**				
94	87	**Method 8290**				
95	88	2,3,7,8-TCDF	3.8	U	NA	
96	89	Total TCDF	3.8	U	NA	
97	90	2,3,7,8-TCDD	3.5	U	NA	
98	91	Total TCDD	3.5	U	NA	
99	92	1,2,3,7,8-PeCDF	2.8	U	NA	
100	93	2,3,4,7,8-PeCDF	2.6	U	NA	
101	94	Total PeCDF	2.6	U	NA	
102	95	1,2,3,7,8-PeCDD	3.2	U	NA	
103	96	Total PeCDD	3.2	U	NA	
104	97	1,2,3,4,7,8-HxCDF	2.3	U	NA	
105	98	1,2,3,6,7,8-HxCDF	2.1	U	NA	
106	99	2,3,4,6,7,8-HxCDF	2.3	U	NA	
107	100	1,2,3,7,8,9-HxCDF	2.5	U	NA	
108	101	Total HxCDF	**9.2**		NA	
109	102	1,2,3,4,7,8-HxCDD	2.9	U	NA	
110	103	1,2,3,6,7,8-HxCDD	2.2	U	NA	
111	104	1,2,3,7,8,9-HxCDD	2.5	U	NA	
112	105	Total HxCDD	2.2	U	NA	
113	106	1,2,3,4,6,7,8-HpCDF	**7.5**	J	NA	
114	107	1,2,3,4,7,8,9-HpCDF	3.8	U	NA	
115	108	Total HpCDF	**34**		NA	
116	109	1,2,3,4,6,7,8-HpCDD	**36**		NA	
117	110	Total HpCDD	**57**		NA	
118	111	OCDF	**35**	J	NA	
119	112	OCDD	**230**		NA	
120						
121		**ETHANOL (mg/L)**	NA		NA	
122						

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2					Dup of OX8S	
3			OX8S		Y	
4			FY72E		FY72D	
5			10/22/03		10/22/03	
123		**PAHs (µg/L)**				
124		**EPA Method SW8270 SIM**				
125		Naphthalene	NA		NA	
126		2-Methylnaphthalene	NA		NA	
127		Acenaphthylene	NA		NA	
128		Acenaphthene	NA		NA	
129		Fluorene	NA		NA	
130		Anthracene	NA		NA	
131		Dibenzofuran	NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			PZ1		PZ1	
4			EM65E		FF48K	
5			6/24/02		2/10/03	
7	1	**CHLORINATED PHENOLS (µg/L)**				
8	2	**EPA Method SW8040**				
9	3	Pentachlorophenol	NA		**700**	
10	4	2,4,6-Trichlorophenol	NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA	
16	10					
17	11	**SEMIVOLATILES (µg/L)**				
18	12	**EPA Method SW8270**				
19	13	Phenol	NA		NA	
20	14	4-Methylphenol	NA		NA	
21	15	Isophorone	NA		NA	
22	16	2,4-Dimethylphenol	NA		NA	
23	17	Benzoic Acid	NA		NA	
24	18	Naphthalene	NA		NA	
25	19	2-Methylnaphthalene	NA		NA	
26	20	2,4,6-Trichlorophenol	NA		NA	
27	21	2,4,5-Trichlorophenol	NA		NA	
28	22	Acenaphthene	NA		NA	
29	23	Dibenzofuran	NA		NA	
30	24	Fluorene	NA		NA	
31	25	Pentachlorophenol	NA		NA	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA	
33	27					
34	28	**VOLATILES (µg/L)**				
35	29	**EPA Method SW8260**				
36	30	Acetone	250	U	NA	
37	31	Carbon Disulfide	50	U	NA	
38	32	2-Butanone	250	U	NA	
39	33	Benzene	50	U	NA	
40	34	Bromoform	50	U	NA	
41	35	Toluene	**80**		NA	
42	36	Ethylbenzene	**470**		NA	
43	37	Styrene	50	U	NA	
44	38	m,p-Xylene	**1000**		NA	
45	39	o-Xylene	**710**		NA	
46	40	1,3,5-Trimethylbenzene	**290**		NA	
47	41	1,2,4-Trimethylbenzene	**870**		NA	
48	42	Isopropylbenzene	**120**		NA	
49	43	n-Propylbenzene	**170**		NA	
50	44	tert-Butylbenzene	50	U	NA	
51	45	sec-Butylbenzene	50	U	NA	
52	46	4-Isopropyltoluene	50	U	NA	
53	47	n-Butylbenzene	50	U	NA	
54	48	Naphthalene	250	U	NA	
55	48.5	Methyl tert-butyl ether	NA		NA	
56	49					
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**				
58	51	**Method OR-DEQ**				
59	52	**TPH-Diesel**	NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA	
61	54	**TPH-Gasoline**	NA		NA	
62	55					
63	56	**PRIORITY POLLUTANT**				
64	57	**METALS (mg/L)**				
65	58	Arsenic (7060)	**0.005**		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			PZ1		PZ1	
4			EM65E		FF48K	
5			6/24/02		2/10/03	
66	59	Chromium (6010)	**0.035**		NA	
67	60	Copper (6010)	**0.011**		NA	
68	61	Lead (7421)	**0.001**		NA	
69	62	Nickel (6010)	**0.04**		NA	
70	63	Zinc (6010)	**0.087**		NA	
71	64					
72	65	**MAJOR IONS AND CONVENTIONALS**				
73	66	Calcium (mg/L) (6010)	**42.3**		NA	
74	67	Magnesium (mg/L) (6010)	**13.6**		NA	
75	68	Potassium (mg/L) (6010)	**3.3**		NA	
76	69	Sodium (mg/L) (6010)	**5.25**		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**180**		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**180**		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**250**		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA	
86	79					

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			PZ1		PZ1	
4			EM65E		FF48K	
5			6/24/02		2/10/03	
87	80	**FIELD PARAMETERS**				
88	81	pH (avg)	6.02		6.61	
89	82	Temperature (° C) (avg)	15.3		14.9	
90	83	Conductivity (um/hos)	278		376	
91	84	Dissolved oxygen (mg/L) (avg)	5.09		1.01	
92	85					
93	86	**DIOXINS AND FURANS (ng/L)**				
94	87	**Method 8290**				
95	88	2,3,7,8-TCDF	NA		NA	
96	89	Total TCDF	NA		NA	
97	90	2,3,7,8-TCDD	NA		NA	
98	91	Total TCDD	NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA	
101	94	Total PeCDF	NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA	
103	96	Total PeCDD	NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA	
108	101	Total HxCDF	NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA	
112	105	Total HxCDD	NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA	
115	108	Total HpCDF	NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA	
117	110	Total HpCDD	NA		NA	
118	111	OCDF	NA		NA	
119	112	OCDD	NA		NA	
120						
121		**ETHANOL (mg/L)**	NA		NA	
122						

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			PZ1		PZ1	
4			EM65E		FF48K	
5			6/24/02		2/10/03	
123		**PAHs (µg/L)**				
124		**EPA Method SW8270 SIM**				
125		Naphthalene	NA		NA	
126		2-Methylnaphthalene	NA		NA	
127		Acenaphthylene	NA		NA	
128		Acenaphthene	NA		NA	
129		Fluorene	NA		NA	
130		Anthracene	NA		NA	
131		Dibenzofuran	NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			PZ2	
4			FF48J	
5			2/10/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	**590**	
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	NA	
20	14	4-Methylphenol	NA	
21	15	Isophorone	NA	
22	16	2,4-Dimethylphenol	NA	
23	17	Benzoic Acid	NA	
24	18	Naphthalene	NA	
25	19	2-Methylnaphthalene	NA	
26	20	2,4,6-Trichlorophenol	NA	
27	21	2,4,5-Trichlorophenol	NA	
28	22	Acenaphthene	NA	
29	23	Dibenzofuran	NA	
30	24	Fluorene	NA	
31	25	Pentachlorophenol	NA	
32	26	bis(2-Ethylhexyl)phthalate	NA	
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	NA	
37	31	Carbon Disulfide	NA	
38	32	2-Butanone	NA	
39	33	Benzene	NA	
40	34	Bromoform	NA	
41	35	Toluene	NA	
42	36	Ethylbenzene	NA	
43	37	Styrene	NA	
44	38	m,p-Xylene	NA	
45	39	o-Xylene	NA	
46	40	1,3,5-Trimethylbenzene	NA	
47	41	1,2,4-Trimethylbenzene	NA	
48	42	Isopropylbenzene	NA	
49	43	n-Propylbenzene	NA	
50	44	tert-Butylbenzene	NA	
51	45	sec-Butylbenzene	NA	
52	46	4-Isopropyltoluene	NA	
53	47	n-Butylbenzene	NA	
54	48	Naphthalene	NA	
55	48.5	Methyl tert-butyl ether	NA	
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	NA	
60	53	**TPH-D Motor Oil**	NA	
61	54	**TPH-Gasoline**	NA	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			PZ2	
4			FF48J	
5			2/10/03	
66	59	Chromium (6010)	NA	
67	60	Copper (6010)	NA	
68	61	Lead (7421)	NA	
69	62	Nickel (6010)	NA	
70	63	Zinc (6010)	NA	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			PZ2	
4			FF48J	
5			2/10/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.46	
89	82	Temperature (° C) (avg)	15.2	
90	83	Conductivity (um/hos)	483	
91	84	Dissolved oxygen (mg/L) (avg)	0.89	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121		**ETHANOL (mg/L)**	NA	
122				

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			PZ2	
4			FF48J	
5			2/10/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	NA	
126		2-Methylnaphthalene	NA	
127		Acenaphthylene	NA	
128		Acenaphthene	NA	
129		Fluorene	NA	
130		Anthracene	NA	
131		Dibenzofuran	NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			PZ3	
4			FF65B	
5			2/11/03	
7	1	**CHLORINATED PHENOLS (µg/L)**		
8	2	**EPA Method SW8040**		
9	3	Pentachlorophenol	1.2	U
10	4	2,4,6-Trichlorophenol	NA	
11	5	2,3,6-Trichlorophenol	NA	
12	6	2,4,5-Trichlorophenol	NA	
13	7	2,3,4-Trichlorophenol	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	9	2,3,4,5-Tetrachlorophenol	NA	
16	10			
17	11	**SEMIVOLATILES (µg/L)**		
18	12	**EPA Method SW8270**		
19	13	Phenol	NA	
20	14	4-Methylphenol	NA	
21	15	Isophorone	NA	
22	16	2,4-Dimethylphenol	NA	
23	17	Benzoic Acid	NA	
24	18	Naphthalene	NA	
25	19	2-Methylnaphthalene	NA	
26	20	2,4,6-Trichlorophenol	NA	
27	21	2,4,5-Trichlorophenol	NA	
28	22	Acenaphthene	NA	
29	23	Dibenzofuran	NA	
30	24	Fluorene	NA	
31	25	Pentachlorophenol	NA	
32	26	bis(2-Ethylhexyl)phthalate	NA	
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	NA	
37	31	Carbon Disulfide	NA	
38	32	2-Butanone	NA	
39	33	Benzene	NA	
40	34	Bromoform	NA	
41	35	Toluene	NA	
42	36	Ethylbenzene	NA	
43	37	Styrene	NA	
44	38	m,p-Xylene	NA	
45	39	o-Xylene	NA	
46	40	1,3,5-Trimethylbenzene	NA	
47	41	1,2,4-Trimethylbenzene	NA	
48	42	Isopropylbenzene	NA	
49	43	n-Propylbenzene	NA	
50	44	tert-Butylbenzene	NA	
51	45	sec-Butylbenzene	NA	
52	46	4-Isopropyltoluene	NA	
53	47	n-Butylbenzene	NA	
54	48	Naphthalene	NA	
55	48.5	Methyl tert-butyl ether	NA	
56	49			
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	51	**Method OR-DEQ**		
59	52	**TPH-Diesel**	NA	
60	53	**TPH-D Motor Oil**	NA	
61	54	**TPH-Gasoline**	NA	
62	55			
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			PZ3	
4			FF65B	
5			2/11/03	
66	59	Chromium (6010)	NA	
67	60	Copper (6010)	NA	
68	61	Lead (7421)	NA	
69	62	Nickel (6010)	NA	
70	63	Zinc (6010)	NA	
71	64			
72	65	**MAJOR IONS AND CONVENTIONALS**		
73	66	Calcium (mg/L) (6010)	NA	
74	67	Magnesium (mg/L) (6010)	NA	
75	68	Potassium (mg/L) (6010)	NA	
76	69	Sodium (mg/L) (6010)	NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA	
86	79			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			PZ3	
4			FF65B	
5			2/11/03	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	5.24	
89	82	Temperature (° C) (avg)	15.7	
90	83	Conductivity (um/hos)	62	
91	84	Dissolved oxygen (mg/L) (avg)	1.66	
92	85			
93	86	**DIOXINS AND FURANS (ng/L)**		
94	87	**Method 8290**		
95	88	2,3,7,8-TCDF	NA	
96	89	Total TCDF	NA	
97	90	2,3,7,8-TCDD	NA	
98	91	Total TCDD	NA	
99	92	1,2,3,7,8-PeCDF	NA	
100	93	2,3,4,7,8-PeCDF	NA	
101	94	Total PeCDF	NA	
102	95	1,2,3,7,8-PeCDD	NA	
103	96	Total PeCDD	NA	
104	97	1,2,3,4,7,8-HxCDF	NA	
105	98	1,2,3,6,7,8-HxCDF	NA	
106	99	2,3,4,6,7,8-HxCDF	NA	
107	100	1,2,3,7,8,9-HxCDF	NA	
108	101	Total HxCDF	NA	
109	102	1,2,3,4,7,8-HxCDD	NA	
110	103	1,2,3,6,7,8-HxCDD	NA	
111	104	1,2,3,7,8,9-HxCDD	NA	
112	105	Total HxCDD	NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA	
115	108	Total HpCDF	NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA	
117	110	Total HpCDD	NA	
118	111	OCDF	NA	
119	112	OCDD	NA	
120				
121		**ETHANOL (mg/L)**	NA	
122				

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D
1				
2				
3			PZ3	
4			FF65B	
5			2/11/03	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	NA	
126		2-Methylnaphthalene	NA	
127		Acenaphthylene	NA	
128		Acenaphthene	NA	
129		Fluorene	NA	
130		Anthracene	NA	
131		Dibenzofuran	NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																	Dup of RW1						Dup of RW1			
3			RW1		RW1		RW1		RW1		RW1		RW1		RW1		W		RW1		RW1		W		RW1	
4			AH76F		AU36E		BC21U		BH96X		BR64O		CB68G		CK77B		CK77A		CT67K		DE87Q		DE87M		DM30G	
5			5/20/99		9/21/99		12/7/99		2/16/00		5/25/00		8/30/00		11/7/00		11/7/00		2/15/01		6/6/01		6/6/01		8/13/01	
6																										
7	1	**CHLORINATED PHENOLS (µg/L)**																								
8	2	**EPA Method SW8040**																								
9	3	Pentachlorophenol	**130**		**3100**		**3400**		**6400**		**11000**		**6300**		**3400**		**3400**		**11000**	J	NA		NA		NA	
10	4	2,4,6-Trichlorophenol	**0.22**	J1	**0.77**		**1.7**		**3.1**		**2.4**		**2.3**		**1.1**		**1.1**		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	**0.12**	J1	0.25	U	**0.33**		**0.54**		0.53	U	**0.53**		0.44	U	0.48	U	NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	3.1	U	14	U	20	U	3.0	U	6.2	U	22	U	30	U	32	U	NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.27	U	0.25	U	0.25	U	0.25	U	**0.79**		0.25	U	0.25	U	NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**48**		**250**		**620**		**530**		**580**		**1100**		**630**		**640**		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	**1.1**		**7.3**		**9.3**		**9.3**		**21**		**24**		**16**		**16**		NA		NA		NA		NA	
16	10																									
17	11	**SEMIVOLATILES (µg/L)**																								
18	12	**EPA Method SW8270**																								
19	13	Phenol	2.0	U	**5.7**		**4.0**		**6.5**		2.0	U	**15**		**8.2**	J2	**14**	J2	**60**		**12**		**12**		**32**	
20	14	4-Methylphenol	1.0	U	**1.4**		2.0	U	**7.0**		1.0	U	**1.6**	M	1.0	U	1.0	U	**16**		**1.7**		**1.8**		**2.1**	
21	15	Isophorone	1.0	U	1.0	U	2.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	6.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	20	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
24	18	Naphthalene	1.0	U	**2.5**		**4.2**		**2.8**		**12**		**12**		**7.1**		**5.8**		**13**		**9.3**		**9.8**		**2.7**	
25	19	2-Methylnaphthalene	1.0	U	1.0	U	2.0	U	1.0	U	**2.0**		**3.4**		**2.2**		**1.7**		**5.2**		**3.7**		**4.0**		1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	10	U	5.0	U	**6.2**		**6.8**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	**35**		5.0	U	5.0	U	5.0	U	**40**		**31**		**17**		**13**		**13**		**6.9**	
28	22	Acenaphthene	1.0	U	1.0	U	2.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	2.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	2.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	**150**		**3100**		**4100**		**2800**		**7300**		**5400**		**4000**		**3900**		**1400**	J	**1900**		**2000**		**410**	
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	2.0	U	1.0	U	1.0	U	1.0	U	**1.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
33	27																									
34	28	**VOLATILES (µg/L)**																								
35	29	**EPA Method SW8260**																								
36	30	Acetone	5.0	U	5.0	U	**30**		5.0	U	**39**	M	30	U	**16**		**14**		**28**		**13**		**13**		**7.2**	M
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U	6.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	**7.9**		**29**		**47**		**80**		25	U	30	U	**7.4**	J2	**41**	J2	5.0	U	**5.7**		**6.4**		**5.6**	
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U	6.0	U	**1.0**		1.0	U	**9.0**		**3.4**		**3.4**		**11**	
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U	6.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	**6.6**		**1.8**		**1.1**		**20**		**14**		**9.1**		**8.2**		**18**		**14**		**15**		**18**	
42	36	Ethylbenzene	**1.3**		**51**		**34**		**31**		**130**		**120**		**96**		**86**		**80**		**71**		**72**		**82**	
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U	6.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	**1.6**		**52**		**23**		**32**		**170**		**150**		**92**		**82**		**160**		**140**		**140**		**200**	
45	39	o-Xylene	**1.6**		**130**		**71**		**73**		**250**		**240**		**160**		**150**		**110**		**100**		**100**		**120**	
46	40	1,3,5-Trimethylbenzene	1.0	U	**41**		**12**		**38**		**120**		**64**		**29**		**25**		**58**		**37**		**38**		**40**	
47	41	1,2,4-Trimethylbenzene	**2.2**		**160**		**75**		**170**		**500**		**320**		**240**		**250**		**160**		**160**		**160**		**150**	
48	42	Isopropylbenzene	**3.5**		**36**		**23**		**21**		**58**		**47**		**26**		**21**		**28**		**28**		**28**		**29**	
49	43	n-Propylbenzene	**1.5**		**37**		**24**		**35**		**82**		**61**		**36**		**31**		**45**		**34**		**36**		**36**	
50	44	tert-Butylbenzene	1.0	U	**2.6**		**1.6**		**2.0**	M	5.0	U	6.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	**3.2**		**17**		**8.6**		**14**		**21**		**16**		**11**		**10**		**10**		**7.7**		**7.8**		**6.8**	
52	46	4-Isopropyltoluene	1.0	U	1.0	U	**1.6**		**7.2**		**13**		**8.6**		**5.2**		**4.6**		**5.9**		**4.1**		**4.2**		**3.8**	
53	47	n-Butylbenzene	1.0	U	**4.7**		2.3	U	**5.8**	M	5.0	U	7.7	U	**6.0**		**6.0**		**9.2**	M	6.0	U	6.2	U	4.8	U
54	48	Naphthalene	5.0	U	**7.1**		**7.3**		**8.9**		25	U	30	U	**11**		**12**		**29**		**25**		**28**		**14**	
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	51	**Method OR-DEQ**																								
59	52	**TPH-Diesel**	**1.0**		**7.5**		**5.7**		**5.1**		**12**		**13**		**6.4**		**5.7**		**4.1**		**4.9**		**4.5**		**4.3**	
60	53	**TPH-D Motor Oil**	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	2.0	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	2.5	U
61	54	**TPH-Gasoline**	**0.63**		**6.6**		**5.1**		**4.5**		**29**		**26**		**9.7**		**9.9**		**7.1**		**5.4**		**5.3**		**7.7**	
62	55																									
63	56	**PRIORITY POLLUTANT**																								
64	57	**METALS (mg/L)**																								
65	58	Arsenic (7060)	**0.002**		**0.005**		**0.006**		**0.004**		**0.004**		**0.006**		**0.006**		**0.006**		**0.007**		**0.007**		**0.007**		**0.008**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
2				Dup of RW1						Dup of RW1										Dup of RW1					
3		RW1		X		RW1		RW1		X		RW1		RW1		RW1		RW1		X		RW1		RW1	
4		DW37D		DW37A		ED34A		EM66B		EM66A		ER93J		EZ17H		FF65D		FL41L		FL41P		FU50C		FY72J	
5		11/28/01		11/28/01		2/28/02		6/24/02		6/24/02		08/27/02		11/13/02		2/11/03		5/7/03		5/7/03		8/29/03		10/22/03	
7	**CHLORINATED PHENOLS (µg/L)**																								
8	**EPA Method SW8040**																								
9	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																									
17	**SEMIVOLATILES (µg/L)**																								
18	**EPA Method SW8270**																								
19	Phenol	**2.1**		2.0	U	**66**		**57**	J	**76**	J	**16**		**10**		**8.9**		2.1	U	2	U	**24**		**3.7**	M
20	4-Methylphenol	1.0	U	1.0	U	**4.6**		**21**		**25**		**5.4**		1.2	U	**6.9**		1	U	1	U	**5.3**		1	U
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.2	U	1	U	1	U	1	U	1	U	1	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	**53**		3.5	U	**3.8**		3.1	U	3.1	U	13	U	6.4	U
23	Benzoic Acid	50	U	50	U	50	U	50	U	50	U	54	U	58	U	50	U	52	U	51	U	50	U	10	U
24	Naphthalene	**13**		**12**		**6.9**		**11**	J	**15**	J	**16**		**8.6**		**14**		**3.7**		**3.7**		**9**		**5.1**	
25	2-Methylnaphthalene	**3.7**		**3.3**		**2.3**		**5.1**		**6.1**		**6**		**4.4**		**6.5**		**1.6**		**1.6**		**2.8**		1	U
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.4	U	5.8	U	5	U	5.2	U	5.1	U	**13**		5.1	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	**5.8**	M	**20**		5.8	U	**9.2**	M	5.2	U	5.1	U	**20**		**33**	
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.2	U	1	U	1	U	1	U	1	U	1	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.2	U	1	U	1	U	1	U	1	U	1	U
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.2	U	1	U	1	U	1	U	1	U	1	U
31	Pentachlorophenol	**17**		**17**		**1200**		**880**	J	**1100**	J	**2600**		**5400**		**2800**		**1700**		**1600**		**1400**		**350**	
32	bis(2-Ethylhexyl)phthalate	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U	4.3	U	4.7	U	1	U	**9.8**	J	**3.3**	J	1	U	1	U
33																									
34	**VOLATILES (µg/L)**																								
35	**EPA Method SW8260**																								
36	Acetone	**8.4**		**7.6**		**110**	J	50	U	48	U	15	U	5	U	**16**	M	**20**		**24**	M	**26**	MJ	**15**	M
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U	3	U	1	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	**30**		**30**	M	**47**	J	15	U	**16**	J	**32**	M	5	U	5	U	5	U	5	U	5	U	**46**	M
39	Benzene	**24**		**23**		**1.9**	J	3.0	U	3.0	U	**4.8**		**22**		**12**		**1**		**2**		**4.9**	J	**4.9**	
40	Bromoform	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U	3	U	1	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	**5.7**		**5.3**		**12**	J	**16**		**14**	J	**15**		**13**		1	U	1	U	1	U	**3**	J	1	U
42	Ethylbenzene	**74**		**74**		**81**	J	**140**		**120**	J	**120**		**130**		**57**		**14**	J	**37**	J	**68**	J	**64**	
43	Styrene	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U	3	U	1	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	**270**		**280**		**97**	J	**310**		**250**	J	**230**		**160**		**41**		**12**	J	**34**	J	**90**	J	**62**	
45	o-Xylene	**87**		**87**		**170**	J	**220**		**190**	J	**200**		**200**		**73**		**25**	J	**66**		**120**	J	**90**	
46	1,3,5-Trimethylbenzene	**53**		**52**		**40**	J	**100**		**100**	J	**97**		**87**		**19**		**9.8**	J	**30**	J	**67**	J	**31**	
47	1,2,4-Trimethylbenzene	**200**		**200**		**170**	J	**370**		**310**	J	**380**		**410**		**110**		**64**	J	**160**	J	**230**		**170**	
48	Isopropylbenzene	**26**		**26**		**29**	J	**42**		**47**	J	**53**		**60**		**20**		**12**	J	**24**	J	**42**	J	**34**	
49	n-Propylbenzene	**32**		**31**		**34**	J	**63**		**64**	J	**72**		**80**		**29**		**14**	J	**32**	J	**52**	J	**40**	
50	tert-Butylbenzene	1.0	U	1.0	U	**1.8**	J	3.0	U	3.0	U	3	U	**3**		**1**		**1.7**		**2.3**		**3.1**	J	**2**	
51	sec-Butylbenzene	1.0	U	1.0	U	**8.9**	J	3.0	U	3.0	U	3	U	**16**		**5.5**		**5.7**	J	**9.3**	J	**17**	J	**11**	
52	4-Isopropyltoluene	**5.5**		**5.4**		4.5	U	**9.3**		**8.8**	J	**11**		**9.5**		**2.6**		**1.2**	J	**6.2**	J	**6.9**	J	**3.6**	
53	n-Butylbenzene	**4.7**	M	**4.7**	M	**6.8**	J	10	U	8.2	U	**14**	M	**9**		**4**	M	**2.2**	MJ	**4.5**	J	**7.3**	MJ	**4.7**	M
54	Naphthalene	**24**		**22**		**21**	J	**19**		**20**	J	**45**		**19**		**19**		5	U	**10**		**19**	J	**13**	
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																									
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	**Method OR-DEQ**																								
59	**TPH-Diesel**	**4.7**		**5.0**		**4.9**		**6.8**	J	**17**	J	**9.4**		**13**		**6.8**		**5.1**		**5.4**		**8.1**		**5.8**	
60	**TPH-D Motor Oil**	2.0	U	0.50	U	0.50	U	0.50	U	0.50	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
61	**TPH-Gasoline**	**5.2**		**5.3**		12		**13**		**14**		**14**		**18**		**6.9**		**5.2**	J	**6.7**	J	**8.2**		**7**	
62																									
63	**PRIORITY POLLUTANT**																								
64	**METALS (mg/L)**																								
65	Arsenic (7060)	**0.009**		**0.008**		**0.008**		**0.006**		**0.006**		**0.008**		0.05	U	**0.004**		**0.005**		**0.005**		**0.006**		**0.005**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																	Dup of RW1						Dup of RW1			
3			RW1		RW1		RW1		RW1		RW1		RW1		RW1		W		RW1		RW1		W		RW1	
4			AH76F		AU36E		BC21U		BH96X		BR64O		CB68G		CK77B		CK77A		CT67K		DE87Q		DE87M		DM30G	
5			5/20/99		9/21/99		12/7/99		2/16/00		5/25/00		8/30/00		11/7/00		11/7/00		2/15/01		6/6/01		6/6/01		8/13/01	
66	59	Chromium (6010)	0.005	U	0.005	U	**0.007**		**0.011**		0.005	U	0.005	U	**0.015**		**0.010**		0.005	U	0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	**0.018**		**0.003**		**0.013**		**0.024**		**0.005**		0.002	U	**0.020**	J2	**0.016**	J2	0.002	U	0.002	U	0.002	U	0.002	U
68	61	Lead (7421)	**0.003**		0.001	U	**0.004**		**0.005**		0.001	U	0.001	U	**0.006**		**0.004**		0.001	U	0.001	U	0.001	U	0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	**0.02**		0.01	U	0.01	U	**0.01**		**0.01**		0.01	U	0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	**0.020**		0.004	U	**0.028**		**0.046**		0.006	U	0.006	U	**0.054**		**0.048**		**0.017**		0.006	U	0.006	U	0.006	U
71	64																									
72	65	**MAJOR IONS AND CONVENTIONALS**																								
73	66	Calcium (mg/L) (6010)	**37.3**		NA		NA		NA		NA		NA		NA		NA		**49.1**		**36.1**		**37.3**		**45.3**	
74	67	Magnesium (mg/L) (6010)	**11.7**		NA		NA		NA		NA		NA		NA		NA		**15.2**		**11.9**		**12.2**		**15.2**	
75	68	Potassium (mg/L) (6010)	**4.0**		NA		NA		NA		NA		NA		NA		NA		**4.0**		**2.8**		**3.4**		**3.5**	
76	69	Sodium (mg/L) (6010)	**6.03**		NA		NA		NA		NA		NA		NA		NA		**6.67**		**6.01**		**5.59**		**6.62**	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**140**		NA		NA		NA		NA		NA		NA		NA		**230**		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	NA		NA		NA		NA		NA		NA		NA		1.0	U	NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**140**		NA		NA		NA		NA		NA		NA		NA		**230**		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**180**		**210**		**170**		**200**		**350**		**240**		**220**		**230**		**320**		**220**	J	**220**	J	**220**	J
81	74	Chloride (mg/L) (EPA 325.2)	**2.9**		**3.8**		**6.7**		**12**		**4.2**		**13**		**7.3**		**6.2**		**5.9**	J	**4.7**		**5.1**		**7.6**	
82	75	N-Nitrate (mg-N/L) (Calculated)	0.010	U	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	0.010	U	NA		NA		NA		NA		NA		NA		NA		**0.023**	J	NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	0.010	U	NA		NA		NA		NA		NA		NA		NA		**0.030**		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	**3.8**		NA		NA		NA		NA		NA		NA		NA		**3.0**		NA		NA		NA	
86	79																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
1																									
2				Dup of RW1						Dup of RW1										Dup of RW1					
3		RW1		X		RW1		RW1		X		RW1		RW1		RW1		RW1		X		RW1		RW1	
4		DW37D		DW37A		ED34A		EM66B		EM66A		ER93J		EZ17H		FF65D		FL41L		FL41P		FU50C		FY72J	
5		11/28/01		11/28/01		2/28/02		6/24/02		6/24/02		08/27/02		11/13/02		2/11/03		5/7/03		5/7/03		8/29/03		10/22/03	
66	Chromium (6010)	**0.008**	J	**0.014**	J	**0.015**		0.005	U	0.005	U	0.005	U	**0.013**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	**0.008**	J	**0.013**	J	**0.028**		**0.005**		**0.006**		**0.004**		**0.018**		**0.006**		**0.004**		**0.005**		**0.003**		**0.005**	
68	Lead (7421)	**0.002**	J	**0.004**	J	**0.006**		**0.001**		0.001	U	**0.001**		0.02	U	0.001	U	0.001	U	**0.001**		0.001	U	0.001	U
69	Nickel (6010)	0.01	U	**0.01**		**0.02**		0.01	U	0.01	U	0.01	U	**0.02**		**0.11**		0.01	U	**0.01**		0.01	U	0.01	U
70	Zinc (6010)	**0.026**	J	**0.038**	J	**0.054**		**0.016**		**0.020**		0.006	U	**0.055**		**0.008**		**0.065**	J	**0.013**	J	**0.009**		**0.01**	
71																									
72	**MAJOR IONS AND CONVENTIONALS**																								
73	Calcium (mg/L) (6010)	**58.7**	J	**65.4**	J	**152**		NA		NA		NA		NA		**31.7**		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	**19.5**	J	**21.8**	J	**51.9**		NA		NA		NA		NA		**10.6**		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	**4.2**		**5.1**		**6.7**		NA		NA		NA		NA		**3.6**		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	**8.18**		**9.48**		**12.0**		NA		NA		NA		NA		**7.9**		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		**480**		NA		NA		NA		NA		**130**		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		1.0	U	NA		NA		NA		NA		1	U	NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		**480**		NA		NA		NA		NA		**130**		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**290**		**280**		**1100**		**1900**		**2000**		**230**		**260**		**230**		**240**		**240**		**320**		**320**	
81	Chloride (mg/L) (EPA 325.2)	**8.4**		**8.3**		**11**		**8.8**		**8.0**		**6.4**		**7.0**		**5.4**		**6**		**6**		**5.9**		**7.8**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		**0.044**		NA		NA		NA		NA		**0.043**		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		0.010	U	NA		NA		NA		NA		**0.043**		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		**0.044**		NA		NA		NA		NA		**0.086**		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		**5.7**		NA		NA		NA		NA		**46**		NA		NA		NA		NA	
86																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

															Dup of RW1						Dup of RW1		
			RW1		RW1		RW1		RW1		RW1		RW1		W		RW1		RW1		W		RW1	
			AH76F		AU36E		BC21U		BH96X		BR64O		CB68G		CK77B		CK77A		CT67K		DE87Q		DE87M		DM30G	
			5/20/99		9/21/99		12/7/99		2/16/00		5/25/00		8/30/00		11/7/00		11/7/00		2/15/01		6/6/01		6/6/01		8/13/01	
	80	**FIELD PARAMETERS**																							
	81	pH (avg)	6.54		6.14		6.18		6.44		6.46		5.69		5.28		5.27		6.35		6.62		6.61		6.54	
	82	Temperature (° C) (avg)	14.0		17.3		17.2		14.6		13.2		14.8		14.2		14.1		12.7		14.4		14.4		16.4	
	83	Conductivity (um/hos)	244		271		273		211		440		314		305		303		506		377		377		389	
	84	Dissolved oxygen (mg/L) (avg)	1.52		2.09		1.72		0.76		1.00		0.87		0.69		0.72		0.32		0.97		0.94		1.10	
	85																									
	86	**DIOXINS AND FURANS (ng/L)**																								
	87	**Method 8290**																								
	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
		ETHANOL (mg/L)	NA		NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
1																									
2				Dup of RW1						Dup of RW1										Dup of RW1					
3		RW1		X		RW1		RW1		X		RW1		RW1		RW1		RW1		X		RW1		RW1	
4		DW37D		DW37A		ED34A		EM66B		EM66A		ER93J		EZ17H		FF65D		FL41L		FL41P		FU50C		FY72J	
5		11/28/01		11/28/01		2/28/02		6/24/02		6/24/02		08/27/02		11/13/02		2/11/03		5/7/03		5/7/03		8/29/03		10/22/03	
87	**FIELD PARAMETERS**																								
88	pH (avg)	6.51		6.5		6.15		6.16		6.14		6.71		6.03		6.4		6.82		6.84		6.65		6.73	
89	Temperature (° C) (avg)	13.7		13.5		12.8		15.6		15.6		15.6		17.3		15.3		14.2		14.2		15.4		17.5	
90	Conductivity (um/hos)	584		583		878		803		805		291		394		366		308		308		430		415	
91	Dissolved oxygen (mg/L) (avg)	3.36		3.43		7.27		3.86		3.54		0.00		0.00		0		1.79		1.75		1.59		2.65	
92																									
93	**DIOXINS AND FURANS (ng/L)**																								
94	**Method 8290**																								
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		3.0	U
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		3.0	U
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		4.1	U
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.4	U
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.9	U
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.7	U
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.7	U
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.9	U
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**6.5**	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.2	U
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		1.9	U
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.1	U
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.3	U
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**20.2**	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.8	U
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		3.0	U
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.4	U
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**19.9**	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**18.1**	J
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		4.3	U
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**86**	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**125**	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**211**	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**119**	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**1226**	
120																									
121	**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																	Dup of RW1						Dup of RW1			
3			RW1		RW1		RW1		RW1		RW1		RW1		RW1		W		RW1		RW1		W		RW1	
4			AH76F		AU36E		BC21U		BH96X		BR64O		CB68G		CK77B		CK77A		CT67K		DE87Q		DE87M		DM30G	
5			5/20/99		9/21/99		12/7/99		2/16/00		5/25/00		8/30/00		11/7/00		11/7/00		2/15/01		6/6/01		6/6/01		8/13/01	
123		**PAHs (µg/L)**																								
124		**EPA Method SW8270 SIM**																								
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
1																									
2				Dup of RW1						Dup of RW1										Dup of RW1					
3		RW1		X		RW1		RW1		X		RW1		RW1		RW1		RW1		X		RW1		RW1	
4		DW37D		DW37A		ED34A		EM66B		EM66A		ER93J		EZ17H		FF65D		FL41L		FL41P		FU50C		FY72J	
5		11/28/01		11/28/01		2/28/02		6/24/02		6/24/02		08/27/02		11/13/02		2/11/03		5/7/03		5/7/03		8/29/03		10/22/03	
123	**PAHs (µg/L)**																								
124	**EPA Method SW8270 SIM**																								
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			RW3		RW3	
4			BC30H		9912050-07A	
5			12/8/99		12/8/1999 (d)	
7	1	**CHLORINATED PHENOLS (µg/L)**				
8	2	**EPA Method SW8040**				
9	3	Pentachlorophenol	**590**		NA	
10	4	2,4,6-Trichlorophenol	**0.19**	J1	NA	
11	5	2,3,6-Trichlorophenol	**0.13**	J1	NA	
12	6	2,4,5-Trichlorophenol	0.25	U	NA	
13	7	2,3,4-Trichlorophenol	0.25	U	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**110**		NA	
15	9	2,3,4,5-Tetrachlorophenol	**3.0**		NA	
16	10					
17	11	**SEMIVOLATILES (µg/L)**				
18	12	**EPA Method SW8270**				
19	13	Phenol	2.0	U	NA	
20	14	4-Methylphenol	1.0	U	NA	
21	15	Isophorone	1.0	U	NA	
22	16	2,4-Dimethylphenol	3.0	U	NA	
23	17	Benzoic Acid	10	U	NA	
24	18	Naphthalene	**14**		NA	
25	19	2-Methylnaphthalene	1.0	U	NA	
26	20	2,4,6-Trichlorophenol	5.0	U	NA	
27	21	2,4,5-Trichlorophenol	5.0	U	NA	
28	22	Acenaphthene	1.0	U	NA	
29	23	Dibenzofuran	1.0	U	NA	
30	24	Fluorene	1.0	U	NA	
31	25	Pentachlorophenol	**720**		NA	
32	26	bis(2-Ethylhexyl)phthalate	**1.4**		NA	
33	27					
34	28	**VOLATILES (µg/L)**				
35	29	**EPA Method SW8260**				
36	30	Acetone	5.0	U	NA	
37	31	Carbon Disulfide	1.0	U	NA	
38	32	2-Butanone	**9.1**		NA	
39	33	Benzene	1.0	U	NA	
40	34	Bromoform	1.0	U	NA	
41	35	Toluene	1.0	U	NA	
42	36	Ethylbenzene	**8.3**		NA	
43	37	Styrene	1.0	U	NA	
44	38	m,p-Xylene	**12**		NA	
45	39	o-Xylene	**34**		NA	
46	40	1,3,5-Trimethylbenzene	**57**		NA	
47	41	1,2,4-Trimethylbenzene	**160**		NA	
48	42	Isopropylbenzene	**10**		NA	
49	43	n-Propylbenzene	**19**		NA	
50	44	tert-Butylbenzene	1.0	U	NA	
51	45	sec-Butylbenzene	**9.2**		NA	
52	46	4-Isopropyltoluene	**9.8**		NA	
53	47	n-Butylbenzene	8.9	U	NA	
54	48	Naphthalene	**15**		NA	
55	48.5	Methyl tert-butyl ether	NA		NA	
56	49					
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**				
58	51	**Method OR-DEQ**				
59	52	**TPH-Diesel**	**3.5**		NA	
60	53	**TPH-D Motor Oil**	0.50	U	NA	
61	54	**TPH-Gasoline**	**2.5**		NA	
62	55					
63	56	**PRIORITY POLLUTANT**				
64	57	**METALS (mg/L)**				
65	58	Arsenic (7060)	**0.014**		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			RW3		RW3	
4			BC30H		9912050-07A	
5			12/8/99		12/8/1999 (d)	
66	59	Chromium (6010)	0.005	U	NA	
67	60	Copper (6010)	0.002	U	NA	
68	61	Lead (7421)	0.001	U	NA	
69	62	Nickel (6010)	0.01	U	NA	
70	63	Zinc (6010)	0.006	U	NA	
71	64					
72	65	**MAJOR IONS AND CONVENTIONALS**				
73	66	Calcium (mg/L) (6010)	NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**150**		NA	
81	74	Chloride (mg/L) (EPA 325.2)	**3.9**		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA	
86	79					

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			RW3		RW3	
4			BC30H		9912050-07A	
5			12/8/99		12/8/1999 (d)	
87	80	**FIELD PARAMETERS**				
88	81	pH (avg)	6.52		NM	
89	82	Temperature (° C) (avg)	12.9		NM	
90	83	Conductivity (um/hos)	231		NM	
91	84	Dissolved oxygen (mg/L) (avg)	1.76		NM	
92	85					
93	86	**DIOXINS AND FURANS (ng/L)**				
94	87	**Method 8290**				
95	88	2,3,7,8-TCDF	NA		NA	
96	89	Total TCDF	NA		NA	
97	90	2,3,7,8-TCDD	NA		NA	
98	91	Total TCDD	NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA	
101	94	Total PeCDF	NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA	
103	96	Total PeCDD	NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA	
108	101	Total HxCDF	NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA	
112	105	Total HxCDD	NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA	
115	108	Total HpCDF	NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA	
117	110	Total HpCDD	NA		NA	
118	111	OCDF	NA		NA	
119	112	OCDD	NA		NA	
120						
121		**ETHANOL (mg/L)**	5.0	U	10	U
122						

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			RW3		RW3	
4			BC30H		9912050-07A	
5			12/8/99		12/8/1999 (d)	
123		**PAHs (µg/L)**				
124		**EPA Method SW8270 SIM**				
125		Naphthalene	NA		NA	
126		2-Methylnaphthalene	NA		NA	
127		Acenaphthylene	NA		NA	
128		Acenaphthene	NA		NA	
129		Fluorene	NA		NA	
130		Anthracene	NA		NA	
131		Dibenzofuran	NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1																						
2									Dup of LW2S													
3			LW2S		LW2S		LW2S		LW2D		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S	
4			S177G		T176C		U235M		U235E		V224N		W391A		Y336G		Z225A		Z960Q		AH27F	
5			4/2/97		7/15/97		10/22/97		10/22/97		1/29/98		5/19/98		8/19/98		11/13/98		2/18/99		5/17/99	
7	1	**CHLORINATED PHENOLS (µg/L)**																				
8	2	**EPA Method SW8040**																				
9	3	Pentachlorophenol	**2600**		**2900**		**4400**		**4800**		**7600**		**8500**		**5000**		**3800**		**6000**		**560**	
10	4	2,4,6-Trichlorophenol	**0.46**		0.43	U	0.34	U	0.38	U	**0.56**		**0.57**		**0.34**		**0.34**		0.46		0.25	U
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
12	6	2,4,5-Trichlorophenol	0.86	U	0.25	U	0.49	U	0.51	U	0.25	U	**0.57**		**0.61**		0.25	U	0.60	U	0.25	U
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.13**	J1	**0.18**	J1	0.25	U	0.25	U	0.25	U
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**150**		**150**		**190**		**190**		**290**		**370**		**180**		**130**		**300**		**20**	
15	9	2,3,4,5-Tetrachlorophenol	**2.5**		**3.4**		**4.8**		**4.7**		**4.4**		**6.6**		**8.6**		**2.8**		**3.2**		**1.1**	
16	10																					
17	11	**SEMIVOLATILES (µg/L)**																				
18	12	**EPA Method SW8270**																				
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
24	18	Naphthalene	**5.5**		**2.3**		**20**		**17**		**13**		**10**	J2	**13**		**14**		**8.4**		1.0	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	**3900**		**3000**		**6000**		**7300**		**7900**		**7300**		**4200**		**4100**		**5400**		**500**	
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	**1.9**		1.0	U	1.0	U	**12**		1.0	U	1.0	U	**1.6**		**1.3**	
33	27																					
34	28	**VOLATILES (µg/L)**																				
35	29	**EPA Method SW8260**																				
36	30	Acetone	10	U	5.0	U	6.9		45	U	5.0	U	**7.4**		5.0	U	**35**		15	U	5.0	U
37	31	Carbon Disulfide	2.0	U	1.0	U	1.0	U	9.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U
38	32	2-Butanone	10	U	5.0	U	5.0	U	45	U	5.0	U	5.0	U	5.0	U	**7.4**		15	U	**9.4**	
39	33	Benzene	2.0	U	1.0	U	1.0	U	9.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U
40	34	Bromoform	2.0	U	1.0	U	1.0	U	9.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U
41	35	Toluene	2.0	U	**2.0**		**1.1**		9.0	U	1.0	U	1.0	U	**1.4**		**1.3**		3.0	U	1.0	U
42	36	Ethylbenzene	**5.7**		**11**		**32**		**32**		**17**		**5.1**		**9.7**		**12**		**11**		**2.0**	
43	37	Styrene	2.0	U	1.0	U	1.0	U	9.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U
44	38	m,p-Xylene	**13**		**16**		**37**		**36**		**32**		**12**		**17**		**24**		**18**		**2.6**	
45	39	o-Xylene	**23**		**35**		**91**		**92**		**63**		**23**		**39**		**61**		**42**		**6.9**	
46	40	1,3,5-Trimethylbenzene	**53**		**49**		**130**		**110**		**80**		**34**		**54**		**62**		**93**		**8.7**	
47	41	1,2,4-Trimethylbenzene	**210**		**200**		**640**	J2	**790**	J2	**490**		**160**		**180**		**280**		**330**		**44**	
48	42	Isopropylbenzene	**7.5**		**14**		**62**	J2	**49**	J2	**19**		**6.4**		**10**		**12**		**16**		**2.2**	
49	43	n-Propylbenzene	**16**		**26**		**110**		**90**		**38**		**15**		**21**		**22**		**35**		**4.8**	
50	44	tert-Butylbenzene	2.0	U	**1.8**	MJ	**5.7**		9.0	U	**2.7**		1.0	U	1.0	U	1.0	U	3.0		1.0	U
51	45	sec-Butylbenzene	**7.6**		**11**		**40**	J2	**27**	J2	**22**		**8.2**		**12**	J2	**12**		**15**		**2.9**	
52	46	4-Isopropyltoluene	**9.6**		**9.6**		**31**	J2	**22**	J2	**21**		**9.1**		**12**		**12**		**12**		**2.0**	
53	47	n-Butylbenzene	**8.5**		**8.4**	M	**29**	J2	**18**	J2	**16**		**7.7**		**10**		**10**		**12**		**1.9**	
54	48	Naphthalene	**12.0**		**14**		**75**	J2	**58**	J2	**31**		**14**		**19**		**18**		**22**		5.0	U
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																					
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																				
58	51	**Method OR-DEQ**																				
59	52	**TPH-Diesel**	**4.4**		**5.0**		**11**		**11**		**10**		**5.6**		**5.2**		**5.0**		**6.2**		**1.1**	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																					
63	56	**PRIORITY POLLUTANT**																				
64	57	**METALS (mg/L)**																				
65	58	Arsenic (7060)	**0.008**		**0.012**		0.05	U	0.05	U	0.05	U	**0.011**		**0.011**		**0.017**		**0.007**		**0.005**	

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
3		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S	
4		AU22G		BC27H		9912050-04A		BH75F		BR64C		CB49I		CK77I		CT55G		DE68C		DM52I		DW48K		ED23E	
5		9/20/99		12/8/99		12/8/1999 (d)		2/15/00		5/24/00		8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/26/02	
7	**CHLORINATED PHENOLS (µg/L)**																								
8	**EPA Method SW8040**																								
9	Pentachlorophenol	**1500**		**1300**		NA		**2100**		**1000**		**720**		**1100**		**650**	J	NA		NA		NA		NA	
10	2,4,6-Trichlorophenol	**0.16**	J1	**0.12**	J1	NA		**0.42**		0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	0.25	U	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	0.57	U	0.33	U	NA		0.37	U	0.25	U	0.74	U	0.33	U	NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	0.25	U	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**47**		**36**		NA		**84**		**28**		**28**		**47**		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	**2.2**		**1.6**		NA		**2.2**		**2.1**		**1.0**		**1.5**		NA		NA		NA		NA		NA	
16																									
17	**SEMIVOLATILES (µg/L)**																								
18	**EPA Method SW8270**																								
19	Phenol	2.0	U	2.0	U	NA		2.0	U	2.0	U	2.0	U	**2.4**	J2	2.0	U	2.0	U	2.0	U	**2.8**		2.0	U
20	4-Methylphenol	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**3.0**		1.0	U
21	Isophorone	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	NA		3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	Benzoic Acid	10	U	10	U	NA		10	U	10	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U
24	Naphthalene	**4.3**		**36**		NA		**8.2**		**5.2**		**1.4**		**9.2**		**12**		**21**		**6.8**		**14**		1.0	U
25	2-Methylnaphthalene	1.0	U	**1.2**		NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	Acenaphthene	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	Dibenzofuran	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	Fluorene	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	Pentachlorophenol	**1600**		**1800**		NA		**2100**		**1300**	J2	**200**		**1500**		**1200**	J	**1300**		**700**		**8000**		**320**	
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	**1.4**		1.0	U	1.0	U	**1.5**		4.0	U
33																									
34	**VOLATILES (µg/L)**																								
35	**EPA Method SW8260**																								
36	Acetone	5.0	U	**29**		NA		5.0	U	5.0	U	5.0	U	**27**			R	**33**		**20**		**39**		5.0	U
37	Carbon Disulfide	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	3.0	U	2.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	2-Butanone	**28**		**6.7**	M	NA		**32**		**22**		5.0	U	15	U	10	U	34	U	**32**		5.0	U	**5.2**	
39	Benzene	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	3.0	U	2.0	U	1.0	U	1.0	U	1.0	U	1.0	U
40	Bromoform	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	3.0	U	2.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	Toluene	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	3.0	U	2.0	U	**1.1**		1.0	U	1.0	U	1.0	U
42	Ethylbenzene	**6.3**		**22**		NA		**11**		**5.3**		**1.6**		**11**		**9.7**		**26**		1.0	U	**15**		1.0	U
43	Styrene	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	3.0	U	2.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	m,p-Xylene	**11**		**18**		NA		**18**		**9.9**		**3.0**		**15**		**18**		**36**		**14**		**35**		**1.2**	
45	o-Xylene	**29**		**97**		NA		**45**		**25**		**8.1**		**36**		**49**		**87**		**36**		**84**		**3.0**	
46	1,3,5-Trimethylbenzene	**45**		**80**		NA		**69**		**38**		**16**		**47**		**61**		**94**		**34**		**130**		**5.7**	
47	1,2,4-Trimethylbenzene	**120**		**540**		NA		**330**		**160**		**66**		**250**		**320**		**490**		**200**		**420**		**25**	
48	Isopropylbenzene	**7.0**		**38**		NA		**23**		**7.3**		**2.2**		**9.1**		**19**		**32**		**13**		**16**		1.0	U
49	n-Propylbenzene	**15**		**60**		NA		**48**		**16**		**5.8**		**20**		**36**		**67**		**28**		**32**		**2.0**	
50	tert-Butylbenzene	1.0	U	1.0	U	NA		3.1	U	**1.2**		1.0	U	3.0	U	**3.2**		1.0	U	1.0	U	**68**		1.0	U
51	sec-Butylbenzene	**8.0**		**27**		NA		**24**		**8.2**		**3.9**		**9.3**		**20**		**30**		**15**		1.0	U	**1.4**	
52	4-Isopropyltoluene	**8.8**		**20**		NA		**15**		**7.4**		**3.8**		**8.5**		**17**		**25**		**13**		**22**		**1.5**	
53	n-Butylbenzene	**7.0**		15	U	NA		17	U	**6.5**	M	**3.7**	M	**9.5**		**15**	M	**21**		**12**	M	**18**		**1.2**	
54	Naphthalene	**16**		**54**		NA		**26**		**10**		5.0	U	**27**		**23**		**60**		**28**		**54**		5.0	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																									
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	**Method OR-DEQ**																								
59	**TPH-Diesel**	**2.3**		**9.4**		NA		**5.5**		**3.5**		**1.8**		**4.0**		**9.1**		**9.4**		**5.4**		10		**1.5**	
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																									
63	**PRIORITY POLLUTANT**																								
64	**METALS (mg/L)**																								
65	Arsenic (7060)	**0.008**		**0.011**		NA		**0.011**		**0.011**		**0.011**		**0.017**		**0.013**		**0.018**		**0.019**		**0.013**		**0.015**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AU	AV
1			
2			
3		LW2S	
4		EM85F	
5		6/26/02	
6			
7	**CHLORINATED PHENOLS (µg/L)**		
8	**EPA Method SW8040**		
9	Pentachlorophenol	NA	
10	2,4,6-Trichlorophenol	NA	
11	2,3,6-Trichlorophenol	NA	
12	2,4,5-Trichlorophenol	NA	
13	2,3,4-Trichlorophenol	NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	2,3,4,5-Tetrachlorophenol	NA	
16			
17	**SEMIVOLATILES (µg/L)**		
18	**EPA Method SW8270**		
19	Phenol	2.0	U
20	4-Methylphenol	1.0	U
21	Isophorone	1.0	U
22	2,4-Dimethylphenol	3.0	U
23	Benzoic Acid	50	U
24	Naphthalene	**6.2**	
25	2-Methylnaphthalene	1.0	U
26	2,4,6-Trichlorophenol	5.0	U
27	2,4,5-Trichlorophenol	5.0	U
28	Acenaphthene	1.0	U
29	Dibenzofuran	1.0	U
30	Fluorene	1.0	U
31	Pentachlorophenol	**950**	
32	bis(2-Ethylhexyl)phthalate	4.0	U
33			
34	**VOLATILES (µg/L)**		
35	**EPA Method SW8260**		
36	Acetone	**8.2**	
37	Carbon Disulfide	1.0	U
38	2-Butanone	**13**	
39	Benzene	1.0	U
40	Bromoform	1.0	U
41	Toluene	1.0	U
42	Ethylbenzene	**4.7**	
43	Styrene	1.0	U
44	m,p-Xylene	**7.3**	
45	o-Xylene	**18**	
46	1,3,5-Trimethylbenzene	**24**	
47	1,2,4-Trimethylbenzene	**110**	
48	Isopropylbenzene	**6.8**	
49	n-Propylbenzene	**14**	
50	tert-Butylbenzene	1.0	U
51	sec-Butylbenzene	**7.5**	
52	4-Isopropyltoluene	**6.6**	
53	n-Butylbenzene	5.7	U
54	Naphthalene	**11**	
55	Methyl tert-butyl ether	NA	
56			
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	**Method OR-DEQ**		
59	**TPH-Diesel**	**2.8**	
60	**TPH-D Motor Oil**	NA	
61	**TPH-Gasoline**	NA	
62			
63	**PRIORITY POLLUTANT**		
64	**METALS (mg/L)**		
65	Arsenic (7060)	**0.014**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1																						
2									Dup of LW2S													
3			LW2S		LW2S		LW2S		LW2D		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S	
4			S177G		T176C		U235M		U235E		V224N		W391A		Y336G		Z225A		Z960Q		AH27F	
5			4/2/97		7/15/97		10/22/97		10/22/97		1/29/98		5/19/98		8/19/98		11/13/98		2/18/99		5/17/99	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.006**		0.005	U
67	60	Copper (6010)	0.002	U	**0.002**		0.002	U	0.002	U	0.002	U	0.002	U	**0.002**		0.002	U	**0.007**		0.002	U
68	61	Lead (7421)	0.001	U	**0.001**		0.02	U	0.02	U	0.02	U	0.001	U	**0.007**		0.001	U	**0.004**		0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	**0.004**		**0.006**	J2	**0.007**		**0.004**		**0.004**		**0.004**	J2	**0.098**		**0.006**		**0.026**		0.005	U
71	64																					
72	65	**MAJOR IONS AND CONVENTIONALS**																				
73	66	Calcium (mg/L) (6010)	NA		NA		**18.4**		**18.2**		**9.13**		NA		NA		NA		**7.23**		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		**5.15**		**5.12**		**2.30**		NA		NA		NA		**2.52**		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		**2.8**		**2.8**		**1.6**		NA		NA		NA		**1.9**		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		**4.77**		**4.74**		**2.54**		NA		NA		NA		**3.69**		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		**62**		**61**		**52**		NA		NA		NA		**25**		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		**62**		**61**		**52**		NA		NA		NA		**25**		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**170**	J2	**130**		**140**		**66**		160		140		220		**76**		**160**	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		**15**		**15**		**1.9**		3.9		4.6		26		**1.9**		**1.8**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		**0.023**		**0.017**		0.010	UJ	NA		NA		NA		**0.040**		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		0.010	U	0.010	U	0.010	UJ	NA		NA		NA		**0.016**		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		**0.023**		**0.017**		0.010	UJ	NA		NA		NA		**0.056**		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		**5.3**		**5.9**		**6.5**		NA		NA		NA		**9.4**		NA	
86	79																					

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
3		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S	
4		AU22G		BC27H		9912050-04A		BH75F		BR64C		CB49I		CK77I		CT55G		DE68C		DM52I		DW48K		ED23E	
5		9/20/99		12/8/99		12/8/1999 (d)		2/15/00		5/24/00		8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/26/02	
66	Chromium (6010)	0.005	U	0.005	U	NA		0.005	U	0.005	U	**0.005**		0.005	U	0.005	U	0.05	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	0.002	U	**0.002**		NA		**0.003**		**0.003**		**0.007**		**0.005**	J2	0.002	U	0.002	U	**0.004**		0.004	U	**0.003**	
68	Lead (7421)	0.001	U	0.001	U	NA		0.001	U	0.001	U	**0.003**		**0.003**		0.001	U	0.001	U	**0.001**		**0.004**		0.001	U
69	Nickel (6010)	0.01	U	0.01	U	NA		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)	**0.008**		0.009	U	NA		**0.010**		**0.006**		**0.016**		**0.013**		**0.011**		0.006	U	**0.012**		**0.012**		**0.006**	
71																									
72	**MAJOR IONS AND CONVENTIONALS**																								
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**35.6**		**42.2**		**24.3**		**23.3**		**12.3**	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**9.27**		**10.1**		**7.63**		**7.65**		**3.88**	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**2.7**		**3.4**		**3.1**		**2.9**		**2.0**	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**5.10**		**5.23**		**5.84**		**5.14**		**3.46**	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**140**		NA		NA		NA		**67**	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		1.0	U	NA		NA		NA		1.0	U
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**140**		NA		NA		NA		**67**	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**160**		**170**		NA		**84**		**140**		**180**		**220**		**210**		**300**		**210**		**190**		**120**	
81	Chloride (mg/L) (EPA 325.2)	**3.1**		**7.5**		NA		**1.8**		**2.5**		**2.8**		**26**		**15**		**38**		**26**		**9.7**		**4.1**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		**0.010**		NA		NA		NA		0.010	U
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.026**	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		**0.010**		NA		NA		NA		**0.033**	J
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		**5.7**		NA		NA		NA		**4.3**	
86																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AU	AV
1			
2			
3		LW2S	
4		EM85F	
5		6/26/02	
66	Chromium (6010)	0.005	U
67	Copper (6010)	0.002	U
68	Lead (7421)	0.001	U
69	Nickel (6010)	0.01	U
70	Zinc (6010)	**0.012**	
71			
72	**MAJOR IONS AND CONVENTIONALS**		
73	Calcium (mg/L) (6010)	NA	
74	Magnesium (mg/L) (6010)	NA	
75	Potassium (mg/L) (6010)	NA	
76	Sodium (mg/L) (6010)	NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**110**	
81	Chloride (mg/L) (EPA 325.2)	**3.3**	
82	N-Nitrate (mg-N/L) (Calculated)	NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA	
85	Sulfate (mg/L) (EPA 375.2)	NA	
86			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1																						
2									Dup of LW2S													
3			LW2S		LW2S		LW2S		LW2D		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S	
4			S177G		T176C		U235M		U235E		V224N		W391A		Y336G		Z225A		Z960Q		AH27F	
5			4/2/97		7/15/97		10/22/97		10/22/97		1/29/98		5/19/98		8/19/98		11/13/98		2/18/99		5/17/99	
87	80	**FIELD PARAMETERS**																				
88	81	pH (avg)	6.69		6.62		6.77		6.78		6.83		6.19		6.18		5.9300		6.21		5.62	
89	82	Temperature (° C) (avg)	10.0		15		15.7		15.7		10.8		12.6		14.4		14.7000		8.6		11.2	
90	83	Conductivity (um/hos)	291		258		168		167		108		244		299		148.0000		57		221	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		NA		2.71		1.43		1.31		1.47		3.08	
92	85																					
93	86	**DIOXINS AND FURANS (ng/L)**																				
94	87	**Method 8290**																				
95	88	2,3,7,8-TCDF	**0.0040**		0.0045	U	**0.036**		NA		**0.0052**	(c)	**0.0045**	(c)	**0.012**	(c)	**0.0080**	(c)	**0.0079**	(c)	**0.0045**	(c)
96	89	Total TCDF	**0.0180**		0.0016-0.0048	U	**0.310**		NA		**0.0190**		**0.0280**		**0.060**		**0.0370**		**0.0079**		**0.0230**	
97	90	2,3,7,8-TCDD	0.0042	U	0.0034	U	0.049	U	NA		0.0051	U	0.0025	U	0.0062	U	0.0044	U	**0.0280**		0.0035	U
98	91	Total TCDD	0.0014-0.0042	U	0.0011-0.0036	U	**0.940**		NA		**0.0044**		0.0025	U	0.0062	U	0.0044	U	**0.3000**		**0.0025**	
99	92	1,2,3,7,8-PeCDF	0.0340	U	0.2600	U	0.075	U	NA		**0.0077**		**0.0150**		2.0000	U (b)	**0.0200**		3.00	U,E	**0.0130**	
100	93	2,3,4,7,8-PeCDF	**0.0120**		0.0190	U	**0.110**		NA		0.0160	U	**0.0110**		0.1200	U (b)	**0.0430**		**0.2600**		**0.0240**	
101	94	Total PeCDF	**0.2400**		**0.120**		**1.300**		NA		**0.2200**		**0.1900**		**0.470**		**0.3000**		**0.4200**		**0.1600**	
102	95	1,2,3,7,8-PeCDD	0.0120	U	0.0072	U	**0.360**		NA		0.0160	U	**0.0049**		**0.014**		**0.0110**		**0.2800**		0.0045	U
103	96	Total PeCDD	0.0032-0.0077	U	0.0025-0.014	U	**3.000**		NA		0.0160	U	**0.0049**		**0.014**		**0.0110**		**1.5000**		**0.0019**	
104	97	1,2,3,4,7,8-HxCDF	**0.0590**		**0.019**		1.900	U	NA		0.1300	UE	0.1100	U	**0.180**		0.8400	U	0.50	U,E	**0.0280**	
105	98	1,2,3,6,7,8-HxCDF	**0.0300**		0.0160	U	**0.260**		NA		**0.0470**		**0.0260**		**0.120**		**0.0660**		**0.0870**		0.1900	U,E
106	99	2,3,4,6,7,8-HxCDF	**0.0580**		**0.033**		**0.620**		NA		**0.0740**		**0.0610**	J2	**0.220**		**0.0840**		**0.5700**		**0.0430**	
107	100	1,2,3,7,8,9-HxCDF	**0.0280**		**0.013**		**0.260**		NA		**0.0340**		0.0220	U	**0.078**		**0.0380**		0.53	U,E	**0.0220**	
108	101	Total HxCDF	**0.8800**		**0.370**		**14.000**		NA		**0.9700**		**2.0000**	J2	**2.700**		**1.6000**		**14.0000**		**1.5000**	
109	102	1,2,3,4,7,8-HxCDD	**0.0120**		0.0110	U	**0.630**		NA		**0.0180**		**0.0170**		**0.045**		**0.0310**		**0.2600**		**0.0110**	
110	103	1,2,3,6,7,8-HxCDD	**0.3400**		**0.150**		**3.400**		NA		**0.4000**		**0.4000**	J2	**1.200**		**0.5900**		**3.0000**		**0.1800**	
111	104	1,2,3,7,8,9-HxCDD	**0.0280**		**0.012**		**0.960**		NA		**0.0410**		**0.0400**		**0.110**		**0.0540**		**0.4900**		**0.0170**	
112	105	Total HxCDD	**0.7900**		**0.350**		**14.000**		NA		**0.9500**		**1.0000**	J2	**2.800**		**1.5000**		**10.0000**		**0.4200**	
113	106	1,2,3,4,6,7,8-HpCDF	**1.5000**		**0.600**		**9.700**		NA		**1.5000**		**1.4000**		**4.500**		**2.6000**		**11.0000**		**0.4800**	
114	107	1,2,3,4,7,8,9-HpCDF	**0.0980**		**0.039**		**0.990**		NA		**0.1000**		**0.0990**		**0.340**		**0.1800**		**0.8300**		**0.0440**	
115	108	Total HpCDF	**6.7000**		**0.640**		**43.000**		NA		**4.8000**		**6.3000**		**4.800**		**13.0000**		**65.0000**		**2.8000**	
116	109	1,2,3,4,6,7,8-HpCDD	**10.0000**		**3.800**		**54.000**		NA		**9.9000**		**8.4000**		**28.000**	J2	**17.0000**		**56.0000**		**4.0000**	
117	110	Total HpCDD	**15.0000**		**5.700**		**82.000**		NA		**15.0000**		**13.0000**		**39.000**	J2	**26.0000**		**84.0000**		**5.6000**	
118	111	OCDF	**8.8000**		**2.600**		**40.000**		NA		**7.0000**		**6.9000**		**20.000**		**12.0000**		**43.0000**		**3.1000**	
119	112	OCDD	**76.0000**		**25.000**		**350.000**		NA		**65.0000**		**58.0000**	J2	**190.000**	J2	**110.0000**		**320.0000**		**25.0000**	
120																						
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																						

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
1																									
2																									
3		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S	
4		AU22G		BC27H		9912050-04A		BH75F		BR64C		CB49I		CK77I		CT55G		DE68C		DM52I		DW48K		ED23E	
5		9/20/99		12/8/99		12/8/1999 (d)		2/15/00		5/24/00		8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/26/02	
87	**FIELD PARAMETERS**																								
88	pH (avg)	6.06		6.25		NM		6.42		6.23		6.59		5.58		6.01		6.33		6.54		6.22		4.96	
89	Temperature (° C) (avg)	16.6		12.6		NM		10.8		12.8		15.5		15.3		11.3		12.7		15.5		14.5		11.1	
90	Conductivity (um/hos)	221		267		NM		91		267		268		302		305		427		299		321		124	
91	Dissolved oxygen (mg/L) (avg)	1.58		2.34		NM		0.95		1.22		1.73		0.98		0.59		1.32		3.04		3.76		7.98	
92																									
93	**DIOXINS AND FURANS (ng/L)**																								
94	**Method 8290**																								
95	2,3,7,8-TCDF	**0.0060**	(c)	0.00330	U	NA		0.086	U	NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	**0.0510**		**0.0280**		NA		**0.0540**		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	0.0054	U	0.00079	U	NA		0.0047	U	NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	0.0054	U	0.00079	U	NA		0.0047	U	NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	0.1800	UE	0.00170	U	NA		2.400	U	NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	**0.1100**		**0.0160**	J1	NA		**0.0260**	J1	NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	**0.6700**		**0.1000**		NA		**0.1200**		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	**0.0130**		**0.0049**	J1	NA		**0.0068**	J1	NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	**0.0200**		**0.0074**	J1	NA		**0.0110**		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	**0.1800**		**0.0690**		NA		0.860	U	NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	**0.1200**		0.720	U	NA		0.0460	U	NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	**0.1600**		**0.0330**	J1	NA		**0.0420**	J1	NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	**0.0950**		0.011	U	NA		0.0100	U	NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	**14.0000**		**2.1000**		NA		**2.9000**		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	**0.0620**		0.020	U	NA		0.012	U	NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	**1.2000**		**0.4800**		NA		**0.4400**		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	**0.1200**		**0.0410**	J1	NA		**0.0290**	J1	NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	**2.8000**		**1.1000**		NA		**1.2000**		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	**4.8000**		**2.2000**		NA		**1.7000**		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	**0.3300**		**0.1200**		NA		**0.1200**		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	**5.1000**		**10.0000**		NA		**9.2000**		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	**30.0000**		**14.0000**		NA		**11.0000**		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	**45.0000**		**20.0000**		NA		**17.0000**		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	**29.0000**		**11.0000**		NA		**9.0000**		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	**210.0000**		**100.0000**	N2	NA		**76.0000**		NA		NA		NA		NA		NA		NA		NA		NA	
120																									
121	**ETHANOL (mg/L)**	NA		NA		10	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																									

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AU	AV
1			
2			
3		LW2S	
4		EM85F	
5		6/26/02	
87	**FIELD PARAMETERS**		
88	pH (avg)	6.39	
89	Temperature (° C) (avg)	15.2	
90	Conductivity (um/hos)	150	
91	Dissolved oxygen (mg/L) (avg)	3.67	
92			
93	**DIOXINS AND FURANS (ng/L)**		
94	**Method 8290**		
95	2,3,7,8-TCDF	NA	
96	Total TCDF	NA	
97	2,3,7,8-TCDD	NA	
98	Total TCDD	NA	
99	1,2,3,7,8-PeCDF	NA	
100	2,3,4,7,8-PeCDF	NA	
101	Total PeCDF	NA	
102	1,2,3,7,8-PeCDD	NA	
103	Total PeCDD	NA	
104	1,2,3,4,7,8-HxCDF	NA	
105	1,2,3,6,7,8-HxCDF	NA	
106	2,3,4,6,7,8-HxCDF	NA	
107	1,2,3,7,8,9-HxCDF	NA	
108	Total HxCDF	NA	
109	1,2,3,4,7,8-HxCDD	NA	
110	1,2,3,6,7,8-HxCDD	NA	
111	1,2,3,7,8,9-HxCDD	NA	
112	Total HxCDD	NA	
113	1,2,3,4,6,7,8-HpCDF	NA	
114	1,2,3,4,7,8,9-HpCDF	NA	
115	Total HpCDF	NA	
116	1,2,3,4,6,7,8-HpCDD	NA	
117	Total HpCDD	NA	
118	OCDF	NA	
119	OCDD	NA	
120			
121	**ETHANOL (mg/L)**	NA	
122			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1									Dup of LW2S													
2			LW2S		LW2S		LW2S		LW2D		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S	
3			S177G		T176C		U235M		U235E		V224N		W391A		Y336G		Z225A		Z960Q		AH27F	
4			4/2/97		7/15/97		10/22/97		10/22/97		1/29/98		5/19/98		8/19/98		11/13/98		2/18/99		5/17/99	
5																						
123		**PAHs (µg/L)**																				
124		**EPA Method SW8270 SIM**																				
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		**8.2**		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		**0.41**		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		**0.11**	M	NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
1																									
2																									
3		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S	
4		AU22G		BC27H		9912050-04A		BH75F		BR64C		CB49I		CK77I		CT55G		DE68C		DM52I		DW48K		ED23E	
5		9/20/99		12/8/99		12/8/1999 (d)		2/15/00		5/24/00		8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/26/02	
123	**PAHs (µg/L)**																								
124	**EPA Method SW8270 SIM**																								
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AU	AV
1			
2			
3		LW2S	
4		EM85F	
5		6/26/02	
123	**PAHs (µg/L)**		
124	**EPA Method SW8270 SIM**		
125	Naphthalene	NA	
126	2-Methylnaphthalene	NA	
127	Acenaphthylene	NA	
128	Acenaphthene	NA	
129	Fluorene	NA	
130	Anthracene	NA	
131	Dibenzofuran	NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S	
4			S167C		T160D		U235C		V208B		W371C		Z960T		AH76M		BH75A		CT37J		ED16C		EM75C		FF48D	
5			3/31/97		7/14/97		10/21/97		1/28/98		5/18/98		2/16/99		5/19/99		2/15/00		2/13/01		2/25/02		6/25/02		2/10/03	
7	1	**CHLORINATED PHENOLS (µg/L)**																								
8	2	**EPA Method SW8040**																								
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	0.25	U	**0.86**		0.25	U	0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
16	10																									
17	11	**SEMIVOLATILES (µg/L)**																								
18	12	**EPA Method SW8270**																								
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	NA		2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	NA		2	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	NA		3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	NA		3	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	NA		10	U	10	U	10	U	10	U	50	U	NA		50	U
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	NA		5	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	NA		5	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	NA		5	U
32	26	bis(2-Ethylhexyl)phthalate	1.0	UJ	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	4.0	U	NA		1	U
33	27																									
34	28	**VOLATILES (µg/L)**																								
35	29	**EPA Method SW8260**																								
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	14	U	5.0	U	NA		5	U
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	5.0	U	**5.7**		NA		5	U
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		5	U
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	51	**Method OR-DEQ**																								
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	0.25	U	0.25	U	NA		0.25	U
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																									
63	56	**PRIORITY POLLUTANT**																								
64	57	**METALS (mg/L)**																								
65	58	Arsenic (7060)	**0.001**		**0.002**		0.05	U	0.05	U	**0.002**		0.001	U	0.001	U	0.001	U	**0.002**		**0.005**		NA		0.001	U

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S	
4			S167C		T160D		U235C		V208B		W371C		Z960T		AH76M		BH75A		CT37J		ED16C		EM75C		FF48D	
5			3/31/97		7/14/97		10/21/97		1/28/98		5/18/98		2/16/99		5/19/99		2/15/00		2/13/01		2/25/02		6/25/02		2/10/03	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	NA		0.005	U
67	60	Copper (6010)	**0.002**		**0.002**		0.002	U	**0.003**		**0.004**		**0.002**		**0.003**		**0.003**		0.002	U	**0.008**		NA		**0.005**	
68	61	Lead (7421)	**0.001**		**0.002**		0.02	U	0.02	U	**0.002**		0.001	U	**0.001**		**0.001**		0.001	U	**0.002**		NA		**0.001**	
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	NA		0.01	U
70	63	Zinc (6010)	**0.006**		**0.012**		**0.004**		**0.007**		**0.012**	J2	**0.017**	J	**0.010**		**0.006**		0.006	U	**0.017**		NA		**0.011**	
71	64																									
72	65	**MAJOR IONS AND CONVENTIONALS**																								
73	66	Calcium (mg/L) (6010)	**12.5**		**12.8**		**12.0**		**5.13**		NA		NA		NA		NA		NA		**7.22**		NA		**2.58**	
74	67	Magnesium (mg/L) (6010)	**3.83**		**3.71**		**2.94**		**1.64**		NA		NA		NA		NA		NA		**2.44**		NA		**1.03**	
75	68	Potassium (mg/L) (6010)	**2.2**		**3.0**		**3.1**		**1.4**		NA		NA		NA		NA		NA		**1.7**		NA		**0.8**	
76	69	Sodium (mg/L) (6010)	**7.77**		**4.6**		**4.80**		**4.86**		NA		NA		NA		NA		NA		**7.44**		NA		**7**	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**46**		**39**		**34**		**28**		NA		NA		NA		NA		NA		**38**		NA		**15**	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		1.0	U	NA		1	U
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**46**		**39**		**34**		**28**		NA		NA		NA		NA		NA		**38**		NA		**15**	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**110**		**94**		**61**	J2	NA		NA		**75**		**67**		**100**		**72**		NA		**84**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.1**	J	**2.1**		**1.2**		**1.0**		NA		NA		**1.7**		**1.6**		**1.8**		**1.0**		NA		**1.6**	
82	75	N-Nitrate (mg-N/L) (Calculated)	**1.3**	J	**2.2**		**1.8**		**0.17**		NA		NA		NA		NA		NA		**0.098**		NA		**0.91**	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	**0.016**	J	**0.021**		0.010	U	**0.013**		NA		NA		NA		NA		NA		0.010	U	NA		**0.017**	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**1.3**	J	**2.2**		**1.8**		**0.18**		NA		NA		NA		NA		NA		**0.098**		NA		**0.93**	
85	78	Sulfate (mg/L) (EPA 375.2)	**19**	J	**14**		**14**		**3.4**		NA		NA		NA		NA		NA		**5.2**		NA		**6.2**	
86	79																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S	
4			S167C		T160D		U235C		V208B		W371C		Z960T		AH76M		BH75A		CT37J		ED16C		EM75C		FF48D	
5			3/31/97		7/14/97		10/21/97		1/28/98		5/18/98		2/16/99		5/19/99		2/15/00		2/13/01		2/25/02		6/25/02		2/10/03	
87	80	**FIELD PARAMETERS**																								
88	81	pH (avg)	6.75		6.44		6.52		6.89		5.89		6.61		5.91		6.69		6.36		6.00		5.43		6.64	
89	82	Temperature (° C) (avg)	10.5		18.4		16.1		9.5		11.9		8.6		13.1		9.8		10.6		9.0		13.6		10.8	
90	83	Conductivity (um/hos)	138		147		115		0.63		93		78		64		66		133		73		174		41	
91	84	Dissolved oxygen (mg/L) (avg)									4.88		5.21		3.12		4.83		3.47		5.49		4.62		4.71	
92	85																									
93	86	**DIOXINS AND FURANS (ng/L)**																								
94	87	**Method 8290**																								
95	88	2,3,7,8-TCDF	**0.0088**		0.0025	U	0.0066	U	0.0017	U	NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	0.0044-0.016	U	0.0011-0.0037	U	0.0025-0.0081	U	0.0017	U	NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	0.0160	U	0.0023	U	0.0074	U	0.0023	U	NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	0.0032-0.025	U	0.0012-0.0052	U	0.0018-0.0099	U	**0.0035**		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	0.0083	U	0.0058	U	**0.0100**		0.0015	U	NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	0.0120	U	0.0021	U	0.0062	U	0.0017	U	NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	0.0026-0.018	U	0.0015-0.0064	U	**0.0960**		0.0016	U	NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	0.0260	U	0.0100	U	0.0120	U	0.0030	U	NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	0.010-0.034	U	0.0020-0.0100	U	0.0056-0.013	U	0.0030	U	NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	0.0044	U	0.0017	U	0.0083	U	0.0018	U	NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	0.0057	U	0.0034	U	0.0049	U	0.0021	U	NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	0.0080	U	0.0076	U	0.0064	U	0.0041	U	NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	0.0160	U	0.0045	U	0.0068	U	0.0020	U	NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	0.0048-0.017	U	0.0017-0.0076	U	0.0270	U	0.0041	U	NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	0.0250	U	0.0078	U	0.0080	U	0.0025	U	NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	0.0180	U	0.0072	U	**0.0089**		0.0041	U	NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	0.0160	U	0.0032	U	0.0120	U	0.0030	U	NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	0.011-0.031	U	0.0025-0.0078	U	**0.0230**		0.0032	U	NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	0.0160	U	0.0046	U	**0.0240**		0.0130	U	NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	0.0280	U	0.0057	U	0.0039	U	0.0035	U	NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	0.012-0.028	U	0.0014-0.0058	U	0.0280	U	0.0083	U	NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	0.0230	U	0.0068	U	**0.3000**		0.0064	U	NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	0.013-0.038	U	0.0021-0.0080	U	**0.4400**		0.0064	U	NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	0.0520	U	0.0079	U	**0.1800**		0.0041	U	NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	0.0500	U	0.0300	U	**1.2000**		0.0210	U	NA		NA		NA		NA		NA		NA		NA		NA	
120																										
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																										

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S		LW101S	
4			S167C		T160D		U235C		V208B		W371C		Z960T		AH76M		BH75A		CT37J		ED16C		EM75C		FF48D	
5			3/31/97		7/14/97		10/21/97		1/28/98		5/18/98		2/16/99		5/19/99		2/15/00		2/13/01		2/25/02		6/25/02		2/10/03	
123		**PAHs (µg/L)**																								
124		**EPA Method SW8270 SIM**																								
125		Naphthalene	NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1																									
2																									
3			LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S
4			S167D		T160E		U235B		V211B		W371B		Z960S		AH76L		BH75B		CT37H		ED16B		EM75B		FF48C
5			3/31/97		7/14/97		10/21/97		1/27/98		5/18/98		2/16/99		5/19/99		2/15/00		2/13/01		2/25/02		6/25/02		2/10/03
7	1	**CHLORINATED PHENOLS (µg/L)**																							
8	2	**EPA Method SW8040**																							
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		**0.66**		**0.31**		0.25	U	**0.28**		0.25	U	0.25
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA
16	10																								
17	11	**SEMIVOLATILES (µg/L)**																							
18	12	**EPA Method SW8270**																							
19	13	Phenol	2.0	U	2.0	U	2.0	UJ	2.0	U	NA		NA		2.0	U	2.0	U	2.0	U	2.0	U	NA		2
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	UJ	1.0	U	NA		NA		1.0	U	1.0	U	**3.5**		1.0	U	NA		**6.8**
21	15	Isophorone	1.0	U	1.0	U	1.0	UJ	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	UJ	3.0	U	NA		NA		3.0	U	3.0	U	3.0	U	3.0	U	NA		3
23	17	Benzoic Acid	10	U	10	U	10	UJ	10	U	NA		NA		10	U	10	U	10	U	50	U	NA		50
24	18	Naphthalene	1.0	U	1.0	U	1.0	UJ	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	UJ	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	UJ	5.0	U	NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		5
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	UJ	5.0	U	NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		5
28	22	Acenaphthene	1.0	U	1.0	U	1.0	UJ	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	UJ	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
30	24	Fluorene	1.0	U	1.0	U	1.0	UJ	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	UJ	5.0	U	NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		5
32	26	bis(2-Ethylhexyl)phthalate	1.0	UJ	1.0	U	1.3	UJ	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	4.0	U	NA		1
33	27																								
34	28	**VOLATILES (µg/L)**																							
35	29	**EPA Method SW8260**																							
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	160	U	**7.9**		NA		**15**
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		5
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		5
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56	49																								
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																							
58	51	**Method OR-DEQ**																							
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	0.25	U	0.25	U	NA		0.25
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62	55																								
63	56	**PRIORITY POLLUTANT**																							
64	57	**METALS (mg/L)**																							
65	58	Arsenic (7060)	0.001	U	**0.002**		0.05	U	0.05	U	**0.001**		0.001	U	0.001	U	0.001	U	**0.001**		0.001	U	NA		0.001

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	Z
1		
2		
3		
4		
5		
7	**CHLORINATED PHENOLS (µg/L)**	
8	**EPA Method SW8040**	
9	Pentachlorophenol	U
10	2,4,6-Trichlorophenol	
11	2,3,6-Trichlorophenol	
12	2,4,5-Trichlorophenol	
13	2,3,4-Trichlorophenol	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	
15	2,3,4,5-Tetrachlorophenol	
16		
17	**SEMIVOLATILES (µg/L)**	
18	**EPA Method SW8270**	
19	Phenol	U
20	4-Methylphenol	
21	Isophorone	U
22	2,4-Dimethylphenol	U
23	Benzoic Acid	U
24	Naphthalene	U
25	2-Methylnaphthalene	U
26	2,4,6-Trichlorophenol	U
27	2,4,5-Trichlorophenol	U
28	Acenaphthene	U
29	Dibenzofuran	U
30	Fluorene	U
31	Pentachlorophenol	U
32	bis(2-Ethylhexyl)phthalate	U
33		
34	**VOLATILES (µg/L)**	
35	**EPA Method SW8260**	
36	Acetone	
37	Carbon Disulfide	U
38	2-Butanone	U
39	Benzene	U
40	Bromoform	U
41	Toluene	U
42	Ethylbenzene	U
43	Styrene	U
44	m,p-Xylene	U
45	o-Xylene	U
46	1,3,5-Trimethylbenzene	U
47	1,2,4-Trimethylbenzene	U
48	Isopropylbenzene	U
49	n-Propylbenzene	U
50	tert-Butylbenzene	U
51	sec-Butylbenzene	U
52	4-Isopropyltoluene	U
53	n-Butylbenzene	U
54	Naphthalene	U
55	Methyl tert-butyl ether	
56		
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**	
58	**Method OR-DEQ**	
59	**TPH-Diesel**	U
60	**TPH-D Motor Oil**	
61	**TPH-Gasoline**	
62		
63	**PRIORITY POLLUTANT**	
64	**METALS (mg/L)**	
65	Arsenic (7060)	U

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1																									
2																									
3			LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S
4			S167D		T160E		U235B		V211B		W371B		Z960S		AH76L		BH75B		CT37H		ED16B		EM75B		FF48C
5			3/31/97		7/14/97		10/21/97		1/27/98		5/18/98		2/16/99		5/19/99		2/15/00		2/13/01		2/25/02		6/25/02		2/10/03
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	NA		0.005
67	60	Copper (6010)	**0.003**		**0.002**		0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.002**		0.002	U	0.002	U	NA		**0.005**
68	61	Lead (7421)	0.001	U	**0.002**		0.02	U	0.02	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	NA		0.001
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	NA		0.01
70	63	Zinc (6010)	**0.008**		**0.009**		0.004	U	0.004	U	**0.014**	J2	**0.008**	J	0.004	U	0.006	U	0.006	U	0.006	U	NA		0.006
71	64																								
72	65	**MAJOR IONS AND CONVENTIONALS**																							
73	66	Calcium (mg/L) (6010)	**14.6**		**14.1**		**12.6**		**18.5**		NA		NA		NA		NA		NA		**8.93**		NA		**9.42**
74	67	Magnesium (mg/L) (6010)	**5.39**		**5.64**		**4.87**		**6.76**		NA		NA		NA		NA		NA		**3.65**		NA		**3.85**
75	68	Potassium (mg/L) (6010)	**2.4**		**2.6**		**2.5**		**2.0**		NA		NA		NA		NA		NA		**1.6**		NA		**1.5**
76	69	Sodium (mg/L) (6010)	**6.16**		**5.94**		**6.18**		**7.92**		NA		NA		NA		NA		NA		**5.36**		NA		**5.2**
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**62**		**67**		**61**		**110**		NA		NA		NA		NA		NA		**46**		NA		**47**
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		1.0	U	NA		1
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**62**		**67**		**61**		**110**		NA		NA		NA		NA		NA		**46**		NA		**47**
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**110**		**120**		**120**		NA		NA		**83**		**72**		**120**		**80**		NA		**84**
81	74	Chloride (mg/L) (EPA 325.2)	**4.2**	J	**3.0**		**1.9**		**4.4**		NA		NA		**1.6**		**1.5**		**1.3**		**2.5**		NA		**2.2**
82	75	N-Nitrate (mg-N/L) (Calculated)	**0.12**	J	**0.083**		**0.023**		**0.78**	J2	NA		NA		NA		NA		NA		**0.21**		NA		**0.66**
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	0.010	U	0.010	U	0.010	U	0.010	UJ	NA		NA		NA		NA		NA		0.010	U	NA		0.01
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.12**	J	**0.083**		**0.023**		**0.78**	J2	NA		NA		NA		NA		NA		**0.21**		NA		**0.66**
85	78	Sulfate (mg/L) (EPA 375.2)	**4.5**	J	**4.7**		**3.2**		**6.0**		NA		NA		NA		NA		NA		**5.1**		NA		**6.1**
86	79																								

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TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	Z
1		
2		
3		
4		
5		
66	Chromium (6010)	U
67	Copper (6010)	
68	Lead (7421)	U
69	Nickel (6010)	U
70	Zinc (6010)	U
71		
72	**MAJOR IONS AND CONVENTIONALS**	
73	Calcium (mg/L) (6010)	
74	Magnesium (mg/L) (6010)	
75	Potassium (mg/L) (6010)	
76	Sodium (mg/L) (6010)	
77	Alkalinity (mg/L CaCO3) (SM 2320)	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	U
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	
81	Chloride (mg/L) (EPA 325.2)	
82	N-Nitrate (mg-N/L) (Calculated)	
83	N-Nitrite (mg-N/L) (EPA 354.1)	U
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	
85	Sulfate (mg/L) (EPA 375.2)	
86		

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

			C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
3			LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S
4			S167D		T160E		U235B		V211B		W371B		Z960S		AH76L		BH75B		CT37H		ED16B		EM75B		FF48C
5			3/31/97		7/14/97		10/21/97		1/27/98		5/18/98		2/16/99		5/19/99		2/15/00		2/13/01		2/25/02		6/25/02		2/10/03
87	80	**FIELD PARAMETERS**																							
88	81	pH (avg)	6.63		6.60		6.76		6.60		6.06		6.71		6.04		6.59		5.63		6.13		5.24		6.74
89	82	Temperature (° C) (avg)	10.6		19.0		16.8		9.8		14.4		9.3		13.5		10.0		9.5		9.1		14.5		11
90	83	Conductivity (um/hos)	136		158		133		188		129		100		87		94		127		90		91		104
91	84	Dissolved oxygen (mg/L) (avg)									2.82		5.70		3.14		3.51		1.74		7.06		4.96		2.17
92	85																								
93	86	**DIOXINS AND FURANS (ng/L)**																							
94	87	**Method 8290**																							
95	88	2,3,7,8-TCDF	0.0026	U	0.0011	U	0.0024	U	0.0018	U	NA		NA		NA		NA		NA		NA		NA		NA
96	89	Total TCDF	0.0013-0.0048	U	0.0006-0.0058	U	0.0012-0.0052	U	0.0018	U	NA		NA		NA		NA		NA		NA		NA		NA
97	90	2,3,7,8-TCDD	0.0033	U	0.0023	U	0.0055	U	0.0037	U	NA		NA		NA		NA		NA		NA		NA		NA
98	91	Total TCDD	0.0023-0.0075	U	0.008-0.0068	U	0.0018-0.0090	U	0.0037	U	NA		NA		NA		NA		NA		NA		NA		NA
99	92	1,2,3,7,8-PeCDF	0.0027	U	0.0045	U	0.0020	U	0.0018	U	NA		NA		NA		NA		NA		NA		NA		NA
100	93	2,3,4,7,8-PeCDF	0.0025	U	0.0031	U	0.0021	U	0.0024	U	NA		NA		NA		NA		NA		NA		NA		NA
101	94	Total PeCDF	0.0013-0.0078	U	0.0014-0.0088	U	0.0015-0.0068	U	0.0021	U	NA		NA		NA		NA		NA		NA		NA		NA
102	95	1,2,3,7,8-PeCDD	0.0061	U	0.0077	U	0.0040	U	0.0057	U	NA		NA		NA		NA		NA		NA		NA		NA
103	96	Total PeCDD	0.0030-0.011	U	0.0023-0.0093	U	0.0016-0.0092	U	0.0057	U	NA		NA		NA		NA		NA		NA		NA		NA
104	97	1,2,3,4,7,8-HxCDF	0.0031	U	0.0034	U	0.0067	U	0.0021	U	NA		NA		NA		NA		NA		NA		NA		NA
105	98	1,2,3,6,7,8-HxCDF	0.0043	U	0.0031	U	0.0048	U	0.0019	U	NA		NA		NA		NA		NA		NA		NA		NA
106	99	2,3,4,6,7,8-HxCDF	0.0053	U	0.0031	U	0.0048	U	0.0036	U	NA		NA		NA		NA		NA		NA		NA		NA
107	100	1,2,3,7,8,9-HxCDF	0.0049	U	0.0049	U	0.0020	U	0.0031	U	NA		NA		NA		NA		NA		NA		NA		NA
108	101	Total HxCDF	0.0053	U	0.0020-0.0066	U	0.0048	U	0.0057	U	NA		NA		NA		NA		NA		NA		NA		NA
109	102	1,2,3,4,7,8-HxCDD	0.0054	U	0.0030	U	0.0073	U	0.0034	U	NA		NA		NA		NA		NA		NA		NA		NA
110	103	1,2,3,6,7,8-HxCDD	0.0068	U	0.0056	U	0.0084	U	0.0041	U	NA		NA		NA		NA		NA		NA		NA		NA
111	104	1,2,3,7,8,9-HxCDD	0.0073	U	0.0084	U	0.0039	U	0.0019	U	NA		NA		NA		NA		NA		NA		NA		NA
112	105	Total HxCDD	0.0030-0.010	U	0.0023-0.0084	U	0.0029-0.013	U	0.0031	U	NA		NA		NA		NA		NA		NA		NA		NA
113	106	1,2,3,4,6,7,8-HpCDF	0.0044	U	**0.0016**		0.0047	U	0.0160	U	NA		NA		NA		NA		NA		NA		NA		NA
114	107	1,2,3,4,7,8,9-HpCDF	0.0073	U	0.0063	U	0.0077	U	0.0052	U	NA		NA		NA		NA		NA		NA		NA		NA
115	108	Total HpCDF	**0.0062**		**0.0043**		0.0150	U	0.0106	U	NA		NA		NA		NA		NA		NA		NA		NA
116	109	1,2,3,4,6,7,8-HpCDD	0.0110	U	0.0065	U	**0.0180**		0.0070	U	NA		NA		NA		NA		NA		NA		NA		NA
117	110	Total HpCDD	0.0170	U	0.0024-0.0092	U	**0.0310**		0.0070	U	NA		NA		NA		NA		NA		NA		NA		NA
118	111	OCDF	**0.0100**		**0.0062**		0.0170	U	**0.0074**		NA		NA		NA		NA		NA		NA		NA		NA
119	112	OCDD	0.0710	U	0.0280	U	**0.1200**		0.0390	U	NA		NA		NA		NA		NA		NA		NA		NA
120																									
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
122																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	Z
1		
2		
3		
4		
5		
87	**FIELD PARAMETERS**	
88	pH (avg)	
89	Temperature (° C) (avg)	
90	Conductivity (um/hos)	
91	Dissolved oxygen (mg/L) (avg)	
92		
93	**DIOXINS AND FURANS (ng/L)**	
94	**Method 8290**	
95	2,3,7,8-TCDF	
96	Total TCDF	
97	2,3,7,8-TCDD	
98	Total TCDD	
99	1,2,3,7,8-PeCDF	
100	2,3,4,7,8-PeCDF	
101	Total PeCDF	
102	1,2,3,7,8-PeCDD	
103	Total PeCDD	
104	1,2,3,4,7,8-HxCDF	
105	1,2,3,6,7,8-HxCDF	
106	2,3,4,6,7,8-HxCDF	
107	1,2,3,7,8,9-HxCDF	
108	Total HxCDF	
109	1,2,3,4,7,8-HxCDD	
110	1,2,3,6,7,8-HxCDD	
111	1,2,3,7,8,9-HxCDD	
112	Total HxCDD	
113	1,2,3,4,6,7,8-HpCDF	
114	1,2,3,4,7,8,9-HpCDF	
115	Total HpCDF	
116	1,2,3,4,6,7,8-HpCDD	
117	Total HpCDD	
118	OCDF	
119	OCDD	
120		
121	**ETHANOL (mg/L)**	
122		

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1																									
2																									
3			LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S
4			S167D		T160E		U235B		V211B		W371B		Z960S		AH76L		BH75B		CT37H		ED16B		EM75B		FF48C
5			3/31/97		7/14/97		10/21/97		1/27/98		5/18/98		2/16/99		5/19/99		2/15/00		2/13/01		2/25/02		6/25/02		2/10/03
123		**PAHs (µg/L)**																							
124		**EPA Method SW8270 SIM**																							
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	Z
1		
2		
3		
4		
5		
123	**PAHs (µg/L)**	
124	**EPA Method SW8270 SIM**	
125	Naphthalene	
126	2-Methylnaphthalene	
127	Acenaphthylene	
128	Acenaphthene	
129	Fluorene	
130	Anthracene	
131	Dibenzofuran	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																									Dup of LW103S	
3			LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW13D	
4			S167B		T160C		U235D		V211A		W371D		Z960U		AH76N		BH75C		CT37K		ED16D		EM75D		EM75I	
5			3/31/97		7/14/97		10/21/97		1/27/98		5/18/98		2/16/99		5/19/99		2/15/00		2/13/01		2/25/02		6/25/02		6/25/02	
6																										
7	1	**CHLORINATED PHENOLS (µg/L)**																								
8	2	**EPA Method SW8040**																								
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	0.25	U	**0.58**		0.25	U	0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
16	10																									
17	11	**SEMIVOLATILES (µg/L)**																								
18	12	**EPA Method SW8270**																								
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	NA		NA		2.0	U	2.0	U	2.0	U	2.0	U	NA		NA	
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	NA		NA		3.0	U	3.0	U	3.0	U	3.0	U	NA		NA	
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	50	U	NA		NA	
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		NA	
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		NA	
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		NA	
32	26	bis(2-Ethylhexyl)phthalate	1.0	UJ	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	4.0	U	NA		NA	
33	27																									
34	28	**VOLATILES (µg/L)**																								
35	29	**EPA Method SW8260**																								
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	9.1	U	5.0	U	NA		NA	
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		NA	
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		NA	
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		NA	
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	51	**Method OR-DEQ**																								
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	0.25	U	0.25	U	NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																									
63	56	**PRIORITY POLLUTANT**																								
64	57	**METALS (mg/L)**																								
65	58	Arsenic (7060)	**0.007**		**0.011**		0.05	U	0.05	U	**0.010**		**0.009**		**0.011**		**0.019**		**0.008**		**0.013**		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB
1			
2			
3		LW103S	
4		FF48E	
5		2/10/03	
7	**CHLORINATED PHENOLS (µg/L)**		
8	**EPA Method SW8040**		
9	Pentachlorophenol	0.25	U
10	2,4,6-Trichlorophenol	NA	
11	2,3,6-Trichlorophenol	NA	
12	2,4,5-Trichlorophenol	NA	
13	2,3,4-Trichlorophenol	NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA	
15	2,3,4,5-Tetrachlorophenol	NA	
16			
17	**SEMIVOLATILES (µg/L)**		
18	**EPA Method SW8270**		
19	Phenol	2	U
20	4-Methylphenol	1	U
21	Isophorone	1	U
22	2,4-Dimethylphenol	3	U
23	Benzoic Acid	50	U
24	Naphthalene	1	U
25	2-Methylnaphthalene	1	U
26	2,4,6-Trichlorophenol	5	U
27	2,4,5-Trichlorophenol	5	U
28	Acenaphthene	1	U
29	Dibenzofuran	1	U
30	Fluorene	1	U
31	Pentachlorophenol	5	U
32	bis(2-Ethylhexyl)phthalate	1	U
33			
34	**VOLATILES (µg/L)**		
35	**EPA Method SW8260**		
36	Acetone	5	U
37	Carbon Disulfide	1	U
38	2-Butanone	5	U
39	Benzene	1	U
40	Bromoform	1	U
41	Toluene	1	U
42	Ethylbenzene	1	U
43	Styrene	1	U
44	m,p-Xylene	1	U
45	o-Xylene	1	U
46	1,3,5-Trimethylbenzene	1	U
47	1,2,4-Trimethylbenzene	1	U
48	Isopropylbenzene	1	U
49	n-Propylbenzene	1	U
50	tert-Butylbenzene	1	U
51	sec-Butylbenzene	1	U
52	4-Isopropyltoluene	1	U
53	n-Butylbenzene	1	U
54	Naphthalene	5	U
55	Methyl tert-butyl ether	NA	
56			
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	**Method OR-DEQ**		
59	**TPH-Diesel**	0.25	U
60	**TPH-D Motor Oil**	NA	
61	**TPH-Gasoline**	NA	
62			
63	**PRIORITY POLLUTANT**		
64	**METALS (mg/L)**		
65	Arsenic (7060)	**0.008**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																									Dup of LW103S	
3			LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW13D	
4			S167B		T160C		U235D		V211A		W371D		Z960U		AH76N		BH75C		CT37K		ED16D		EM75D		EM75I	
5			3/31/97		7/14/97		10/21/97		1/27/98		5/18/98		2/16/99		5/19/99		2/15/00		2/13/01		2/25/02		6/25/02		6/25/02	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	NA		NA	
67	60	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.007**		0.002	U	**0.003**		NA		NA	
68	61	Lead (7421)	0.001	U	**0.001**		0.02	U	0.02	U	0.001	U	0.001	U	0.001	U	**0.003**		0.001	U	0.001	U	NA		NA	
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	NA		NA	
70	63	Zinc (6010)	**0.005**		**0.008**		**0.004**		**0.005**		**0.006**	J2	**0.007**	J	0.004	U	**0.010**		0.006	U	0.006	U	NA		NA	
71	64																									
72	65	**MAJOR IONS AND CONVENTIONALS**																								
73	66	Calcium (mg/L) (6010)	**13.5**		**19**		**15.6**		**16.0**		NA		NA		NA		NA		NA		**17.0**		NA		NA	
74	67	Magnesium (mg/L) (6010)	**5.02**		**6.95**		**5.65**		**5.89**		NA		NA		NA		NA		NA		**6.51**		NA		NA	
75	68	Potassium (mg/L) (6010)	**1.8**		**2.0**		**2.0**		**1.3**		NA		NA		NA		NA		NA		**1.7**		NA		NA	
76	69	Sodium (mg/L) (6010)	**4.93**		**5.35**		**5.11**		**5.99**		NA		NA		NA		NA		NA		**5.57**		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**95**		**84**		**71**		**84**		NA		NA		NA		NA		NA		**83**		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		1.0	U	NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**95**		**84**		**71**		**84**		NA		NA		NA		NA		NA		**83**		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**130**		**100**		**110**		NA		NA		**110**		**97**		**130**		**110**		NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	**2.2**	J	**2.5**		**1.7**		**1.3**		NA		NA		**1.7**		**2.3**		**2.5**		**2.3**		NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	0.010	U	0.010	U	**0.036**		**0.057**	J2	NA		NA		NA		NA		NA		**0.093**		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	0.010	U	**0.017**		**0.016**		0.010	UJ	NA		NA		NA		NA		NA		0.010	U	NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	0.010	U	0.010	U	**0.052**		**0.057**	J2	NA		NA		NA		NA		NA		**0.093**		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	**5.5**	J	**4.6**		**2.6**		2.5	U	NA		NA		NA		NA		NA		**2.9**		NA		NA	
86	79																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB
1			
2			
3		LW103S	
4		FF48E	
5		2/10/03	
66	Chromium (6010)	0.005	U
67	Copper (6010)	0.002	U
68	Lead (7421)	0.001	U
69	Nickel (6010)	0.01	U
70	Zinc (6010)	0.006	U
71			
72	**MAJOR IONS AND CONVENTIONALS**		
73	Calcium (mg/L) (6010)	**15.4**	
74	Magnesium (mg/L) (6010)	**5.89**	
75	Potassium (mg/L) (6010)	**1.4**	
76	Sodium (mg/L) (6010)	**6.7**	
77	Alkalinity (mg/L CaCO3) (SM 2320)	**100**	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1	U
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**100**	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**110**	
81	Chloride (mg/L) (EPA 325.2)	**2.8**	
82	N-Nitrate (mg-N/L) (Calculated)	**0.2**	
83	N-Nitrite (mg-N/L) (EPA 354.1)	0.01	U
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.2**	
85	Sulfate (mg/L) (EPA 375.2)	**8.6**	
86			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																									Dup of LW103S	
3			LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW13D	
4			S167B		T160C		U235D		V211A		W371D		Z960U		AH76N		BH75C		CT37K		ED16D		EM75D		EM75I	
5			3/31/97		7/14/97		10/21/97		1/27/98		5/18/98		2/16/99		5/19/99		2/15/00		2/13/01		2/25/02		6/25/02		6/25/02	
87	80	**FIELD PARAMETERS**																								
88	81	pH (avg)	6.74		6.75		6.77		6.73		6.37		7.02		6.14		6.74		6.52		6.17		6.47		6.47	
89	82	Temperature (° C) (avg)	10.9		14.6		14.7		12.2		13.2		10.8		12.4		11.0		11.5		10.7		13.5		13.5	
90	83	Conductivity (um/hos)	157		222		180		198		214		128		174		135		160		170		187		188	
91	84	Dissolved oxygen (mg/L) (avg)									1.47		2.98		2.79		2.56		3.55		5.73		5.70		5.74	
92	85																									
93	86	**DIOXINS AND FURANS (ng/L)**																								
94	87	**Method 8290**																								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																										
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																										

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB
1			
2			
3		LW103S	
4		FF48E	
5		2/10/03	
87	**FIELD PARAMETERS**		
88	pH (avg)	7.12	
89	Temperature (° C) (avg)	12.2	
90	Conductivity (um/hos)	184	
91	Dissolved oxygen (mg/L) (avg)	1.79	
92			
93	**DIOXINS AND FURANS (ng/L)**		
94	**Method 8290**		
95	2,3,7,8-TCDF	NA	
96	Total TCDF	NA	
97	2,3,7,8-TCDD	NA	
98	Total TCDD	NA	
99	1,2,3,7,8-PeCDF	NA	
100	2,3,4,7,8-PeCDF	NA	
101	Total PeCDF	NA	
102	1,2,3,7,8-PeCDD	NA	
103	Total PeCDD	NA	
104	1,2,3,4,7,8-HxCDF	NA	
105	1,2,3,6,7,8-HxCDF	NA	
106	2,3,4,6,7,8-HxCDF	NA	
107	1,2,3,7,8,9-HxCDF	NA	
108	Total HxCDF	NA	
109	1,2,3,4,7,8-HxCDD	NA	
110	1,2,3,6,7,8-HxCDD	NA	
111	1,2,3,7,8,9-HxCDD	NA	
112	Total HxCDD	NA	
113	1,2,3,4,6,7,8-HpCDF	NA	
114	1,2,3,4,7,8,9-HpCDF	NA	
115	Total HpCDF	NA	
116	1,2,3,4,6,7,8-HpCDD	NA	
117	Total HpCDD	NA	
118	OCDF	NA	
119	OCDD	NA	
120			
121	**ETHANOL (mg/L)**	NA	
122			

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																									Dup of LW103S	
3			LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW13D	
4			S167B		T160C		U235D		V211A		W371D		Z960U		AH76N		BH75C		CT37K		ED16D		EM75D		EM75I	
5			3/31/97		7/14/97		10/21/97		1/27/98		5/18/98		2/16/99		5/19/99		2/15/00		2/13/01		2/25/02		6/25/02		6/25/02	
123		**PAHs (µg/L)**																								
124		**EPA Method SW8270 SIM**																								
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB
1			
2			
3		LW103S	
4		FF48E	
5		2/10/03	
123	**PAHs (µg/L)**		
124	**EPA Method SW8270 SIM**		
125	Naphthalene	NA	
126	2-Methylnaphthalene	NA	
127	Acenaphthylene	NA	
128	Acenaphthene	NA	
129	Fluorene	NA	
130	Anthracene	NA	
131	Dibenzofuran	NA	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S	
4			S167A		T160B		U235A		V208A		W371A		Z960R		AH76K		BH75D		CT37G		ED16A		EM75A		FF48B	
5			3/31/97		7/14/97		10/21/97		1/28/98		5/18/98		2/16/99		5/19/99		2/15/00		2/13/01		2/25/02		6/25/02		2/10/03	
7	1	**CHLORINATED PHENOLS (µg/L)**																								
8	2	**EPA Method SW8040**																								
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	0.25	U	**0.77**		0.25	U	0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	NA		NA		NA		NA	
16	10																									
17	11	**SEMIVOLATILES (µg/L)**																								
18	12	**EPA Method SW8270**																								
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	NA		NA		2.0	U	2.0	U	2.0	U	2.0	U	NA		2	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	NA		NA		3.0	U	3.0	U	3.0	U	3.0	U	NA		3	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	50	U	NA		50	U
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		5	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		5	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		5	U
32	26	bis(2-Ethylhexyl)phthalate	1.0	UJ	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	**2.0**		**10**		NA		1	U
33	27																									
34	28	**VOLATILES (µg/L)**																								
35	29	**EPA Method SW8260**																								
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	8.9	U	5.0	U	NA		5	U
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		5	U
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	1.0	U	NA		1	U
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	NA		NA		5.0	U	5.0	U	5.0	U	5.0	U	NA		5	U
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	51	**Method OR-DEQ**																								
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		0.25	U	0.25	U	**0.32**		0.25	U	NA		0.25	U
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																									
63	56	**PRIORITY POLLUTANT**																								
64	57	**METALS (mg/L)**																								
65	58	Arsenic (7060)	**0.002**		**0.003**		0.05	U	0.05	U	**0.002**		**0.002**		**0.001**		**0.002**		**0.002**		**0.002**		NA		**0.002**	

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S	
4			S167A		T160B		U235A		V208A		W371A		Z960R		AH76K		BH75D		CT37G		ED16A		EM75A		FF48B	
5			3/31/97		7/14/97		10/21/97		1/28/98		5/18/98		2/16/99		5/19/99		2/15/00		2/13/01		2/25/02		6/25/02		2/10/03	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	NA		0.005	U
67	60	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	NA		**0.028**	
68	61	Lead (7421)	0.001	U	0.001	U	0.02	U	0.02	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	NA		0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	NA		0.01	U
70	63	Zinc (6010)	0.004	U	**0.005**		0.004	U	0.004	U	0.004	U	**0.019**	J	0.004	U	**0.008**		0.006	U	0.006	U	NA		**0.018**	
71	64																									
72	65	**MAJOR IONS AND CONVENTIONALS**																								
73	66	Calcium (mg/L) (6010)	**17.6**		**16.1**		**20.9**		**13.0**		NA		NA		NA		NA		NA		**9.25**		NA		**15.7**	
74	67	Magnesium (mg/L) (6010)	**4.63**		**4.26**		**5.48**		**3.66**		NA		NA		NA		NA		NA		**2.88**		NA		**4.9**	
75	68	Potassium (mg/L) (6010)	**2.5**		**2.8**		**3.4**		**1.8**		NA		NA		NA		NA		NA		**1.8**		NA		**2.3**	
76	69	Sodium (mg/L) (6010)	**11.4**		**12.1**		**12.6**		**9.60**		NA		NA		NA		NA		NA		**7.09**		NA		**9.5**	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**92**		**86**		**100**		**81**		NA		NA		NA		NA		NA		**53**		NA		**88**	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		1.0	U	NA		1	U
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**92**		**86**		**100**		**81**		NA		NA		NA		NA		NA		**53**		NA		**88**	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**140**		**160**	J2	**110**		NA		NA		**110**		**83**		**160**		**99**		NA		**120**	
81	74	Chloride (mg/L) (EPA 325.2)	**3.8**	J	**2.8**		**2.5**		**2.2**		NA		NA		**2.1**		**1.9**		**1.4**		**2.8**		NA		**3.3**	
82	75	N-Nitrate (mg-N/L) (Calculated)	0.010	U	0.010	U	**0.031**		**0.011**		NA		NA		NA		NA		NA		0.010	U	NA		**0.021**	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	0.010	U	**0.019**		0.010	U	0.010	U	NA		NA		NA		NA		NA		0.010	U	NA		0.01	U
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	0.010	U	**0.011**		**0.031**		**0.011**		NA		NA		NA		NA		NA		0.010	U	NA		**0.021**	
85	78	Sulfate (mg/L) (EPA 375.2)	**4.2**	J	**5.7**		2.5	U	**8.0**		NA		NA		NA		NA		NA		**9.3**		NA		**9.3**	
86	79																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

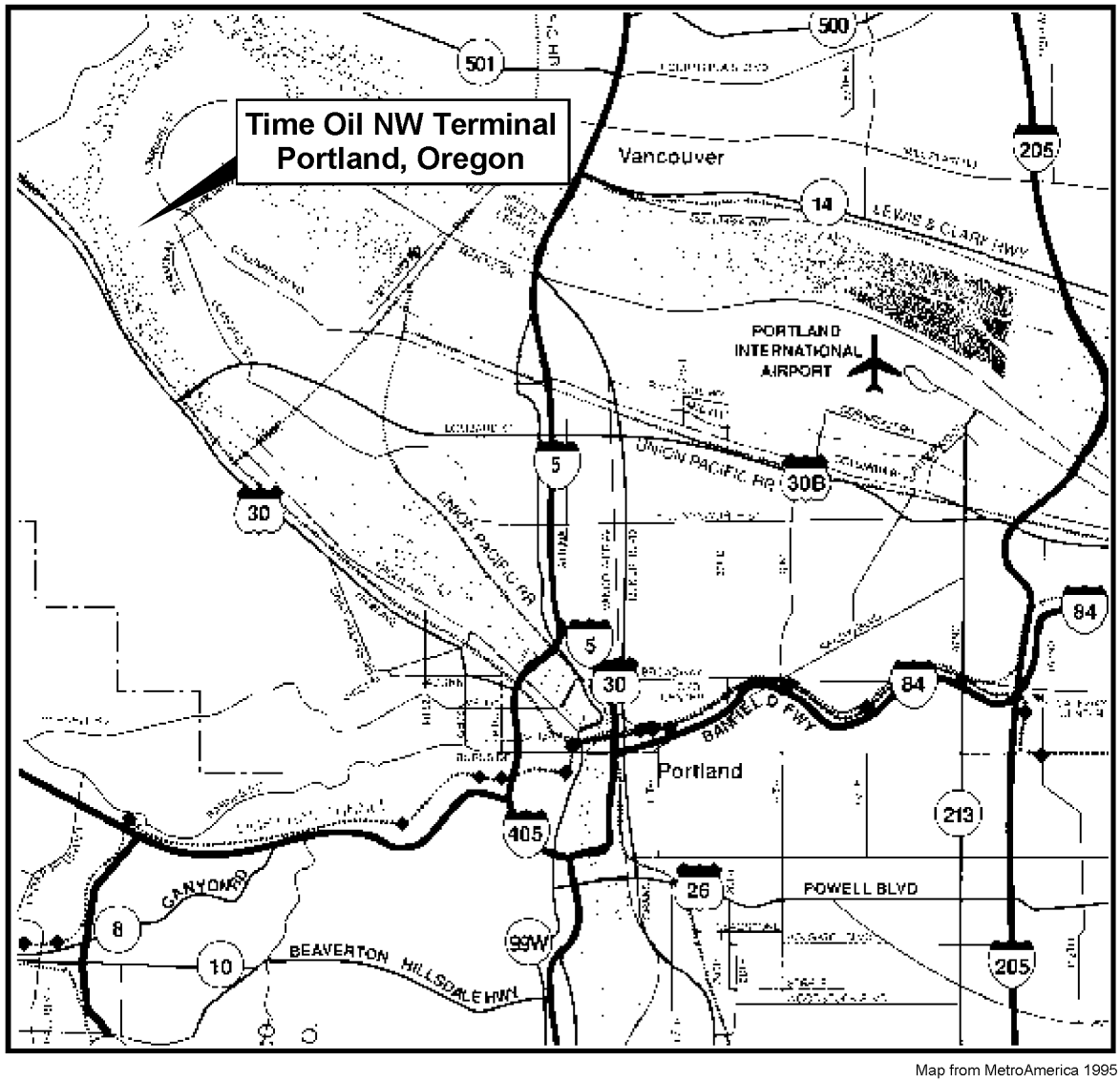
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S	
4			S167A		T160B		U235A		V208A		W371A		Z960R		AH76K		BH75D		CT37G		ED16A		EM75A		FF48B	
5			3/31/97		7/14/97		10/21/97		1/28/98		5/18/98		2/16/99		5/19/99		2/15/00		2/13/01		2/25/02		6/25/02		2/10/03	
87	80	**FIELD PARAMETERS**																								
88	81	pH (avg)	6.75		6.80		6.77		6.85		6.39		7.19		6.32		6.88		6.05		6.15		5.43		7.28	
89	82	Temperature (° C) (avg)	9.7		15.1		15.9		11.9		12.1		10.7		12.4		10.5		11.4		11.1		13.8		12.3	
90	83	Conductivity (um/hos)	198		223		228		185		197		131		167		99		238		111		123		196	
91	84	Dissolved oxygen (mg/L) (avg)									1.75		1.45		1.45		2.00		1.48		5.18		4.26		1.67	
92	85																									
93	86	**DIOXINS AND FURANS (ng/L)**																								
94	87	**Method 8290**																								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																										
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																										

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S		LW104S	
4			S167A		T160B		U235A		V208A		W371A		Z960R		AH76K		BH75D		CT37G		ED16A		EM75A		FF48B	
5			3/31/97		7/14/97		10/21/97		1/28/98		5/18/98		2/16/99		5/19/99		2/15/00		2/13/01		2/25/02		6/25/02		2/10/03	
123		**PAHs (µg/L)**																								
124		**EPA Method SW8270 SIM**																								
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

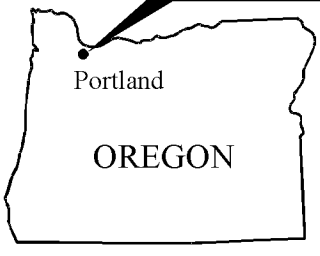
	A	B	C
1			
2			
3			
4			
5			
6			
7		**CHLORINATED PHENOLS (µg/L)**	
8		**EPA Method SW8040**	
9	Pentachlorophenol	Pentachlorophenol	3
10		2,4,6-Trichlorophenol	
11		2,3,6-Trichlorophenol	
12		2,4,5-Trichlorophenol	
13		2,3,4-Trichlorophenol	
14		2,3,5,6- and 2,3,4,6-Tetrachlorophenol	
15		2,3,4,5-Tetrachlorophenol	
16			
17		**SEMIVOLATILES (µg/L)**	
18		**EPA Method SW8270**	
19	Phenol	Phenol	13
20	4-Methylphenol	4-Methylphenol	14
21	Isophorone	Isophorone	15
22	2,4-Dimethylphenol	2,4-Dimethylphenol	16
23	Benzoic Acid	Benzoic Acid	17
24	Naphthalene	Naphthalene	18
25	2-Methylnaphthalene	2-Methylnaphthalene	19
26	2,4,6-Trichlorophenol	2,4,6-Trichlorophenol	20
27	2,4,5-Trichlorophenol	2,4,5-Trichlorophenol	21
28	Acenaphthene	Acenaphthene	22
29	Dibenzofuran	Dibenzofuran	23
30	Fluorene	Fluorene	24
31	Pentachlorophenol	Pentachlorophenol	25
32	bis(2-Ethylhexyl)phthalate	bis(2-Ethylhexyl)phthalate	26
33			
34		**VOLATILES (µg/L)**	
35		**EPA Method SW8260**	
36	Acetone	Acetone	30
37	Carbon Disulfide	Carbon Disulfide	31
38	2-Butanone	2-Butanone	32
39	Benzene	Benzene	33
40	Bromoform	Bromoform	34
41	Toluene	Toluene	35
42	Ethylbenzene	Ethylbenzene	36
43	Styrene	Styrene	37
44	m,p-Xylene	m,p-Xylene	38
45	o-Xylene	o-Xylene	39
46	1,3,5-Trimethylbenzene	1,3,5-Trimethylbenzene	40
47	1,2,4-Trimethylbenzene	1,2,4-Trimethylbenzene	41
48	Isopropylbenzene	Isopropylbenzene	42
49	n-Propylbenzene	n-Propylbenzene	43
50	tert-Butylbenzene	tert-Butylbenzene	44
51	sec-Butylbenzene	sec-Butylbenzene	45
52	4-Isopropyltoluene	4-Isopropyltoluene	46
53	n-Butylbenzene	n-Butylbenzene	47
54	Naphthalene	Naphthalene	48
55	Methyl tert-butyl ether	Methyl tert-butyl ether	48.5
56			
57		**TOTAL PETROLEUM HYDROCARBONS (mg/L)**	
58		**Method OR-DEQ**	
59	Diesel Range Hydrocarbons	**TPH-Diesel**	52
60	Motor Oil	**TPH-D Motor Oil**	53
61	Gasoline Range Hydrocarbons	**TPH-Gasoline**	54
62			
63		**PRIORITY POLLUTANT**	
64		**METALS (mg/L)**	
65	Arsenic	Arsenic (7060)	58
66	Chromium	Chromium (6010)	59
67	Copper	Copper (6010)	60
68	Lead	Lead (7421)	61
69	Nickel	Nickel (6010)	62
70	Zinc	Zinc (6010)	63
71			
72		**MAJOR IONS AND CONVENTIONALS**	
73		Calcium (mg/L) (6010)	

	A	B	C
74		Magnesium (mg/L) (6010)	
75		Potassium (mg/L) (6010)	
76		Sodium (mg/L) (6010)	
77		Alkalinity (mg/L CaCO3) (SM 2320)	
78		Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	
79		Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	
80	Total Dissolved Solids	Total Dissolved Solids (mg/L) (EPA 160.1)	73
81	Chloride	Chloride (mg/L) (EPA 325.2)	74
82		N-Nitrate (mg-N/L) (Calculated)	
83		N-Nitrite (mg-N/L) (EPA 354.1)	
84		Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	
85		Sulfate (mg/L) (EPA 375.2)	
86			
87		**FIELD PARAMETERS**	
88	pH	pH (avg)	81
89	Temperature	Temperature (° C) (avg)	82
90	Conductivity	Conductivity (um/hos)	83
91	Dissolved oxygen	Dissolved oxygen (mg/L) (avg)	84
92			
93		**DIOXINS AND FURANS (ng/L)**	
94		**Method 8290**	
95		2,3,7,8-TCDF	88
96		TotalTCDF	89
97		2,3,7,8-TCDD	90
98		TotalTCDD	91
99		1,2,3,7,8-PeCDF	92
100		2,3,4,7,8-PeCDF	93
101		TotalPeCDF	94
102		1,2,3,7,8-PeCDD	95
103		TotalPeCDD	96
104		1,2,3,4,7,8-HxCDF	97
105		1,2,3,6,7,8-HxCDF	98
106		2,3,4,6,7,8-HxCDF	99
107		1,2,3,7,8,9-HxCDF	100
108		TotalHxCDF	101
109		1,2,3,4,7,8-HxCDD	102
110		1,2,3,6,7,8-HxCDD	103
111		1,2,3,7,8,9-HxCDD	104
112		TotalHxCDD	105
113		1,2,3,4,6,7,8-HpCDF	106
114		1,2,3,4,7,8,9-HpCDF	107
115		TotalHpCDF	108
116		1,2,3,4,6,7,8-HpCDD	109
117		TotalHpCDD	110
118		OCDF	111
119		OCDD	112
120			
121		**ETHANOL (mg/L)**	
122			
123		**PAHs (µg/L)**	
124		**EPA Method SW8270 SIM**	
125		Naphthalene	118
126		2-Methylnaphthalene	119
127		Acenaphthylene	120
128		Acenaphthene	121
129		Fluorene	122
130		Anthracene	123
131		Dibenzofuran	124



Map from MetroAmerica 1995

SITE LOCATION
(see enlarged map area above)



0 2 4
Approximate Scale in Miles

Time Oil NW Terminal Portland, Oregon	**Vicinity Map**	Figure 1-1

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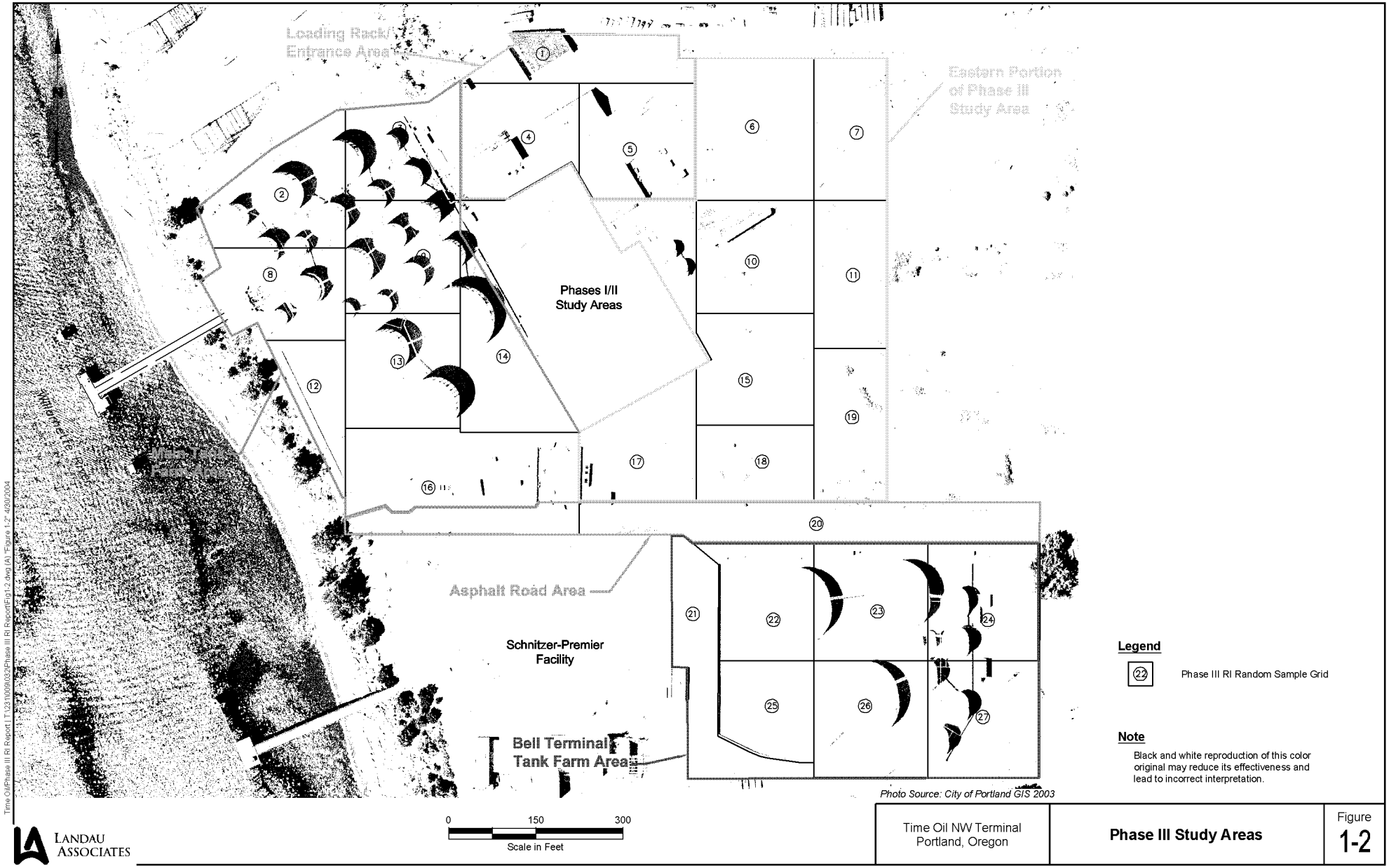
Time Oil\Phase III RI Report | T:\2311\009\032\Phase III RI Report\Fig1-1.cdr (C) 3/29/2004



Time Oil/Phase III RI Report | T:\231\009\032\Phase III RI Report\Fig1-2.dwg (A) "Figure 1-2" 4/30/2004

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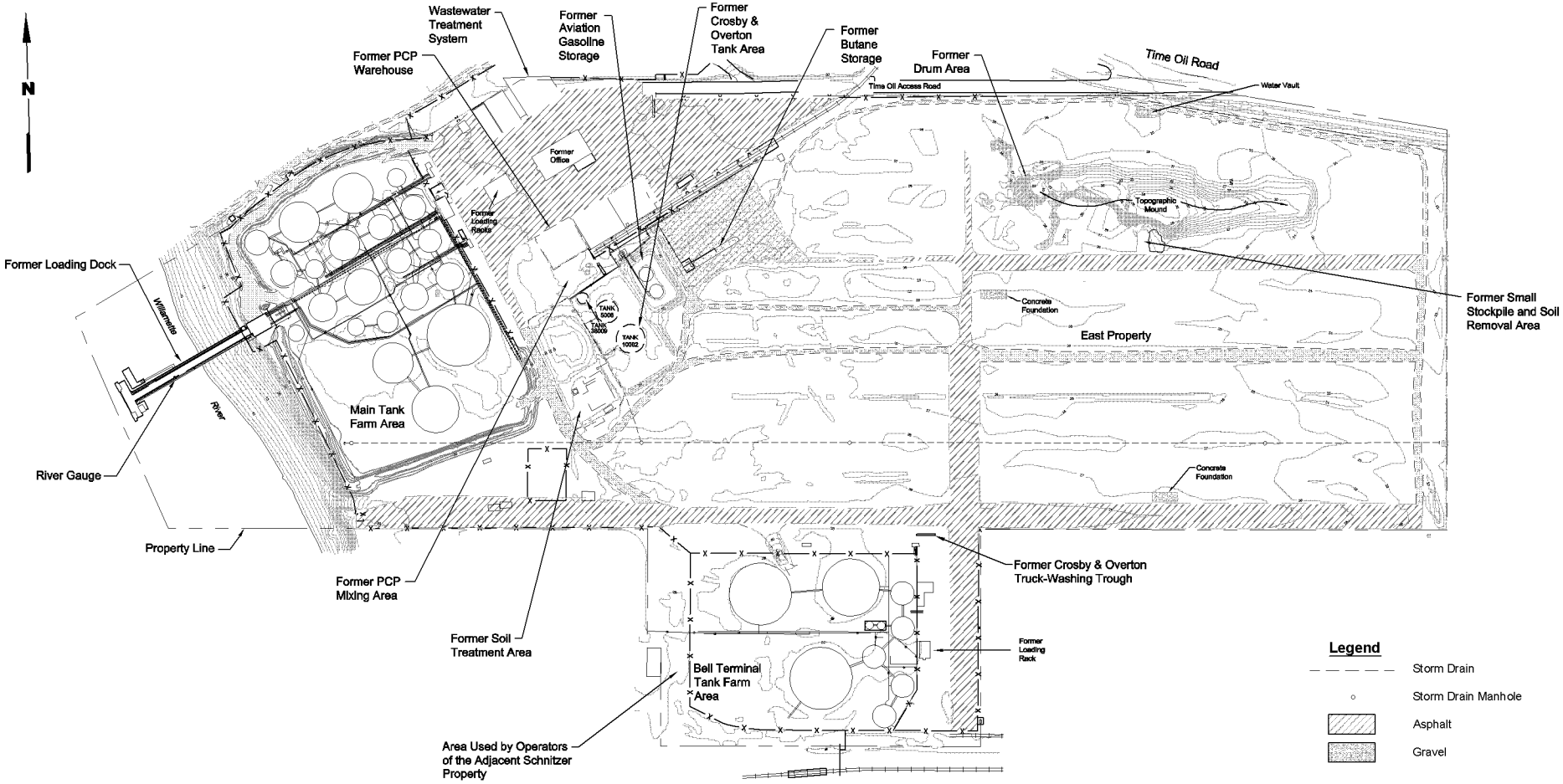
Time Oil NW Terminal Portland, Oregon	**Phase III Study Areas**	Figure 1-2

BZTO104(e)020572



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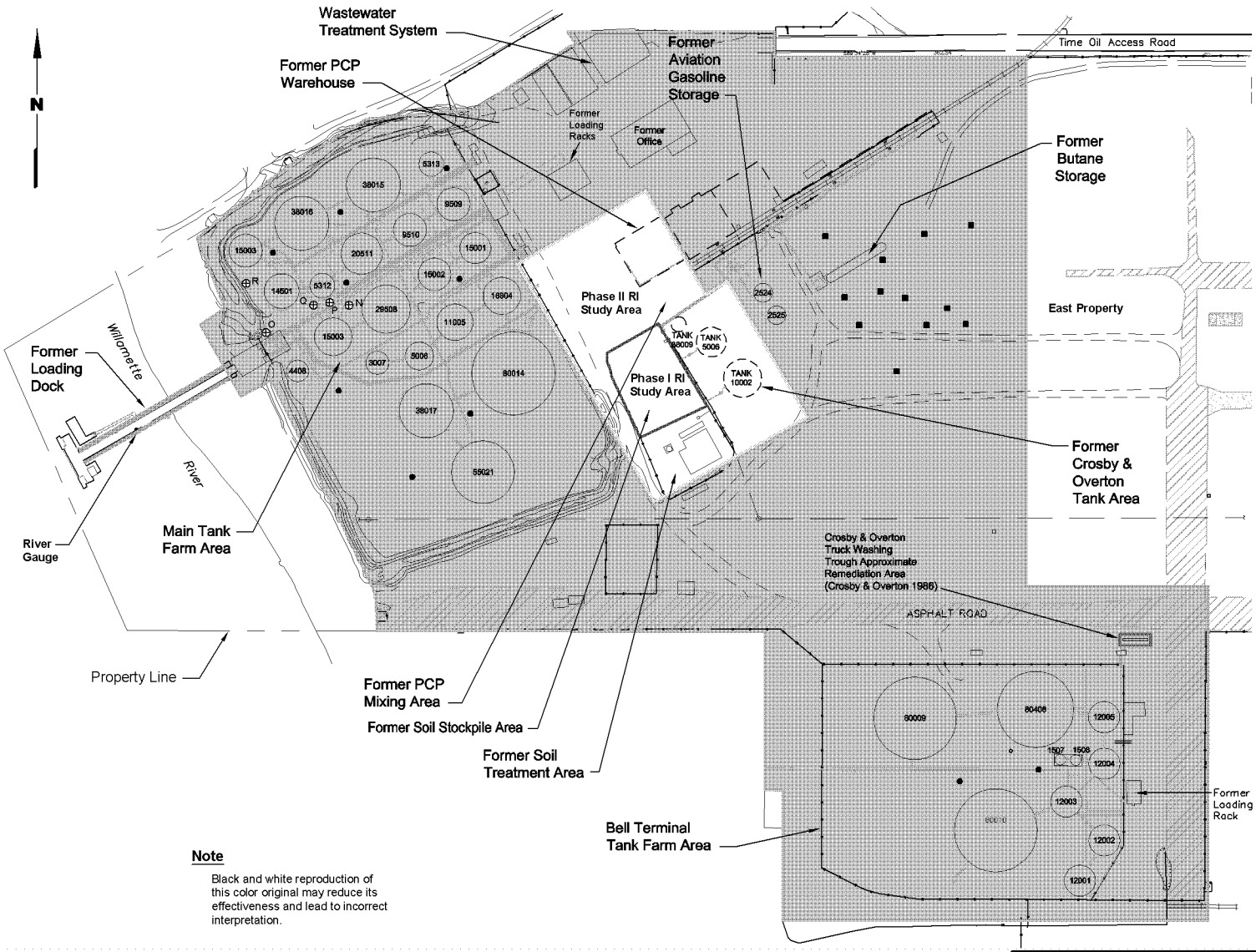
Time Oil NW Terminal Portland, Oregon	**Terminal Map**	Figure **2-1**

Time Oil\Phase III RI Report | T:\231\009\032\Phase III RI Report\Fig2-1.dwg (A) Figure 2-1 4/30/2004

BZTO104(e)020573



Legend

- Phase III RI Study Area
- DEQ Site Inspection Approximate Soil Sample Location (DEQ 1984)
- Soil TPH Investigation Approximate Test Pit/Soil Sample Location (ECOVA 1989)
- Phase I RI Study Area
- Phase II RI Study Area
- Unleaded Gasoline Spill Groundwater Monitoring Well and Soil Sample Location (Landau Associates 1994)

Note

Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

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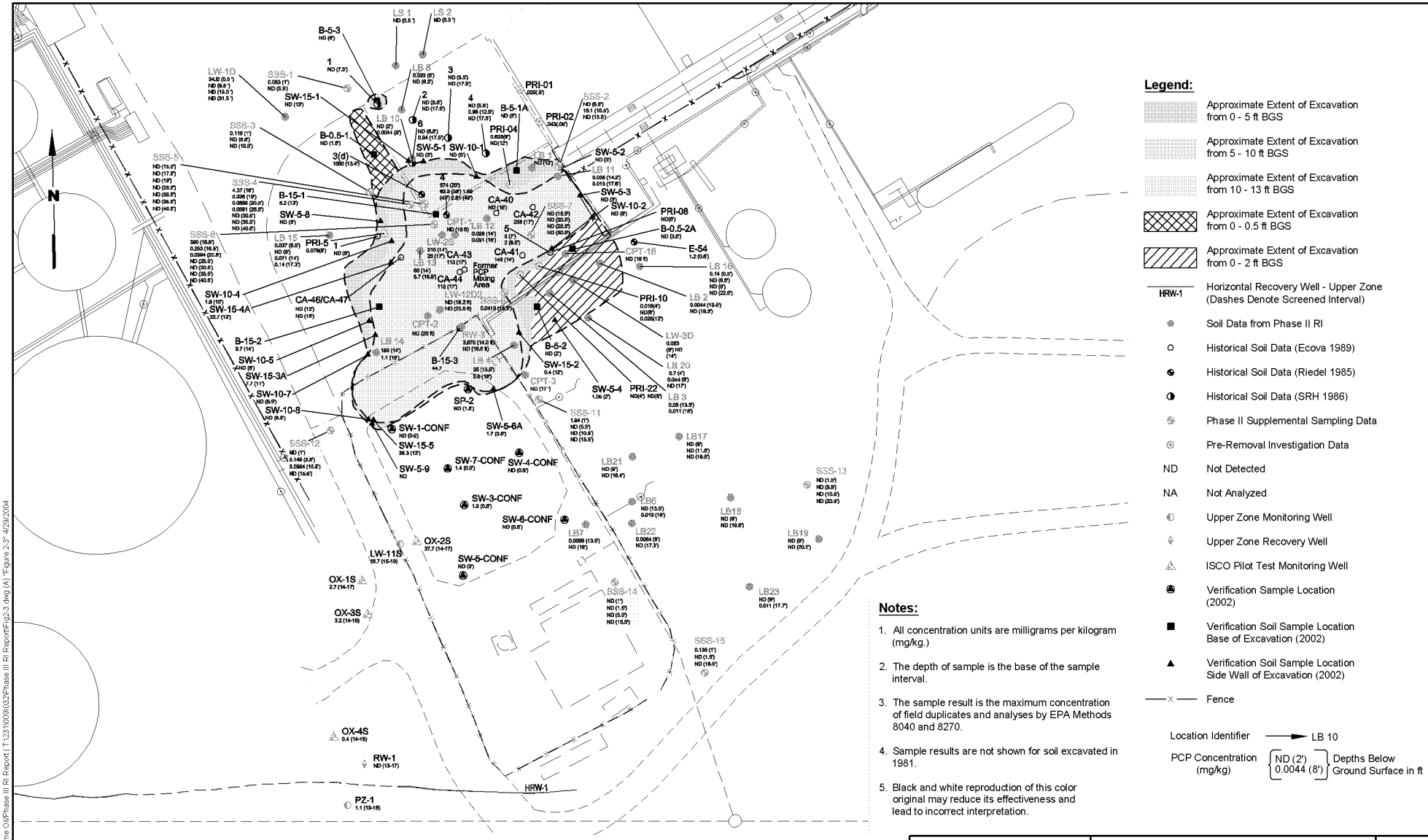
Time Oil NW Terminal
Portland, Oregon

Previous Investigation Areas and Phase III Study Area

Figure 2-2

Time Oil\Phase III RI Report | T:\23\10009\032\Phase III RI Report\Fig2-2.dwg (A) Figure 2-2* 4/29/2004

BZTO104(e)020574



Legend:

- Approximate Extent of Excavation from 0 - 5 ft BGS
- Approximate Extent of Excavation from 5 - 10 ft BGS
- Approximate Extent of Excavation from 10 - 13 ft BGS
- Approximate Extent of Excavation from 0 - 0.5 ft BGS
- Approximate Extent of Excavation from 0 - 2 ft BGS
- HRW-1 — Horizontal Recovery Well - Upper Zone (Dashes Denote Screened Interval)
- Soil Data from Phase II RI
- Historical Soil Data (Ecova 1989)
- Historical Soil Data (Riedel 1985)
- Historical Soil Data (SRH 1986)
- Phase II Supplemental Sampling Data
- Pre-Removal Investigation Data
- ND — Not Detected
- NA — Not Analyzed
- Upper Zone Monitoring Well
- Upper Zone Recovery Well
- ISCO Pilot Test Monitoring Well
- Verification Sample Location (2002)
- Verification Soil Sample Location Base of Excavation (2002)
- Verification Soil Sample Location Side Wall of Excavation (2002)
- Fence

Location Identifier → LB 10

PCP Concentration (mg/kg): ND (2') / 0.0044 (8') — Depths Below Ground Surface in ft

Notes:

1. All concentration units are milligrams per kilogram (mg/kg.)
2. The depth of sample is the base of the sample interval.
3. The sample result is the maximum concentration of field duplicates and analyses by EPA Methods 8040 and 8270.
4. Sample results are not shown for soil excavated in 1981.
5. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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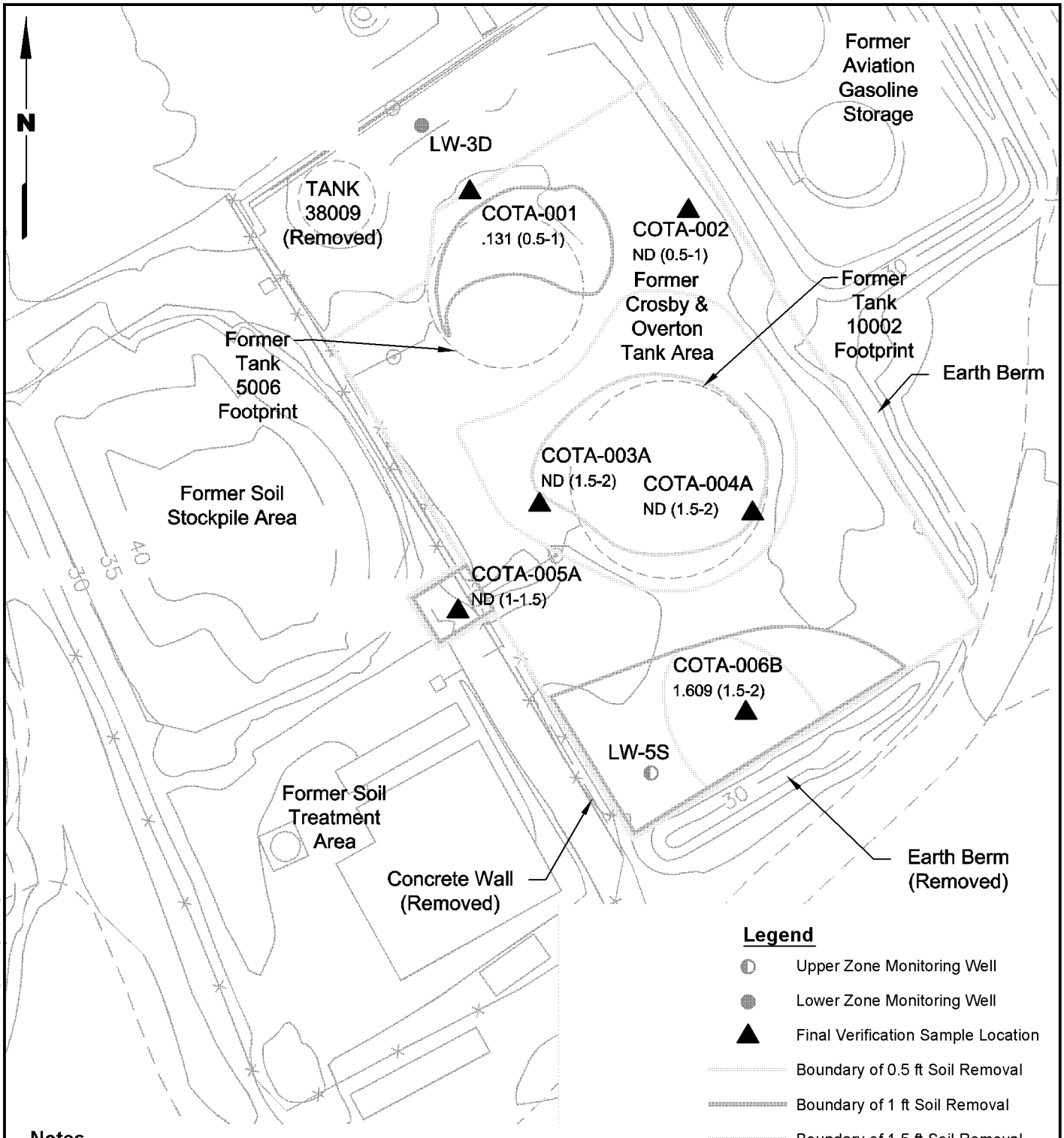
Time Oil NW Terminal
Portland, Oregon

PCP Mixing Area Excavation Boundaries and Summary of PCP Concentrations Remaining in Soil

Figure 2-3

Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig2-3.dwg (A) "Figure 2-3" 4/29/2004

BZTO104(e)020575



Notes

1. Total PCB results represent the sum of detected concentrations of individual Aroclors.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Time Oil/Phase III RI Report | T:\231\009\032\Phase III RI Report\Fig2-4.dwg (A) "Figure 2-4" 4/29/2004

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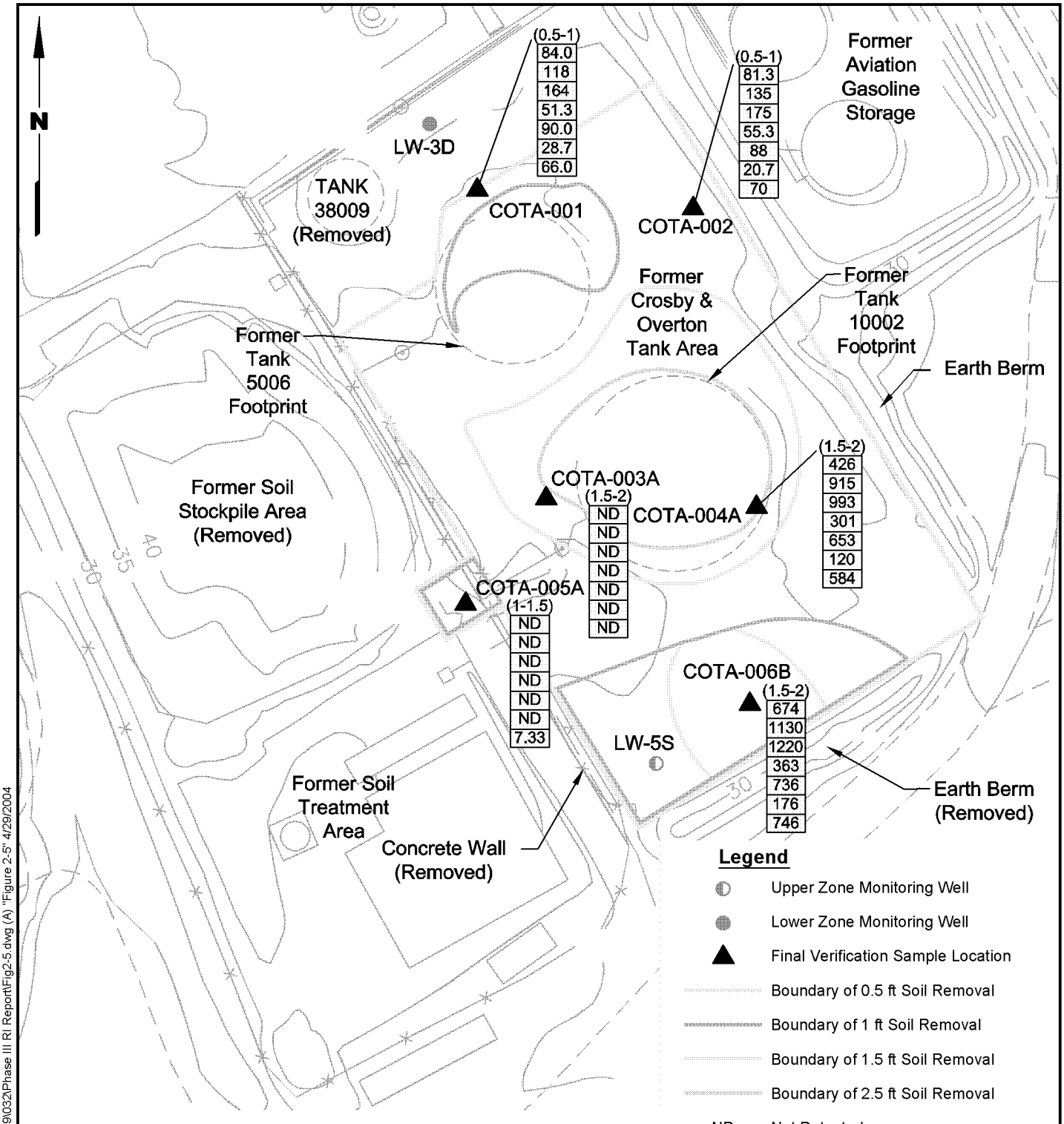
Time Oil NW Terminal Portland, Oregon	**Removal Boundaries and Verification Soil Sample PCB Results Former Crosby & Overton Tank Area**	Figure **2-4**



Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

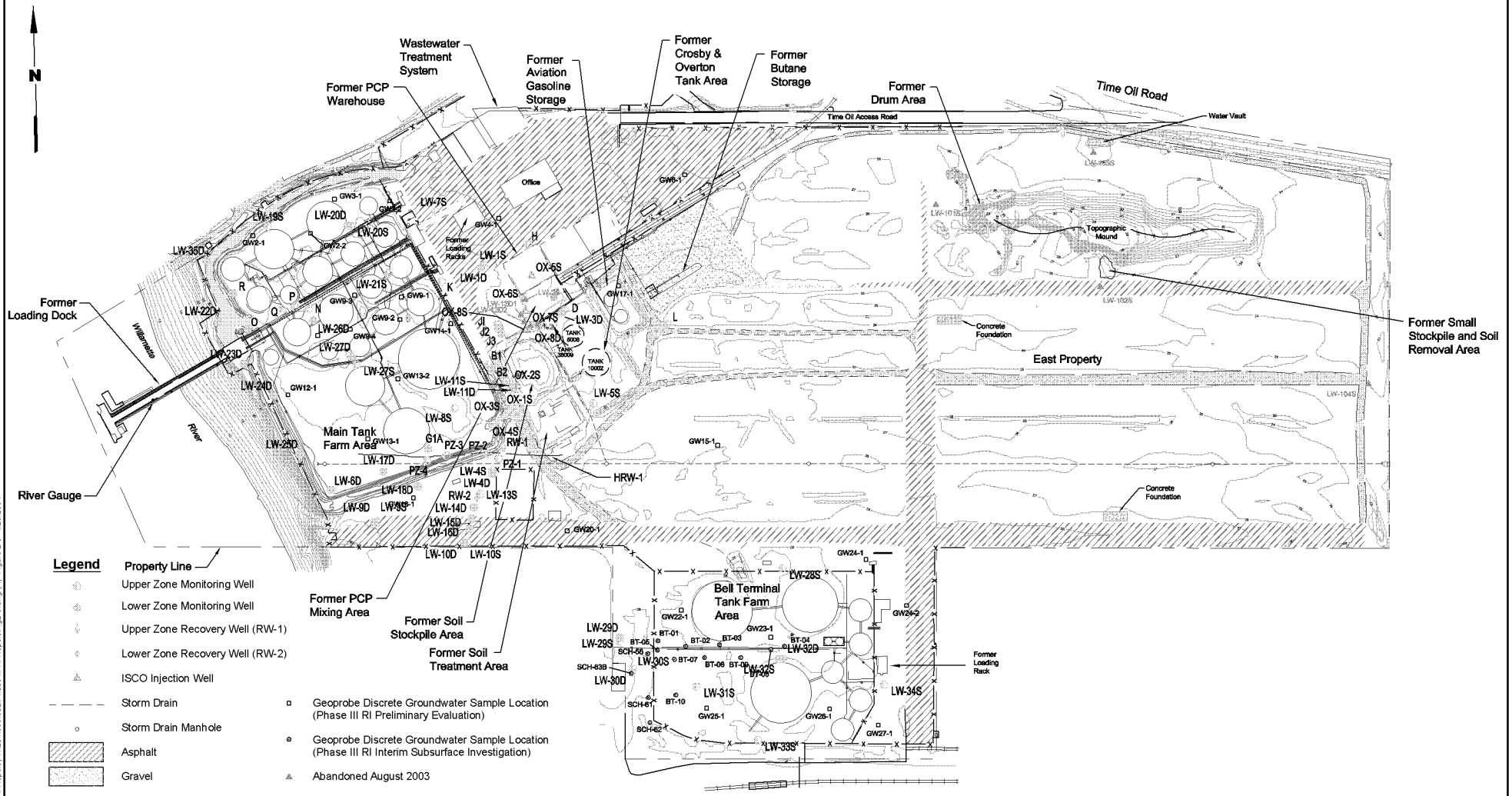
0 40 80

Scale in Feet

Time Oil/Phase III RI Report | T:\2311\009\032\Phase III RI Report\Fig2-5.dwg (A) "Figure 2-5" 4/29/2004

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Removal Boundaries and Verification Soil Sample cPAH Results Former Crosby & Overton Tank Area**	Figure **2-5**



Note

Locations for some wells/well points installed pre-1996 are approximate.

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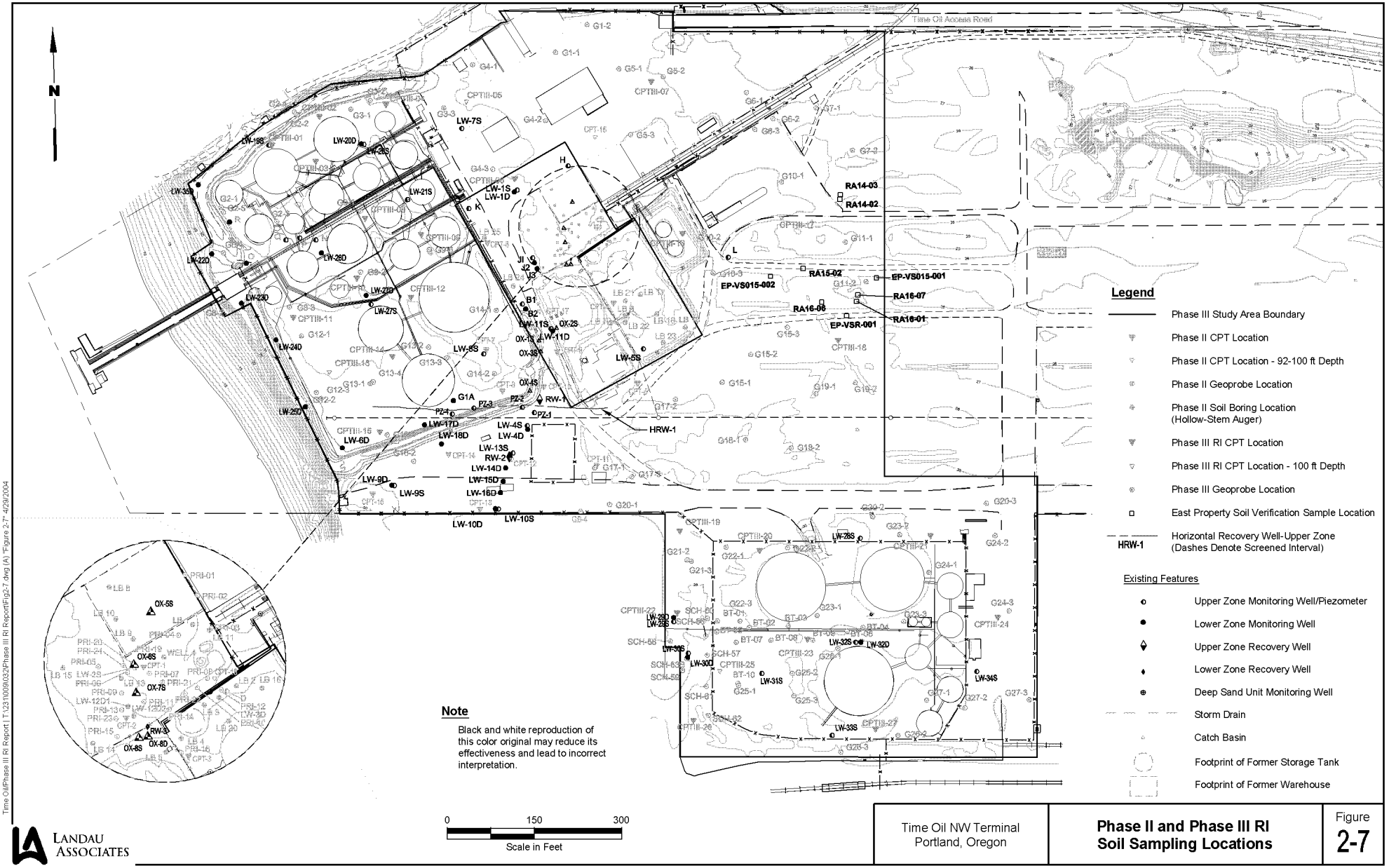
Time Oil NW Terminal Portland, Oregon	**Phase II and Phase III RI Groundwater Sampling Locations**	Figure **2-6**

Time Oil\Phase III RI Report\ T:\23\10009\002\Phase III RI Report\Fig2-6.dwg (A) "Figure 2-6" 4/29/2004

BZTO104(e)020578



Legend

- Phase III Study Area Boundary
- Phase II CPT Location
- Phase II CPT Location - 92-100 ft Depth
- Phase II Geoprobe Location
- Phase II Soil Boring Location (Hollow-Stem Auger)
- Phase III RI CPT Location
- Phase III RI CPT Location - 100 ft Depth
- Phase III Geoprobe Location
- East Property Soil Verification Sample Location
- HRW-1 Horizontal Recovery Well-Upper Zone (Dashes Denote Screened Interval)

Existing Features

- Upper Zone Monitoring Well/Piezometer
- Lower Zone Monitoring Well
- Upper Zone Recovery Well
- Lower Zone Recovery Well
- Deep Sand Unit Monitoring Well
- Storm Drain
- Catch Basin
- Footprint of Former Storage Tank
- Footprint of Former Warehouse

Note

Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

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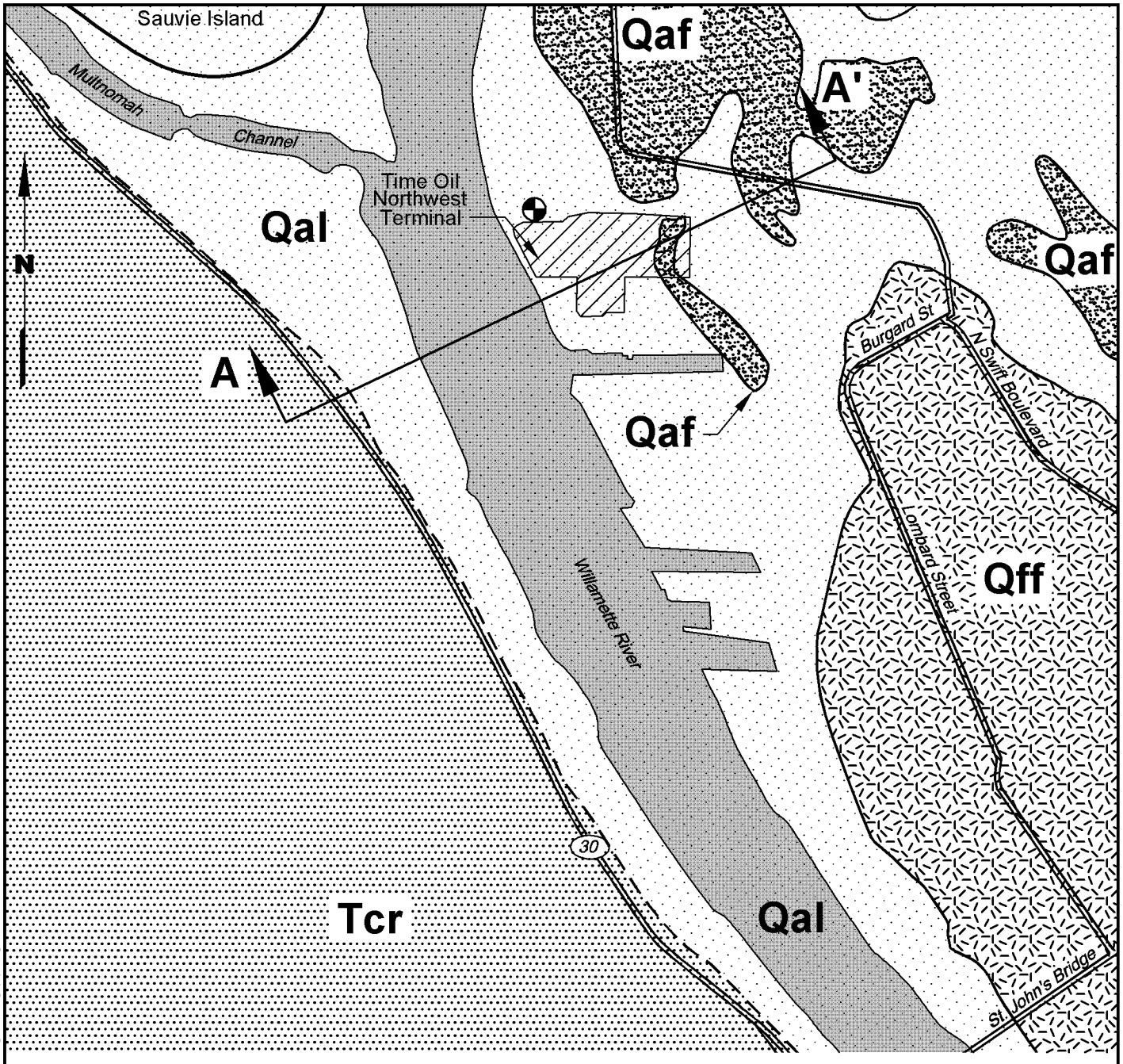
Time Oil NW Terminal
Portland, Oregon

Phase II and Phase III RI Soil Sampling Locations

Figure 2-7

Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig2-7.dwg (A) "Figure 2-7" 4/29/2004

BZTO104(e)020579



Legend

Qaf	Imported fill (Recent)
Qal	Alluvium (Recent)
Qff	Catastrophic Flood Deposits-Fine-grained facies (Pleistocene)
Tcr	Undifferentiated Columbia River Basalt Group (middle Miocene)
	Portland Hills Fault
	Port of Portland Well

A — A' Location of regional geologic cross section

0 2000 4000
Scale in Feet

Geology inferred from: Beeson et. al., 1991; Madin 1984

Time Oil/Phase III RI Report | T:\2311\009\032\Phase III RI Report\Fig3-1.dwg (A) "Figure 3-1" 4/29/2004

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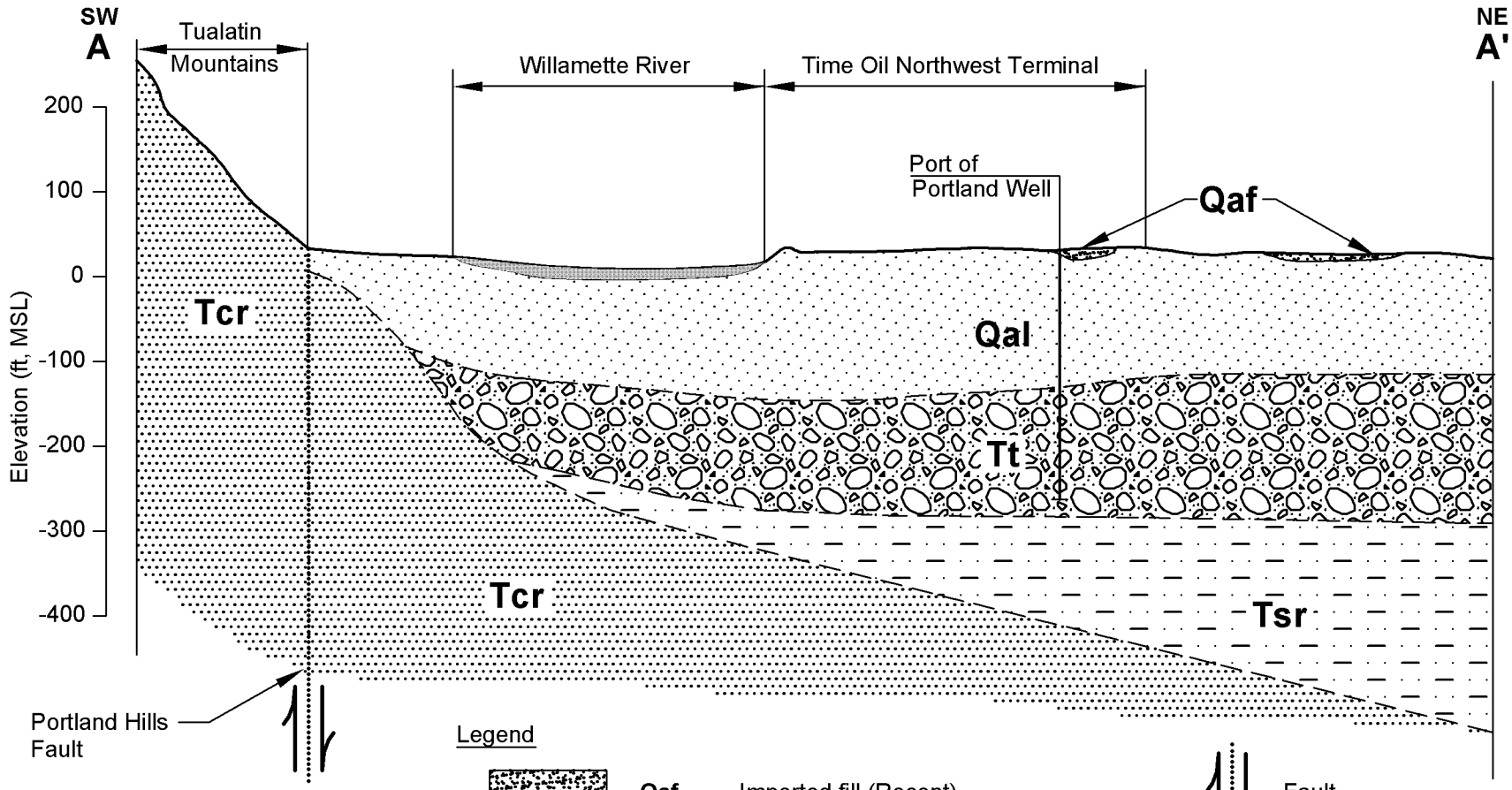
Time Oil NW Terminal Portland, Oregon	**Regional Surficial Geology and Cross Section Location**	Figure **3-1**



Legend

Qaf	Imported fill (Recent)	Fault
Qal	Alluvium (Recent)	Inferred Contact Between Geologic Units
Tt	Troutdale Formation (Miocene-Pliocene)	
Tsr	Sandy River Mudstone (Miocene-Pliocene)	
Tcr	Undifferentiated Columbia River Basalt Group (middle Miocene)	

Notes

1. Dip of high angle fault unknown
2. Rivergate Well - 1 (Port of Portland) projected approximately 1.3 miles south to cross section location

Geology inferred from Beeson et. al., 1991; Madin 1984; PTI 1992

0 1000 2000

Horizontal Scale in Feet
Vertical Exaggeration = 5x

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Time Oil NW Terminal
Portland, Oregon

Regional Geologic Cross Section

Figure
3-2

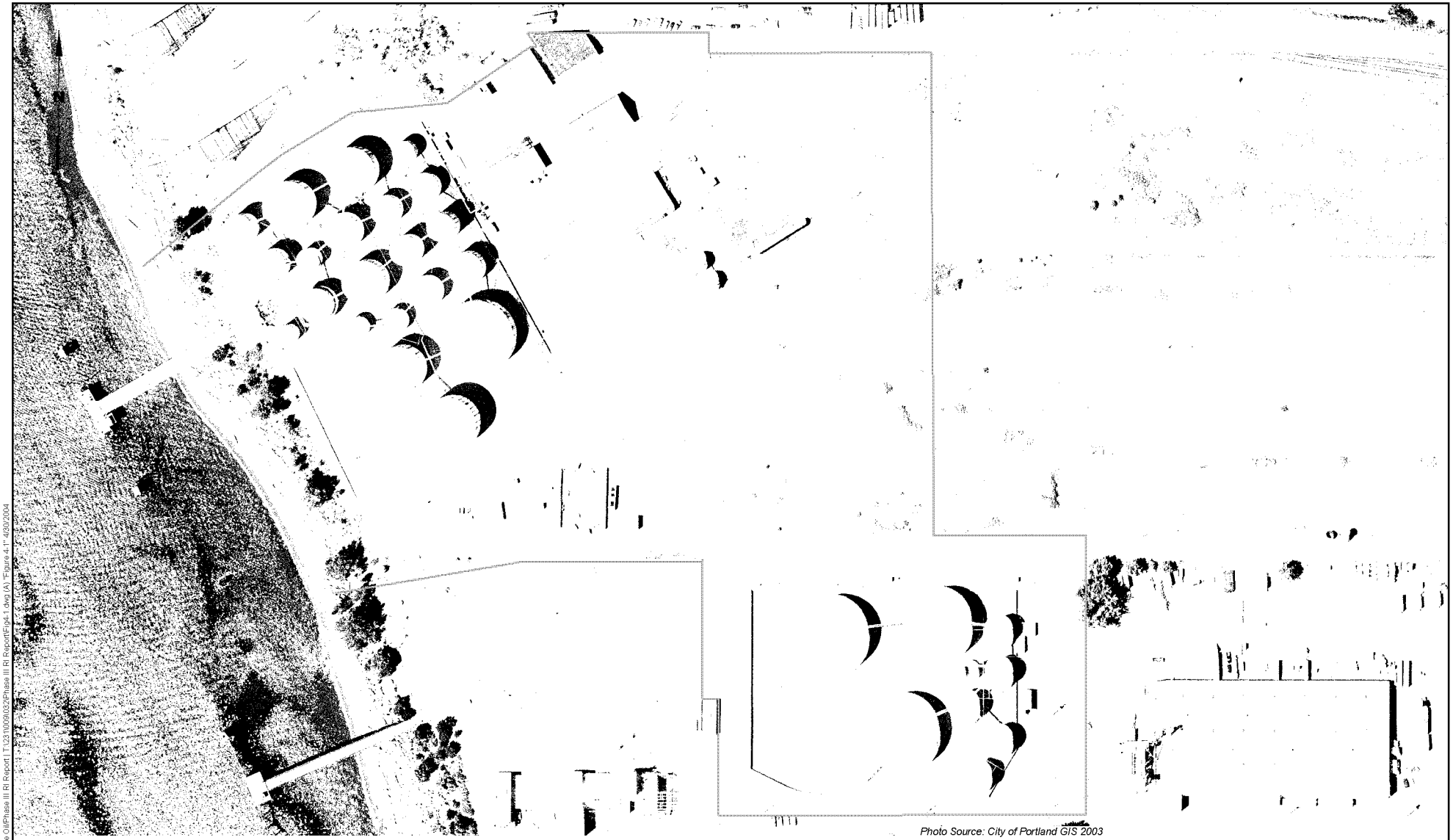


Photo Source: City of Portland GIS 2003

Note

Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300

Scale in Feet

LANDAU ASSOCIATES

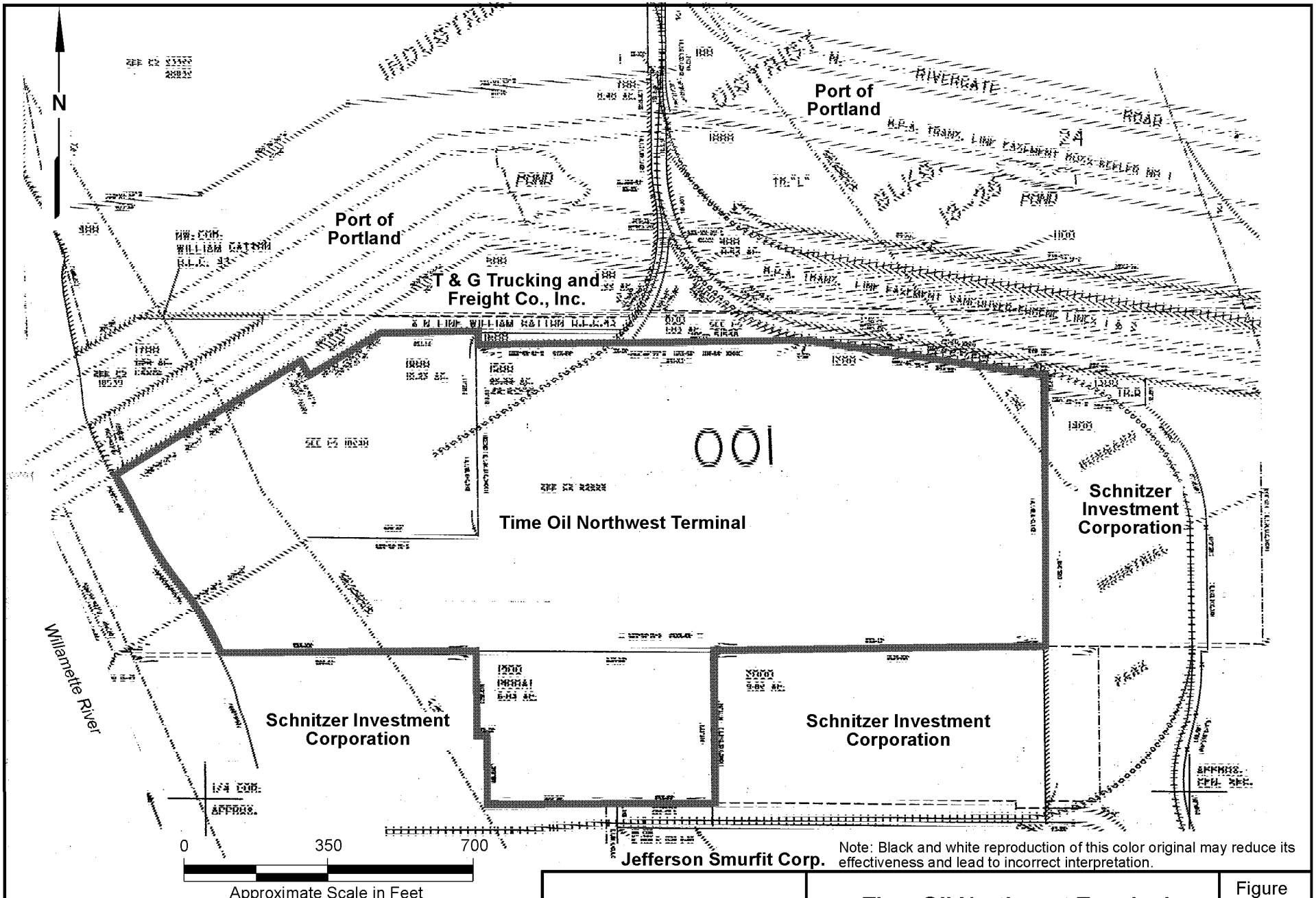
Time Oil NW Terminal
Portland, Oregon

Locality of the Facility

Figure
4-1

Time Oil\Phase III RI Report\ T:\231\0009\023\Phase III RI Report\Fig4-1.dwg (A) "Figure 4-1" 4/30/2004

BZTO104(e)020582



Note: Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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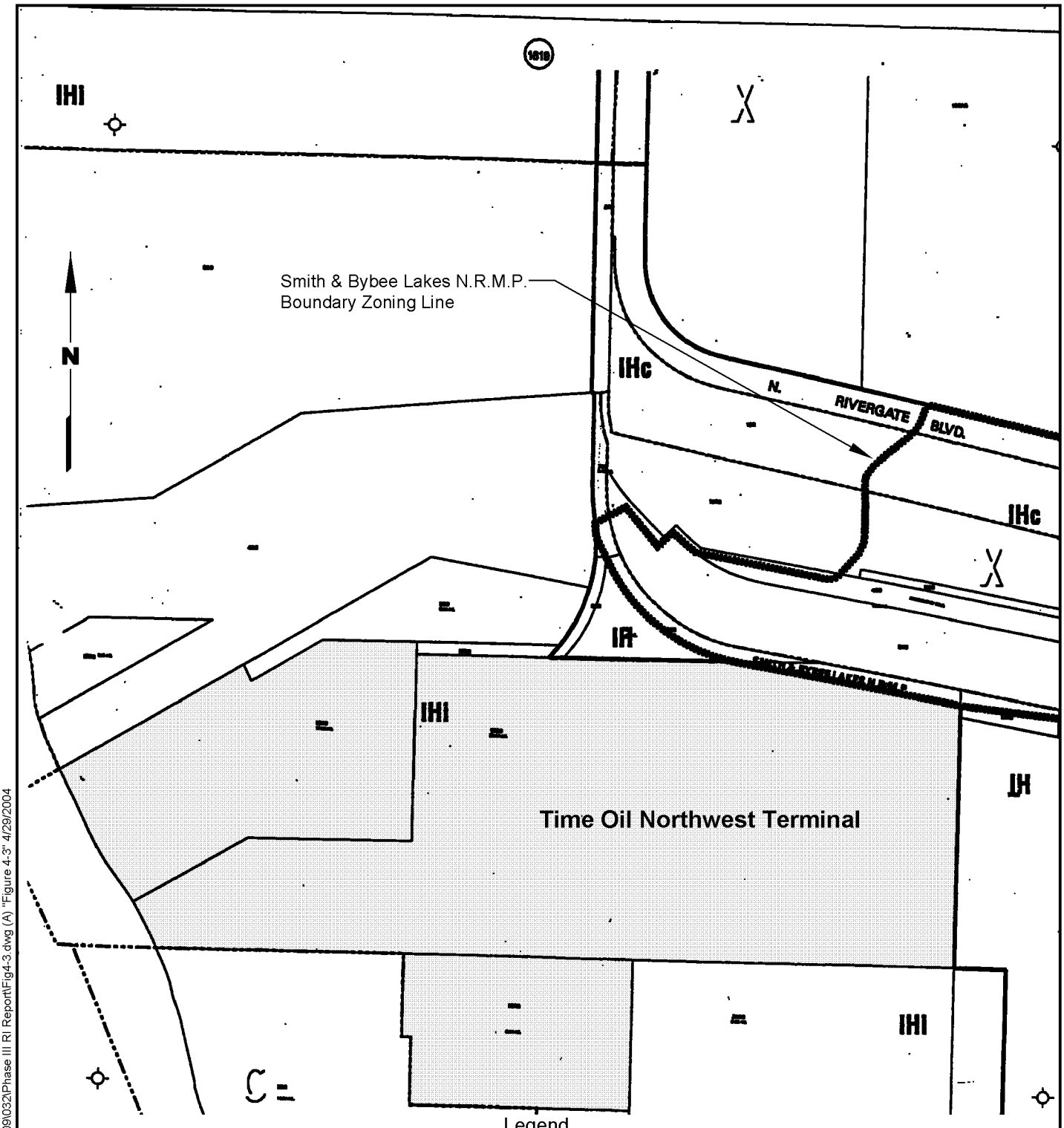
Source: Multnomah County Tax Plot Map, 1999
2N 1W 35B Portland

Time Oil NW Terminal
Portland, Oregon

Time Oil Northwest Terminal and Adjacent Properties

Figure
4-2



Legend

IH Heavy Industrial Zoning Code

IHi Heavy Industrial Zoning Code with a River Industrial Greenway Zone Overlay

IHc Heavy Industrial Zoning Code with an Environmental Concern Overlay

0 400 800

Approximate Scale in Feet

Source: City of Portland, Bureau of Planning, Zoning Map 1719, April 1999

Time Oil/Phase III RI Report | T:\2311009\032\Phase III RI Report\Fig4-3.dwg (A) "Figure 4-3" 4/29/2004

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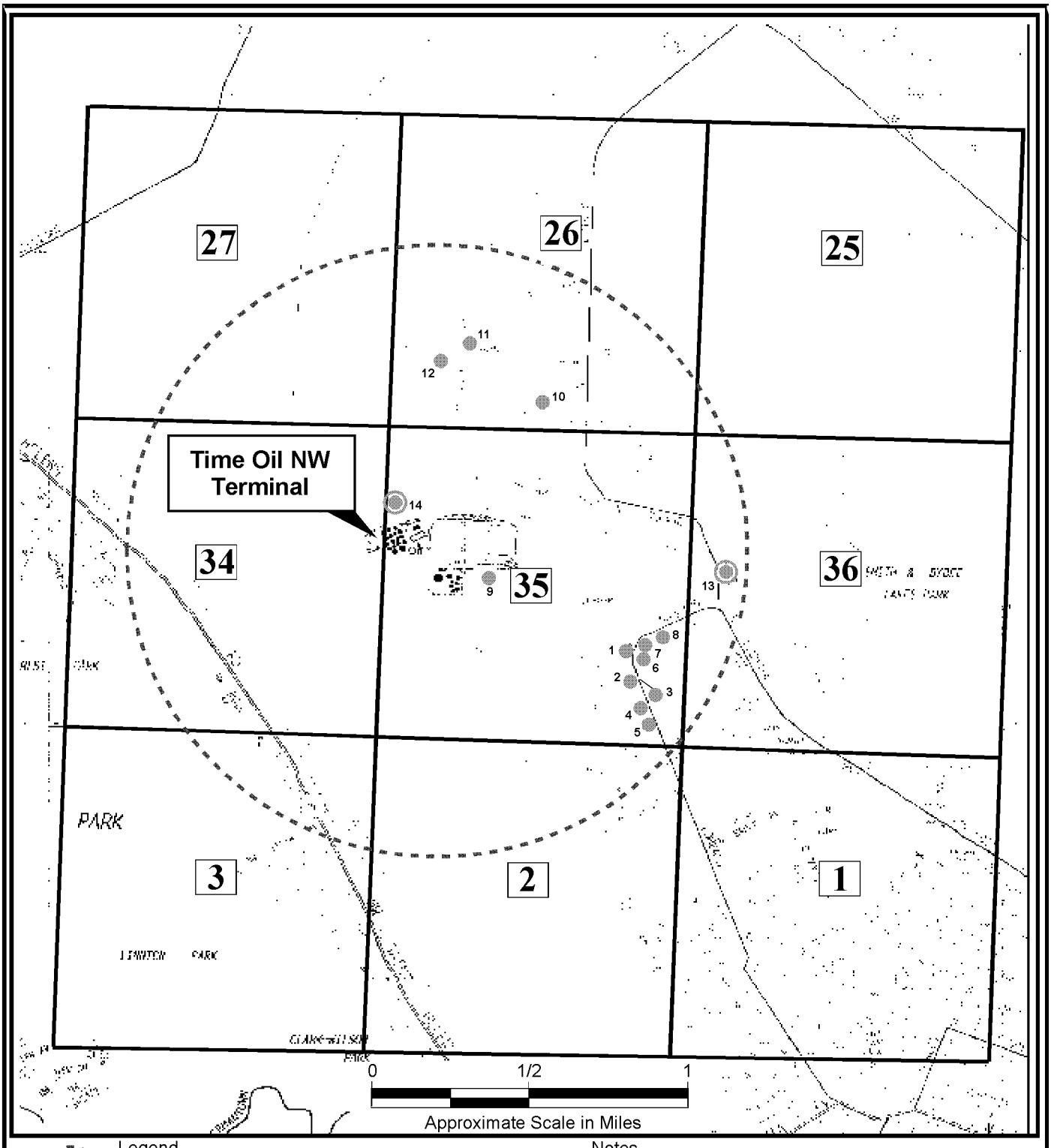
Time Oil NW Terminal Portland, Oregon	**Zoning Map**	Figure **4-3**



Legend

- One Mile Radius
- 1 — Section and Section Number
- 4 — Approximate Offsite Well Location and Identification Number
- 13 — Approximate Offsite Irrigation Well Location and Identification Number

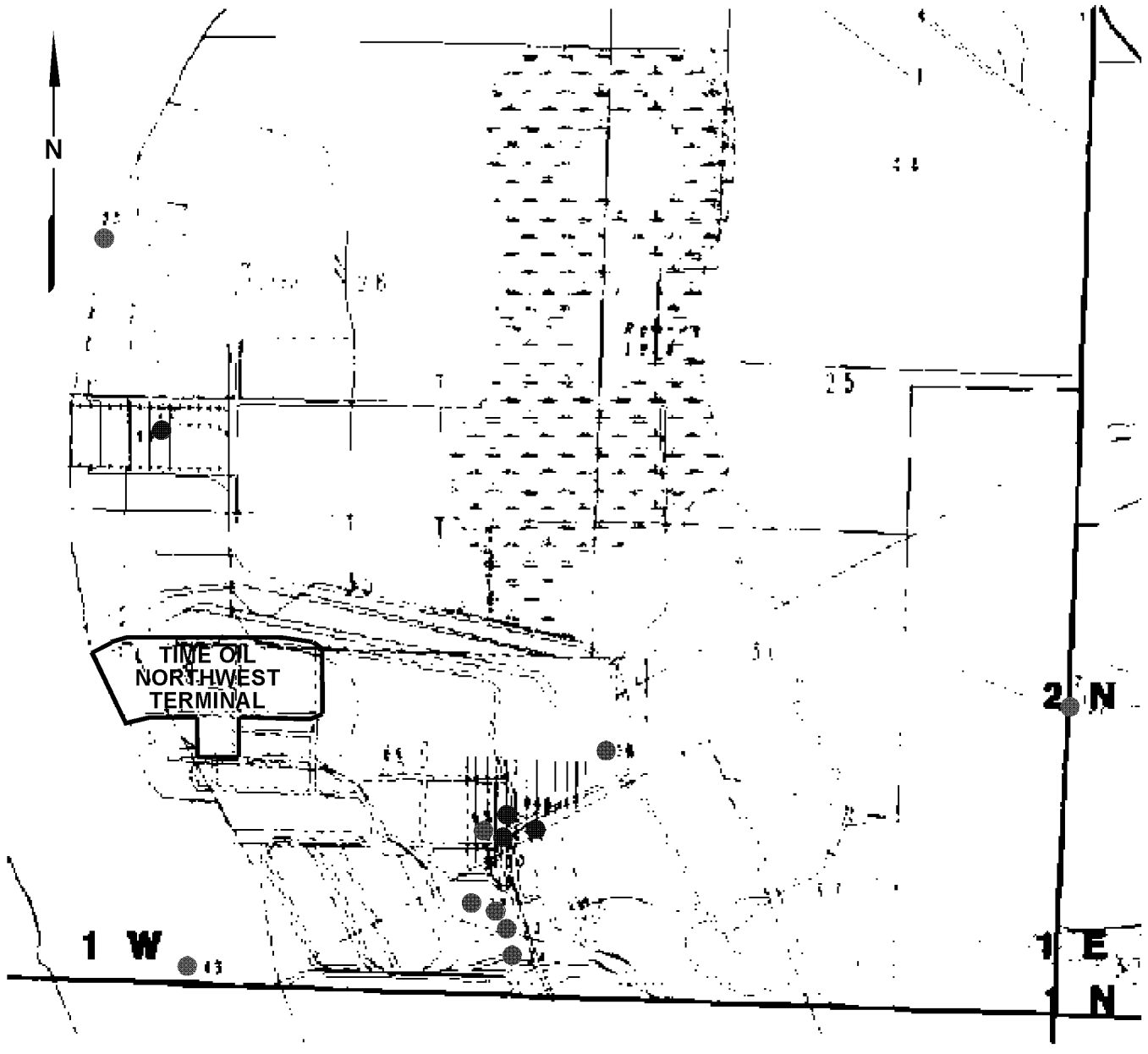
Notes

1. Much of the map area was originally surveyed as private donation land claim prior to establishment of the public land system and conventional section boundaries. Accordingly, many of the section boundaries on this figure are inferred.
2. Black and white reproduction of this color original many reduce its effectiveness and lead to incorrect interpretation.

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Well Inventory Results**	Figure 4-4

Time Oil/Phase III RI Report | T:\23110091037\Phase III RI Report\Fig4-4.cdr (C) 3/17/2004



PLACE OF USE BY SOURCE OF RIGHT
Multiple shades indicates multiple sources for rights servicing the parcel.
Bold number in parcel is referenced in report.

- Serviced by surface water or decree right
- Serviced by groundwater right
- Serviced by groundwater registration right

POINT OF DIVERSION BY SOURCE OF RIGHT
Number next to point is referenced in report.

- Groundwater right point of diversion
- Surface water right point of diversion
- Groundwater registration point of diversion (Pre-August 3, 1955 wells)

Rights shown on this map are approximate.

0 1/2 1

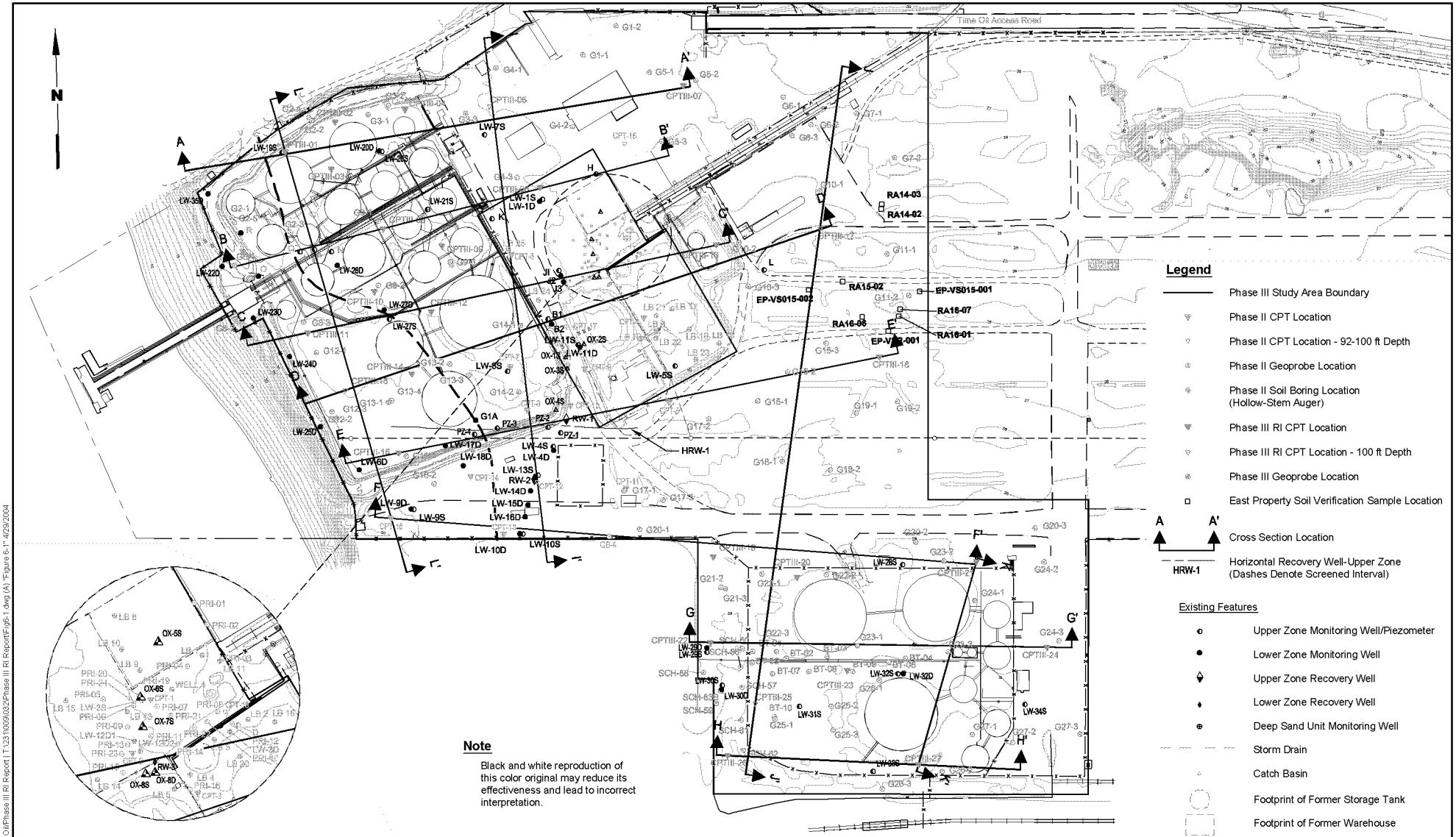
Approximate Scale in Miles

Note: Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Source: Oregon Water Resources Department 1999

LANDAU ASSOCIATES	Time Oil NW Terminal Portland, Oregon	**Water Rights -Time Oil Northwest Terminal and Vicinity**	Figure **4-5**

Time Oil/Phase III RI Report | T:\231\0091032\Phase III RI Report\Fig4-5.FH8 (PC) 3/17/2004



Note

Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Cross Section Locations**	Figure **6-1**

Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig6-1.dwg (A) "Figure 6-1" 4/29/2004

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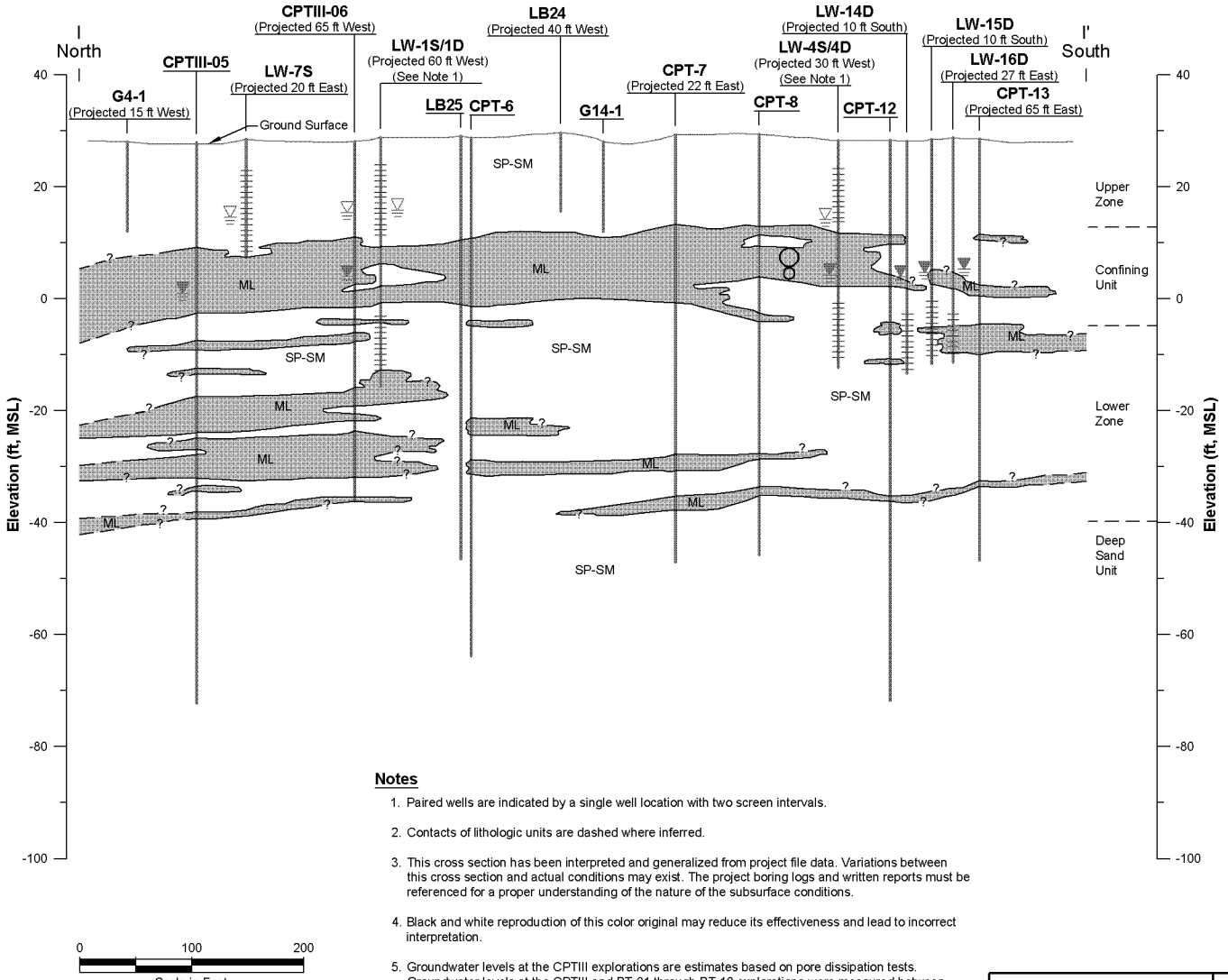


0 100 200

Scale in Feet
Vertical Exaggeration 5X

Notes

1. Paired wells are indicated by a single well location with two screen intervals.
2. Contacts of lithologic units are dashed where inferred.
3. This cross section has been interpreted and generalized from project file data. Variations between this cross section and actual conditions may exist. The project boring logs and written reports must be referenced for a proper understanding of the nature of the subsurface conditions.
4. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
5. Groundwater levels at the CPTIII explorations are estimates based on pore dissipation tests. Groundwater levels at the CPTIII and BT-01 through BT-10 explorations were measured between July 8 and July 16, 2002. Groundwater levels at all existing phase II wells were measured on August 26, 2002.

Legend

- SP-SM — Predominantly gray and brown fine to medium SAND with silt
- ML — Predominantly gray SILT with fine sand
- Monitoring Well Screen Interval
- Groundwater level within the upper zone (See Note 5)
- Groundwater level within the lower zone (See Note 5)
- Approximate Location of East-West Trending Storm Drain
- Approximate Location of East-West Trending Horizontal Recovery Well, HRW-1

LANDAU ASSOCIATES

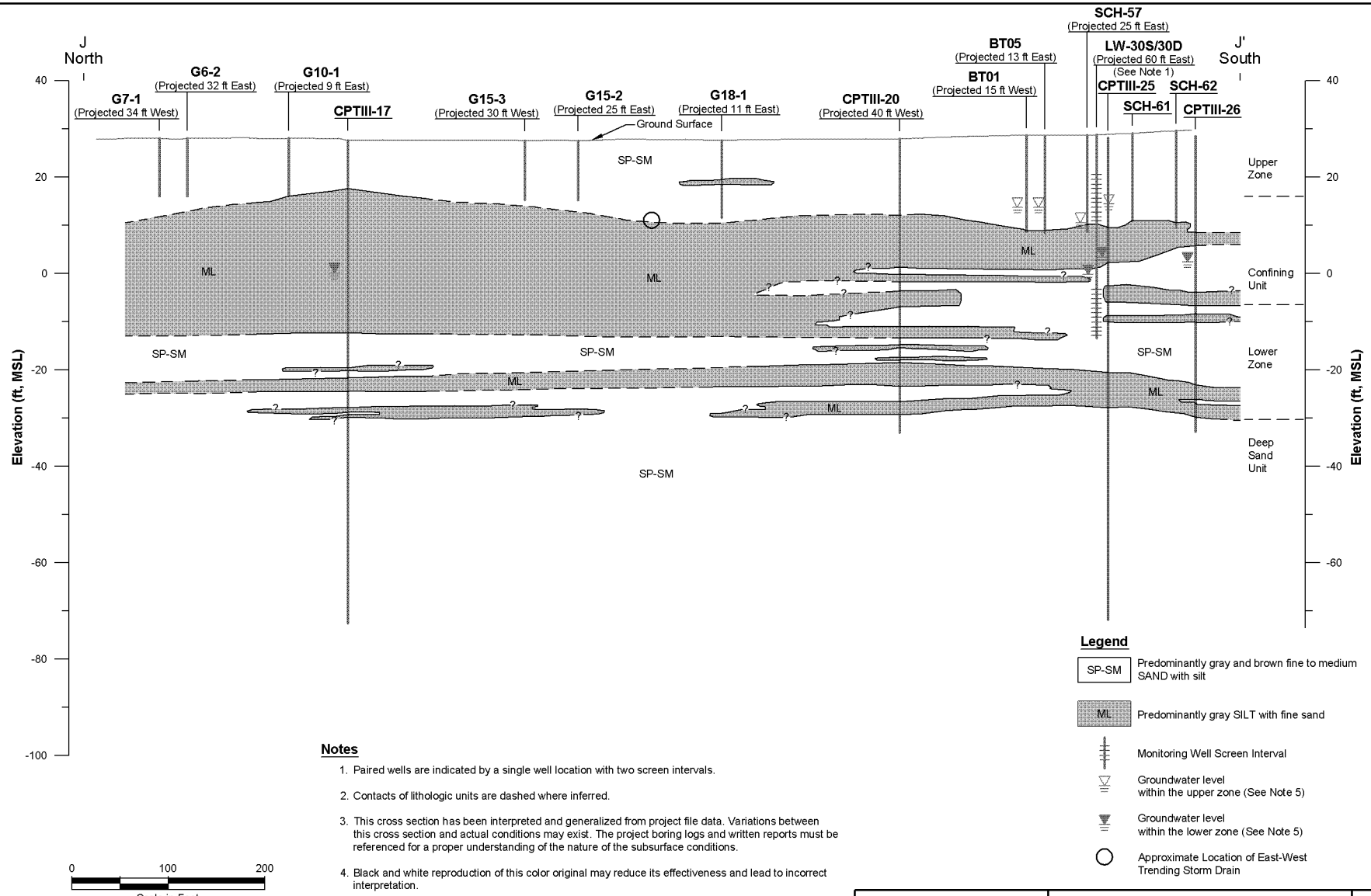
Time Oil NW Terminal
Portland, Oregon

Cross Section I-I'

Figure
6-10

Time Oil\Phase III RI Report | T:\23\10009\029\Phase III RI Report\Fig6-10.dwg (A) "Figure 6-10" 4/30/2004

BZTO104(e)020588



Legend

- SP-SM — Predominantly gray and brown fine to medium SAND with silt
- ML — Predominantly gray SILT with fine sand
- Monitoring Well Screen Interval
- Groundwater level within the upper zone (See Note 5)
- Groundwater level within the lower zone (See Note 5)
- Approximate Location of East-West Trending Storm Drain

Notes

1. Paired wells are indicated by a single well location with two screen intervals.
2. Contacts of lithologic units are dashed where inferred.
3. This cross section has been interpreted and generalized from project file data. Variations between this cross section and actual conditions may exist. The project boring logs and written reports must be referenced for a proper understanding of the nature of the subsurface conditions.
4. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
5. Groundwater levels at the CPTIII explorations are estimates based on pore dissipation tests. Groundwater levels at the CPTIII and BT-01 through BT-10 explorations were measured between July 8 and July 16, 2002. Groundwater levels at all existing wells were measured on August 26, 2002.

0 100 200
Scale in Feet
Vertical Exaggeration 5X

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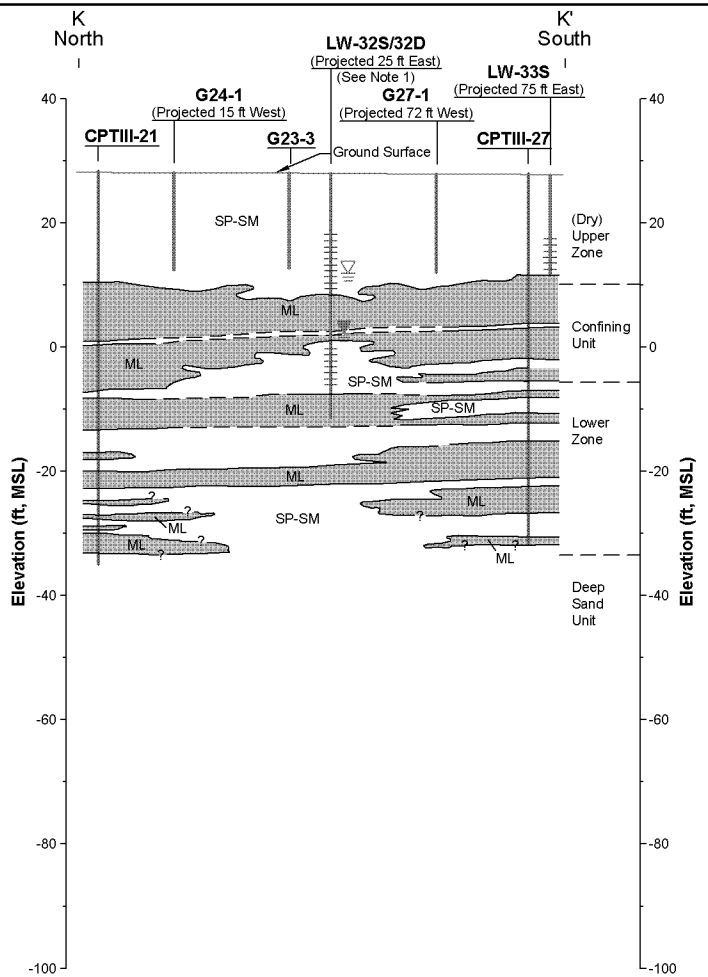
Time Oil NW Terminal Portland, Oregon	**Cross Section J-J'**	Figure 6-11

Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig6-11.dwg (A) "Figure 6-11" 4/29/2004



Notes

1. Paired wells are indicated by a single well location with two screen intervals.
2. Contacts of lithologic units are dashed where inferred.
3. This cross section has been interpreted and generalized from project file data. Variations between this cross section and actual conditions may exist. The project boring logs and written reports must be referenced for a proper understanding of the nature of the subsurface conditions.
4. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
5. Groundwater levels at all new phase III wells were measured at time of installation in September 2003.

Legend

- SP-SM — Predominantly gray and brown fine to medium SAND with silt
- ML — Predominantly gray SILT with fine sand
- Monitoring Well Screen Interval
- Groundwater level within the upper zone (See Note 5)
- Groundwater level within the lower zone (See Note 5)

0 100 200
Scale in Feet
Vertical Exaggeration 5X

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Cross Section K-K'**	Figure 6-12

Time Oil\Phase III RI Report | T:\23\10009\032\Phase III RI Report\Fig6-12.dwg (A) 'Figure 6-12' 4/29/2004

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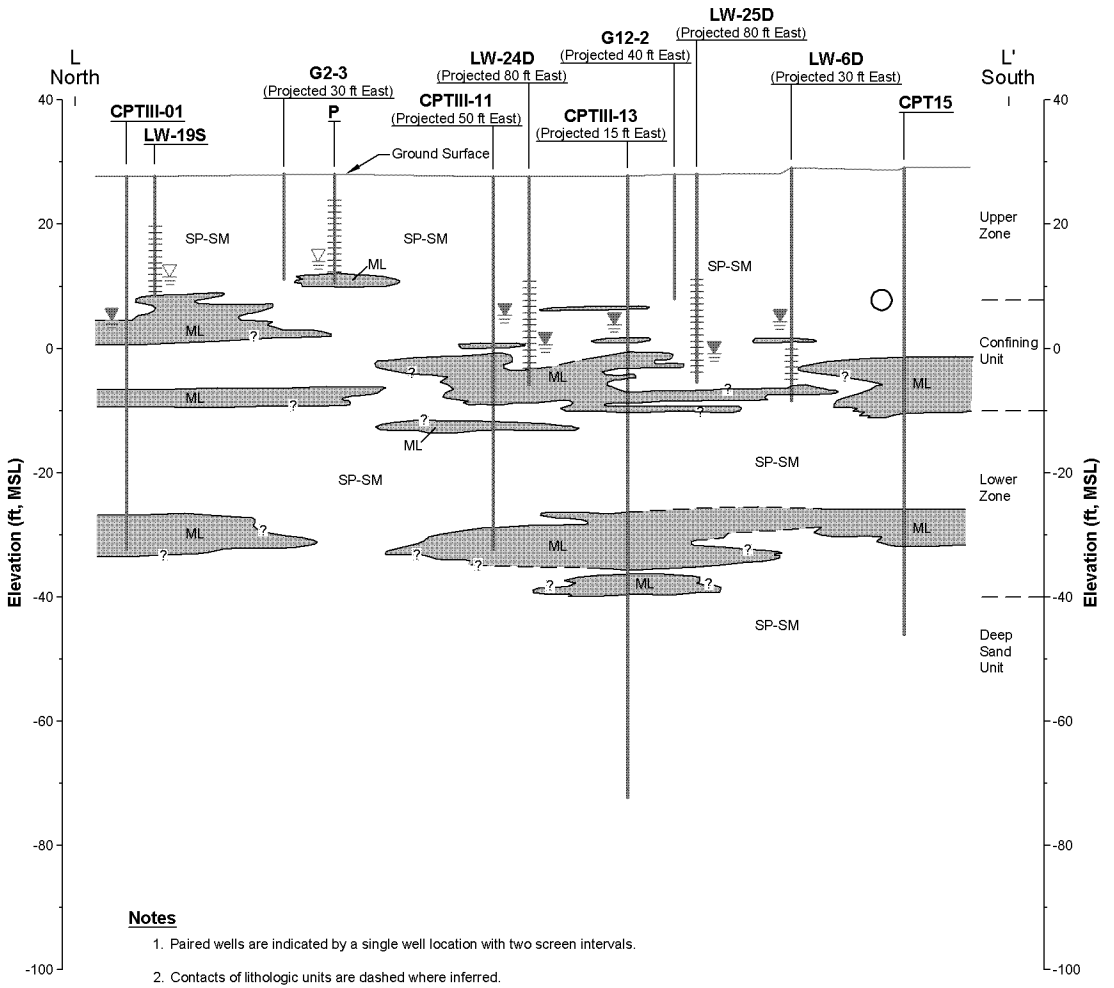


Notes

1. Paired wells are indicated by a single well location with two screen intervals.
2. Contacts of lithologic units are dashed where inferred.
3. This cross section has been interpreted and generalized from project file data. Variations between this cross section and actual conditions may exist. The project boring logs and written reports must be referenced for a proper understanding of the nature of the subsurface conditions.
4. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
5. Groundwater levels at the CPTIII explorations are estimates based on pore dissipation tests. Groundwater levels at the CPTIII and BT-01 through BT-10 explorations were measured between July 8 and July 16, 2002. Groundwater levels at all existing phase II wells were measured on August 26, 2002. Groundwater levels at all new phase III wells were measured at time of installation in September 2003.

Legend

- SP-SM — Predominantly gray and brown fine to medium SAND with silt
- ML — Predominantly gray SILT with fine sand
- Monitoring Well Screen Interval
- Groundwater level within the upper zone (See Note 5)
- Groundwater level within the lower zone (See Note 5)
- Approximate Location of East-West Trending Storm Drain

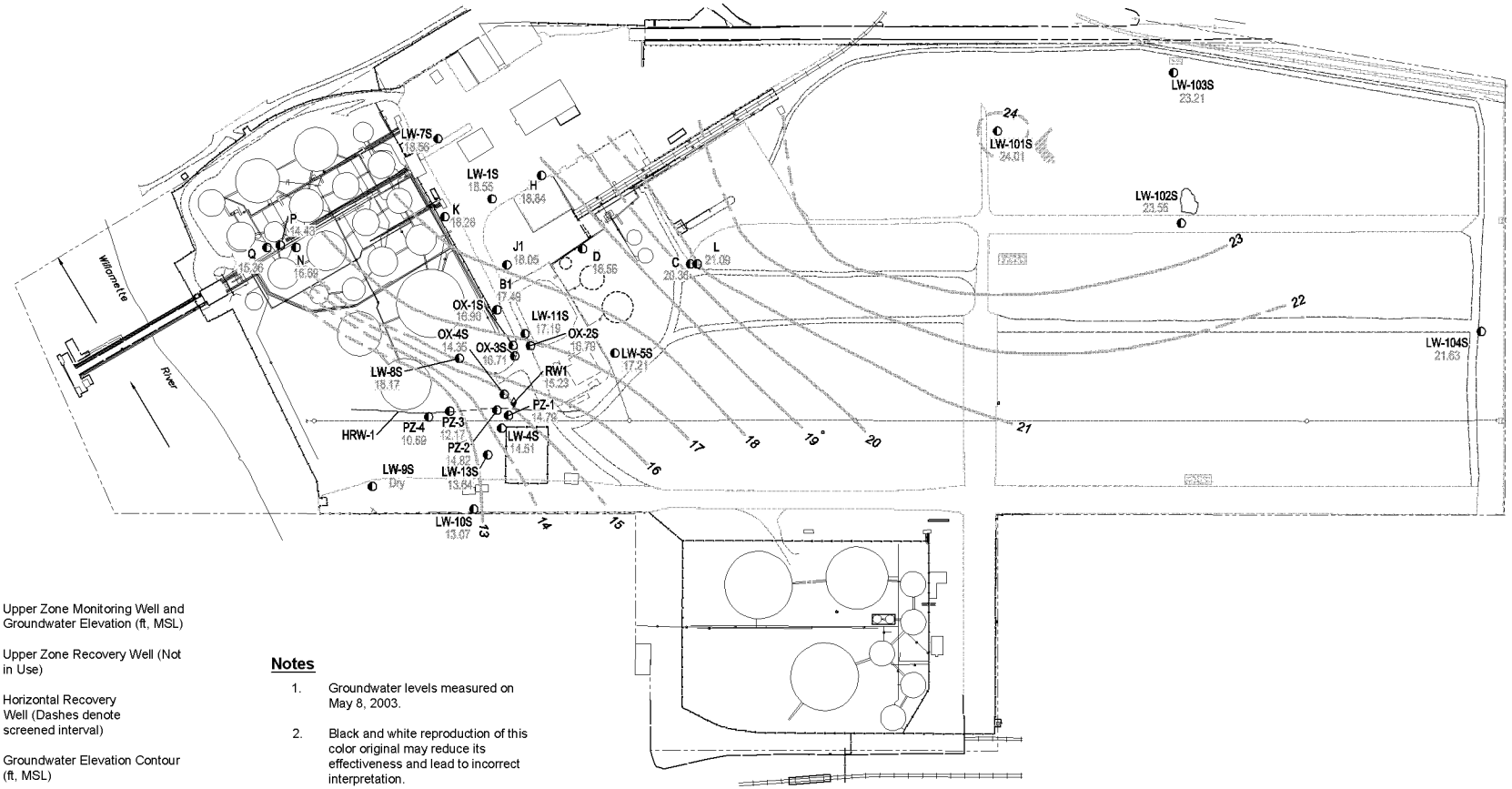
0 100 200
Scale in Feet
Vertical Exaggeration 5X

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Cross Section L-L'**	Figure 6-13

Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig6-13.dwg (A) "Figure 6-13" 4/29/2004

BZTO104(e)020591



Legend

- LW-8S 16.56 — Upper Zone Monitoring Well and Groundwater Elevation (ft, MSL)
- Upper Zone Recovery Well (Not in Use)
- HRW-1 — Horizontal Recovery Well (Dashes denote screened interval)
- 18 — Groundwater Elevation Contour (ft, MSL)

Notes

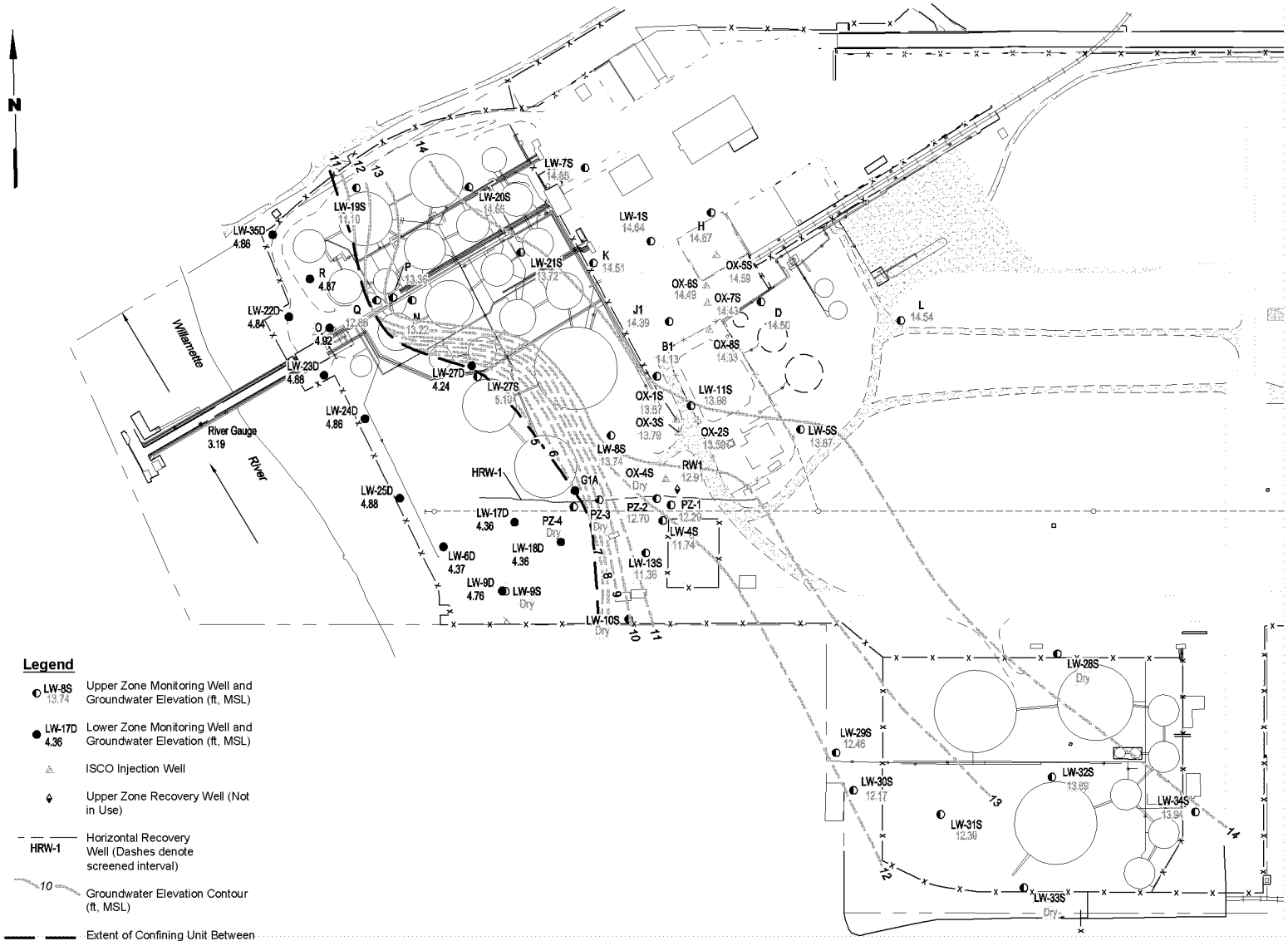
1. Groundwater levels measured on May 8, 2003.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 200 400
Scale in Feet

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Groundwater Elevation Contours Upper Zone May 2003**	Figure **6-14**

Time Oil\Phase III RI Report\ T:\231\0009\032\Phase III RI Report\Fig6-14.dwg (A) "Figure 6-14" 4/29/2004



Notes

1. Groundwater levels measured on October 23, 2003.
2. Data presented to west of confining unit boundary represent groundwater elevations where the upper and lower zones converge.

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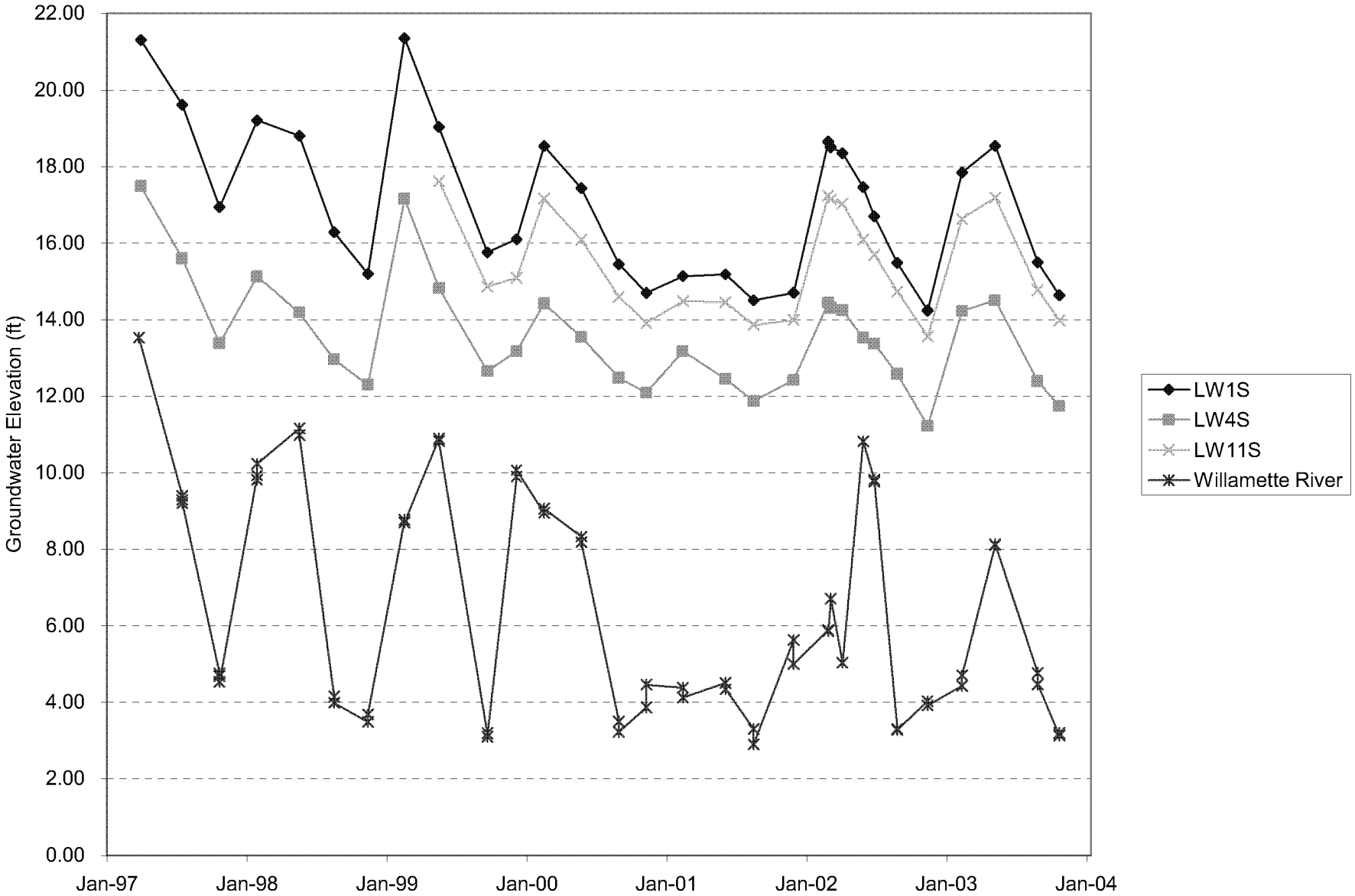
Time Oil NW Terminal Portland, Oregon	**Groundwater Elevation Contours Upper Zone October 2003**	Figure **6-15**

Time Oil\Phase III RI Report | T:\23\10009\0029\Phase III RI Report\Fig6-15.dwg (A) "Figure 6-15" 4/29/2004

BZTO104(e)020593

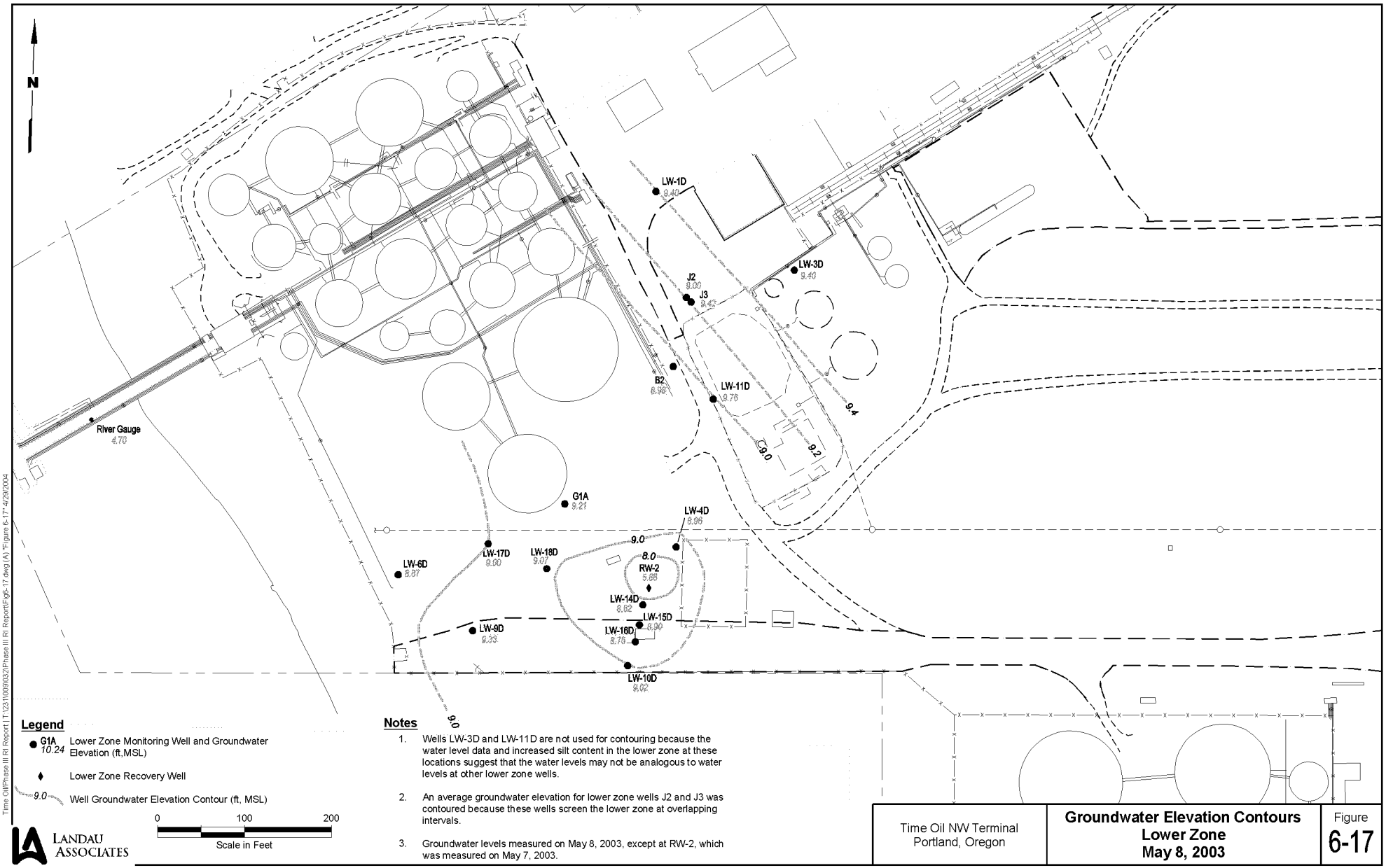


LANDAU ASSOCIATES

Time Oil Northwest Terminal
Portland, Oregon

Seasonal Trends
Upper Zone and River
March 1997 - October 2003

Figure
6-16



Legend

- G1A 10.24 — Lower Zone Monitoring Well and Groundwater Elevation (ft,MSL)
- Lower Zone Recovery Well
- 9.0 — Well Groundwater Elevation Contour (ft, MSL)

0 100 200
Scale in Feet

Notes

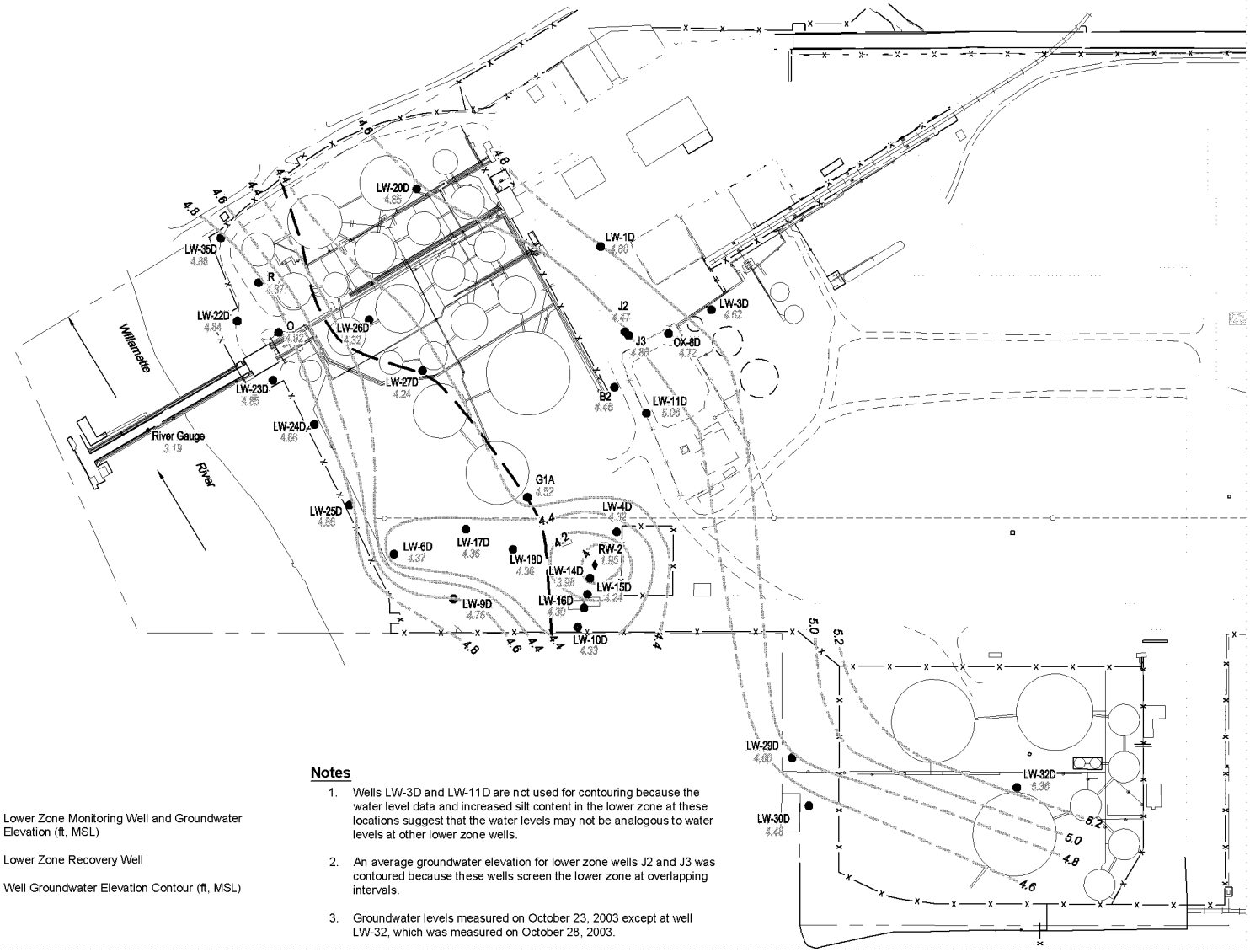
1. Wells LW-3D and LW-11D are not used for contouring because the water level data and increased silt content in the lower zone at these locations suggest that the water levels may not be analogous to water levels at other lower zone wells.
2. An average groundwater elevation for lower zone wells J2 and J3 was contoured because these wells screen the lower zone at overlapping intervals.
3. Groundwater levels measured on May 8, 2003, except at RW-2, which was measured on May 7, 2003.

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Groundwater Elevation Contours Lower Zone May 8, 2003**	Figure 6-17

Time Oil\Phase III RI Report | T:\231\009\032\Phase III RI Report\Fig6-17.dwg (A) "Figure 6-17" 4/29/2004

BZTO104(e)020595



Legend

- G1A 4.52 — Lower Zone Monitoring Well and Groundwater Elevation (ft, MSL)
- Lower Zone Recovery Well
- 4.8 — Well Groundwater Elevation Contour (ft, MSL)

Notes

1. Wells LW-3D and LW-11D are not used for contouring because the water level data and increased silt content in the lower zone at these locations suggest that the water levels may not be analogous to water levels at other lower zone wells.
2. An average groundwater elevation for lower zone wells J2 and J3 was contoured because these wells screen the lower zone at overlapping intervals.
3. Groundwater levels measured on October 23, 2003 except at well LW-32, which was measured on October 28, 2003.

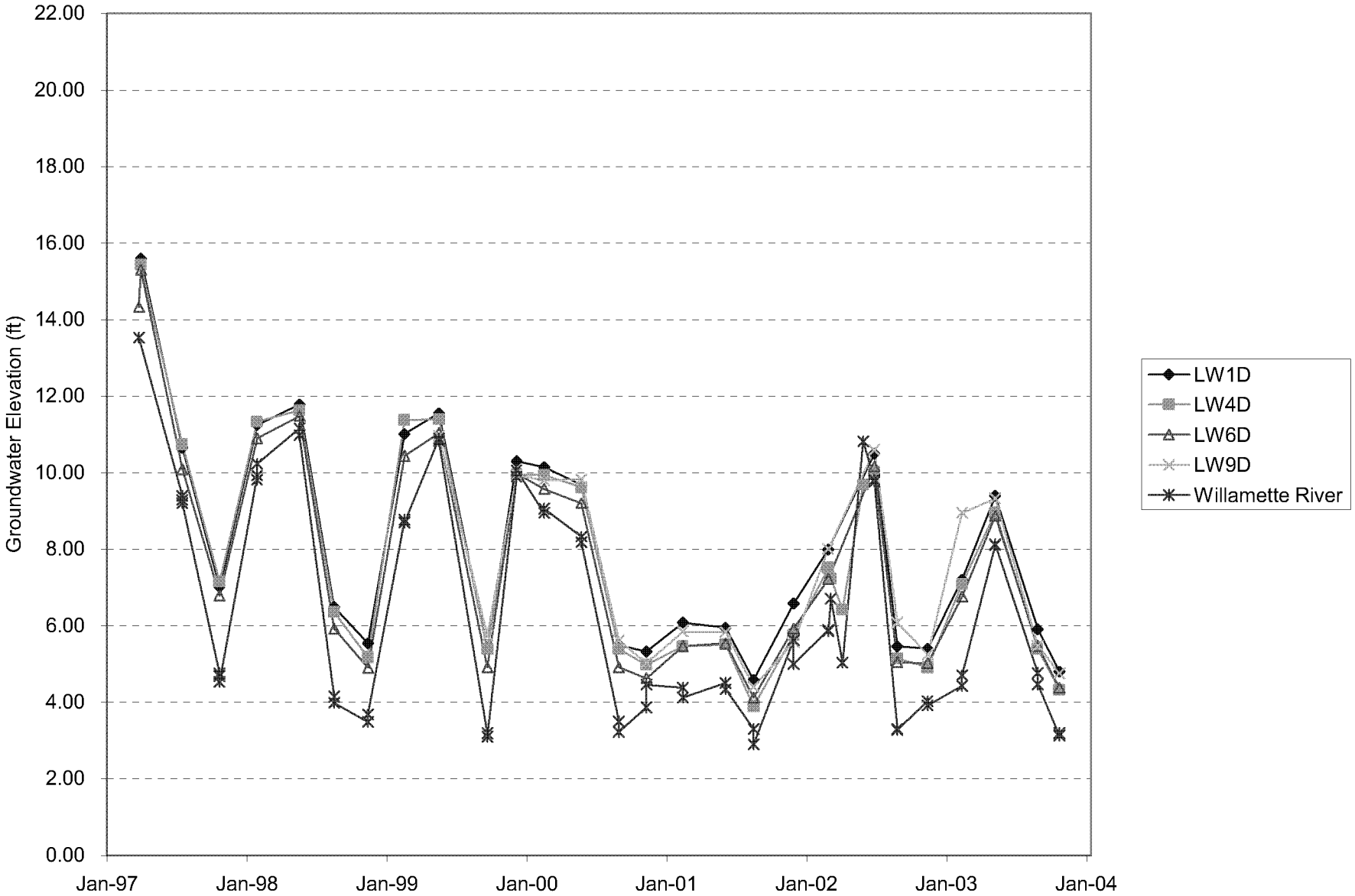
0 150 300
Scale in Feet

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Groundwater Elevation Contours Lower Zone October 2003**	Figure **6-18**

Time Oil\Phase III RI Report | T:\23\10009\022\Phase III RI Report\Fig6-18.dwg (A) "Figure 6-18" 4/29/2004

BZTO104(e)020596

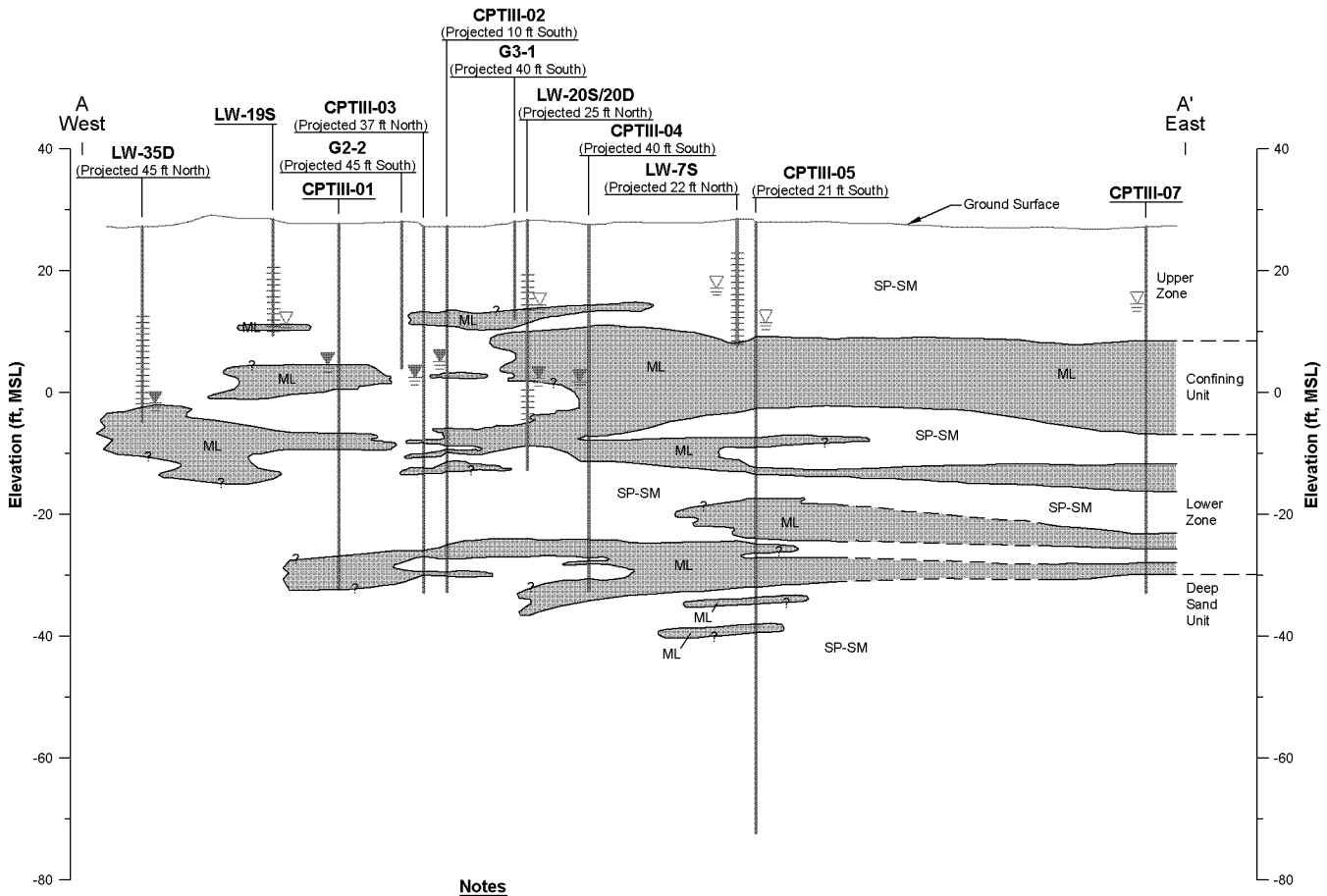


LANDAU ASSOCIATES

Time Oil Northwest Terminal
Portland, Oregon

Seasonal Trends
Lower Zone and River
March 1997 - October 2003

Figure
6-19



Notes

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Legend

- SP-SM — Predominantly gray and brown fine to medium SAND with silt
- ML — Predominantly gray SILT with fine sand
- Monitoring well screen interval
- Groundwater level within the upper zone (See Note 5)
- Groundwater level within the lower zone (See Note 5)

0 100 200
Scale in Feet
Vertical Exaggeration 5X

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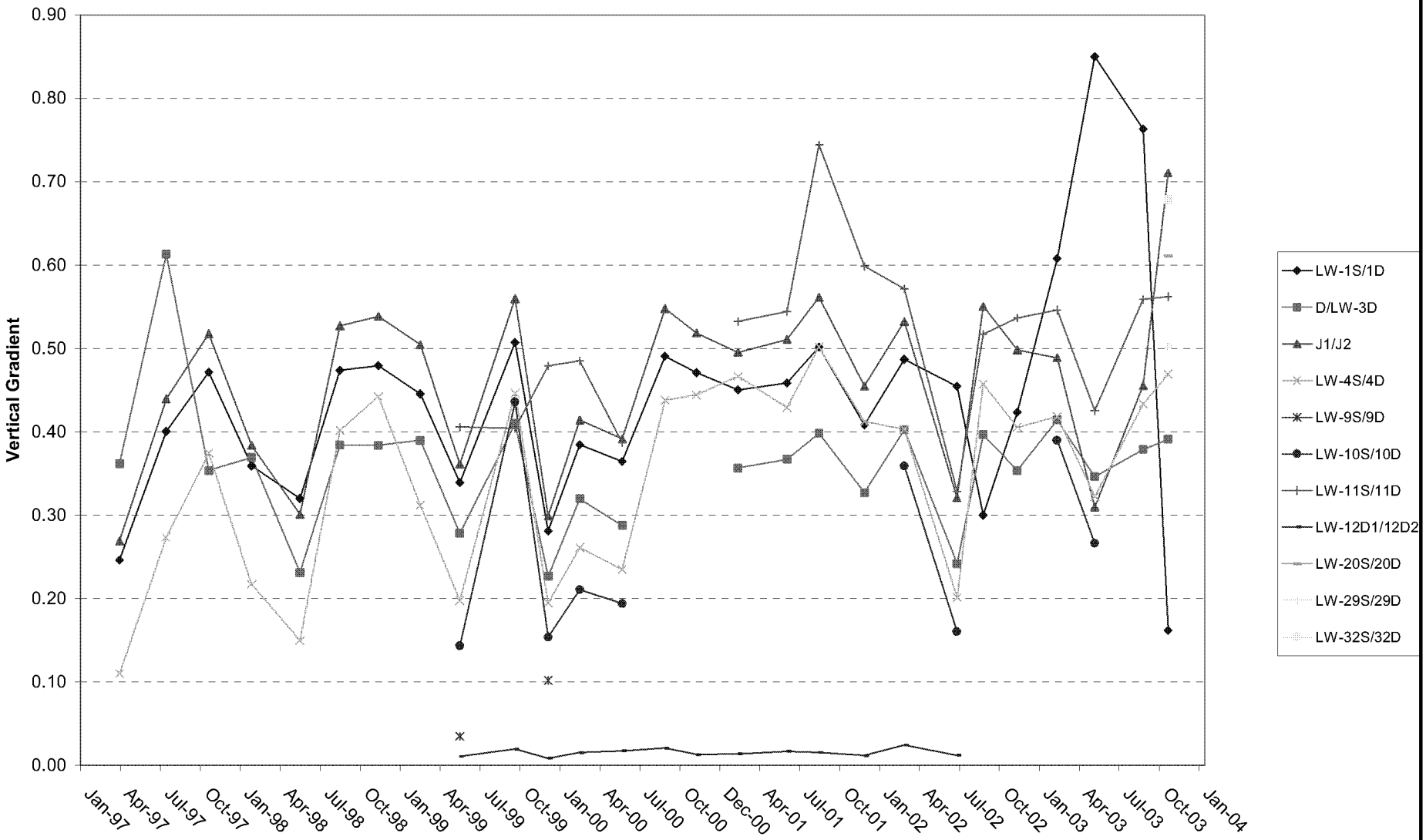
Time Oil NW Terminal Portland, Oregon	**Cross Section A-A'**	Figure 6-2

Time Oil\Phase III RI Report | T:\23\10009\002\Phase III RI Report\Fig6-2.dwg (A) "Figure 6-2" 4/29/2004

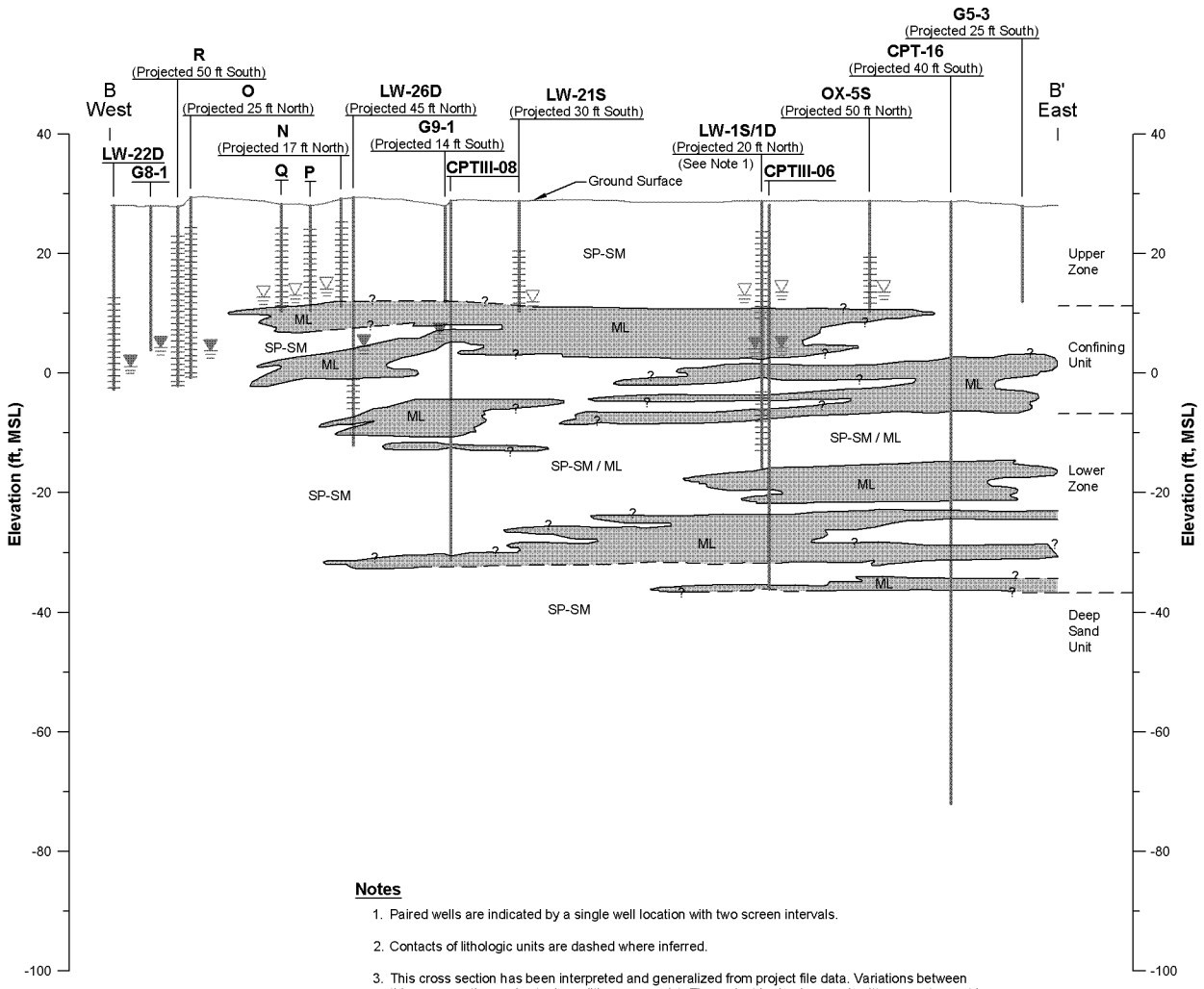


LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

Groundwater Vertical Gradients

Figure
6-20



Notes

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Legend

- SP-SM — Predominantly gray and brown fine to medium SAND with silt
- ML — Predominantly gray SILT with fine sand
- Monitoring well screen interval
- Groundwater level within the upper zone (See Note 5)
- Groundwater level within the lower zone (See Note 5)

0 100 200
Scale in Feet
Vertical Exaggeration 5X

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Cross Section B-B'**	Figure 6-3

Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig6-3.dwg (A) 'Figure 6-3' 4/29/2004

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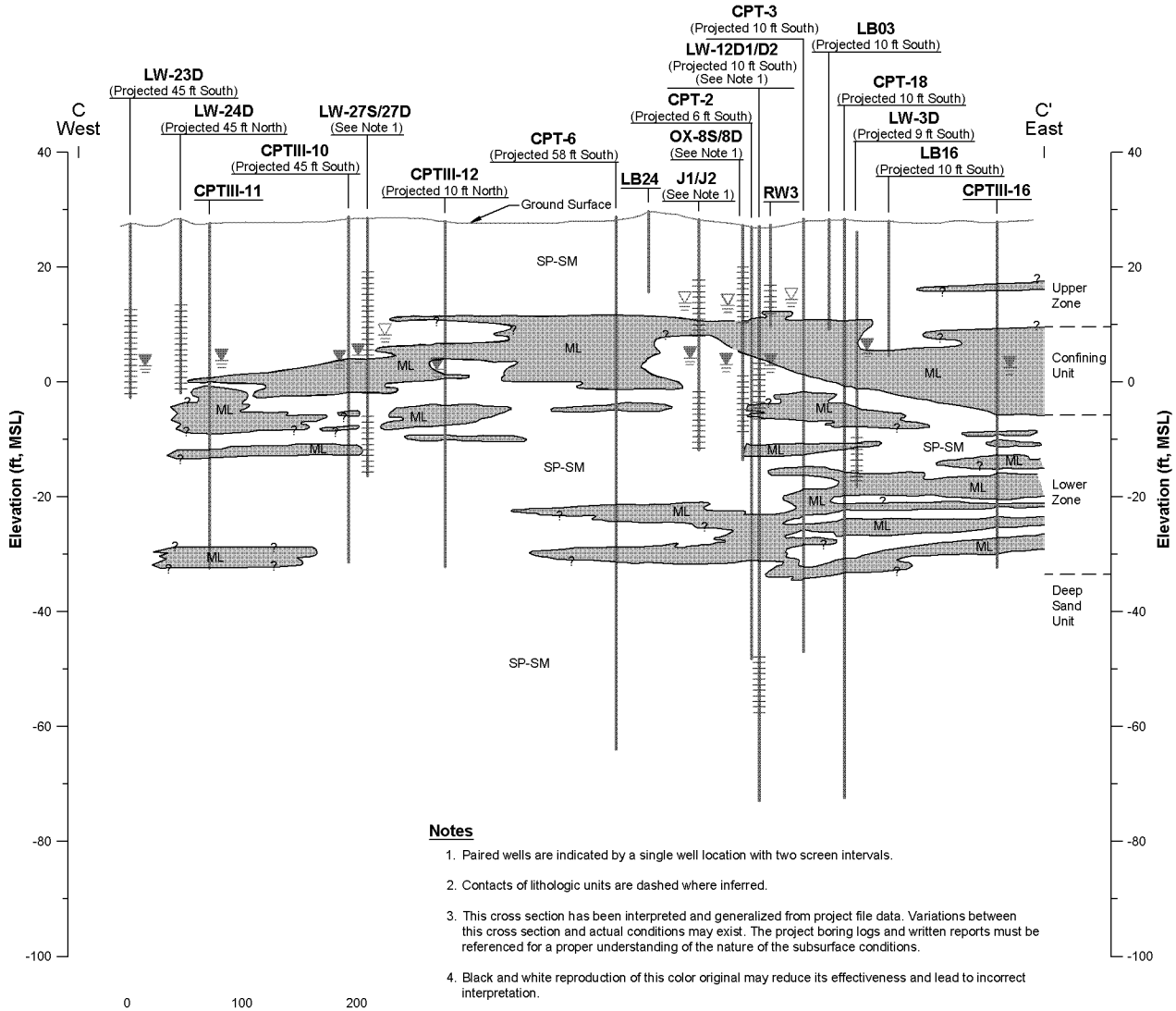

Notes

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3. This cross section has been interpreted and generalized from project file data. Variations between this cross section and actual conditions may exist. The project boring logs and written reports must be referenced for a proper understanding of the nature of the subsurface conditions.
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Legend

- SP-SM — Predominantly gray and brown fine to medium SAND with silt
- ML — Predominantly gray SILT with fine sand
- Monitoring Well Screen Interval
- Groundwater level within the upper zone (See Note 5)
- Groundwater level within the lower zone (See Note 5)

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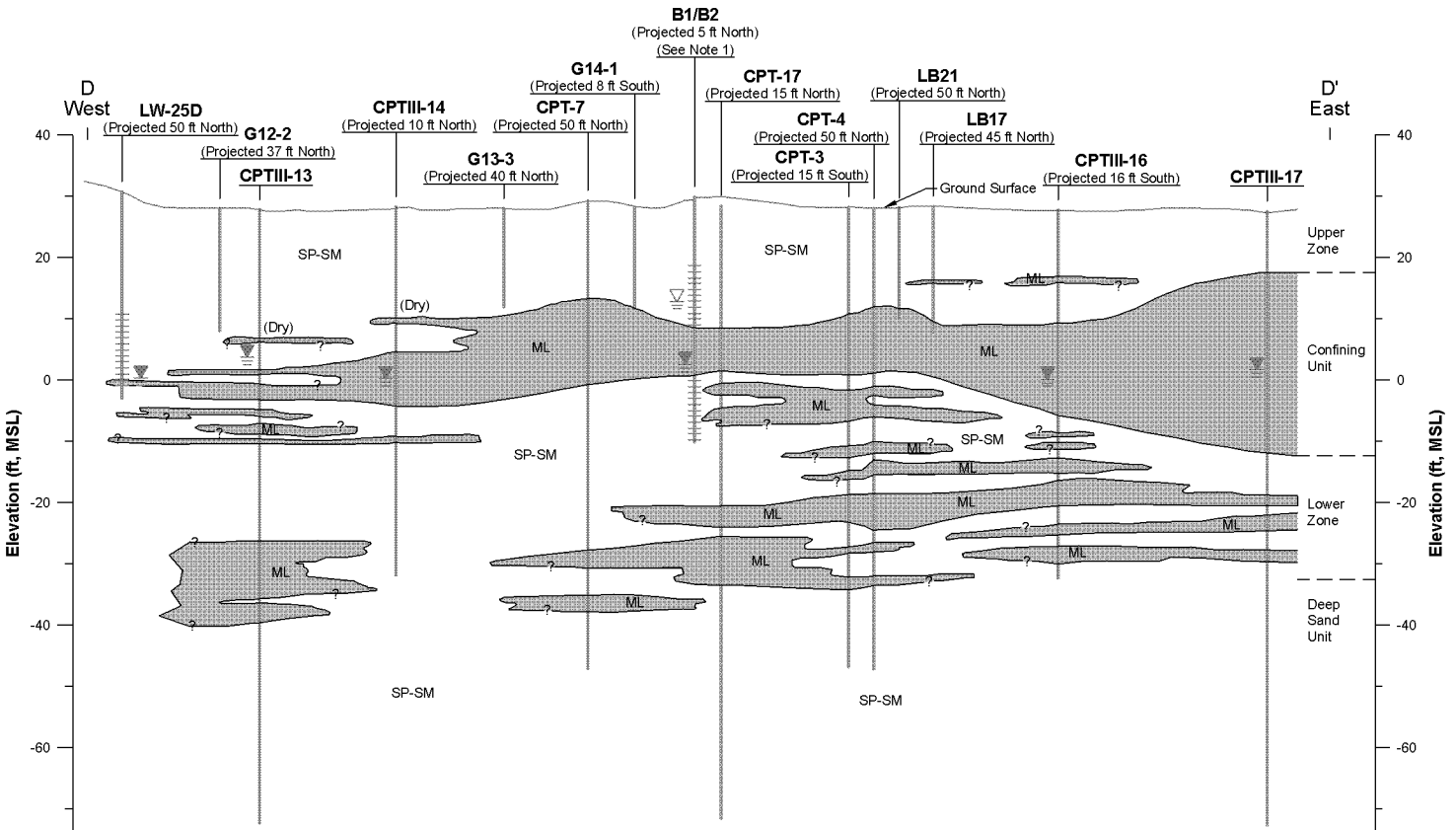
Time Oil NW Terminal Portland, Oregon	**Cross Section C-C'**	Figure 6-4

Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig6-4.dwg (A) "Figure 6-4" 4/29/2004

BZTO104(e)020601



Notes

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2. Contacts of lithologic units are dashed where inferred.
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Legend

- SP-SM — Predominantly gray and brown fine to medium SAND with silt
- ML — Predominantly gray SILT with fine sand
- Monitoring Well Screen Interval
- Groundwater level within the upper zone (See Note 5)
- Groundwater level within the lower zone (See Note 5)

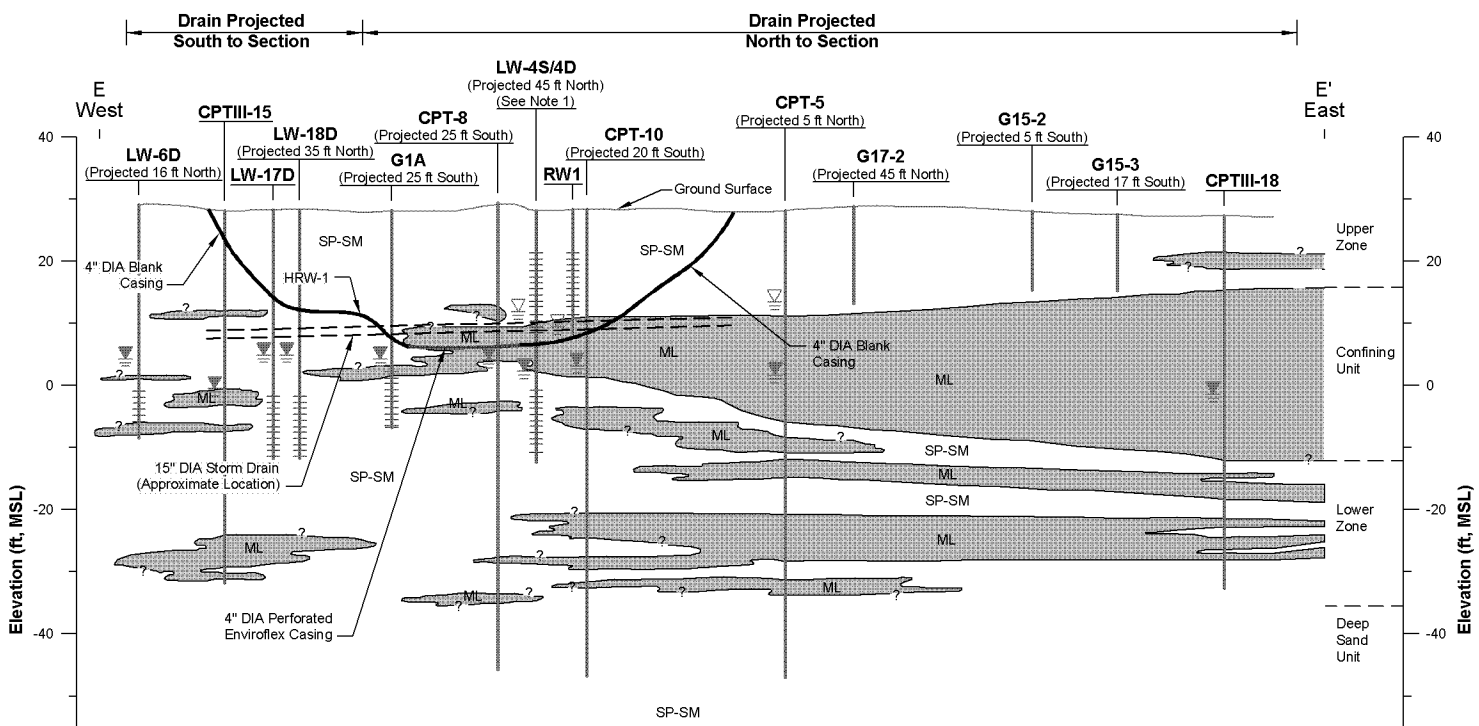
0 100 200
Scale in Feet
Vertical Exaggeration 5X

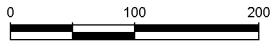
LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Cross Section D-D'**	Figure 6-5

Time Oil\Phase III RI Report\ T:\231\0009\032\Phase III RI Report\Fig6-5.dwg (A) 'Figure 6-5' 4/29/2004

BZTO104(e)020602





Notes

1. Paired wells are indicated by a single well location with two screen intervals.
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3. This cross section has been interpreted and generalized from project file data. Variations between this cross section and actual conditions may exist. The project boring logs and written reports must be referenced for a proper understanding of the nature of the subsurface conditions.
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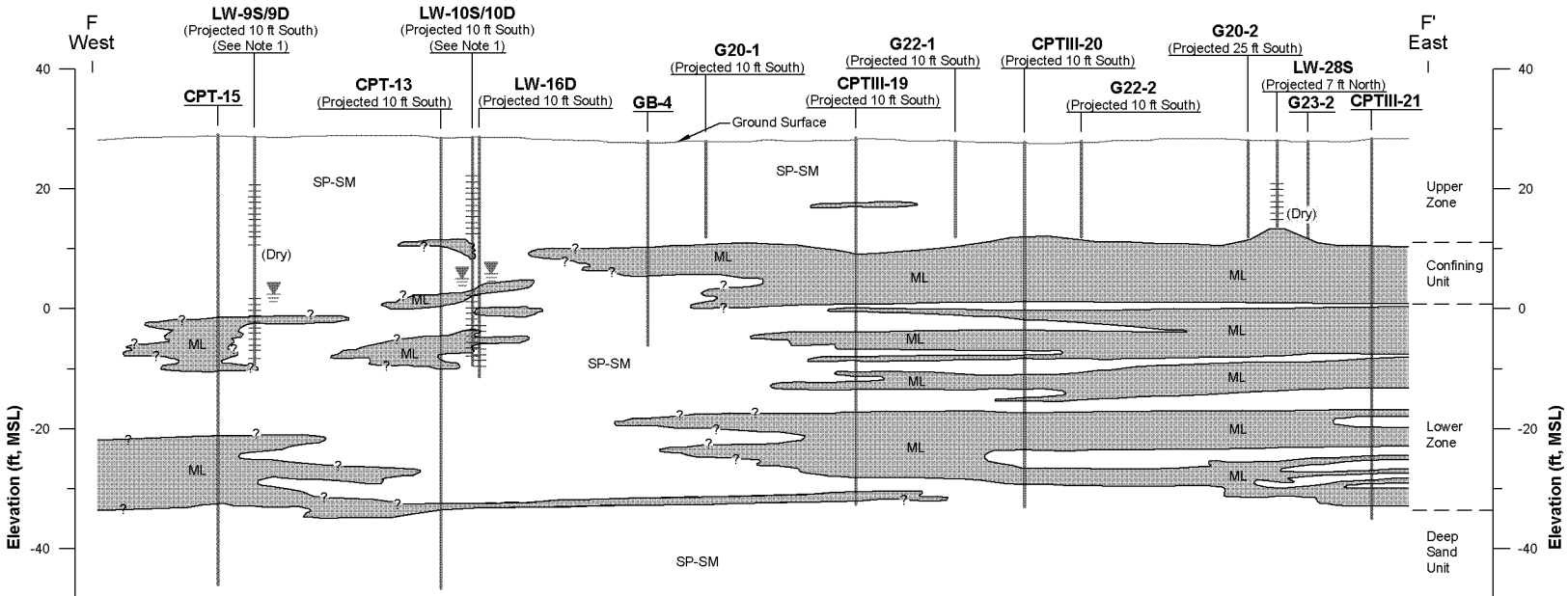
Legend

- SP-SM — Predominantly gray and brown fine to medium SAND with silt
- ML — Predominantly gray SILT with fine sand
- Monitoring Well Screen Interval
- Groundwater level within the upper zone (See Note 5)
- Groundwater level within the lower zone (See Note 5)
- Approximate Location of East-West Trending Storm Drain

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Cross SectionE-E'**	Figure 6-6

Time Oil\Phase III RI Report\T:\23\10009\022\Phase III RI Report\Fig6-6.dwg (A) "Figure 6-6" 4/30/2004



Legend:

SP-SM	Predominantly gray and brown fine to medium SAND with silt
ML	Predominantly gray SILT with fine sand
	Monitoring well screen interval
	Groundwater level within the lower zone (See Note 5)

Notes

1. Paired wells are indicated by a single well location with two screen intervals.
2. Contacts of lithologic units are dashed where inferred.
3. This cross section has been interpreted and generalized from project file data. Variations between this cross section and actual conditions may exist. The project boring logs and written reports must be referenced for a proper understanding of the nature of the subsurface conditions.
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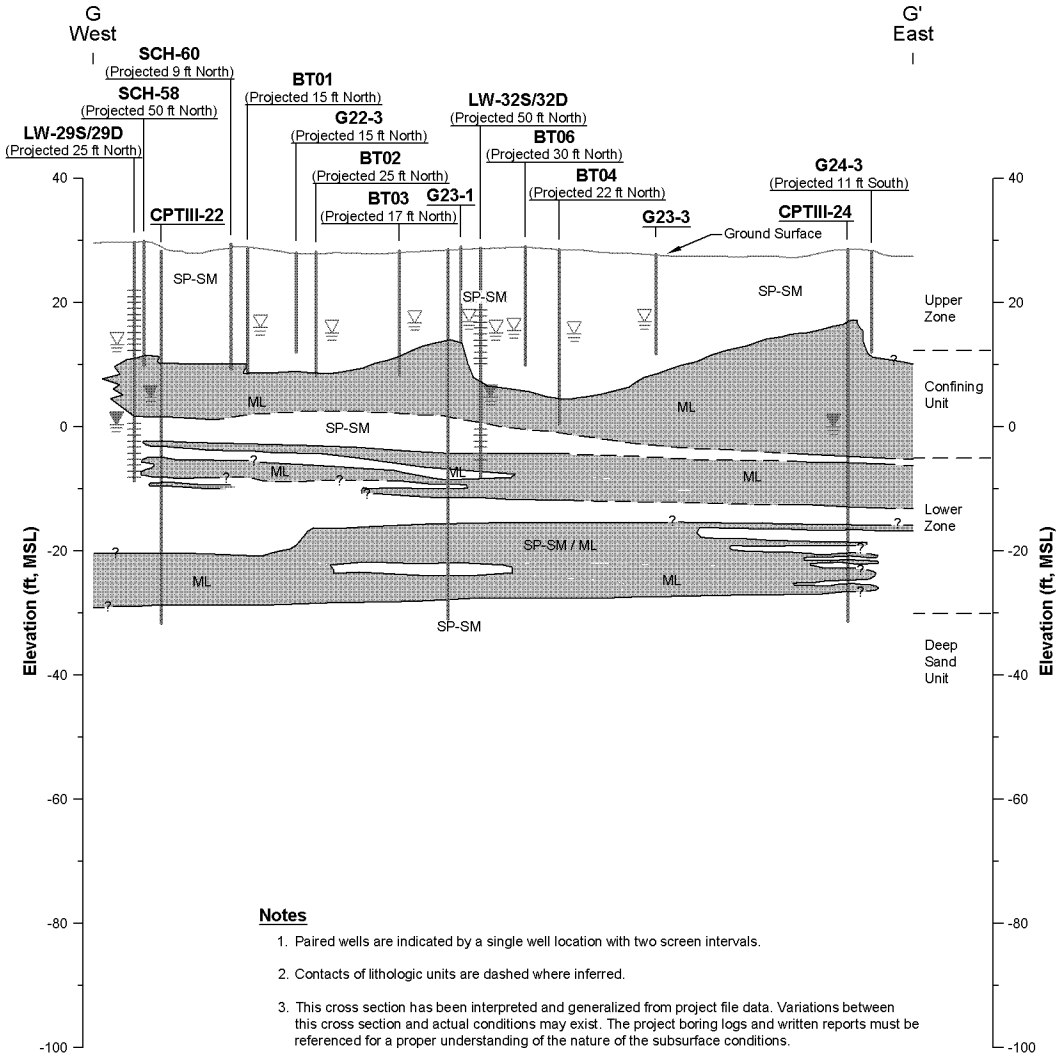
0 100 200
Scale in Feet
Vertical Exaggeration 5X

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Cross Section F-F'**	Figure **6-7**

Time Oil\Phase III RI Report | T:\23\10009\002\Phase III RI Report\Fig6-7.dwg (A) "Figure 6-7" 4/29/2004



0 100 200

Scale in Feet
Vertical Exaggeration 5X

Notes

1. Paired wells are indicated by a single well location with two screen intervals.
2. Contacts of lithologic units are dashed where inferred.
3. This cross section has been interpreted and generalized from project file data. Variations between this cross section and actual conditions may exist. The project boring logs and written reports must be referenced for a proper understanding of the nature of the subsurface conditions.
4. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
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Legend

- SP-SM — Predominantly gray and brown fine to medium SAND with silt
- ML — Predominantly gray SILT with fine sand
- Monitoring Well Screen Interval
- Groundwater level within the upper zone (See Note 5)
- Groundwater level within the lower zone (See Note 5)

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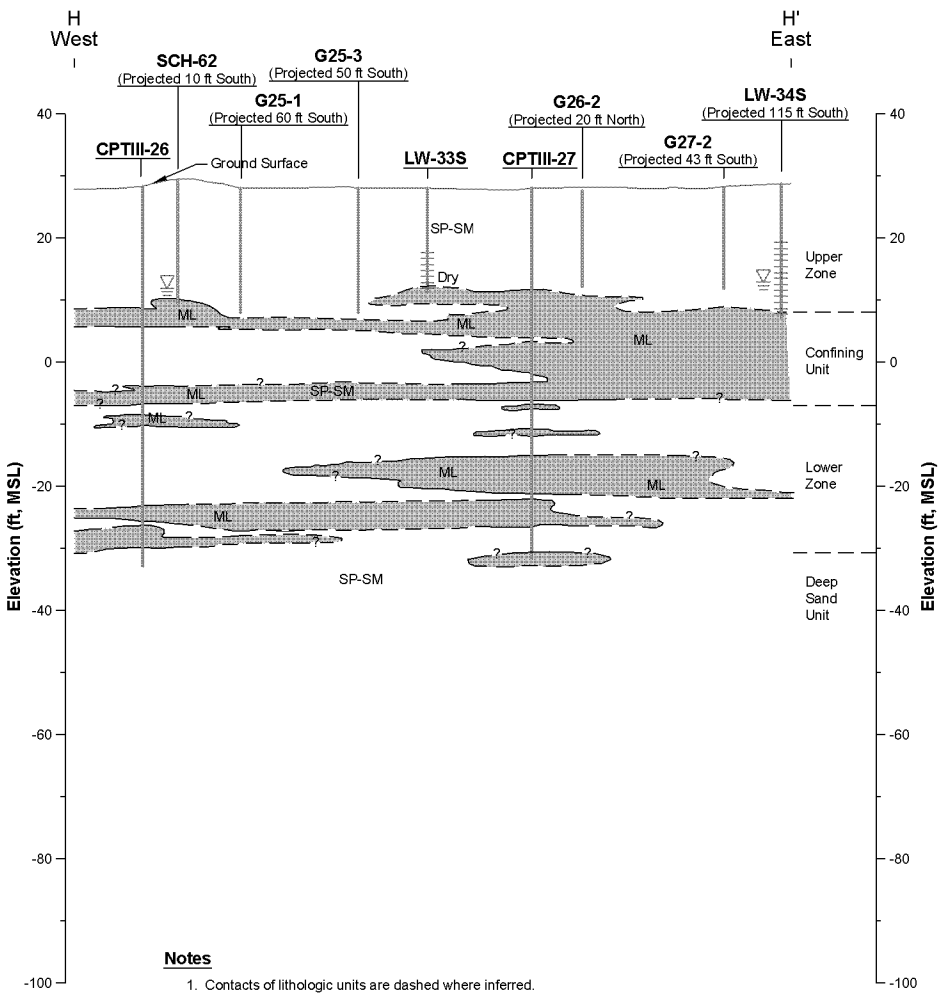
Time Oil NW Terminal Portland, Oregon	**Cross Section G-G'**	Figure 6-8

Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig6-8.dwg (A) "Figure 6-8" 4/29/2004

BZTO104(e)020605



Notes

1. Contacts of lithologic units are dashed where inferred.
2. This cross section has been interpreted and generalized from project file data. Variations between this cross section and actual conditions may exist. The project boring logs and written reports must be referenced for a proper understanding of the nature of the subsurface conditions.
3. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
4. Groundwater levels at all new phase III wells were measured at time of installation in September 2003. The groundwater level at temporary well point, SCH-62, was measured on October 9, 2001.

Legend

- SP-SM — Predominantly gray and brown fine to medium SAND with silt
- ML — Predominantly gray SILT with fine sand
- Monitoring Well Screen Interval
- Groundwater level within the upper zone (See Note 4)

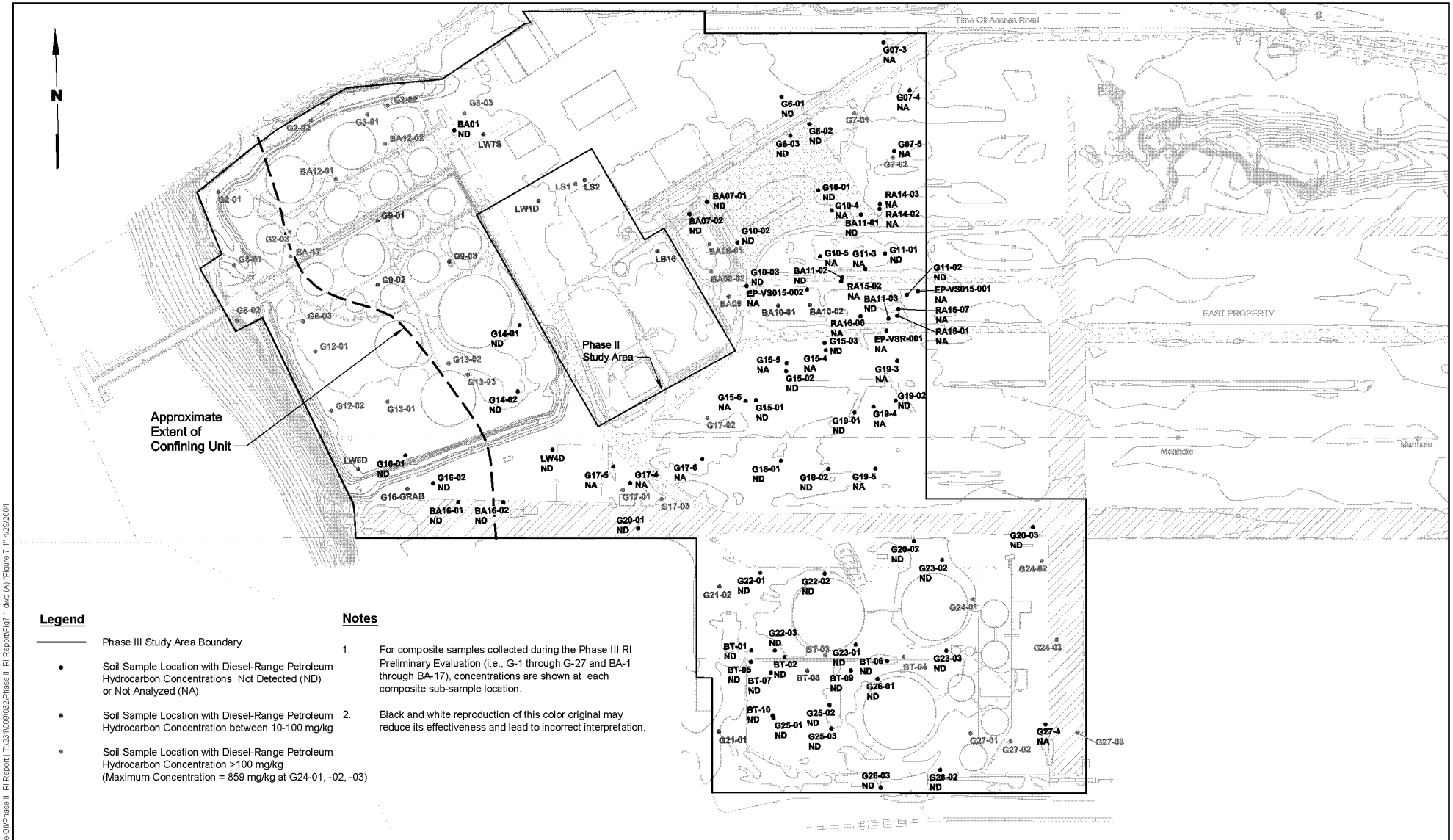
0 100 200
Scale in Feet
Vertical Exaggeration 5X

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Cross Section H-H'**	Figure 6-9

Time Oil\Phase III RI Report\ T:\231\0009\032\Phase III RI Report\Fig6-9.dwg (A) "Figure 6-9" 4/29/2004

BZTO104(e)020606



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Diesel-Range Petroleum Hydrocarbon Concentrations Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Diesel-Range Petroleum Hydrocarbon Concentration between 10-100 mg/kg
- Soil Sample Location with Diesel-Range Petroleum Hydrocarbon Concentration >100 mg/kg (Maximum Concentration = 859 mg/kg at G24-01, -02, -03)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

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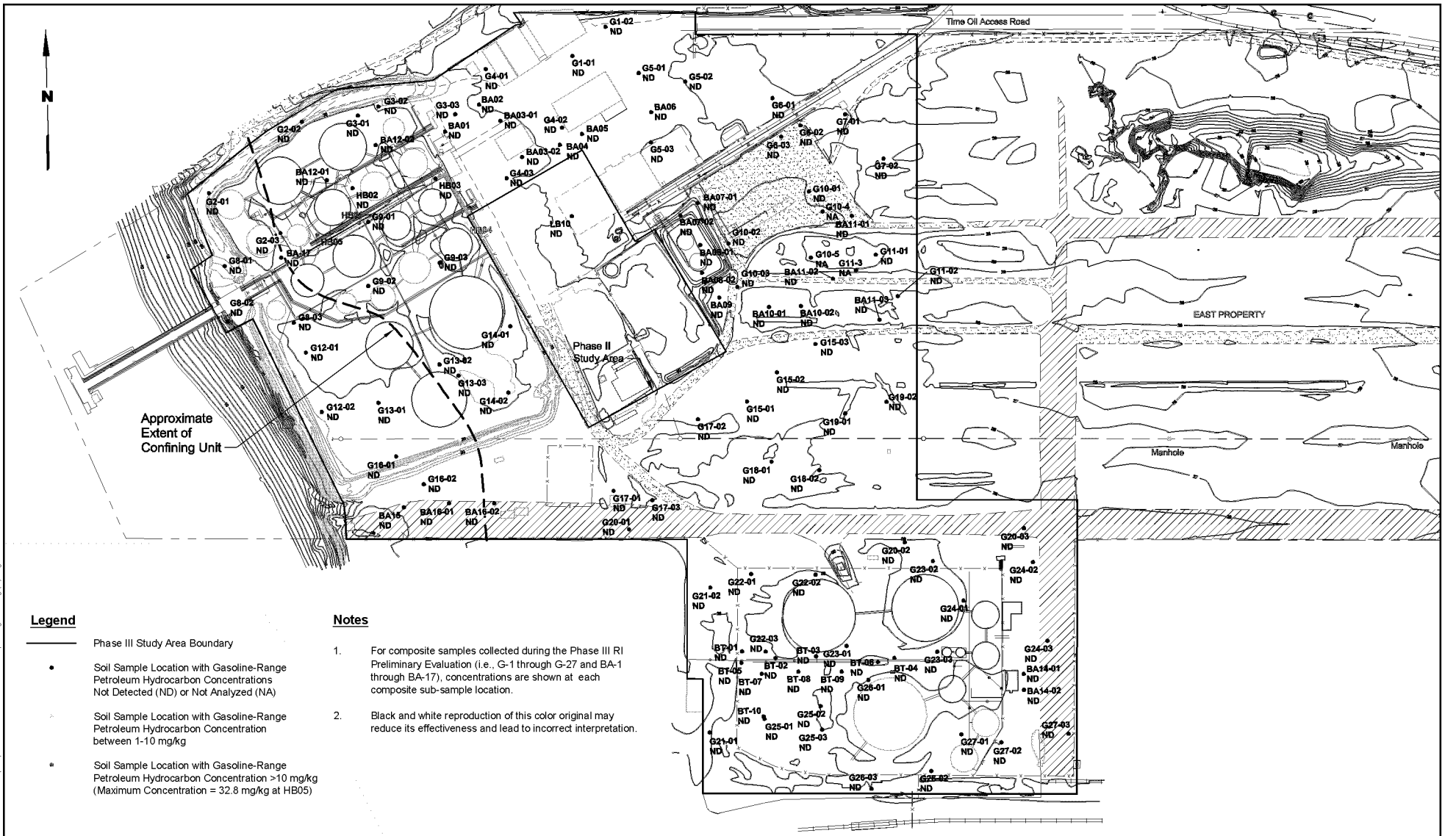
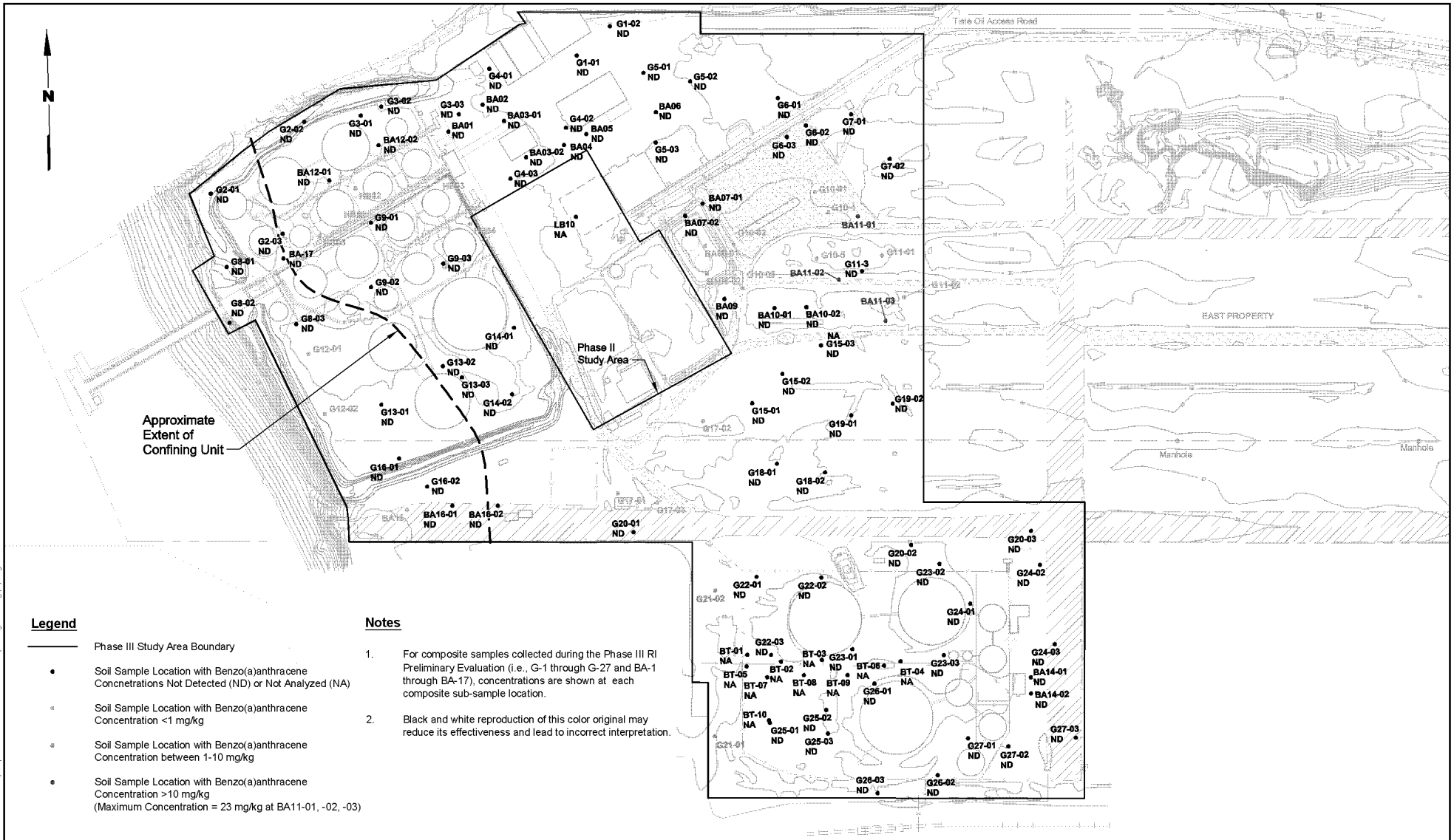
Time Oil NW Terminal Portland, Oregon	**Diesel-Range Petroleum Hydrocarbon Concentrations in Soil 0-0.5 ft BGS**	Figure **7-1**

Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig7-1.dwg (A) "Figure 7-1" 4/29/2004



Time Oil\Phase III RI Report | T:\23\10009023\Phase III RI Report\Fig7-10.dwg (A) "Figure 7-10" 4/30/2004

BZTO104(e)020608



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Benzo(a)anthracene Concnetrations Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Benzo(a)anthracene Concentration <1 mg/kg
- Soil Sample Location with Benzo(a)anthracene Concentration between 1-10 mg/kg
- Soil Sample Location with Benzo(a)anthracene Concentration >10 mg/kg
  (Maximum Concentration = 23 mg/kg at BA11-01, -02, -03)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

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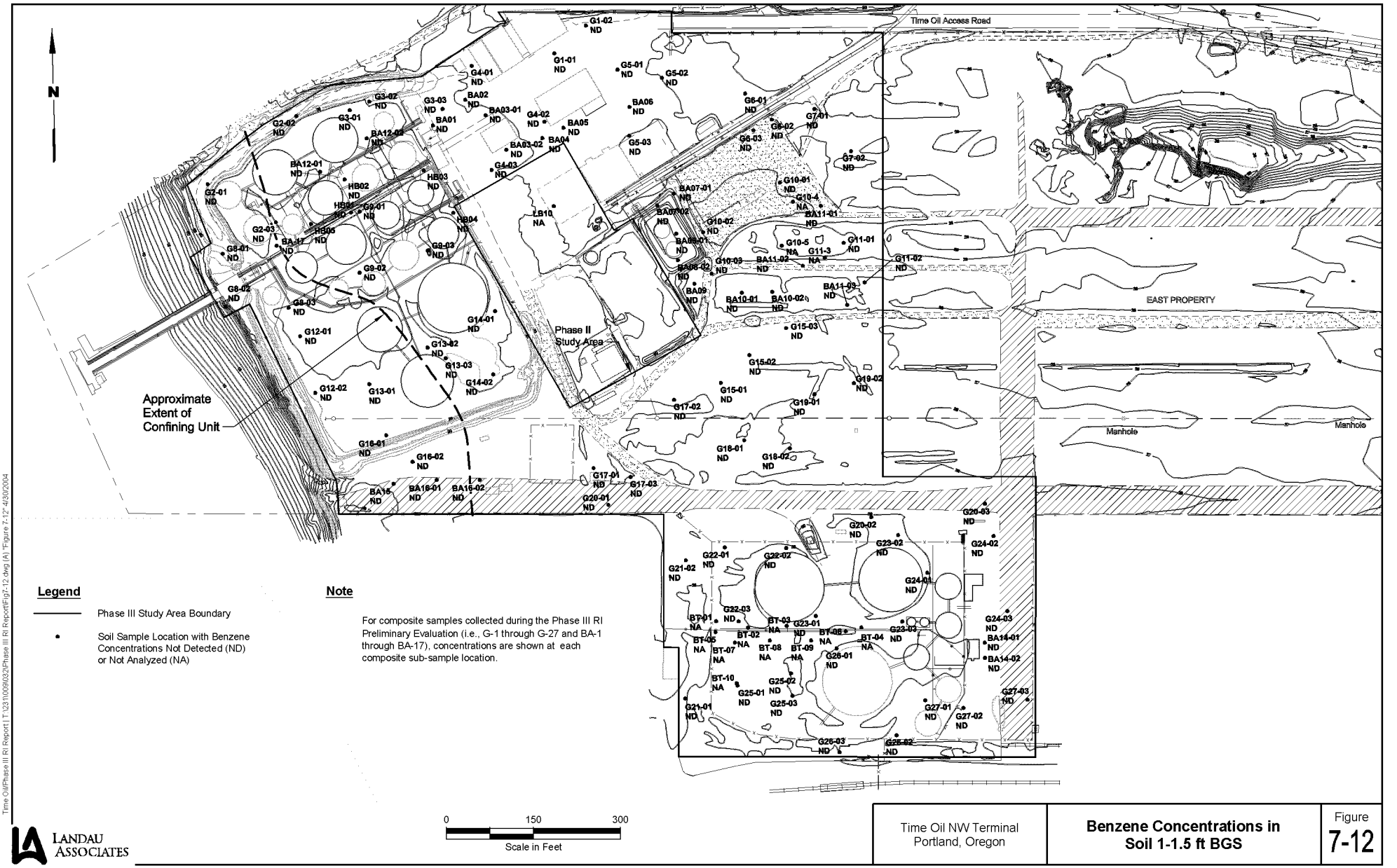
Time Oil NW Terminal Portland, Oregon	**Benzo(a)anthracene Concentrations in Soil 1-1.5 ft BGS**	Figure **7-11**

Time Oil\Phase III RI Report\ T:\23\10009\032\Phase III RI Report\Fig7-11.dwg (A) "Figure 7-11" 4/30/2004

BZTO104(e)020609



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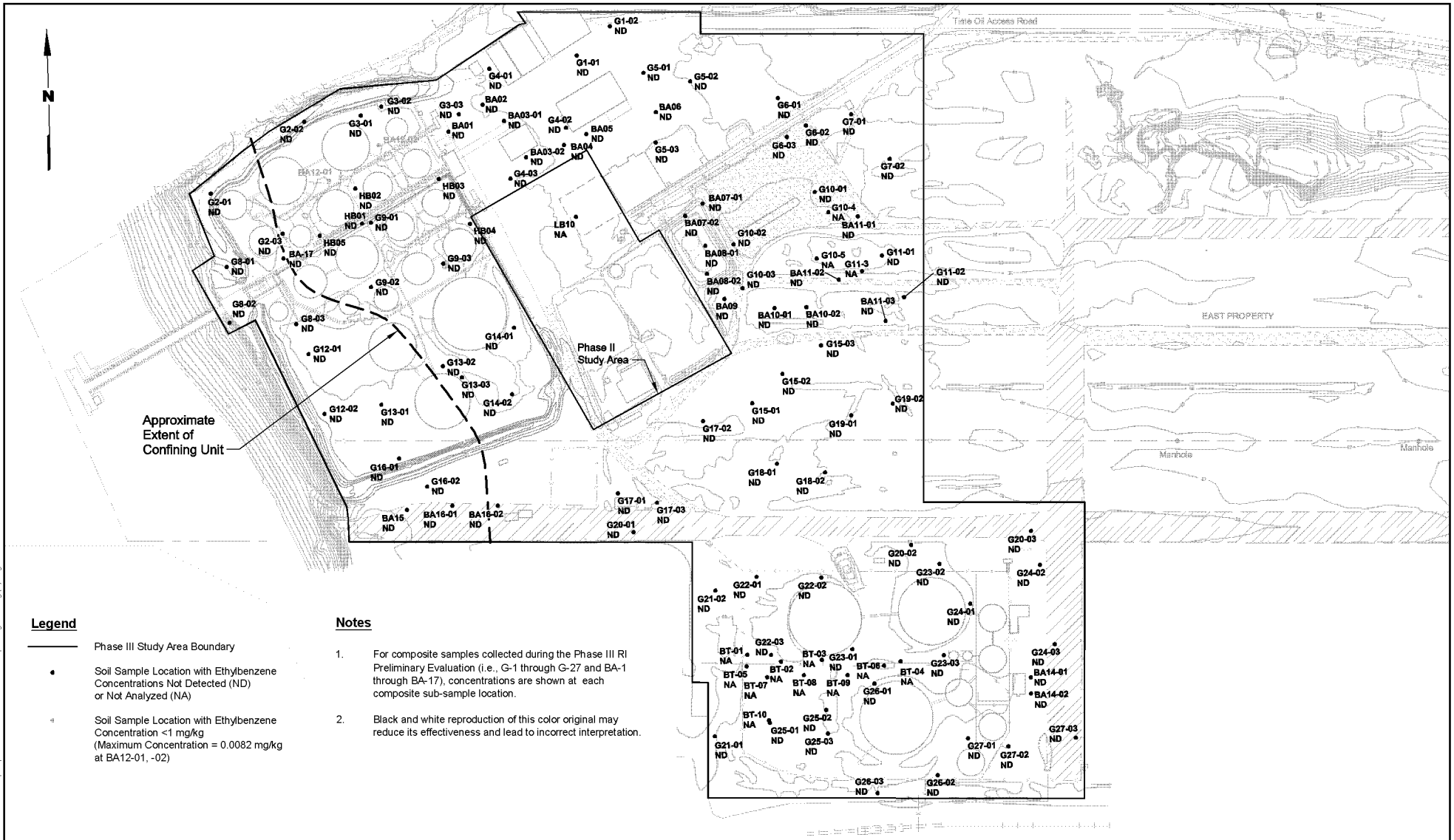
Time Oil NW Terminal Portland, Oregon	**Benzene Concentrations in Soil 1-1.5 ft BGS**	Figure **7-12**

Time Oil\Phase III RI Report\T:\23\10009023\Phase III RI Report\Fig7-12.dwg (A) 'Figure 7-12' 4/30/2004

BZTO104(e)020610



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Ethylbenzene Concentrations Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Ethylbenzene Concentration <1 mg/kg (Maximum Concentration = 0.0082 mg/kg at BA12-01, -02)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

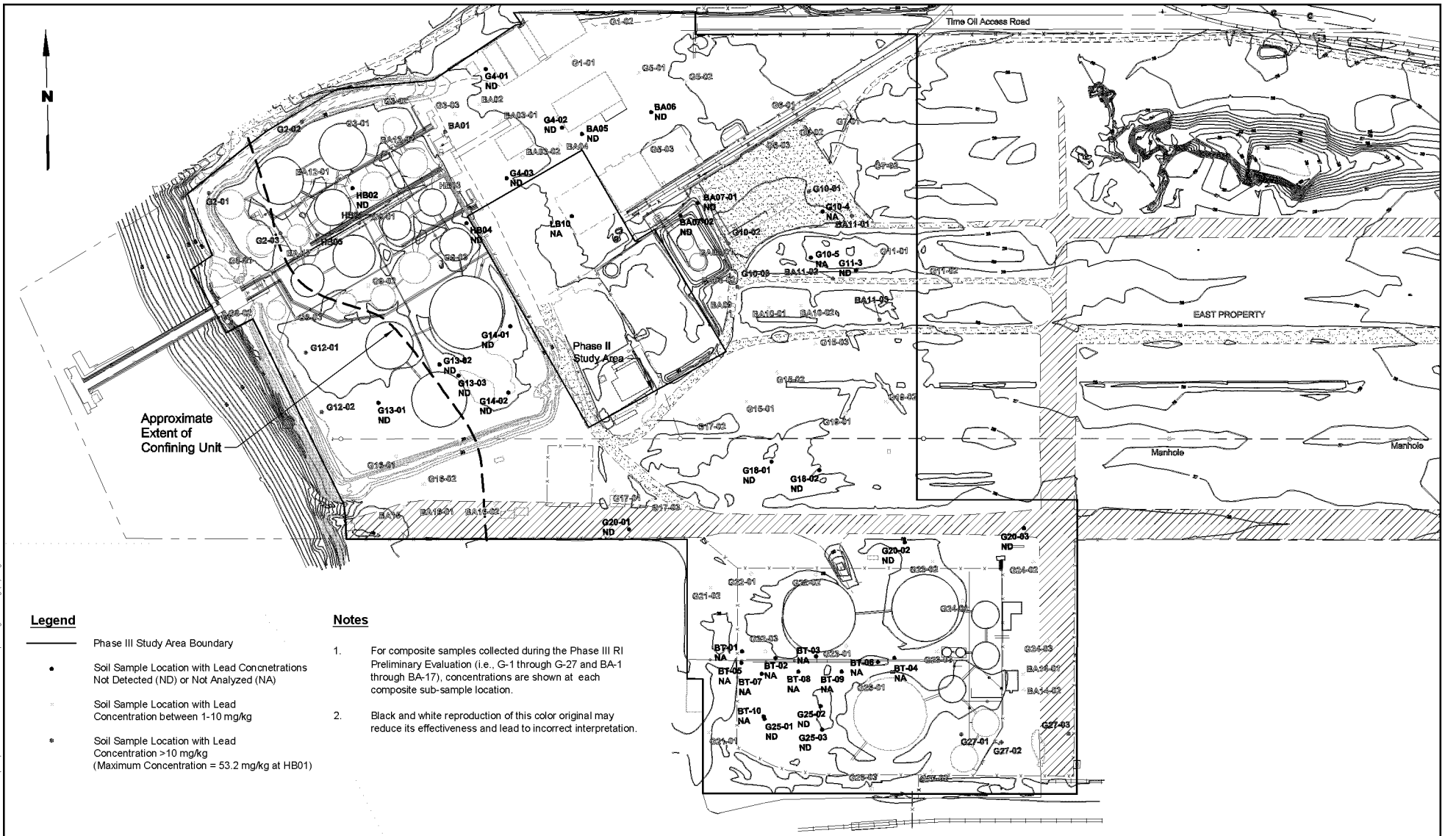
0 150 300
Scale in Feet

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Ethylbenzene Concentrations in Soil 1-1.5 ft BGS**	Figure **7-13**

Time Oil\Phase III RI Report [T:\23\10009\032\Phase III RI Report\Fig7-13.dwg (A) 'Figure 7-13' 4/30/2004

BZTO104(e)020611



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Lead Concnetrations Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Lead Concentration between 1-10 mg/kg
- Soil Sample Location with Lead Concentration >10 mg/kg (Maximum Concentration = 53.2 mg/kg at HB01)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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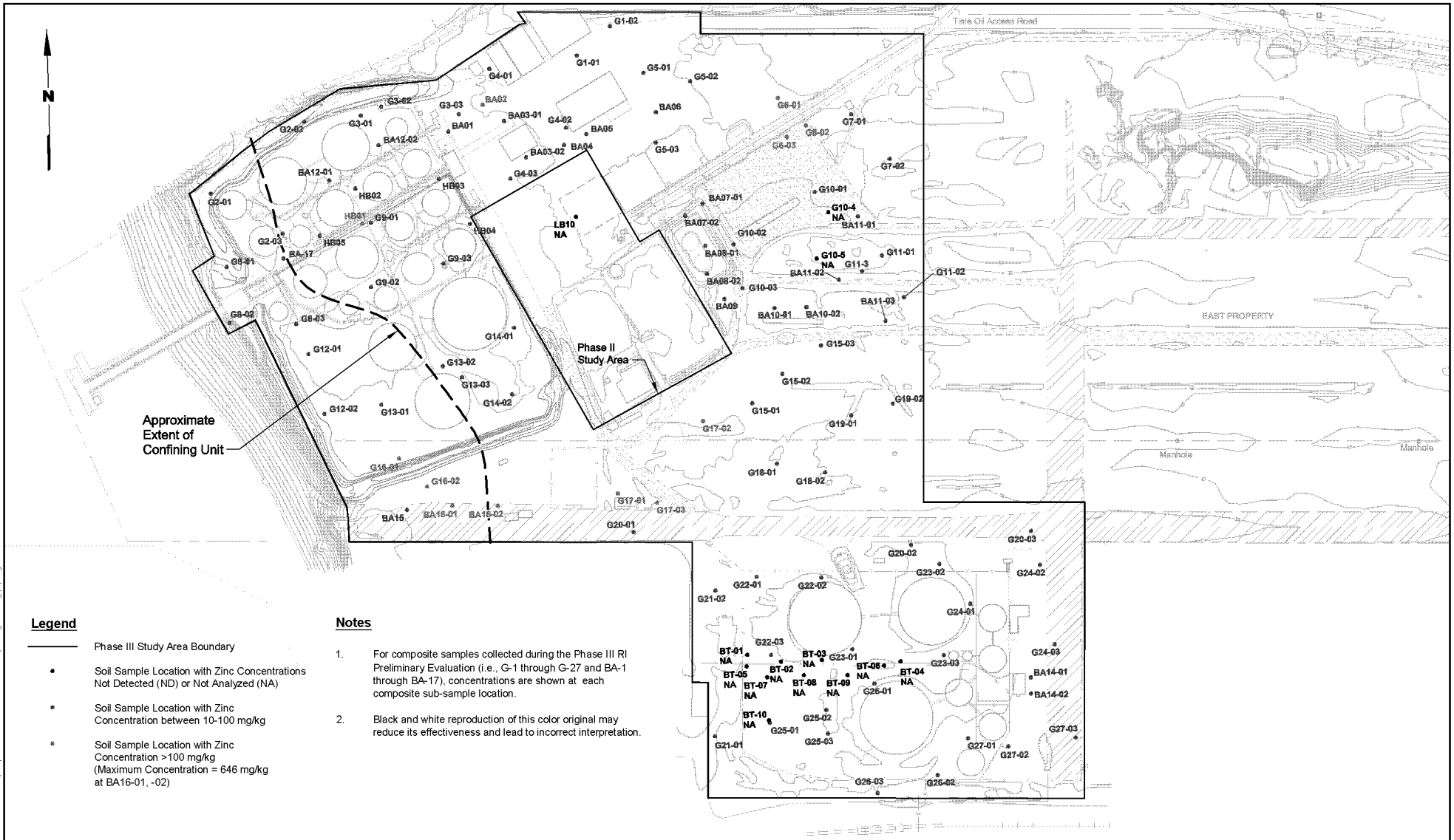
Time Oil NW Terminal Portland, Oregon	**Lead Concentrations in Soil 1-1.5 ft BGS**	Figure **7-14**

Time Oil\Phase III RI Report\T:\23\10009023\Phase III RI Report\Fig7-14.dwg (A) "Figure 7-14" 4/30/2004

BZTO104(e)020612



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Zinc Concentrations Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Zinc Concentration between 10-100 mg/kg
- Soil Sample Location with Zinc Concentration >100 mg/kg (Maximum Concentration = 646 mg/kg at BA16-01, -02)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

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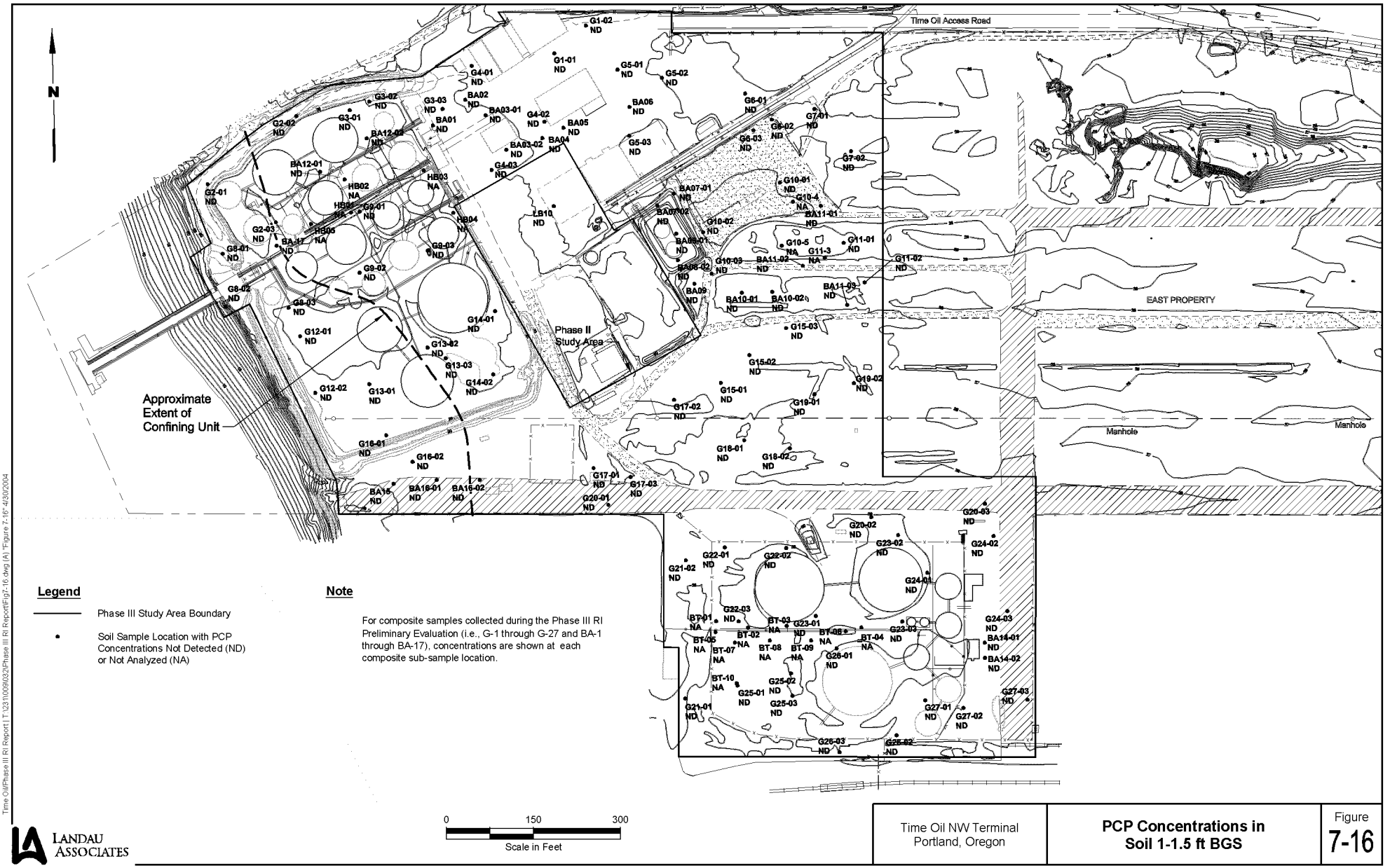
Time Oil NW Terminal Portland, Oregon	**Zinc Concentrations in Soil 1-1.5 ft BGS**	Figure **7-15**

Time Oil\Phase III RI Report\ T:\231\0009\032\Phase III RI Report\Fig7-15.dwg (A) "Figure 7-15" 4/30/2004

BZTO104(e)020613



Legend

Phase III Study Area Boundary

Soil Sample Location with PCP Concentrations Not Detected (ND) or Not Analyzed (NA)

Note

For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.

0 150 300

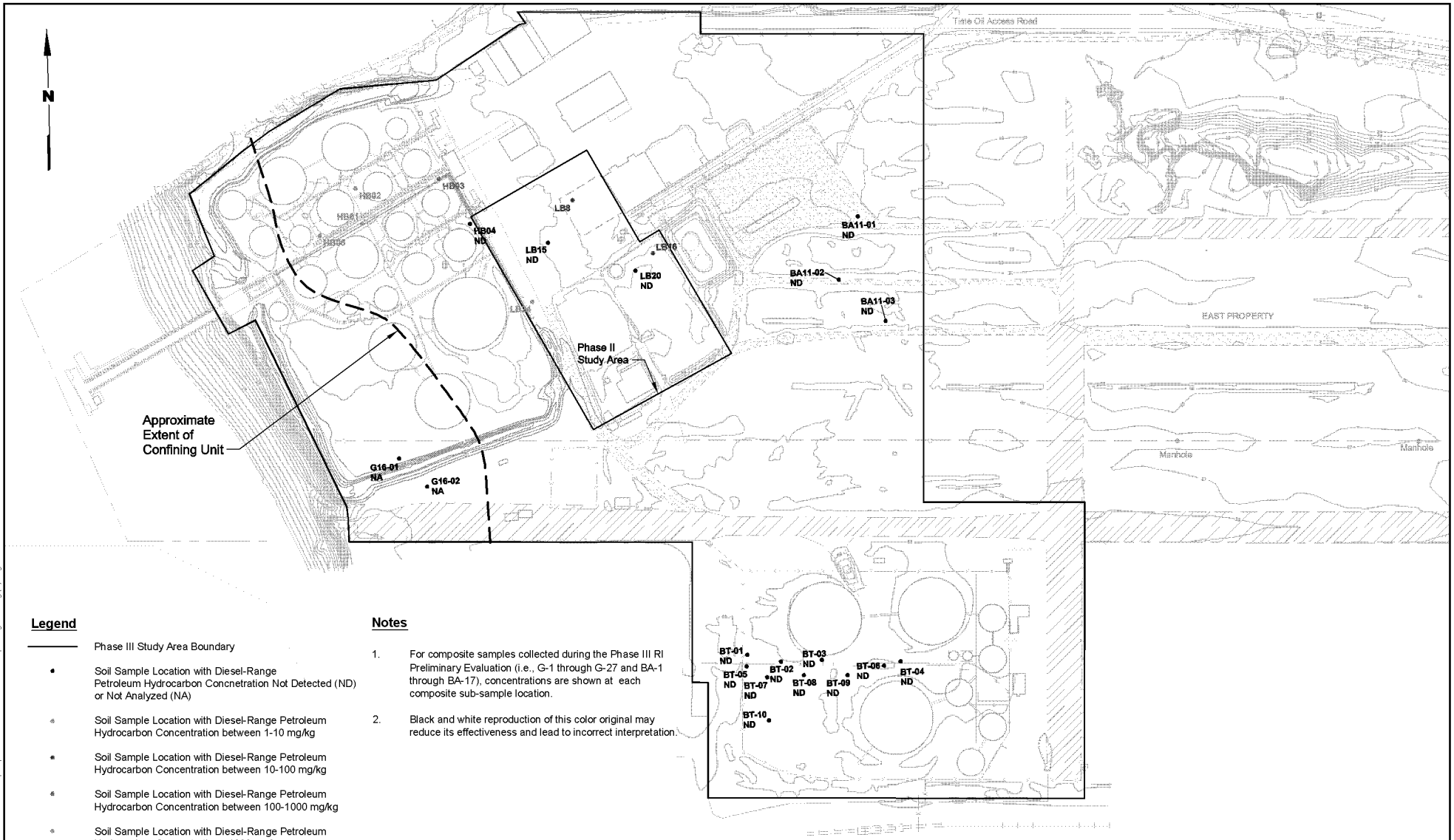
Scale in Feet

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**PCP Concentrations in Soil 1-1.5 ft BGS**	Figure 7-16

Time Oil/Phase III RI Report | T:\231\009\032\Phase III RI Report\Fig7-16.dwg (A) "Figure 7-16" 4/30/2004

BZTO104(e)020614



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Diesel-Range Petroleum Hydrocarbon Concnetration Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Diesel-Range Petroleum Hydrocarbon Concentration between 1-10 mg/kg
- Soil Sample Location with Diesel-Range Petroleum Hydrocarbon Concentration between 10-100 mg/kg
- Soil Sample Location with Diesel-Range Petroleum Hydrocarbon Concentration between 100-1000 mg/kg
- Soil Sample Location with Diesel-Range Petroleum Hydrocarbon Concentration >1000 mg/kg (Maximum Concentration = 7170 mg/kg at HB02)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

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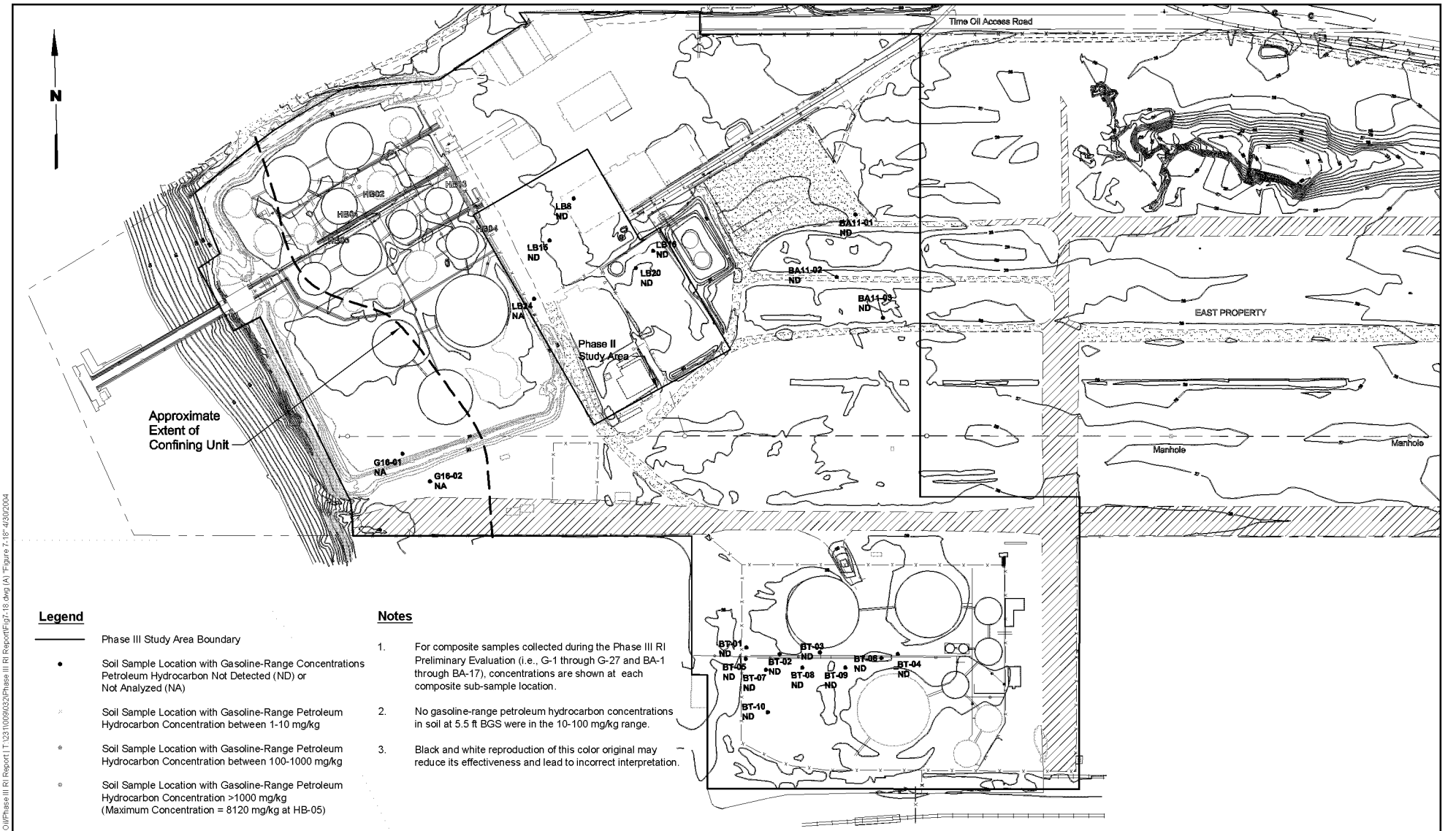
Time Oil NW Terminal Portland, Oregon	**Diesel-Range Petroleum Hydrocarbon Concentrations in Soil 5-5.5 ft BGS**	Figure **7-17**

Time Oil\Phase III RI Report | T:\23\10009\032\Phase III RI Report\Fig7-17.dwg (A) 'Figure 7-17' 4/30/2004



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Gasoline-Range Concentrations Petroleum Hydrocarbon Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Gasoline-Range Petroleum Hydrocarbon Concentration between 1-10 mg/kg
- Soil Sample Location with Gasoline-Range Petroleum Hydrocarbon Concentration between 100-1000 mg/kg
- Soil Sample Location with Gasoline-Range Petroleum Hydrocarbon Concentration >1000 mg/kg (Maximum Concentration = 8120 mg/kg at HB-05)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. No gasoline-range petroleum hydrocarbon concentrations in soil at 5.5 ft BGS were in the 10-100 mg/kg range.
3. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

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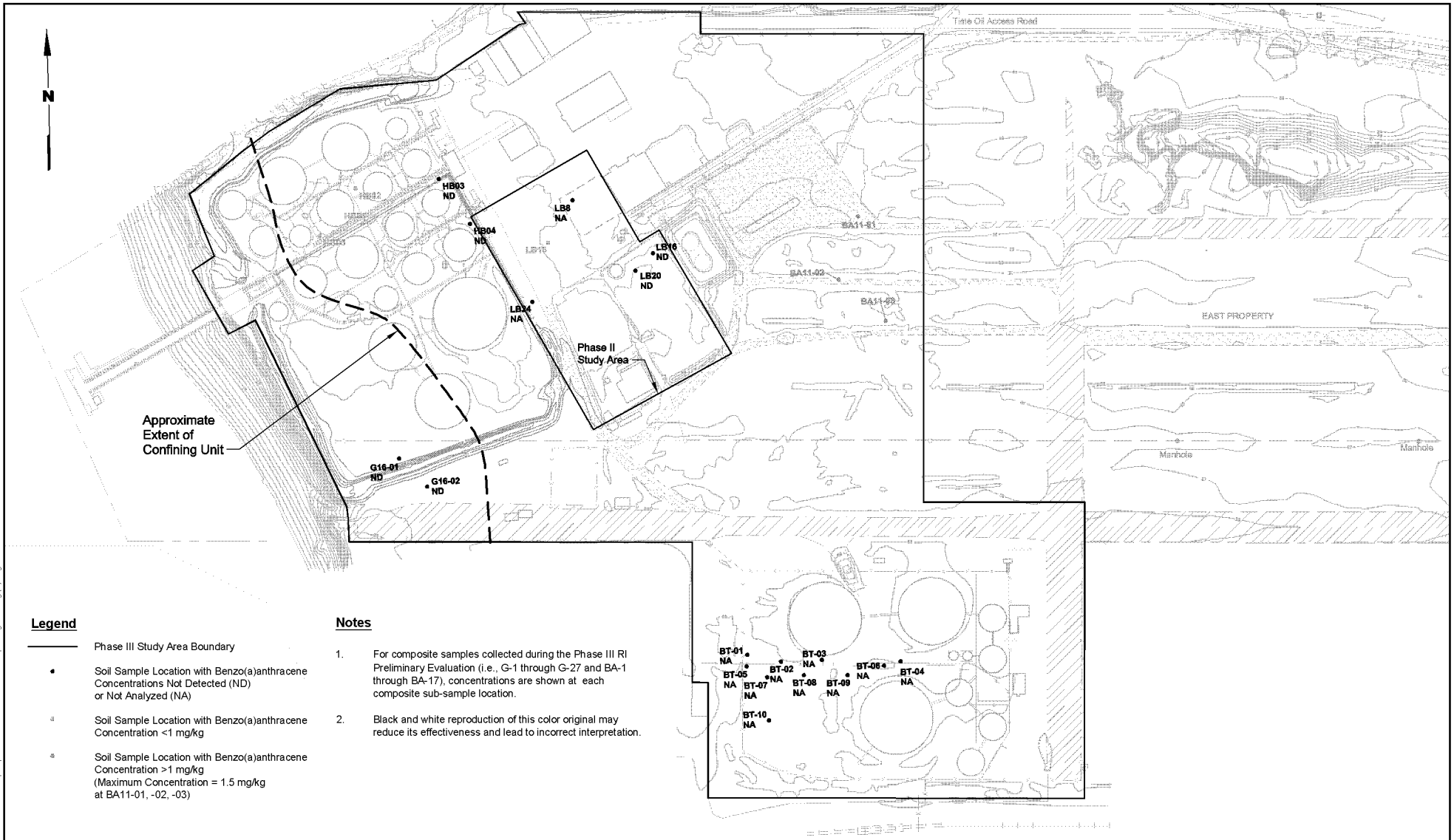
Time Oil NW Terminal Portland, Oregon	**Gasoline-Range Petroleum Hydrocarbon Concentrations in Soil 5-5.5 ft BGS**	Figure **7-18**

Time Oil\Phase III RI Report\ T:\23\10009023\Phase III RI Report\Fig7-18.dwg (A) "Figure 7-18" 4/30/2004

BZTO104(e)020616



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Benzo(a)anthracene Concentrations Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Benzo(a)anthracene Concentration <1 mg/kg
- Soil Sample Location with Benzo(a)anthracene Concentration >1 mg/kg (Maximum Concentration = 1.5 mg/kg at BA11-01, -02, -03)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

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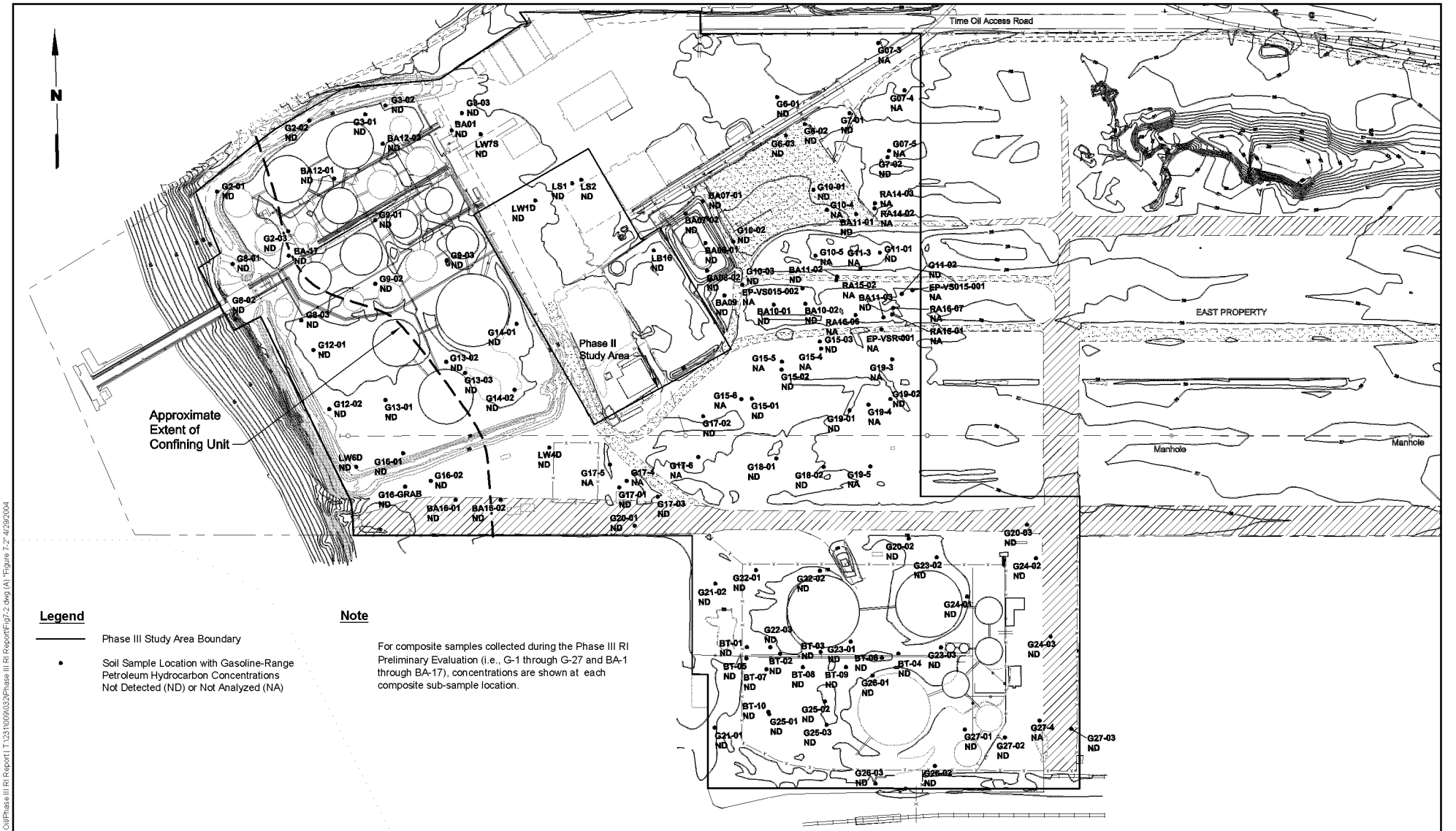
Time Oil NW Terminal Portland, Oregon	**Benzo(a)anthracene Concentrations in Soil 5-5.5 ft BGS**	Figure **7-19**

Time Oil\Phase III RI Report [T:\23\10009\032\Phase III RI Report\Fig7-19.dwg (A) 'Figure 7-19' 4/30/2004

BZTO104(e)020617



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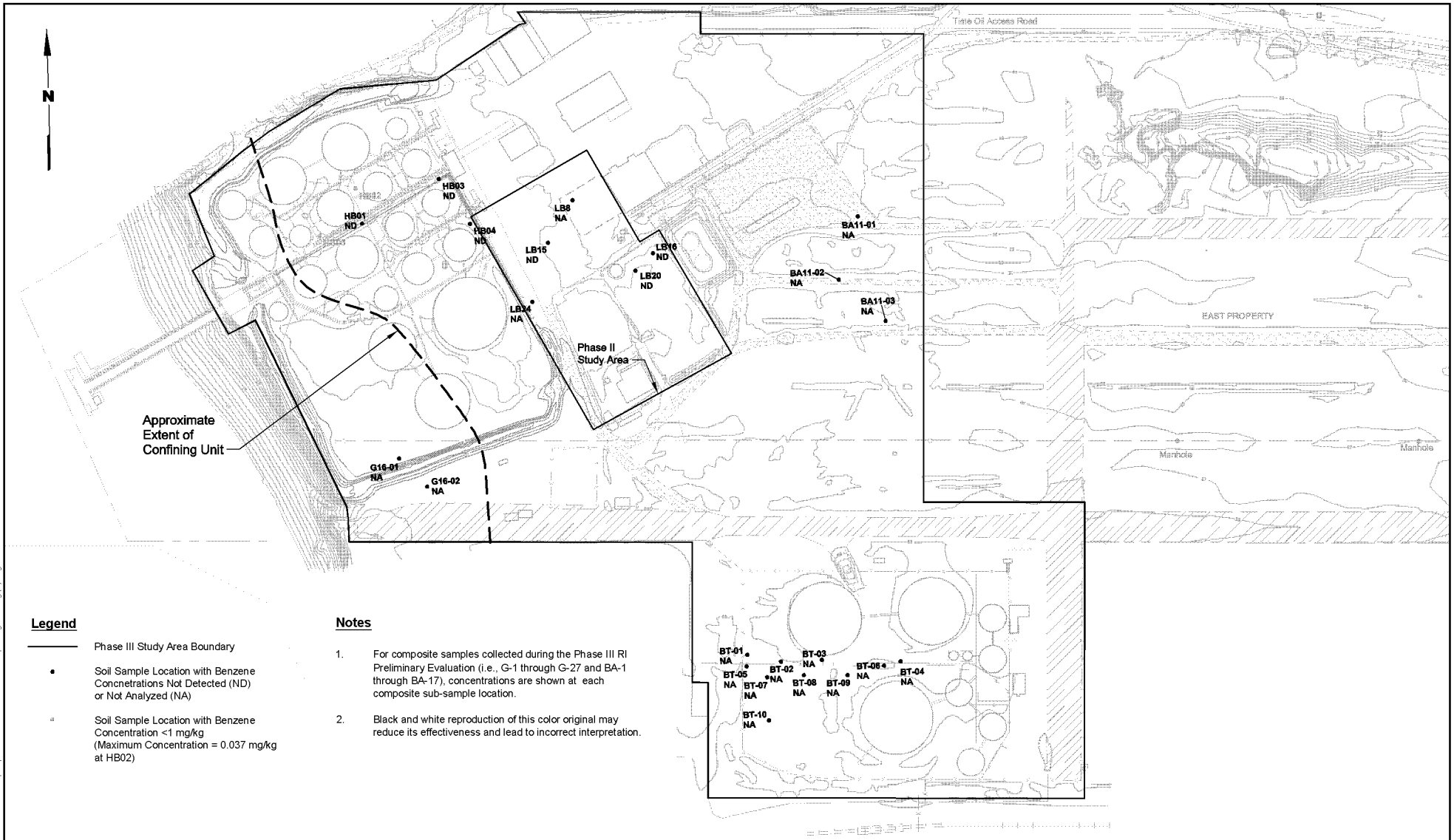
Time Oil NW Terminal Portland, Oregon	**Gasoline-Range Petroleum Hydrocarbon Concentrations in Soil 0-0.5 ft BGS**	Figure **7-2**

Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig7-2.dwg (A) "Figure 7-2" 4/29/2004

BZTO104(e)020618



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Benzene Concnetrations Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Benzene Concentration <1 mg/kg (Maximum Concentration = 0.037 mg/kg at HB02)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

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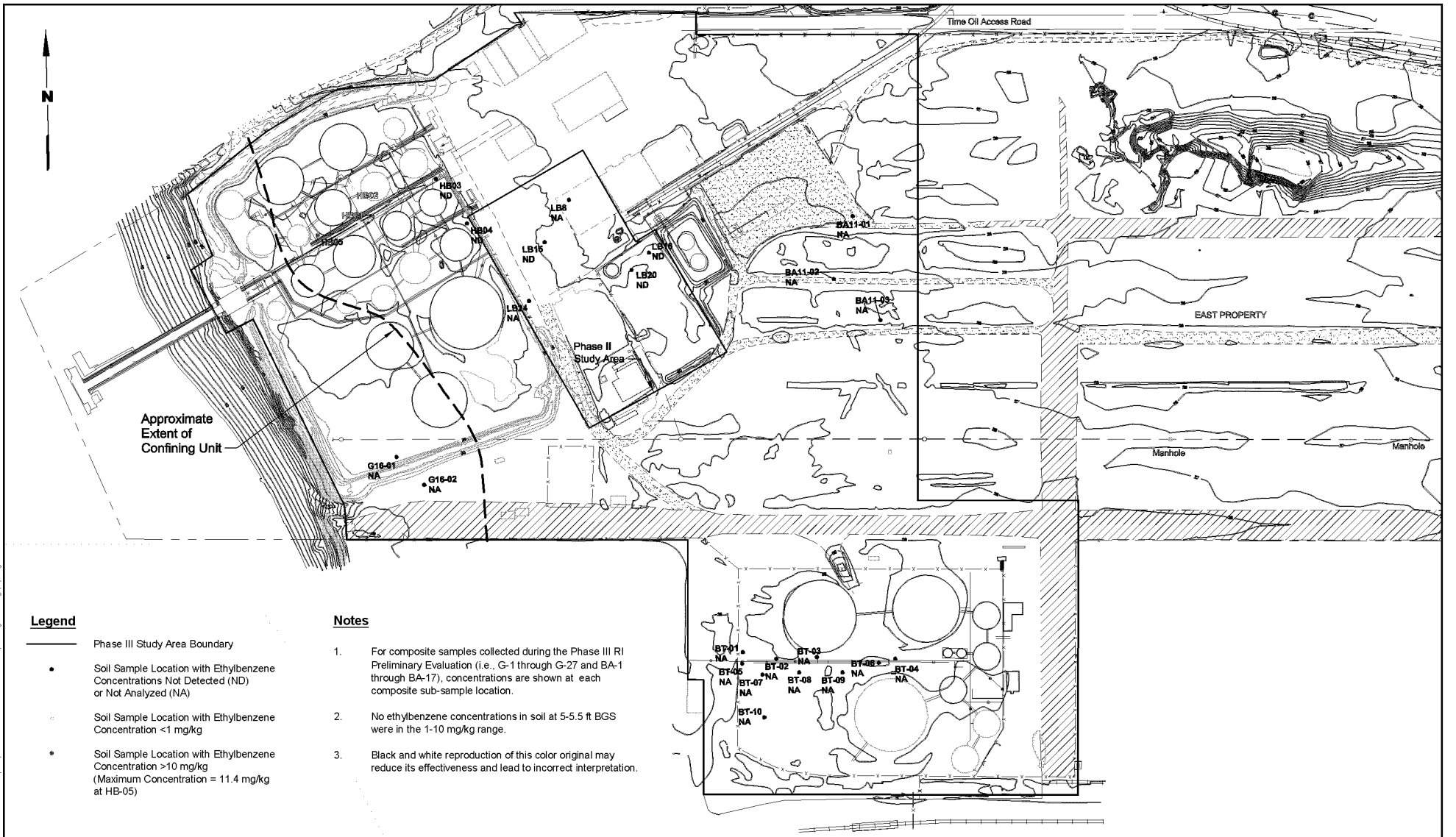
Time Oil NW Terminal Portland, Oregon	**Benzene Concentrations in Soil 5-5.5 ft BGS**	Figure **7-20**

Time Oil\Phase III RI Report [T:\23\1\0009\032\Phase III RI Report\Fig7-20.dwg (A) 'Figure 7-20' 4/30/2004

BZTO104(e)020619



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Ethylbenzene Concentrations Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Ethylbenzene Concentration <1 mg/kg
- Soil Sample Location with Ethylbenzene Concentration >10 mg/kg (Maximum Concentration = 11.4 mg/kg at HB-05)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. No ethylbenzene concentrations in soil at 5-5.5 ft BGS were in the 1-10 mg/kg range.
3. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

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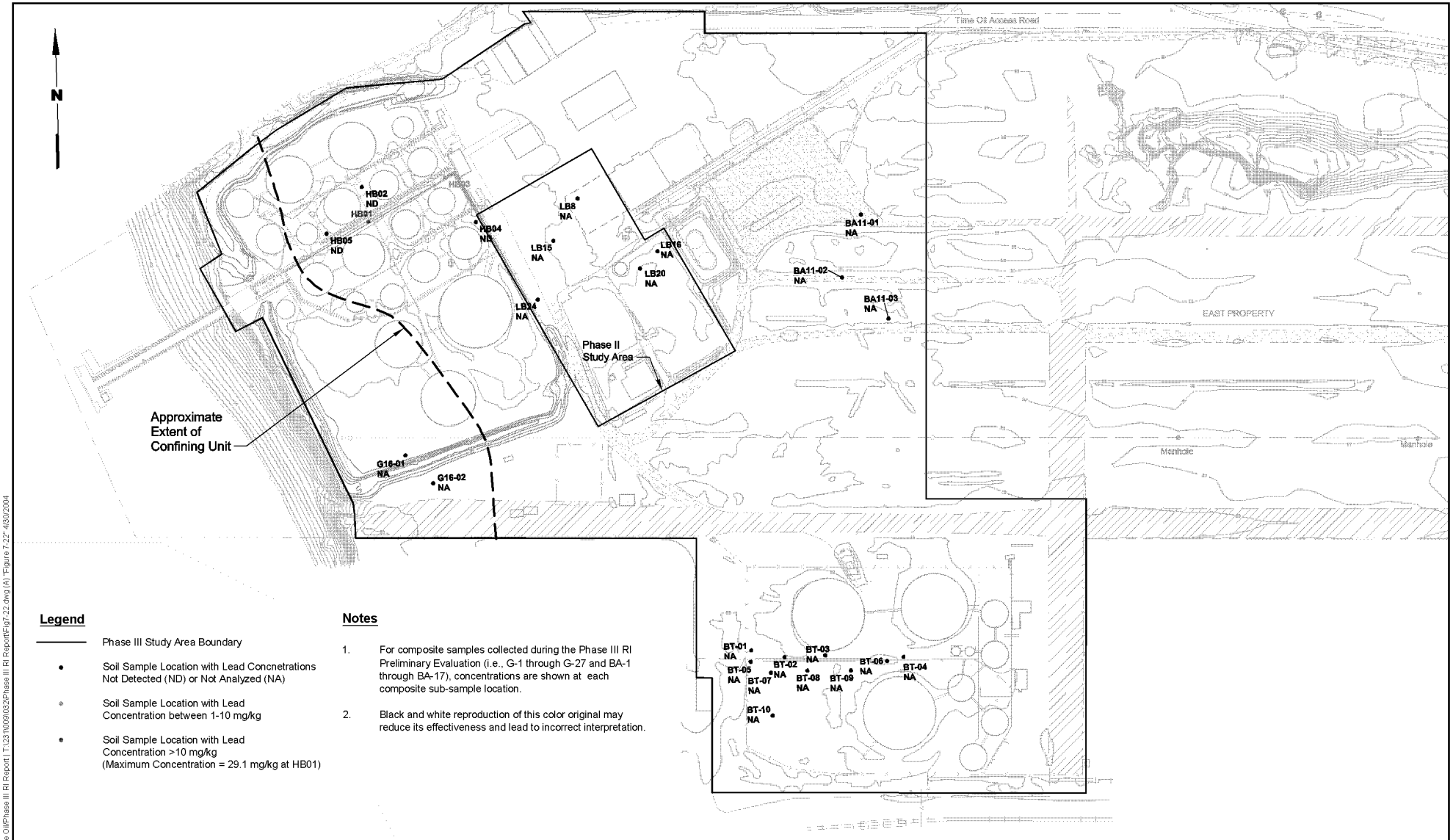
Time Oil NW Terminal Portland, Oregon	**Ethylbenzene Concentrations in Soil 5-5.5 ft BGS**	Figure **7-21**

Time Oil\Phase III RI Report | T:\23\10009\02\Phase III RI Report\Fig7-21.dwg (A) "Figure 7-21" 4/30/2004

BZTO104(e)020620



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Lead Concnetrations Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Lead Concentration between 1-10 mg/kg
- Soil Sample Location with Lead Concentration >10 mg/kg (Maximum Concentration = 29.1 mg/kg at HB01)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

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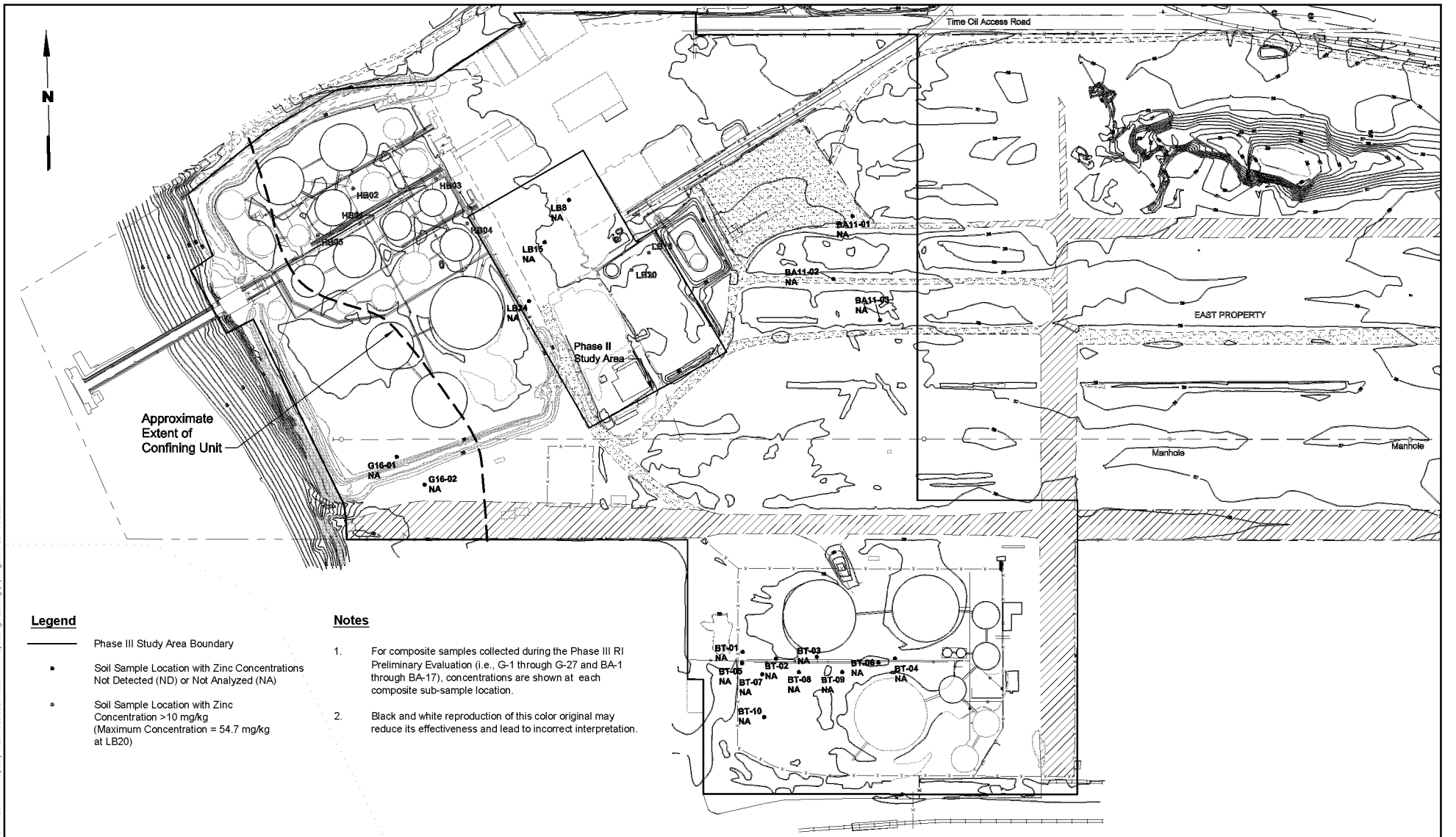
Time Oil NW Terminal Portland, Oregon	**Lead Concentrations in Soil 5-5.5 ft BGS**	Figure **7-22**

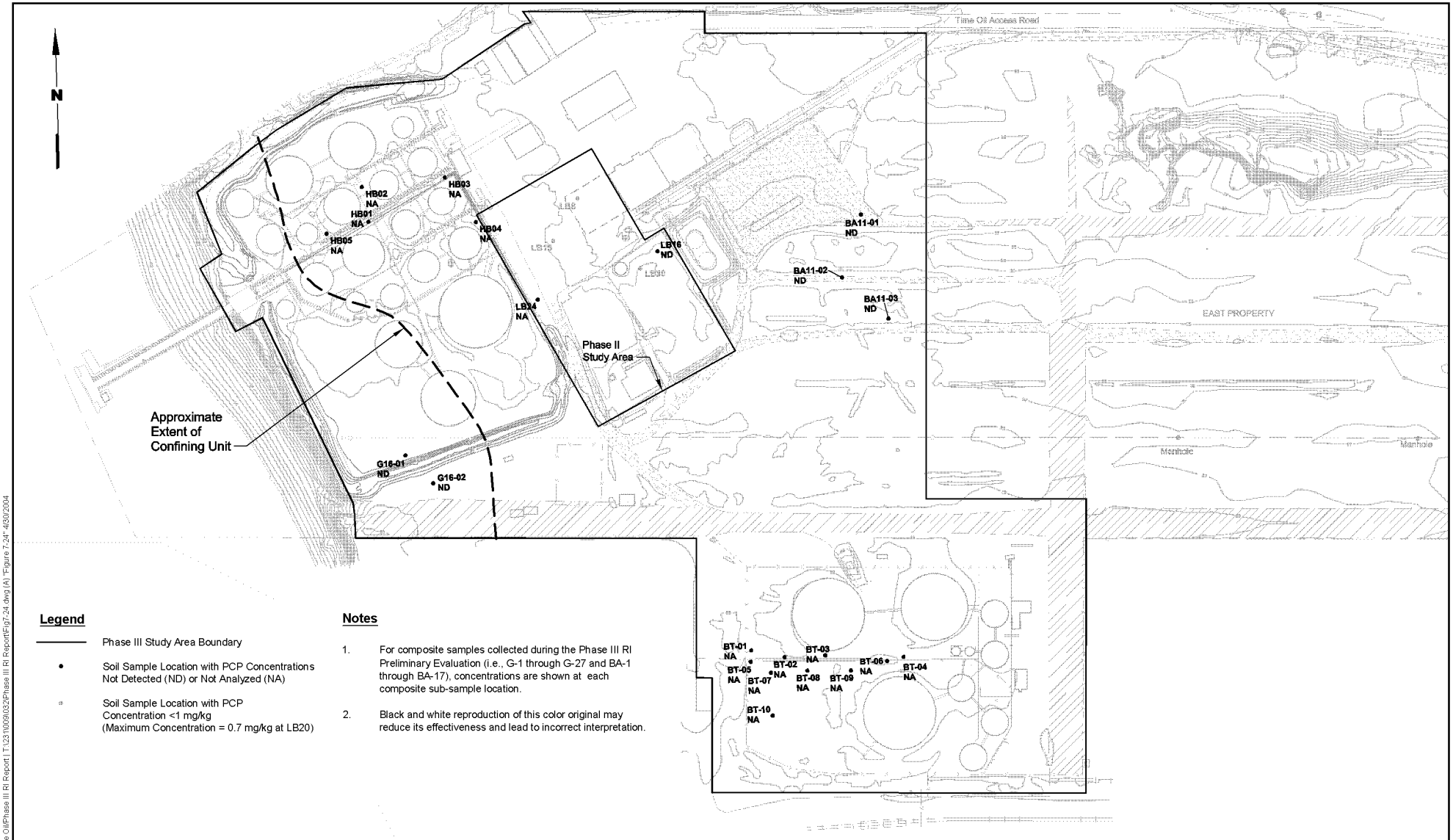
Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig7-22.dwg (A) "Figure 7-22" 4/30/2004

BZTO104(e)020621

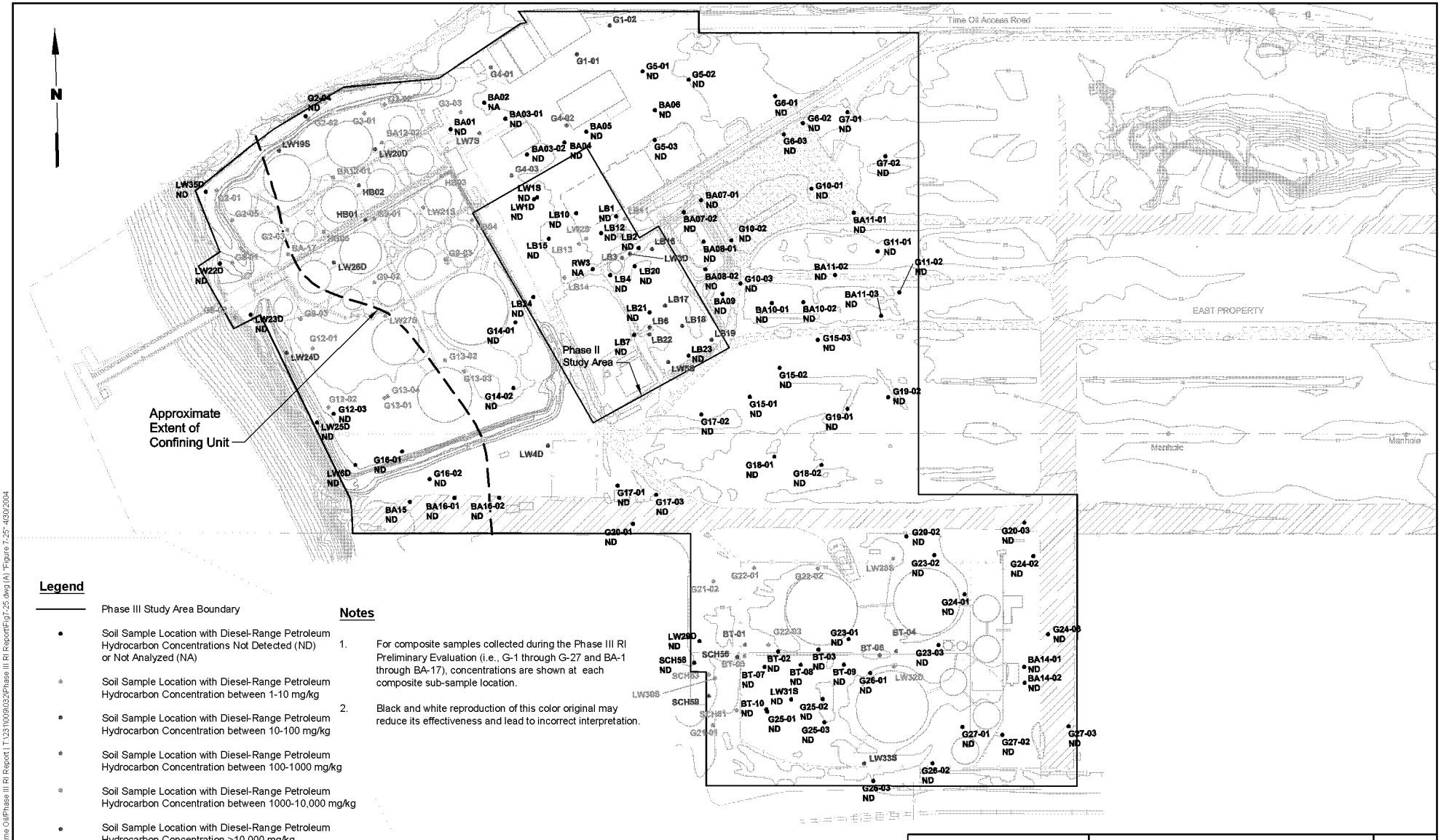


Time Oil\Phase III RI Report | T:\231\0009\02\Phase III RI Report\Fig7-23.dwg (A) 'Figure 7-23' 4/30/2004

BZTO104(e)020622



BZTO104(e)020623



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Diesel-Range Petroleum Hydrocarbon Concentrations Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Diesel-Range Petroleum Hydrocarbon Concentration between 1-10 mg/kg
- Soil Sample Location with Diesel-Range Petroleum Hydrocarbon Concentration between 10-100 mg/kg
- Soil Sample Location with Diesel-Range Petroleum Hydrocarbon Concentration between 100-1000 mg/kg
- Soil Sample Location with Diesel-Range Petroleum Hydrocarbon Concentration between 1000-10,000 mg/kg
- Soil Sample Location with Diesel-Range Petroleum Hydrocarbon Concentration >10,000 mg/kg (Maximum Concentration = 36,100 mg/kg at LW19S)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

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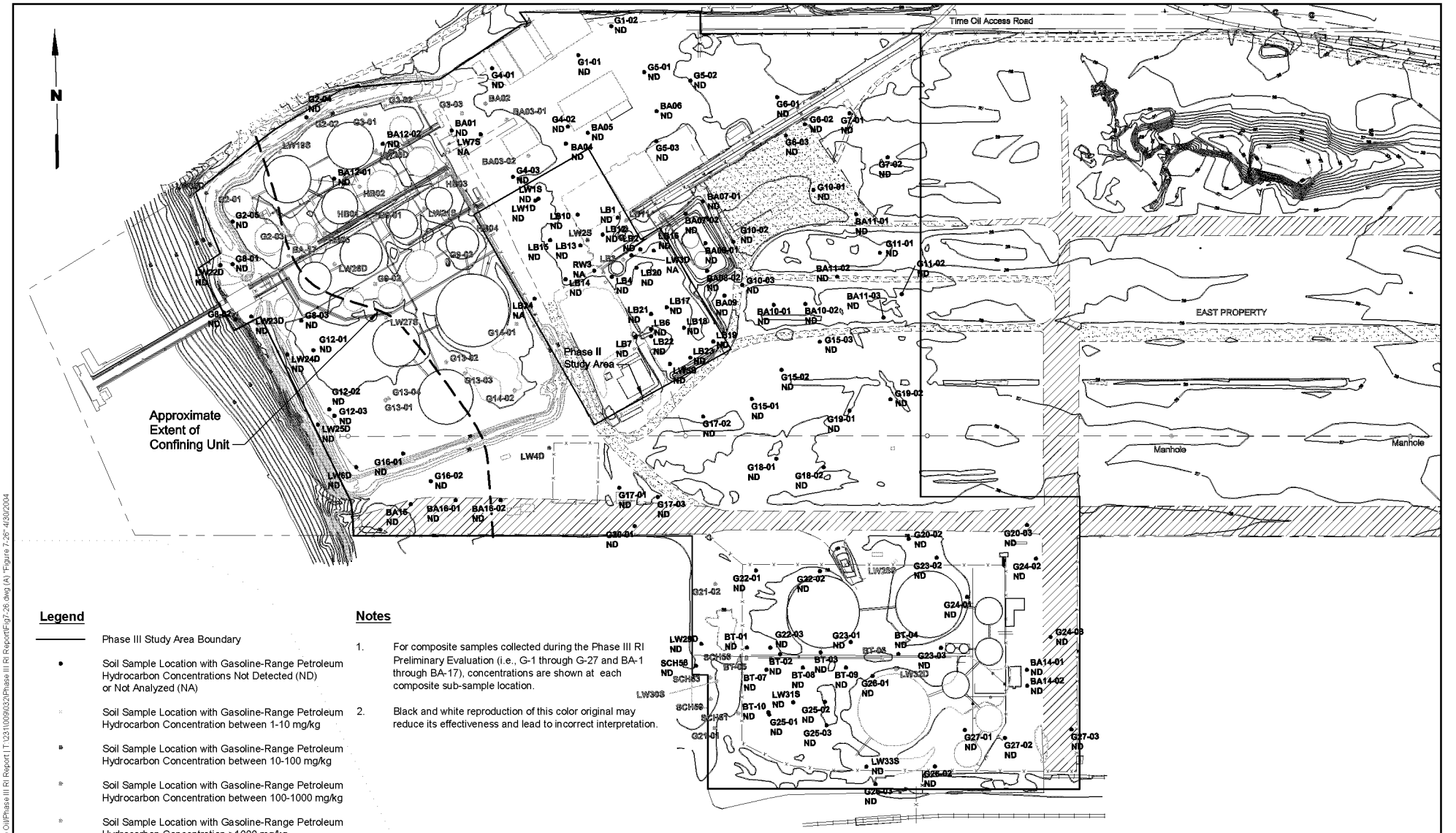
Time Oil NW Terminal Portland, Oregon	**Diesel-Range Petroleum Hydrocarbon Concentrations in Soil Capillary Fringe and Below**	Figure **7-25**

Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig7-25.dwg (A) Figure 7-25 4/30/2004



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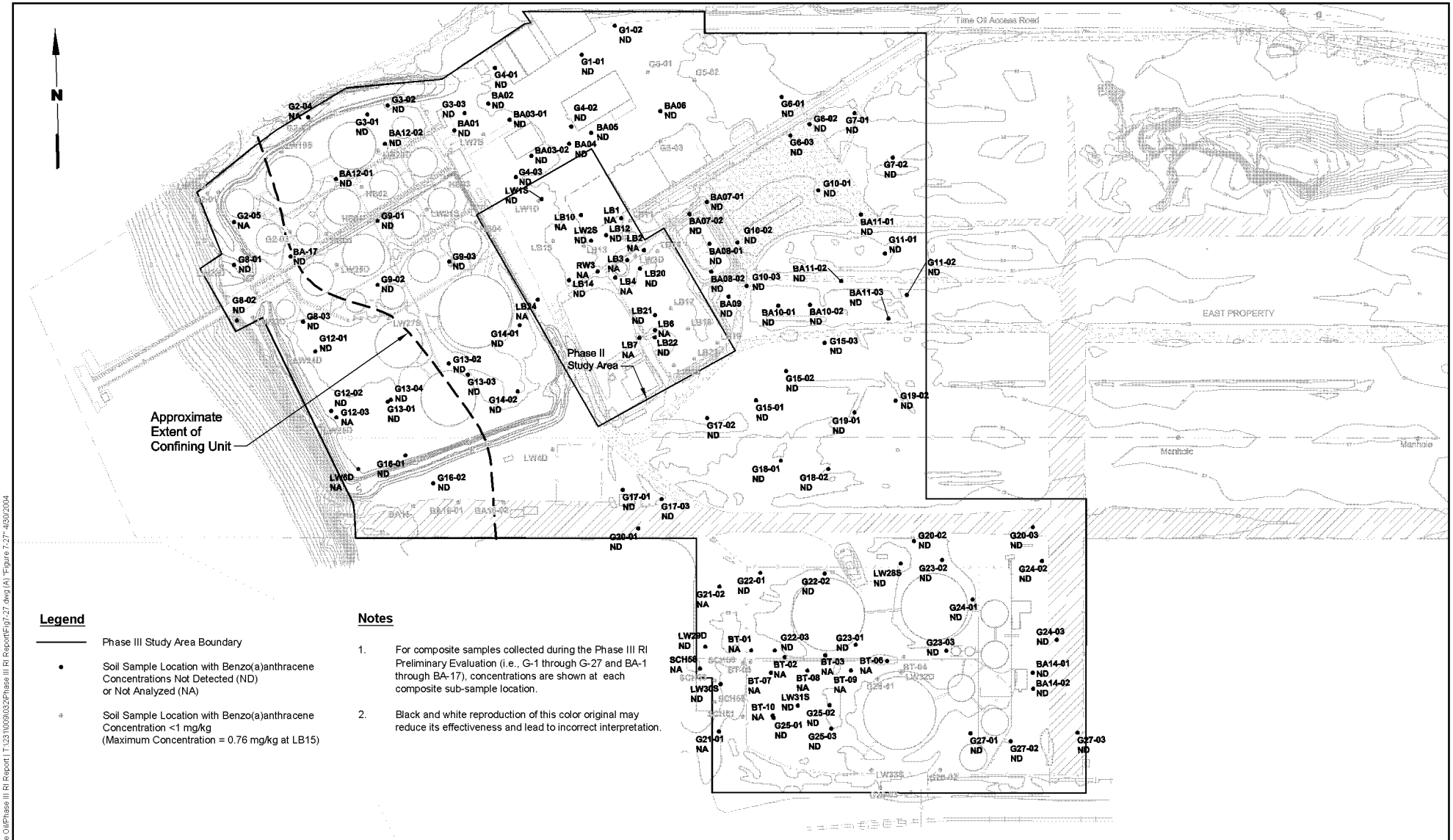
Time Oil NW Terminal Portland, Oregon	**Gasoline-Range Petroleum Hydrocarbon Concentrations in Soil Capillary Fringe and Below**	Figure **7-26**

Time Oil\Phase III RI Report | T:\231\0009\02\Phase III RI Report\Fig7-26.dwg (A) *Figure 7-26* 4/30/2004

BZTO104(e)020625



Legend

- Phase III Study Area Boundary
- • Soil Sample Location with Benzo(a)anthracene Concentrations Not Detected (ND) or Not Analyzed (NA)
- + Soil Sample Location with Benzo(a)anthracene Concentration <1 mg/kg (Maximum Concentration = 0.76 mg/kg at LB15)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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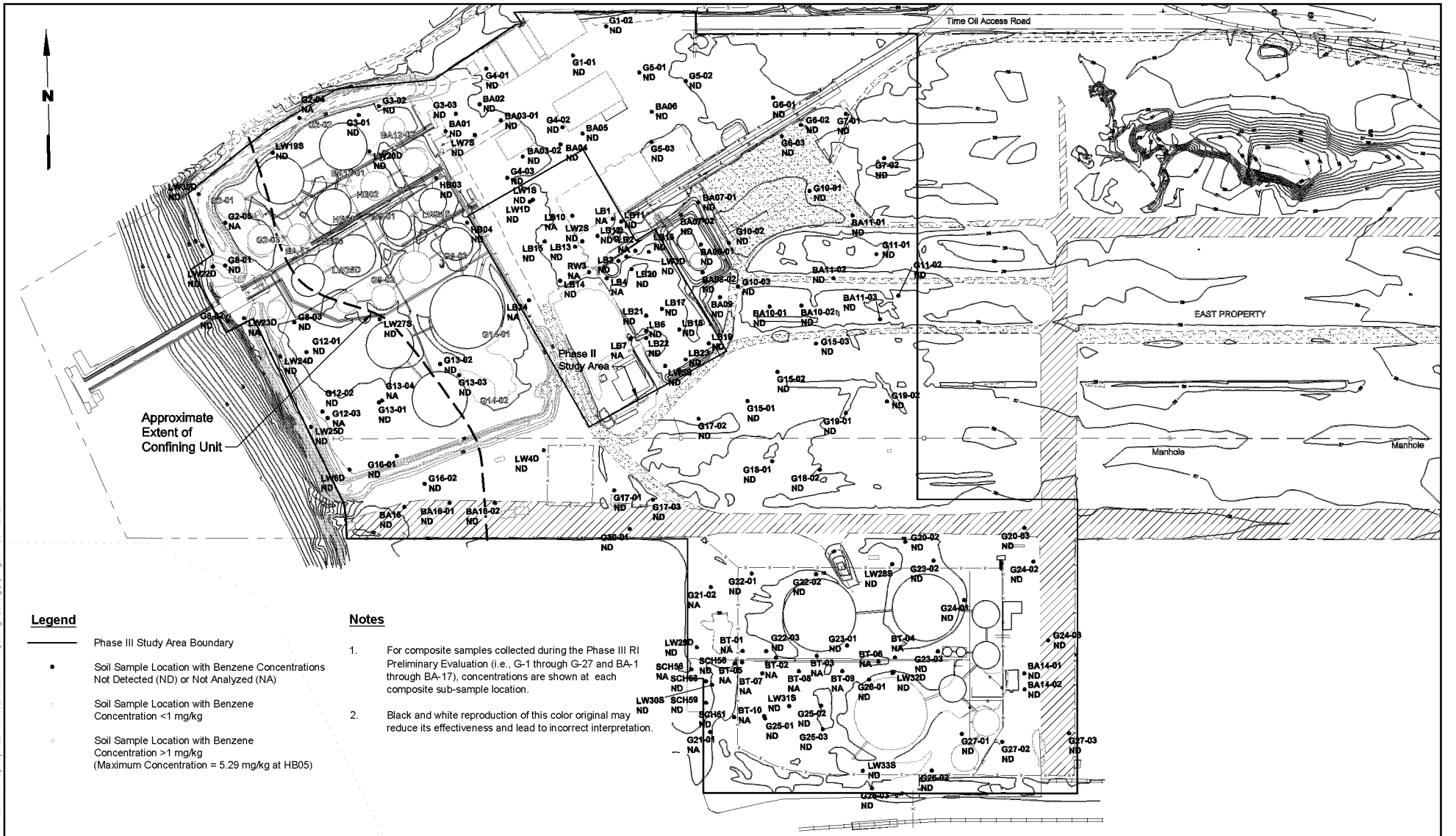
Time Oil NW Terminal Portland, Oregon	**Benzo(a)anthracene Concentrations in Soil Capillary Fringe**	Figure **7-27**

Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig7-27.dwg (A) Figure 7-27 4/30/2004

BZTO104(e)020626



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Benzene Concentrations Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Benzene Concentration <1 mg/kg
- Soil Sample Location with Benzene Concentration >1 mg/kg (Maximum Concentration = 5.29 mg/kg at HB05)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

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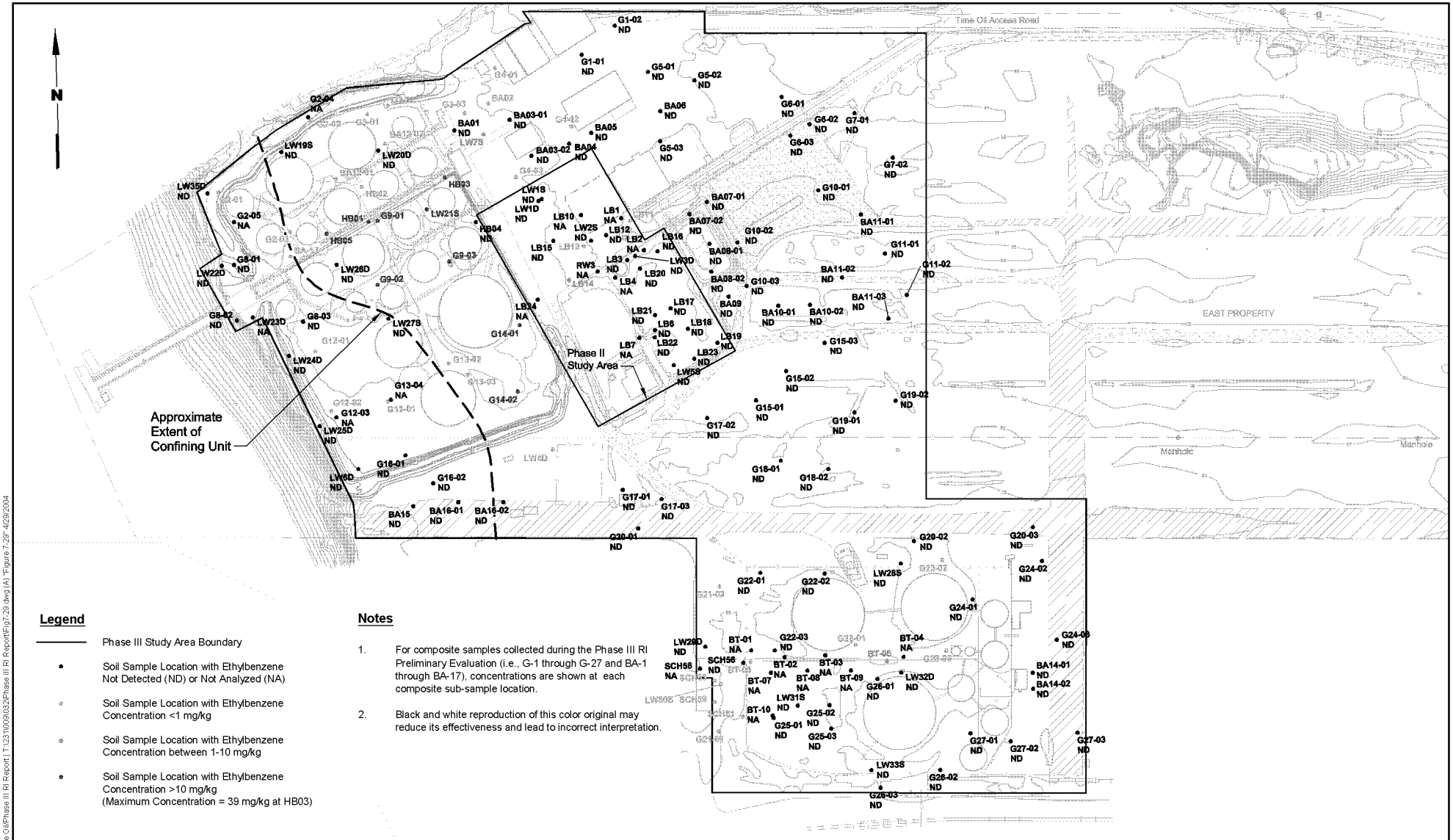
Time Oil NW Terminal Portland, Oregon	**Benzene Concentrations in Soil Capillary Fringe**	Figure 7-28

Time Oil/Phase III RI Report | T:\231\009\032\Phase III RI Report\Fig7-28.dwg (A) "Figure 7-28" 4/29/2004

BZTO104(e)020627



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Ethylbenzene Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Ethylbenzene Concentration <1 mg/kg
- Soil Sample Location with Ethylbenzene Concentration between 1-10 mg/kg
- Soil Sample Location with Ethylbenzene Concentration >10 mg/kg (Maximum Concentration = 39 mg/kg at HB03)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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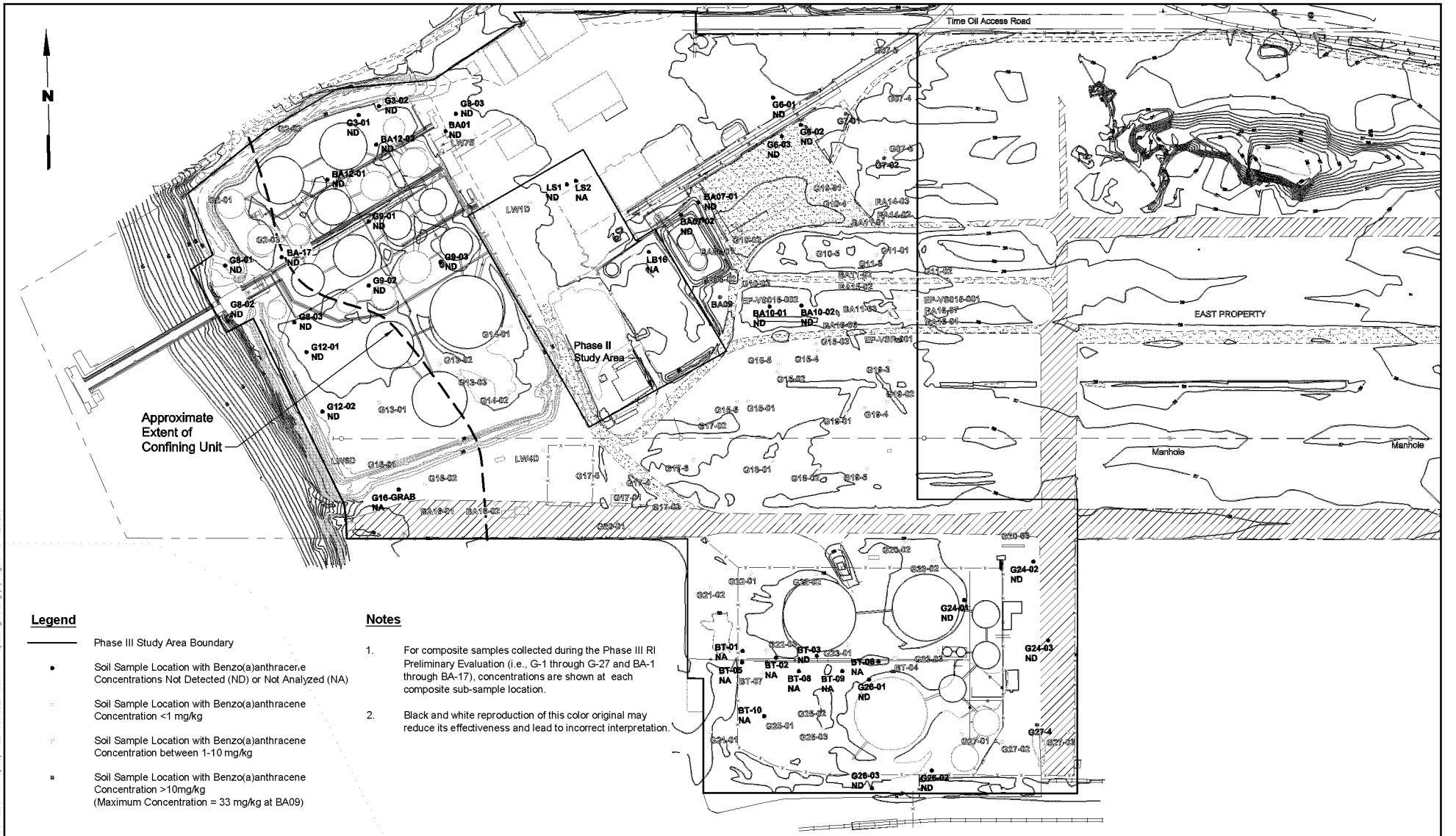
Time Oil NW Terminal
Portland, Oregon

Ethylbenzene Concentrations in Soil Capillary Fringe

Figure
7-29

Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig7-29.dwg (A) Figure 7-29" 4/29/2004

BZTO104(e)020628



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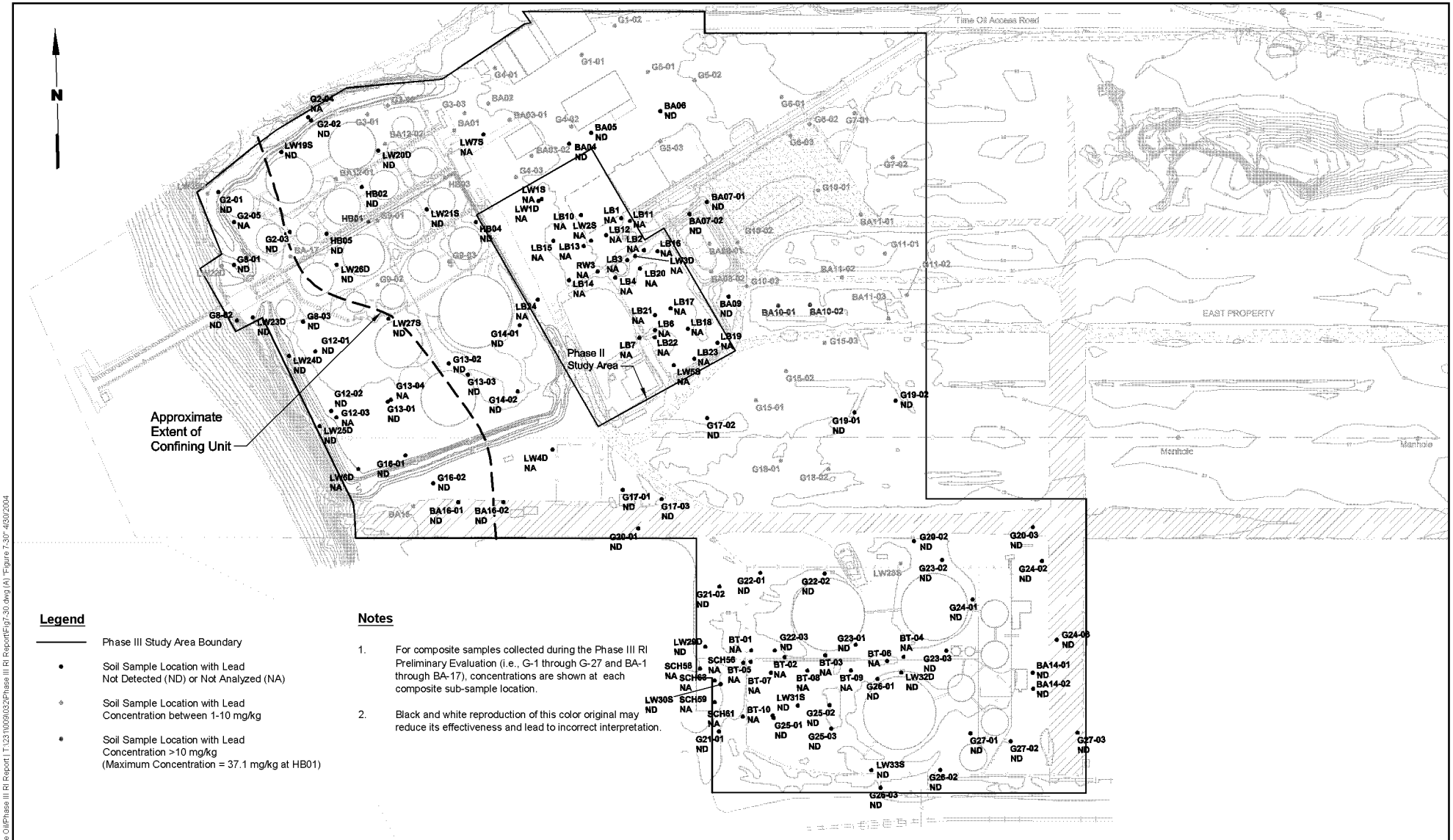
Time Oil NW Terminal Portland, Oregon	**Benzo(a)anthracene Concentrations in Soil 0-0.5 ft BGS**	Figure **7-3**

Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig7-3.dwg (A) "Figure 7.3" 4/29/2004

BZTO104(e)020629



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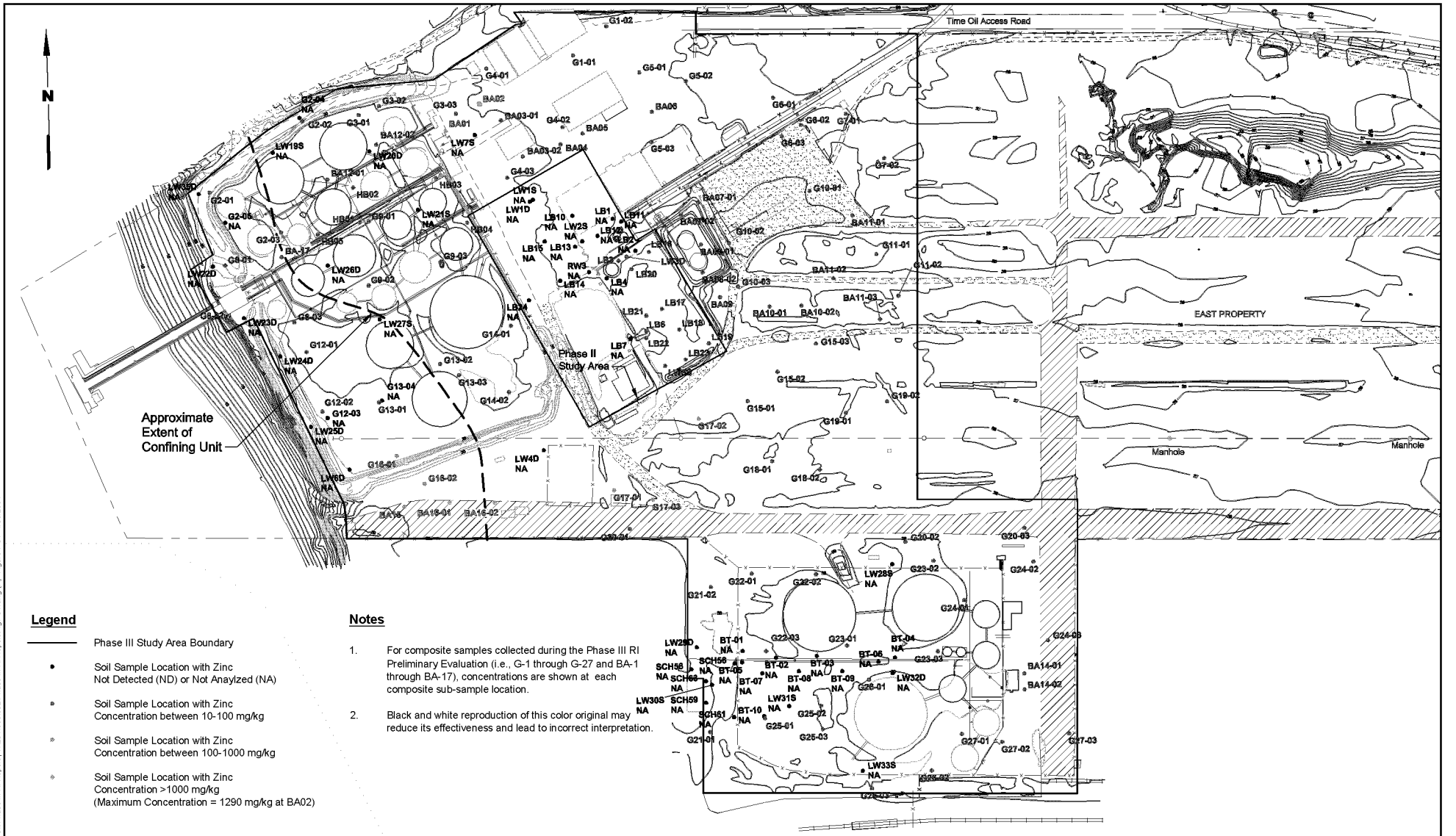
Time Oil NW Terminal Portland, Oregon	**Lead Concentrations in Soil Capillary Fringe**	Figure **7-30**

Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig7-30.dwg (A) Figure 7-30" 4/30/2004

BZTO104(e)020630

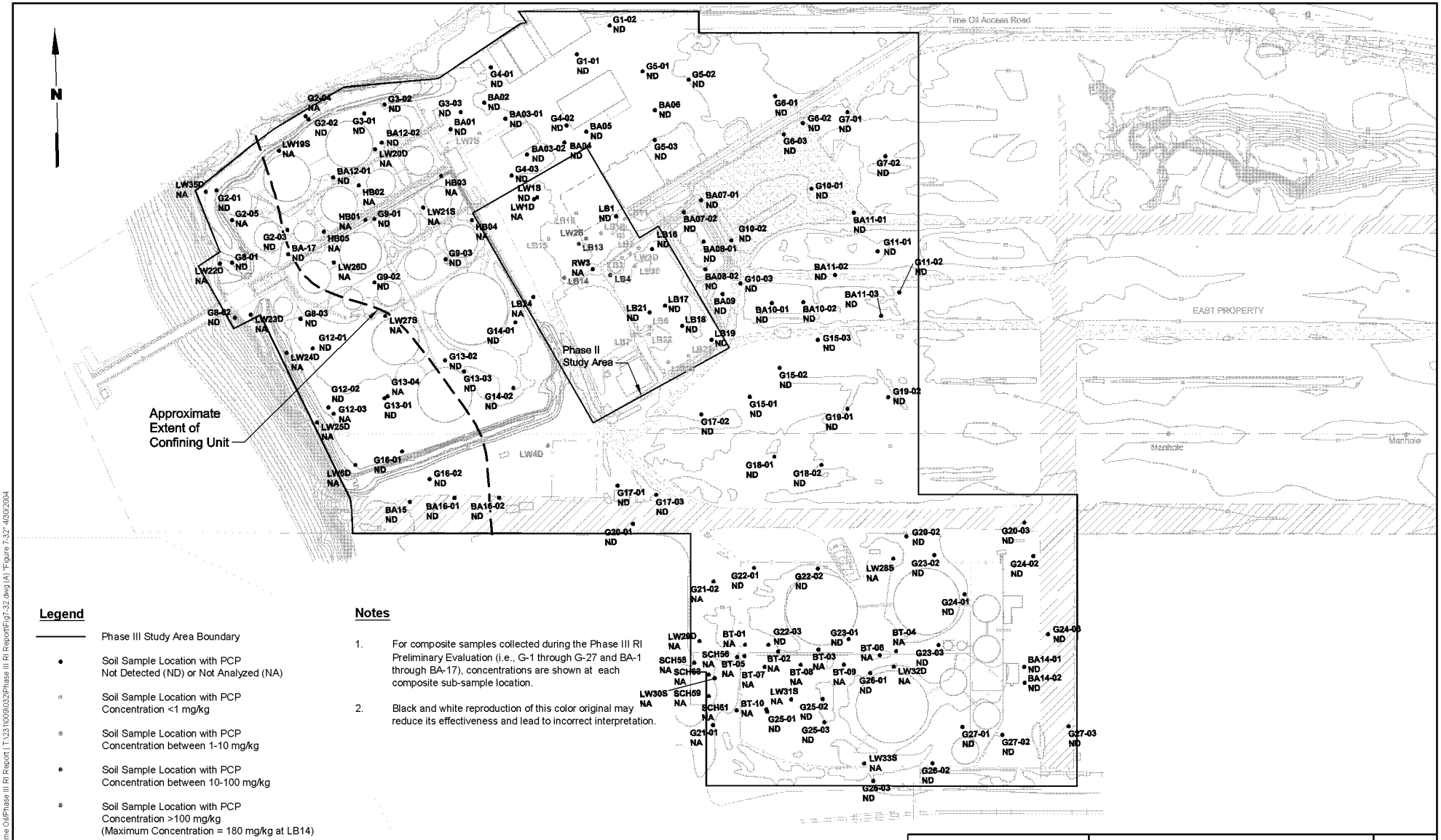


LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Zinc Concentrations in Soil Capillary Fringe and Below**	Figure **7-31**

Time Oil\Phase III RI Report | T:\231\0009\02\Phase III RI Report\Fig7-31.dwg (A) *Figure 7-31* 4/30/2004

BZTO104(e)020631



Legend

- Phase III Study Area Boundary
- Soil Sample Location with PCP Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with PCP Concentration <1 mg/kg
- Soil Sample Location with PCP Concentration between 1-10 mg/kg
- Soil Sample Location with PCP Concentration between 10-100 mg/kg
- Soil Sample Location with PCP Concentration >100 mg/kg (Maximum Concentration = 180 mg/kg at LB14)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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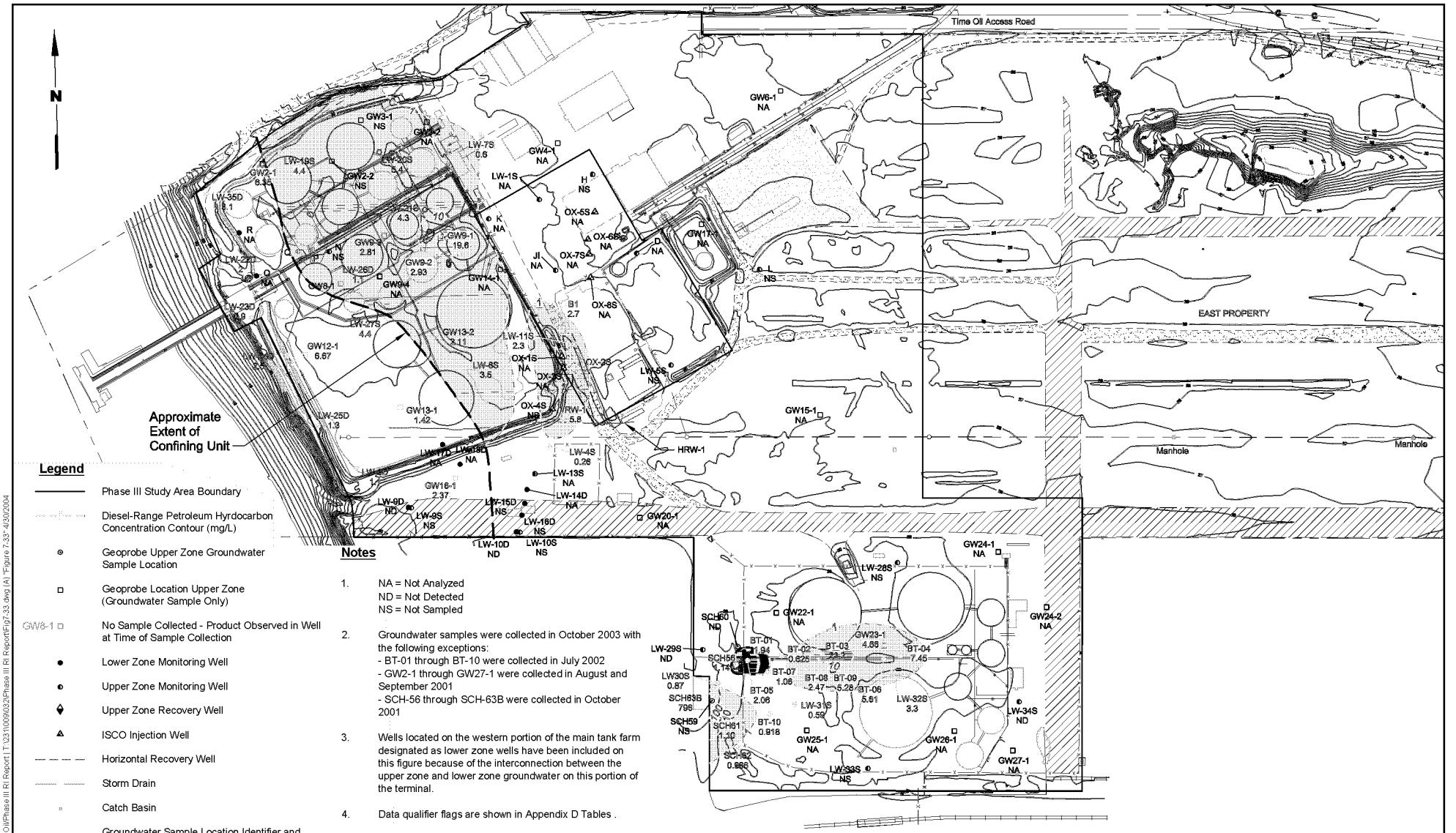
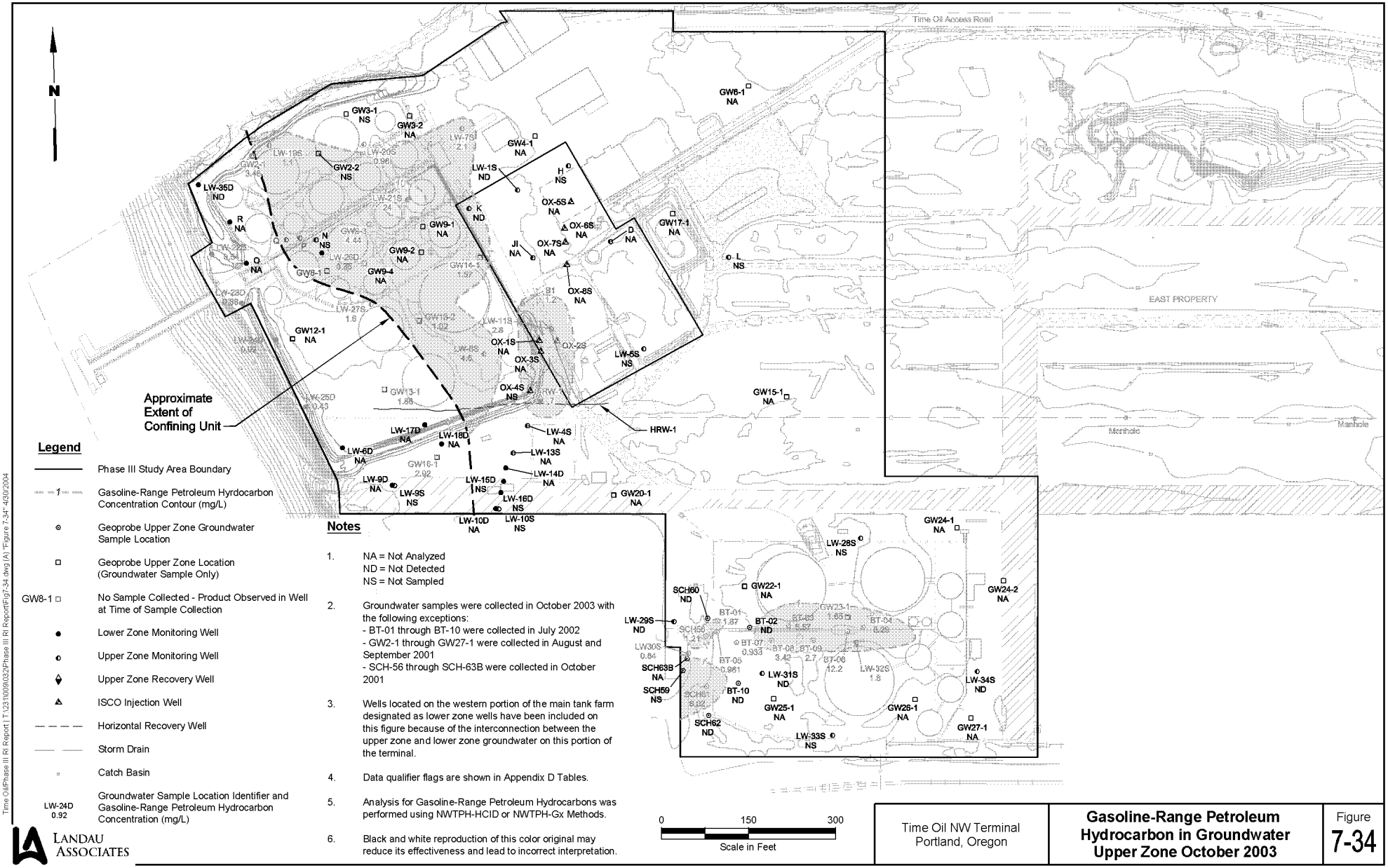
Time Oil NW Terminal Portland, Oregon	**PCP Concentrations in Soil Capillary Fringe and Below**	Figure **7-32**

Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig7-32.dwg (A) Figure 7-32" 4/30/2004

BZTO104(e)020632


Time Oil Access Road
EAST PROPERTY
Manhole
Manhole
Approximate Extent of Confining Unit
Legend
Phase III Study Area Boundary
Diesel-Range Petroleum Hyrdocarbon Concentration Contour (mg/L)
Geoprobe Upper Zone Groundwater Sample Location
Geoprobe Location Upper Zone (Groundwater Sample Only)
GW8-1 No Sample Collected - Product Observed in Well at Time of Sample Collection
Lower Zone Monitoring Well
Upper Zone Monitoring Well
Upper Zone Recovery Well
ISCO Injection Well
Horizontal Recovery Well
Storm Drain
Catch Basin
Groundwater Sample Location Identifier and Diesel-Range Petroleum Hydrocarbon Concentration (mg/L)
Notes
1. NA = Not Analyzed
ND = Not Detected
NS = Not Sampled
2. Groundwater samples were collected in October 2003 with the following exceptions:
- BT-01 through BT-10 were collected in July 2002
- GW2-1 through GW27-1 were collected in August and September 2001
- SCH-56 through SCH-63B were collected in October 2001
3. Wells located on the western portion of the main tank farm designated as lower zone wells have been included on this figure because of the interconnection between the upper zone and lower zone groundwater on this portion of the terminal.
4. Data qualifier flags are shown in Appendix D Tables .
5. Analysis for Diesel-Range Petroleum Hydrocarbons was performed using NWTPH-HCID or NWTPH-Dx Methods.
6. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
0
150
300
Scale in Feet
LANDAU ASSOCIATES
Time Oil NW Terminal
Portland, Oregon
Diesel-Range Petroleum Hydrocarbons in Groundwater Upper Zone, October 2003
Figure
7-33
Time Oil\Phase III RI Report\T:\23\10\09\02\Phase III RI Report\Fig7-33.dwg (A) *Figure 7-33* 4/30/2004
BZTO104(e)020633



Legend

- Phase III Study Area Boundary
- Gasoline-Range Petroleum Hyrdocarbon Concentration Contour (mg/L)
- Geoprobe Upper Zone Groundwater Sample Location
- Geoprobe Upper Zone Location (Groundwater Sample Only)
- GW8-1 — No Sample Collected - Product Observed in Well at Time of Sample Collection
- Lower Zone Monitoring Well
- Upper Zone Monitoring Well
- Upper Zone Recovery Well
- ISCO Injection Well
- Horizontal Recovery Well
- Storm Drain
- Catch Basin
- LW-24D 0.92 — Groundwater Sample Location Identifier and Gasoline-Range Petroleum Hydrocarbon Concentration (mg/L)

Notes

1. NA = Not Analyzed
   ND = Not Detected
   NS = Not Sampled
2. Groundwater samples were collected in October 2003 with the following exceptions:
   - BT-01 through BT-10 were collected in July 2002
   - GW2-1 through GW27-1 were collected in August and September 2001
   - SCH-56 through SCH-63B were collected in October 2001
3. Wells located on the western portion of the main tank farm designated as lower zone wells have been included on this figure because of the interconnection between the upper zone and lower zone groundwater on this portion of the terminal.
4. Data qualifier flags are shown in Appendix D Tables.
5. Analysis for Gasoline-Range Petroleum Hydrocarbons was performed using NWTPH-HCID or NWTPH-Gx Methods.
6. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

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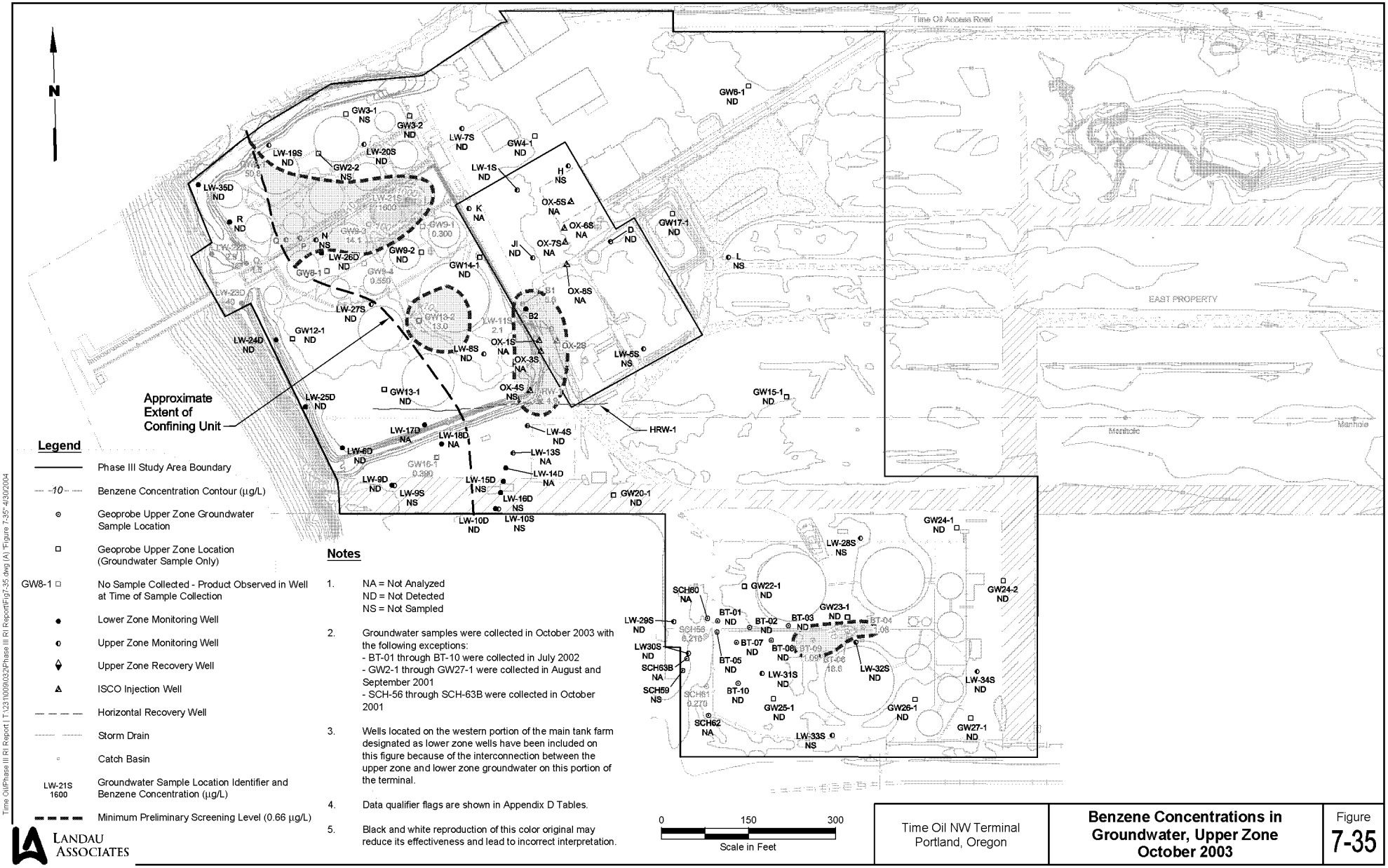
Time Oil NW Terminal
Portland, Oregon

Gasoline-Range Petroleum Hydrocarbon in Groundwater Upper Zone October 2003

Figure 7-34

Time Oil\Phase III RI Report | T:\23\10009\032\Phase III RI Report\Fig7-34.dwg (A) Figure 7-34" 4/30/2004

BZTO104(e)020634



Legend

- Phase III Study Area Boundary
- -10- Benzene Concentration Contour (µg/L)
- Geoprobe Upper Zone Groundwater Sample Location
- Geoprobe Upper Zone Location (Groundwater Sample Only)
- GW8-1 No Sample Collected - Product Observed in Well at Time of Sample Collection
- Lower Zone Monitoring Well
- Upper Zone Monitoring Well
- Upper Zone Recovery Well
- ISCO Injection Well
- Horizontal Recovery Well
- Storm Drain
- Catch Basin
- LW-21S 1600 Groundwater Sample Location Identifier and Benzene Concentration (µg/L)
- Minimum Preliminary Screening Level (0.66 µg/L)

Notes

1. NA = Not Analyzed
   ND = Not Detected
   NS = Not Sampled
2. Groundwater samples were collected in October 2003 with the following exceptions:
   - BT-01 through BT-10 were collected in July 2002
   - GW2-1 through GW27-1 were collected in August and September 2001
   - SCH-56 through SCH-63B were collected in October 2001
3. Wells located on the western portion of the main tank farm designated as lower zone wells have been included on this figure because of the interconnection between the upper zone and lower zone groundwater on this portion of the terminal.
4. Data qualifier flags are shown in Appendix D Tables.
5. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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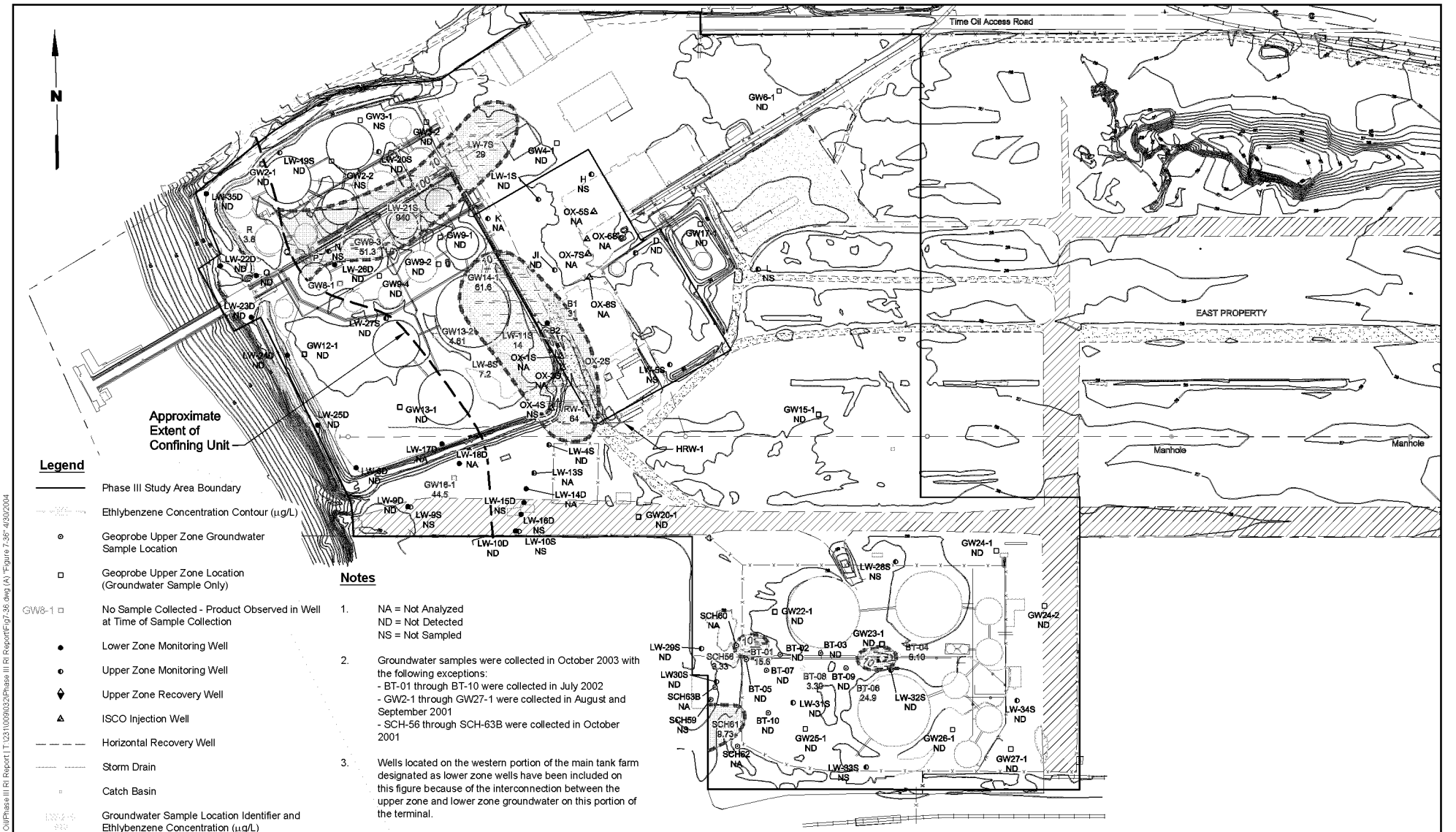
Time Oil NW Terminal
Portland, Oregon

Benzene Concentrations in Groundwater, Upper Zone October 2003

Figure 7-35

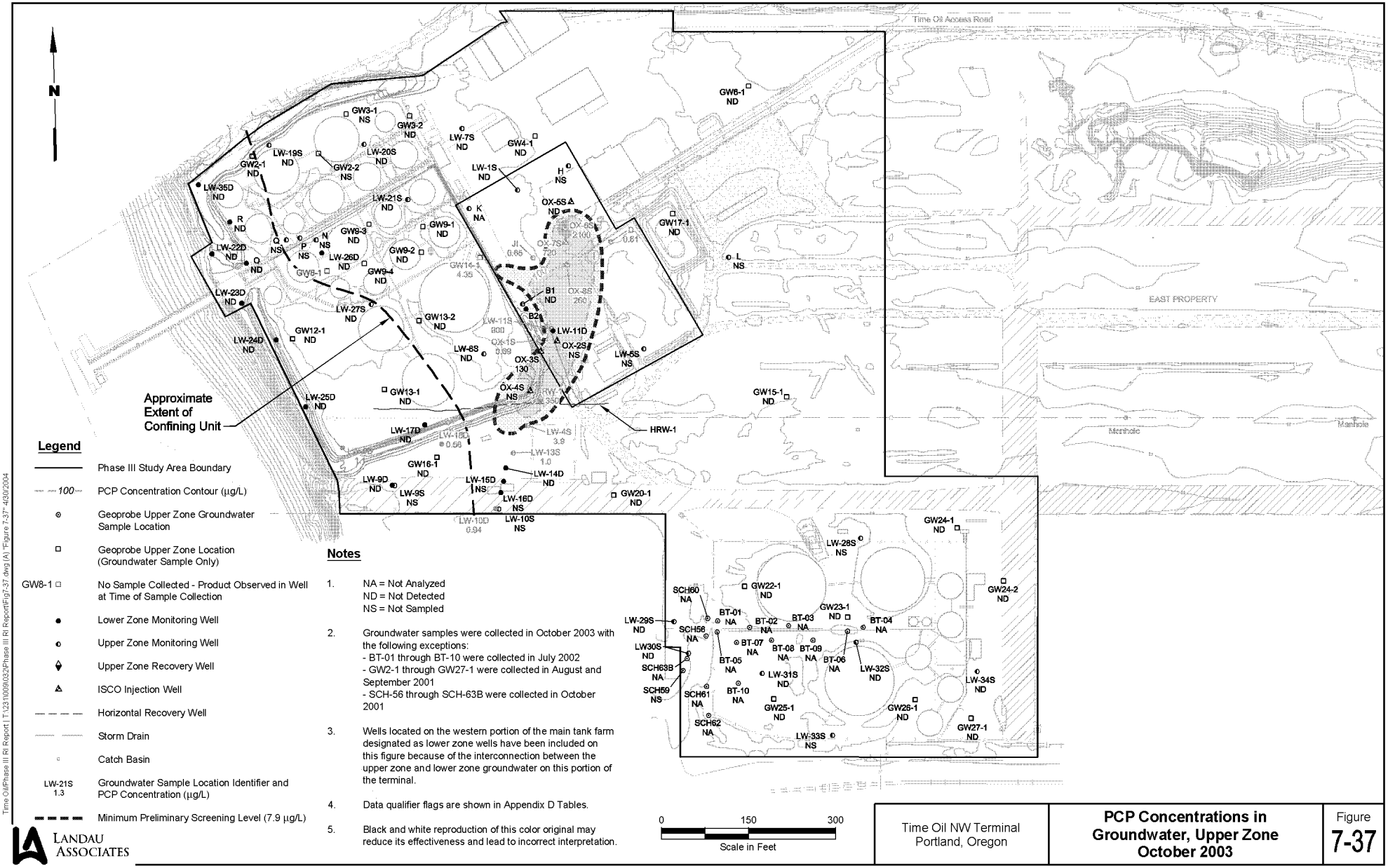
Time Oil\Phase III RI Report | T:\231\0009\032\Phase III RI Report\Fig7-35.dwg (A) Figure 7-35" 4/30/2004

BZTO104(e)020635



Time Oil\Phase III RI Report | T:\231\000\903\2\Phase III RI Report\Fig7-36.dwg (A) "Figure 7-36" 4/30/2004

BZTO104(e)020636



Legend

- Phase III Study Area Boundary
- 100 — PCP Concentration Contour (µg/L)
- Geoprobe Upper Zone Groundwater Sample Location
- Geoprobe Upper Zone Location (Groundwater Sample Only)
- GW8-1 — No Sample Collected - Product Observed in Well at Time of Sample Collection
- Lower Zone Monitoring Well
- Upper Zone Monitoring Well
- Upper Zone Recovery Well
- ISCO Injection Well
- Horizontal Recovery Well
- Storm Drain
- Catch Basin
- LW-21S 1.3 — Groundwater Sample Location Identifier and PCP Concentration (µg/L)
- Minimum Preliminary Screening Level (7.9 µg/L)

Notes

1. NA = Not Analyzed
   ND = Not Detected
   NS = Not Sampled
2. Groundwater samples were collected in October 2003 with the following exceptions:
   - BT-01 through BT-10 were collected in July 2002
   - GW2-1 through GW27-1 were collected in August and September 2001
   - SCH-56 through SCH-63B were collected in October 2001
3. Wells located on the western portion of the main tank farm designated as lower zone wells have been included on this figure because of the interconnection between the upper zone and lower zone groundwater on this portion of the terminal.
4. Data qualifier flags are shown in Appendix D Tables.
5. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

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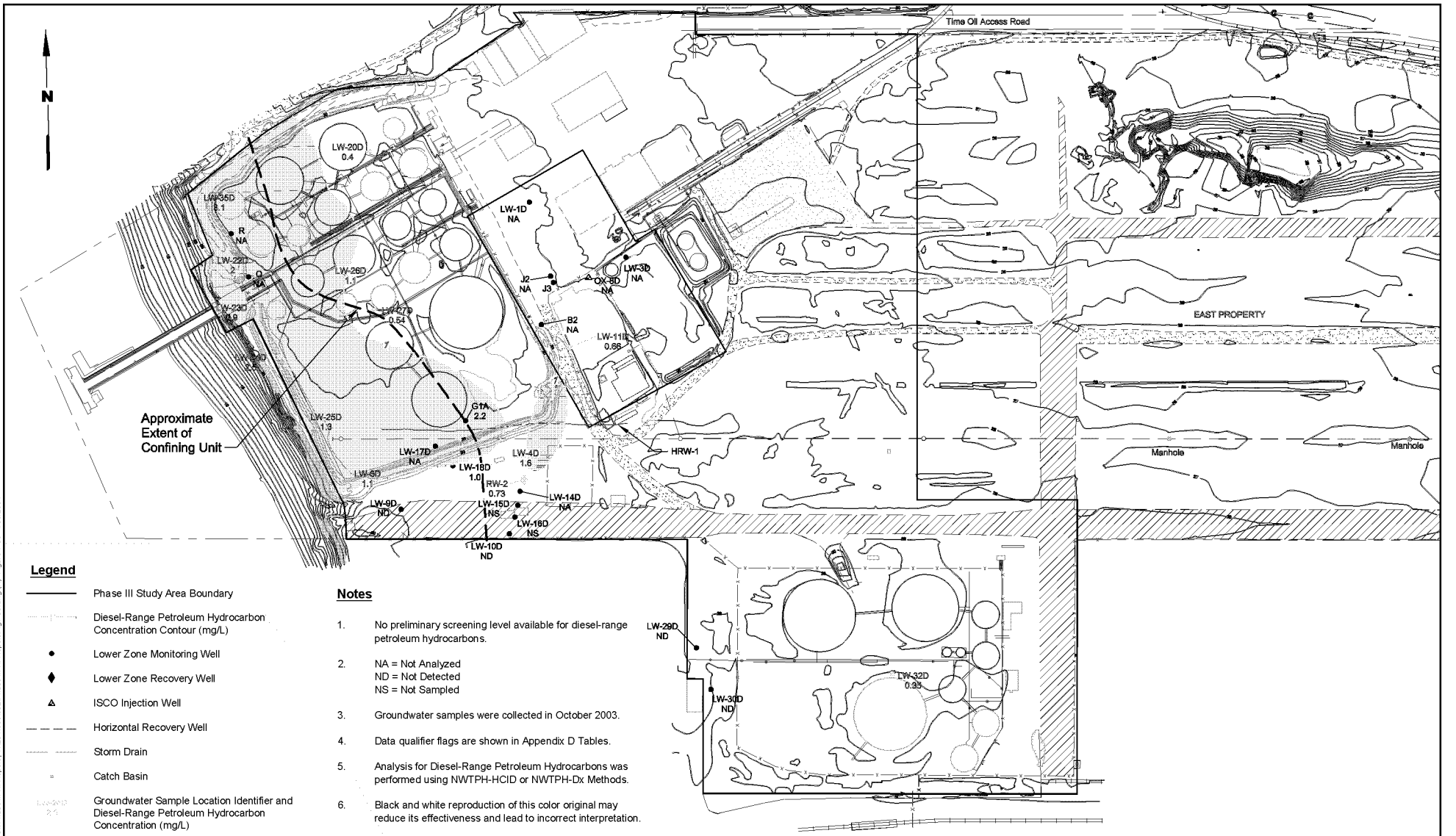
Time Oil NW Terminal
Portland, Oregon

PCP Concentrations in Groundwater, Upper Zone October 2003

Figure 7-37

Time Oil\Phase III RI Report [T:\231\0009\032\Phase III RI Report\Fig7-37.dwg (A) "Figure 7-37" 4/30/2004

BZTO104(e)020637



Legend

- Phase III Study Area Boundary
- Diesel-Range Petroleum Hydrocarbon Concentration Contour (mg/L)
- Lower Zone Monitoring Well
- Lower Zone Recovery Well
- ISCO Injection Well
- Horizontal Recovery Well
- Storm Drain
- Catch Basin
- Groundwater Sample Location Identifier and Diesel-Range Petroleum Hydrocarbon Concentration (mg/L)

Notes

1. No preliminary screening level available for diesel-range petroleum hydrocarbons.
2. NA = Not Analyzed
   ND = Not Detected
   NS = Not Sampled
3. Groundwater samples were collected in October 2003.
4. Data qualifier flags are shown in Appendix D Tables.
5. Analysis for Diesel-Range Petroleum Hydrocarbons was performed using NWTPH-HCID or NWTPH-Dx Methods.
6. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

LANDAU ASSOCIATES

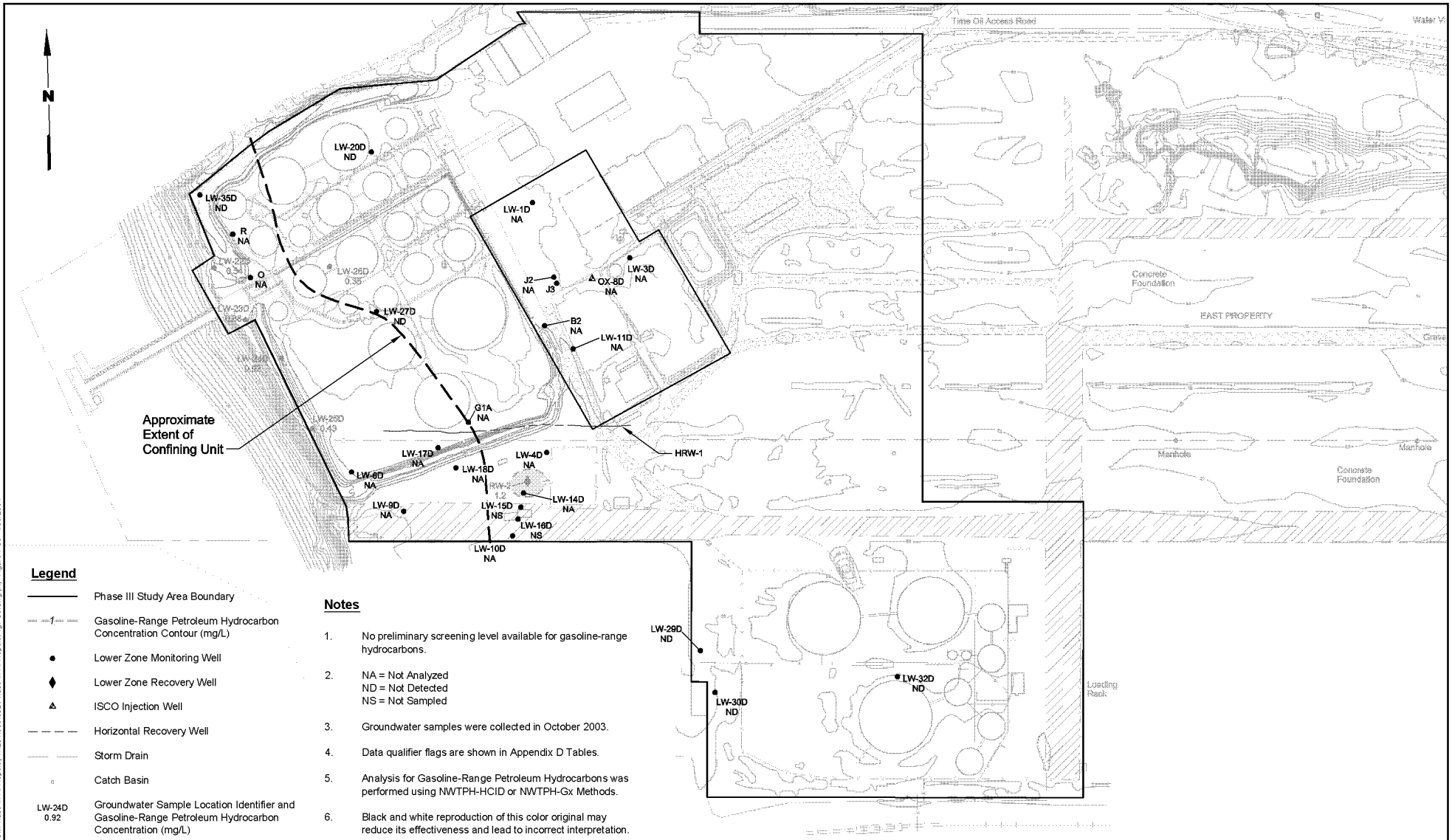
Time Oil NW Terminal
Portland, Oregon

Diesel-Range Petroleum Hydrocarbons in Groundwater, Lower Zone, October 2003

Figure
7-38

Time Oil\Phase III RI Report | T:\231\0009\02\Phase III RI Report\Fig7-38.dwg (A) "Figure 7-38" 4/30/2004

BZTO104(e)020638



Legend

- Phase III Study Area Boundary
- 1 — Gasoline-Range Petroleum Hydrocarbon Concentration Contour (mg/L)
- Lower Zone Monitoring Well
- Lower Zone Recovery Well
- ISCO Injection Well
- Horizontal Recovery Well
- Storm Drain
- Catch Basin
- LW-24D 0.92 — Groundwater Sample Location Identifier and Gasoline-Range Petroleum Hydrocarbon Concentration (mg/L)

Notes

1. No preliminary screening level available for gasoline-range hydrocarbons.
2. NA = Not Analyzed
   ND = Not Detected
   NS = Not Sampled
3. Groundwater samples were collected in October 2003.
4. Data qualifier flags are shown in Appendix D Tables.
5. Analysis for Gasoline-Range Petroleum Hydrocarbons was performed using NWTPH-HCID or NWTPH-Gx Methods.
6. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

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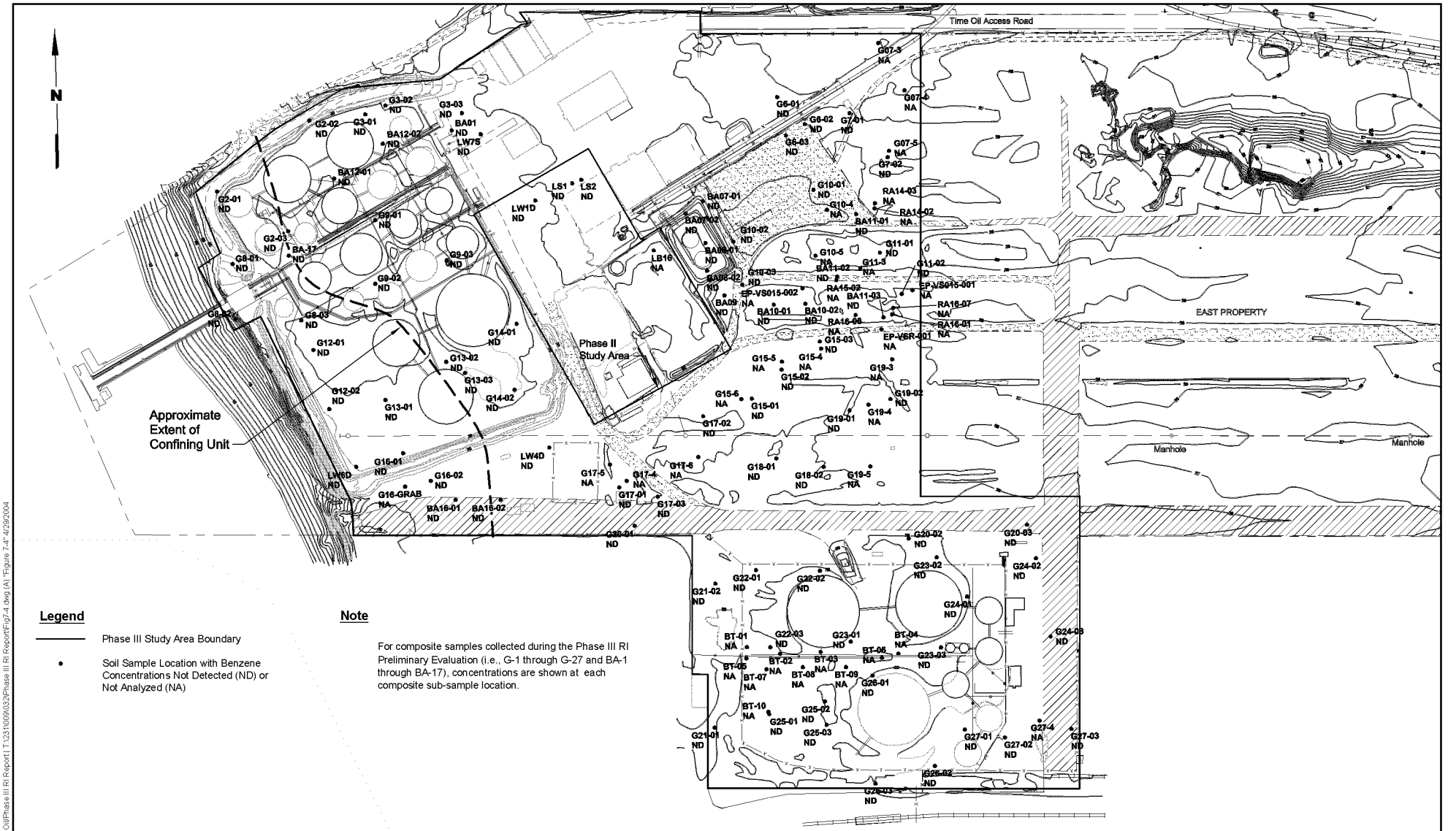
Time Oil NW Terminal Portland, Oregon	**Gasoline-Range Petroleum Hydrocarbons in Groundwater, Lower Zone October 2003**	Figure **7-39**

Time Oil\Phase III RI Report\ T:\231\0009\026\Phase III RI Report\Fig7-39.dwg (A) "Figure 7-39" 4/30/2004

BZTO104(e)020639

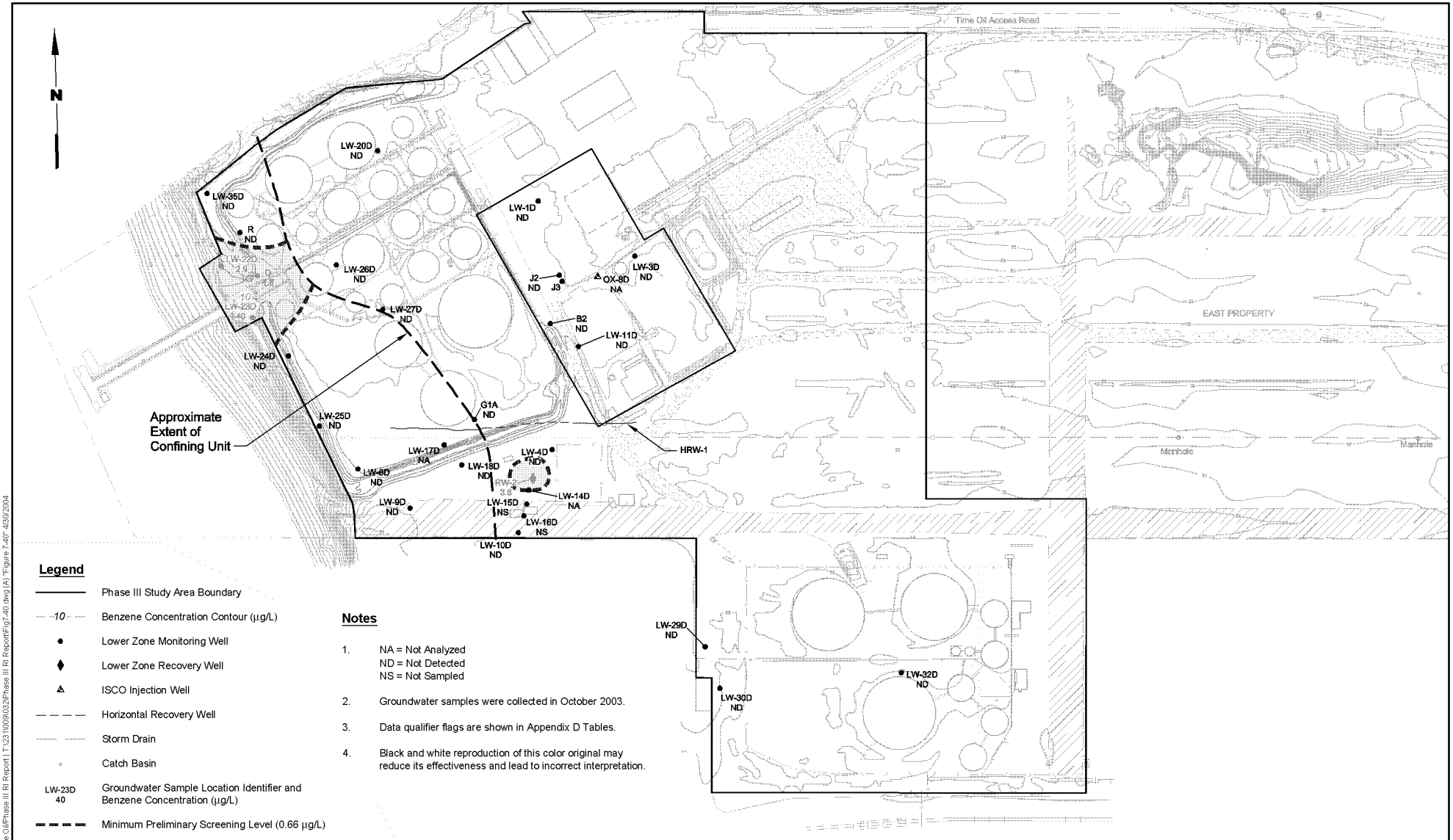


LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Benzene Concentrations in Soil 0-0.5 ft BGS**	Figure **7-4**

Time Oil\Phase III RI Report\ T:\231\0009\032\Phase III RI Report\Fig7-4.dwg (A) "Figure 7-4" 4/29/2004

BZTO104(e)020640

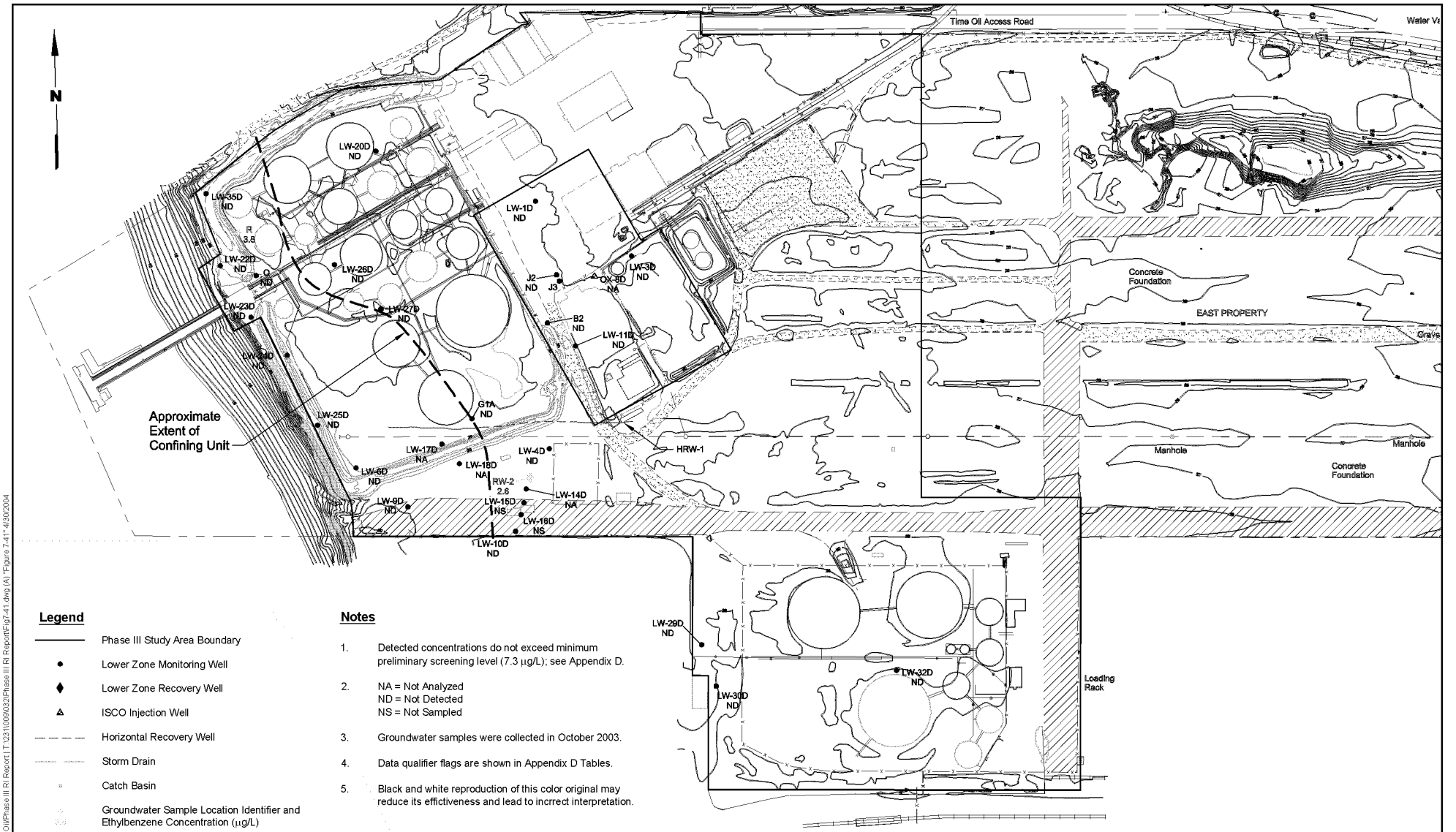


LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Benzene Concentrations in Groundwater, Lower Zone October 2003**	Figure **7-40**

Time Oil\Phase III RI Report | T:\23\10009\020\Phase III RI Report\Fig7-40.dwg (A) "Figure 7-40" 4/30/2004

BZTO104(e)020641



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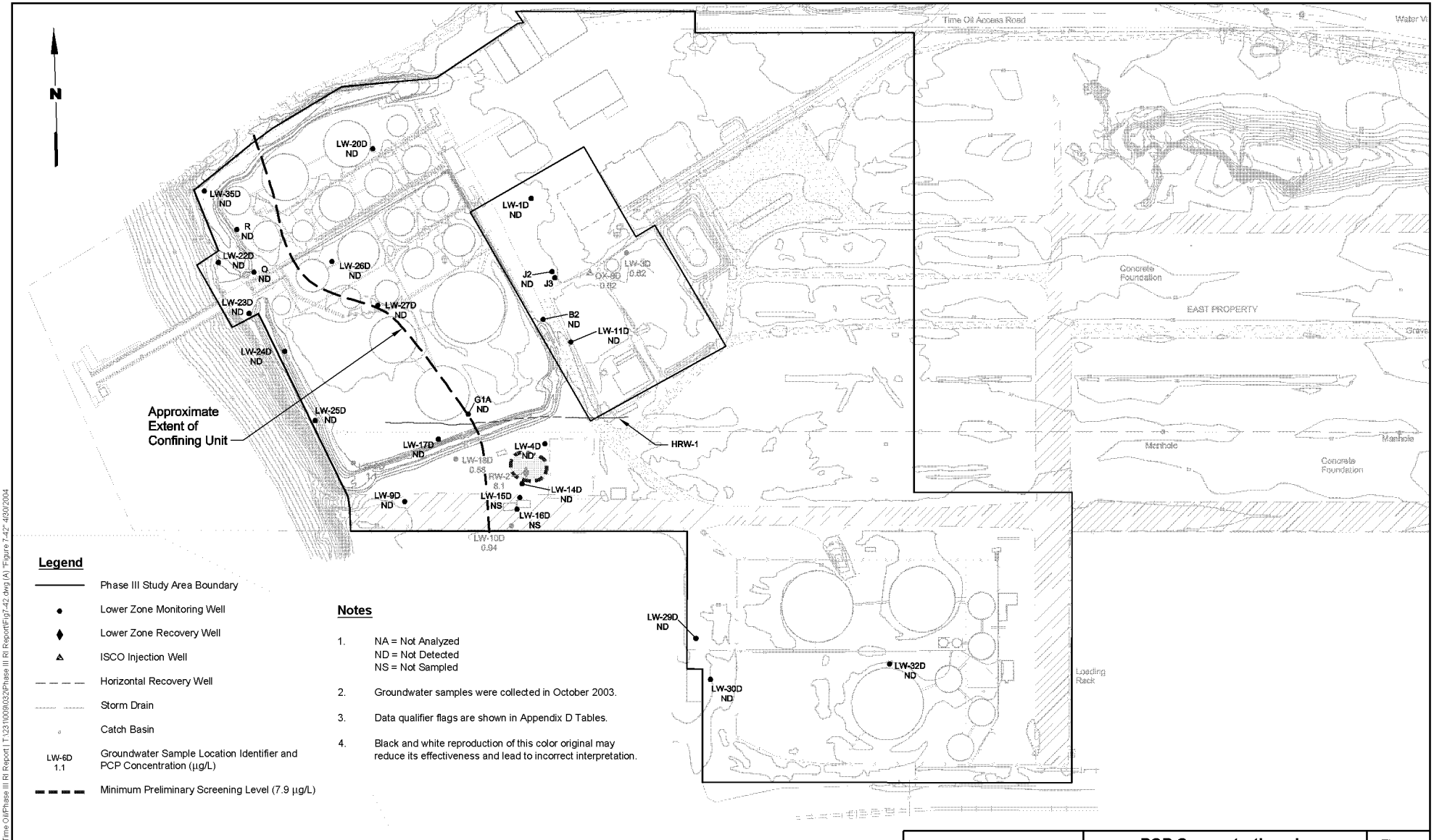
Time Oil NW Terminal Portland, Oregon	**Ethylbenzene Concentrations in Groundwater, Lower Zone October 2003**	Figure **7-41**

Time Oil\Phase III RI Report | T:\231\0009\02\Phase III RI Report\Fig7-41.dwg (A) "Figure 7-41" 4/30/2004

BZTO104(e)020642

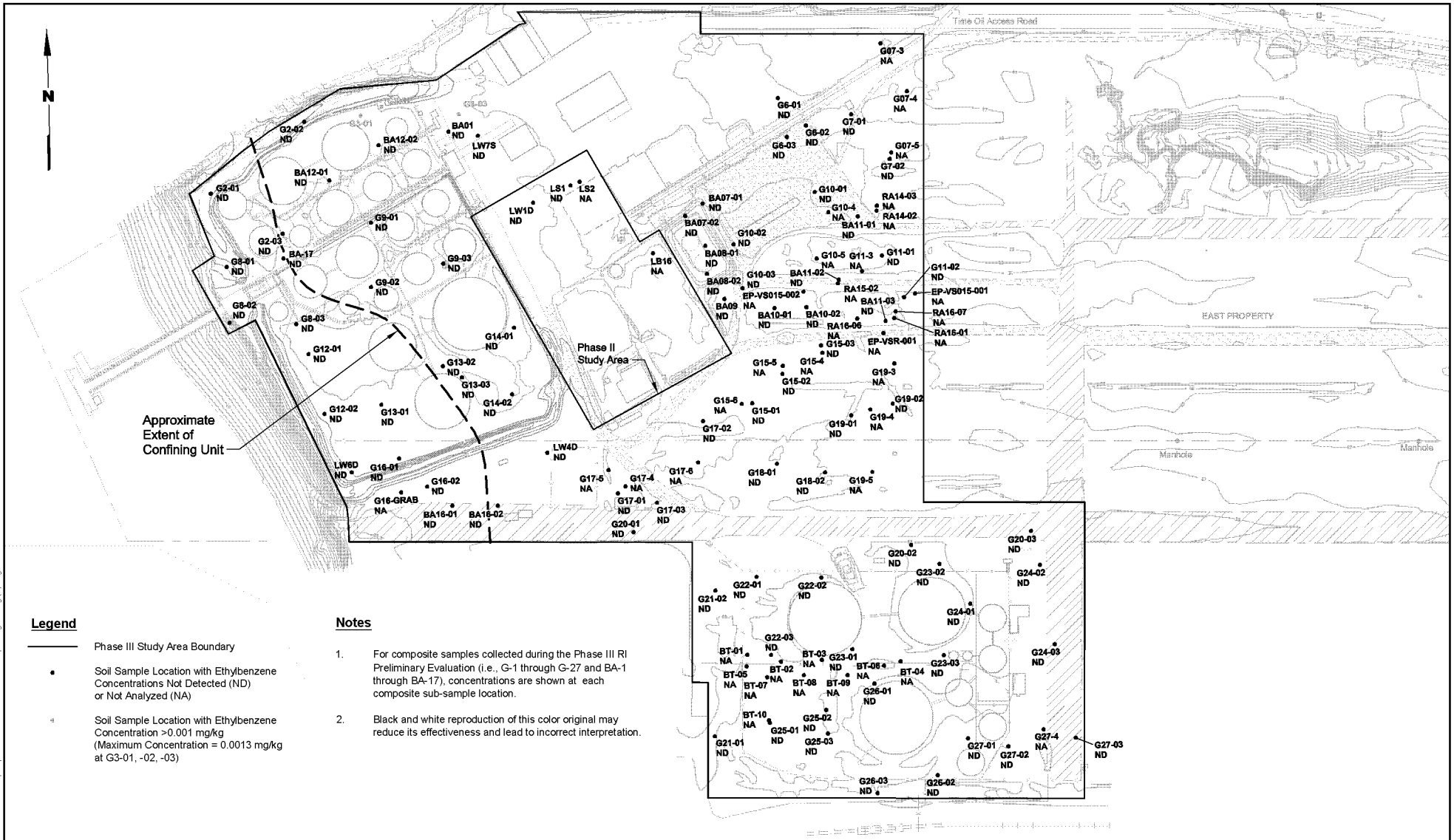


LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**PCP Concentrations in Groundwater, Lower Zone October 2003**	Figure **7-42**

Time Oil\Phase III RI Report | T:\23\10009\020\Phase III RI Report\Fig7-42.dwg (A) 'Figure 7-42' 4/30/2004

BZTO104(e)020643



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Ethylbenzene Concentrations Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Ethylbenzene Concentration >0.001 mg/kg (Maximum Concentration = 0.0013 mg/kg at G3-01, -02, -03)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

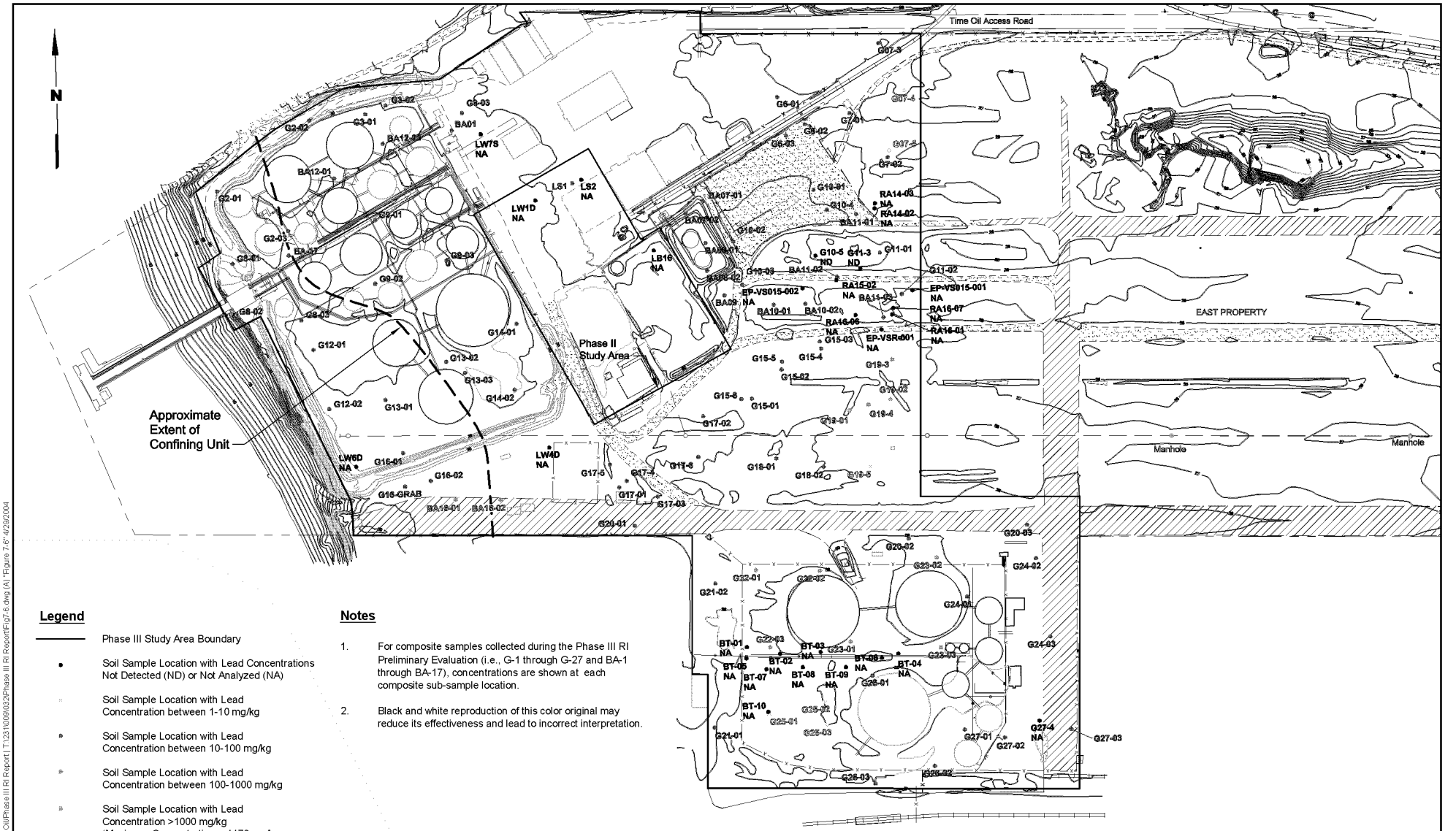
0 150 300
Scale in Feet

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Ethylbenzene Concentrations in Soil 0-0.5 ft BGS**	Figure **7-5**

Time Oil\Phase III RI Report | T:\23\10009\032\Phase III RI Report\Fig7-5.dwg (A) "Figure 7-5" 4/30/2004

BZTO104(e)020644



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Lead Concentrations Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Lead Concentration between 1-10 mg/kg
- Soil Sample Location with Lead Concentration between 10-100 mg/kg
- Soil Sample Location with Lead Concentration between 100-1000 mg/kg
- Soil Sample Location with Lead Concentration >1000 mg/kg (Maximum Concentration = 1170 mg/kg at G19-01, -02)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

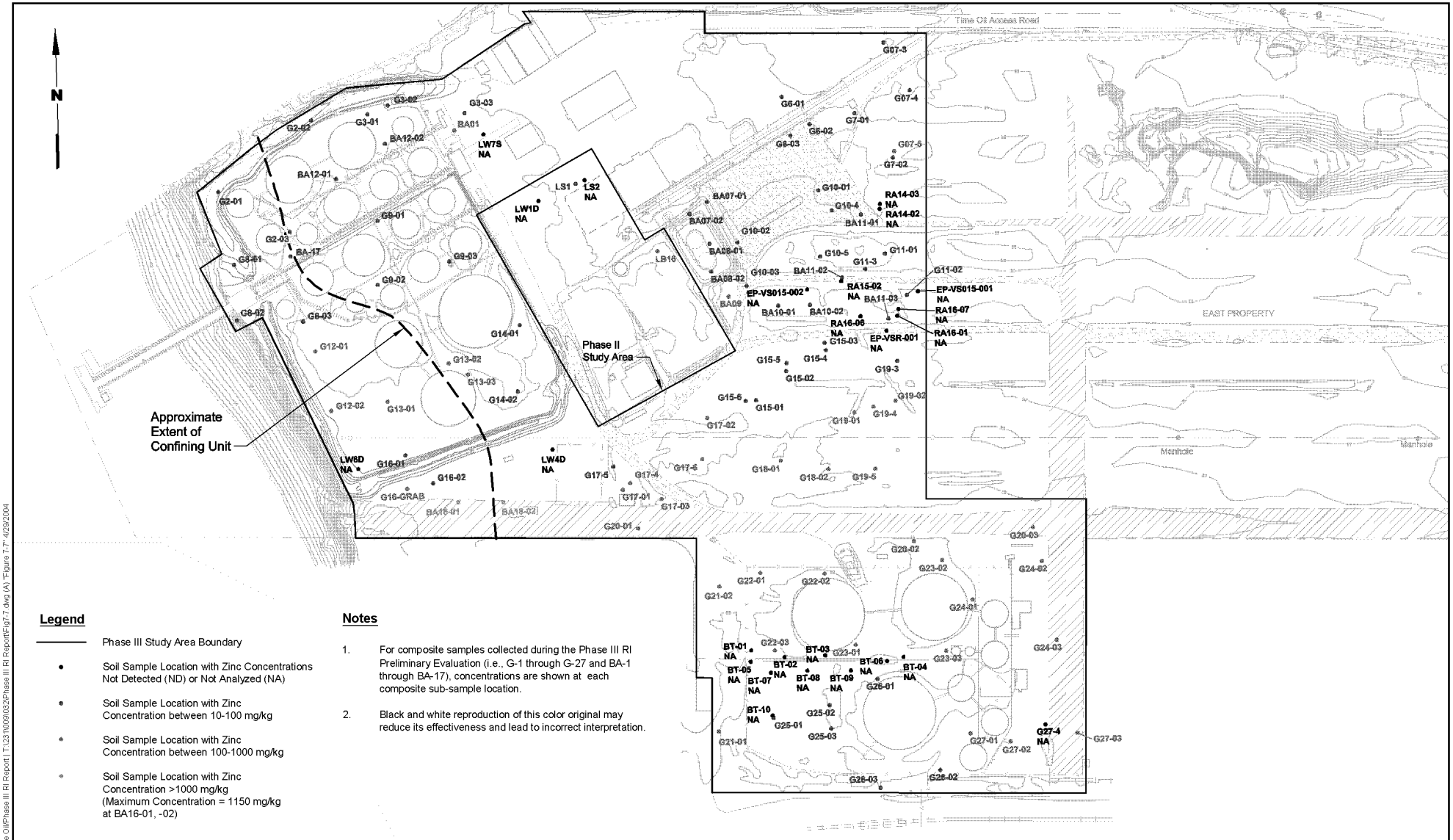
0 150 300
Scale in Feet

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Lead Concentrations in Soil 0-0.5 ft BGS**	Figure **7-6**

Time Oil\Phase III RI Report\T1231\0009032\Phase III RI Report\Fig7-6.dwg (A) "Figure 7.6" 4/29/2004

BZTO104(e)020645



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Zinc Concentrations Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Zinc Concentration between 10-100 mg/kg
- Soil Sample Location with Zinc Concentration between 100-1000 mg/kg
- Soil Sample Location with Zinc Concentration >1000 mg/kg (Maximum Concentration = 1150 mg/kg at BA16-01, -02)

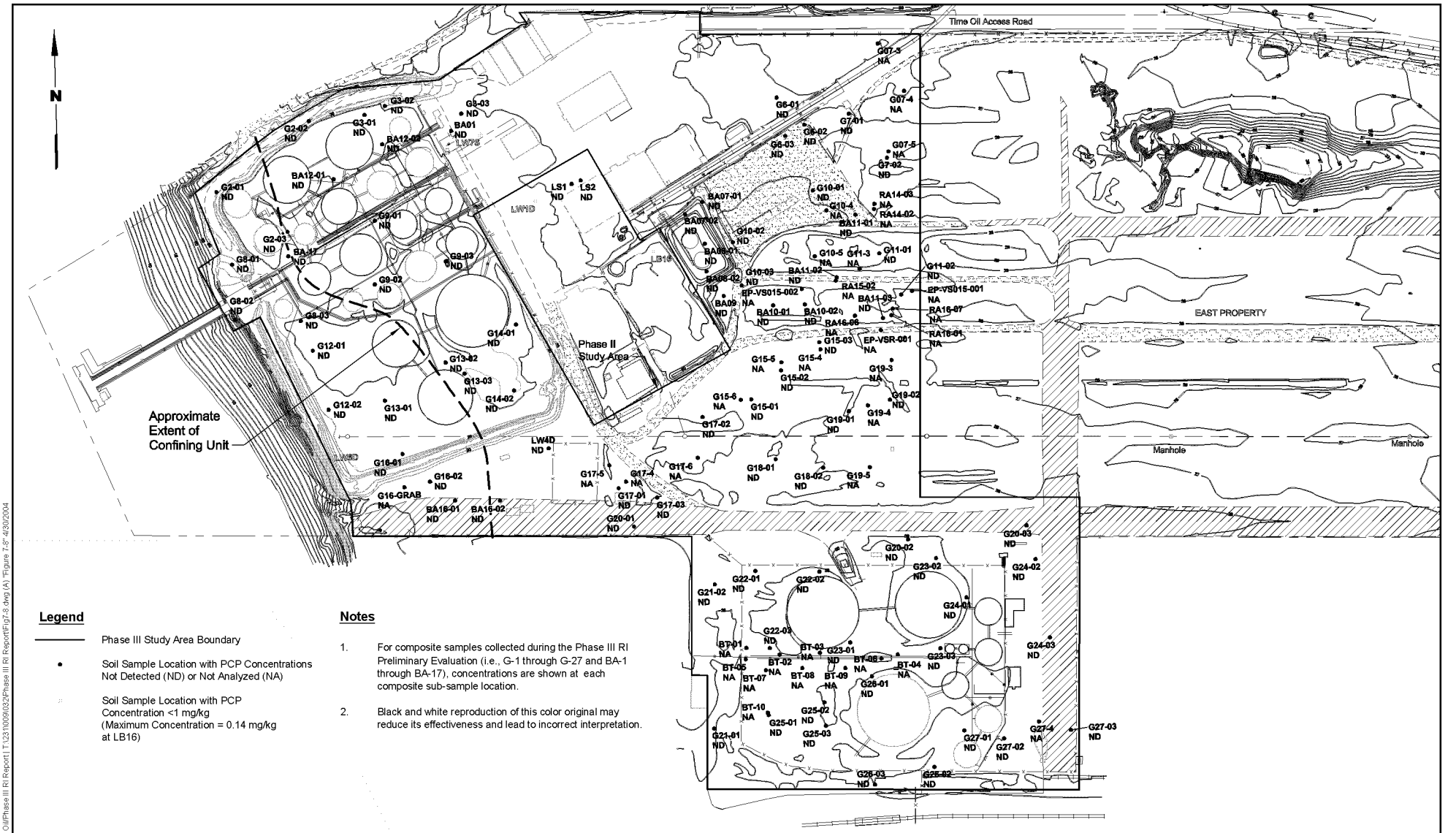
Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Zinc Concentrations in Soil 0-0.5 ft BGS**	Figure **7-7**

Time Oil\Phase III RI Report | T:\23\10009\032\Phase III RI Report\Fig7-7.dwg (A) "Figure 7-7" 4/29/2004



Legend

- Phase III Study Area Boundary
- Soil Sample Location with PCP Concentrations Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with PCP Concentration <1 mg/kg (Maximum Concentration = 0.14 mg/kg at LB16)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

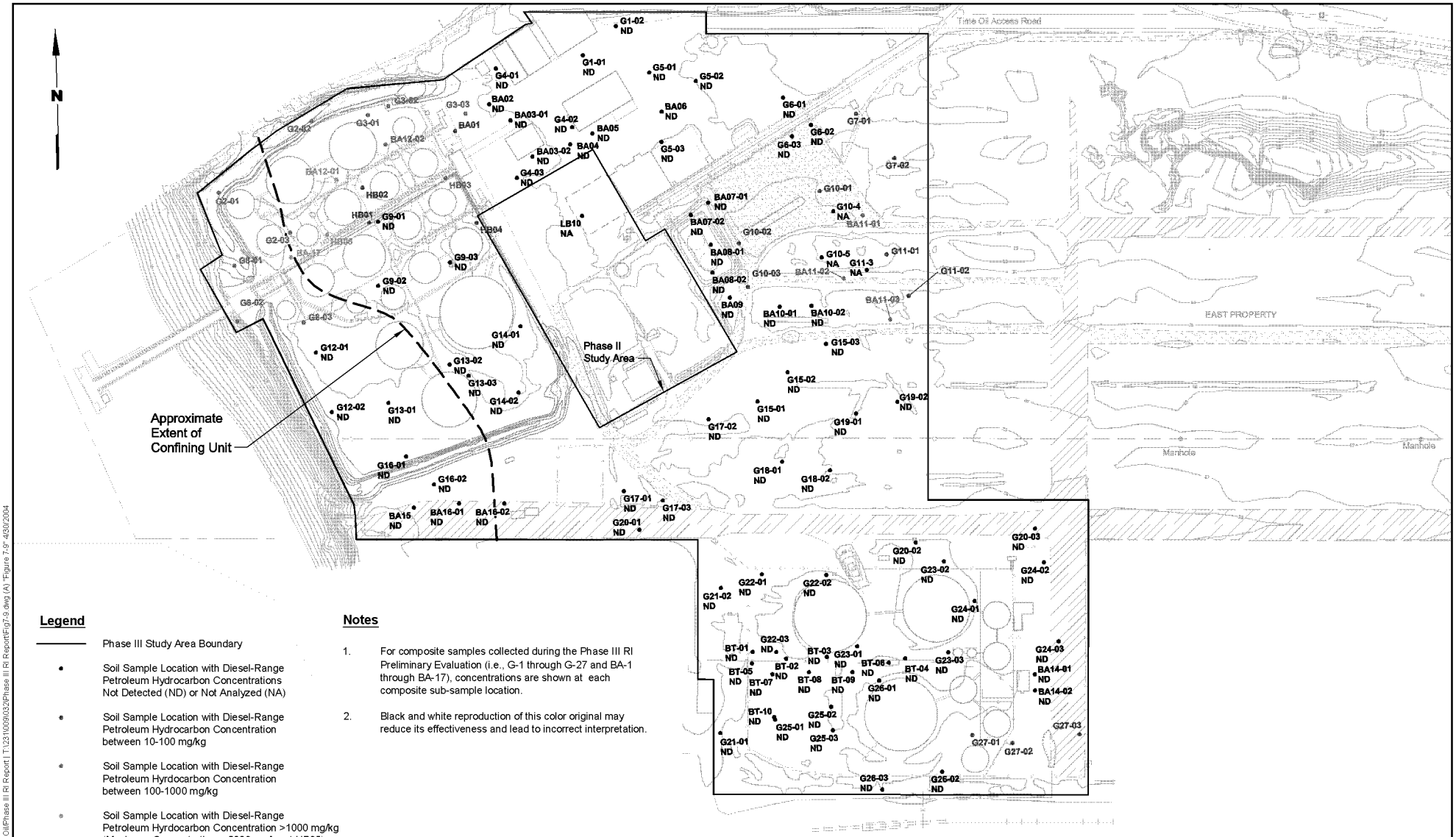
0 150 300
Scale in Feet

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**PCP Concentrations in Soil 0-0.5 ft BGS**	Figure **7-8**

Time Oil\Phase III RI Report\ T:\23\10009\002\Phase III RI Report\Fig7-8.dwg (A) 'Figure 7.8' 4/30/2004

BZTO104(e)020647



Legend

- Phase III Study Area Boundary
- Soil Sample Location with Diesel-Range Petroleum Hydrocarbon Concentrations Not Detected (ND) or Not Analyzed (NA)
- Soil Sample Location with Diesel-Range Petroleum Hydrocarbon Concentration between 10-100 mg/kg
- Soil Sample Location with Diesel-Range Petroleum Hyrdocarbon Concentration between 100-1000 mg/kg
- Soil Sample Location with Diesel-Range Petroleum Hyrdocarbon Concentration >1000 mg/kg (Maximum Concentration = 2330 mg/kg at HB05)

Notes

1. For composite samples collected during the Phase III RI Preliminary Evaluation (i.e., G-1 through G-27 and BA-1 through BA-17), concentrations are shown at each composite sub-sample location.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 150 300
Scale in Feet

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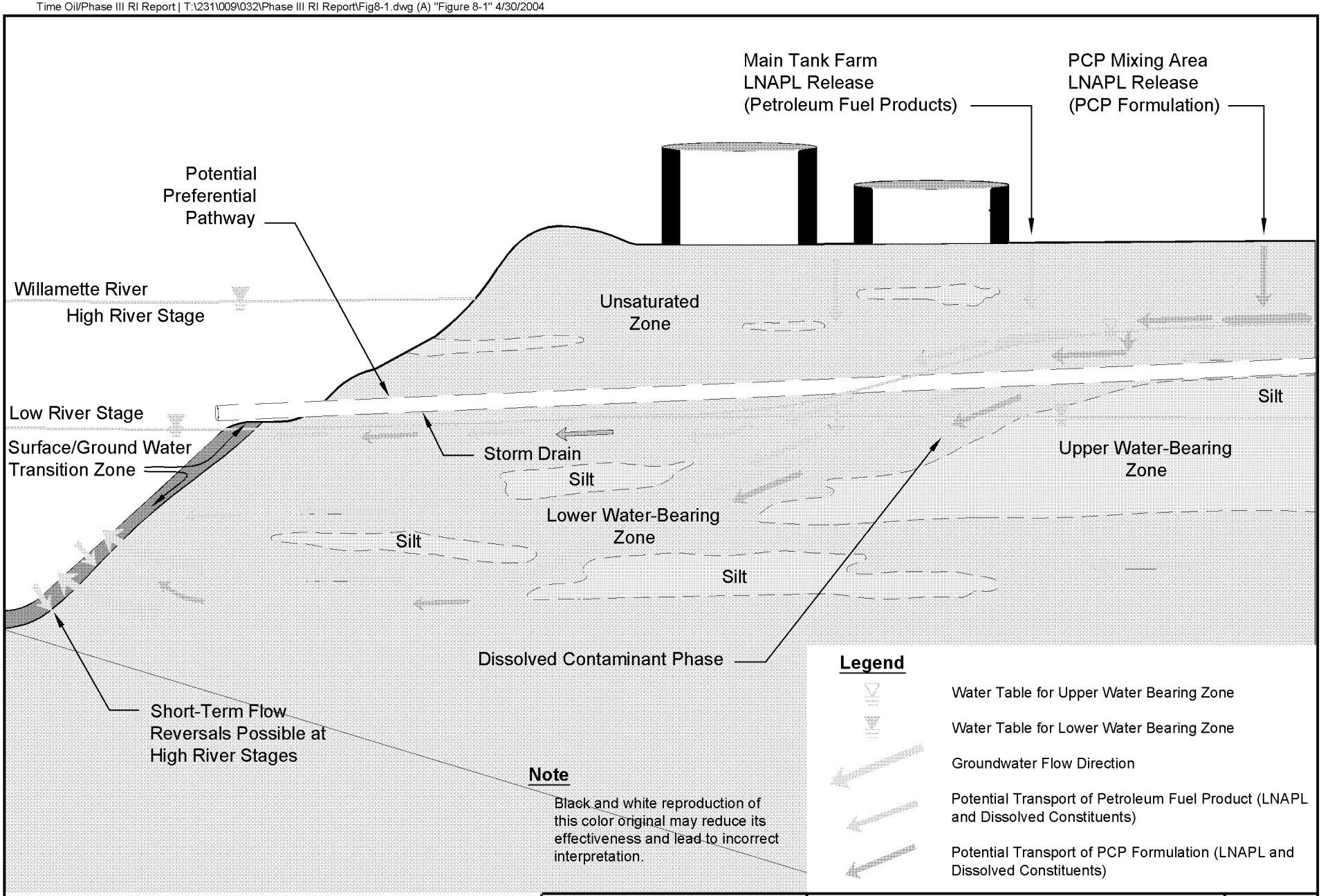
Time Oil NW Terminal Portland, Oregon	**Diesel-Range Petroleum Hydrocarbon Concentrations in Soil 1-1.5 ft BGS**	Figure **7-9**

Time Oil\Phase III RI Report [T:\23\10009\032\Phase III RI Report\Fig7-9.dwg (A) "Figure 7-9" 4/30/2004

BZTO104(e)020648



LANDAU ASSOCIATES

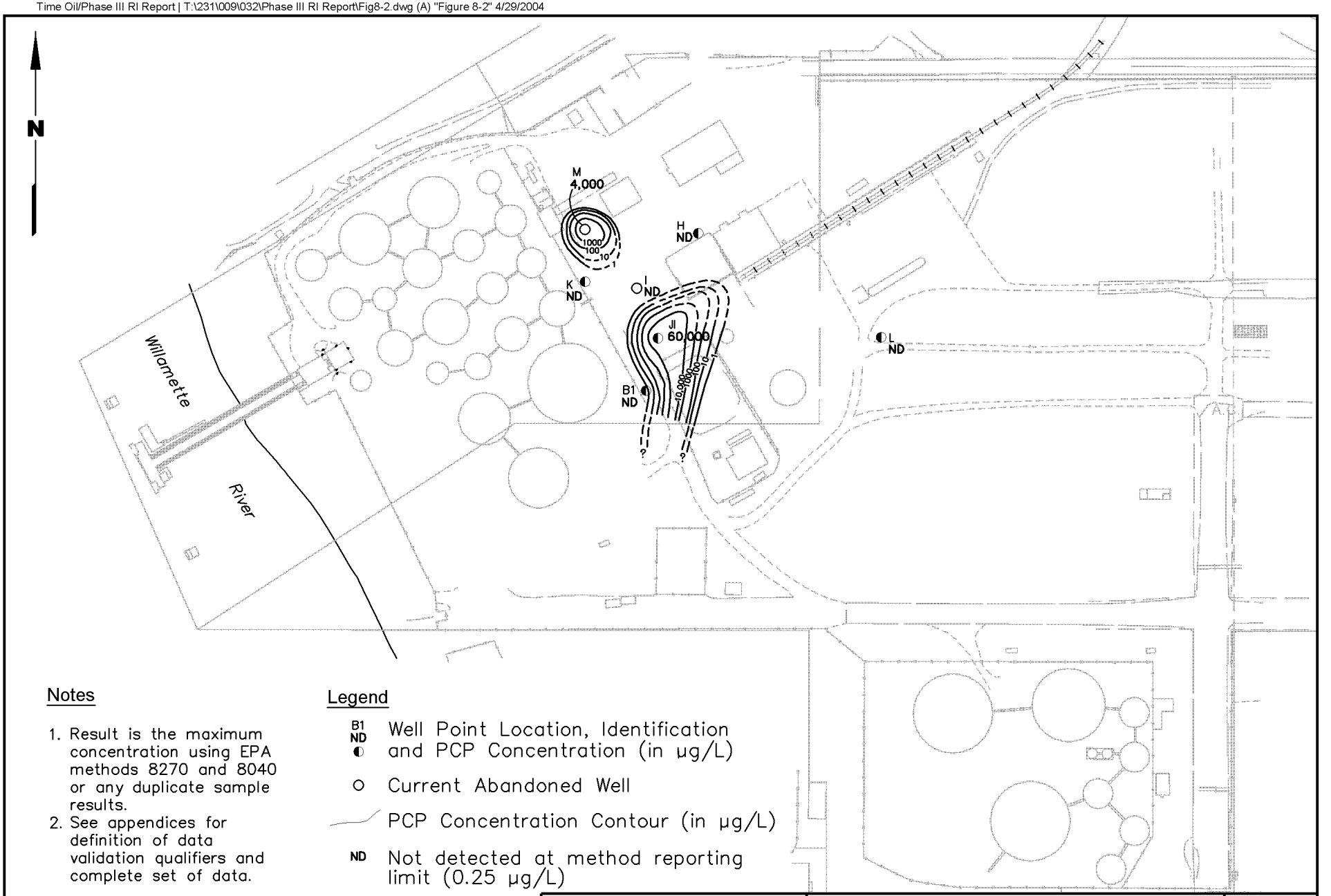
Not to Scale

Time Oil NW Terminal
Portland, Oregon

Conceptual Site Model

Figure
8-1

BZTO104(e)020649



Notes

1. Result is the maximum concentration using EPA methods 8270 and 8040 or any duplicate sample results.
2. See appendices for definition of data validation qualifiers and complete set of data.

Legend

- B1 / ND / ◐ — Well Point Location, Identification and PCP Concentration (in µg/L)
- ○ — Current Abandoned Well
- PCP Concentration Contour (in µg/L)
- ND — Not detected at method reporting limit (0.25 µg/L)

0 200 400
Scale in Feet

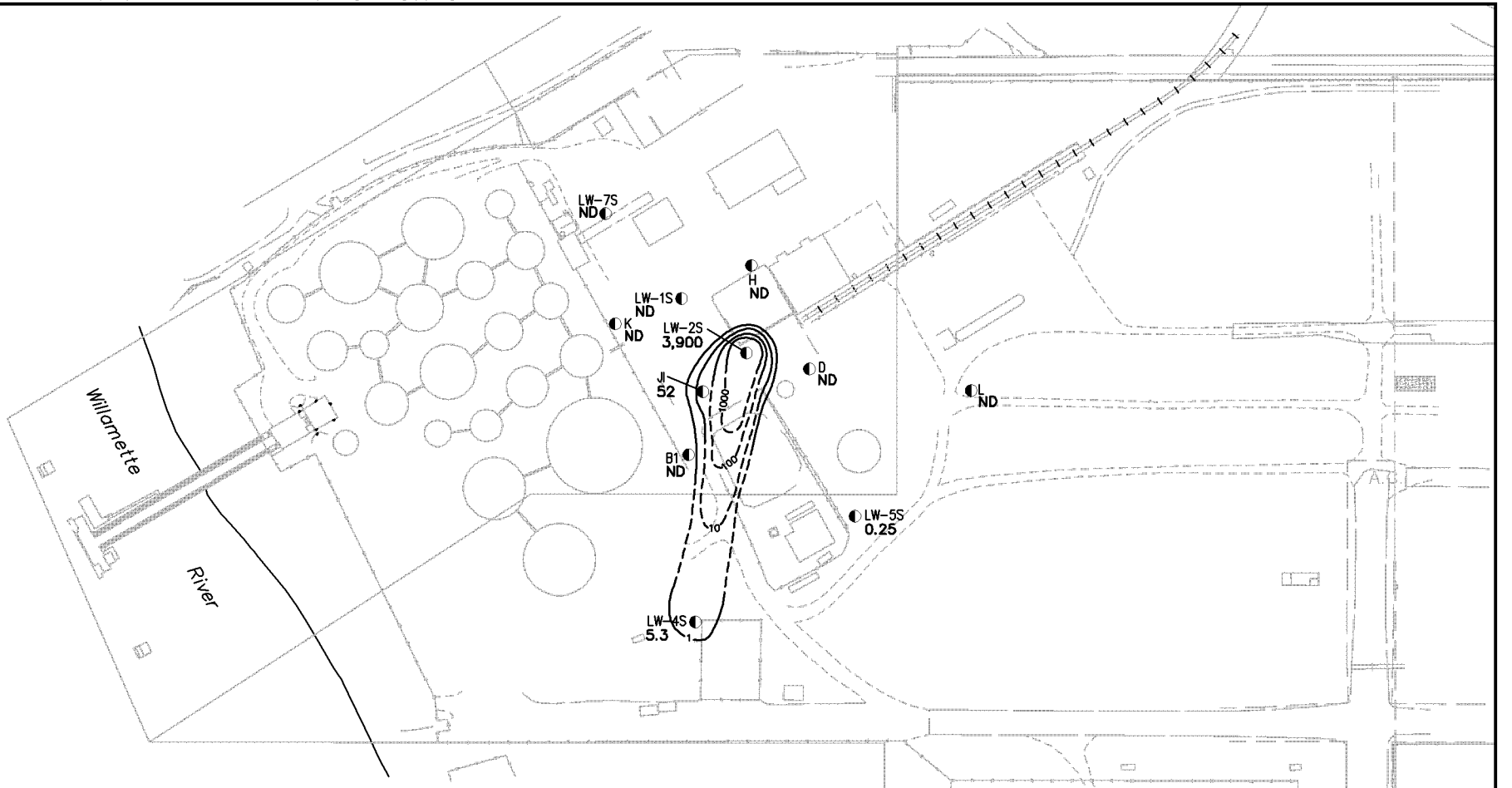
LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

PCP Groundwater Concentrations Upper Zone, February 1991

Figure
8-2

BZTO104(e)020650



Notes

1. Result is the maximum concentration using EPA methods 8270 and 8040 or any duplicate sample results.
2. See appendices for definition of data validation qualifiers and complete set of data.

Legend

LW-4S ND — Shallow Monitoring Well Location, Identification, and PCP Concentration (in µg/L)

PCP Concentration Contour (in µg/L)

ND — Not detected at method reporting limit (0.25 µg/L)

0 200 400

Scale in Feet

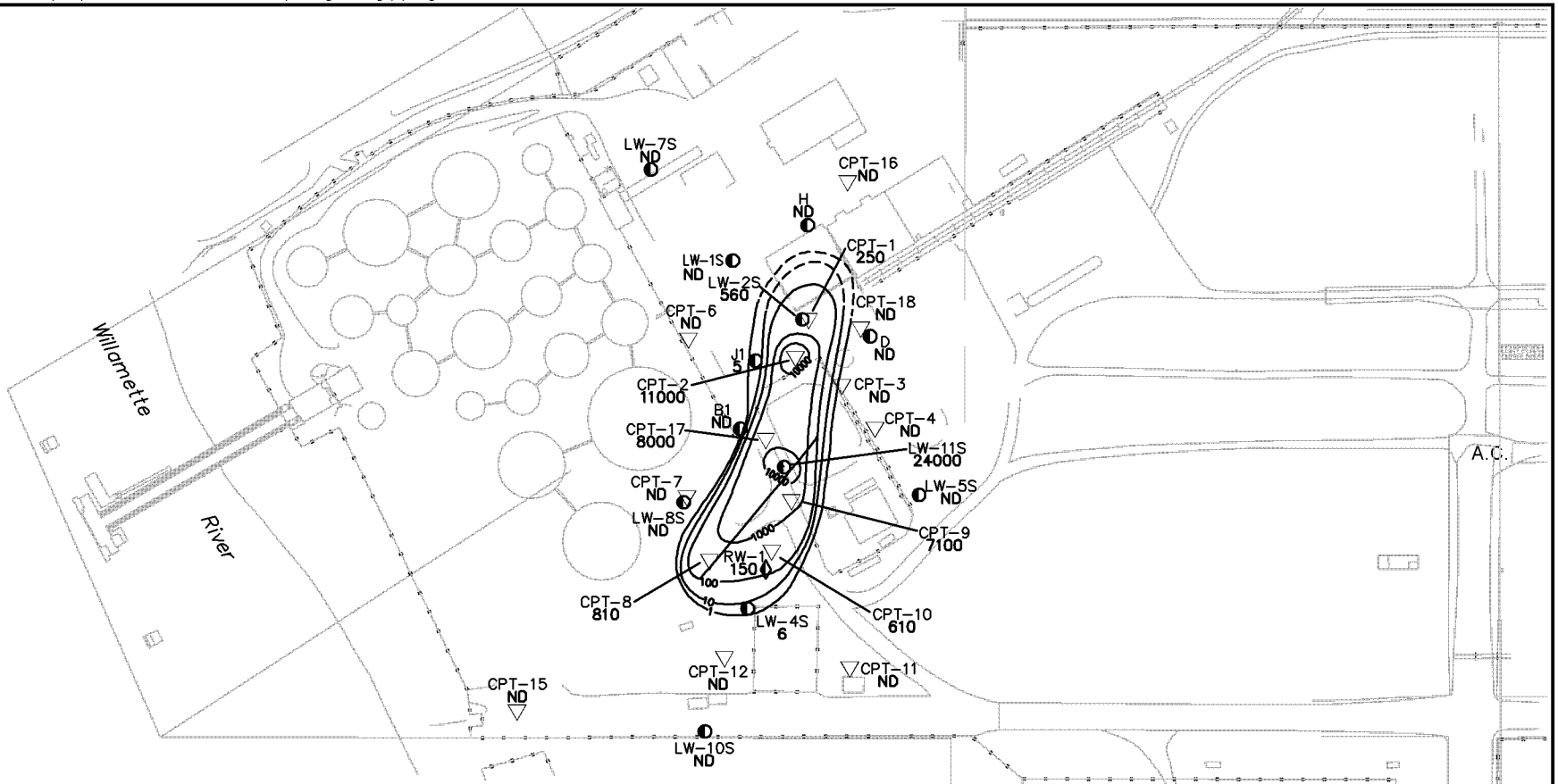
LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

PCP Groundwater Concentrations Upper Zone, March-April 1997

Figure 8-3

BZTO104(e)020651



Notes

1. Result is the maximum concentration using EPA methods 8270 and 8040 or any duplicate sample results.
2. See appendices for definition of data validation qualifiers and complete set of data.

Legend

- CPT-1 250 — CPT Exploration Location, Indentification, and PCP Concentration (in µg/L) (March 1999)
- LW-1S ND — Monitoring Well Location, Identification, and PCP Concentration (in µg/L) (May 1999)
- PCP Concentration Contour (in µg/L)
- ND — Not detected at method reporting limit (0.25 µg/L)

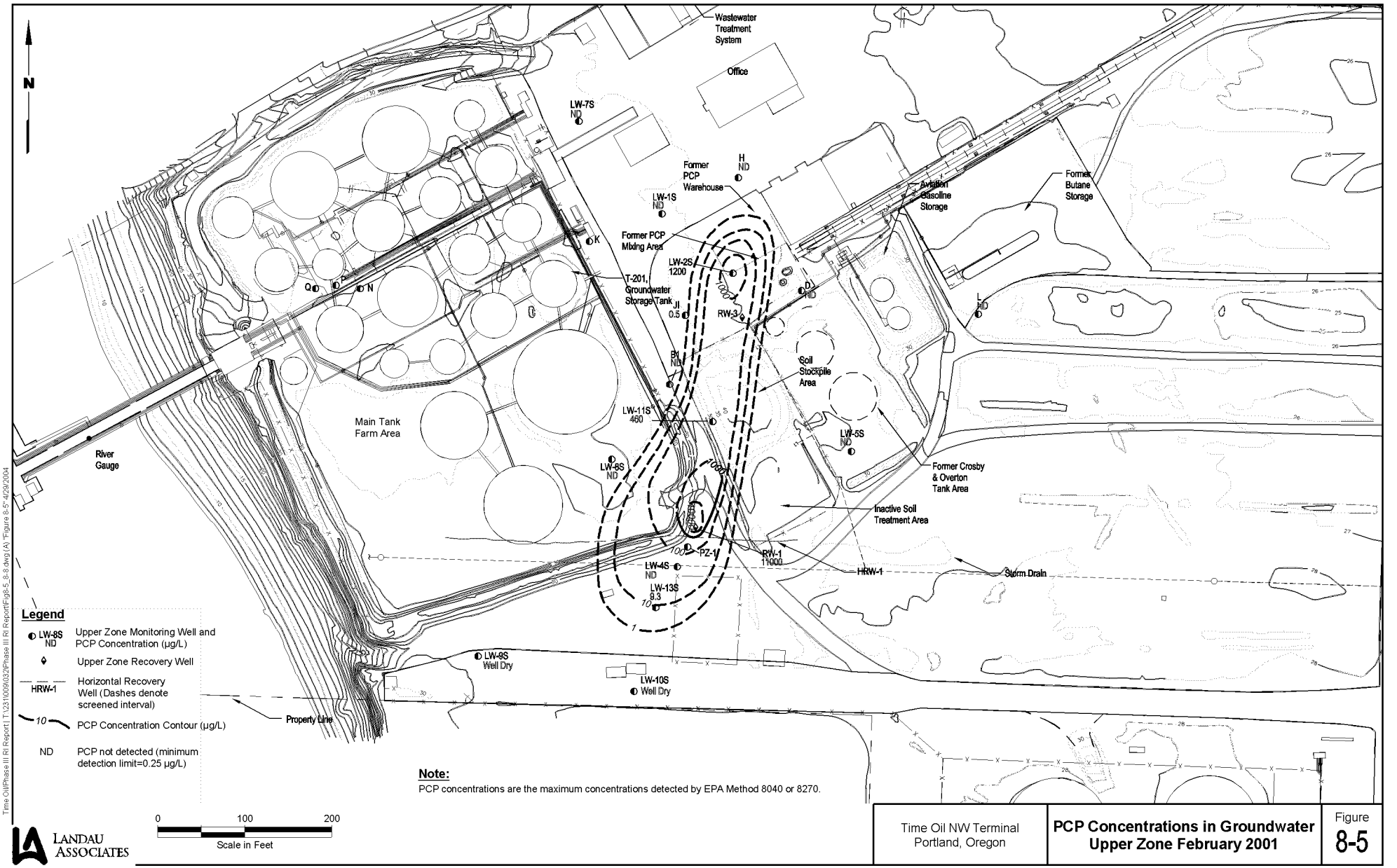
0 200 400
Scale in Feet

LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

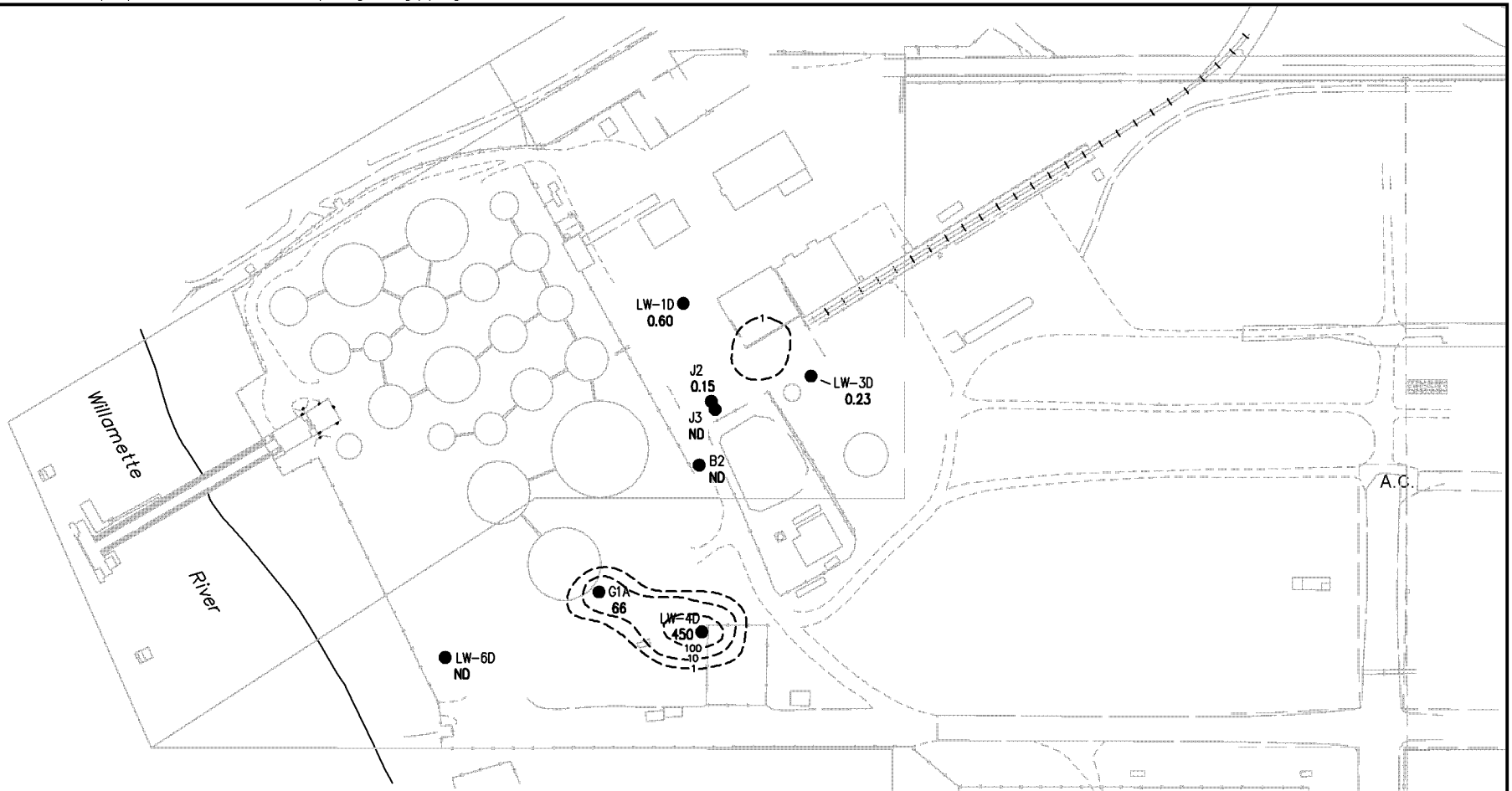
PCP Groundwater Concentrations Upper Zone, Spring 1999

Figure 8-4



Time Oil\Phase III RI Report\T123100903\2Phase III RI Report\Fig8-5_8-8.dwg (A) "Figure 8-5" 4/29/2004

BZTO104(e)020653



Notes

1. Result is the maximum concentration using EPA methods 8270 and 8040 or any duplicate sample results.
2. See appendices for definition of data validation qualifiers and complete set of data.

Legend

LW-6D ND ● Monitoring Well Location, Identification, and PCP Concentration (in µg/L)

PCP Concentration Contour (in µg/L)

ND Not detected at method reporting limit (0.25 µg/L)

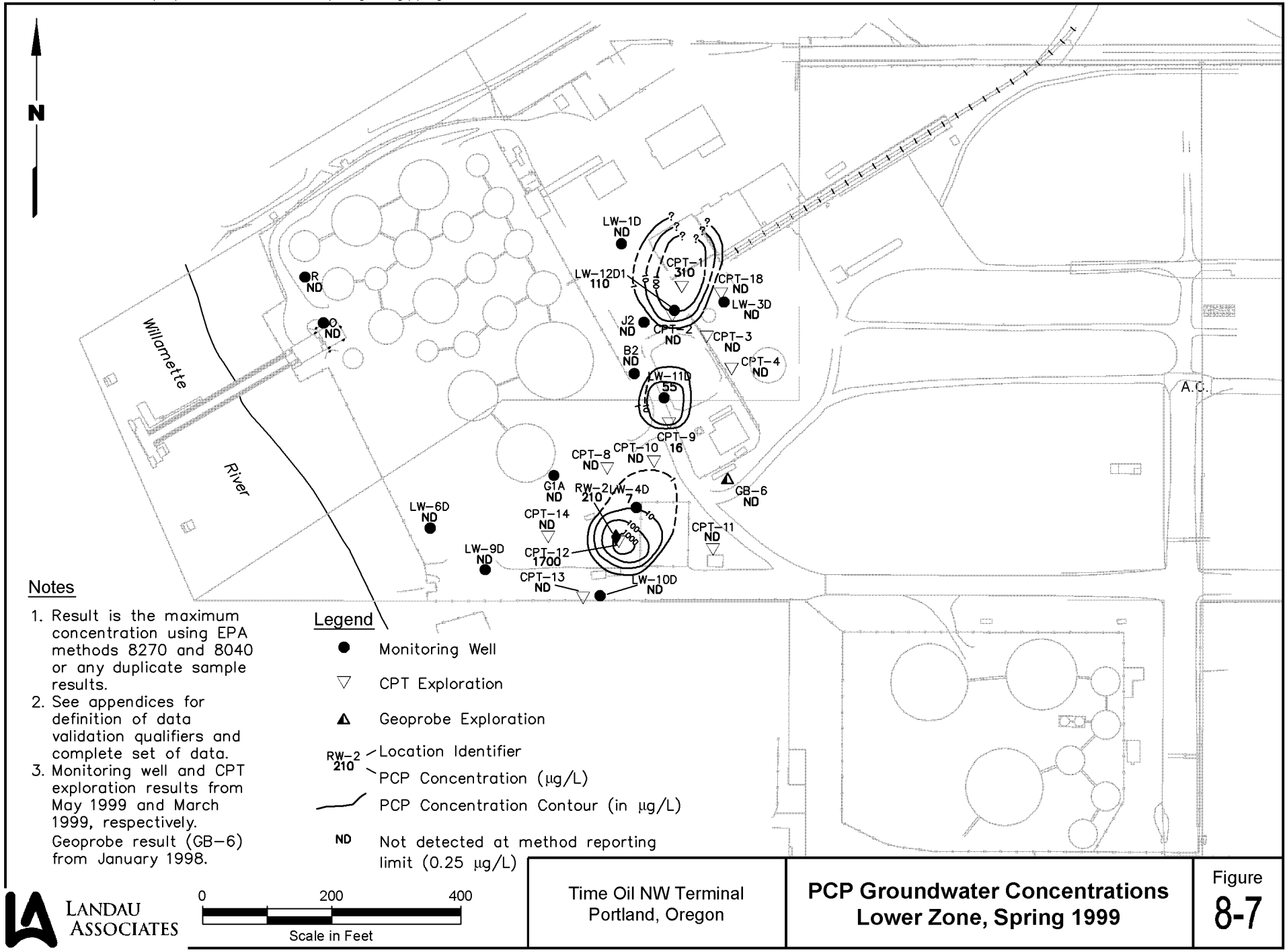
0 200 400
Scale in Feet

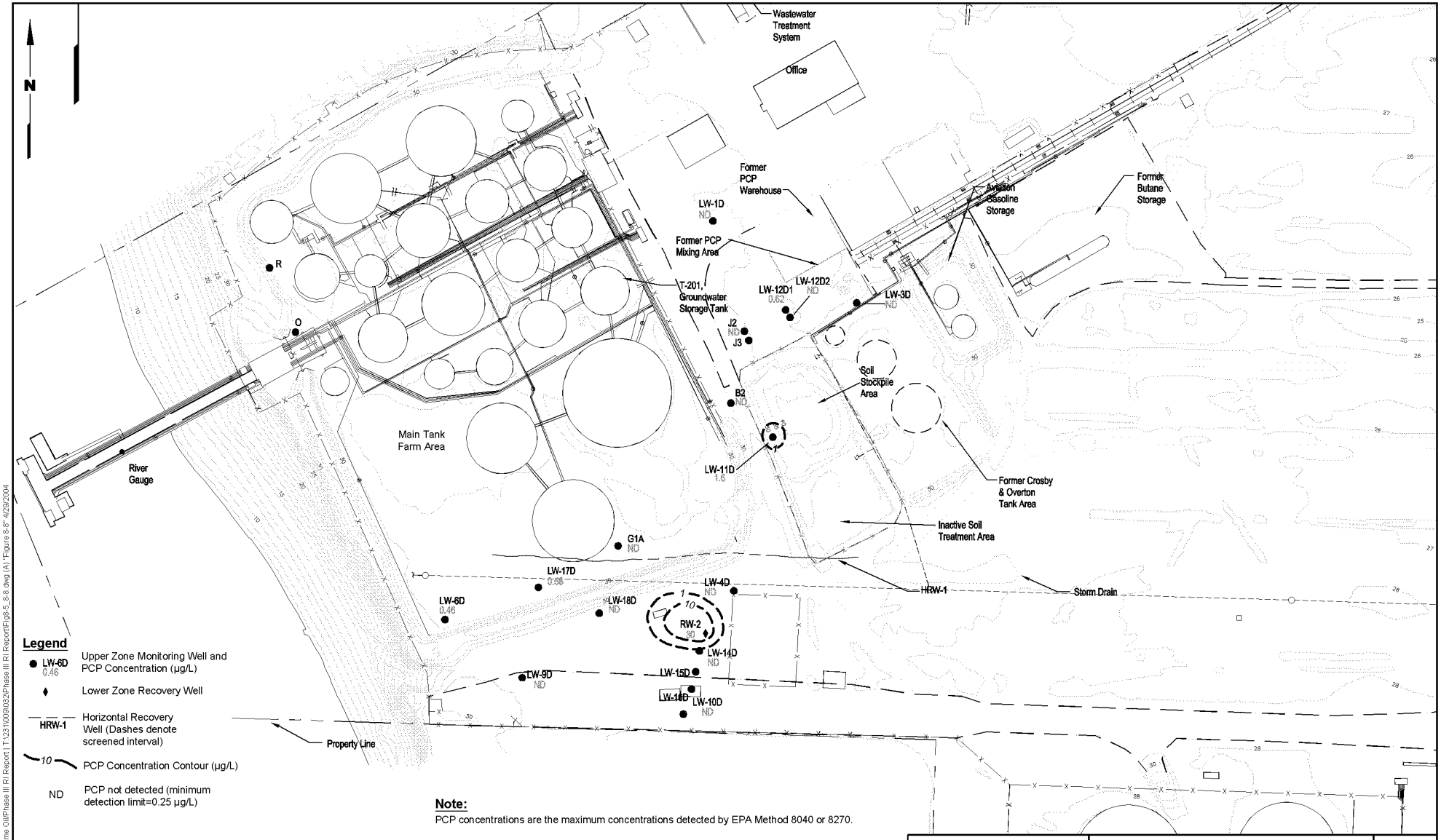
LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

PCP Groundwater Concentrations Lower Zone, March-April 1997

Figure 8-6


N
Willamette
River
A.C.
LW-1D
ND
LW-12D1
110
CPT-1
310
CPT-18
ND
LW-3D
ND
R
ND
O
ND
J2
ND
CPT-2
ND
CPT-3
ND
CPT-4
ND
B2
ND
LW-11D
55
CPT-9
16
CPT-8
ND
CPT-10
ND
G1A
ND
RW-2
210
LW-4D
7
GB-6
ND
LW-6D
ND
CPT-14
ND
CPT-11
ND
LW-9D
ND
CPT-12
1700
CPT-13
ND
LW-10D
ND
100
1000
10
Notes
1. Result is the maximum concentration using EPA methods 8270 and 8040 or any duplicate sample results.
2. See appendices for definition of data validation qualifiers and complete set of data.
3. Monitoring well and CPT exploration results from May 1999 and March 1999, respectively. Geoprobe result (GB-6) from January 1998.
Legend
Monitoring Well
CPT Exploration
Geoprobe Exploration
RW-2 / 210
Location Identifier
PCP Concentration (µg/L)
PCP Concentration Contour (in µg/L)
ND
Not detected at method reporting limit (0.25 µg/L)
LANDAU ASSOCIATES
0
200
400
Scale in Feet
Time Oil NW Terminal
Portland, Oregon
PCP Groundwater Concentrations
Lower Zone, Spring 1999
Figure
8-7



BZTO104(e)020656

TABLE 2-1
SUMMARY OF QUARTERLY GROUNDWATER ANALYSES
TIME OIL NORTHWEST TERMINAL

Well	Sampling Date	SVOC 8270	SVOC SIM	PAH (8270 SIM)	VOC 8260	PCP 8040/8270	TPH-D	TPH-Dx	TPH-Gx	PP Metals 6010/7000	TDS	Major Ions	Chloride	PCBs 8081	Dioxin/ Furans	Ethanol
B1	April-97	X			X	X	X			X	X	X				
	July-97	X			X	X	X			X	X	X				
	October-97	X			X	X	X			X	X	X				
	January-98	X			X	X	X			X	X	X				
	May-98	X			X	X	X			X	X		X			
	August-98	X			X	X	X			X	X		X			
	November-98	X			X	X	X			X	X		X			
	February-99	X	X		X	X	X			X	X	X	X			
	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X			
	December-99 (a,b)	X			X	X	X			X	X		X			X
	February-00	X			X	X	X			X	X	X	X			X
	May-00	X			X	X	X	X	X	X	X		X			X
	August-00	X			X	X	X	X	X	X	X		X			X
	November-00	X			X	X	X	X	X	X	X		X			X
	February-01	X			X	X	X	X	X	X	X	X	X			X
	June-01	X			X	X		X	X	X	X		X			
	August-01	X			X	X		X	X	X	X		X			
	November-01	X			X	X		X	X	X	X		X			
	February-02	X			X	X		X	X	X	X	X	X			
	June-02	X			X	X		X	X	X	X		X			
	August-02	X			X	X		X	X	X	X		X			
	November-02	X			X	X		X	X	X	X		X			
	February-03	X			X	X		X	X	X	X	X	X			
	May-03	X			X	X		X	X	X	X		X			
	August-03	X			X	X		X	X	X	X		X			
	October-03	X			X	X		X	X	X	X		X			
B2	April-97	X			X	X	X			X	X	X				
	July-97	X			X	X	X			X	X	X				
	October-97	X			X	X	X			X	X	X				
	January-98	X			X	X	X			X	X	X				
	May-98	X			X	X	X			X	X		X			
	August-98	X			X	X	X			X	X		X			
	November-98	X			X	X	X			X	X		X			
	February-99	X			X	X	X			X	X	X	X			
	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X			
	December-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X				X	X		X			
	August-01	X			X	X				X	X		X			
	November-01	X			X	X				X	X		X			
	February-02	X			X	X	X			X	X	X	X			
	June-02	X			X	X				X	X		X			
	August-02	X			X	X				X	X		X			
	November-02	X			X	X				X	X		X			
	February-03	X			X	X	X			X	X	X	X			
	May-03	X			X	X				X	X		X			

TABLE 2-1
SUMMARY OF QUARTERLY GROUNDWATER ANALYSES
TIME OIL NORTHWEST TERMINAL

Well	Sampling Date	SVOC 8270	SVOC SIM	PAH (8270 SIM)	VOC 8260	PCP 8040/8270	TPH-D	TPH-Dx	TPH-Gx	PP Metals 6010/7000	TDS	Major Ions	Chloride	PCBs 8081	Dioxin/ Furans	Ethanol
	August-03	X			X	X				X	X		X			
	October-03	X			X	X				X	X		X			
D	April-97	X			X	X	X			X	X	X		X		
	July-97	X			X	X	X			X	X	X				
	October-97	X			X	X	X			X	X	X		X		
	January-98	X			X	X	X			X	X	X				
	May-98	X			X	X	X			X	X		X			
	August-98	X			X	X	X			X	X		X			
	November-98	X			X	X	X			X	X		X			
	February-99	X			X	X	X			X	X	X	X			
	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X			
	December-99 (b)	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X				X	X		X			
	August-01	X			X	X				X	X		X			
	November-01	X			X	X				X	X		X			
	February-02	X			X	X				X	X	X	X			
	June-02	X			X	X				X	X		X			
	August-02	X			X	X				X	X		X			
	November-02	X			X	X				X	X		X			
	February-03	X			X	X				X	X	X	X			
	May-03	X			X	X				X	X		X			
	August-03	X			X	X				X	X		X			
	October-03	X			X	X				X	X		X			
J1	April-97	X			X	X	X			X	X	X			X	
	July-97	X			X	X	X			X	X	X			X	
	October-97	X			X	X	X			X	X	X			X	
	January-98	X			X	X	X			X	X	X				
	May-98	X			X	X	X			X	X		X		X	
	August-98	X			X	X	X			X	X		X		X	
	November-98	X			X	X	X			X	X		X		X	
	February-99	X			X	X	X			X	X	X	X			
	May-99	X			X	X	X			X	X	X	X		X	
	September-99	X			X	X	X			X	X		X			
	December-99 (a,b)	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X				X	X		X			
	August-01	X			X	X				X	X		X			
	November-01	X			X	X				X	X		X			
	February-02	X			X	X				X	X	X	X			
	June-02	X			X	X				X	X		X			
	August-02	X			X	X				X	X		X			
	November-02	X			X	X				X	X		X			

TABLE 2-1
SUMMARY OF QUARTERLY GROUNDWATER ANALYSES
TIME OIL NORTHWEST TERMINAL

Well	Sampling Date	SVOC 8270	SVOC SIM	PAH (8270 SIM)	VOC 8260	PCP 8040/8270	TPH-D	TPH-Dx	TPH-Gx	PP Metals 6010/7000	TDS	Major Ions	Chloride	PCBs 8081	Dioxin/ Furans	Ethanol
	February-03	X			X	X				X	X	X	X			
	May-03	X			X	X				X	X		X			
	August-03	X			X	X				X	X		X			
	October-03	X			X	X				X	X		X			
J2	April-97											X				
	July-97	X			X	X	X			X	X	X				
	October-97	X			X	X	X			X	X	X				
	January-98	X			X	X	X			X	X	X				
	May-98	X			X	X	X			X	X		X			
	August-98	X			X	X	X			X	X		X			
	November-98	X			X	X	X			X	X		X			
	February-99	X			X	X	X			X	X	X	X			
	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X			
	December-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X				X	X		X			
	August-01	X			X	X				X	X		X			
	November-01	X			X	X				X	X		X			
	February-02	X			X	X				X	X	X	X			
	June-02	X			X	X				X	X		X			
	August-02	X			X	X				X	X		X			
	November-02	X			X	X				X	X		X			
	February-03	X			X	X				X	X	X	X			
	May-03	X			X	X				X	X		X			
	August-03	X			X	X				X	X		X			
	October-03	X			X	X				X	X		X			
J3	April-97	X			X	X	X			X	X	X				
	July-97	X			X	X	X			X	X	X				
	October-97	X			X	X	X			X	X	X				
	January-98	X			X	X	X			X	X	X				
	May-98	X			X	X	X			X	X		X			
	August-98	X			X	X	X			X	X		X			
	November-98	X			X	X	X			X	X		X			
G1A	April-97	X			X	X	X			X	X	X				
	July-97	X			X	X	X			X	X	X				
	October-97	X			X	X	X			X	X	X				
	January-98	X			X	X	X			X	X	X				
	May-98	X			X	X	X			X	X		X			
	August-98	X			X	X	X			X	X		X			
	November-98	X			X	X	X			X	X		x			
	February-99	X	X		X	X	X			X	X	X	X			
	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X			
	December-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			

TABLE 2-1
SUMMARY OF QUARTERLY GROUNDWATER ANALYSES
TIME OIL NORTHWEST TERMINAL

Well	Sampling Date	SVOC 8270	SVOC SIM	PAH (8270 SIM)	VOC 8260	PCP 8040/8270	TPH-D	TPH-Dx	TPH-Gx	PP Metals 6010/7000	TDS	Major Ions	Chloride	PCBs 8081	Dioxin/ Furans	Ethanol
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X	X			X	X		X			
	August-01	X			X	X	X			X	X		X			
	November-01	X			X	X	X			X	X		X			
	February-02	X			X	X	X			X	X	X	X			
	June-02	X			X	X	X			X	X		X			
	August-02	X			X	X	X			X	X		X			
	November-02	X			X	X	X			X	X		X			
	February-03	X			X	X	X			X	X	X	X			
	May-03	X			X	X	X			X	X		X			
	August-03	X			X	X	X			X	X		X			
	October-03	X			X	X		X		X	X		X			
H	April-97	X			X	X	X			X	X	X				
	July-97	X			X	X	X			X	X	X				
	October-97	X			X	X	X			X	X	X				
	January-98	X			X	X	X			X	X	X				
	May-98					X				X						
	August-98					X				X						
	November-98					X				X						
	February-99					X				X						
	May-99					X				X						
	September-99					X				X						
	December-99					X				X						
	February-00					X				X						
	May-00					X				X						
	February-01					X				X						
	February-02					X				X						
	February-03					X				X						
K	April-97	X			X	X	X			X	X					
	July-97	X			X	X	X			X	X					
	October-97	X			X	X	X			X	X					
	January-98	X			X	X	X			X	X					
	May-98									X						
	August-98									X						
	November-98									X						
	February-99									X						
	May-99									X						
	September-99									X						
	December-99									X						
	February-00									X						
	May-00									X						
	August-00									X						
	November-00									X						
	February-01									X						
	June-01									X						
	August-01									X						
	November-01									X						
	February-02									X						
	June-02									X						
	August-02									X						

TABLE 2-1
SUMMARY OF QUARTERLY GROUNDWATER ANALYSES
TIME OIL NORTHWEST TERMINAL

Well	Sampling Date	SVOC 8270	SVOC SIM	PAH (8270 SIM)	VOC 8260	PCP 8040/8270	TPH-D	TPH-Dx	TPH-Gx	PP Metals 6010/7000	TDS	Major Ions	Chloride	PCBs 8081	Dioxin/ Furans	Ethanol
	November-02									X						
	February-03									X						
	May-03									X						
	August-03									X						
	October-03			X	X				X	X						
L	April-97	X			X	X	X			X	X	X				
	July-97	X			X	X	X			X	X	X				
	October-97	X			X	X	X			X	X	X				
	January-98	X			X	X	X			X	X	X				
	May-98	X			X	X	X			X	X		X			
	August-98	X			X	X	X			X	X		X			
	November-98	X			X	X	X			X	X		X			
	February-99	X			X	X	X			X	X	X	X			
	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X			
	December-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	February-02	X			X	X	X			X	X	X	X			
O	April-97	X			X											
	July-97	X			X						X					
	October-97	X			X											
	January-98	X			X											
	May-98	X			X											
	August-98	X			X											
	November-98	X			X											
	February-99	X			X											
	May-99	X			X											
	September-99	X			X											
	December-99	X			X											
	February-00	X			X											
	May-00	X			X											
	August-00	X			X											
	November-00	X			X											
	February-01	X			X											
	June-01	X			X											
	August-01	X			X											
	November-01	X			X											
	February-02	X			X											
	June-02	X			X											
	August-02	X			X											
	November-02	X			X											
	February-03	X			X											
	May-03	X			X											
	August-03	X			X											
	October-03	X			X											
R	April-97	X			X											
	July-97	X			X						X					
	October-97	X			X											
	January-98	X			X											

TABLE 2-1
SUMMARY OF QUARTERLY GROUNDWATER ANALYSES
TIME OIL NORTHWEST TERMINAL

Well	Sampling Date	SVOC 8270	SVOC SIM	PAH (8270 SIM)	VOC 8260	PCP 8040/8270	TPH-D	TPH-Dx	TPH-Gx	PP Metals 6010/7000	TDS	Major Ions	Chloride	PCBs 8081	Dioxin/ Furans	Ethanol
	May-98	X			X											
	August-98	X			X											
	November-98	X			X											
	February-99	X			X											
	May-99	X			X											
	September-99	X			X											
	December-99	X			X											
	February-00	X			X											
	May-00	X			X											
	August-00	X			X											
	November-00	X			X											
	February-01	X			X											
	June-01	X			X											
	August-01	X			X											
	November-01	X			X											
	February-02	X			X											
	June-02	X			X											
	August-02	X			X											
	November-02	X			X											
	February-03	X			X											
	May-03	X			X											
	August-03	X			X											
	October-03	X			X											
LW1D	April-97	X			X	X	X			X	X	X				
	July-97	X			X	X	X			X	X	X				
	October-97	X			X	X	X			X	X	X				
	January-98	X			X	X	X			X	X	X				
	May-98	X			X	X	X			X	X		X			
	August-98	X			X	X	X			X	X		X			
	November-98	X			X	X	X			X	X		X			
	February-99	X			X	X	X			X	X	X	X			
	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X			
	December-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X				X	X		X			
	August-01	X			X	X				X	X		X			
	November-01	X			X	X				X	X		X			
	February-02	X			X	X				X	X	X	X			
	June-02	X			X	X				X	X		X			
	August-02	X			X	X				X	X		X			
	November-02	X			X	X				X	X		X			
	February-03	X			X	X				X	X	X	X			
	May-03	X			X	X				X	X		X			
	August-03	X			X	X				X	X		X			
	October-03	X			X	X				X	X		X			
LW1S	April-97	X			X	X	X			X	X	X				
	July-97	X			X	X	X			X	X	X				

TABLE 2-1
SUMMARY OF QUARTERLY GROUNDWATER ANALYSES
TIME OIL NORTHWEST TERMINAL

Well	Sampling Date	SVOC 8270	SVOC SIM	PAH (8270 SIM)	VOC 8260	PCP 8040/8270	TPH-D	TPH-Dx	TPH-Gx	PP Metals 6010/7000	TDS	Major Ions	Chloride	PCBs 8081	Dioxin/ Furans	Ethanol
	October-97	X			X	X	X			X	X	X				
	January-98	X			X	X	X			X	X	X				
	May-98	X			X	X	X			X	X		X			
	August-98	X			X	X	X			X	X		X			
	November-98	X			X	X	X			X	X		X			
	February-99	X			X	X	X			X	X	X	X			
	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X			
	December-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X				X	X		X			
	August-01	X			X	X				X	X		X			
	November-01	X			X	X				X	X		X			
	February-02	X			X	X				X	X	X	X			
	June-02	X			X	X				X	X		X			
	August-02	X			X	X				X	X		X			
	November-02	X			X	X				X	X		X			
	February-03	X			X	X				X	X	X	X			
	May-03	X			X	X				X	X		X			
	August-03	X			X	X				X	X		X			
	October-03	X		X	X	X			X	X	X		X			
LW2S*	April-97	X			X	X	X			X	X	X			X	
	July-97	X			X	X	X			X	X				X	
	October-97	X			X	X	X			X	X	X			X	
	January-98	X			X	X	X			X	X	X			X	
	May-98	X			X	X	X			X	X		X		X	
	August-98	X			X	X	X			X	X		X		X	
	November-98	X			X	X	X			X	X		X		X	
	February-99	X	X		X	X	X			X	X	X	X			
	May-99	X			X	X	X			X	X	X	X		X	
	September-99	X			X	X	X			X	X		X		X	
	December-99 (a,b)	X			X	X	X			X	X		X		X	
	February-00	X			X	X	X			X	X	X	X		X	
	May-00	X			X	X	X			X	X		X			
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X	X			X	X		X			
	August-01	X			X	X	X			X	X		X			
	November-01	X			X	X	X			X	X		X			
	February-02	X			X	X	X			X	X	X	X			
	June-02	X			X	X	X			X	X		X			
LW3D	April-97	X			X	X	X			X	X	X				
	July-97	X			X	X	X			X	X	X				
	October-97	X			X	X	X			X	X	X				
	January-98	X			X	X	X			X	X	X				
	May-98	X			X	X	X			X	X		X			
	November-98	X			X	X	X			X	X		X			

TABLE 2-1
SUMMARY OF QUARTERLY GROUNDWATER ANALYSES
TIME OIL NORTHWEST TERMINAL

Well	Sampling Date	SVOC 8270	SVOC SIM	PAH (8270 SIM)	VOC 8260	PCP 8040/8270	TPH-D	TPH-Dx	TPH-Gx	PP Metals 6010/7000	TDS	Major Ions	Chloride	PCBs 8081	Dioxin/ Furans	Ethanol
	February-99	X			X	X	X			X	X	X	X			
	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X			
	December-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X				X	X		X			
	August-01	X			X	X				X	X		X			
	November-01	X			X	X				X	X		X			
	February-02	X			X	X				X	X	X	X			
	June-02	X			X	X				X	X		X			
	August-02	X			X	X				X	X		X			
	November-02	X			X	X				X	X		X			
	February-03	X			X	X				X	X	X	X			
	May-03	X			X	X				X	X		X			
	August-03	X			X	X				X	X		X			
	October-03	X			X	X				X	X		X			
LW4D	April-97	X			X	X	X			X	X	X				
	July-97	X			X	X	X			X	X	X				
	October-97	X			X	X	X			X	X	X				
	January-98	X			X	X	X			X	X	X			X	
	May-98	X			X	X	X			X	X		X			
	August-98	X			X	X	X			X	X		X		X	
	November-98	X			X	X	X			X	X		X		X	
	February-99	X	X		X	X	X			X	X	X	X			
	May-99	X			X	X	X			X	X		X		X	
	September-99	X			X	X	X			X	X		X		X	
	December-99	X			X	X	X			X	X		X		X	
	February-00	X			X	X	X			X	X	X	X		X	
	May-00	X			X	X	X			X	X		X			
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X	X			X	X		X			
	August-01	X			X	X	X			X	X		X			
	November-01	X			X	X	X			X	X		X			
	February-02	X			X	X	X			X	X	X	X			
	June-02	X			X	X	X			X	X		X			
	August-02	X			X	X	X			X	X		X			
	November-02	X			X	X	X			X	X		X			
	February-03	X			X	X	X			X	X	X	X			
	May-03	X			X	X	X			X	X		X			
	August-03	X			X	X	X			X	X		X			
	October-03	X			X	X		X		X	X		X			
LW4S	April-97	X			X	X	X			X	X	X				
	July-97	X			X	X	X			X	X	X				
	October-97	X			X	X	X			X	X	X				
	January-98	X			X	X	X			X	X	X				
	May-98	X			X	X	X			X	X		X			

TABLE 2-1
SUMMARY OF QUARTERLY GROUNDWATER ANALYSES
TIME OIL NORTHWEST TERMINAL

Well	Sampling Date	SVOC 8270	SVOC SIM	PAH (8270 SIM)	VOC 8260	PCP 8040/8270	TPH-D	TPH-Dx	TPH-Gx	PP Metals 6010/7000	TDS	Major Ions	Chloride	PCBs 8081	Dioxin/ Furans	Ethanol
	August-98	X			X	X	X			X	X		X			
	November-98	X			X	X	X			X	X		X			
	February-99	X			X	X	X			X	X	X	X			
	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X			
	December-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X	X			X	X		X			
	August-01	X			X	X	X			X	X		X			
	November-01	X			X	X	X			X	X		X			
	February-02	X			X	X	X			X	X	X	X			
	June-02	X			X	X	X			X	X		X			
	August-02	X			X	X	X			X	X		X			
	November-02	X			X	X	X			X	X		X			
	February-03	X			X	X	X			X	X	X	X			
	May-03	X			X	X	X			X	X		X			
	August-03	X			X	X	X			X	X		X			
	October-03	X			X	X		X		X	X		X			
LW5S	April-97	X			X	X	X			X	X	X		X		
	July-97	X			X	X	X			X	X	X		X		
	October-97	X			X	X	X			X	X	X		X		
	January-98	X			X	X	X			X	X	X		X		
	May-98	X			X	X	X			X	X		X			
	August-98	X			X	X	X			X	X		X			
	November-98	X			X	X	X			X	X		X			
	February-99	X			X	X	X			X	X	X	X			
	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X			
	December-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X		X			
	June-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X		X			
	February-02	X			X	X	X			X	X		X			
	February-03	X			X	X	X			X	X		X			
LW6D	April-97	X			X	X	X			X	X	X				
	July-97	X			X	X	X			X	X	X			X	
	October-97	X			X	X	X			X	X	X				
	January-98	X			X	X	X			X	X	X				
	May-98	X			X	X	X			X	X		X			
	August-98	X			X	X	X			X	X		X			
	November-98	X			X	X	X			X	X		X			
	February-99	X			X	X	X			X	X	X	X			
	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X			
	December-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			

TABLE 2-1
SUMMARY OF QUARTERLY GROUNDWATER ANALYSES
TIME OIL NORTHWEST TERMINAL

Well	Sampling Date	SVOC 8270	SVOC SIM	PAH (8270 SIM)	VOC 8260	PCP 8040/8270	TPH-D	TPH-Dx	TPH-Gx	PP Metals 6010/7000	TDS	Major Ions	Chloride	PCBs 8081	Dioxin/ Furans	Ethanol
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X	X			X	X		X			
	August-01	X			X	X	X			X	X		X			
	November-01	X			X	X	X			X	X		X			
	February-02	X			X	X	X			X	X	X	X			
	June-02	X			X	X	X			X	X		X			
	August-02	X			X	X	X			X	X		X			
	November-02	X			X	X	X			X	X		X			
	February-03	X			X	X	X			X	X	X	X			
	May-03	X			X	X	X			X	X		X			
	August-03	X			X	X	X			X	X		X			
	October-03	X			X	X		X		X	X		X			
LW7S	April-97	X			X	X	X			X	X	X				
	July-97	X			X	X	X			X	X	X				
	October-97	X			X	X	X			X	X	X				
	January-98	X			X	X	X			X	X	X				
	May-98	X			X	X	X			X	X		X			
	August-98	X			X	X	X			X	X		X			
	November-98	X			X	X	X			X	X		X			
	February-99	X	X		X	X	X			X	X	X	X			
	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X			
	December-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X	X			X	X		X			
	August-01	X			X	X	X			X	X		X			
	November-01	X			X	X	X			X	X		X			
	February-02	X			X	X	X			X	X	X	X			
	June-02	X			X	X	X			X	X		X			
	August-02	X			X	X	X			X	X		X			
	November-02	X			X	X	X			X	X		X			
	February-03	X			X	X	X			X	X	X	X			
	May-03	X			X	X	X			X	X		X			
	August-03	X			X	X	X			X	X		X			
	October-03	X		X	X	X		X	X	X	X		X			
LW8S	May-99	X			X	X	X	X	X	X	X		X			
	September-99	X			X	X	X	X	X	X	X		X			
	December-99 (a,b)	X			X	X	X	X	X	X	X		X			
	February-00	X			X	X	X	X	X	X	X	X	X			
	May-00	X			X	X	X	X	X	X	X		X			X
	August-00	X			X	X	X	X	X	X	X		X			X
	November-00	X			X	X	X	X	X	X	X		X			X
	February-01	X			X	X	X	X	X	X	X	X	X			X
	June-01	X			X	X	X	X	X	X	X		X			
	August-01	X			X	X	X	X	X	X	X		X			
	November-01	X			X	X	X	X	X	X	X		X			

TABLE 2-1
SUMMARY OF QUARTERLY GROUNDWATER ANALYSES
TIME OIL NORTHWEST TERMINAL

Well	Sampling Date	SVOC 8270	SVOC SIM	PAH (8270 SIM)	VOC 8260	PCP 8040/8270	TPH-D	TPH-Dx	TPH-Gx	PP Metals 6010/7000	TDS	Major Ions	Chloride	PCBs 8081	Dioxin/ Furans	Ethanol
	February-02	X			X	X	X	X	X	X	X	X	X			
	June-02	X			X	X	X	X	X	X	X		X			
	August-02	X			X	X	X	X	X	X	X		X			
	November-02	X			X	X	X	X	X	X	X		X			
	February-03	X			X	X	X	X	X	X	X	X	X			
	May-03	X			X	X	X	X	X	X	X		X			
	August-03	X			X	X	X	X	X	X	X		X			
	October-03	X			X	X		X	X	X	X		X			
LW9S	May-99	X			X	X	X			X	X		X			
LW9D	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X					
	December-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X	X			X	X		X			
	August-01	X			X	X	X			X	X		X			
	November-01	X			X	X	X			X	X		X			
	February-02	X			X	X	X			X	X	X	X			
	June-02	X			X	X	X			X	X		X			
	August-02	X			X	X	X			X	X		X			
	November-02	X			X	X	X			X	X		X			
	February-03	X			X	X	X			X	X	X	X			
	May-03	X			X	X	X			X	X		X			
	August-03	X			X	X	X			X	X		X			
	October-03	X			X	X		X		X	X		X			
LW10S	May-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			
	November-01	X			X	X	X			X	X		X			
	February-02	X			X	X	X			X	X	X	X			
	June-02	X			X	X	X			X	X		X			
	February-03	X			X	X	X			X	X	X	X			
	May-03	X			X	X	X			X	X		X			
	October-03	X			X	X		X		X	X		X			
LW10D	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X			
	December-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X	X			X	X		X			
	August-01	X			X	X	X			X	X		X			
	November-01	X			X	X	X			X	X		X			
	February-02	X			X	X	X			X	X	X	X			
	June-02	X			X	X	X			X	X		X			

TABLE 2-1
SUMMARY OF QUARTERLY GROUNDWATER ANALYSES
TIME OIL NORTHWEST TERMINAL

Well	Sampling Date	SVOC 8270	SVOC SIM	PAH (8270 SIM)	VOC 8260	PCP 8040/8270	TPH-D	TPH-Dx	TPH-Gx	PP Metals 6010/7000	TDS	Major Ions	Chloride	PCBs 8081	Dioxin/ Furans	Ethanol
	August-02	X			X	X	X			X	X		X			
	November-02	X			X	X	X			X	X		X			
	February-03	X			X	X	X			X	X	X	X			
	May-03	X			X	X	X			X	X		X			
	August-03	X			X	X	X			X	X		X			
	October-03	X			X	X		X		X	X		X			
LW11S	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X		X	
	December-99 (a,b)	X			X	X	X			X	X		X		X	
	February-00	X			X	X	X			X	X	X	X		X	X
	May-00	X			X	X	X	X	X	X	X		X			X
	August-00	X			X	X	X	X	X	X	X		X			X
	February-01	X			X	X	X	X	X	X	X	X	X			X
	June-01	X			X	X	X	X	X	X	X		X			
	February-02	X			X	X	X	X	X	X	X	X	X			
	June-02	X			X	X	X	X	X	X	X		X			
	August-02	X			X	X	X	X	X	X	X		X			
	November-02	X			X	X	X	X	X	X	X		X			
	February-03	X			X	X	X	X	X	X	X	X	X			
	May-03	X			X	X	X	X	X	X	X		X			
	August-03	X			X	X	X	X	X	X	X		X			
	October-03	X			X	X		X	X	X	X		X			
LW11D	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X			
	December-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X	X			X	X		X			
	August-01	X			X	X	X			X	X		X			
	November-01	X			X	X	X			X	X		X			
	February-02	X			X	X	X			X	X	X	X			
	June-02	X			X	X	X			X	X		X			
	August-02	X			X	X	X			X	X		X			
	November-02	X			X	X	X			X	X		X			
	February-03	X			X	X	X			X	X	X	X			
	May-03	X			X	X	X			X	X		X			
	August-03	X			X	X	X			X	X		X			
	October-03	X			X	X		X		X	X		X			
LW12D1*	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X			
	December-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X	X			X	X		X			
	August-01	X			X	X	X			X	X		X			

TABLE 2-1
SUMMARY OF QUARTERLY GROUNDWATER ANALYSES
TIME OIL NORTHWEST TERMINAL

Well	Sampling Date	SVOC 8270	SVOC SIM	PAH (8270 SIM)	VOC 8260	PCP 8040/8270	TPH-D	TPH-Dx	TPH-Gx	PP Metals 6010/7000	TDS	Major Ions	Chloride	PCBs 8081	Dioxin/ Furans	Ethanol
	November-01	X			X	X	X			X	X		X			
	February-02	X			X	X	X			X	X	X	X			
	June-02	X			X	X	X			X	X		X			
LW12D2*	May-99	X			X	X	X			X	X		X			
	September-99	X			X	X	X			X	X		X			
	December-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	May-00	X			X	X	X			X	X		X			
	August-00	X			X	X	X			X	X		X			
	November-00	X			X	X	X			X	X		X			
	February-01	X			X	X	X			X	X	X	X			
	June-01	X			X	X	X			X	X		X			
	August-01	X			X	X	X			X	X		X			
	November-01	X			X	X	X			X	X		X			
	February-02	X			X	X	X			X	X	X	X			
	June-02	X			X	X	X			X	X		X			
RW1	May-99	X			X	X	X	X	X	X	X	X	X			
	September-99	X			X	X	X	X	X	X	X		X			
	December-99	X			X	X	X	X	X	X	X		X			
	February-00	X			X	X	X	X	X	X	X	X	X			X
	May-00	X			X	X	X	X	X	X	X		X			X
	August-00	X			X	X	X	X	X	X	X		X			X
	November-00	X			X	X	X	X	X	X	X		X			X
	February-01	X			X	X	X	X	X	X	X	X	X			X
	June-01	X			X	X	X	X	X	X	X		X			
	August-01	X			X	X	X	X	X	X	X		X			
	November-01	X			X	X	X	X	X	X	X		X			
	February-02	X			X	X	X	X	X	X	X	X	X			
	June-02	X			X	X	X	X	X	X	X		X			
	August-02	X			X	X	X	X	X	X	X		X			
	November-02	X			X	X	X	X	X	X	X		X			
	February-03	X			X	X	X	X	X	X	X	X	X			
	May-03	X			X	X	X	X	X	X	X		X			
	August-03	X			X	X	X	X	X	X	X		X			
	October-03	X			X	X		X	X	X	X		X			
RW2	May-99	X			X	X	X	X	X	X	X	X	X			
	September-99	X			X	X	X	X	X	X	X		X			
	December-99	X			X	X	X	X	X	X	X		X			
	February-00	X			X	X	X	X	X	X	X	X	X			
	May-00	X			X	X	X	X	X	X	X		X			
	August-00	X			X	X	X	X	X	X	X		X			
	November-00	X			X	X	X	X	X	X	X		X			
	February-01	X			X	X	X	X	X	X	X	X	X			
	June-01	X			X	X	X	X	X	X	X		X			
	August-01	X			X	X	X	X	X	X	X		X			
	November-01	X			X	X	X	X	X	X	X		X			
	February-02	X			X	X	X	X	X	X	X	X	X			
	June-02	X			X	X	X	X	X	X	X		X			
	August-02	X			X	X	X	X	X	X	X		X			
	November-02	X			X	X	X	X	X	X	X		X			
	February-03	X			X	X	X	X	X	X	X	X	X			

TABLE 2-1
SUMMARY OF QUARTERLY GROUNDWATER ANALYSES
TIME OIL NORTHWEST TERMINAL

Well	Sampling Date	SVOC 8270	SVOC SIM	PAH (8270 SIM)	VOC 8260	PCP 8040/8270	TPH-D	TPH-Dx	TPH-Gx	PP Metals 6010/7000	TDS	Major Ions	Chloride	PCBs 8081	Dioxin/ Furans	Ethanol
	May-03	X			X	X	X	X	X	X	X		X			
	August-03	X			X	X	X	X	X	X	X		X			
	October-03	X			X	X		X	X	X	X		X			
RW3*	December-99 (b)	X			X	X	X	X	X	X	X	X	X			X
LW101S*	April-97	X			X	X	X			X	X	X			X	
	July-97	X			X	X	X			X	X	X			X	
	October-97	X			X	X	X			X	X	X			X	
	January-98	X			X	X	X			X	X	X			X	
	May-98															
	August-98															
	November-98															
	February-99		X							X						
	May-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	February-01	X			X	X	X			X	X	X	X			
	February-02	X			X	X	X			X	X	X	X			
	February-03	X			X	X	X			X	X	X	X			
LW102S*	April-97	X			X	X	X			X	X	X			X	
	July-97	X			X	X	X			X	X	X			X	
	October-97	X			X	X	X			X	X	X			X	
	January-98	X			X	X	X			X	X	X			X	
	May-98									X						
	August-98															
	November-98															
	February-99									X						
	May-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	February-01	X			X	X	X			X	X	X	X			
	February-02	X			X	X	X			X	X	X	X			
	February-03	X			X	X	X			X	X	X	X			
LW103S*	April-97	X			X	X	X			X	X	X				
	July-97	X			X	X	X			X		X				
	October-97	X			X	X	X			X	X	X				
	January-98	X			X	X	X			X	X	X				
	May-98									X						
	August-98															
	November-98															
	February-99									X						
	May-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	February-01	X			X	X	X			X	X	X	X			
	February-02	X			X	X	X			X	X	X	X			
	February-03	X			X	X	X			X	X	X	X			
LW104S*	April-97	X			X	X	X			X	X	X				
	July-97	X			X	X	X			X		X				
	October-97	X			X	X	X			X	X	X				
	January-98	X			X	X	X			X	X	X				
	May-98									X						
	August-98															

TABLE 2-1
SUMMARY OF QUARTERLY GROUNDWATER ANALYSES
TIME OIL NORTHWEST TERMINAL

Well	Sampling Date	SVOC 8270	SVOC SIM	PAH (8270 SIM)	VOC 8260	PCP 8040/8270	TPH-D	TPH-Dx	TPH-Gx	PP Metals 6010/7000	TDS	Major Ions	Chloride	PCBs 8081	Dioxin/ Furans	Ethanol
	November-98															
	February-99									X						
	May-99	X			X	X	X			X	X		X			
	February-00	X			X	X	X			X	X	X	X			
	February-01	X			X	X	X			X	X	X	X			
	February-02	X			X	X	X			X	X	X	X			
	February-03	X			X	X	X			X	X	X	X			
OX1S	June-02				X					X	X					
	February-03					X										
	May-03					X										
	August-03					X										
	October-03					X										
OX2S	June-02				X					X	X					
	February-03					X										
	May-03					X										
	August-03					X										
	October-03					X										
OX3S	June-02				X					X	X					
	February-03					X										
	May-03					X										
	August-03					X										
	October-03					X										
OX4S	June-02				X					X	X					
	February-03					X										
	May-03					X										
	August-03					X										
	October-03					X										
OX5S	October-03					X										
OX6S	October-03					X										
OX7S	October-03					X										
OX8D	October-03					X										
OX8S	October-03					X										
LW19S	October-03	X		X	X			X	X	X	X		X			
LW20D	October-03	X		X	X			X	X	X	X		X			
LW20S	October-03	X		X	X			X	X	X	X		X			
LW21S	October-03	X		X	X			X	X	X	X		X			
LW22D	October-03	X		X	X			X	X	X	X		X			
LW23D	October-03	X		X	X			X	X	X	X		X			

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TABLE 2-1
SUMMARY OF QUARTERLY GROUNDWATER ANALYSES
TIME OIL NORTHWEST TERMINAL

Well	Sampling Date	SVOC 8270	SVOC SIM	PAH (8270 SIM)	VOC 8260	PCP 8040/8270	TPH-D	TPH-Dx	TPH-Gx	PP Metals 6010/7000	TDS	Major Ions	Chloride	PCBs 8081	Dioxin/ Furans	Ethanol
LW24D	October-03	X		X	X			X	X	X	X		X			
LW25D	October-03	X		X	X			X	X	X	X		X			
LW26D	October-03	X		X	X			X	X	X	X		X			
LW27D	October-03	X		X	X			X	X	X	X		X			
LW27S	October-03	X		X	X			X	X	X	X		X			
LW28S (c)	October-03															
LW29D	October-03	X		X	X			X	X	X	X		X			
LW29S	October-03	X		X	X			X	X	X	X		X			
LW30D	October-03	X		X	X			X	X	X	X		X			
LW30S	October-03	X		X	X			X	X	X	X		X			
LW31S	October-03	X		X	X			X	X	X	X		X			
LW32D	October-03	X		X	X			X	X	X	X		X			
LW32S	October-03	X		X	X			X	X	X	X		X			
LW33S (c)	October-03															
LW34S	October-03	X		X	X			X	X	X	X		X			
LW35D	October-03	X		X	X			X	X	X	X		X			

(a) In addition to the quarterly groundwater sampling, additional groundwater samples were taken on 11/1/99 and analyzed for chlorinated phenols, BTEX, and ethano
(b) In addition to the quarterly groundwater sampling, additional groundwater samples were taken on 12/8/99 and analyzed for ethanol
(c) Monitoring wells were dry and not sampled as part of the first Phase III RI sampling event

(*) Monitoring well location abandoned

B1 Monitoring well locations in black text are Phase II RI sampling locations
LW19S Monitoring well locations in blue text are Phase III RI sampling locations

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TABLE 2-2
SUMMARY OF MODIFICATIONS TO QUARTERLY GROUNDWATER ANALYSIS PROGRAM

- ***Second Quarter 1998:***
  - Annual sampling of east property wells LW-101S, LW-102S, LW-103S, and LW-104S
  - Elimination of 2-chloroethylvinylether from the volatile analyte list
  - Reduction of the suite of metals analyses to include only arsenic, chromium, copper, lead, nickel, and zinc
  - Quarterly analysis of only metals in well K and only chlorinated phenols and metals in well H
  - Elimination of polychlorinated biphenyls (PCB) analysis
  - Annual analysis for major ions; quarterly analysis for chloride and dissolved oxygen.
- ***First Quarter 1999:***
  - Analysis of polynuclear aromatic hydrocarbons (PAH) using analytical techniques that provide lower detection limits at upper zone wells LW-2S, LW-7S and LW-101S and at lower zone wells G1A, O, and LW-4D for the first quarter 1999 event only
  - Elimination of sampling at well J3.
- ***Second Quarter 2000:***
  - Elimination of dioxin/furan analyses.
- ***Third Quarter 2000:***:
  - Reduction of sampling frequency of wells H, L, and LW-5S from quarterly to annually.
- ***Second Quarter 2001:***
  - Reduction of the list of chlorinated phenols being analyzed by U.S. Environmental Protection Agency (EPA) Method 8040 to pentachlorophenol (PCP) only using EPA Method 8270 SIM
  - Reduction of the frequency of total petroleum hydrocarbon (TPH) analysis from quarterly to annually at upper zone wells J1 and LW-1S; lower zone wells B2, J2, LW-1D; and deep sand unit well LW-12D2. In addition, TPH analysis was eliminated for the following wells: upper zone wells D, L, LW-5S, LW-101S through -104S, and lower zone well LW-3D.

TABLE 2-3
SUPPLEMENTAL PHASE II REMEDIAL INVESTIGATION
SUMMARY OF STORM DRAIN MANHOLE LOCATION ANALYTICAL RESULTS
TIME OIL NORTHWEST TERMINAL

			TOTAL PETROLEUM HYDROCARBONS (a)					
Location	Lab ID	Date Collected	Gasoline (mg/L)	Mineral Spirits (mg/L)	Kerosene (mg/L)	Diesel (mg/L)	Lube Oil (mg/L)	PENTACHLOROPHENOL (µg/L)
SDM-1	0109005-02	9/4/2001	0.250 U	0.250 U	0.630 U	0.630 U	0.630 U	**11.5**
	0111183-02	11/30/2001	NA	NA	NA	0.250 U	0.500 U	**0.700**
	ED34K	2/28/2002	NA	NA	NA	**0.3**	0.50 U	**100**
	EG43A	4/5/2002	NA	NA	NA	NA	NA	**82**
	EN01A	6/27/2002	NA	NA	NA	NA	NA	**190**
	ES04I	8/28/2002	NA	NA	NA	NA	NA	**25**
SDM-2	0109005-01	9/4/2001	0.250 U	0.250 U	0.630 U	0.630 U	0.630 U	0.500 U
	0111183-01	11/30/2001	NA	NA	NA	**0.261**	0.500 U	0.500 U
	ED34L	2/28/2002	NA	NA	NA	0.25 U	0.50 U	**0.46**
	EN01B	6/27/2002	NA	NA	NA	NA	NA	0.25 U
	ES04J	8/28/2002	NA	NA	NA	NA	NA	0.30 U

U = Indicates compound was analyzed for, but was not detected at the reported sample detection limit.

NA = Not Analyzed

(a) Samples collected in September, 2001 were analyzed using total petroleum hydrocarbon (TPH) method, NWTPH-HCID. Samples collected in November 2001 were analyzed using NWTPH-Dx.

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TABLE 2-4
GROUNDWATER INTERIM ACTION OPERATIONAL HISTORY
UPPER AND LOWER WATER-BEARING ZONES
TIME OIL NORTHWEST TERMINAL

	RW-2 Discharge				HRW-1 Discharge				SDM-1 Discharge				Treatment System Discharge			
Monitoring Period	Volume of Water Pumped (gal)	Sample Date	PCP Concentration (µg/L)	Estimated PCP Mass Removal (lb)	Volume of Water Pumped (gal)	Sample Date	PCP Concentration (µg/L)	Estimated PCP Mass Removal (lb)	Volume of Water Pumped (gal)	Sample Date	PCP Concentration (µg/L)	Estimated PCP Mass Removal (lb)	Volume of Water Treated (gal)	Sample Date	Discharge PCP Concentration (µg/L)	Comments
Fourth Quarter 2000																
October 2000	439,003			0.35									0			Mass removal calculated using 11/00 PCP concentration.
November 2000	305,601	11/9/2000	95	0.24									467,478	11/7/2000	ND (a)	
December 2000	348,720	12/20/2000	39	0.11									497,656	12/6/2000	5.89	
														12/20/2000	9.73	
Quarterly Totals	*1,093,324*			*0.70*				*0.00*					*965,134*			
First Quarter 2001																
January 2001	416,140	1/18/2001	38.8	0.13									239,207	1/18/2001	14.3	
February 2001	335,008	2/13/2001	30	0.08									184,192			
March 2001	332,963	3/7/2001	ND (b)	0.03									517,332	3/7/2001	ND (b)	
Quarterly Totals	*1,084,111*			*0.25*				*0.00*					*940,731*			
Second Quarter 2001																
April 2001	377,931			0.04									275,519			
May 2001	344,252	5/22/2001	12.3	0.04									195,522	5/22/2001	5.29	
June 2001	361,846	6/4/2001	0.88	0.04									563,853			
Quarterly Totals	*1,084,029*			*0.11*				*0.00*					*1,034,894*			
Third Quarter 2001																
July 2001	351,509			0.01									559,015			
August 2001	486,123	8/13/2001	5	0.02									66,876			
Quarterly Totals	*837,632*			*0.03*				*0.00*					*625,891*			
Fourth Quarter 2001																
October 2001	393,188	10/11/2001	ND (a)	0.01									484,158	10/11/2001	ND (a)	
November 2001	319,798			0.01									118,788	11/1 & 11/15/01	ND (a)	
December 2001	361,058	12/6/2001	ND (c)	0.01									717,789	12/6/2001	ND (c)	
Quarterly Totals	*680,856*			*0.02*				*0.00*					*836,555*			
First Quarter 2002																
January 2002	331,224			0.02	1,812			0.01					340,888			Recovered groundwater from HRW-1 from January 22-29. Re-initiated groundwater recovery from HRW-1 on February 28.
February 2002	282,480	2/27/2002	8.6	0.02	58			0.00					437,943			HRW-1 mass removal estimates for January and February are based on the March 12 sampling event.
March 2002	280,814			0.02	40,294	3/12/2002	786	0.26					234,816			RW-2 mass removal estimates for January and March are based on February 27 sampling event.
Quarterly Totals	*894,518*			*0.06*	*42,164*			*0.28*					*1,013,447*			
Second Quarter 2002																
April 2002	292,099			0.19	74,996	4/5/2002	94	0.06					391,263	4/5/02	34.4	
														4/22/02	9.33	RW-2 mass removal estimates for April and May are based on June 27 sampling event.
May 2002	310,584			0.20	23,427	5/29/2002	452	0.09					247,440			
June 2002	272,393	6/27/2002	76	0.17	25,484	6/25/2002	410	0.09					307,810			
Quarterly Totals	*875,076*			*0.56*	*123,907*			*0.23*					*946,513*			
Third Quarter 2002																
July 2002	272,771			0.08	51,111			0.18					188,300	7/24/2002	2.09	
August 2002	270,746	8/27/2002	36	0.08	7								301,613	8/20/2002	9.15	HRW-1 shut down on July 24 due to dry pumping conditions and potential biofouling of the well. HRW-1 mass removal rate estimate based on June 2002 data.
September 2002	143,662			0.04	0				110,000	9/23/2002	47.0		369,469	9/23/2002	11.8	RW-2 temporarily shut down on September 25. Water being intercepted from SDM-1 and pumped to treatment system beginning on September 16.
Quarterly Totals	*687,179*			*0.21*	*51,118*			*0.18*					*859,382*			RW-2 mass removal rates based on August 27 sampling event. Total Volume pumped from SDM-1 estimated based on throughout of WWTP and volume recovered from RW-2; Flowmeter to be installed for SDM-1 in October 2002.
Fourth Quarter 2002																
October 2002	177,937			0.06	0				Not metered				112,129	10/3/2002	8.84	
November 2002	275,033	11/13/2002	37	0.09	0				95,157				399,747			The storage tank gauge was moved to groundwater sump SDM-1 on November 1.
December 2002	418,846			0.13	0				124,894				507,766			
Quarterly Totals	*871,816*			*0.27*	*0*			*0.00*				*0.00*	*1,019,642*			RW-2 mass removal rates based on November 13 sampling event.

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TABLE 2-4
GROUNDWATER INTERIM ACTION OPERATIONAL HISTORY
UPPER AND LOWER WATER-BEARING ZONES
TIME OIL NORTHWEST TERMINAL

	RW-2 Discharge				HRW-1 Discharge				SDM-1 Discharge				Treatment System Discharge			
Monitoring Period	Volume of Water Pumped (gal)	Sample Date	PCP Concentration (µg/L)	Estimated PCP Mass Removal (lb)	Volume of Water Pumped (gal)	Sample Date	PCP Concentration (µg/L)	Estimated PCP Mass Removal (lb)	Volume of Water Pumped (gal)	Sample Date	PCP Concentration (µg/L)	Estimated PCP Mass Removal (lb)	Volume of Water Treated (gal)	Sample Date	Discharge PCP Concentration (µg/L)	Comments
First Quarter 2003																
January 2003	417,846			0.12	0				166,863			0.38	574,451	1/15/2003	11.6	
February 2003	398,299	2/11/2003	33	0.11	0				192,395	2/13/2003	290	0.43	483,579			
March 2003	458,160			0.13	0				210,400			0.47	624,807			SDM-1 mass removal rates based on February 13 sampling event.
Quarterly Totals	*1,140,149*			*0.35*	*51,118*			*0.00*	*95,157*			*1.28*	*1,371,258*			RW-2 mass removal rates based on February 11 sampling event.
Second Quarter 2003																
April 2003	445,275			0.04	0				55,037			0.00	481,816	4/9/2003	22.2	
May 2003	455,994	5/7/2003	12	0.05	0	Not Analyzed			0	5/7/2003	0.93	0.00	469,079			
June 2003	385,658			0.04	4,175				89,243			0.00	446,127			RW-2 mass removal rates based on April 8, 2003 sampling event.
Quarterly Totals	*1,286,927*			*0.13*	*4,175*			*0.00*	*144,280*			*0.00*	*1,397,022*			
Third Quarter 2003																
July 2003	330,738	7/28/2003	<5.0	0.01	30,104	7/28/2003	370	0.09	128,562	7/28/2003	409	0.44	441,023	7/11/2003 7/30/2003	87.4 8.6	Multiple treatment system discharge samples collected and analyzed due to upset concentration (87.4 ug/L) reported for July 11, 2003 sampling event. Additional discharge samples in response to request from City of Portland.
August 2003	386,307	8/27/2003	10	0.03	7,388			0.02	119,831	8/27/2003	120	0.41	397,748	8/4/2003 8/6/2003 8/11/2003 8/13/2003 8/18/2003 8/20/2003 8/25/2003 8/27/2003	<5.0 <5.0 <4.76 <4.83 <4.75 <5.16 23.8 36.5	HRW-1 mass removal rates based on July 28 sampling event. SDM-1 mass removal rates based on July 28 sampling event. RW-2 mass removal rates based on August 27 sampling event.
September 2003	262,403			0.02	0			0.00	87,439			0.09	479,703	9/3/2003 9/5/2003 9/9/2003 9/23/2003 9/29/2003	19.3 19.6 7.09 16.9 5.96	
Quarterly Totals	*959,448*			*0.07*	*37,492*			*0.12*	*335,832*			*0.94*	*1,318,474*			
Fourth Quarter 2003																
October 2003	298,092	10/23/2003	8.1	0.02					74,025	10/20/2003	43	0.03	350,921	10/6/2003 10/13/2003 10/20/2003 10/30/2003	<4.75 <4.76 <4.84 <5.19	Multiple treatment system discharge samples collected and analyzed due to upset concentration (87.4 ug/L) reported for July 11, 2003 sampling event. Additional discharge samples in response to request from City of Portland.
November 2003	216,630			0.01					45,472			0.02	216,711	11/3/2003 11/10/2003 11/17/2003 11/21/2003	<4.73 <4.78 <4.84 <4.79	SDM-1 mass removal rates based on October 20 sampling event. RW-2 mass removal rates based on October 23 sampling event.
December 2003	367,462			0.02					95,504			0.03	488,055	12/1/2003 12/15/2003 12/29/2003 12/30/2003	<4.79 <4.92 30.40 31.10	
Quarterly Totals	*882,184*			*0.06*				*0.00*	*215,001*			*0.08*	*1,055,687*			
Grand Totals	***12,377,249***			***2.83***	***309,974***			***0.80***	***790,270***			***2.30***	***13,384,630***			

ND = Not Detected.

(a) PCP not detected above the detection limit of 5 µg/L; concentration-dependent calculations based on half the detection limit
(b) PCP not detected above the detection limit of 25 µg/L; concentration-dependent calculations based on half the detection limit
(c) PCP not detected above the detection limit of 5.25 µg/L; concentration-dependent calculations based on half the detection limit

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TABLE 6-1
HORIZONTAL HYDRAULIC GRADIENTS
UPPER AND LOWER WATER-BEARING ZONES

	Season	Water Table Elevation (ft, MSL)		Difference in Elevation (ft)	Distance Between Locations (a) (ft)	Hydraulic Gradient (ft/ft)
Upper Zone						
North		LW-7S	P			
February-03	Winter	17.92	15.84	2.08	340	6.12E-03
May-03	Spring	18.56	14.44	4.12	340	1.21E-02
August-03	Summer	15.48	13.77	1.71	340	5.03E-03
October-03	Fall	14.65	13.38	1.27	340	3.74E-03
					Average	6.75E-03
Central		D	LW-4S			
February-03	Winter	17.94	14.23	3.71	340	1.09E-02
May-03	Spring	18.56	14.51	4.05	330	1.23E-02
August-03	Summer	15.44	12.39	3.05	330	9.24E-03
October-03	Fall	14.50	11.74	2.76	340	8.11E-03
					Average	1.01E-02
Confining Unit Transition		13 ft Contour	LW-27S			
October-03	Fall	13.00	5.19	7.81	70	1.12E-01
South		LW-32S	LW-31S			
October-03	Fall	13.69	12.39	1.30	150	8.67E-03
Lower Zone						
North (b)		LW-1D	RIVER			
February-03	Winter	7.20	4.47	2.73	650	4.20E-03
May-03	Spring	9.40	8.13	1.27	650	1.95E-03
August-03	Summer	5.91	4.47	1.44	650	2.22E-03
October-03	Fall	4.80	3.19	1.61	650	2.48E-03
					Average	2.71E-03
Central		B2	LW-25D			
October-03	Fall	4.46	4.37	0.09	400	2.25E-04
South		4.6 ft Contour	LW-30D			
October-03	Fall	4.60	4.48	0.12	90	1.33E-03

(a) Distance was estimated along groundwater flow path.
(b) Distance from LW-1D to River was estimated from LW-1D to river bank in direction of groundwater flow.

TABLE 6-2
VERTICAL GRADIENTS
MARCH 1997-DECEMBER 2003
TIME OIL NORTHWEST TERMINAL

Upper Groundwater Zone			Lower Groundwater Zone			Vertical Gradients	
Well	Date	GW Elevation	Well	Date	GW Elevation	Vertical Gradient (a)	Average Vertical Gradient
LW1S	03/31/97	21.31	LW1D	03/31/97	15.60	0.25	
LW1S	07/16/97	19.62	LW1D	07/16/97	10.66	0.40	
LW1S	10/21/97	16.94	LW1D	10/21/97	7.02	0.47	
LW1S	01/27/98	19.21	LW1D	01/27/98	11.25	0.36	
LW1S	05/18/98	18.81	LW1D	05/18/98	11.78	0.32	
LW1S	08/17/98	16.29	LW1D	08/17/98	6.49	0.47	
LW1S	11/13/98	15.20	LW1D	11/13/98	5.54	0.48	
LW1S	02/16/99	21.36	LW1D	02/16/99	11.01	0.45	
LW1S	05/18/99	19.04	LW1D	05/18/99	11.55	0.34	
LW1S	09/21/99	15.76	LW1D	09/21/99	5.40	0.51	
LW1S	12/06/99	16.10	LW1D	12/06/99	10.31	0.28	
LW1S	02/16/00	18.54	LW1D	02/16/00	10.15	0.38	
LW1S	05/23/00	17.44	LW1D	05/23/00	9.69	0.36	
LW1S	08/29/00	15.45	LW1D	08/29/00	5.50	0.49	
LW1S	11/09/00	14.70	LW1D	11/09/00	5.33	0.47	
LW1S	02/12/01	15.14	LW1D	02/12/01	6.08	0.45	
LW1S	06/04/01	15.19	LW1D	06/04/01	5.95	0.46	
LW1S	08/16/01	14.51	LW1D	08/16/01	4.58	0.50	
LW1S	11/28/01	14.71	LW1D	11/28/01	6.58	0.41	
LW1S	02/27/02	18.65	LW1D	02/27/02	8.00	0.49	
LW1S	06/27/02	16.70	LW1D	06/27/02	10.50	0.45	
LW1S	08/26/02	15.49	LW1D	08/26/02	5.46	0.30	
LW1S	11/12/02	14.24	LW1D	11/12/02	5.40	0.42	
LW1S	02/11/03	17.85	LW1D	02/11/03	7.20	0.61	
LW1S	05/08/03	18.55	LW1D	05/08/03	9.40	0.85	
LW1S	08/27/03	15.50	LW1D	08/27/03	5.91	0.76	
LW1S	10/23/03	14.64	LW1D	10/23/03	4.80	0.16	0.44
D	03/31/97	21.38	LW3D	03/31/97	11.42	0.36	
D	07/16/97	19.59	LW3D	07/16/97	2.71	0.61	
D	10/21/97	16.77	LW3D	10/21/97	7.44	0.35	
D	01/27/98	19.32	LW3D	01/27/98	9.14	0.37	
D	05/18/98	17.81	LW3D	05/18/98	11.59	0.23	
D	08/17/98	16.21	LW3D	08/17/98	6.18	0.38	
D	11/13/98	15.03	LW3D	11/13/98	5.24	0.38	
D	02/16/99	21.54	LW3D	02/16/99	10.80	0.39	
D	05/18/99	19.04	LW3D	05/18/99	11.38	0.28	
D	09/21/99	15.63	LW3D	09/21/99	5.04	0.41	
D	12/06/99	16.00	LW3D	12/06/99	10.11	0.23	
D	02/16/00	18.54	LW3D	02/16/00	9.82	0.32	
D	05/23/00	17.30	LW3D	05/23/00	9.64	0.29	
D	02/12/01	15.05	LW3D	02/12/01	5.95	0.36	
D	06/04/01	15.09	LW3D	06/04/01	5.71	0.37	
D	08/16/01	14.40	LW3D	08/16/01	4.37	0.40	
D	11/28/01	14.59	LW3D	11/28/01	6.32	0.33	
D	02/27/02	18.67	LW3D	02/27/02	7.67	0.40	
D	06/27/02	16.61	LW3D	06/27/02	10.25	0.24	
D	08/26/02	15.36	LW3D	08/26/02	5.17	0.40	
D	11/12/02	14.08	LW3D	11/12/02	5.23	0.35	
D	02/11/03	17.94	LW3D	02/11/03	6.77	0.41	
D	05/08/03	18.56	LW3D	05/08/03	9.12	0.35	
D	08/27/03	15.44	LW3D	08/27/03	5.70	0.38	

TABLE 6-2
VERTICAL GRADIENTS
MARCH 1997-DECEMBER 2003
TIME OIL NORTHWEST TERMINAL

Upper Groundwater Zone			Lower Groundwater Zone			Vertical Gradients	
Well	Date	GW Elevation	Well	Date	GW Elevation	Vertical Gradient (a)	Average Vertical Gradient
D	10/23/03	14.50	LW3D	10/23/03	4.62	0.39	0.36
J1	03/31/97	20.68	J2	03/31/97	15.27	0.27	
J1	07/16/97	19.21	J2	07/16/97	10.37	0.44	
J1	10/21/97	16.60	J2	10/21/97	6.63	0.52	
J1	01/27/98	18.67	J2	01/27/98	10.96	0.38	
J1	05/18/98	17.43	J2	05/18/98	11.51	0.30	
J1	08/17/98	15.92	J2	08/17/98	5.95	0.53	
J1	11/13/98	14.93	J2	11/13/98	5.01	0.54	
J1	02/16/99	20.79	J2	02/16/99	10.65	0.50	
J1	05/18/99	18.51	J2	05/18/99	11.25	0.36	
J1	09/21/99	15.34	J2	09/21/99	4.92	0.56	
J1	12/06/99	15.75	J2	12/06/99	10.12	0.30	
J1	02/16/00	18.03	J2	02/16/00	9.76	0.41	
J1	05/23/00	16.92	J2	05/23/00	9.32	0.39	
J1	08/29/00	15.12	J2	08/29/00	4.98	0.55	
J1	11/09/00	14.40	J2	11/09/00	4.99	0.52	
J1	02/12/01	14.83	J2	02/12/01	5.73	0.50	
J1	06/04/01	14.87	J2	06/04/01	5.48	0.51	
J1	08/16/01	14.22	J2	08/16/01	4.08	0.56	
J1	11/28/01	14.47	J2	11/28/01	6.20	0.45	
J1	02/27/02	18.08	J2	02/27/02	7.44	0.53	
J1	06/27/02	16.30	J2	06/27/02	10.17	0.32	
J1	08/26/02	15.19	J2	08/26/02	4.98	0.55	
J1	11/12/02	13.99	J2	11/12/02	5.05	0.50	
J1	02/11/03	17.37	J2	02/11/03	6.70	0.49	
J1	05/08/03	18.05	J2	05/08/03	9.00	0.31	
J1	08/27/03	15.24	J2	08/27/03	5.53	0.46	
J1	10/23/03	14.39	J2	10/23/03	4.47	0.71	0.46
LW4S	03/31/97	17.49	LW4D	03/31/97	15.44	0.11	
LW4S	07/16/97	15.60	LW4D	07/16/97	10.74	0.27	
LW4S	10/21/97	13.38	LW4D	10/21/97	7.15	0.37	
LW4S	01/27/98	15.13	LW4D	01/27/98	11.33	0.22	
LW4S	05/18/98	14.18	LW4D	05/18/98	11.63	0.15	
LW4S	08/17/98	12.96	LW4D	08/17/98	6.36	0.40	
LW4S	11/13/98	12.30	LW4D	11/13/98	5.18	0.44	
LW4S	02/16/99	17.16	LW4D	02/16/99	11.38	0.31	
LW4S	05/18/99	14.83	LW4D	05/18/99	11.40	0.20	
LW4S	09/21/99	12.65	LW4D	09/21/99	5.39	0.45	
LW4S	12/06/99	13.18	LW4D	12/06/99	9.96	0.19	
LW4S	02/16/00	14.42	LW4D	02/16/00	9.94	0.26	
LW4S	05/23/00	13.55	LW4D	05/23/00	9.62	0.23	
LW4S	08/29/00	12.48	LW4D	08/29/00	5.39	0.44	
LW4S	11/09/00	12.09	LW4D	11/09/00	4.98	0.44	
LW4S	02/12/01	13.18	LW4D	02/12/01	5.46	0.47	
LW4S	06/04/01	12.45	LW4D	06/04/01	5.51	0.43	
LW4S	08/16/01	11.87	LW4D	08/16/01	3.90	0.50	
LW4S	11/28/01	12.42	LW4D	11/28/01	5.76	0.41	
LW4S	02/27/02	14.44	LW4D	02/27/02	7.52	0.40	
LW4S	06/27/02	13.37	LW4D	06/27/02	10.02	0.20	
LW4S	08/26/02	12.58	LW4D	08/26/02	5.15	0.46	
LW4S	11/12/02	11.22	LW4D	11/12/02	4.91	0.41	
LW4S	02/11/03	14.23	LW4D	02/11/03	7.09	0.42	

TABLE 6-2
VERTICAL GRADIENTS
MARCH 1997-DECEMBER 2003
TIME OIL NORTHWEST TERMINAL

Upper Groundwater Zone			Lower Groundwater Zone			Vertical Gradients	
Well	Date	GW Elevation	Well	Date	GW Elevation	Vertical Gradient (a)	Average Vertical Gradient
LW4S	05/08/03	14.51	LW4D	05/08/03	8.96	0.32	
LW4S	08/27/03	12.39	LW4D	08/27/03	5.39	0.43	
LW4S	10/23/03	11.74	LW4D	10/23/03	4.32	0.47	0.35
LW9S	05/18/99	11.46	LW9D	05/18/99	10.96	0.03	
LW9S	09/21/99	---	LW9D	09/21/99	5.75	---	
LW9S	12/06/99	11.40	LW9D	12/06/99	9.94	0.10	
LW9S	02/16/00	---	LW9D	02/16/00	9.81	---	
LW9S	05/23/00	---	LW9D	05/23/00	9.83	---	
LW9S	08/29/00	---	LW9D	08/29/00	5.62	---	
LW9S	11/09/00	---	LW9D	11/09/00	5.02	---	
LW9S	02/12/01	---	LW9D	02/12/01	5.85	---	
LW9S	06/04/01	---	LW9D	06/04/01	5.83	---	
LW9S	08/16/01	---	LW9D	08/16/01	4.41	---	
LW9S	11/28/01	---	LW9D	11/28/01	5.58	---	
LW9S	02/27/02	---	LW9D	02/27/02	8.01	---	
LW9S	06/27/02	---	LW9D	06/27/02	10.60	---	
LW9S	08/26/02	---	LW9D	08/26/02	6.08	---	
LW9S	11/12/02	---	LW9D	11/12/02	5.25	---	
LW9S	02/11/03	---	LW9D	02/11/03	8.95	---	
LW9S	05/08/03	---	LW9D	05/08/03	9.33	---	
LW9S	08/27/03	---	LW9D	08/27/03	5.48	---	
LW9S	10/23/03	---	LW9D	10/23/03	4.76	---	0.07
LW10S	05/18/99	13.51	LW10D	05/18/99	11.30	0.14	
LW10S	09/21/99	11.62	LW10D	09/21/99	5.31	0.44	
LW10S	12/06/99	12.21	LW10D	12/06/99	9.94	0.15	
LW10S	02/16/00	13.13	LW10D	02/16/00	9.92	0.21	
LW10S	05/23/00	12.50	LW10D	05/23/00	9.61	0.19	
LW10S	08/29/00	--	LW10D	08/29/00	5.26	--	
LW10S	11/09/00	--	LW10D	11/09/00	4.86	--	
LW10S	02/12/01	--	LW10D	02/12/01	5.49	--	
LW10S	06/04/01	--	LW10D	06/04/01	5.50	--	
LW10S	08/16/01	--	LW10D	08/16/01	3.96	--	
LW10S	11/28/01	--	LW10D	11/28/01	5.66	--	
LW10S	02/27/02	12.98	LW10D	02/27/02	7.54	0.36	
LW10S	06/27/02	12.48	LW10D	06/27/02	10.09	0.16	
LW10S	08/26/02	--	LW10D	08/26/02	5.21	--	
LW10S	11/12/02	--	LW10D	11/12/02	4.95	--	
LW10S	02/11/03	13.25	LW10D	02/11/03	7.29	0.39	
LW10S	05/08/03	13.07	LW10D	05/08/03	9.02	0.27	
LW10S	08/27/03	--	LW10D	08/27/03	5.38	--	
LW10S	10/23/03	--	LW10D	10/23/03	4.33	--	0.26
LW11S	05/18/99	17.63	LW11D	05/18/99	10.45	0.41	
LW11S	09/21/99	14.87	LW11D	09/21/99	8.28	0.40	
LW11S	12/06/99	15.10	LW11D	12/06/99	7.23	0.48	
LW11S	02/16/00	17.16	LW11D	02/16/00	8.69	0.49	
LW11S	05/23/00	16.09	LW11D	05/23/00	9.54	0.39	
LW11S	08/29/00	14.59	LW11D	08/29/00	--	--	
LW11S	11/09/00	13.92	LW11D	11/09/00	--	--	
LW11S	02/12/01	14.48	LW11D	02/12/01	5.90	0.53	
LW11S	06/04/01	14.45	LW11D	06/04/01	5.69	0.54	
LW11S	08/16/01	13.86	LW11D	08/16/01	2.10	0.74	

TABLE 6-2
VERTICAL GRADIENTS
MARCH 1997-DECEMBER 2003
TIME OIL NORTHWEST TERMINAL

Upper Groundwater Zone			Lower Groundwater Zone			Vertical Gradients	
Well	Date	GW Elevation	Well	Date	GW Elevation	Vertical Gradient (a)	Average Vertical Gradient
LW11S	11/28/01	14.00	LW11D	11/28/01	4.50	0.60	
LW11S	02/27/02	17.24	LW11D	02/27/02	7.24	0.57	
LW11S	06/27/02	15.70	LW11D	06/27/02	10.20	0.33	
LW11S	08/26/02	14.73	LW11D	08/26/02	6.33	0.52	
LW11S	11/12/02	13.57	LW11D	11/12/02	5.17	0.54	
LW11S	02/11/03	16.64	LW11D	02/11/03	7.25	0.55	
LW11S	05/08/03	17.19	LW11D	05/08/03	9.76	0.43	
LW11S	08/27/03	14.78	LW11D	08/27/03	5.69	0.56	
LW11S	10/23/03	13.98	LW11D	10/23/03	5.06	0.56	0.51
			LW12D1 (b)	05/18/99	11.57		
			LW12D1	09/21/99	5.58		
			LW12D1	12/06/99	10.30		
			LW12D1	02/16/00	10.13		
			LW12D1	05/23/00	9.79		
			LW12D1	08/29/00	5.64		
			LW12D1	11/09/00	5.36		
			LW12D1	02/12/01	6.10		
			LW12D1	06/04/01	6.03		
			LW12D1	08/16/01	4.63		
			LW12D1	11/28/01	6.69		
			LW12D1	02/27/02	8.14		
			LW12D1	06/27/02	10.44		
			LW12D2 (b,c)	05/18/99	11.01	0.01	
			LW12D2	09/21/99	4.55	0.02	
			LW12D2	12/06/99	9.84	0.01	
			LW12D2	02/16/00	9.32	0.02	
			LW12D2	05/23/00	8.86	0.02	
			LW12D2	08/29/00	4.56	0.02	
			LW12D2	11/09/00	4.68	0.01	
			LW12D2	02/12/01	5.36	0.01	
			LW12D2	06/04/01	5.14	0.02	
			LW12D2	08/16/01	3.81	0.02	
			LW12D2	11/28/01	6.07	0.01	
			LW12D2	02/27/02	6.86	0.02	
			LW12D2	06/27/02	9.80	0.01	0.01 (c)
LW20S	10/23/03	14.65	LW20D	08/27/03	4.65	0.61	
LW29S	10/23/03	12.46	LW29D	08/27/03	4.66	0.50	
LW32S	10/23/03	13.69	LW32D	08/27/03	4.36	0.68	

(a) Vertical gradient was calculated using a distance between the midpoint of the screened intervals in each groundwater zone or unit (including an adjustment for variations in the elevation of the water table within the screened interval). The screen was not fully saturated at time of WL measurements; midpoint of screened interval was adjusted to account for unsaturated portion of screen.

(c) Monitoring wells LW12D1 and LW12D2 were abandoned in the summer of 2002 prior to the remedial action conducted within the former PCP mixing area.

(b) LW12D2 is screened in the deep sand unit; values shown represent vertical gradient between lower groundwater zone and deep groundwater zone.

TABLE 7-1
NAPL, SHEEN, AND ODOR OBSERVATIONS IN SOIL
TIME OIL NW TERMINAL

Location	Depth (ft. bgs)			Presence of: NAPL	Sheen	Odor
Main Terminal Tank Farm Area						
LW-27S	8	to	24	product at 22.5	no	slight diesel
LW-27S	8	to	24	no	no	strong diesel
LW-27S	24	to	44.5	no	no	faint diesel
LW-17D	0	to	16	no	no	mild petroleum-like
LW-17D	19	to	22	no	no	mild petroleum-like
LW-17D	22	to	27	no	heavy	strong petroleum-like
LW-17D	27	to	34	no	mild	strong petroleum-like
LW-17D	34	to	40	no	no	mild petroleum-like
LW-21S	4.5	to	17	no	moderate	strong diesel
LW-21S	17	to	17.5	no	no	mild diesel
LW-19S	7	to	16	no	no	strong diesel
LW-19S	16	to	18.5	no	slight	strong diesel
LW-19S	18.5	to	19	no	no	mild diesel
LW-20S	4	to	13.5	no	no	strong diesel
LW-20S	13.5	to	14.5	no	no	mild diesel
LW-20S	3.5	to	13.5	no	slight	strong diesel
LW-26D	3	to	15	no	no	slight diesel
LW-26D	15	to	24	no	slight	strong diesel
LW-26D	24	to	26.5	no	no	strong diesel
LW-26D	33	to	35	no	no	mild asphaltic
N	2	to	15	no	no	faint diesel-type
N	15	to	17	no	slight	faint diesel-type
N	17	to	18	no	no	faint diesel-type
P	0	to	14	no	no	strong gasoline
P	14	to	16	no	yes	strong gasoline
P	16	to	17.5	no	no	faint hydrocarbon
Q	0	to	14	no	no	strong gasoline
Q	14	to	17	no	yes	strong gasoline
G13-3	12	to	16	no	no	very strong petroleum
G13-3	5	to	12	no	no	strong petroleum
G9-1	8	to	16	no	no	very strong petroleum
G9-1	3	to	8	no	no	mild petroleum
G14-1	1	to	3.5	no	no	mild ethanol
G14-1	3.5	to	8	no	no	mild petroleum
G14-1	8	to	16	no	no	strong petroleum
LW-23D	27	to	29	no	no	slight to moderate petroleum-like
LW-23D	24	to	26	no	no	slight petroleum-like
LW-23D	26	to	27	no	no	moderate petroleum-like

TABLE 7-1
NAPL, SHEEN, AND ODOR OBSERVATIONS IN SOIL
TIME OIL NW TERMINAL

Location	Depth (ft. bgs)			Presence of: NAPL	Sheen	Odor
RW-2	19	to	42	no	no	slight to moderate hydrocarbon
LW-22D	25	to	30.5	no	no	slight petroleum-like
LW-4S	18	to	20	no	no	slight organic
LW-15D	25	to	40	no	no	mild petroleum-like
G2-2	22	to	24	no	no	mild petroleum
G3-1	12	to	16	no	no	mild petroleum
LW-24D	26	to	30	no	no	mild diesel
LW-8S	0	to	16.5	no	no	hydrocarbon
R	15	to	22	no	no	faint, sweet, soap-like
R	22	to	30	no	no	faint diesel-type
LW-4D	27.5	to	40.5	no	no	faint to moderate hydrocarbon
LW-4D	26	to	27.5	no	no	faint hydrocarbon
O	25	to	30	no	no	faint diesel-type
LW-25D	28.5	to	31.5	no	no	faint diesel
LW-6D	28	to	35	no	no	faint
Bell Terminal Tank Farm Area						
LW-32D	14	to	17	no	slight	strong diesel
LW-32D	17	to	18	no	moderate	strong diesel
LW-32D	18	to	19	no	strong	strong diesel
LW-32S	15	to	20	no	moderate	slight diesel
G25-1	17	to	19.5	no	slight	no
LW-30D	12.5	to	16.5	no	no	strong petroleum-like
LW-30D	16.5	to	17.5	no	slight	strong petroleum-like
LW-30S	12.5	to	14	no	no	mild petroleum
LW-30S	14	to	17	no	no	strong petroleum
LW-30S	17	to	18	no	slight	strong petroleum
LW-30S	18	to	19	no	slight	mild petroleum
BT-05	16	to	19.5	no	trace	strong petroleum-like
BT-05	13	to	16	no	no	strong petroleum-like
BT-01	14	to	19.75	no	no	very strong petroleum-like
BT-01	12	to	14	no	no	strong petroleum-like
BT-03	13.5	to	17	no	no	strong petroleum-like
BT-03	17	to	20	no	no	mild petroleum-like
BT-06	14	to	18.5	no	no	strong petroleum-like
BT-08	15	to	19	no	no	strong petroleum-like

TABLE 7-1
NAPL, SHEEN, AND ODOR OBSERVATIONS IN SOIL
TIME OIL NW TERMINAL

Location	Depth (ft. bgs)			Presence of: NAPL	Sheen	Odor
BT-09	15.5	to	17	no	no	strong petroleum-like
G26-1	15	to	16	no	no	strong petroleum
LW-35D	28.5	to	29.5	no	no	mild rotton sewer-like
BT-02	16	to	19	no	no	mild petroleum-like
BT-04	14	to	24	no	no	mild petroleum-like
BT-07	15.5	to	19.5	no	no	mild petroleum-like
G21-1	17	to	20	no	no	mild petroleum
G22-1	15.5	to	16	no	no	mild petroleum
LW-31S	16.5	to	18.5	no	no	mild gasoline-like
LW-28S	13	to	13.5	no	no	mild ethanol-like
SCH-56	14	to	16	no	no	petroleum-like
SCH-56	16	to	18	no	yes	yes
SCH-56	18	to	20	no	no	slight
SCH-57	11.5	to	12	no	no	diesel
SCH-57	15	to	18.5	no	no	slight to moderate petroleum-like
SCH-59	12	to	14	no	no	moderate non-petroleum-like
SCH-59	14	to	17	no	no	moderate to strong
SCH-59	17	to	17.5	no	slight	strong
SCH-61	15.6	to	17.8	no	no	moderate to strong
SCH-63/63B	14.5	to	16	no	no	moderate to strong petroleum-like
	16	to	18	no	slight	petroleum-like
Phase II Study Area						
LB14	8	to	16	no	heavy	strong
LB14	16	to	18.5	no	slight	faint
LW-8S	16.5	to	17.5	no	medium	strong hydrocarbon
LW-2S	8	to	10	no	no	faint hydrocarbon
LW-2S	10	to	11	no	slight	faint hydrocarbon
LW-2S	11	to	17	no	moderate	moderate hydrocarbon
LW-2S	17	to	18	no	slight	moderate hydrocarbon
LB12	12	to	16	no	slight	slight to moderate
LB13	11	to	16	no	slight	slight to moderate
LB13	16	to	18	no	slight	slight
LB17	0.5	to	1.5	trace	slight	moderate
LB17	9	to	12	no	slight	moderate

TABLE 7-1
NAPL, SHEEN, AND ODOR OBSERVATIONS IN SOIL
TIME OIL NW TERMINAL

Location	Depth (ft. bgs)			Presence of: NAPL	Sheen	Odor
LB17	12.5	to	19.5	no	slight	no
LB2	6	to	9	no	slight	faint hydrocarbon
LB2	9	to	16	no	no	faint hydrocarbon
LB-25	12.5	to	17	no	slight	petroleum
RW-3	8.5	to	15.5	no	slight	strong mineral spirit
RW-3	15.5	to	17.5	no	no	slight mineral spirit
OX-8D	14	to	17	no	no	strong mineral spirit/PCP
OX-8S	13	to	17	no	no	strong mineral spirit/PCP
LW-11S	0	to	15	no	no	strong mineral spirit
LW-11D	0	to	15	no	no	strong mineral spirit
LW-12D1	0	to	16.5	no	no	strong hydrocarbon
LW-12D1	20	to	35	no	no	strong hydrocarbon
LW-12D2	0	to	16.5	no	no	strong hydrocarbon
LW-12D2	20	to	30	no	no	strong hydrocarbon
LW-12D2	90	to	100	no	no	slight to moderate hydrocarbon
LW-12D2	30	to	90	no	no	moderate hydrocarbon
LB-24	0	to	14	no	no	slight
LB3	4	to	14	no	no	moderate hydrocarbon
LW-3D	13	to	17	no	no	moderate hydrocarbon
OX-6S	15.5	to	18	no	no	mild mineral spirit/PCP
OX-7S	16	to	18	no	no	mild mineral spirit/PCP
LB-11	10	to	17.5	no	no	faint to moderate hydrocarbon
LB-5	1	to	9	no	no	faint hydrocarbon
LB-8	4	to	5	no	no	faint hydrocarbon

TABLE 7-2
LNAPL OBSERVATIONS AND MEASUREMENTS IN GROUNDWATER
AUGUST 1993 - OCTOBER 2003
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	LNAPL Thickness (ft)	Observations
Upper Zone Groundwater Monitoring Wells:				
N	03/25/1997	11:48	----	
N	03/31/1997	08:59	----	Hydrocarbon odor, product
N	07/16/1997	07:20	1.20	Light brown color; thick coating on probe
N	10/21/1997	16:09	----	No product - strong petroleum odor
N	10/23/1997	17:20	----	No product - strong petroleum odor
N	01/27/1998	11:13	0.02	
N	05/18/1998	17:20	0.06	
N	08/17/1998	10:40	0.02	Thin coat of thick product
N	11/13/1998	09:48	0.01	
N	02/16/1999	12:55	0.27	Strong petroleum odor
N	05/18/1999	14:47	0.04	
N	09/21/1999	11:23	0.01	
N	12/06/1999	14:00	----	
N	02/16/2000	10:10	----	
N	05/23/2000	16:24	----	Strong petroleum odor, no product
N	08/29/2000	13:07	----	
N	11/09/2000	12:26	0.03	
N	02/12/2001	15:49	----	
N	06/04/2001	11:31	----	
N	08/16/2001	10:29	----	Trace product
N	11/28/2001	11:27	----	Trace product
N	02/27/2002	13:25	----	
N	04/05/2002	08:09	----	
N	05/29/2002	00:00	----	
N	06/27/2002	14:12	----	
N	08/26/2002	15:56	----	
N	11/13/2002	07:27	0.03	Product present
N	02/11/2003	08:49	----	
N	05/08/2003	06:51	----	
N	08/27/2003	13:33	----	
N	10/23/2003	12:08	----	
P	03/25/1997	11:45	----	
P	03/31/1997	08:55	----	Hydrocarbon odor, product
P	07/16/1997	07:15	0.17	Light coating on probe; light brown color
P	10/21/1997	16:05	----	No product - strong petroleum odor
P	10/23/1997	17:25	----	No product - strong petroleum odor
P	01/27/1998	11:09	----	
P	05/18/1998	17:18	----	Trace of product on probe
P	08/17/1998	10:37	0.01	Sheen on probe, strong petroleum odor
P	11/13/1998	09:46	0.05	Strong gasoline odor
P	02/16/1999	12:52	0.06	Strong petroleum odor
P	05/18/1999	14:43	0.13	
P	09/21/1999	11:20	0.01	
P	12/06/1999	13:55	----	
P	02/16/2000	10:08	----	
P	05/23/2000	16:21	----	Trace of product on surface
P	08/29/2000	13:04	0.01	
P	11/09/2000	12:24	0.03	
P	02/12/2001	15:46	----	
P	06/04/2001	11:27	----	Trace product
P	08/16/2001	10:28	----	
P	11/28/2001	11:24	----	
P	02/27/2002	13:22	0.10	Strong ethanol-like odor
P	04/05/2002	08:07	0.10	
P	05/29/2002	00:00	----	Trace product
P	06/27/2002	14:11	----	
P	08/26/2002	15:54	----	
P	11/13/2002	07:25	0.04	Product present
P	02/11/2003	08:44	0.01	Product present
P	05/08/2003	06:47	0.01	Trace product
P	08/27/2003	13:30	----	
P	10/23/2003	12:05	0.02	
Q	03/25/1997	11:42	----	
Q	03/31/1997	08:52	----	Hydrocarbon odor
Q	07/16/1997	07:10	0.02	Light coating on probe; light brown color

TABLE 7-2
LNAPL OBSERVATIONS AND MEASUREMENTS IN GROUNDWATER
AUGUST 1993 - OCTOBER 2003
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	LNAPL Thickness (ft)	Observations
Q	10/21/1997	16:04	----	No product - strong petroleum odor
Q	10/23/1997	17:29	----	No product - strong petroleum odor
Q	01/27/1998	11:05	----	
Q	05/18/1998	17:16	----	
Q	08/17/1998	10:35	----	Slight sheen on probe; no product, strong petroleum odor
Q	11/13/1998	09:44	0.01	Strong gasoline odor
Q	02/16/1999	12:49	0.01	Strong petroleum odor
Q	05/18/1999	14:40	----	Strong odor when cap removed
Q	09/21/1999	11:17	----	
Q	12/06/1999	13:53	----	
Q	02/16/2000	10:06	----	Film of product
Q	05/23/2000	16:19	----	Strong petroleum odor, no product
Q	08/29/2000	13:01	----	
Q	11/09/2000	12:23	----	Trace of product
Q	02/12/2001	15:45	----	
Q	06/04/2001	11:25	----	
Q	08/16/2001	10:26	----	Trace product
Q	11/28/2001	11:21	0.42	
Q	02/27/2002	13:20	----	Strong petroleum odor, no product
Q	04/05/2002	08:05	----	Trace product
Q	05/29/2002	00:00	----	Trace product
Q	06/27/2002	14:10	----	Trace product
Q	08/26/2002	15:52	----	
Q	11/13/2002	07:30	0.01	Product present
Q	02/11/2003	08:47	----	
Q	05/08/2003	06:48	0.22	
Q	08/27/2003	13:28	----	
Q	10/23/2003	12:03	0.24	
LW007S	03/31/1997	11:05	----	
LW007S	07/16/1997	08:05	----	
LW007S	10/21/1997	16:45	----	
LW007S	01/27/1998	12:47	----	
LW007S	05/18/1998	17:48	----	
LW007S	08/17/1998	10:48	----	
LW007S	11/13/1998	10:12	----	Strong gasoline odor
LW007S	02/16/1999	13:53	----	
LW007S	05/18/1999	15:23	----	
LW007S	09/21/1999	12:03	----	
LW007S	12/06/1999	14:27	----	
LW007S	02/16/2000	10:46	----	
LW007S	05/23/2000	17:09	----	
LW007S	08/29/2000	13:53	----	
LW007S	11/09/2000	13:14	----	
LW007S	02/12/2001	15:39	----	
LW007S	06/04/2001	12:17	----	
LW007S	08/16/2001	11:33	----	
LW007S	11/28/2001	12:22	----	
LW007S	02/27/2002	14:15	----	
LW007S	03/05/2002	10:52	----	
LW007S	04/05/2002	08:57	----	
LW007S	05/29/2002	00:00	----	
LW007S	06/27/2002	14:45	----	
LW007S	08/26/2002	17:18	----	
LW007S	11/13/2002	09:16	----	
LW007S	02/11/2003	10:37	----	
LW007S	05/08/2003	08:27	----	
LW007S	08/27/2003	14:58	----	
LW007S	10/23/2003	13:39	----	
LW008S	05/18/1999	14:55	----	
LW008S	09/21/1999	12:24	----	
LW008S	12/06/1999	14:40	----	
LW008S	02/16/2000	10:16	----	
LW008S	05/23/2000	17:42	----	
LW008S	08/29/2000	14:26	----	
LW008S	11/09/2000	13:32	----	
LW008S	02/12/2001	15:58	----	

TABLE 7-2
LNAPL OBSERVATIONS AND MEASUREMENTS IN GROUNDWATER
AUGUST 1993 - OCTOBER 2003
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	LNAPL Thickness (ft)	Observations
LW008S	06/04/2001	13:05	----	
LW008S	08/16/2001	12:00	----	
LW008S	11/28/2001	12:57	0.04	
LW008S	02/27/2002	14:37	----	
LW008S	03/05/2002	11:09	----	
LW008S	04/05/2002	08:17	----	
LW008S	05/29/2002	00:00	----	
LW008S	06/27/2002	15:21	----	
LW008S	08/26/2002	16:38	----	
LW008S	11/13/2002	08:50	----	
LW008S	02/11/2003	09:48	----	
LW008S	05/08/2003	08:00	----	
LW008S	08/27/2003	14:25	----	
LW008S	10/23/2003	12:42	----	
LW011S	05/18/1999	15:10	----	
LW011S	09/21/1999	11:51	----	
LW011S	12/06/1999	15:05	----	
LW011S	02/16/2000	11:01	----	
LW011S	05/23/2000	11:01	----	
LW011S	08/29/2000	14:55	----	
LW011S	11/09/2000	13:36	0.37	First occurrence of product in well.
LW011S	02/12/2001	15:18	----	
LW011S	06/04/2001	13:12	----	
LW011S	08/16/2001	11:24	0.28	
LW011S	11/28/2001	12:51	----	Trace product
LW011S	02/27/2002	14:59	----	
LW011S	03/05/2002	11:40	----	
LW011S	04/05/2002	08:34	----	
LW011S	05/29/2002	00:00	----	
LW011S	06/27/2002	15:09	----	
LW011S	08/26/2002	16:48	----	
LW011S	11/13/2002	08:54	----	
LW011S	02/11/2003	10:03	----	
LW011S	05/08/2003	08:07	----	
LW011S	08/27/2003	14:36	----	
LW011S	10/23/2003	14:12	----	
PZ2	06/27/2002	15:18	----	
PZ2	08/26/2002	16:34	----	
PZ2	11/13/2002	08:25	----	
PZ2	02/11/2003	09:44	----	
PZ2	05/08/2003	07:45	----	
PZ2	08/27/2003	14:03	----	
PZ2	10/23/2003	13:21	0.06	
OX002S	06/27/2002	15:12	----	
OX002S	08/26/2002	16:44	----	
OX002S	11/13/2002	08:33	----	New reference elevation September 2002
OX002S	02/11/2003	10:06	----	
OX002S	05/08/2003	08:09	----	
OX002S	08/27/2003	14:33	----	
OX002S	10/23/2003	14:14	0.31	
Deep Wells:				
B2	08/11/1993	10:02	----	Slight sheen, slight to mod mineral spirits-like odor
B2	10/26/1993	13:32	----	
B2	11/17/1993	13:32	----	
B2	12/17/1993	12:59	----	
B2	01/17/1994	13:12	----	
B2	02/18/1994	14:20	----	
B2	03/18/1994	12:59	----	
B2	04/18/1994	14:42	----	
B2	05/18/1994	15:22	----	
B2	06/17/1994	14:54	----	
B2	07/19/1994	09:20	----	
B2	08/17/1994	07:35	----	

TABLE 7-2
LNAPL OBSERVATIONS AND MEASUREMENTS IN GROUNDWATER
AUGUST 1993 - OCTOBER 2003
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	LNAPL Thickness (ft)	Observations
B2	09/16/1994	07:27	----	
B2	10/17/1994	09:03	----	
B2	11/21/1994	11:51	----	
B2	12/19/1994	11:10	----	
B2	01/18/1995	11:18	----	
B2	02/21/1995	13:23	----	
B2	03/21/1995	13:05	----	
B2	04/19/1995	12:48	----	
B2	05/19/1995	13:38	----	
B2	07/17/1995	13:55	----	
B2	08/22/1995	07:53	----	
B2	09/22/1995	08:28	----	
B2	11/20/1995	07:57	----	
B2	12/01/1995	08:29	----	
B2	12/19/1995	07:26	----	
B2	01/19/1996	08:38	----	
B2	02/20/1996	10:42	----	
B2	03/19/1996	09:23	----	
B2	04/19/1996	11:53	----	
B2	07/22/1996	14:24	----	
B2	08/20/1996	14:20	----	
B2	09/24/1996	08:11	----	
B2	10/28/1996	11:09	----	
B2	12/13/1996	10:47	----	
B2	03/25/1997	12:02	----	
B2	03/31/1997	09:27	----	
B2	07/16/1997	07:45	----	
B2	10/21/1997	16:30	----	
B2	01/27/1998	12:06	----	
B2	05/18/1998	17:54	----	
B2	08/17/1998	10:23	----	
B2	11/13/1998	10:17	----	
B2	02/16/1999	13:34	----	
B2	05/18/1999	15:50	----	
B2	09/21/1999	12:18	----	
B2	12/06/1999	14:39	----	
B2	02/16/2000	10:56	----	
B2	05/23/2000	17:33	----	
B2	08/29/2000	14:20	----	
B2	11/09/2000	13:29	----	
B2	02/12/2001	15:27	----	
B2	06/04/2001	13:04	----	
B2	08/16/2001	11:58	----	
B2	11/28/2001	12:46	----	
B2	02/27/2002	14:35	----	
B2	06/27/2002	15:07	----	
B2	08/26/2002	17:01	----	
B2	11/13/2002	09:03	----	
B2	02/11/2003	10:14	----	
B2	05/08/2003	08:13	----	
B2	08/27/2003	15:32	----	
B2	10/23/2003	14:08	----	

NM = Not measured.
NA = Not available.
-- No measurable product or odor observed.
* Well Point

Notes:
(1) Reference Elevation (Ref. Elev) is the north side of the top of the 1.25-, 2- or 4-inch well casing, reference elevation surveys were conducted by Zarosinski-Tatone Engineers, Inc., Portland, Oregon. For the river gauge, the reference elevation was measured at a marked location on the south side of the dock on the Willamette River.
(2) Depth to water (DTW) measured from surveyed reference elevation [see note (1)].
(3) Where LNAPL thickness measured, groundwater elevation adjusted to account for the presence of LNAPL in the well using the method in "*Estimation of Free Hydrocarbon Volume from Fluid Levels* in Monitoring Wells" [Lenhard and Parker 1990;Groundwater 28(1):57-67].

Phase III Soil Data Tables

TABLE E-1
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE	G07-3	G07-4	G07-5	G10-4	G10-4	G10-5
		SAMPLE ID	G7-3(0-0.5)	G7-4(0-0.5)	G7-5(0-0.5)	G10-4(0-0.5)	G10-4(1.0-1.5)	G10-5(0.0-0.5)
		DATE	09/29/2003	09/29/2003	09/29/2003	09/29/2003	09/29/2003	09/29/2003
		DEPTH (ft)	0.50	0.50	0.50	0.50	1.50	0.50
Acenaphthene	(ug/kg)		118	38.7	6.67U	6.67U	10	6.67U
Acenaphthylene	(ug/kg)		744	253	20	12	67.3	6.67U
Anthracene	(ug/kg)		1090	404	14	9.33	78	6.67U
Benzo(a)anthracene	(ug/kg)		8270	3050	132	40.7	481	24
Benzo(a)pyrene	(ug/kg)		9240	2790	297	68	936	44.7
Benzo(b)fluoranthene	(ug/kg)		12400	3650	366	101	1200	50.7
Benzo(ghi)perylene	(ug/kg)		2880	920	134	22	386	46
Benzo(k)fluoranthene	(ug/kg)		3800	1160	107	28.7	379	16
Chrysene	(ug/kg)		10000	3560	176	44	561	27.3
Dibenzo(a,h)anthracene	(ug/kg)		660	303	28	6.67U	77.3	8.67
Fluoranthene	(ug/kg)		24500	9200	305	80.7	1360	48
Fluorene	(ug/kg)		247	90	6.67U	6.67U	19.3	6.67U
Indeno(1,2,3-cd)pyrene	(ug/kg)		2600	1270	115	20	337	33.3
Naphthalene	(ug/kg)		96.7	41.3	14	6.67U	16	6.67U
Pentachlorophenol	(ug/kg)		NT	NT	NT	NT	NT	NT
Phenanthrene	(ug/kg)		10900	4440	84.7	30.7	547	12.7
Pyrene	(ug/kg)		28900	13600	483	123	2080	67.3

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TABLE E-1
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE SAMPLE ID DATE DEPTH (ft)	G10-5 G10-5(1.0-1.5) 09/29/2003 1.50	G11-3 G11-3(0-0.5) 09/29/2003 0.50	G11-3 G11-3(1.0-1.5) 09/29/2003 1.50	G15-4 G15-4(0-0.5) 09/29/2003 0.50	G15-5 G15-5(0-0.5) 09/29/2003 0.50	G15-6 G15-6(0-0.5) 09/29/2003 0.50
Acenaphthene	(ug/kg)		6.67U	6.67U	6.67U	6.67U	6.67U	6.67U
Acenaphthylene	(ug/kg)		9.33	20.7	6.67U	18	64	18
Anthracene	(ug/kg)		6.67U	14	6.67U	18	55.3	18
Benzo(a)anthracene	(ug/kg)		28	148	6.67U	100	456	118
Benzo(a)pyrene	(ug/kg)		66	285	10	230	893	237
Benzo(b)fluoranthene	(ug/kg)		62	315	12	311	977	277
Benzo(ghi)perylene	(ug/kg)		75.3	315	11.3	254	794	240
Benzo(k)fluoranthene	(ug/kg)		21.3	78	6.67U	82.7	272	79.3
Chrysene	(ug/kg)		32	204	6.67U	145	597	151
Dibenzo(a,h)anthracene	(ug/kg)		12	54	6.67U	47.3	133	42
Fluoranthene	(ug/kg)		52.7	466	11.3	263	1520	277
Fluorene	(ug/kg)		6.67U	6.67U	6.67U	6.67U	10.7	6.67U
Indeno(1,2,3-cd)pyrene	(ug/kg)		50.7	223	8	185	583	173
Naphthalene	(ug/kg)		6.67U	6.67U	6.67U	14.7	16	12
Pentachlorophenol	(ug/kg)		NT	NT	NT	NT	NT	NT
Phenanthrene	(ug/kg)		13.3	130	6.67U	60	437	82
Pyrene	(ug/kg)		75.3	605	15.3	367	2100	387

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TABLE E-1
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE SAMPLE ID DATE DEPTH (ft)	G17-4 G17-4(0-0.5) 09/29/2003 0.50	G17-5 G17-5(0-0.5) 09/29/2003 0.50	G17-6 G17-6(0.0-0.5) 09/29/2003 0.50	G19-3 G19-3(0-0.5) 09/29/2003 0.50	G19-4 G19-4(0-0.5) 09/29/2003 0.50	G19-5 G19-5(0-0.5) 09/29/2003 0.50
Acenaphthene	(ug/kg)		64.7	6.67U	6.67U	18	15.3	6.67U
Acenaphthylene	(ug/kg)		398	11.3	16.7	96	174	8
Anthracene	(ug/kg)		671	14.7	38.7	131	133	6.67U
Benzo(a)anthracene	(ug/kg)		4110	73.3	78	962	1150	54.7
Benzo(a)pyrene	(ug/kg)		6910	163	128	1430	2320	113
Benzo(b)fluoranthene	(ug/kg)		7300	215	194	1480	2590	128
Benzo(ghi)perylene	(ug/kg)		6520	184	187	1330	2730	115
Benzo(k)fluoranthene	(ug/kg)		2120	70.7	52.7	511	770	42
Chrysene	(ug/kg)		5390	109	90.7	1170	1570	68
Dibenzo(a,h)anthracene	(ug/kg)		881	38	44	227	373	21.3
Fluoranthene	(ug/kg)		13900	161	142	2770	3710	103
Fluorene	(ug/kg)		173	6.67U	6.67U	40	28	6.67U
Indeno(1,2,3-cd)pyrene	(ug/kg)		4810	136	144	983	1890	82.7
Naphthalene	(ug/kg)		58.7	6.67U	38	49.3	50.7	16
Pentachlorophenol	(ug/kg)		NT	NT	NT	NT	NT	NT
Phenanthrene	(ug/kg)		7560	39.3	70.7	1460	1180	32.7
Pyrene	(ug/kg)		17200	210	160	3750	4890	143

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TABLE E-1
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE SAMPLE ID DATE DEPTH (ft)	G27-4 G27-4(0-0.5) 09/29/2003 0.50	G27-5 G27-5(0-0.5) 09/29/2003 0.50	HB01 HB01(1-1.5) 10/15/2003 1.50	HB01 HB01(5-6) 10/15/2003 6.00	HB01 HB01(10-11) 10/15/2003 11.00	HB01 HB01(14-15) 10/15/2003 15.00
Acenaphthene	(ug/kg)		93.3	8	6.67U	355	442	1010
Acenaphthylene	(ug/kg)		1060	194	8	70.7	76	208
Anthracene	(ug/kg)		1160	120	13.3	156	187	409
Benzo(a)anthracene	(ug/kg)		11100	507	24.7	12.7	14.7	18
Benzo(a)pyrene	(ug/kg)		16800	1060	32	6.67U	6.67U	6.67U
Benzo(b)fluoranthene	(ug/kg)		19800	2070	58	9.33	7.33	10
Benzo(ghi)perylene	(ug/kg)		6000	837	32.7	11.3	6.67U	6.67U
Benzo(k)fluoranthene	(ug/kg)		5950	688	15.3	6.67U	6.67U	6.67U
Chrysene	(ug/kg)		12300	787	82	12	14.7	22
Dibenzo(a,h)anthracene	(ug/kg)		1230	187	10	6.67U	6.67U	6.67U
Fluoranthene	(ug/kg)		23500	1280	37.3	29.3	34	50
Fluorene	(ug/kg)		178	10	7.33	517	655	2180
Indeno(1,2,3-cd)pyrene	(ug/kg)		5280	762	22.7	6.67U	6.67U	6.67U
Naphthalene	(ug/kg)		127	68	22	865	2560	6300
Pentachlorophenol	(ug/kg)		NT	NT	NT	NT	NT	NT
Phenanthrene	(ug/kg)		6230	285	37.3	797	1110	3240
Pyrene	(ug/kg)		34100	2270	52	96	88.7	99.3

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TABLE E-1
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE	HB02	HB02	HB02	HB02	HB03	HB03
		SAMPLE ID	HB02(1-1.5)	HB02(5-6)	HB02(10-11)	HB02(13-14)	HB03(1-1.5)	HB03(5-6)
		DATE	10/15/2003	10/15/2003	10/15/2003	10/15/2003	10/15/2003	10/15/2003
		DEPTH (ft)	1.50	6.00	11.00	14.00	1.50	6.00
Acenaphthene	(ug/kg)		6.67U	507	1130J	1480	6.67U	6.67U
Acenaphthylene	(ug/kg)		6.67U	223	440J	483	6.67U	6.67U
Anthracene	(ug/kg)		6.67U	363	653J	793	6.67U	6.67U
Benzo(a)anthracene	(ug/kg)		6.67U	14.7	35.3J	120	16	6.67U
Benzo(a)pyrene	(ug/kg)		6.67U	6.67U	12J	72	6.67U	6.67U
Benzo(b)fluoranthene	(ug/kg)		6.67U	6.67U	14.7J	58.7	6.67U	6.67U
Benzo(ghi)perylene	(ug/kg)		6.67U	6.67U	6.67U	58.7	11.3	6.67U
Benzo(k)fluoranthene	(ug/kg)		6.67U	6.67U	6.67U	20.7	6.67U	6.67U
Chrysene	(ug/kg)		6.67U	21.3	47.3J	147	6.67U	6.67U
Dibenzo(a,h)anthracene	(ug/kg)		6.67U	6.67U	6.67U	14	6.67U	6.67U
Fluoranthene	(ug/kg)		6.67U	33.3	107J	107	6.67U	6.67U
Fluorene	(ug/kg)		6.67U	1530	3160J	3530	6.67U	6.67U
Indeno(1,2,3-cd)pyrene	(ug/kg)		6.67U	6.67U	6.67U	47.3	6.67U	6.67U
Naphthalene	(ug/kg)		6.67U	383	507J	960	6.67U	6.67U
Pentachlorophenol	(ug/kg)		NT	NT	NT	NT	NT	NT
Phenanthrene	(ug/kg)		6.67U	2350	4340J	6170	8	6.67U
Pyrene	(ug/kg)		6.67U	207	471J	270	6.67U	6.67U

BZTO104(e)020695

TABLE E-1
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE SAMPLE ID DATE DEPTH (ft)	HB03 HB03(10-11) 10/15/2003 11.00	HB04 HB04(1-1.5) 10/15/2003 1.50	HB04 HB04(5-6) 10/15/2003 6.00	HB04 HB04(10-11) 10/15/2003 11.00	HB04 HB04(12-13) 10/15/2003 13.00	HB05 HB05(1-1.5) 10/15/2003 1.50
Acenaphthene	(ug/kg)		656	6.67U	6.67U	6.67U	22.7	6.67U
Acenaphthylene	(ug/kg)		162	6.67U	6.67U	6.67U	82	6.67U
Anthracene	(ug/kg)		312	6.67U	6.67U	6.67U	36	7.33J
Benzo(a)anthracene	(ug/kg)		17.3	6.67U	6.67U	6.67U	30	18J
Benzo(a)pyrene	(ug/kg)		7.33	6.67U	6.67U	6.67U	27.3	6.67U
Benzo(b)fluoranthene	(ug/kg)		10	11.3	6.67U	6.67U	26	9.33J
Benzo(ghi)perylene	(ug/kg)		6.67U	6.67U	6.67U	6.67U	12.7	16J
Benzo(k)fluoranthene	(ug/kg)		6.67U	6.67U	6.67U	6.67U	10.7	6.67U
Chrysene	(ug/kg)		24	6.67U	6.67U	6.67U	25.3	6.67U
Dibenzo(a,h)anthracene	(ug/kg)		6.67U	6.67U	6.67U	6.67U	6.67U	6.67U
Fluoranthene	(ug/kg)		65.3	6.67U	6.67U	6.67U	60	14.7J
Fluorene	(ug/kg)		1220	6.67U	6.67U	11.3	451	13.3J
Indeno(1,2,3-cd)pyrene	(ug/kg)		6.67U	6.67U	6.67U	6.67U	10	6.67U
Naphthalene	(ug/kg)		10600	6.67U	6.67U	6.67U	125	8J
Pentachlorophenol	(ug/kg)		NT	NT	NT	NT	NT	NT
Phenanthrene	(ug/kg)		2030	6.67U	6.67U	6.67U	101	16.7J
Pyrene	(ug/kg)		152	6.67U	6.67U	6.67U	101	6.67U

BZTO104(e)020696

TABLE E-1
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE SAMPLE ID DATE DEPTH (ft)	HB05 HB05(5-6) 10/15/2003 6.00	HB05 HB05(10-11) 10/15/2003 11.00	LW019S LW19S(16.5-17.5) 09/29/2003 17.50	LW020D LW020D(12-13) 09/30/2003 13.00	LW021S LW21S(13.5-14.5) 10/21/2003 14.50	LW022D LW022D (24-25) 09/24/2003 25.00
Acenaphthene	(ug/kg)		403	588	2240	1140	399	6.67U
Acenaphthylene	(ug/kg)		68	162	963	533	125	6.67U
Anthracene	(ug/kg)		96.7	179	1140	800	175	8
Benzo(a)anthracene	(ug/kg)		21.3	23.3	70.7	78	138	16.7
Benzo(a)pyrene	(ug/kg)		15.3	16.7	13.3	49.3	132	12.7
Benzo(b)fluoranthene	(ug/kg)		12.7	17.3	12.7	54	119	12.7
Benzo(ghi)perylene	(ug/kg)		16.7	11.3	10	24	56	6.67U
Benzo(k)fluoranthene	(ug/kg)		6.67U	6.67U	6.67U	17.3	46	6.67U
Chrysene	(ug/kg)		24	24.7	93.3	81.3	136	14
Dibenzo(a,h)anthracene	(ug/kg)		6.67U	6.67U	6.67U	6.67U	16	6.67U
Fluoranthene	(ug/kg)		43.3	50.7	70	170	139	29.3
Fluorene	(ug/kg)		647	855	5950	4060	813	6.67U
Indeno(1,2,3-cd)pyrene	(ug/kg)		6.67U	6.67U	8.67	20.7	48.7	6.67U
Naphthalene	(ug/kg)		2090	6620	4360	627	6220	6.67U
Pentachlorophenol	(ug/kg)		NT	NT	NT	NT	NT	NT
Phenanthrene	(ug/kg)		779	1170	9610	5170	1300	32.7
Pyrene	(ug/kg)		107	121	1250	443	255	38

BZTO104(e)020697

TABLE E-1
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE DEPTH (ft)	LW023D LW023D22.5-23.5 09/24/2003 23.50	LW024D LW24D(26-27) 10/20/2003 27.00	LW025D LW25D(28-29) 10/20/2003 29.00	LW026D LW026D (15-16) 09/25/2003 16.00	LW027S LW027S13.5-14.5 09/25/2003 14.50	LW027S LW027S (21-22) 09/25/2003 22.00
Acenaphthene	(ug/kg)	6.67U	6.67U	6.67U	513	953	1520
Acenaphthylene	(ug/kg)	8	6.67U	11.3	157	353	470
Anthracene	(ug/kg)	22	10.7	43.3	94.7	170	309
Benzo(a)anthracene	(ug/kg)	41.3	21.3	115	13.3	9.33	68.7
Benzo(a)pyrene	(ug/kg)	31.3	20	101	8.67	6.67U	52.7
Benzo(b)fluoranthene	(ug/kg)	29.3	17.3	88.7	8	6.67U	50
Benzo(ghi)perylene	(ug/kg)	14	9.33	43.3	6.67U	6.67U	26
Benzo(k)fluoranthene	(ug/kg)	11.3	7.33	40	6.67U	6.67U	15.3
Chrysene	(ug/kg)	36.7	20	118J	11.3	12	64
Dibenzo(a,h)anthracene	(ug/kg)	6.67U	6.67U	13.3	6.67U	6.67U	6.67U
Fluoranthene	(ug/kg)	73.3	30.7	169	26	23.3	137
Fluorene	(ug/kg)	6.67U	6.67U	6.67U	1130	2110	2840
Indeno(1,2,3-cd)pyrene	(ug/kg)	12	8	38	6.67U	6.67U	21.3
Naphthalene	(ug/kg)	6.67U	6.67U	6.67U	213	680	983
Pentachlorophenol	(ug/kg)	NT	NT	NT	NT	NT	NT
Phenanthrene	(ug/kg)	62.7	21.3	136J	1170	1880	2760
Pyrene	(ug/kg)	94.7	41.3	233J	52.7	49.3	240

BZTO104(e)020698

TABLE E-1
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE DEPTH (ft)	LW028S LW028S (12-13) 09/23/2003 13.00	LW028S LW028S(12-13) 10/01/2003 13.00	LW029D LW029D (15-16) 09/22/2003 16.00	LW030S LW030S13.5-14.5 09/19/2003 14.50	LW031S LW031S(15-16) 10/01/2003 16.00	LW032D LW032D13.5-14.5 10/02/2003 14.50
Acenaphthene	(ug/kg)	6.67U	6.67U	6.67U	1280	6.67U	251J
Acenaphthylene	(ug/kg)	6.67U	6.67U	6.67U	1490	6.67U	105J
Anthracene	(ug/kg)	6.67U	6.67U	6.67U	545	6.67U	42.7J
Benzo(a)anthracene	(ug/kg)	6.67U	6.67U	6.67U	13.3U	6.67U	7.33J
Benzo(a)pyrene	(ug/kg)	6.67U	6.67U	6.67U	13.3U	6.67U	8J
Benzo(b)fluoranthene	(ug/kg)	6.67U	6.67U	6.67U	13.3U	6.67U	8.67J
Benzo(ghi)perylene	(ug/kg)	6.67U	6.67U	6.67U	13.3U	6.67U	6.67UJ
Benzo(k)fluoranthene	(ug/kg)	6.67U	6.67U	6.67U	13.3U	6.67U	6.67UJ
Chrysene	(ug/kg)	6.67U	6.67U	6.67U	13.3U	6.67U	7.33J
Dibenzo(a,h)anthracene	(ug/kg)	6.67U	6.67U	6.67U	13.3U	6.67U	6.67UJ
Fluoranthene	(ug/kg)	6.67U	6.67U	6.67U	61.3	6.67U	22.7J
Fluorene	(ug/kg)	6.67U	6.67U	6.67U	3330	6.67U	349J
Indeno(1,2,3-cd)pyrene	(ug/kg)	6.67U	6.67U	6.67U	13.3U	6.67U	6.67UJ
Naphthalene	(ug/kg)	6.67U	6.67U	6.67U	624	6.67U	2240J
Pentachlorophenol	(ug/kg)	NT	NT	NT	NT	NT	NT
Phenanthrene	(ug/kg)	6.67U	6.67U	6.67U	5290	6.67U	288J
Pyrene	(ug/kg)	6.67U	6.67U	6.67U	171	6.67U	37.3J

BZTO104(e)020699

TABLE E-1
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE SAMPLE ID DATE DEPTH (ft)	LW033S LW033S13.5-14.5 10/02/2003 14.50	LW035D LW035(27-28) 10/01/2003 28.00	LW035D LW035(29-29.5) 10/01/2003 29.50	LW035D LW035(30-31) 10/01/2003 31.00	OX005S OX-5s (12-13) 09/17/2003 13.00	OX006S OX-6s (15-16) 09/17/2003 16.00
Acenaphthene	(ug/kg)		6.67UJ	6.67U	6.67U	10.7	NT	NT
Acenaphthylene	(ug/kg)		7.33J	6.67U	10	43.3	NT	NT
Anthracene	(ug/kg)		129J	6.67U	36	78	NT	NT
Benzo(a)anthracene	(ug/kg)		45.3J	14.7	48.7	104	NT	NT
Benzo(a)pyrene	(ug/kg)		67.3J	12.7	49.3	115	NT	NT
Benzo(b)fluoranthene	(ug/kg)		65.3J	14.7	40	94	NT	NT
Benzo(ghi)perylene	(ug/kg)		47.3J	7.33	23.3	66.7	NT	NT
Benzo(k)fluoranthene	(ug/kg)		22.7J	6.67U	14.7	30	NT	NT
Chrysene	(ug/kg)		48J	14	43.3	91.3	NT	NT
Dibenzo(a,h)anthracene	(ug/kg)		6.67UJ	6.67U	6.67U	11.3	NT	NT
Fluoranthene	(ug/kg)		148J	22.7	78	205	NT	NT
Fluorene	(ug/kg)		7.33J	6.67U	6.67U	20.7	NT	NT
Indeno(1,2,3-cd)pyrene	(ug/kg)		30.7J	6.67U	19.3	49.3	NT	NT
Naphthalene	(ug/kg)		6.67UJ	6.67U	6.67U	49.3	NT	NT
Pentachlorophenol	(ug/kg)		NT	NT	NT	NT	333U	576
Phenanthrene	(ug/kg)		107J	14.7	44.7	161	NT	NT
Pyrene	(ug/kg)		165J	28.7	107	270	NT	NT

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TABLE E-1
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT	SITE SAMPLE ID DATE DEPTH (ft)	OX007S OX-7s (12-13) 09/18/2003 13.00	OX008D OX-8d13.5-14.5 09/16/2003 14.50	OX008D OX-8d (22-23) 09/16/2003 23.00	OX008S OX-8s13.5-14.5 09/16/2003 14.50
Acenaphthene	(ug/kg)	NT	NT	NT	NT
Acenaphthylene	(ug/kg)	NT	NT	NT	NT
Anthracene	(ug/kg)	NT	NT	NT	NT
Benzo(a)anthracene	(ug/kg)	NT	NT	NT	NT
Benzo(a)pyrene	(ug/kg)	NT	NT	NT	NT
Benzo(b)fluoranthene	(ug/kg)	NT	NT	NT	NT
Benzo(ghi)perylene	(ug/kg)	NT	NT	NT	NT
Benzo(k)fluoranthene	(ug/kg)	NT	NT	NT	NT
Chrysene	(ug/kg)	NT	NT	NT	NT
Dibenzo(a,h)anthracene	(ug/kg)	NT	NT	NT	NT
Fluoranthene	(ug/kg)	NT	NT	NT	NT
Fluorene	(ug/kg)	NT	NT	NT	NT
Indeno(1,2,3-cd)pyrene	(ug/kg)	NT	NT	NT	NT
Naphthalene	(ug/kg)	NT	NT	NT	NT
Pentachlorophenol	(ug/kg)	333U	12900	333U	3220
Phenanthrene	(ug/kg)	NT	NT	NT	NT
Pyrene	(ug/kg)	NT	NT	NT	NT

TABLE E-2
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
VOLATILES (SW8260)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE	HB01	HB01	HB01	HB01	HB02	HB02
		SAMPLE ID	HB01(1-1.5)	HB01(5-6)	HB01(10-11)	HB01(14-15)	HB02(1-1.5)	HB02(5-6)
		DATE	10/15/2003	10/15/2003	10/15/2003	10/15/2003	10/15/2003	10/15/2003
		DEPTH (ft)	1.50	6.00	11.00	15.00	1.50	6.00
1,2,4-Trimethylbenzene	(ug/kg)		10U	36000J	116000J	141000J	10U	12000J
1,2-Dibromoethane	(ug/kg)		10U	10UJ	10UJ	10UJ	10U	10UJ
1,2-Dichlorobenzene	(ug/kg)		NT	NT	NT	NT	NT	NT
1,2-Dichloroethane	(ug/kg)		10U	10UJ	100UJ	100UJ	10U	10UJ
1,3,5-Trimethylbenzene	(ug/kg)		10U	652J	5810J	8290J	10U	1260J
Benzene	(ug/kg)		10U	10UJ	100UJ	136J	10U	36.8J
Ethylbenzene	(ug/kg)		10U	608J	11800J	33600J	10U	212J
Isopropylbenzene	(ug/kg)		10U	657J	6470J	8300J	10U	1370J
m,p-Xylene	(ug/kg)		20U	4330J	89600J	239000J	20U	982J
Methyl tert-butyl ether	(ug/kg)		10U	10UJ	100UJ	100UJ	10U	10UJ
n-Propylbenzene	(ug/kg)		10U	2240J	16200J	21900J	10U	3390J
o-Xylene	(ug/kg)		10U	1680J	35400J	88600J	10U	471J
Toluene	(ug/kg)		10U	196J	1520J	20000J	10U	33.2J

TABLE E-2
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
VOLATILES (SW8260)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT	SITE	HB02	HB02	HB03	HB03	HB03	HB04
	SAMPLE ID	HB02(10-11)	HB02(13-14)	HB03(1-1.5)	HB03(5-6)	HB03(10-11)	HB04(1-1.5)
	DATE	10/15/2003	10/15/2003	10/15/2003	10/15/2003	10/15/2003	10/15/2003
	DEPTH (ft)	11.00	14.00	1.50	6.00	11.00	1.50
1,2,4-Trimethylbenzene	(ug/kg)	22J	16.9J	10U	10U	151000	10UJ
1,2-Dibromoethane	(ug/kg)	10UJ	10UJ	10U	10U	10U	10UJ
1,2-Dichlorobenzene	(ug/kg)	NT	NT	NT	NT	NT	NT
1,2-Dichloroethane	(ug/kg)	10UJ	10UJ	10U	10U	100U	10UJ
1,3,5-Trimethylbenzene	(ug/kg)	1710J	2420J	10U	10U	8130	10UJ
Benzene	(ug/kg)	85.7J	94.2J	10U	10U	100U	10UJ
Ethylbenzene	(ug/kg)	57.4J	56.3J	10U	10U	39000	10UJ
Isopropylbenzene	(ug/kg)	1930J	2720J	10U	10U	8930	10UJ
m,p-Xylene	(ug/kg)	194J	332J	30.4	20U	182000	20UJ
Methyl tert-butyl ether	(ug/kg)	10UJ	10UJ	10U	10U	100U	10UJ
n-Propylbenzene	(ug/kg)	3820J	5630J	10U	10U	26800	10UJ
o-Xylene	(ug/kg)	94.1J	114J	10U	10U	112000	10UJ
Toluene	(ug/kg)	62.5J	225J	10U	10U	1780	10UJ

TABLE E-2
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
VOLATILES (SW8260)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE	HB04	HB04	HB04	HB05	HB05	HB05
		SAMPLE ID	HB04(5-6)	HB04(10-11)	HB04(12-13)	HB05(1-1.5)	HB05(5-6)	HB05(10-11)
		DATE	10/15/2003	10/15/2003	10/15/2003	10/15/2003	10/15/2003	10/15/2003
		DEPTH (ft)	6.00	11.00	13.00	1.50	6.00	11.00
1,2,4-Trimethylbenzene	(ug/kg)		10UJ	10U	15.7J	10U	153000J	114000J
1,2-Dibromoethane	(ug/kg)		10UJ	10U	10UJ	10U	10UJ	10UJ
1,2-Dichlorobenzene	(ug/kg)		NT	NT	NT	NT	NT	NT
1,2-Dichloroethane	(ug/kg)		10UJ	10U	10UJ	10U	10UJ	10UJ
1,3,5-Trimethylbenzene	(ug/kg)		10UJ	10U	1090J	10U	3890J	5130J
Benzene	(ug/kg)		10UJ	10U	10UJ	10U	21J	5290J
Ethylbenzene	(ug/kg)		10UJ	10U	10UJ	10U	11400J	26800J
Isopropylbenzene	(ug/kg)		10UJ	10U	1420J	10U	4240J	5270J
m,p-Xylene	(ug/kg)		20UJ	20U	44.8J	29.1	99400J	182000J
Methyl tert-butyl ether	(ug/kg)		10UJ	10U	10UJ	10U	10UJ	10UJ
n-Propylbenzene	(ug/kg)		10UJ	10U	1600J	10U	20000J	16000J
o-Xylene	(ug/kg)		10UJ	10U	30.4J	10.2	41900J	67900J
Toluene	(ug/kg)		10UJ	10U	20.5J	10U	3230J	64900J

TABLE E-2
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
VOLATILES (SW8260)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE SAMPLE ID DATE DEPTH (ft)	LW019S LW19S(16.5-17.5) 09/29/2003 17.50	LW020D LW020D(12-13) 09/30/2003 13.00	LW021S LW21S(13.5-14.5) 10/21/2003 14.50	LW022D LW022D (24-25) 09/24/2003 25.00	LW023D LW023D22.5-23.5 09/24/2003 23.50	LW024D LW24D(26-27) 10/20/2003 27.00
1,2,4-Trimethylbenzene	(ug/kg)		10U	10UJ	73800J	NT	NT	10U
1,2-Dibromoethane	(ug/kg)		10U	10UJ	100UJ	10U	10U	10U
1,2-Dichlorobenzene	(ug/kg)		NT	NT	NT	NT	NT	NT
1,2-Dichloroethane	(ug/kg)		10U	10UJ	100UJ	10U	10U	10U
1,3,5-Trimethylbenzene	(ug/kg)		10U	1110J	6830J	NT	NT	10U
Benzene	(ug/kg)		10U	10UJ	254J	NT	NT	10U
Ethylbenzene	(ug/kg)		10U	10UJ	16500J	NT	NT	10U
Isopropylbenzene	(ug/kg)		2050J	1160J	7880J	NT	NT	10U
m,p-Xylene	(ug/kg)		20U	20UJ	68800J	NT	NT	20U
Methyl tert-butyl ether	(ug/kg)		10U	10UJ	100UJ	10U	10U	10U
n-Propylbenzene	(ug/kg)		4900J	2520J	17800J	NT	NT	10U
o-Xylene	(ug/kg)		10U	42J	16200J	NT	NT	10U
Toluene	(ug/kg)		10U	10UJ	676J	NT	NT	10U

TABLE E-2
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
VOLATILES (SW8260)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT	SITE	LW025D	LW026D	LW027S	LW027S	LW028S	LW028S
	SAMPLE ID	LW25D(28-29)	LW026D (15-16)	LW027S13.5-14.5	LW027S (21-22)	LW028S (12-13)	LW028S(12-13)
	DATE	10/20/2003	09/25/2003	09/25/2003	09/25/2003	09/23/2003	10/01/2003
	DEPTH (ft)	29.00	16.00	14.50	22.00	13.00	13.00
1,2,4-Trimethylbenzene	(ug/kg)	10UJ	23.7J	15.6J	12.9J	NT	10U
1,2-Dibromoethane	(ug/kg)	10UJ	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	(ug/kg)	NT	NT	NT	NT	NT	NT
1,2-Dichloroethane	(ug/kg)	10UJ	10U	10U	10U	10U	10U
1,3,5-Trimethylbenzene	(ug/kg)	10UJ	1040J	832J	1050J	NT	10U
Benzene	(ug/kg)	10UJ	44.5J	10U	10U	NT	10U
Ethylbenzene	(ug/kg)	10UJ	10U	10U	10U	NT	10U
Isopropylbenzene	(ug/kg)	10UJ	1000J	835J	1110J	NT	10U
m,p-Xylene	(ug/kg)	20UJ	84.6J	38.2	20U	NT	20U
Methyl tert-butyl ether	(ug/kg)	10UJ	10U	10U	10U	10U	10U
n-Propylbenzene	(ug/kg)	10UJ	1430J	1170J	1260J	NT	10U
o-Xylene	(ug/kg)	10UJ	66J	10U	10U	NT	10U
Toluene	(ug/kg)	10UJ	29.9J	14.5J	18.3J	NT	10U

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TABLE E-2
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
VOLATILES (SW8260)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT	SITE	LW029D	LW030S	LW031S	LW032D	LW033S	LW035D
	SAMPLE ID	LW029D (15-16)	LW030S13.5-14.5	LW031S(15-16)	LW032D13.5-14.5	LW033S13.5-14.5	LW035(27-28)
	DATE	09/22/2003	09/19/2003	10/01/2003	10/02/2003	10/02/2003	10/01/2003
	DEPTH (ft)	16.00	14.50	16.00	14.50	14.50	28.00
1,2,4-Trimethylbenzene	(ug/kg)	NT	NT	10U	10U	10U	10U
1,2-Dibromoethane	(ug/kg)	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	(ug/kg)	NT	NT	NT	100U	NT	NT
1,2-Dichloroethane	(ug/kg)	10U	10U	10U	10U	10U	10U
1,3,5-Trimethylbenzene	(ug/kg)	NT	NT	10U	860J	10U	10U
Benzene	(ug/kg)	NT	NT	10U	10U	10U	10U
Ethylbenzene	(ug/kg)	NT	NT	10U	10U	10U	10U
Isopropylbenzene	(ug/kg)	NT	NT	10U	773J	10U	10U
m,p-Xylene	(ug/kg)	NT	NT	20U	20U	20U	20U
Methyl tert-butyl ether	(ug/kg)	10U	10U	10U	10U	10U	10U
n-Propylbenzene	(ug/kg)	NT	NT	10U	1750J	10U	10U
o-Xylene	(ug/kg)	NT	NT	10U	10U	10U	10U
Toluene	(ug/kg)	NT	NT	10U	13.6	10U	10U

TABLE E-2
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
VOLATILES (SW8260)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE SAMPLE ID DATE DEPTH (ft)	LW035D LW035(29-29.5) 10/01/2003 29.50	LW035D LW035(30-31) 10/01/2003 31.00
1,2,4-Trimethylbenzene	(ug/kg)		10U	10U
1,2-Dibromoethane	(ug/kg)		10U	10U
1,2-Dichlorobenzene	(ug/kg)		NT	NT
1,2-Dichloroethane	(ug/kg)		10U	10U
1,3,5-Trimethylbenzene	(ug/kg)		10U	10U
Benzene	(ug/kg)		10U	10U
Ethylbenzene	(ug/kg)		10U	10U
Isopropylbenzene	(ug/kg)		10U	10U
m,p-Xylene	(ug/kg)		20U	20U
Methyl tert-butyl ether	(ug/kg)		10U	10U
n-Propylbenzene	(ug/kg)		10U	10U
o-Xylene	(ug/kg)		10U	10U
Toluene	(ug/kg)		10U	10U

TABLE E-3
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
TOTAL PETROLEUM HYDROCARBONS (ORDEQ-TPH)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE SAMPLE ID DATE DEPTH (ft)	HB01 HB01(1-1.5) 10/15/2003 1.50	HB01 HB01(5-6) 10/15/2003 6.00	HB01 HB01(10-11) 10/15/2003 11.00	HB01 HB01(14-15) 10/15/2003 15.00	HB02 HB02(1-1.5) 10/15/2003 1.50	HB02 HB02(5-6) 10/15/2003 6.00
Diesel	(mg/kg)		33.9	2710J	4020J	10100J	97.4	7170J
Gasoline	(mg/kg)		32.4	2540	3280	6880	2.68U	1540J
TPH-Motor Oil Range	(mg/kg)		56.4U	109J	83MJ	588U	63.6	280MJ

TABLE E-3
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
TOTAL PETROLEUM HYDROCARBONS (ORDEQ-TPH)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE	HB02	HB02	HB03	HB03	HB03	HB04
		SAMPLE ID	HB02(10-11)	HB02(13-14)	HB03(1-1.5)	HB03(5-6)	HB03(10-11)	HB04(1-1.5)
		DATE	10/15/2003	10/15/2003	10/15/2003	10/15/2003	10/15/2003	10/15/2003
		DEPTH (ft)	11.00	14.00	1.50	6.00	11.00	1.50
Diesel	(mg/kg)		12000J	13100J	681	159	5250J	31.6
Gasoline	(mg/kg)		1830J	2670	2.78U	3.43	8560	5.7
TPH-Motor Oil Range	(mg/kg)		585U	561U	229M	70.7M	218MJ	53.6U

TABLE E-3
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
TOTAL PETROLEUM HYDROCARBONS (ORDEQ-TPH)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE SAMPLE ID DATE DEPTH (ft)	HB04 HB04(5-6) 10/15/2003 6.00	HB04 HB04(10-11) 10/15/2003 11.00	HB04 HB04(12-13) 10/15/2003 13.00	HB05 HB05(1-1.5) 10/15/2003 1.50	HB05 HB05(5-6) 10/15/2003 6.00	HB05 HB05(10-11) 10/15/2003 11.00
Diesel	(mg/kg)		16.9U	893J	2430J	2330J	2200	5910J
Gasoline	(mg/kg)		121	10.1	1330J	32.8	8120	3070
TPH-Motor Oil Range	(mg/kg)		56.2U	190MJ	117MJ	429MJ	83.3M	101MJ

TABLE E-3
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
TOTAL PETROLEUM HYDROCARBONS (ORDEQ-TPH)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE SAMPLE ID DATE DEPTH (ft)	LW019S LW19S(16.5-17.5) 09/29/2003 17.50	LW020D LW020D(12-13) 09/30/2003 13.00	LW021S LW21S(13.5-14.5) 10/21/2003 14.50	LW022D LW022D (24-25) 09/24/2003 25.00	LW023D LW023D22.5-23.5 09/24/2003 23.50	LW024D LW24D(26-27) 10/20/2003 27.00
Diesel	(mg/kg)		36100J	13700J	6290J	16.6U	16.6U	20.2
Gasoline	(mg/kg)		2310	2310	8920J	2.76U	2.76U	3.22U
TPH-Motor Oil Range	(mg/kg)		63.8U	611U	642U	55.2U	55.3U	64.4U

TABLE E-3
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
TOTAL PETROLEUM HYDROCARBONS (ORDEQ-TPH)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE SAMPLE ID DATE DEPTH (ft)	LW025D LW25D(28-29) 10/20/2003 29.00	LW026D LW026D (15-16) 09/25/2003 16.00	LW027S LW027S13.5-14.5 09/25/2003 14.50	LW027S LW027S (21-22) 09/25/2003 22.00	LW028S LW028S (12-13) 09/23/2003 13.00	LW028S LW028S(12-13) 10/01/2003 13.00
Diesel	(mg/kg)		18.7U	12500J	9000J	9790J	17.9U	18.1U
Gasoline	(mg/kg)		3.12U	2270J	4190J	5010J	2.98U	3.66
TPH-Motor Oil Range	(mg/kg)		62.4U	64.5U	59.5U	56.9U	59.7U	60.5U

TABLE E-3
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
TOTAL PETROLEUM HYDROCARBONS (ORDEQ-TPH)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE	LW029D	LW030S	LW031S	LW032D	LW033S	LW035D
		SAMPLE ID	LW029D (15-16)	LW030S13.5-14.5	LW031S(15-16)	LW032D13.5-14.5	LW033S13.5-14.5	LW035(27-28)
		DATE	09/22/2003	09/19/2003	10/01/2003	10/02/2003	10/02/2003	10/01/2003
		DEPTH (ft)	16.00	14.50	16.00	14.50	14.50	28.00
Diesel	(mg/kg)		18.1U	6260J	18.4U	6450	82.4	16.5U
Gasoline	(mg/kg)		3.02U	1880J	3.07U	4200J	3.16U	12.7
TPH-Motor Oil Range	(mg/kg)		60.4U	55U	61.3U	57.6U	175	54.9U

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TABLE E-3
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
TOTAL PETROLEUM HYDROCARBONS (ORDEQ-TPH)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE	LW035D	LW035D
		SAMPLE ID	LW035(29-29.5)	LW035(30-31)
		DATE	10/01/2003	10/01/2003
		DEPTH (ft)	29.50	31.00
Diesel	(mg/kg)		19.7U	44.3
Gasoline	(mg/kg)		7.28	5.07
TPH-Motor Oil Range	(mg/kg)		65.8U	92.3

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TABLE E-4
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
METALS (SW6010)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE	G07-3	G07-4	G07-5	G10-4	G10-5	G11-3
		SAMPLE ID	G7-3(0-0.5)	G7-4(0-0.5)	G7-5(0-0.5)	G10-4(0-0.5)	G10-5(0.0-0.5)	G11-3(0-0.5)
		DATE	09/29/2003	09/29/2003	09/29/2003	09/29/2003	09/29/2003	09/29/2003
		DEPTH (ft)	0.50	0.50	0.50	0.50	0.50	0.50
Lead	(mg/kg)		18.8	5.07	5.87	19.7	1.85U	1.85U
Zinc	(mg/kg)		97.9	70.3	102	68.9	57.7	86.6

TABLE E-4
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
METALS (SW6010)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE	G11-3	G15-4	G15-5	G15-6	G17-4	G17-5
		SAMPLE ID	G11-3(1.0-1.5)	G15-4(0-0.5)	G15-5(0-0.5)	G15-6(0-0.5)	G17-4(0-0.5)	G17-5(0-0.5)
		DATE	09/29/2003	09/29/2003	09/29/2003	09/29/2003	09/29/2003	09/29/2003
		DEPTH (ft)	1.50	0.50	0.50	0.50	0.50	0.50
Lead	(mg/kg)		1.67U	16.3	76.5	12.7	43	11.9J
Zinc	(mg/kg)		52.1	77.7	73	63.9	148	80.8J

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TABLE E-4
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
METALS (SW6010)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE	G17-6	G19-3	G19-4	G19-5	HB01	HB01
		SAMPLE ID	G17-6(0.0-0.5)	G19-3(0-0.5)	G19-4(0-0.5)	G19-5(0-0.5)	HB01(1-1.5)	HB01(5-6)
		DATE	09/29/2003	09/29/2003	09/29/2003	09/29/2003	10/15/2003	10/15/2003
		DEPTH (ft)	0.50	0.50	0.50	0.50	1.50	6.00
Lead	(mg/kg)		28	158	236	6.96	53.2	29.1
Zinc	(mg/kg)		410	87.1	197	228	199	43.8

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TABLE E-4
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
METALS (SW6010)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE	HB01	HB01	HB02	HB02	HB02	HB02
		SAMPLE ID	HB01(10-11)	HB01(14-15)	HB02(1-1.5)	HB02(5-6)	HB02(10-11)	HB02(13-14)
		DATE	10/15/2003	10/15/2003	10/15/2003	10/15/2003	10/15/2003	10/15/2003
		DEPTH (ft)	11.00	15.00	1.50	6.00	11.00	14.00
Lead	(mg/kg)		37.1	3.22	1.56U	1.45U	1.61U	1.43U
Zinc	(mg/kg)		42.5	47.7	56.1	39.1	50.1	40.1

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TABLE E-4
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
METALS (SW6010)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE	HB03	HB03	HB03	HB04	HB04	HB04
		SAMPLE ID	HB03(1-1.5)	HB03(5-6)	HB03(10-11	HB04(1-1.5)	HB04(5-6)	HB04(10-11)
		DATE	10/15/2003	10/15/2003	10/15/2003	10/15/2003	10/15/2003	10/15/2003
		DEPTH (ft)	1.50	6.00	11.00	1.50	6.00	11.00
Lead	(mg/kg)		2.99	3.58	2.05	1.61U	1.67U	1.64U
Zinc	(mg/kg)		70	45.4	44.8	51	48.4	45.4

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TABLE E-4
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
METALS (SW6010)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE	HB04	HB05	HB05	HB05	LW019S	LW020D
		SAMPLE ID	HB04(12-13)	HB05(1-1.5)	HB05(5-6)	HB05(10-11)	LW19S(16.5-17.5)	LW020D(12-13)
		DATE	10/15/2003	10/15/2003	10/15/2003	10/15/2003	09/29/2003	09/30/2003
		DEPTH (ft)	13.00	1.50	6.00	11.00	17.50	13.00
Lead	(mg/kg)		1.56U	28.9	1.61U	1.64U	2.28U	2.44U
Zinc	(mg/kg)		43.2	55.9	44.9	45	NT	NT

TABLE E-4
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
METALS (SW6010)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE SAMPLE ID DATE DEPTH (ft)	LW021S LW21S(13.5-14.5) 10/21/2003 14.50	LW022D LW022D (24-25) 09/24/2003 25.00	LW023D LW023D22.5-23.5 09/24/2003 23.50	LW024D LW24D(26-27) 10/20/2003 27.00	LW025D LW25D(28-29) 10/20/2003 29.00	LW026D LW026D (15-16) 09/25/2003 16.00
Lead	(mg/kg)		1.61U	4.49J	1.92UJ	1.67U	1.79U	1.85U
Zinc	(mg/kg)		NT	NT	NT	NT	NT	NT

TABLE E-4
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
METALS (SW6010)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE SAMPLE ID DATE DEPTH (ft)	LW027S LW027S13.5-14.5 09/25/2003 14.50	LW027S LW027S (21-22) 09/25/2003 22.00	LW028S LW028S (12-13) 09/23/2003 13.00	LW028S LW028S(12-13) 10/01/2003 13.00	LW029D LW029D (15-16) 09/22/2003 16.00	LW030S LW030S13.5-14.5 09/19/2003 14.50
Lead	(mg/kg)		1.72U	1.72U	1.67UJ	2.42U	1.85UJ	1.79U
Zinc	(mg/kg)		NT	NT	NT	NT	NT	NT

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TABLE E-4
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
METALS (SW6010)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE SAMPLE ID DATE DEPTH (ft)	LW031S LW031S(15-16) 10/01/2003 16.00	LW032D LW032D13.5-14.5 10/02/2003 14.50	LW033S LW033S13.5-14.5 10/02/2003 14.50	LW035D LW035(27-28) 10/01/2003 28.00	LW035D LW035(29-29.5) 10/01/2003 29.50	LW035D LW035(30-31) 10/01/2003 31.00
Lead	(mg/kg)		2.45U	1.67U	2.25U	2.2U	2.63U	4.38
Zinc	(mg/kg)		NT	NT	NT	NT	NT	NT

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TABLE E-5
PHASE III REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
BETX (SW8021)
TIME OIL NORTHWEST TERMINAL

PERIOD: From 09/16/2003 thru 10/21/2003 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT		SITE SAMPLE ID DATE DEPTH (ft)	LW022D LW022D (24-25) 09/24/2003 25.00	LW023D LW023D22.5-23.5 09/24/2003 23.50	LW028S LW028S (12-13) 09/23/2003 13.00	LW029D LW029D (15-16) 09/22/2003 16.00	LW030S LW030S13.5-14.5 09/19/2003 14.50
Benzene	(mg/kg)		0.0276U	0.0276U	0.0298U	0.0302U	0.0275U
Ethylbenzene	(mg/kg)		0.11U	0.111U	0.119U	0.121U	0.759
Toluene	(mg/kg)		0.11U	0.111U	0.119U	0.121U	0.304
Xylene (total)	(mg/kg)		0.331U	0.332U	0.358U	0.362U	3.21

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APPENDIX F

Data Validation Reports

TECHNICAL MEMORANDUM

LANDAU ASSOCIATES
ENVIRONMENTAL | GEOTECHNICAL | NATURAL RESOURCES

TO: Rebekah Brooks, Project Manager, Landau Associates

cc: Tom Roick, Oregon Department of Environmental Quality (DEQ)
Kevin Murphy, Time Oil Co.
Patty Dost, Schwabe, Williamson & Wyatt
Mike Tischuk, Beazer East, Inc.

FROM: Stacy Pischer and Terry McGourty, Landau Associates

DATE: April 26, 2004

RE: PHASE III RI SOIL SAMPLES
LABORATORY DATA QUALITY EVALUATION
TIME OIL NORTHWEST TERMINAL

This technical memorandum provides the results of a data quality evaluation for 46 soil samples collected at the Time Oil Northwest Terminal between September 19 and October 20, 2003 for the Phase III Remedial Investigation (RI). A data quality evaluation was performed for analyses of total petroleum hydrocarbons [TPH; northwest regional methods NWTPH-Dx and NWTPH-Gx]; volatile organic compounds [VOCs; U.S. Environmental Protection Agency (EPA) Method 8260]; polycyclic aromatic hydrocarbons [PAHs; EPA Method 8270 with selected ion monitoring (SIM)]; and selected priority pollutant metals (EPA Method 6010). All of the analyses were performed by Specialty Analytical (Specialty), located in Tualatin, Oregon. This data quality evaluation covers Specialty data packages 0309137, 0309163, 0309185, 0309195, 0310011, 0310041, 0310117, and 0310149. The data quality evaluation was performed in accordance with the revised quality assurance project plan (QAPP) contained in Appendix C of the *Phase III Remedial Investigation* work plan (Landau Associates 2001), and with applicable portions of the EPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* and *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA 1994a,b).

The evaluation considered the following elements:

- Chain-of-custody records
- Holding times
- Method blank results
- Surrogate recoveries
- Laboratory matrix spikes and matrix spike duplicates (MS/MSD) (including laboratory control samples)
- Duplicate analyses (field and laboratory)

- Quantitation limits
- Completeness.

Data validation qualifiers are added to sample results based on the evaluation of data quality. The absence of a data qualifier indicates that the datum is acceptable without qualification. Applicable data validation qualifiers are summarized in Table 1.

CHAIN-OF-CUSTODY RECORDS

Signed chain-of-custody records accompanied each data package. The laboratory received all samples in good condition and all analyses requested were performed.

HOLDING TIMES

For all analyses and all samples, the time between sample collection, extraction, and analysis was determined to be within EPA- and project-specified holding times, except as indicated in Table 1 and discussed below:

- The recommended holding time of 14 days between sample collection and sample extraction was exceeded for the PAH analysis of soil samples LW033S (13.5-14.5) and LW032D (13.5-14.5) by 18 days due to laboratory oversight. All of the detected semivolatile organic compound (SVOC) results and the reporting limit for the non-detected SVOC results for these two samples were qualified as estimates (J/UJ), as indicated in Table 1.

SURROGATE SPIKE RECOVERIES

All of the surrogate recoveries were within the project-specified control limits, except as indicated in Table 1 and discussed below:

- Recovery of PAH surrogate 2-fluorobiphenyl for sample HB02 (10-11) exceeded the upper laboratory control limit, indicating a potential high bias. All detected PAH results for this sample were qualified as estimates (J), as indicated in Table 1. Recovery of surrogate 2-fluorobiphenyl for sample HB05 (1-1.5) was less that the lower laboratory control limit, indicating a potential low bias. All detected PAH results and all reporting limits for nondetected PAHs for sample HB05 (1-1.5) were qualified as estimates (J/UJ), as indicated in Table 1.

- Recovery of NWTPH-Gx surrogate 4-bromofluorobenzene for samples HB02 (5-6), HB02 (10-11), and HB04 (12-13) analyzed for gasoline-range petroleum hydrocarbons exceeded the upper laboratory control limit, indicating a potential high bias. All detected gasoline-range petroleum hydrocarbon results for these samples were qualified as estimates (J), as indicated in Table 1.

- Recovery of NWTPH-Dx surrogate o-terphenyl for several samples reported in data package 0310117 exceeded the upper laboratory control limit, indicating a potential high bias. All

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detected diesel-range and motor oil-range petroleum hydrocarbon results for these samples were qualified as estimates (J). The samples and associated qualifiers are indicated in Table 1.

- Recovery values for VOC surrogates 4- bromofluorobenzene and toluene-d8 for several samples reported in data package 0310117 exceeded the upper laboratory control limit, indicating a potential high bias. Also, the recovery of other VOC surrogates for these samples were less than the lower laboratory control limit, indicating a potential low bias. Therefore, all VOC detected results and reporting limits for the non-detected results for the affected samples were qualified as estimates (J/UJ). The samples and associated qualifiers are indicated in Table 1.

- Recovery values for VOC surrogates 4-bromofluorobenzene and toluene-d8 exceeded the upper laboratory control limit in sample LW019S (16.5-17.5). Detected VOC results for this sample were qualified as estimates (J), as indicated in Table 1.

- Recovery of NWTPH-Dx surrogate o-terphenyl for sample LW019S (16.5-17.5) exceeded the upper laboratory control limit, indicating a potential high bias. Only diesel-range petroleum hydrocarbons were detected in this sample for this analysis. This result was qualified as an estimate (J), as indicated in Table 1.

- Recovery values for VOC surrogates 4-bromofluorobenzene and toluene-d8 exceeded the upper laboratory control limit for samples LW029D (15-16) and LW022D (24-25), indicating a potential high bias. No qualification of the data was necessary because VOCs were not detected in either sample.

- Recovery of VOC surrogate 4-bromofluorobenzene for sample LW032D (13.5-14.5) exceeded the upper laboratory control limit, indicating a potential high bias. All detected VOCs for this sample were qualified as estimates (J), as indicated in Table 1.

- Recovery of NWTPH-Dx surrogate o-terphenyl for sample LW030S (13.5-14.5) exceeded the upper laboratory control limit, indicating a potential high bias. Only diesel-range petroleum hydrocarbons were detected in this sample for this analysis. This result was qualified as an estimate (J), as indicated in Table 1.

- Recovery values for NWTPH-Gx surrogate 4-bromofluorobenzene for samples LW030S (13.5-14.5) and LW032D (13.5-14.5) exceeded the upper laboratory control limit, indicating a potential high bias. The detected gasoline-range petroleum hydrocarbon results for these samples were qualified as estimates (J), as indicated in Table 1.

- Recovery values for VOC surrogates 4-bromofluorobenzene and toluene-d8 exceeded the upper laboratory control limit for sample LW030S (13.5-14.5), indicating a potential high bias. No qualification of the data was necessary because VOCs were not detected in the sample.

- Recovery values for two VOC surrogates for sample LW25D (28-29) were less than the lower laboratory control limit, indicating a potential low bias. All detected VOC results and reporting limits for the non-detected results for this sample were qualified as estimates (J/UJ).

- Recovery of each VOC surrogate for sample LW21S (13.5-14.5) either exceeded the upper laboratory control limit or was less than the lower laboratory control limit, indicating a mixed

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low and high bias. Therefore, all detected VOC results and reporting limits for the non-detected results for this sample were qualified as estimates (J/UJ).

- Recovery values for VOC surrogates for three samples reported in data package 0309185 exceeded the upper laboratory control limit, indicating a potential high bias. All detected VOC results for the three samples were qualified as estimates (J). The samples and qualifiers are indicated in Table 1.

- Recovery values for surrogate o-terphenyl were high during the diluted NWTPH-Dx analysis of samples reported in data package 0309185. All detected diesel-range petroleum hydrocarbon results for these samples were qualified as estimates (J). The samples and qualifiers are indicated in Table 1. Recovery values for surrogate o-terphenyl were low during the non-diluted NWTPH-Dx analysis of samples reported in data package 0309185. All detected motor oil-range petroleum hydrocarbon results and reporting limits for non-detected motor oil-range petroleum hydrocarbon results for these samples were qualified as estimates (J/UJ). The samples and qualifiers are indicated in Table 1.

- Recovery values for NWTPH-Gx surrogate 4-bromofluorobenzene for samples LW021S (13.5-14.5), LW026D (15-16), LW027S (13.5-14.5), and LW027S (21-22) were less than the lower laboratory control limit, indicating a potential low bias. Gasoline-range petroleum hydrocarbon was detected in each of the samples. The detected concentrations were qualified as estimates (J), as indicated in Table 1.

- Recovery of surrogate o-terphenyl for sample LW021S (13.5-14.5) exceeded the upper laboratory control limit, indicating a potential high bias. Only diesel-range petroleum hydrocarbons were detected in this sample for this analysis. This result was qualified as an estimate (J), as indicated in Table 1.

- Recovery of surrogate o-terphenyl for sample LW20D (12-13) exceeded the upper laboratory control limit, indicating a potential high bias. Only diesel-range petroleum hydrocarbons were detected in this sample for this analysis. This result was qualified as an estimate (J), as indicated in Table 1.

- The recovery value for one VOC surrogate exceeded the upper laboratory control limit and the recovery values for two VOC surrogates were less than the lower laboratory control limit for sample LW020D (12-13). Therefore, all detected VOC results and all reporting limits for the non-detected VOC results for this sample were qualified as estimates (J, UJ), as indicated in Table 1.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Spike recoveries and relative percent differences (RPDs) between duplicate results were evaluated for MS/MSD pairs performed using project samples. Recoveries and RPDs for the MS/MSDs were within the project-specified control limits, except as indicated in Table 1 and discussed below:

- Recovery values for spiked compounds chrysene, phenanthrene, and pyrene in the MS and MSD pair associated with the PAH analysis of samples reported in data package 0310149 were below the lower laboratory control limits indicating a potential low bias. Results for these compounds for the parent sample, LW25D (28-29) were qualified as estimates (J/UJ), as indicated in Table 1.

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- The RPD between the diesel-range petroleum hydrocarbon results for the MS/MSD pair associated with the NWTPH-Dx analysis reported in data package 0310011 exceeded the laboratory control limit, indicating poor analytical precision or a nonhomogeneous sample. The diesel-range petroleum hydrocarbon result for the parent sample, LW020D (12-13), was qualified as an estimate (J), as indicated in Table 1.

- The spike recovery values for lead and zinc in the MS/MSD pair associated with the metals analysis of samples reported in data package 03019196 exceeded the upper laboratory control limits indicating a potential high bias. Results for these compounds for the parent sample, G17-5 (0-0.5) were qualified as estimates (J), as indicated in Table 1.

LABORATORY DUPLICATE

Some laboratory duplicate samples were analyzed with both the organic and inorganic analyses. All RPDs were within the laboratory control limits.

LABORATORY CONTROL SAMPLE RESULTS

At least one LCS/blank spike was analyzed with each batch of samples for each analysis. LCS duplicates were performed with some analyses. Recoveries and RPDs for the laboratory control samples and associated duplicates were within laboratory-specified control limits, except as indicated in Table 1 and as discussed below:

- The recovery of lead in the LCS associated with samples reported in data package 0309163 was slightly below the lower laboratory control limit, indicating a potential low bias. All detected lead results and reporting limits for non-detected lead results reported in this data package were qualified as estimates (J/UJ), as indicated in Table 1.

METHOD BLANKS

Method blanks were analyzed with each batch of samples for each analysis. Contamination was detected in some of the method blanks, as discussed below:

- Gasoline range-petroleum hydrocarbons, VOCs, and lead were detected in the method blanks associated with samples reported in data package 0310117. Only lead results for samples HB01 (14-15), HB03 (1-1.5), HB03 (5-6), and HB03 (10-11) were detected at concentrations less than 5 times the blank concentrations. Lead results for these samples were qualified as non-detects (U), as indicated in Table 1. All other lead results, VOC results, and gasoline-range petroleum hydrocarbon results were either non-detect or detected at concentrations greater than 5 times the blank concentration.

- Benzene and chloroform were detected in the method blank associated with the VOC analyses reported in data package 0309195. No qualification of the data was necessary because these VOCs were not detected in the associated project sample.

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- Several PAHs were detected in the method blank associated with the analysis of sample LW019S (16.5-17.5). However, no qualification of the project sample results was necessary because all of the results were greater than five times the blank contamination or not detected.

- Several VOCs were detected in the method blank associated with the samples reported in data package 0309163. However, no qualification of the project sample results was necessary because none of the VOCs detected in the method blank were detected in the associated project samples.

- Chloromethane and methylene chloride were detected in the method blank associated with the samples reported in data package 0310041. However, no qualification of the project sample results was necessary because neither of these VOCs detected in the associated project samples.

- Lead was detected in the method blank associated with the samples reported in data package 0310041. However, no qualification of the project sample results was necessary because lead was not detected in the associated project samples.

- 1,2,4-trimethylbenzene was detected in the method blank associated with the VOC analysis of the sample reported in data package 0309137. However, no qualification of the project sample results was necessary because 1,2,4-trimethylbenzene was not detected in the associated project sample.

- Two VOCs were detected in the method blanks associated with the samples reported in data package 0310149 and 0309185. However, no qualification of the project sample results was necessary because the concentration of these VOCs detected in the associated project samples were greater than 5 times the method blank concentration or these VOCs were not detected in the associated project samples.

- Naphthalene was detected in the method blank associated with the PAH analysis of samples reported in data package 0310149. However, no qualification of the project sample results was necessary because the concentration of naphthalene detected in the associated project samples were greater than 5 times the method blank concentration or naphthalene was not detected in the associated project samples.

- Several PAHs were detected in the method blank associated with the analysis of samples reported in data package 0309185. However, no qualification of the project sample results was necessary because all of the results were greater than 5 times the blank contamination.

FIELD DUPLICATE RESULTS

Blind field duplicate samples were collected during this sampling event and the RPD between the duplicate sample results were evaluated. A project-specified control limit of 20 percent was used to evaluate the RPDs, except when the sample results were within 5 times the reporting limit. In these cases, a project-specified control limit of plus or minus the reporting limit was used. RPDs for all duplicate sample results were within the project-specified control limits. No qualification of the data was necessary.

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REPORTING LIMITS

Method and/or project-specified reporting limits were met for all samples.

OVERALL DATA QUALITY AND COMPLETENESS

Data precision was evaluated through laboratory, field, and matrix spike duplicates. Data accuracy was evaluated through laboratory control samples, surrogate spikes, and matrix spikes. Based on this data quality evaluation, all of the data were determined to be acceptable and no data were rejected.

The completeness for this set of data is 100 percent, which exceeds the project-specified goal of 90 percent.

REFERENCES

EPA. 1994a. *Contract Laboratory Program National Functional Guidelines for Organic Data Review.* U.S. Environmental Protection Agency.

EPA. 1994b. *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review.* U.S. Environmental Protection Agency.

Landau Associates. 2001. *Work Plan, Phase III Remedial Investigation, Time Oil Northwest Terminal, Portland, Oregon.* June 18.

BZTO104(e)020733

TABLE 1
SUMMARY OF DATA QUALIFIERS
PHASE III RI SOIL SAMPLE RESULTS
SPECIALTY ANALYTICAL DATA PACKAGES 0309137, 0309163, 0309185, 0309195, 0309196, 0310011, 0310041, 0310117, and 0310149

Data Package No.	Analyte	Qualifier	Sample Number	Reason
0309137	Gasoline-range TPH	J	LW030S (13.5-14.5)	High surrogate recovery
0309137	Diesel-range TPH	J	LW030S (13.5-14.5)	High surrogate recovery
0309163	Lead	J, UJ	LW022D (24-25) LW023D (22.5-23.5) LW028S (12-13) LW029D (15-16)	Low LCS recovery
0309185	Diesel-range TPH	J	LW026D (15-16)	High surrogate recovery
0309185	Motor Oil-range TPH	J, UJ	LW027S (13.5-14.5) LW027S (21-22)	Low surrogate recovery
0309185	Gasoline-range TPH	J	LW021S (13.5-14.5) LW026D (15-16) LW027S (13.5-14.5) LW027S (21-22)	Low surrogate recovery
0309185	1,3,5-Trimethylbenzene 1,2,4-Trimethylbenzene Isopropylbenzene N-propylbenzene Toluene	J	LW027S (13.5-14.5) LW027S (21-22)	High surrogate recovery
0309185	1,3,5-Trimethylbenzene 1,2,4-Trimethylbenzene Isopropylbenzene N-propylbenzene o-Xylene Toluene	J	LW026D (15-16)	High surrogate recovery
0309195	Diesel-range TPH	J	LW019S (16.5-17.5)	High surrogate recovery
0309195	Isopropylbenzene N-propylbenzene	J	LW019S (16.5-17.5)	High surrogate recovery
0309196	Lead Zinc	J	G17-5 (0-0.5)	High MS recovery
0310011	Diesel-range TPH	J	LW020D (12-13)	High surrogate and high MS/MSD RPD
0310011	All VOCs	J, UJ	LW020D (12-13)	High surrogate recoveries and low surrogate recoveries

TABLE 1
SUMMARY OF DATA QUALIFIERS
PHASE III RI SOIL SAMPLE RESULTS
SPECIALTY ANALYTICAL DATA PACKAGES 0309137, 0309163, 0309185, 0309195, 0309196, 0310011, 0310041, 0310117, and 0310149

Data Package No.	Analyte	Qualifier	Sample Number	Reason
0310117	Diesel-range TPH Motor Oil-range TPH	J	HB01 (5-6) HB01 (10-11) HB02 (5-6) HB02 (10-11) HB01 (14-15) HB02 (13-14) HB03 (10-11) HB04 (10-11) HB04 (12-13) HB05 (1-1.5) HB05 (10-11)	High surrogate recovery
0310117	Gasoline-range TPH	J	HB02 (5-6) HB02 (10-11) HB04 (12-13)	High surrogate recovery
0310117	All VOCs	J, UJ	HB01 (5-6) HB01 (10-11) HB01 (14-15) HB02 (5-6) HB02 (13-14) HB02 (10-11) HB04 (1-1.5) HB04 (5-6) HB04 (12-13) HB05 (5-6) HB05 (10-11)	Low surrogate recoveries and high surrogate recoveries
0310117	All PAHs	J	HB02 (10-11)	High surrogate recovery
0310117	All PAHs	J, UJ	HB05 (1-1.5)	Low surrogate recovery
0310117	Lead	U	HB01 (14-15) HB03 (1-1.5) HB03 (5-6) HB03 (10-11)	Method blank contamination
0310041	All PAHs	J, UJ	LW032D (13.5-14.5) LW033S (13.5-14.5)	Holding time exceeded by 18 days
0310041	Gasoline-range TPH	J	LW032D (13.5-14.5)	High surrogate recovery
0310041	1,3,5-Trimethylbenzene Isopropylbenzene N-propylbenzene	J	LW032D (13.5-14.5)	High surrogate recovery
0310149	Chrysene Phenanthrene Pyrene	J	LW025D (28-29)	Low surrogate recovery

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TABLE 1
SUMMARY OF DATA QUALIFIERS
PHASE III RI SOIL SAMPLE RESULTS
SPECIALTY ANALYTICAL DATA PACKAGES 0309137, 0309163, 0309185, 0309195, 0309196, 0310011, 0310041, 0310117, and 0310149

Data Package No.	Analyte	Qualifier	Sample Number	Reason
0310149	Gasoline-range TPH	J	LW021S (13.5-14.5)	Low surrogate recovery
0310149	All VOCs	J, UJ	LW025D (28-29)	Low surrogate recovery
0310149	All VOCs	J, UJ	LW021S (13.5-14.5)	High surrogate recoveries and low surrogate recoveries
0310149	Diesel-range TPH	J	LW021S (13.5-14.5)	High surrogate recovery

J = Indicates the analyte was positively identified; the associated numerical is the approximate concentration of the analyte in the sample.

U = Indicates compound was analyzed for, but was not detected at the given detection limit.

UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.

EXECUTIVE SUMMARY

Beginning in the fall of 2001, Landau Associates conducted the third phase of a remedial investigation for Time Oil Co. (Time Oil) at its Northwest Terminal (Terminal) in Portland, Oregon. This third phase of the RI (referred to as the Phase III RI) followed Phases I and II of the RI and was conducted to complete the assessment of the nature and extent of contamination in soil and groundwater at the Terminal. The earlier phases addressed soil and groundwater within an area of the Terminal where a PCP mixing operation was formerly located and where waste oil was formerly stored (Phase II), and where a stockpile containing soil excavated from the former PCP mixing area was temporarily placed (Phase I). Investigations for the third phase focused on areas where petroleum products were stored and handled. This report comprehensively describes the nature and extent of soil and groundwater contamination throughout the Terminal, as defined by all three phases of the remedial investigation. Each RI phase has been conducted in accordance with the state of Oregon's Hazardous Substance Remedial Action Rules (OAR 340-122), with oversight by the Oregon Department of Environmental Quality (DEQ), under the provisions of the voluntary cleanup program (VCP) agreement between Time Oil and DEQ dated September 5, 1996. The information obtained in this Phase III RI will be used with information obtained during Phase II of the RI in a human health and ecological risk assessment and a subsequent feasibility study of potential remedial actions.

FACILITY DESCRIPTION

The Time Oil Northwest Terminal is a former bulk petroleum storage and transfer facility currently owned and operated by Time Oil Co. Time Oil ceased operations at the Terminal on October 31, 2001. From 1943 to 2001, the Terminal was operated by Time Oil as the Terminal petroleum products facility. Since operations began, the Terminal was used for the receipt, storage, and distribution of petroleum and petroleum-related products. Historically, Time Oil leased tank space to Crosby & Overton for storage of waste oils, and the Koppers Company leased tanks and property at the Terminal for the formulation of pentachlorophenol (PCP)-containing wood treatment products. Within the Terminal, the specific areas of focus for the Phase III RI include:

- **Northwest Terminal tank farm areas** where various petroleum products were stored and handled. Bulk product Terminal areas are located in the western and southern portions of the facility adjacent to the Willamette River. The tank farm areas include 21 aboveground storage tanks (ASTs) in the Main Terminal tank farm area and 10 ASTs in the Bell Terminal tank farm area. The storage tanks range from 3,000 to 80,000 barrels in size. Currently all tanks are empty except for tank 16804 in the main tank farm area, which contains water from the groundwater interim action wells RW-2 and HRW-1, and water collected from the groundwater intercept system in the east-west trending storm drain at SDM-1 prior to treatment by the onsite wastewater system. At the Bell Terminal, a strip of land

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approximately 80 ft wide along the entire western property boundary was used by operators of the adjacent Schnitzer property for approximately 25 years, ending in 2000.

- **Butane and aviation gasoline storage areas** located to the southeast of the Terminal office. These areas include two ASTs formerly used for storage of aviation gasoline and one AST formerly used for butane storage. Currently all tanks are empty.

- **Former petroleum transfer and receipt facilities** include above and below ground piping; product receipt facilities via rail, truck, and vessel; and product distribution facilities via truck and rail (loading racks), and via marine vessels (a 380-ft dock in the Willamette River). A former rack for loading trucks is located just west of the Terminal office. A former loading rack for rail transfer and receipt is located at the terminus of the rail spur to the east of the Terminal office. A former loading rack for the Bell Terminal is located at the eastern side of the Bell Terminal area. None of the equipment in these areas is currently in use.

- **Entrance, former office, warehouses, and equipment maintenance area** located in the northern portion of the facility.

- **Undeveloped area of the Terminal** located in the eastern portion of the Terminal. This area is currently inactive and undeveloped. Only the western portion of this area was included in the Phase III RI. The remaining portion of this area (referred to as the East Property) was studied outside of the RI and has been granted a conditional No-Further-Action (NFA) determination by DEQ.

Other features located within the Terminal that were not the focus of the Phase III RI, but have been included in earlier phases of the RI include:

- **Former pentachlorophenol mixing area** where specialty wood treating products containing PCP in various formulations (typically with petroleum based carriers) were blended and stored for offsite shipment. The former PCP mixing area is located in the approximate center of the Terminal, and includes the former PCP warehouse and the area south of the warehouse (formerly occupied by various mixing and storage tanks, which were removed by 1982). During a soil removal action in fall 2002, 6500 yd^3 of PCP-impacted soil were excavated from these areas for offsite incineration and disposal. The Phase II remedial investigation report describing this area was submitted to DEQ on February 9, 2001. The soil removal action completion report was submitted to DEQ on November 10, 2003.

- **Former Crosby & Overton tank area** located directly south of the former PCP mixing area where waste oils were previously stored in two ASTs. The tanks have since been removed from this area. During a soil removal action in fall 2002 (in conjunction with the former PCP mixing area), 819 tons of polychlorinated biphenyl (PCB) and carcinogenic polycyclic aromatic hydrocarbon (cPAH)-impacted soil was excavated from this area for offsite thermal treatment and disposal. The Phase II remedial investigation report describing this area was submitted to DEQ on *February 9, 2001. The soil removal action completion report was submitted to DEQ on November 10, 2003.

- **Former soil stockpile area** where approximately 3,600 yd^3 of soil that was excavated from the former PCP mixing area in 1989 or was transferred from the East Property during interim removal actions in 1996-1997 was temporarily located. The stockpile was located southwest of the former PCP mixing area and north of an inactive soil treatment area. The former stockpile was removed and incinerated and disposed offsite during Phase I/II soil removal

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actions conducted in fall, 2002. The Phase I remedial investigation report describing the former soil stockpile area was submitted to DEQ on April 25, 1997.

SCOPE OF THE PHASE III RI

The purpose of the Phase III RI was to characterize the nature and extent of contamination and complete the conceptual site model for the Terminal and to use this information for assessing risks to human health and the environment. For this purpose, the scope of the Phase III RI included: collecting soil and groundwater samples for chemical analysis within those areas (referred to as the Phase III study area) of the Terminal not previously investigated during Phases I and II of the RI or during east property investigations; collecting soil samples to better define the hydrogeologic units for the Terminal; and groundwater monitoring to determine groundwater flow within each hydrogeologic unit throughout the Terminal area. This included collecting over 250 soil samples and over 60 groundwater samples for chemical analyses; monitoring groundwater levels at over 20 monitoring well locations; and logging soil conditions at over 160 soil boring locations.

PHASE III RI ACTIVITIES

The Phase III RI was conducted in three stages: a preliminary evaluation; an interim subsurface investigation, and a final soil and groundwater investigation.

- A preliminary evaluation was conducted in the fall of 2001 to evaluate the general distribution of hazardous substances, if found, in groundwater and soil within the Phase III study area and to collect geological, hydrogeologic, and chemical data in advance of a full-scale Phase III RI to focus future sampling efforts. This evaluation included collecting composite soil samples within twenty-seven grids and seventeen biased areas using direct-push methods. Also, during the implementation of the preliminary investigation, Schnitzer Investment Corporation (Schnitzer) collected soil and groundwater samples at nine direct-push borings located on the Time Oil property just west of the Bell Terminal tank farm area. During the sampling, Landau Associates collected split soil and groundwater samples at each boring for Time Oil.

- An interim subsurface investigation was conducted in July 2002 to better understand the subsurface geology and hydrogeology prior to selecting Phase III RI permanent monitoring well locations. The investigation included: 1) collecting lithological information at 27 locations within the Phase III study area using the cone penetrometer technique (CPT), 2) collecting soil samples at 10 locations in the Bell Terminal using direct-push sampling techniques, and collecting groundwater samples at these locations from temporary well points, and 3) collecting 5 discrete soil samples in certain areas where soil composite samples were collected during the preliminary evaluation and additional information was needed.

- A final soil and groundwater investigation was conducted within the Phase III study area from August through October 2003. For these investigations, soil samples were collected from 27 soil borings and 15 hand-dug holes. Twelve monitoring wells (4 shallow and 8 deep)

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were installed in the Main Terminal tank farm and 10 monitoring wells (7 shallow and 3 deep) were installed in the Bell Terminal tank farm area. Groundwater samples were collected from all but two of the wells. During the Phase III RI groundwater sampling event, 2 shallow wells located in the Bell Terminal were dry.

PHASE III RI RESULTS

The results of the Phase III RI investigations were used to determine the locality of facility, the nature and extent of contamination at the Terminal, and the fate and transport processes of these contaminants, as described below.

Locality of Facility

Locality of the facility is defined by DEQ rule as "any point where a human or an ecological receptor contacts, or is reasonably likely to come into contact with, facility-related hazardous substances." Based on the soil and groundwater data collected to date, the locality of the facility for the Terminal has been defined to include all of the Phase II and Phase III study areas, the shoreline west of the Main Terminal tank farm area, and the nearshore areas of the Willamette River. The shoreline and river have been included in the locality of facility because hydrogeologic data obtained during the Phase II RI and Phase III RI show that these areas are downgradient of the Main Terminal tank farm area where contaminants have been detected in groundwater and soil, and there is a potential for migration of impacted groundwater from these areas. Low level detections of PCP have been observed within the lower zone during the past year at the southern property boundary of the Terminal. The current groundwater interim action has effectively reversed downgradient groundwater flow near this area; however, because the predominant groundwater flow direction from this area is to the west/southwest toward the river (Bridgewater Group 1998, 2001) and there is potential for migration of these concentrations to the river outside the influence of the interim action, a small portion of the Schnitzer property south of the property boundary near the river is included in the locality of facility. Other properties downgradient of the Terminal include the Schnitzer property located west of the Bell Terminal. The property west of the Bell Terminal has not been included in the locality of the facility because, although contaminants have been detected in soil and groundwater along the western property boundary, current data do not indicate that these contaminants are associated with the Terminal.

Nature and Extent of Contamination: Soil

The nature and extent of contamination in soil is evaluated by specific areas: the Main Terminal and Bell Terminal tank farm areas, the loading rack/entrance area of the Main Terminal, the eastern portion of the Phase III study area, the asphalt-paved road area, and the Phase II study area. Preliminary

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screening levels, based on various published federal and state criteria and site-specific background concentrations, were used for comparison to the observed soil and groundwater concentrations. The Phase III RI data evaluation indicated the following:

- Petroleum hydrocarbons and constituents commonly associated with petroleum products [i.e., PAHs and volatile organic compounds (VOCs)] were detected in soil in the unsaturated zone within the Main Terminal and Bell Terminal tank farm areas. The highest concentrations and the most exceedances of preliminary soil screening levels were detected at the capillary fringe depth within each tank farm area.

- The presence of non-aqueous phase liquid (NAPL) was observed in soil during drilling at well LW-27S located in the central portion of the Main Terminal tank farm area.at a depth of 22.5 ft below ground surface (BGS). Slight to heavy sheens were observed on soil at several locations within the Main Terminal tank farm and the Bell Terminal tank farm areas. These sheens were observed in soil at depths ranging between 3.5 to 34 ft BGS in the Main Terminal tank farm and at depths ranging from 12.5 to 19.5 ft BGS in the Bell Terminal tank farm area.

- Along the portion of the Terminal that is bounded to the west by the Willamette River and its shoreline (i.e., the western boundary of the Main Terminal tank farm), diesel-range and motor oil-range petroleum hydrocarbons were detected in the upper 1.5 ft of soil at concentrations up to 438 mg/kg and 308 mg/kg, respectively. Within the capillary fringe, diesel-range and gasoline-range petroleum hydrocarbons were detected in the soil at two locations: LW-24D and LW-35D. The maximum gasoline-range and diesel-range petroleum hydrocarbons (12.7 mg/kg and 44.3 mg/kg, respectively) at this depth occurred at LW-35D located in the northwest corner of the Main Terminal. Detectable concentrations of PAHs were also reported for soil collected from the capillary fringe depth interval at three locations along the western property boundary in the Main Terminal, including location LW-35D.

- In the Bell Terminal, total petroleum hydrocarbon (TPH; gasoline-range and diesel-range petroleum hydrocarbons)-contaminated soil was found within three areas: at locations adjacent to the western portion of the pipeline that trends east-west through the tank farm, along the western property boundary where operators of the adjacent Schnitzer property used the property until approximately 2000, and in the central portion of the tank farm. The highest concentrations of contaminants in soil occur west of the tank farm near where the east-west trending pipeline formerly existed but was demolished by Schnitzer in the mid-1970s while still in use and containing product. Diesel-range and gasoline-range petroleum hydrocarbons were found at the capillary fringe depth at this location at concentrations of 12,700 mg/kg and 8,750 mg/kg, respectively. Other elevated concentrations of TPH were observed at the capillary fringe depth along the western property boundary of the Bell Terminal and appear to be related to activities in this area when used by operators of the adjacent Schnitzer property. Within the central portion of the Bell Terminal, gasoline-range and diesel-range petroleum hydrocarbon concentrations appear to have originated from different sources than those along the western property boundary because of the decreases in concentrations between the two areas. The TPH concentrations within the central portion of the tank farm are likely a result of minor, incidental releases related to operations within the Bell Terminal.

- Soil with concentrations of PAHs, VOCs, and metals exceeding preliminary screening levels is found in the loading rack/entrance area of the Main Terminal at the capillary fringe.

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Elevated concentrations of diesel-range and gasoline-range petroleum hydrocarbons were also detected at the same depth interval.

- Diesel-range TPH, PAHs, and metals were detected in the surface soil in the eastern portion of the Phase III Study Area. Concentrations exceeding preliminary screening levels are most frequently found at the 0 to 0.5-ft depth interval. These concentrations appear to be associated with historic road oiling for dust suppression in this area.

- Within the asphalt-paved road area, TPH, PAHs, and metals were detected in the surface soil. Only metals were found in soil at depths greater than 0.5 ft BGS in this area. Contaminants found in the surface soil likely result from the presence of these constituents in the roadbase material of the asphalt road.

- Within the Phase II study area, PCP concentrations ranging from nondetected to 180 mg/kg remain in soil at depths at and greater than about 13 ft BGS. This soil was not excavated during the removal action performed in the former PCP mixing area due to limitations in excavating soil below the water table and the plan to use *in situ* chemical oxidation (ISCO) to remediate soil and groundwater at this depth. Other constituents (diesel-range, motor oil-range, and gasoline-range TPH, PAHs, VOCs, and metals) are present in the surface soil and at depths at or deeper than the capillary fringe. Concentrations of several of the constituents exceed preliminary screening levels.

Nature and Extent of Contamination: Groundwater

The nature and extent of contamination in groundwater is evaluated by areas, as described above for the soil evaluation. A summary of the Phase III groundwater results follows:

- Diesel-range and gasoline-range petroleum hydrocarbons are present throughout the upper zone groundwater in the Main Terminal tank farm area at concentrations ranging from nondetect to 24 mg/L. Constituents typically associated with diesel-range and gasoline-range petroleum hydrocarbons (i.e., PAHs and VOCs) are also present in the upper zone groundwater in the Main Terminal tank farm area but these plumes are not as widespread as the TPH plumes. Metals were detected in the upper zone groundwater throughout the Main Terminal tank farm area at concentrations typically less than site-specific background concentrations.

- Concentrations of petroleum hydrocarbons present in the upper zone groundwater in the Bell Terminal tank farm indicates that there are three likely sources of contamination in the Bell Terminal: 1) near the location of a rupture along the western portion of the east-west trending pipeline where Schnitzer demolished the pipeline while still in use and containing product, 2) along the western property boundary south of the pipeline resulting from activities by operators of the adjacent Schnitzer property, and 3) the central portion of the Bell Terminal, likely resulting from minor, incidental releases related to Terminal operations. The maximum concentration of petroleum hydrocarbons in upper zone groundwater in the Bell Terminal (796 mg/L for diesel-range hydrocarbons) was found near the western property boundary. Within the central portion of the Bell Terminal, gasoline-range and diesel-range petroleum hydrocarbon concentrations appear to have originated from different sources than those along the western property boundary because of the decreases in concentrations between the two areas and resulting discontinuity between the plumes. Constituents associated with diesel-range and gasoline-range petroleum hydrocarbons (i.e., PAHs and VOCs) are also present in the upper zone groundwater in the Bell Terminal; however, the

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areas of impacted groundwater appears to be smaller than the areas of TPH-impacted groundwater.

- The gasoline-range TPH and VOC plumes present in upper zone groundwater in the Main Terminal tank farm area extend into the western portion of the loading rack/entrance area.

- Although TPH was not analyzed for in the upper zone groundwater in the eastern portion of the Phase III study area, no VOCs or PAHs were detected in the upper zone groundwater.

- The only significant plume of contamination in the upper zone groundwater in the Phase II study area is PCP. Based on the fourth quarter 2003 groundwater data, PCP concentrations in this plume range from 0.61 µg/L to 2,100 µg/L and extend approximately 450 ft downgradient from the PCP mixing area. However, historical PCP concentrations within the upper zone have been as high as 23,000 µg/L at well LW-11S.

- The Phase III RI results also indicate that separate plumes of diesel-range and gasoline-range petroleum hydrocarbons and VOCs are observed in the upper zone groundwater within and downgradient of the Phase II study area. These concentrations do not appear to originate from the tank farm areas and are likely related to the presence of PCP carrier oils (e.g., mineral spirits) as light non-aqueous phase liquid (LNAPL) and to the partitioning of these constituents into groundwater.

- No contaminants were detected in upper zone groundwater within the asphalt-paved road area.

- LNAPL has been previously documented in the upper zone groundwater in the Main Terminal tank farm area at monitoring wells N, P, Q, and GW8-1. (LNAPL was also observed at wells LW-21S, LW-27S during the February 2004 groundwater monitoring event; validated data for this event are not yet available.) The thickness of LNAPL present at these locations varies over time and between locations. The thicknesses range from 0.01 to 1.2 ft.

- No LNAPL was observed on upper zone groundwater in the Bell Terminal.

- Occasional observations of LNAPL have also been recorded for upper zone groundwater monitoring wells within the Phase II study area. These wells include OX-2S, LW-8S, and LW-11S and piezometer PZ-2. LNAPL thicknesses at these locations since the soil removal action have ranged from 0.04 to 0.37 ft. LNAPL occurring in this area appears to be related to activities performed in the former PCP mixing area and not related to LNAPL observed in the Main Terminal tank farm area. LNAPL presence is also related to seasonal groundwater fluctuations.

- Diesel-range and gasoline-range petroleum hydrocarbons, PAHs, VOCs, and metals are present in the lower zone groundwater along the western portion of the Main Terminal tank farm where the confining unit is discontinuous or not present and the upper and lower groundwater zones converge; however, concentrations are typically significantly less than those detected in the upper zone groundwater in these areas. Within the western portion of the Main Terminal tank farm, where the confining unit is present, fewer occurrences of contaminants in the lower zone groundwater are observed.

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- PCP is detected in the lower zone groundwater within the Phase II study area, the southern portion of the Main Terminal tank farm, and the western portion of the asphalt-paved road area at concentrations less than 1 µg/L. This distribution of PCP concentrations in lower zone groundwater in this area reflects downgradient movement from a historically high PCP concentration area and the influence of recovery well RW-2. Detections of diesel-range petroleum hydrocarbons are observed in the lower zone groundwater in these areas at concentrations up to 3.1 mg/L.

- Except for diesel-range petroleum hydrocarbons and arsenic, contaminants are not present in the lower zone groundwater in the Bell Terminal tank farm area. A low level concentration of diesel-range petroleum hydrocarbons (0.35 mg/L) was observed at well LW-32D. Metals (chromium, copper, nickel, and zinc) were observed at three lower zone monitoring well locations at concentrations ranging from 0.004 to 0.01 mg/L.

- Metals concentrations in the lower zone are typically greater than upper zone and are unlikely related to operations at the Terminal.

- No lower zone groundwater monitoring wells exist in the loading rack/entrance area of the Main Terminal.

- Except for a slight sheen and a slight to moderate mineral spirits-like odor during the first sampling of well B2 in August 1993, no NAPL or odors have been reported for the lower zone groundwater at the Terminal.

Contaminant Fate and Transport: Soil

Contamination of soil throughout the Terminal appears to be a result of the release of hazardous substances directly onto the soil during operation of the Terminal. Within the former PCP mixing area, releases occurred during PCP formulation activities. Within the former Crosby & Overton area, releases occurred during lease operations and tank closure. In the Main Terminal tank farm area, releases occurred due to spills and possibly leaking along conveyance pipelines and/or with activities associated with bulk fuel storage. In the Bell Terminal tank farm, releases appear to have occurred due to a petroleum release resulting from demolition of a western portion of the conveyance pipeline by Schnitzer while still in use in the mid-1970s, activities along the western property boundary in an area used by operators of the adjacent Schnitzer property, and activities within the central portion of the tank farm associated with operations of the Terminal. Within the eastern portion of the Phase III study area and the asphalt-paved road areas, the releases appear to be associated with current and/or historic road material. The elevated concentrations of contaminants in soil at the capillary fringe depth interval throughout the tank farm areas and in the Phase II area indicate that releases of hazardous substances to the ground surface were historical and that the NAPL has had sufficient time to migrate downward and spread laterally along the capillary fringe. The partitioning of constituents in contaminated soil or LNAPL to groundwater has resulted in dissolved phase contamination. Stockpiled soil in the Phase I study area and

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PCP-impacted soil in the Phase II study area at the ground surface to the depth of the water table (approximately 13 ft BGS) has been removed and incinerated and disposed offsite. Concentrations of contaminants remaining in soil in this area are at levels that appear to be protective of surface water, which receives groundwater impacted by soil contamination from this area.

Contaminant Fate and Transport: Groundwater

The presence of the same contaminants found in groundwater as in soil throughout the tank farm areas and the former PCP mixing area, indicate that contaminants have partitioned from the soil and/or NAPL into the groundwater. TPH plumes and PCP plumes found in the upper zone of the tank farm areas and the former PCP mixing area, respectively, appear to have migrated in the downgradient direction (west or southwest). For PCP, historical and recent concentrations of PCP in groundwater were used to evaluate potential contaminant migration pathways between the historical and recent monitoring periods. Historical groundwater quality data are not available for the tank farm areas.

In the Main Terminal tank farm area, the presence of contaminants in the lower zone groundwater in the western portion of the tank farm where the confining unit is discontinuous or absent and the lesser presence of these contaminants in the lower zone groundwater in the eastern portion of the tank farm where the confining unit is present indicates that contaminants in the upper zone groundwater are migrating westward (downgradient) and mixing with the lower zone groundwater. The limited extent of the diesel-range and gasoline-range hydrocarbon plumes in the Bell Terminal suggests that lateral movement of the contaminants is slow, which may be due to the low horizontal hydraulic gradient in this area, partitioning of these constituents from the dissolved phase onto organic matter, or attenuation processes (e.g., biodegradation and/or volatilization).

Vertical migration of contaminants from the upper zone groundwater to the lower zone groundwater seems to occur only in locations where the confining unit is discontinuous and/or absent (e.g., the western portion of the Main Terminal tank farm area and within and downgradient of the former PCP mixing area). This suggests that the silt layer over much of the western portion of the Main Terminal tank farm area and the Bell Terminal tank farm area is acting as an impermeable geologic/hydrogeologic boundary.

The storm drain located in the southern half of the Terminal and the backfill associated with the storm drain appear to affect groundwater flow and contaminant transport in the upper groundwater zone. The presence of the storm drain may partly explain the southerly components of upper zone groundwater flow in the Terminal area as groundwater flows toward the zone of higher hydraulic conductivity. The storm drain does not appear to fully penetrate the confining unit (where present) and thus is not thought to provide a vertical pathway for groundwater flow and contaminant transport to deeper aquifers, except

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beyond the extent of the confining unit. Groundwater samples collected from manholes in the storm drain and at the storm drain outfall in the river indicate that the storm drain has in the past acted as a preferential pathway for upper zone groundwater to the river. The groundwater intercept system was installed to eliminate the potential for upper zone groundwater to migrate through the storm drain to the river. The influence of the storm drain on groundwater quality will continue to be evaluated as part of the groundwater interim action. Additionally, implementation of full-scale in situ chemical oxidation (ISCO) technique for shallow groundwater and soil in and downgradient of the former PCP mixing area is planned as an interim remedial action to address migration of PCP contamination in groundwater from this area.

The most critical exposure pathway at the Terminal is migration of contaminants via groundwater to surface water. Even though impacts from discharge of groundwater from the Terminal are expected to be minimal because of dilution and other processes at the groundwater-surface water interface, there is a potential for impacted groundwater to reach sediment or surface water resulting in potential exposure by ecological receptors in the river.

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1.0 INTRODUCTION

This report presents the results of the Phase III remedial investigation (Phase III RI) conducted at the Time Oil Northwest Terminal (Terminal) in Portland, Oregon (Figure 1-1). The Phase III RI was implemented in accordance with the state of Oregon's Hazardous Substance Remedial Action Rules (OAR 340-122), under the oversight of the Oregon Department of Environmental Quality (DEQ) under the voluntary cleanup program (VCP) agreement between Time Oil and DEQ, dated September 9, 1996 (DEQ No. WMCVC-NWR-96-07; DEQ 1996). The Phase III RI was conducted in accordance with the Phase III Remedial Investigation (RI) Work Plan, dated June 18, 2001 (Phase III work plan, Landau Associates 2001a).

This report documents the third and final phase of the RI for the Terminal. The data collected for the Phase III RI focuses on the tank farm areas and other areas of the property not covered by previous investigations; however, this report provides comprehensive documentation of the historical and current nature and extent of contamination at the Terminal using data from the Phase II RI and other relevant investigations to complete the RI portion of this project. Hot spots of contamination for the Terminal will be identified, in accordance with OAR 340-122-080, in conjunction with the evaluations for the human health and ecological risk assessment following selection of acceptable risk levels. The data presented herein are adequate and of sufficient quality to perform the human health and ecological risk assessments for the Terminal.

1.1 SCOPE AND OBJECTIVES

As described in the RI work plan, the Phase III RI at the Time Oil Northwest Terminal was conducted to collect sufficient data from those areas of the Terminal for which no extensive investigations had previously been performed (i.e., the Phase III Study Area), such that, when evaluated in conjunction with previous site investigation data from other portions of the Terminal, the nature and extent of contamination within the Terminal boundaries may be determined, and assessment of the potential risks to human health and the environment may be assessed. The Phase III study area, shown on Figure 1-2, was divided into the following areas of the Terminal:

- Main Terminal tank farm area
- Bell Terminal tank farm area
- Historical loading racks for the tank farms/terminal entrance.
- The eastern portion of the Phase III study area
- Asphalt Road area.

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The Phase III RI did not include an investigation of Willamette River sediments. Collection of sediment samples at locations in the river adjacent to the Terminal are currently planned as part of the RI/FS for the Portland Harbor Superfund Project.

The objectives of the Phase III RI were to:

- Identify which hazardous substances, if any, had been released to the Phase III study area.
- Estimate the nature and extent of any soil and groundwater contamination identified within the Phase III study area.
- Obtain the hydrogeologic information needed to characterize the hydrogeologic system within the Phase III study area and to refine the hydrogeological conceptual site model.
- Obtain additional information needed to complete the conceptual site model, evaluate risk to human health and the environment, and conduct evaluations for a remedial action, if necessary. The conceptual model identifies the direction and migration of hazardous substances and identifies potential migration pathways and receptors based on current and reasonably likely future land and beneficial water use.

1.2 REPORT ORGANIZATION

This report consists of two volumes. Volume I includes the main text, figures, and tables. Volume II includes the report appendices.

The remainder of Volume I is organized into the following sections:

- **Section 2.0 Background Information**. This section provides a description of the facility and its history, previous investigations conducted at the Terminal, and the regulatory framework of the RI process.
- **Section 3.0 Physical Setting**. This section provides a description of the physical setting of the Terminal, including the topography, regional geology and hydrogeology, surface water features, and climate and meteorology.
- **Section 4.0 Land and Beneficial Water Use Evaluations**. This section provides information regarding the locality of facility, and a summary of the land use and beneficial water use evaluations conducted during the Phase II RI, with information obtained during the Phase III investigation incorporated into the evaluation.
- **Section 5.0 Phase III Remedial Investigation Sampling**. This section describes the field investigative work and laboratory analyses performed during the Phase III RI.
- **Section 6.0 Geology and Hydrogeology**. This section presents the results of the Phase III RI and previous investigations with regard to the geologic and hydrogeologic conceptual model.

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- **Section 7.0 Nature and Extent of Contamination**. This section describes the nature and extent of contamination at the Terminal based upon the Phase III RI and previous investigations, including a summary of preliminary screening levels.

- **Section 8.0 Conceptual Site Model**. This section identifies the conceptual site model for the Terminal including source areas and general and site-specific transport mechanisms and fate processes.

- **Section 9.0 Scope of Future Activities**. This section provides the scope of future planned activities to be conducted at the Terminal, including the continued implementation of the Phase II groundwater interim action, continued quarterly and semiannual sampling of site monitoring wells, implementation of the *In Situ* Chemical Oxidation work plan (Landau Associates 2002a), and the Phases II/III risk assessment and feasibility study.

- **Section 10.0 Proposed Schedule**. This section provides a proposed schedule for upcoming RI/FS activities.

- **Section 11.0 Use of This Report**.

- **Section 12.0 References.**

The appendices (Volume II) of this report include:

- **Appendix A**. This appendix contains summary information for soil explorations and monitoring wells and provides logs for the explorations performed for this RI that have not been previously reported.

- **Appendix B.** This section provides water level measurements collected between 1996 to the present that were used to evaluate groundwater elevations and flow direction in this report.

- **Appendix C**. This appendix contains analytical data summary tables for detected constituents in soil for the Phase II RI and the Phase III RI, definitions of laboratory data validation qualifiers, and preliminary screening levels for soil.

- **Appendix D**. This appendix contains analytical data summary tables for detected constituents in groundwater for the October 2003 quarterly sampling event and from groundwater investigations conducted previously for the Phase III RI, definitions of laboratory data validation qualifiers, and preliminary screening levels for groundwater.

- **Appendix E**. This appendix contains Phase III RI soil data for September to October 2003.

- **Appendix F**. This appendix provides data validation reports for Phase III RI soil and groundwater analyses not previously reported.

- **Appendix G**. This appendix provides laboratory data reports for the Phase III soil analyses not previously reported.

- **Appendix H.** This appendix provides cumulative groundwater data collected between April 1997 and October 2003 for wells monitored during quarterly groundwater sampling events. Because of the size of these tables, this appendix is provided only electronically by CD with this report.

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2.0 BACKGROUND INFORMATION

This section provides background information that was used in the evaluation of the nature and extent of contamination for the Phase III RI at the Time Oil Northwest Terminal. This section describes the Terminal and its operational history, summarizes available results from previous soil and groundwater investigations at the facility, and outlines the regulatory framework of the RI process.

2.1 FACILITY DESCRIPTION

The Time Oil Northwest Terminal (Terminal) is a former bulk petroleum storage and transfer facility currently owned and operated by Time Oil Co. (Time Oil). Time Oil ceased operations at the Terminal on October 31, 2001. From 1943 to 2001, the Terminal was operated by Time Oil as the Northwest Terminal petroleum products facility. Since operations began, the Terminal was used for the receipt, storage, and distribution of petroleum and petroleum-related products. Historically, Time Oil leased tank space to Crosby & Overton for storage of waste oils, and the Koppers Company leased tanks and property at the Terminal for the formulation and blending of pentachlorophenol (PCP)-containing wood treatment products.

The facility is located in Township 2 North, Range 1 West, Sections 34 and 35, in the industrialized Rivergate area of north Portland, Oregon (Figure 1-1). The Terminal is bordered to the east and south by heavy industrial complexes, to the north by heavy industrial property and Port of Portland undeveloped property, and to the west by the Willamette River (Figure 1-2). The Terminal is approximately 52 acres in size and is generally flat with an average land surface elevation of about 28 ft above mean sea level (MSL). The Terminal is enclosed by a terminal-wide chain link fence and access is through the main gate at the termination of Time Oil Road. Within the Terminal, there are several features that are distinguished by their historical uses, as shown on Figure 2-1. Of these areas,, the following were included in the Phase III RI study area:

- **Former Northwest Terminal tank farm areas** where various petroleum products were stored and handled. Bulk product Terminal areas are located in the western and southern portions of the facility adjacent to the Willamette River. The tank farm areas include 21 aboveground storage tanks (ASTs) in the Main Terminal tank farm area and ten ASTs in the Bell Terminal tank farm area. The storage tanks range from 3,000 to 80,000 barrels in size. Currently, all tanks are empty except for tank 16804 in the main tank farm area, which contains recovered water from the groundwater interim action wells RW-2 and HRW-1, and water collected from the groundwater intercept system in the east-west trending storm drain at SDM-1 prior to treatment at the onsite wastewater treatment system. At the Bell Terminal, a strip of land approximately 80 ft wide along the entire western property boundary was used by operators of the adjacent Schnitzer property for approximately 25 years, ending in 2000.

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- **Former butane and aviation gasoline storage areas** located to the southeast of the Terminal office. These areas include two ASTs for storage of aviation gasoline and one AST for butane storage. Currently all tanks are empty.

- **Former petroleum transfer and receipt facilities** that include above and below ground piping; product receipt facilities via rail, truck, and vessel; and product distribution facilities via truck and rail (loading racks), and via marine vessels (a 380-ft dock in the Willamette River). A former rack for loading trucks is located just west of the Terminal office. A former loading rack for rail transfer and receipt is located at the terminus of the rail spur to the east of the Terminal office. A former loading rack for the Bell Terminal is located at the eastern side of the Bell Terminal area. None of these areas are currently in use.

- **Wastewater treatment system** located to the north of the Terminal office. The wastewater treatment system (WWTS) is used to treat Terminal stormwater runoff for the industrial portions of the Terminal, investigation wastewater (e.g., development and purge water from monitoring and recovery wells), and remediation wastewater (e.g., groundwater from the groundwater interim action system) before discharge to the sanitary sewer line along Time Oil Road under permit with the City of Portland. Stormwater routed to the WWTS originates from former industrial areas of the main part of the Terminal, including the former loading rack along the rail spur, the former truck loading rack, the former valve pit on the vessel dock, and other former valve areas. Influent and effluent sampling results are documented in self-monitoring reports (SMRs) to the City of Portland, conducted according to the permit requirements.

- **Storm drain lines** consisting of the main line running east-west along the length of the Terminal about 160 ft north of the southern property boundary. The stormwater collection system for the stockpile was abandoned or removed following completion of the stockpile removal action, as documented in the Phases I/II Removal Actions Completion Report (Landau Associates 2003a). Stormwater from the Terminal entrance area, the low topographic area east of the rail spur, and the East Property is collected into the main storm drain line for discharge into the Willamette River. In the fall of 2002, a groundwater intercept system was installed within the east-west trending storm drain to capture groundwater infiltrating into the concrete storm drain line between the two stormwater manholes located south of the horizontal recovery well (HWR-1). Installation activities are documented in the *Fourth Quarter 2002 Groundwater Monitoring and Groundwater Interim Action Status Report* (Landau Associates 2003b). Summaries of stormwater treatment and sampling are provided in the quarterly groundwater monitoring reports for the Terminal.

- **Subsurface utilities** consisting of thousands of feet of pipeline underlying the facility and adjacent areas, including public utilities (e.g., electrical and water) and private utilities (e.g., hydrant lines). All product lines were flushed and cleaned upon cessation of operations at the Terminal.

- **Entrance, former office, warehouses, and equipment maintenance area** located in the northwest portion of the facility.

Other features within the Terminal and shown on Figure 2-1 that are currently being investigated or have been previously investigated and, therefore, were not included in the Phase III RI are:

- **Former pentachlorophenol mixing area and warehouse** where specialty wood treating products containing PCP in various formulations (typically with petroleum-based carriers)

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were blended and stored for offsite shipment from 1967 to 1984 under an agreement with the Koppers Company. The former PCP mixing area is located in the approximate center of the Terminal, and includes the former PCP warehouse and the area south of the warehouse (formerly occupied by various mixing and storage tanks that were removed by 1982). During September through November 2002, soil removal action activities were conducted within the former PCP mixing area and associated areas. These activities included the demolition of the former PCP warehouse and the removal of 6,500 yd^3 of PCP-impacted soil from the former PCP mixing area. Remedial action activities are documented in the *Removal Actions Completion Report, Phases I/II RI Areas* (Landau Associates 2003a).

- **Former Crosby & Overton tank area** located directly south of the former PCP mixing area where waste oils were previously stored in two ASTs from 1974 to 1989 through a lease to Crosby & Overton. The tanks have since been removed from this area. Another AST (38009), removed during Phase I/II RI removal actions, was established in 1989 as a bioreactor during soil treatment activities for the former soil stockpile. Remedial action activities were conducted within the former Crosby & Overton tank areas in late 2002. Activities included the removal of 819 tons of polychlorinated biphenyls (PCB) and carcinogenic polycyclic aromatic hydrocarbons (cPAH)-impacted soil. Removal activities are documented in the Phase I/II Removal Actions Completion Report (Landau Associates 2003c).

- **Former soil stockpile area** where approximately 3,600 yd^3 of soil that was excavated from the former PCP mixing area in 1989 or was transferred from the East Property during interim removal actions in 1996-1997 was temporarily located. The stockpile was located southwest of the former PCP mixing area and north of an inactive soil treatment area. The former stockpile was removed during Phase I/II soil removal actions conducted in 2002. Stockpile removal activities are documented in the Phase I/II Removal Actions Completion Report (Landau Associates 2003a).

- **East Property** located in the eastern portion of the facility is an inactive and currently and historically undeveloped area. A remedial action for the East Property resulted in the removal and disposal of 1,732 tons of PAH-impacted soil. A conditional No-Further-Action (NFA) determination was granted to Time Oil by DEQ on November 24, 2003 (DEQ 2003a).

Investigations associated with these areas are discussed in further detail in the following sections.

2.2 SUMMARY OF PREVIOUS ENVIRONMENTAL INVESTIGATIONS AND INTERIM ACTIONS

This section summarizes the history of previous environmental site investigations and interim actions, including activities conducted under the Phase II RI, and previous investigations within the Phase III study area.

2.2.1 HISTORICAL ENVIRONMENTAL INVESTIGATIONS – PHASE III STUDY AREA

Beginning in 1984, a series of environmental investigations were conducted to evaluate the potential for soil and groundwater contamination due to former operations at the Terminal. These

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investigations included a site inspection by DEQ in 1984, removal of the Crosby & Overton truck-washing trough in 1986, test pit explorations near the Crosby & Overton truck-washing trough in 1989, and a groundwater and soil investigation conducted in 1994 in response to an unleaded gasoline spill in the Main Terminal tank farm area. These investigations are briefly discussed below.

2.2.1.1 1984 DEQ Site Inspection

As part of a DEQ site inspection in 1984, eight soil samples were collected in the Main Terminal tank farm area and two samples were collected in the Bell Terminal tank farm area (DEQ 1985), as shown on Figure 2-2. Each sample was a composite of three depth intervals: ground surface, 1 ft below ground surface (BGS), and 2 to 3 ft BGS. The samples were analyzed for lead (EP toxicity), base-neutral semivolatiles, pesticides, and PCBs. Concentrations of these constituents were mostly nondetect, except in the northeast portion of the Main Terminal tank farm area where concentrations of individual PAHs constituents ranged from 13 mg/kg to 105 mg/kg. No constituents were detected in the soil samples collected from the Bell Terminal tank farm area.

2.2.1.2 1986 Crosby & Overton Truck Washing Trough Remediation

In 1986, gravel used by Crosby & Overton for a truck-washing trough in the Bell Terminal area was excavated and the trough liner was removed and disposed at a private contractor facility (Crosby & Overton 1986). Two confirmation samples collected from the base of the excavation indicated oil and grease concentrations of 113 mg/kg and 30 mg/kg. The excavation was backfilled with clean fill material. In 1989, soil in the area of the truck-washing trough was sampled. The sample results indicated elevated levels of petroleum hydrocarbons (6,170 mg/kg). Base-neutral semivolatiles, metals, and PCBs were also analyzed, but were either not detected or detected at low concentrations. In May 1989, about 300 yd^3 of soil was excavated from the truck-washing trough area by Crosby & Overton and disposed at St. Johns Landfill. A composite soil sample was collected from the east wall, the bottom, and the west wall of the excavation, and analyzed for total petroleum hydrocarbons (TPH). The TPH sample result was 15 mg/kg. The area was backfilled with clean fill from an onsite location (Crosby & Overton 1989). The location of the former Crosby & Overton truck-washing trough is shown on Figure 2-2.

2.2.1.3 1989 Soil TPH Investigation

In June 1989, visibly impacted soil was encountered during excavation of soil planned for use as fill for the excavated area within the former PCP mixing area. In response, 14 test pits were excavated and soil and groundwater samples were collected by ECOVA. Twelve of the test pits were located within

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the Phase III study area (specifically, near the former butane storage area), as shown on Figure 2-2. A total of 13 soil samples and 4 groundwater samples were collected from this area and analyzed for total TPH by infrared scan. Soil TPH concentrations ranged from 174 mg/kg to 9,002 mg/kg (ECOVA 1989). TPH was not detected in the groundwater samples. Information regarding the depth of the test pits and samples is not available.

2.2.1.4 1994 Unleaded Gasoline Spill/Groundwater and Soil Investigation

In 1994, in response to an unleaded gasoline spill in the main tank farm area, five groundwater monitoring wells (N, O, P, Q, and R) were installed in and downgradient of the release area (Figure 2-2). Soil samples from the well borings indicated that soil from shallow wells N, P, and Q showed evidence of contamination by gasoline-range and diesel-range petroleum hydrocarbons. The soil at the top of the upper water-bearing zone (upper zone) in well Q exhibited the highest gasoline-range concentration (210 mg/kg) and the highest diesel-range concentration (16,430 mg/kg) (Landau Associates 1994). Water levels and product thickness (when observed) in these wells are monitored as part of the Phase II RI quarterly groundwater sampling events. Light non-aqueous phase liquid (LNAPL) has been observed intermittently at wells N, P, and Q since July 1997.

2.2.2 PHASES I AND II REMEDIAL INVESTIGATIONS AND INTERIM REMEDIAL ACTIONS

In addition to the soil and groundwater investigations conducted between 1984 and 1996, two remedial investigations were conducted at the Terminal from 1996 through 1999. These included a Phase I RI focused on the former soil stockpile area (Figure 2-1) and a Phase II RI focused on the former PCP mixing area and the former Crosby & Overton area (Figure 2-1). Investigations were also conducted for 21 acres of property located along the easternmost portion of the Terminal (referred to as the East Property), as shown on Figure 2-1. Additionally, in 2002, soil removal actions were completed for the soil stockpile in the former PCP mixing/warehouse areas, in the former Crosby & Overton area, and on the East Property. Summaries of the investigations and remedial actions are included in the following sections. Further information regarding these investigations can also be found in the Phase I RI Report (Landau Associates 1997a), the Phase II RI report (Landau Associates 2001b), the EPPI Results Report (Landau Associates 2001c), the Remedial Actions Completion Report, Phases I/II RI Areas (Landau Associates 2003a), and the East Property Soil Remedial Action Completion Report (Landau Associates 2003c).

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2.2.2.1 Former PCP Mixing Area and Warehouse

The previous sampling events conducted in and adjacent to the former PCP mixing area and warehouse included the following:

- 1984 to 1989 - Several soil sampling and remediation events were conducted within the former PCP mixing area and below the former PCP warehouse during this period. The main focus of the historical investigations was to identify the extent of PCP contamination within and adjacent to the former PCP mixing area resulting from historical use of these areas for formulation of wood treatment products. In 1989, approximately 3,000 yd^3 of soil was excavated from this area (Figure 3) and placed into the current soil stockpile, as described earlier. Soil PCP data from the historical sampling events, containing only data representing soil concentrations remaining within the former PCP mixing area after the 1989 excavation, are included on Figure 2-3.

- Phase II RI – Conducted in fall 1996 and spring 1997, the Phase II RI included the following activities:

  - Soil Investigations: sampling and analyses of soil from 45 shallow soil borings and cone penetrometer test (CPT) explorations, five surface soil samples, 25 new shallow and deep monitoring and recovery well borings, and two dust samples from the rafters of the former PCP warehouse.

  - Groundwater Investigations: sampling and analyses of groundwater during an initial groundwater screening event in October 1996 and from selected wells in March 1997, sampling and analysis of groundwater using direct-push methods during February 1998 and February through April 1999, drilling and installation of four shallow and five deep monitoring wells and two recovery wells (one shallow and one deep) during February through April 1999, quarterly water quality sampling and analyses between March 1997 and December 1999, aquifer testing in May through June 1999, and installation of a third recovery well in November 1999.

  - Abandonment of five shallow wells and one well point.

  - Land use and beneficial water use evaluations.

- Phase II Supplemental Sampling - In September 2001, supplemental soil sampling was conducted within and adjacent to the former PCP mixing area and former PCP warehouse to evaluate the extent of soil contamination and to address data gaps identified by DEQ in its comments on the Phase II RI report. Soil samples were collected from 15 soil borings in and around the former PCP mixing area. Sample results for soil remaining after the removal action, including results from this event, are included on Figure 2-3.

- Pre-Removal Investigation (PRI) - In August 2002, soil was collected and analyzed from the following: 1) 3 locations in the area previously identified as "clean fill" or overburden from the 1989 excavation within the former PCP mixing area to determine whether this material could be reused as backfill following the removal action, 2) 7 locations near the perimeter of the proposed excavation to provide additional data coverage, and 3) 5 locations where PCP concentrations were expected to range between 5 and 20 mg/kg for demonstration that groundwater concentrations would not be adversely impacted by residual soil PCP concentrations of 5 mg/kg or less, if left in place at the completion of the removal action.

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PCP results for the soil remaining after the removal action, including samples from this event, are shown on Figure 2-3. The results for the groundwater protection evaluation demonstrate that use of 5 mg/kg as a cleanup action level for the soil removal action is protective of surface water receiving groundwater migrating from the former PCP mixing area. Detailed results for the PRI are provided in a technical memorandum prepared by Landau Associates in September 2002 (Landau Associates 2002c).

During the fall of 2002, the PCP warehouse was demolished and PCP-impacted soil from the former PCP mixing area and adjacent area to the south and from beneath the footprint of the former PCP warehouse was excavated and disposed offsite for a removal action for the area. The removal action work plan required the soil to be designated into three types for proper handling, including "clean" overburden soil, "impacted" soil, and "high PCP-impacted" soil. The extent of the excavation was further divided into three excavation depths or tiers to minimize sloughing of clean ground surface and sidewall soil into the excavation, to limit the need for shoring, and to allow for reasonable segregation of PCP-impacted soil and the clean fill. These depths included the 0 to 0.5 ft BGS, 5 to 10 ft BGS, and 10 to 13 ft BGS tiers. PCP-impacted soil was removed to a maximum depth of 13 ft BGS, the approximate depth of the water table at the time of excavation. Approximately 1,700 yd^3 of clean overburden soil was removed from the excavation, stockpiled, and ultimately used as backfill for the excavation. The soil removal activities resulted in the excavation of approximately 6,400 yd^3 of PCP-impacted soil, including approximately 90 yd^3 of high PCP-impacted soil from beneath the southwest corner of the former PCP warehouse. The PCP-impacted material was incinerated and disposed at the Swan Hills Treatment Center in Swan Hills, Alberta, Canada.

Following the completion of the *in situ* soil removal activities, soil verification samples were collected from the base and the sidewalls of the excavation to document PCP concentrations remaining in soil. A total of 18 sidewall and 8 base of excavation verification samples were collected to represent PCP concentrations remaining in soil within the former PCP mixing area at completion of the removal action. Figure 2-3 shows the boundaries of the excavation and PCP concentrations remaining in soil following the removal action.

PCP concentrations for the soil verification samples collected from the 0 to 5 ft BGS tier and 5 to 10 ft BGS tier were all less than the cleanup action level of 5 mg/kg, as shown on Figure 2-3. All of the final verification sample PCP results collected from the western and southwestern portions of the base of excavation (10 to 13 ft BGS) exceeded the soil cleanup action level (5 mg/kg) with PCP concentrations up to about 45 mg/kg. Removal action activities and documentation are provided in the Phases I/II Removal Actions Completion Report (Landau Associates 2003a).

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2.2.2.2 Former Soil Stockpile

As discussed in the previous section, environmental investigations and removal actions conducted by and for Time Oil since 1984 resulted in the 1989 excavation of approximately 3,000 yd^3 of PCP-impacted soil from the former PCP mixing area. The excavated soil was stockpiled onsite in a bermed and lined area southwest of the mixing area and north of the former soil treatment (bioremediation) area (Figure 2-1). The stockpile was covered to minimize dust generation and contact with precipitation, and to minimize exposure to PCP-impacted soil by human and ecological receptors. Additional soil samples were collected for PCP analyses in 1989 from within the area where excavated soil was to be stockpiled and within the soil treatment area (ECOVA 1991). All sample results were reported as nondetect.

In 1990, eight samples were collected from the soil stockpile for PCP analyses; the eight samples were composited into two samples for dioxin/furan analysis

For the Phase I RI in September 1996, soil samples were collected from 10 borings in the soil stockpile (Landau Associates 1997a). Samples collected at each location were composited over the full depth of the stockpile, ranging from about 3 to 14 ft BGS. The soil samples were analyzed for semivolatile organic compounds (SVOCs), chlorinated phenols, TPH, priority pollutant metals, and volatile organic compounds (VOCs). Two samples were also analyzed for dioxins and furans; the sample with the highest PCP concentration was analyzed for PCP by the toxicity characteristics leaching procedure (TCLP). More detailed information on the results for the 1990 sampling and the Phase I RI was provided in the Phase I RI report (Landau Associates 1997a). In the fall of 1996, Time Oil upgraded the management of the stockpile to incorporate a new cover system and improved stormwater collection systems (Landau Associates 1996). An additional 600 yd^3 of PCP-contaminated soil was added to the stockpile in the fall of 1997, with DEQ's approval, following interim removal actions on the undeveloped eastern portion of the property and investigation activities for the Phase II RI.

In May 2001, soil samples were collected from 18 locations in the soil stockpile to determine the pre-removal soil concentrations. The soil samples were analyzed for SVOCs, metals, dioxin and furan compounds, biological parameters, and soil physical parameters. PCP was considered to be the indicator compound for the soil stockpile and the remaining constituents were evaluated for purposes of profiling the soil for disposal. Detailed results are provided in the Phase I FS (Landau Associates 2001d).

In the fall of 2002, in conjunction with the *in situ* soil removal of PCP-impacted soil from the former PCP mixing area (as discussed in Section 2.2.2.1), the soil stockpile was incinerated and disposed at the Swan Hills Treatment Center in Swan Hills, Alberta, Canada. The soil removal activities resulted in the removal of approximately 2,400 yd^3 of PCP-impacted soil from the stockpile area. (The soil stockpile was volumetrically reduced from about 3,600 yd^3 to about 2,400 yd^3, likely due to compaction from construction equipment used on the stockpile and longer-term settlement since original construction.

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The total mass of the stockpile had not changed since 1999.) Around this time, equipment in the former soil treatment area was also decontaminated and removed from the Terminal for reuse.

Following the removal of the soil stockpile, soil verification samples were collected beneath the footprint of the former soil stockpile. A total of seven samples represent concentrations of soil remaining following the removal activities. Figure 2-3 presents the verification sampling locations and final PCP concentrations. Final soil PCP concentrations ranged from nondetect to 1.46 mg/kg. Dioxin/furan and metals analysis were also performed at two of the locations (SP-1-CONF and SP-3-CONF); the analytical results ranged from 13.7 ng/kg (SP-1-CONF) to 1,135.56 ng/kg (SP-3-CONF) (as total TEQ). Concentrations of the six metals analyzed (arsenic, chromium, copper, lead, nickel, and zinc) ranged from nondetect to 354 mg/kg (zinc) with the highest concentrations occurring at sample location SP-3-CONF. Removal activities are documented in the Phase I/II Removal Actions Completion Report (Landau Associates 2003a).

2.2.2.3 Former Crosby & Overton Tank Area

From 1974 to 1989, two ASTs (5006 and 10002; shown on Figure 2-1) were leased from Time Oil by Crosby & Overton for storage of materials generated from offsite projects. Crosby & Overton reportedly provided services to collect and store waste oils from separators, oil slop tanks, ship tank cleaning, and related tasks.

Analytical results from investigations conducted in the C&O tank area between 1987 and 1989 showed elevated PCB concentrations in soil associated with waste oil releases that occurred historically from the tanks and led to soil removal in this area.

In 1997, as part of the Phase II RI, soil samples were collected from 13 borings and 2 well boreholes within the Crosby & Overton tank area. The Phase II RI sample results indicated concentrations of PCBs ranging from less than 1 mg/kg to 16 mg/kg and PAHs ranging from less than 1 mg/kg to 67 mg/kg in the upper 6 inches of soil. The occurrence of PAHs in this area appears to be from the presence of asphalt-containing tank foundations and, to a lesser extent, from the presence of historical asphalt-containing roadbed material, based on historical aerial photographs.

In 2002, in conjunction with the removal action conducted within the former PCP mixing area, soil removal activities were also conducted within the Crosby & Overton tank area. Removal activities consisted of excavating soil from depths of 0.5 to 2.5 ft BGS from the Crosby & Overton tank farm area. Figures 2-4 and 2-5 show the final excavation extents and depths for soil removal within the tank area. A total of 819 tons of soil were removed from the Crosby & Overton tank area for thermal treatment and disposal at the TPS Technologies, Inc. facility in Lakewood, Washington. Following soil removal activities, verification sampling was conducted within the removal areas. A total of six samples

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document final concentrations remaining in soil at the base of excavation. Sample results for the excavated areas for total PCBs and selected cPAHs are shown on Figures 2-4 and 2-5, respectively. Soil removal activities were documented in the Phase I/II Soil Removal Actions Completion Report (Landau Associates 2003c).

2.2.2.4 East Property

In 1996-1997, Time Oil conducted a limited investigation of the East Property to identify, remove, and dispose of PCP-related wastes that originated from PCP formulation activities conducted within the former PCP mixing area from 1967 to 1984. The wastes were located in and adjacent to a topographic low (referred to as the former drum area, Figure 2-1) in and adjacent to a small stockpile area, and in several other isolated locations on the East Property. Removal activities consisted of removal of over 100 55-gallon drums and approximately 200 yd^3 of soil and debris from the former drum area. In addition, approximately 300 yd^3 of soil and other debris found in a small stockpile and several other localized areas with stressed vegetation were removed. Confirmation samples collected from each of these areas indicated that PCP-impacted soil was successfully removed to concentrations below U.S. Environmental Protection Agency (EPA) Region 9 preliminary remediation goals (PRGs) for residential soil and that soil impacted by other constituents (e.g., metals) was removed from each area to concentrations below the PRGs for industrial soil, and, in some areas, to below PRGs for residential soil.

Also, as part of the 1996-1997 investigation and interim removal activities, soil characterization samples were collected from the topographic mound (Figure 2-1). A few of the topographic mound soil samples contained detectable levels of PCP and PAHs. The concentrations of PCP and PAHs detected in all of the samples were less than the PRGs for industrial soil and some of the samples were also below the PRGs for residential soil. With concurrence from DEQ, the 1996-1997 removal action on the East Property was considered to be complete and no further action in those areas is necessary (DEQ 1998a).

In March 1997, as part of the Phase II RI for the Terminal, two soil borings and four monitoring wells (LB-121, LB-122, LW-101S, LW-102S, LW-103S, and LW-104S) were completed within the East Property. The monitoring wells were installed to monitor groundwater concentrations in the areas where PCP was observed in the soil. The soil borings and monitoring wells were used to establish site-specific soil and groundwater background concentrations for the Terminal. The monitoring wells were placed on a quarterly sampling schedule until May 1998 when sampling was reduced to an annual basis for a reduced set of constituents. Sampling results for the monitoring wells were generally nondetect, demonstrating that there was no migration of contaminants from soil to groundwater in this area; the results are provided in quarterly groundwater monitoring reports for the site. Monitoring wells LW-101S through LW-104S were abandoned in August 2003 following the remedial action for the East Property.

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In 2000-2001, investigations were conducted on the east property to evaluate whether hazardous substances were present in soil and groundwater at concentrations that would require additional action in advance of potential lease or sale of the property by Time Oil and to identify soil removal areas and the extent of cPAH contamination. Using DEQ risk assessment screening methods (DEQ 1999, 2000b) and a statistical evaluation of the soil data to demonstrate compliance with DEQ's soil cleanup levels (SOCLEAN) for industrial soil (OAR 340-122-045), seven cPAH compounds were identified as contaminants of potential concern (COPC) or contaminants of potential ecological concern (CPEC) (COPCs/CPECs) for the surface soil, These compounds included: benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, benzo(k)fluoranthene, and chrysene. No COPCs/CPECs were identified in subsurface soil at concentrations exceeding the SOCLEAN levels for industrial soil. Sixteen soil removal areas, located mainly adjacent to historical and current roads, were identified as having surface soil with at least one of the five retained COPCs/CPECs at concentrations above the SOCLEAN levels for industrial soil. The presence of cPAHs in soil on the east property appeared to be related to historical road oiling as documented in historical photographs from the late 1960s through 1970s. A removal action plan for the East Property (Landau Associates 2002b) was implemented following DEQ's approval (DEQ 2002) during the fall of 2002.

The remedial action for the East Property included the removal of approximately 1,732 tons of soil for thermal treatment and disposal at TPS Technologies, Inc., in Portland, Oregon. In addition, approximately 90 tons of mixed asbestos-containing material and soil were removed and disposed at the Wasco County Landfill in The Dalles, Oregon. As part of the remedial action activities, a total of 81 verification samples were collected from the 16 soil removal areas. The verification sample results were used to indicate that remedial action objectives were met through performance of a statistical evaluation for comparison to the SOCLEAN levels (90 percent upper confidence limit on the true population mean). The results from the East Property investigations and the remedial actions are provided in the EPPI Results Technical Memorandum (Landau Associates 2001c) and the East Property Remedial Action Completion Report (Landau Associates 2003c). Time Oil was granted a conditional No Further Action (NFA) determination from DEQ for the East Property in a letter dated November 24, 2003 (DEQ 2003a). The NFA determination is contingent upon industrial site uses limiting suitable habitat to sensitive ecological receptors. An equitable servitude and deed restriction has been recorded on the property.

2.2.2.5 Quarterly Groundwater Monitoring Events

Quarterly groundwater monitoring events were initiated as part of the Phase II RI in March 1997. In total, 27 quarterly events have been conducted between March 1997 and October 2003 as part of the

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Phase II RI activities. Since the January 1998 sampling event, quarterly data have been provided to DEQ in quarterly groundwater monitoring reports. A summary of analyses conducted at each monitoring location since monitoring began is provided in Table 2-1. Groundwater level measurements conducted during the quarterly events are provided in Table B-1. Modifications to the sampling program approved by DEQ are summarized in Table 2-2. The fourth quarter 2003 groundwater sampling event conducted in October 2003 consisted of sampling 20 upper zone wells, and 16 lower water-bearing zone (lower zone) wells within the Phase II RI areas. This groundwater monitoring event also included the first sampling of the newly installed Phase III RI wells, including eleven upper zone wells and eleven lower zone wells. Installation details for the new Phase III RI wells are discussed in Section 5.2.1. Groundwater sampling locations are shown on Figure 2-6. Groundwater samples collected during the fourth quarter 2003 were analyzed for the following constituents: SVOCs (EPA Method 8270); VOCs (EPA Method 8260); PCP (EPA Method 8270 SIM); six priority pollutant metals (arsenic, chromium, copper, lead, nickel, and zinc; EPA Methods 6010/7000 series); total dissolved solids (TDS; EPA Method 160.1); chloride (EPA Method 325.2); and field parameters (pH, conductivity, dissolved oxygen, turbidity, and temperature). Additionally, groundwater samples from eight monitoring wells were analyzed for diesel-range petroleum hydrocarbons (NWTPH-D Method), and six samples were analyzed for gasoline-range and motor oil-range petroleum hydrocarbon (NWTPH-G and NWTPH-Dx).

2.2.2.6 Groundwater Interim Action

To contain further migration of PCP in upper zone and lower zone groundwater at the Terminal, a groundwater interim action was implemented. The system consists of two groundwater extraction wells, a horizontal well (HRW-1) in the upper zone, and a vertical well (RW-2) in the lower zone and a groundwater intercept system in the east-west trending storm drain at the manhole closest to the Willamette River (SDM-1). Recovery well locations and the storm drain are shown on Figure 2-6.

Pumping within the lower zone from recovery well RW-2 began in October 2000. Since startup of recovery well RW-2, with the exception of periodic shutdowns for system maintenance, groundwater has been extracted continuously from the lower zone. Through December 2003, approximately 12.4 million gallons of water has been removed from the lower zone at RW-2, as shown on Table 2-4. Additional information regarding the quarterly status of the groundwater interim action is provided in quarterly groundwater monitoring reports for the Terminal.

The horizontal well was installed in the upper zone during April 2000. During installation activities of HRW-1, a lateral from the main storm drain was penetrated. This launched an investigation into the impact of the east-west trending storm drain, located approximately 15 to 20 ft south (downgradient) of HRW-1, on the upper zone groundwater. Samples were collected from two manhole

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locations (SDM-1 and SDM-2) and from the stormwater drain outfall at the discharge point into the Willamette River and analyzed for PCP. Results indicated that groundwater from the upper zone was infiltrating into the concrete stormwater drain. Results of this sampling are presented in Table 2-3.

In conjunction with the storm drain outfall sampling, four piezometers (PZ-1 through PZ-4) were installed, and water level monitoring was performed in April and May 2000 in the area of the storm drain and HRW-1. The water level monitoring indicated that the water level in HRW-1 was lower than in the surrounding upper zone monitoring wells. From the water level data collected to date, information collected regarding the storm drain line and the nature of the confining unit (described in Section 6.2.2), it is believed that there is a hydraulic interconnection between the upper and lower zones in the area of the horizontal well. Based on this information and observed conditions, pumping of HRW-1 is limited to the wetter months of the year (i.e., December through May). Table 2-4 summarizes pumping for the upper zone interim action through December 2003. Approximately 310,000 gallons of groundwater have been removed from HRW-1 since startup. Additional information regarding the status of HRW-1 is also provided in the quarterly groundwater monitoring reports for the Terminal.

Due to the inability to operate HRW-1 during the drier months from June through November and the potential for upper zone groundwater to infiltrate into the storm drain line, a groundwater intercept system was installed in the storm drain line on October 8, 2002, at the manhole (SDM-1) located closest to the point of discharge to the Willamette River (Figure 2-6). The system consists of an 8-inch diameter polyethylene pipe routed through the 15-inch storm drain line from manhole SDM-1A through manhole SDM-1. Stormwater from the east property and Terminal office area is routed through the 8-inch liner pipe and discharged to the river. Potentially impacted groundwater entering the storm drain pipe between manholes SDM-1A and SDM-1 is routed through the annulus between the pipes and is collected in manhole SDM-1. The intercepted water is pumped from the manhole to Tank 16804 for processing by the onsite wastewater treatment plant. The installation information for the groundwater intercept system was provided in the *Fourth Quarter 2002 Groundwater Monitoring Report* (Landau Associates 2003b). Status of the groundwater inceptor system is provided in the quarterly groundwater reports for the Terminal.

2.2.2.7 *In Situ* Chemical Oxidation Investigations

To further facilitate the remediation of PCP contamination in the groundwater and soil at the Terminal, use of the *in situ* chemical oxidation (ISCO) technique was assessed during a bench scale laboratory study and a pilot study, conducted within and downgradient of the former PCP mixing area in September 2002. The specific type of chemical oxidation that was implemented during these studies is based on Fenton's Reagent oxidation technology as applied by In-Situ Oxidation Technologies, Inc.

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(ISOTEC) of Englewood, Colorado. The Fenton's Reagent chemical oxidation reaction is created by the combination of soluble iron with low concentrations of hydrogen peroxide to produce hydroxyl radicals (•OH). The hydroxyl radical is a short-lived oxidizer that is very powerful, second only to fluorene in oxidative power. The hydroxyl free radicals attack the carbon double bonds of chlorinated hydrocarbons (e.g., PCP). Iron is used to catalyze the reaction.

For the pilot test, ISOTEC injected reagents into ten locations within and downgradient of the former PCP mixing area. The material injected included 17 percent hydrogen peroxide, complexed iron solution, and tap water. The injection points were driven to a depth of 19 to 19.5 ft BGS and spaced 25 ft apart based on a 12.5 ft estimated radius of influence (ROI). The ROI was estimated based on site lithology, contaminant concentrations, and ISOTEC's previous experience. The depths were chosen so that the reagent could be delivered to the saturated zone between the water table at approximately 16 ft BGS and a silt layer at approximately 19 ft BGS.

Following the injection of the hydrogen peroxide solution, groundwater and soil samples were collected to evaluate the effectiveness of the pilot test. Results from the testing indicated that the pilot study was successful in reducing the concentration of PCP in soil and groundwater (ISOTEC 2003). Currently a work plan is being developed for DEQ's approval for full-scale implementation of ISCO as an interim remedial action treatment of PCP-impacted soil and groundwater in the upper zone within the boundaries of the PCP plume.

2.2.3 PHASE III REMEDIAL INVESTIGATIONS

As described in Section 1.1, the Phase III RI was focused on areas of the Terminal where no extensive soil or groundwater investigations had been previously performed as part of the Phase I, Phase II, or East Property investigations. These areas are referred to as the Phase III study area (shown on Figure 1-2). For purposes of identifying and addressing data gaps, the Phase III investigative work was performed in three stages: a preliminary evaluation, an interim subsurface investigation, and the Phase III RI. Activities associated with the preliminary evaluation and interim subsurface investigation, and the results of these investigations, were previously documented in technical memoranda titled Phase III Preliminary Evaluation (Landau Associates 2002d) and Phase III RI – Interim Subsurface Investigations (Landau Associates 2003d).

The following sections summarize the preliminary evaluation and interim subsurface investigations conducted as part of the Phase III RI.

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2.2.3.1 Preliminary Evaluation

The preliminary evaluation, conducted during the fall of 2001, was performed to identify whether hazardous substances had been released to the environment within the Phase III study area; to evaluate the general distribution of the hazardous substances, if found, in groundwater and soil; and to collect geological, hydrogeologic, and chemical data in advance of a full-scale Phase III RI. The preliminary evaluation consisted of collecting soil samples within twenty-seven grids and seventeen biased areas (Landau Associates 2002d). In addition to soil collection, discrete groundwater samples were collected from 23 temporary well points located within the Phase III study area. The groundwater sampling locations were selected to evaluate groundwater conditions where monitoring wells did not exist at the time of the preliminary evaluation. Discrete groundwater sampling locations (GW-#) are shown on Figure 2-6.

Also, during implementation of the preliminary investigation, Schnitzer Investment Corporation (Schnitzer) collected soil and groundwater samples at nine direct-push borings located on the Time Oil property just west of the Bell Terminal tank farm area. These samples were collected as part of an investigation being performed at the Schnitzer property located directly south and west of the Terminal. During the sampling, Landau Associates collected split soil and groundwater samples at the nine borings for Time Oil. The soil boring locations (SCH-#) are shown on Figure 2-7.

Results from the preliminary evaluation and the Schnitzer split sampling are provided in the Phase III preliminary evaluation technical memorandum (Landau Associates 2002d). Further discussion regarding sampling locations and analysis is provided in Section 5.1 of this report. A discussion of the preliminary evaluation results with the other Phase III RI results is provided in Section 7.0.

2.2.3.2 Interim Subsurface Investigation

Three subsurface investigations were conducted at the Terminal in July 2002 as part of the Phase III RI for the site. The investigations included: 1) a subsurface geology investigation within the Phase III study area using the cone penetrometer technique (CPT), 2) an investigation to better characterize soil and groundwater concentrations in the Bell Terminal tank farm area that were identified during the preliminary evaluation, and 3) a focused investigation to better define the extent of soil contamination identified in selected areas of the Phase III study area during the preliminary evaluation. Results from these investigations are presented in the Phase III Interim Subsurface Investigation Technical Memorandum (Landau Associates 2003d) and are summarized below.

The CPT investigation was conducted to further evaluate the subsurface geology and hydrogeology of the Phase III study area, specifically regarding the extent of the confining unit and the

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interconnection between the upper and lower groundwater zones. Twenty-seven CPT explorations were completed at locations throughout the Phase III study area (Figure 2-7). Information regarding soil behavior type and static water level at various depths was used to refine the geological and hydrogeologic conceptual site model. The geologic and hydrogeologic information from the CPT borings are discussed in Section 6.0 of this report.

Along with the CPT investigation, soil and groundwater samples were collected within the Bell Terminal tank farm area following the detection of gasoline-range and diesel-range petroleum hydrocarbons in soil and groundwater during the Schnitzer investigation. To evaluate the source of the contamination, soil samples were collected at several depth intervals from ten locations (shown on Figure 2-7) within the Bell Terminal. Shallow groundwater samples were also collected from each of the 10 locations. Sampling locations and methods along with the analytical results are discussed in Sections 5.1 and 7.0 of this report.

In conjunction with the CPT investigation, five discrete soil samples were collected to better define the extent of contamination detected in the capillary fringe soil where only composited samples were previously collected. The discrete soil samples were collected within the Phase III preliminary evaluation sampling grids 2, 12, 13, and 21 for chemical analyses (Figure 1-2). Results from the additional discrete soil sampling are discussed in Section 7.0 of this report.

2.3 REGULATORY SETTING

In July 1991, Time Oil entered into a VCP agreement with DEQ for DEQ review and oversight of cleanup of hazardous substances at the Terminal (DEQ 1991). Time Oil was notified in May 1992 (DEQ 1992) that the project was being referred to the Resource Conservation Recovery Act (RCRA) program in lieu of continued work with the VCP. Subsequently, at DEQ's request, Time Oil submitted a site characterization report to DEQ in August 1993 (Landau Associates 1993a) and submitted a draft RCRA facility investigation (RFI) work plan for the former PCP mixing area to DEQ in December 1993 (Landau Associates 1993b). In the spring of 1994, DEQ verbally advised Time Oil that the project would be transferred back to the VCP and, in October 1995, Time Oil received correspondence from DEQ formally reinstating the project to DEQ's VCP (DEQ 1995). A VCP agreement between Time Oil and DEQ was finalized on September 5, 1996. Since that time, investigations at the Terminal have been conducted in accordance with the state of Oregon's Hazardous Substance Remedial Action Rules (OAR 340-122), and associated guidance documents. The guidance documents are listed in the corresponding sections of this report, as applicable.

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3.0 PHYSICAL SETTING

This section provides a description of the physical setting of the Terminal, including topography, regional geology and hydrogeology, surface water features, climate, and meteorology.

3.1 TOPOGRAPHY

The Time Oil Northwest Terminal covers approximately 52 acres within the floodplain of the Willamette River. The ground surface at the Terminal is relatively flat, with ground surface elevations in the Main Terminal tank farm area and the Bell Terminal ranging from about 28 to 30 ft MSL. Along the western boundary of the Main Terminal tank farm area, the ground surface slopes abruptly downward to the Willamette River with topographic elevations ranging from 30 to 8 ft MSL. The East Property, which covers approximately 27 acres, is generally flat with a topographic elevation ranging from 24 to 27 ft MSL. The only significant variation from the generally flat topography is a large linear topographic mound, in the northern portion of the East Property. The east-west trending mound is approximately 450 ft x 50 to 80 ft (L x W) with a topographic range from 24 to 38 ft MSL (Figure 2-1).

Historically, ground surface topography at the Terminal has likely been affected by periodic dredging of the Willamette River. Dredge material from the river was likely used throughout the site as fill for land development. A review of historical aerial photographs indicates that the topographic mound on the East Property existed as early as 1940, but was likely created when the East Property was leveled. Based on a review of historical aerial photographs (Landau Associates 1997b), some changes to the west side of the mound have occurred through time due to scraping from excavation for borrow or regrading, but the majority of the mound has remained unchanged since the 1940s.

Except for the East Property, the main entrance road, and the areas around the office and loading racks, most of the site lacks vegetation and is unpaved. Vegetation on the East Property mainly consists of small scrub brush, blackberry bushes, and grasses. A small topographic depression (approximately 0.9 acre) was observed on the far northeastern corner of the property as part of a site survey conducted for the ecological risk assessment screening process (Landau Associates 1999a). Based on discussions with Time Oil personnel, the depression formed in recent years (since 1995) when drainage from this area was blocked by construction and mounding of soil on the adjacent property to the east. In December 2000, the Oregon Department of State Lands (DSL) ruled that the area was not a jurisdictional wetland on the basis that it appeared to be artificially created on fill material (Oregon DSL 2000).

The Terminal is located approximately at river mile 4 on the Willamette River. Along this reach, the river flows to the northwest and is about 1,500 ft wide.

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3.2 REGIONAL GEOLOGY

This section provides a description of the regional geology in the area, as summarized from several published reports (Swanson et al. 1993; McFarland and Morgan 1996; and Beeson et al. 1991). Regional surficial geology and a regional geologic cross section based on these references are provided on Figures 3-1 and 3-2, respectively. The cross section includes a section through the Willamette River at a location that approximately bisects the Terminal. Local geology for the Terminal is described later in Section 6.1.

The Terminal is located within a structural basin referred to as the Portland Basin. The Portland Basin is defined as the area bounded by the Tualatin Mountains to the west, the Lewis River to the north, the foothills of the Cascade Range to the east, and the Clackamas River to the south. The Portland Basin is described as a northwest trending, pull-apart basin with northwest and northeast trending topographic lineations, faults, and folds. The Tualatin Mountains form a northwest-trending anticlinal ridge that is bounded along its eastern flank by the Portland Hills Fault (Figure 3-1). The Willamette River flows along the base of the eastern side of the Tualatin Mountains and the Terminal is located along the northeastern bank of the river. The Portland Basin is comprised of two distinct geologic associations: the basin-fill sediments of late-Miocene to Holocene age that are present throughout much of the basin, and sedimentary and volcanic bedrock units of Miocene to Pliocene age that underlie the basin-fill sediments and outcrop around the edge of the basin on the west, north, and east. These geologic formations are discussed in the following paragraphs, from oldest to youngest:

- **Columbia River Basalt Group (Tcr)**. The bedrock units of the Portland Basin are comprised of the Miocene flood basalts identified as the Columbia River Basalt Group (CRBG) and the Skamania volcanics. The CRBG is the most extensive rock unit in the Portland Basin. This unit has been folded and faulted and forms the Tualatin Mountain uplands southwest of the site. The unit is assumed to underlie the approximate 1,800 ft thickness of the younger basin-fill sedimentary and volcanic rocks in the center of the basin and reaches a maximum thickness of more than 700 ft.

- **Sandy River Mudstone (Tsr) and Troutdale Formation (Tt)**. Immediately overlying the bedrock units throughout much of the basin are the fine-grained sediments of the Sandy River Mudstone and the conglomerate and finer-grained deposits of the Troutdale Formation of Miocene to Pliocene age. The Troutdale Formation overlays and interlays with the Sandy River Mudstone. These geologic formations were derived from sediment deposited by an ancestral Columbia River and local streams draining the Cascade Range as well as sediment derived from episodes of Pliocene high Cascade volcanism. The Troutdale Formation is the most extensive sedimentary unit in the Portland Basin.

- **Catastrophic Flood Deposits (Qff)**. During the late Pleistocene, sediments were deposited by alluvial and catastrophic flood events in the Portland Basin as a result of repeated failures of glacial ice dams that impounded glacial Lake Missoula (Waitt 1985). These sediments fill the center of the basin and are thickest adjacent to the current locations of the Columbia and Willamette Rivers. Catastrophic flood deposits consist of a basaltic sand and gravel unit with

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varied amounts of cobbles and boulders and a finer stratified, sand, silt, and clay unit. The coarse unit is found near the present channel of the Columbia River and beneath Sauvie Island. The finer unit exists at altitudes of about 250 ft in the basin.

- **Alluvium (Qal)**. Recent alluvial deposits exist along all major streams in the Portland Basin with the most extensive deposits along the Columbia and Willamette Rivers. The Columbia and Willamette River alluvium is primarily sand and silt, whereas the alluvium of the major tributaries is mostly cobble and gravel. Based on geologic logs for wells located near the Terminal, these deposits reach a maximum thickness of about 180 ft.

3.3 REGIONAL HYDROGEOLOGY

This section provides a description of the regional hydrogeology for the Terminal area, as summarized from published reports (McFarland and Morgan 1996 and Swanson et al. 1993). Local hydrogeology at the Terminal is discussed in Section 6.2.

Eight major hydrogeologic units form the Portland Basin aquifer system (for a description of the Portland Basin, see Section 3.2). From oldest to youngest, they include: older rocks, sand and gravel aquifer, confining unit 2, the Troutdale sandstone aquifer, confining unit 1, the consolidated gravel aquifer, and the unconsolidated sedimentary aquifer. The eighth unit is the undifferentiated fine-grained sedimentary aquifer that exists in areas of the basin where the Troutdale sandstone aquifer and the sand and gravel aquifer pinch out. These units can be grouped into three major subsystems, from oldest to youngest: older rocks, lower sedimentary, and upper sedimentary.

The older rock subsystem consists of Miocene and older volcanic and marine sedimentary rocks, generally of low permeability, that underlie and bound the basin-fill sediments in the Portland Basin. With the exception of the CRBG, these older rocks are poor aquifers and, in most areas, supply water in quantities adequate only for domestic use. These rocks are not a primary source of water in many parts of the basin. Where the older rocks are covered by basin-fill sediments, the older rocks are generally too deep to be used as a water supply under the current demand for water.

In most areas of the basin, the lower sedimentary subsystem is composed of interbedded consolidated silt, sand, and clay referred to as confining unit 1 and confining unit 2, and interlayered vitric sandstone and quartzite-pebble-bearing basaltic conglomerate referred to as the Troutdale sandstone aquifer and the sand and gravel aquifer. Toward the western edge of the basin (i.e., along the Willamette River), the Troutdale sandstone and sand and gravel aquifers become finer grained and apparently pinch out. In these areas, confining unit 2 and confining unit 1 are not distinguishable from each other, and the lower sedimentary subsystem is mapped as undifferentiated fine-grained sediments. This undifferentiated fine-grained sediment unit is generally a poor water-bearing formation.

The upper sedimentary subsystem is composed of an unconsolidated sedimentary aquifer overlying the consolidated gravel and volcanic aquifer known as the Troutdale gravel aquifer. The

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unconsolidated sedimentary aquifer consists mainly of late Pleistocene catastrophic flood deposits (Qff) and recent Columbia River alluvium (Qal). The aquifer also includes water-bearing alluvial deposits that occur along smaller streams in the basin as well as floodplain deposits, and terrace deposits along major tributaries. Both the unconsolidated sedimentary aquifer and the Troutdale gravel aquifer are important and productive aquifers in the Portland Basin. In some parts of the basin, the unconsolidated sedimentary deposits are unsaturated; however, in other areas where the unconsolidated sedimentary aquifer consists of saturated alluvium or coarse-grained catastrophic flood deposits, the aquifer is considered the most productive aquifer in the Portland Basin, yielding up to 6,000 gallons per minute (gpm). Alluvium underlying the Columbia River and Willamette River floodplains consists primarily of clayey silt and sand that yields only 5 to 40 gpm. Coarser-grain catastrophic flood deposits can yield 100 to 200 gpm. The Troutdale gravel aquifer can yield from 50 to 2,000 gpm and many public-supply, industrial, and domestic supply wells are completed in this aquifer.

Upland areas (i.e., Tualatin Mountains, Boring Hills, and western Cascade Range) have strong downward components of groundwater flow and are classified as recharge areas. Recharge to the aquifer system in the Portland Basin is primarily by infiltration of precipitation. However, within the urbanized parts of the basin, other sources contribute significant amounts of water locally to the aquifer. The two most significant urban sources of recharge are runoff from impervious surfaces to storm drains or dry wells, and effluent from onsite wastewater treatment or disposal systems (McFarland and Morgan 1996).

Lowland areas (narrow zones along the major streams of the Portland Basin) generally have strong upward components of groundwater flow and are classified as discharge areas. Groundwater discharge in the Portland Basin is primarily to springs, streams, and by pumping from wells. The largest component of groundwater discharge in the Portland Basin is to streams and rivers. Most streams and rivers in the basin are gaining (i.e., receiving groundwater), including the Columbia and Willamette Rivers.

3.4 SURFACE WATER FEATURES

The Willamette River bounds the Terminal to the west, but there are no surface water features (streams, lakes, etc.) on the Terminal property. Because of the relatively flat topographic ground surface, most surface water runoff likely infiltrates directly into the ground. Any runoff along the roads or old railroad beds likely flows toward the eastern side of the property.

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3.5 CLIMATE AND METEOROLOGY

Climate and meteorology data discussed in this section were collected at the Portland International Airport (PDX) by the National Oceanic and Atmospheric Administration (NOAA; http://www.ocs.orst.edu). PDX is located approximately 9 miles east of the Terminal.

The Terminal is located approximately 50 miles from the Pacific Coast and midway between the low coastal range to the west and the higher Cascade range to the east. The climate in the project area is west coast marine, characterized by moderate rainfall. The Cascade mountain range forms a rain shadow from the coastal moisture to the arid and semiarid regions of eastern Oregon and Washington.

The average annual rainfall in Portland (November 1941 through September 2003) was about 36 inches. The average annual rainfall recorded during performance of the Phase III RI activities (2001 to 2003) was approximately 31 inches, and the average monthly rainfall during that time was 2.6 inches. Approximately 60 percent of the annual rainfall occurs during the winter months in the Portland area. Monthly average temperatures at PDX varied between about 35°F during the winter months to about 77°F during the summer months between 1941 and 2003.

Airflow is usually from the northwest in spring and summer and from the east-southeast in fall and winter. Average wind speed at PDX ranges from approximately 7 miles per hour (mph) in September and October through 10 mph in January. The annual mean windspeed is 8 mph.

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4.0 LAND AND BENEFICIAL WATER USE EVALUATIONS

In accordance with OAR 340-122-080 (e) and (f), evaluations were conducted regarding current and reasonably anticipated future land use and regarding current and reasonably likely future beneficial water use at the Terminal and surrounding areas as part of the Phase II RI. The information collected during these evaluations is reported in the Phase II RI report (Landau Associates 2001b). Updated information obtained during the Phase III RI investigation has been incorporated into these evaluations. These evaluations will be used during subsequent studies to evaluate potential human and ecological exposures during the risk assessment and for selecting protective remedial options. The land and beneficial water use evaluations are summarized below.

4.1 LOCALITY OF THE FACILITY

The locality of the facility is defined by DEQ rule as "any point where a human or an ecological receptor contacts, or is reasonably likely to come into contact with, facility-related hazardous substances." [OAR 340-122-115(34)]. Based on the soil and groundwater data collected for all phases of the remedial investigation (see Section 7.0 for nature and extent of contamination at the Terminal), the locality of the facility for the Terminal has been defined to include all of the Phase II and Phase III study areas, the shoreline west of the Main Terminal tank farm area, and the nearshore areas of the Willamette River, as shown on Figure 4-1. The shoreline and river have been included in the locality of facility because hydrogeologic data obtained during the Phase II RI and Phase III RI show that these areas are downgradient of the Main Terminal tank farm area where contaminants have been detected in groundwater and soil, and there is the potential for migration of impacted groundwater from these areas. Low level detections of PCP have been observed within the lower zone during the past year at the southern property boundary of the Terminal. The current groundwater interim action has effectively reversed downgradient groundwater flow near this area; however, because the predominant groundwater flow direction from this area is to the west/southwest toward the river (Bridgewater Group 1998, 2001) and there is potential for migration of these concentrations to the river outside the influence of the interim action, a small portion of the Schnitzer property south of the property boundary near the river is included in the locality of facility. Other properties downgradient of the Terminal include the Schnitzer property located west of the Bell Terminal. The property west of the Bell Terminal has not been included in the locality of the facility because, although contaminants have been detected in soil and groundwater along the western property boundary, current data do not indicate that these contaminants are associated with the Terminal.

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4.2 LAND USE EVALUATION

As described in the Phase II RI report, a land use evaluation was conducted to identify the current and reasonably anticipated future land uses at the Terminal and surrounding properties immediately adjacent to Terminal. The land use evaluation was conducted in accordance with DEQ's guidance *Consideration of Land Use in Environmental Remedial Actions* (DEQ 1998b) and included a survey of adjacent properties, determination of current zoning and comprehensive plans, and identification of any regional trends relevant to land use and activities at the Terminal and the surrounding properties. The results of the land use evaluation identified the following historical and current land use information about the Terminal and at the adjacent properties:

- Current and historical land use for the Terminal and the adjacent properties is/was primarily industrial with some commercial use. Current adjacent property owners are shown on Figure 4-2.

- The East Property at the Terminal and the property owned by Jefferson Smurfit were also used by the military in the 1940s for military barracks and equipment storage.

- The current zoning of the Terminal property is heavy industrial (IH), which is also the comprehensive plan designation for the site property. This designation indicates that the likely reasonable future land use at the Terminal and surrounding properties is and will remain as heavy industrial.

- The Terminal area is within a River Industrial Greenway Zone overlay, within which "river-dependent and river-related industries which strengthen the economic vitality of Portland as a marine shipping and industrial harbor, while preserving and enhancing riparian habitat and providing public access where practical" are encouraged and promoted. Any changes to these designations would require rezoning and are unlikely based on the overall current and planned future use of land in the vicinity of the Terminal.

Zoning designations for the Terminal and the adjacent properties are presented on Figure 4-3.

4.3 BENEFICIAL WATER USE DETERMINATION

As described in the Phase II RI report, a beneficial water use determination was conducted by evaluating current, historical, and reasonably likely future water uses at the Terminal and adjacent properties. The evaluation was conducted in accordance with DEQ's *Guidance for Conducting Beneficial Water Use Determinations at Environmental Cleanup Sites* (DEQ 1998c) and included: inventorying active and inactive private and public/municipal wells within a 1-mile radius of the Terminal, a survey of adjacent property owners and public water suppliers, a review of hydrogeologic documents, a survey of surface water bodies within the Terminal property boundaries or on adjacent properties, and a survey of

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water rights. Private and municipal wells and water rights identified within a one-mile radius of the Terminal are shown on Figures 4-4 and 4-5, respectively.

The results of the evaluation and the data collected during the Phase II and Phase III RI developed the following information about the current and likely future beneficial use of groundwater and surface water at the Terminal, at adjacent properties, and within a 1-mile radius of the Terminal:

- The current and likely future beneficial use of groundwater and surface water at the Terminal, at adjacent properties, and within a 1-mile radius of the Terminal is primarily industrial with some use for irrigation.

- A mitigation wetlands area, owned by the Port of Portland, is located on the adjacent property to the north of the Terminal. These wetlands are upgradient of the Phase II and Phase III study areas and, therefore, do not provide an exposure pathway for contaminants in the soil and groundwater at the Terminal.

- The Willamette River borders the Terminal to the west. Contaminants are present in soil and groundwater along the western property boundary of the Main Terminal tank farm. Because the contaminants in groundwater have the potential to migrate westward (downgradient), contaminants transported in groundwater at the Terminal can potentially reach media in the river (e.g., sediment or surface water).

Continued implementation of the groundwater interim action and implementation of the ISCO technique is expected to contain migration of groundwater impacted by pentachlorophenol (PCP) originating from the former PCP formulation operations in the Phase II RI study area at the Terminal.

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5.0 PHASE III REMEDIAL INVESTIGATION SAMPLING

This section provides a description of soil and groundwater samples collected for the Phase III RI activities performed subsequent to the interim subsurface investigation. Phase III RI soil and groundwater activities previously conducted are summarized in Section 2.2.3 of this report and discussed in detail in the *Phase III Preliminary Evaluation Technical Memorandum* (Landau Associates 2002d), and the *Phase III Interim Subsurface Investigation Technical Memorandum* (Landau Associates 2003d).

Soil analytical data for the investigation described below, the associated data validation report, and laboratory data packages are provided in Appendices E, F, and G of this report. Groundwater data collected in October 2003 for the fourth quarter 2003 groundwater monitoring event is provided with the *Fourth Quarter 2003 Groundwater Monitoring and Groundwater Interim Action Status Report* (Landau Associates 2004).

5.1 SOIL INVESTIGATION

The most recent soil investigation for the Phase III RI was performed during September and October 2003. For this investigation, soil samples were collected from the following locations:

- Twenty-two soil borings drilled for each of the Phase III monitoring wells (LW-19S, LW-20S, LW-20D, LW-21S, LW-22D, LW-23D, LW-24D, LW-25D, LW-26D, LW-27S, LW-27D, LW-28S, LW-29S, LW-29D, LW-30S, LW-30D, LW-31S, LW-32S, LW-32D, LW-33S, LW-34S, and LW-35D; described further in Section 5.2)

- Five soil borings (HB-01 through HB-05) drilled near three sets of parallel conveyance/ manifold pipes that trend northeast-southwest through the Main Terminal tank farm

- Fifteen hand-dug holes located in the eastern portion of the Phase III study area (identified as sample locations G7-03, G7-04, G7-05, G10-4, G10-5, G11-3, G15-4, G15-5, G15-6, G17-4, G17-5, G17-6, G19-3, G19-4, and G19-5); location G10-4 was moved approximately 75 ft directly south from its original planned location due to road base material at the originally planned location

- Two hand-dug holes located in the southeast portion of the Bell Terminal tank farm (identified as sample locations G27-4 and G27-5).

Each of the Phase III soil sample locations are shown with the Phase II soil sample locations on Figure 2-7. The soil samples collected during this investigation were collected with the purpose of filling data gaps identified in the Interim Subsurface Investigation technical memorandum. Soil sample collection procedures were conducted in accordance with the Phase III RI Work Plan (Landau Associates 2001a). Logs for each soil boring or well borehole are provided in Appendix A of this report.

Soil borings HB-01 through HB-05 were drilled using direct-push hand-probe equipment operated by Cascade Drilling, Inc. (Portland, Oregon). Soil samples were collected for chemical analyses

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at these borings at the following depth intervals: 1 to 1.5 ft BGS, 5 to 5.5 ft BGS, and the capillary fringe. No samples were collected from the 0-0.5 ft depth interval, as recommended in the Interim Subsurface Investigation technical memorandum, because during drilling it was observed that at least 0.5 ft of imported sand covered the area where these borings were drilled. Soil samples from 0.5 ft to 1.0 ft were also collected at each of these soil boring locations. Samples from this depth interval were archived pending results of samples collected from the lower depth intervals. Each of the samples collected were analyzed for diesel-range and gasoline-range petroleum hydrocarbons (Methods NWTPH-Dx and NWTPH-Gx); benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl tert-butyl ether (MTBE), 1,2-dibromoethane (EDB), 1,2-dichloroethane (EDC), 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, isopropylbenzene and n-propylbenzene (EPA Method 8260); PAHs (EPA method 8270); and lead and zinc (EPA Method 6010).

The Phase III monitoring well soil samples were collected continuously for lithologic purposes and to check for the presence or absence of non-aqueous phase liquid (NAPL). At paired monitoring well locations, the lower zone monitoring well was drilled and installed first, followed by the upper zone monitoring well. To verify the placement of the upper zone well depth and screened interval, soil samples were collected during drilling of the upper zone well near the estimated top of the confining unit based on the lithologic information collected at the lower zone well. At monitoring well pair LW-27S/27D, the upper zone monitoring well was installed first, because the thickness or presence of the confining unit along the presumed confining unit boundary was unknown and due to the presence of NAPL within the soil samples. Soil samples for chemical analysis were collected from the capillary fringe (about 12.5 ft to 15 ft BGS) at each monitoring well soil boring, except at the well pairs where soil was only collected from one of the well borings.

Soil samples collected within the eastern portion of the Phase III study area and the southeast portion of the Bell Terminal tank farm were collected at the 0 to 0.5 ft BGS depth interval. Samples were also collected from the 0.5 to 1.0 ft and 1.0 to 1.5 ft depth intervals and archived at the laboratory for potential analyses, depending on the results for the surface sample location. The samples were collected from holes dug using hand-held implements (shovels, picks, post-hole diggers, etc.).

Recommendations for analyses to be performed for each soil sample were included in the Interim Subsurface Investigation technical memorandum and were based on constituents previously detected in the associated preliminary evaluation grid sample. The analyses performed for each sample are as follows:

- At locations G7-03, G7-04, G7-05, G11-3, G15-4, G15-5, G15-6, G17-4, G17-5, G17-6, G19-3, G19-4, and G19-5, the samples collected from the 0 to 0.5 ft depth interval were analyzed for PAHs, lead, and zinc. Samples collected from the 0.5 to 1.0 ft and 1.0 to 1.5 ft depth intervals were archived.

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- At locations G10-4 and G10-5, the 0 to 0.5 ft depth interval samples were analyzed for PAHs, lead, and zinc analyses. The samples collected from the 1.0 to 1.5 ft depth interval were analyzed for PAHs only. No samples were collected from the 0.5 to 1.0 ft depth interval.

- At locations G27-4 and G27-5, the soil samples were only collected from the 0 to 0.5 ft interval and analyzed only for PAHs.

All analyses were performed by Specialty Analytical, Inc., laboratory located in Tualatin, Oregon.

5.2 GROUNDWATER INVESTIGATION

The Phase III RI groundwater investigation included installation of 22 permanent monitoring wells in the Phase III study area, development of each well, and collection of groundwater samples from the wells for chemical analyses. These activities were performed during September and October 2003.

5.2.1 WELL DRILLING AND INSTALLATION

Twelve monitoring wells were installed in the Main Terminal tank farm area as part of the Phase III RI. These included:

- Two wells screened in the upper zone (LW-19S and LW-21S)

- Six wells screened in the lower zone (LW-22D, LW-23D, LW-24D, LW-25D, LW-26D, LW-35D)

- Two well pairs each with a well screened in the lower and upper zones (LW-20S/20D and LW-27S/27D).

Well LW-19S was originally scoped to be a lower zone monitoring well near the edge of the confining unit in the northern portion of the Main Tank farm area, based on the geologic conceptual model reported in the Phase III subsurface investigation technical memorandum. During drilling at this monitoring location, the confining unit was encountered at 19 ft BGS. Instead of installing a lower zone well at this location, an upper zone well was installed to characterize hydrogeologic conditions in the upper zone near the estimated boundary of the confining unit, and an additional monitoring well, LW-35D, was installed to the northwest of LW-19S to characterize the lower zone in this portion of the Terminal.

Twelve monitoring wells were installed in the Bell Terminal tank farm area as part of the Phase III RI, including:

- Four wells screened in the upper zone (LW-28S, LW-31S, LW-33S, and LW-34S)

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- Three well pairs each with a well screened in the lower and upper zones (LW-32S/32D, LW-29S/29D, and LW-30S/30D).

Phase III monitoring well locations with Phase II wells and groundwater investigation locations from the Phase III preliminary evaluation and interim subsurface investigation are shown on Figure 2-6.

Soil borings for each of the monitoring wells were drilled using a truck-mounted hollow-stem auger rig. Boreholes were drilled and the wells were constructed and installed in accordance with the Oregon Administrative Rules (OAR) 690-240 and applicable DEQ guidance (DEQ 1992). Borehole drilling and monitoring well construction and installation were performed by Cascade Drilling, Inc., a licensed well driller in the state of Oregon. A summary of drilling and installation activities for the upper and lower zones monitoring wells are discussed in the following sections.

5.2.1.1 Upper Zone Monitoring Wells

The well borings for the upper zone monitoring wells extended to the top of the confining unit, or a maximum of 1 ft into the confining unit. The completed depths for the soil borings ranged from 14.0 ft to 24.0 ft BGS. The depth of the confining unit at each location was determined based on field observations of the soil samples collected continuously to the full depth of each boring (see Section 5.1).

Upper zone monitoring wells were constructed of flush-threaded 2-inch Schedule 40 PVC casing with PVC machine-slotted screen (0.020-inch). The well screens and casing were pre-cleaned using a hot pressure washer. Screen and well casing material were inspected for damage prior to installation. The screened interval for each well extended from near the top of the confining unit to a depth above or near the expected seasonal high water level. This required using a 10-ft well screen at all but four monitoring wells. Monitoring wells LW-20S, LW-28S, and LW-33S were constructed with 5-ft screens because of the thin saturated thickness of the upper zone at these locations. Monitoring well LW-27S was constructed with a 15-ft screen because of the thinning and overall greater depth of the confining unit at this location, which is near the western extent of the confining unit.

Following placement of the well screen and casing in the borehole, a filter pack was installed around each well screen. The filter pack extended from the bottom of the end cap to a minimum of 2 ft above the screen. Filter pack material consisted of commercially prepared, presized, prewashed No. 10-20 Colorado silica sand. The filter pack was carefully placed down the annulus between the well casing and the auger flights or temporary steel casing, as the auger or casing was slowly withdrawn. During filter pack placement, the distribution and depth of the filter pack was monitored with a weighted tape. A 1-ft layer of commercially prepared fine sand (No. 20-40 Colorado silica sand) was placed above the filter pack.

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A bentonite chip seal of at least 2-ft thick was placed above the sand pack to about 1 ft below the ground surface. The surface of each well was completed with a concrete seal and surface pad extending from the top of the bentonite seal to slightly above the surrounding ground surface. Locking steel monuments (aboveground and flush-mount) were cemented in place at the surface to a depth of about 3 ft BGS. At locations where aboveground monuments were installed, a 2x2-ft concrete pad with a minimum thickness of 4 inches was constructed around each well at the ground surface to divert rainfall away from the well casing and three bollards were cemented in place around each wellhead in accordance with OAR 690-240-110. Flush-mounted monuments were installed at locations where vehicular traffic precludes the use of an aboveground monument. The well construction details are presented with the boring logs in Appendix A of this report.

5.2.1.2 Lower Zone Monitoring Wells

Well borings for the lower zone monitoring wells extended at least 10 ft into the lower zone. Completed depths ranged from 29.5 ft BGS to 44.5 ft BGS. Identification of the lower zone at each well location was determined based on field observations of soil samples collected continuously throughout the full depth of each boring (see Section 5.1).

As described in the Phase III work plan (Landau Associates 2001a), a step-down drilling procedure was used for the monitoring wells screened in the lower zone where the confining unit was encountered. This procedure was used to minimize the potential for carry-down of contaminants from the upper zone to the lower zone during drilling. The step-down procedure consisted of drilling to and partially into the top of the confining unit between the two groundwater zones using a 15-inch outside-diameter drill auger. The auger size was then reduced (stepped down) to a 9-inch outside-diameter auger for drilling through the confining unit and into the lower zone. Before drilling the 9-inch-diameter auger through the confining unit, approximately 5 ft of bentonite chips were placed in the borehole and allowed to hydrate for at least one hour. After hydration, the 9-inch auger was lowered into the borehole and drilling was continued through the silt layer to the desired total depth. The step-down procedure was used during drilling of soil boreholes for wells LW-20D, LW-26D, LW-27D, LW-29D, LW-30D, and LW-32D. No step-down procedure was used for drilling boreholes for wells LW-22D, LW-23D, LW-24D, LW-25D and LW-35D located along the western portion of the Main Terminal tank farm because the confining unit was not encountered at these locations.

Lower zone monitoring wells were constructed of flush-threaded 2-inch Schedule 40 PVC casing with PVC machine-slotted screen (0.020-inch). The well screens and casing were pre-cleaned using a hot water pressure wash. Screen and well casing material were inspected for damage prior to installation. All but one of the lower zone monitoring wells installed at locations where the confining unit is present were

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screened over a 10-ft interval that extended from the base of the confining unit into the lower zone. Monitoring well LW-26D was screened over a 5-ft interval to allow for the screened portion of the well to be placed in predominantly sand between two silt layers. In areas where the confining unit was not encountered, a 15-ft screen interval was used to screen across the expected seasonal high and low water elevations.

Following placement of the well screen and casing in the borehole, a filter pack and bentonite seal, concrete seal and surface pad, and locking steel monument (aboveground or flush-mount) were installed using the same procedures described for the upper zone monitoring wells. The well construction details are presented with the boring logs in Appendix A.

5.2.2 WELL DEVELOPMENT

Each monitoring well was developed after the final grout (or bentonite chips) had been allowed to hydrate in the well annulus for a minimum of 24 hours. Development was accomplished using a centrifugal pump and the procedures described in the Phase III work plan. Development continued until at least 5 to 10 casing volumes were removed and turbidity of the discharged water was visibly low. Groundwater sampling did not occur at the wells less than 48 hours following development.

5.2.3 WATER LEVEL MEASUREMENTS

Prior to groundwater sampling, groundwater levels were measured and the presence of NAPL was checked at each monitoring well. Groundwater level measurements were taken from a marked survey point or at the top of the PVC well casing or from the north side of the top of the PVC well casing and recorded to the nearest 0.01 ft. Measurements in the Willamette River were taken from a surveyed PK nail with washer located on the south side of the dock.

5.2.4 GROUNDWATER SAMPLING

Groundwater sampling of the Phase III RI monitoring wells was conducted in conjunction with the fourth quarter 2003 groundwater sampling event. Phase III RI groundwater quality samples were collected on October 27 -28, 2003. Groundwater samples were collected from all but two of the Phase III RI monitoring wells in October 2003. No groundwater samples were collected from monitoring wells LW-28S and LW-33S because these wells were dry during this sampling event. (Note: These wells were sampled as part of the first quarter 2004 sampling event in February 2004. Validated data for this event are not yet available.) Groundwater monitoring locations for this event are shown on Figure 2-6.

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Analytical results and groundwater sampling procedures for the combined Phase II/III fourth quarter 2003 sampling event are provided in the *Fourth Quarter 2003 Groundwater Monitoring and Groundwater Interim Action Status Report* (Landau Associates 2004) and are evaluated in Section 7.0 of this report.

5.2.4.1 Groundwater Chemical Analyses

Groundwater samples collected in October 2003 from the Phase III RI monitoring wells were analyzed for the following constituents: SVOCs (EPA Method 8270); VOCs (EPA Method 8260) including methyl tert-butyl ether (MTBE); PAHs (EPA Method 8270 SIM); diesel-range, motor oil-range, and gasoline-range petroleum hydrocarbons (NWTPH-Dx and NWTPH-Gx); six priority pollutant metals (arsenic, chromium, copper, lead, nickel, and zinc; EPA Methods 6010/7000 series); total dissolved solids (TDS; EPA Method 160.1); chloride (EPA Method 325.2); and field parameters (pH, conductivity, dissolved oxygen, turbidity, and temperature). The laboratory analyses were conducted by Analytical Resources, Inc. (ARI) located in Tukwila, Washington.

5.2.5 SURVEY

Soil sampling locations and temporary well point sampling locations for the Phase III investigations were surveyed by using a global positioning system instrument (GPS), or by taped measurements. Permanent monitoring wells were surveyed using a licensed surveyor (ZTec Engineers of Portland, Oregon). All surveying conducted by the licensed surveyor and/or GPS included the collection of horizontal coordinates (x,y) using the Oregon State Plane coordinate system (NAD 86), and ground surface elevations using MSL datum. Additionally, the elevation of the top of PVC casing and the top of the protective well monument at each of the permanent monitoring wells was surveyed by the licensed surveyor and used as water level measurement reference points. Surveyed reference elevations for each Phase III monitoring well are provided in Table B-1.

5.2.6 RESIDUAL WASTE MANAGEMENT

Investigation-derived wastes including soil, purge water, and decontamination water generated during all activities for the Phase III RI conducted to date were disposed or treated as follows:

- **Soil**: Soil cuttings generated from direct-push borings drilled during the Phase III preliminary evaluation and interim subsurface investigation were disposed at the Swan Hills incineration and disposal facility in Alberta, Canada with the soil stockpile and PCP mixing area soil. Soil generated from the Phase III RI hand probe borings and soil cuttings from the installation of the Phase III monitoring wells was temporarily stockpiled in two lined and covered areas onsite (south-southwest of tank 80014 in the main tank farm area and southeast

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of tank 80009 in the Bell Terminal tank area). The temporary stockpiles were removed on February 19, 2004 and thermally treated and disposed at TPS Technologies in Tacoma, Washington. Disposal documentation is on file at the environmental offices of Time Oil in Seattle, Washington.

- **Purge and Decontamination Water**: Water generated during the sampling of temporary well points, development and sampling of the permanent monitoring wells, and the decontamination of equipment used during the Phase III investigation was transferred directly to the onsite wastewater treatment system for treatment.

5.3 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

The quality assurance and quality control (QA/QC) procedures that were used during the investigations for the Phase III RI were conducted in accordance with the Quality Assurance Project Plan (QAPP; Landau Associates 2001a; Appendix C). These QA/QC procedures included collection and analysis of samples that provided a consistent and predetermined level of precision and accuracy, completeness, representativeness, and comparability/compliance with project data quality objectives; specific QA/QC procedures for sample collection and handling; analytical protocols for analytical laboratories; the use of QC samples; and data validation procedures. As a result of the QA/QC procedures, the Phase III RI data were determined to be adequate for risk assessment evaluations and for future decisions on selection of a remedy for the Phase III soil and groundwater.

5.4 DATA VALIDATION

The results of all Phase III RI chemical analyses underwent a data quality evaluation or data validation. The data quality evaluations were performed in accordance with the QAPP and with applicable portions of the EPA guidance (EPA 1994a, b).

The evaluations considered the following elements:

- Chain-of-custody records
- Holding times
- Blank results (laboratory, method, and field)
- Surrogate recoveries
- Laboratory matrix spikes and matrix spike duplicates (MS/MD) (including laboratory control samples)
- Duplicate analyses (field and laboratory)
- Quantitation limits
- Completeness.

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Data precision was evaluated through laboratory, field, and matrix spike duplicates. Data accuracy was evaluated through laboratory control samples, surrogate spikes, and matrix spikes. Data qualifiers were assigned, as necessary, during the data quality evaluations in accordance with EPA guidelines and data quality objectives established for this project. Data qualifiers that were assigned during data validation are defined within the footnotes of the tabulated analytical data provided in Appendices C and D.

Data summary tables, data validation report, and laboratory data reports for the September/October 2003 Phase III RI soil investigation are provided in Appendices E, F, and G, respectively. The data validation report and laboratory data packages for the October 2003 quarterly groundwater event is provided with the *Fourth Quarter 2003 Groundwater Monitoring and Groundwater Interim Action Status Report* (Landau Associates 2004). All other data discussed herein have been provided with previous submittals.

5.4.1 Data Processing and Management

Data collected during the Phase III RI were processed and managed using a project database (GIS\Key). Additionally, other computer software, including AutoCad, gINT, and Excel were used for evaluation and presentation of the data. Each Phase III RI sample was identified based on the sample location number and depth, as applicable. Field quality control samples (e.g., field duplicates, equipment blanks, etc.) and field parameter measurements (e.g., temperature, pH, specific conductance, dissolved oxygen) were documented on the sample collection forms, and analyses requests were identified from the chain-of-custody forms. Analytical laboratory results were provided in electronic format from the laboratory and were transferred directly into the project database. On occasion, due to small analysis volume, data entry was conducted manually. All entries, whether electronic or manual, underwent a quality assurance check before data quality evaluation or any other type of data analysis was conducted. After the data validation was completed, any data qualifiers were added to the project database.

Data used for graphical presentation or analytical evaluations in AutoCad and Excel originated from the project database after quality assurance checks were complete. Data entered into gINT for the boring logs and well construction information were entered manually based on information recorded in the field on the log of exploration and well completion forms. Each data entry and formula used for the graphical illustrations, spreadsheets, or statistical evaluations was spot-checked again before final data analyses were conducted. Some contour maps were prepared by hand with some initial plots drawn by GIS\Key when the interpretations by the contouring software did not provide an accurate representation of the data considering knowledge of the conceptual site model.

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6.0 GEOLOGY AND HYDROGEOLOGY

This section describes the geology and hydrogeology at the Terminal, as interpreted from the data collected during the site Phase II RI and Phase III RI. The information provided in this section constitutes the geologic/hydrogeologic conceptual site model as it has been refined since previous reports (Landau Associates 1999b, 2001b). This information has also been used to evaluate the potential for contaminant migration, as discussed in Section 8.0. Descriptions of the regional geologic and hydrogeologic settings were provided previously in Section 3.0.

6.1 LOCAL GEOLOGY

The local geology at the Terminal was interpreted from lithologic descriptions of subsurface soil collected during drilling of soil borings and monitoring wells historically and during the Phase III RI, boring logs from adjacent properties, and regional geologic information (see Section 3.2). Available boring logs from historical and Phase II RI locations were provided in the Phase II RI report (Landau Associates 2001b). General soil profiles for different areas of the Terminal based on data collected during the Phase III Preliminary Evaluation were provided in a transmittal to DEQ dated June 3, 2002. Boring logs from the Phase III Interim Subsurface Investigation were provided with the associated reports. Boring logs from the recent (September/October 2003) Phase III investigations are provided in Appendix A.

The Terminal is located on sand fill within the floodplain of the Willamette River. Prior to development of waterfront facilities, this region was characterized by alluvial river deposits consisting of sand and silt deposited by a series of braided channels, lowlands, and marshes. The Willamette River channel has historically, and in the present, been dredged to facilitate transport and moorage of shipping vessels for various industries along the riverfront. It is likely that the shallow soil at the Terminal consists partly of historically dredged fill material that was placed in the upland areas.

As shown on Figures 3-1 and 3-2, the local geology at the Terminal can be inferred from the regional geologic information. A description of the local geologic units observed or anticipated to be present at depth beneath the Terminal based on this data is provided below (from youngest to oldest):

- Fill (Qaf) - River deposits resulting from historic dredging of the Willamette River were likely used as fill material during land development at the Terminal; however, it is unknown whether this material constitutes all the fill at the Terminal or whether the fill in some areas (i.e., East Property) was simply regraded material from elsewhere on the property. The surficial soil at the Terminal is predominantly fill material comprised of fine to medium sand with little silt. The fill material is generally indistinguishable from the uppermost alluvial sand that extends to about 20 ft BGS.

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- Alluvium (Qal) - Alluvial sand and silt deposits are exposed at the surface or underlie the fill at the Terminal. This unit presumably was deposited as overbank or channel alluvium of the ancestral and recent Willamette River channel. Geologic information collected during investigations at the Terminal suggest that thick sequences of alluvial sands, silty sands, and silts are present beneath the Terminal to depths of at least 100 ft BGS.

- Catastrophic Flood Deposits (Qff) - These flood deposits were not observed at the Terminal, but exist at the surface as terraces in adjacent areas southeast of the Terminal, as shown on Figure 3-1. It is expected that, where they exist, they directly overlie the Troutdale Formation.

- Troutdale Formation (Tt) - Based on a boring log for a well owned by the Port of Portland, located about 2 miles northeast of the Terminal, the top of the Troutdale Formation is about 165 ft BGS. Silts and sands above the Troutdale Formation in this area indicate infilling of the ancestral channel with alluvium (Qal). Beeson et al. (1991) report that the Troutdale Formation deposits have been scoured by an ancestral Willamette River, shown on Figure 3-1. Subsurface explorations conducted to date at the Terminal have not encountered the Troutdale Formation.

- Sandy River Mudstone (Tsr) - Published geologic reports suggest that the Sandy River Mudstone deposits can be found at depths of more than 300 ft beneath the Terminal (Beeson et al. 1991); however, no site-specific subsurface data to that depth are available to confirm the presence of these deposits.

- Columbia River Basalt Group (Tcr) - Published maps suggest that the CRBG deposits are present at depths of 300 to 450 ft beneath the Terminal (Beeson et al. 1991; Madin 1994). However, no wells east of the Willamette River in the immediate vicinity of the Terminal have penetrated the overlying sedimentary deposits to the CRBG.

The geologic units encountered at the Terminal include the fill and alluvium.

6.2 LOCAL HYDROGEOLOGY

Based on similar geologic soil types and hydrogeologic characteristics, four principal near-surface hydrogeologic units have been identified at the Terminal. In descending order from ground surface, these units include: 1) an upper zone, 2) a confining unit, 3) a lower zone, and 4) a deep sand unit. As described in the following sections, depending on the continuity of the confining unit, the hydrogeologic units can act as distinct aquifer units with unconfined conditions in the upper zone and confined to semiconfined characteristics in the lower zone, or act as a single unconfined aquifer (beyond the extent of the confining unit). Figure 6-1 shows the location of twelve cross sections of the Terminal that illustrate the relationship between these units. The cross sections are presented on Figures 6-2 through 6-13. The interpretation of local geology and hydrogeology, as represented on the cross sections, was developed from several sources (i.e., soil and well boring logs, and CPT logs). Information from explorations with frequent sampling, such as the CPT, was weighted more heavily than information from

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explorations with less frequent sampling. The hydrogeologic units shown on the cross sections correlate with soil types identified within the fill and alluvium geologic units (see Section 6.1). More detailed descriptions of the hydrogeologic units are provided in the following sections.

6.2.1 UPPER ZONE

The upper zone at the Terminal occurs in the surficial and fill material alluvial sands. The soil is described as a brown to gray, fine- to medium-grained sand with occasional silt and gravel layers. Based on physical testing, silt content in this zone ranges from less than 5 percent to about 25 percent. The alluvial sand is reported to be mostly continuous throughout the Willamette River floodplain.

Hydrostratigraphic relationships and groundwater level data indicate that the upper zone appears to be an unconfined aquifer that is discontinuous in areas where the underlying confining unit is absent (e.g., toward the Willamette River). The top of the upper zone is defined by the shallow water table and, therefore, varies based on seasonal fluctuations. The base of the upper zone ranges from 10 to 20 ft BGS. The average saturated thickness of the upper zone varies from less than about 1 ft along the confining unit boundary to slightly less than 15 ft at wells located in the Main Terminal tank farm area. The variability in the upper zone water levels and, thus, the saturated thickness of the zone, generally is characterized by seasonal high water levels in the winter and spring and seasonal low water levels in the summer and fall. Currently, there are thirty-two Phase II shallow wells and well points (including ISCO wells OX-1S through OX-8S) and eleven Phase III shallow wells at the Terminal installed within the upper zone.

6.2.2 CONFINING UNIT

A silt to sandy silt unit of variable thickness and areal extent separates the upper and lower zones across most of the Terminal. The silt unit appears to act as a confining or semi-confining layer for the lower zone. The silt unit consists of material that is characteristic of natural river overbank deposits, is heterogeneous, and varies in thickness across the site from less than 1 ft to about 30 ft. The confining unit is thickest in the eastern portion of the Main Terminal and the Bell Terminal, and thins as it extends westward in the Main Terminal and as it extends southward in the Bell Terminal, as illustrated on the cross-sections (Figures 6-2 through 6-7, and Figure 6-11). In the western portion of the Main Terminal, as the confining unit becomes thinner, it eventually becomes discontinuous layers of silt and no longer acts as a confining unit between the upper and lower zones. The approximate boundary of the extent of the continuous confining unit is shown on Figure 6-1.

Where present, the uppermost boundary of the confining layer is encountered at about 16 to 20 ft BGS (8 to 13 ft elevation, MSL). Where the silt layer is not present (i.e., along the western portion of the

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Main Terminal at wells LW-22D through LW-25D, LW-6D and LW-9D), the upper zone does not exist and the lower zone acts as a single unconfined groundwater zone.

Constant head permeability tests conducted during the Phase II RI on silt from the confining layer at well locations LW-1D, LW-3D, and LW-4D indicate that average vertical hydraulic conductivities range between 1.4 $x10^{-6}$ to 2.4 x 10^{-6} cm/sec, which is within the typical range of values for silt (Freeze and Cherry 1979).

6.2.3 LOWER ZONE

The lower zone occurs in interlayered river channel and overbank deposits. This material is characterized by gray, fine to medium, sand to silty sand with multiple discontinuous interlayers of silt up to 6 ft thick. In areas where the overlying confining unit is present, the lower zone generally displays semi-confined to confined aquifer characteristics. In areas where the confining unit is absent (i.e., western portion of the Main Terminal), the lower zone appears to act as a single, unconfined aquifer. Where both water-bearing zones are present, the lower zone does not appear to be hydraulically connected with the upper zone, except along the edge of the confining unit over most of the Terminal and downgradient of the PCP mixing area, where the upper and lower zones appear to be interconnected based on the presence of PCP in both zones historically. Hydrogeologic characteristics of the zones (e.g., hydraulic conductivity, yield) and contaminant distribution varies, as discussed in Sections 6.3 and 6.4. Based on local stratigraphic data, the lower zone ranges in thickness from about 15 to 40 ft, depending on the continuity of underlying silt layers. Where the underlying silt layers are continuous, they likely separate the lower zone from a deeper sand unit. Where the silt layers are discontinuous, the lower zone is likely in hydraulic connection with the deeper sand unit. Currently, there are twenty Phase II wells (including recovery well RW-2) and twelve Phase III wells at the Terminal installed in the lower zone.

6.2.4 DEEP SAND UNIT

The deep sand unit is encountered at about 60 to 65 ft BGS. The unit is differentiated from the overlying sand and silt of the lower zone because it predominantly consists of fine to medium sand with low silt content. In most areas, the deep sand unit is separated from the lower zone by thin silt layers. The deep sand unit extends to at least 100 ft BGS, but the extent of the unit and its hydrogeologic characteristics could not be evaluated, based on data collected to date at the Terminal. Currently, there are no monitoring wells installed in the deep sand unit at the Terminal.

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6.3 UPPER ZONE HYDROGEOLOGIC CHARACTERISTICS

This section describes the hydrogeologic characteristics of the upper zone, including groundwater flow, seasonal trends, and hydraulic parameter estimates and groundwater velocities. The hydrogeologic characteristics of the upper zone were evaluated using pre-Phase II RI groundwater level elevation measurements collected from 1993 and 1996, quarterly Phase II RI measurements from March 1997 through October 2003, Phase II continuous water level monitoring and Phase II baseline monitoring during aquifer tests at recovery wells RW-1 and RW-2, and Phase III RI measurements collected in October 2003. The historical groundwater level measurements between 1993 and 1996 were generally collected on a monthly basis and were reported in the Phase II RI report. Continuous water level monitoring and baseline monitoring for the aquifer tests conducted during the Phase II RI are documented in the Aquifer Test Report (Landau Associates 1999b). Quarterly Phase II/III groundwater level measurements since March 1997 are presented on Table B-1 (Appendix B).

Groundwater elevations in the upper zone measured in May and October 2003 during the quarterly groundwater sampling events have been contoured and are shown on Figures 6-14 and 6-15. These quarterly events were chosen because they represent seasonal variability in groundwater elevations in the upper zone, and because of the addition of the Phase III monitoring wells for the October 2003 event. Groundwater elevation contour maps for Phase II RI quarterly events conducted since January 1998 have been provided to DEQ in quarterly groundwater monitoring reports.

6.3.1 GROUNDWATER FLOW AND SEASONAL TRENDS

Phase II and Phase III RI groundwater elevation data indicate that, in general, horizontal groundwater flow in the upper zone within the developed area of the Terminal is consistently to the west/southwest toward the Willamette River. However, a localized shift in the groundwater flow direction to the south/southwest in an area near and including the former PCP mixing area likely reflects the influence of the east-west trending storm drain on groundwater flow. On the east property, a localized change in the groundwater flow pattern occurs, such that the groundwater flow direction in this area is approximately radial away from the north-central property boundary (near LW-101S; Figure 6-14).

As previously discussed, the confining unit between the upper and lower zones thins and terminates along the western portion of the Main Terminal. Groundwater elevations measured at wells located along this boundary reflect the change from two water-bearing zones (upper and lower) to a single unconfined water-bearing zone. For example, during the summer and fall months, well LW-10S and piezometers PZ-3 and PZ-4 are typically dry because they are located beyond the extent of the confining unit. Also, at newly installed Phase III RI well, LW-27S, the water level is not typical of either a lower

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zone or upper zone water level, thereby indicating the edge of the confining unit and the transition from two groundwater zones to one. The groundwater flow patterns in this area mirror the western extent of the confining unit boundary and groundwater gradients increase sharply where groundwater from the upper zone flows over the confining unit boundary. In the area of the Bell Terminal, wells LW-28S and LW-33S were dry during the October 2003 groundwater sampling event. At well LW-33S, the confining unit is likely thinner and discontinuous, as illustrated on Figure 6-9. Overall, the RI data to date show that the groundwater levels in the upper zone are influenced by seasonal variations in precipitation, but the groundwater flow patterns do not appear to vary significantly seasonally.

Hydrographs of water level elevations in the upper zone at selected wells (Figure 6-16) more clearly reflect the seasonal fluctuations, with seasonal lows during the fall months (October-November) and seasonal highs during the winter months (January-February). The hydrographs indicate that the upper zone groundwater table surface fluctuates about 3 to 4 ft seasonally (between about 12 and 24 ft, MSL) for most of the monitoring wells. Figure 6-16 also shows that seasonal upper zone fluctuations generally correspond to seasonal fluctuations in the stage of the Willamette River. However, continuous water level data collected in February 1998 and May 1999 as part of the Phase II RI indicated that water levels in the upper zone do not appear to be directly influenced by semidiurnal fluctuations in the river stage.

Horizontal hydraulic gradients for the upper zone were calculated for four different areas of the Terminal: 1) the area between wells LW-7S and well P represents the northern portion of the Terminal where groundwater flow is generally directly west toward the Willamette River, 2) the area between wells D and LW-4S represents the central portion of the Terminal including the former PCP mixing area where groundwater flow is generally to the south/southwest, 3) the area in the central portion of the Main Tank Farm Area near well LW-27S at the confining unit transition, and 4) the area between wells LW-32S and LW-31S represents the southern portions of the site within the Bell Terminal where groundwater flow is generally to the southwest. Average horizontal gradients range from about 0.007 to 0.01, with the greatest average gradients occurring in the central part of the Terminal at the confining unit boundary (0.1). Average gradients in the northern and southern parts of the Terminal are less and approximately equivalent (Table 6-1).

6.3.2 Hydraulic Parameter Estimates and Groundwater Velocities

Aquifer parameters for the upper zone, including transmissivity (T), hydraulic conductivity (K), and aquifer storage (S) [e.g., specific yield (S_Y) and storativity (S_A)] were estimated from data collected during Phase II RI activities for the Terminal. These included slug/bail tests at wells LW-1S and LW-11S and constant and variable rate pumping tests at recovery well RW-1 in May-June 1999. A detailed

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description of the slug/bail test, aquifer tests, and evaluation results are provided in the Phase II RI report (Landau Associates 2001b) and Aquifer Test report (Landau Associates 1999b).

The slug/bail test analyses results indicate that average K values in the upper zone range from about 40 ft/day at well LW-11S to about 160 ft/day at well LW-1S. For the RW-1 pumping test, the aquifer parameter results indicate that T estimates range from about 180 to 520 ft^2/day and K estimates range from about 45 to 130 ft/day, assuming an average aquifer thickness of 4 ft. In general, slug tests provide estimates that are less representative of aquifer conditions than pumping tests; however, the Phase II RI slug test K estimates agree reasonably with the pumping test K estimates. The S values of 0.02 to 0.13 estimated for the upper zone from the pumping data are within the range of typical storage values for unconfined aquifers. Image well evaluations resulted in little to no difference in aquifer parameter values, indicating that the river had very little to no influence on drawdown in RW-1 during pumping.

Horizontal groundwater velocity (V) is a function of hydraulic gradient, hydraulic conductivity, and effective porosity. Groundwater velocities for the upper zone were estimated using a form of Darcy's Law (Lohman 1972) and the effective porosity (n_e), as shown in the following equation:

$$V = \frac{Ki}{n_e}$$

where: V = average linear groundwater velocity
K = horizontal hydraulic conductivity
i = horizontal hydraulic gradient
n_e = effective porosity

For calculation of groundwater velocities, the range in K values for the upper zone based on the aquifer test evaluations (slug/bail tests and pumping tests) presented above is estimated to be between about 40 to 160 ft/day. Seasonally, horizontal hydraulic gradients range from 0.007 to 0.012. The effective porosity for the upper zone has not been directly measured, but is estimated to be about 0.3 based on the grain size of the aquifer material (Batu 1998). Based on these estimates, upper zone groundwater velocities were estimated to range between about 0.9 to 6.4 ft/day.

6.4 LOWER ZONE HYDROGEOLOGIC CHARACTERISTICS

This section describes the hydrogeologic characteristics of the lower zone, including groundwater flow and seasonal trends, river stage influence, hydraulic parameter estimates, and groundwater velocities. The hydrogeologic characteristics of the lower zone were evaluated using pre-Phase II RI groundwater level elevation measurements collected from 1993 and 1996, quarterly Phase II and Phase III RI measurements from March 1997 through October 2003, Phase II continuous water level monitoring

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measurements, Phase II baseline monitoring during the aquifer tests, and aquifer test results. Water level data pre-1996, Phase II continuous water level monitoring, and baseline monitoring during aquifer tests were documented in the Phase II RI report. Phase II and Phase III quarterly groundwater level measurements since March 1997 are included in Table B-1 (Appendix B).

Similar to the upper zone, groundwater elevation contour maps for May and October 2003 have been provided on Figures 6-17 and 6-18 to assess seasonal variability. The timing for the quarterly water level measurements was scheduled to estimate mean water level elevations or elevations minimally influenced by river stage and to reduce the time-dependent variation between wells screened in the same water-bearing zone.

6.4.1 GROUNDWATER FLOW AND SEASONAL TRENDS

Since startup of groundwater interim action well RW-2 in October 2002, pumping has modified groundwater flow in the lower zone in proximity to the pumping well, such that hydraulic capture is achieved to the west near LW-18D and to the south near LW-10D. Groundwater flow outside the RW-2 capture zone is generally to the west/southwest toward the Willamette River.

Hydrographs of water level elevations in the lower zone at selected wells (Figure 6-19) show typical seasonal fluctuations. Similar to the upper zone, the seasonal lows generally occur during the fall months (October-November). The seasonal highs in the lower zone most commonly occur during the spring months (April-May), likely in response to higher river stage, in contrast to the upper zone where groundwater seasonal highs occurs in January-February. The hydrographs indicate that the lower zone groundwater elevations fluctuate about 6 to 7 ft seasonally, generally between about 5 and 12 ft MSL.

Continuous water level measurements conducted during the Phase II RI and documented in the Phase II RI report, show that during high river stage, groundwater flow in close proximity to the river is inward toward the site; however, groundwater flows toward and discharges to the river from the lower zone when the river stage is at moderate to lower levels. Continuous water level measurements also illustrate the direct correlation between the stages of the river and the lower zone water levels by showing the propagation of semidiurnal tidal fluctuations in the Willamette River into the lower zone. A more detailed discussion of the influence of the Willamette River stage on water levels in the lower zone is provided in the following section.

Horizontal hydraulic gradients for the lower zone were calculated for three different areas of the Terminal: 1) the area between well LW-1D and the Willamette River represents the northern portion of the Terminal where groundwater flow is generally west toward the river, 2) the area between wells B2 and LW-25D represents the central portion where groundwater flow is generally to the west-southwest toward the river, and 3) the area in the southern part of the Terminal near NW-30D. Average horizontal

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gradients range from 0.002 in the central area of the Terminal to 0.003 in the northern portion of the Terminal (Table 6-1). Groundwater gradients are much greater within the area of influence for recovery well RW-2.

6.4.2 River Stage Influence on Lower Zone Groundwater

Baseline monitoring data collected prior to aquifer testing at recovery well RW-2 in February 1999 was used to estimate the correlation of groundwater flow characteristics in the lower zone with the Willamette River stage. This data was evaluated by the following methods: 1) comparison of the Willamette River data with groundwater elevation data at the shallow and deep monitoring wells, 2) calculation of tidal efficiencies and lag times between river stage fluctuations and lower zone well fluctuations, and 3) calculation of mean groundwater level elevations in the lower zone. The results of these Phase II activities are summarized below; more detailed discussions of the evaluations are presented in the Aquifer Test Report (Landau Associates 1999b).

As previously discussed, continuous water level data collected in the Willamette River and the deep monitoring wells during the baseline monitoring period of aquifer testing support the correlation between the groundwater level fluctuations in the lower zone with the stages of the Willamette River. This data was also used to evaluate the tidal efficiency and time lag on the lower zone water levels.

The baseline data indicate that during periods of river recharge to the lower zone (such as those observed in May 1999), tidal efficiencies generally increase with greater distance from the river. These results may be indicative of propagation of river influence farther inward during high river stage, but also reflect a dampening effect of tidal fluctuations in the river on water levels in the nearshore and intermediate lower zone wells. This is converse to the results collected in February 1998 where tidal efficiencies decreased with greater distance from the river during periods of groundwater discharge to the river and response to river stage was much more distinct, reflecting a more typical response to river influence (Landau Associates 1998). Average tidal efficiencies in well LW-12D2, formerly located within the former PCP mixing area and installed within the deep sand unit underlying the lower zone, were generally greater than in the lower zone wells located a comparable distance from the river during the May and June 1999 event. The LW-12D2 tidal efficiency data combined with the overall response to river stage at this location may indicate a more direct influence to river stage in this stratigraphic unit.

Time lags between each maximum and minimum fluctuation in the river and those in the wells were determined for each deep well and averaged. During increasing river stage, it took an average of about 42 minutes for a fluctuation in the Willamette River to be reflected at well LW-9D, located closest to the river, but it took an average of over 1.5 hours for the corresponding river stage influence to be recorded at well LW-12D1. During decreasing river stage, average time lag estimates ranged from about

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1 hour at well J2 to about 3 hours at well LW-12D1. Overall average time lags at LW-12D2 appear to be less than the lower zone wells, again indicating a possible greater river influence in the sand unit underlying the lower zone than in the lower zone. A comparison of the May 1999 and February 1998 data indicate that average time lag estimates tend to be approximately the same for both periods. Tables summarizing the time lag calculations were provided in the Aquifer Test Report and Phase II RI Report.

To remove the effects of semidiurnal river stage fluctuations on the continuous water levels recorded in the deep wells, mean water level elevations were determined using a filtering method by Serfes (1991). The Serfes method uses a time-weighted, moving average to filter out the semidiurnal fluctuations in the wells from river stage influences to produce water level elevation data that are more representative of mean water level conditions. The adjusted groundwater flow directions indicated that mean groundwater flow in the lower zone was generally to the west toward the Willamette River during the monitoring period. Groundwater flow directly adjacent to the river is inward from the river during high river stages. However, mean flow conditions over most of the Terminal and during lower river stages through most of the year are generally toward the river.

6.4.3 Hydraulic Parameter Estimates and Groundwater Velocities

Aquifer parameter estimates for the lower zone were based on data collected during aquifer tests in May-June 1999, including slug/bail tests at five deep wells and a constant rate pumping test at recovery well RW-2. A detailed description of the aquifer tests, evaluation results, and plots is provided in the Aquifer Test Report (Landau Associates 1999b).

Average K values representing the lower zone from the slug/bail test data ranged from about 25 ft/day at well J2 to 80 ft/day at well LW-6D. The average K values calculated at wells LW-11D and LW-9D do not appear to be representative of overall aquifer characteristics, but may possibly be related to the increase in silt content in the water-bearing zone and screened interval at LW-11D or to the effects of recharge from the river during the test period.

Aquifer parameters for the lower zone were also estimated based on data collected during a constant rate discharge test at RW-2. In the lower zone, the data indicate that estimated T values were higher than the upper zone, ranging from about 2,100 to 7,000 ft^2/day. K values were comparable to the upper zone and representative values generally ranged from about 65 to 130 ft/day, assuming an average aquifer thickness of 32 ft. S values generally ranged from about $1.2x10^{-3}$ to $8.1x10^{-2}$, which is within the typical range for storage for confined aquifers. Aquifer test data evaluations indicate that leakage from the upper zone or underlying units is likely occurring to some extent at each observation well and that wells located closest to the river are likely influenced by river recharge. Also, at well LW-9D, the aquifer test data indicate that unconfined aquifer conditions exist at this location. This is consistent with

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stratigraphic data that indicate that the confining unit between the upper and lower zone is absent at this location creating unconfined conditions and a connection between groundwater in the lower zone and the river.

Groundwater velocities for the lower zone were estimated using the equation provided in Section 6.3.2. For calculation of groundwater velocities, the range in K values for the lower zone based on the aquifer test evaluations (slug/bail tests and pumping tests) presented above is estimated to be between 25 and 130 ft/day. Seasonally, horizontal hydraulic gradients range from 0.0002 to 0.004. The effective porosity for the lower zone has not been directly measured, but is estimated to be about 0.3 based on the grain size of the aquifer material (Batu 1998). Based on these aquifer parameter estimates, lower zone groundwater velocities are estimated to range between about 0.02 to 1.7 ft/day.

6.5 VERTICAL GROUNDWATER FLOW

The potential for groundwater flow between the upper and lower zones was evaluated through calculation of vertical hydraulic gradients at shallow and deep well pairs, LW-1S/1D, J1/J2, LW-4S/4D, LW-9S/9D, LW-10S/10D, LW-11S/11D, LW-20S/20D, LW-32S/32D, and LW-29S/29D. Vertical hydraulic gradients were calculated from groundwater elevations measured during the quarterly sampling events from March 1997 through December 2003 (Table 6-2). Vertical gradients were consistently downward at all well pairs during this period. As shown in Table 6-2, vertical gradients at the well pairs between the upper and lower groundwater zones ranged from 0.07 to 0.68. The LW-9S/D well pair, located adjacent to the Willamette River in an area where the confining unit between the upper and lower zones is absent, had the lowest vertical gradient (0.07). The low vertical gradient in this area confirms that the upper and lower zones act as one hydrogeologic unit in this area. The vertical gradients between the upper and lower zones were also much greater than those between the lower zone and the deep sand unit, as represented by abandoned wells LW-12D1/12D2 (average vertical gradient of 0.01).

Figure 6-20 shows the seasonal variability of the vertical gradients at each of the well pair locations. Vertical gradients at the well pairs where long-term data are available are greatest during the seasonal low periods in the fall (October-November). The lowest vertical gradients generally correspond to intermediate seasonal periods during the late spring months (April-May).

6.6 AQUIFER RECHARGE AND DISCHARGE

Groundwater in the upper zone is most likely recharged by direct infiltration from precipitation. Lower zone groundwater appears to be recharged primarily from the upper zone and from subsurface flow from the north and east. Groundwater from both water-bearing zones generally discharges to the

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Willamette River. Groundwater in the lower zone is recharged by the Willamette River during periods of high river flow in response to short-term increases in river stage. The radial flow pattern in the upper zone at the north side of the east property may be representative of localized recharge to the upper zone in this area.

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7.0 NATURE AND EXTENT OF CONTAMINATION

This section provides an evaluation of the nature and extent of contamination in the groundwater and the soil at the Terminal. The nature of the contamination is evaluated based on the contaminants detected in samples collected during the various investigations conducted at the Terminal and comparison of soil and groundwater concentrations to preliminary screening levels. The extent of the contamination is evaluated based on the horizontal and vertical distribution of these contaminants in groundwater and soil. A discussion of the fate and transport of the contaminants based on the evaluation presented in this section is provided in Section 8.0

The preliminary soil screening levels used for the evaluation of the soil sample results include the following:

- EPA Region 9 human health industrial soil screening values (EPA 2002).
- EPA Region 9 human health soil screening values for the potential migration of contaminants from soil to groundwater using a dilution-attenuation factor of 1 (DAF=1) and a dilution-attenuation factor of 20 (DAF=20) (EPA 2002).
- Oregon DEQ ecological risk screening level values (SLVs) for soil (DEQ 2001) for the protection of plants, mammals, birds, and invertebrates. Ecological risk is typically evaluated based on the known or suspected presence of hazardous substances in surficial soil (upper 1 meter; DEQ 1998); therefore, these criteria were not used to evaluate contaminants in soil at depths greater than 3 ft BGS.
- Oregon DEQ generic risk-based concentrations for petroleum constituents and total petroleum hydrocarbons (DEQ 2003b).
- Site-specific background concentrations for metals determined previously during the contaminants of potential concern (COPC) and contaminants of potential ecological concern (CPEC) screening process for Phase I and Phase II soil (Landau Associates 1999a). Metal concentrations in soil were first compared to the site-specific background concentrations; comparison of soil concentrations to the other preliminary screening levels listed above was only conducted where the soil concentrations exceeded background.

The preliminary groundwater screening levels used for the evaluation of the groundwater sample results include the following:

- EPA National Recommended Water Quality Criteria (EPA 2002).
- Oregon DEQ ecological risk SLVs (DEQ 2001) for the protection of aquatic species, mammals, and birds.
- Oregon Ambient Water Quality Criteria for freshwater (DEQ 2004).
- Oregon DEQ generic risk-based concentrations for petroleum constituents and total petroleum hydrocarbons (DEQ 2003b).

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- Site-specific background concentrations for metals determined previously during the COPC/CPEC screening process for upper and lower zone groundwater (Landau Associates 1999a). Metal concentrations in upper and lower zone groundwater were first compared to the site-specific background concentrations; comparison of groundwater concentrations to the other preliminary screening levels listed above was only conducted where groundwater concentrations exceeded background.

These preliminary screening levels are presented in Appendices C and D for soil and groundwater, respectively. The comparison of Phases II and III RI soil and groundwater results to these preliminary screening levels is intended to provide a preliminary and conservative evaluation of the magnitude of contaminant concentrations present at the Terminal. In addition to site-specific background concentrations, only surface water screening levels were used for comparison to groundwater contaminant concentrations because the primary pathway of concern at the Terminal is groundwater to surface water. Groundwater within the locality of the facility is not currently used as drinking water nor is it reasonably likely to be used as a drinking water source in the future. Final screening levels to be used for determining COPCs/CPECs for the Terminal will be determined during the risk assessment process. Also, as indicated earlier, hot spots of contamination will be identified following determination of acceptable risk levels during the risk assessment process.

7.1 SOIL

The nature and extent of contamination present in the soil at the Terminal was evaluated based on chemical results for soil samples collected throughout the Phase II and the Phase III RIs, which are representative of soil remaining at the Terminal following completion of interim remedial or removal actions (Section 2.0).

7.1.1 SELECTED CONTAMINANTS OF INTEREST

Tables summarizing the constituents detected in soil at the Terminal are provided in Appendix C. Consistent with the historical uses of the Terminal for bulk storage of petroleum products and for blending of specialty wood treating products, constituents detected in the soil include these chemical groups: petroleum hydrocarbons and constituents that are commonly associated with petroleum products (i.e., PAHs and VOCs), metals, and chlorinated phenols. To focus the discussion in this report on the distribution of constituents that will likely be risk drivers, concentrations for only a few constituents from each of these groups of chemicals (i.e., TPH, carcinogenic PAHs, VOCs, chlorinated phenols, and metals) were selected for presentation on the Terminal maps. The plots are presented on Figures 7-1 through 7-32. The constituents selected for presentation of soil concentrations and referred to throughout this discussion as selected contaminants of interest (COIs) include: diesel-range and gasoline-range

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petroleum hydrocarbons, benzo(a)anthracene, benzene, ethylbenzene, lead, zinc, and PCP. These constituents were identified as the selected COIs based on the frequency that these constituents were detected in the soil and the frequency that the detected concentrations exceed the minimum preliminary screening levels.

For example, the diesel-range and gasoline-range petroleum hydrocarbons were the most frequently detected petroleum hydrocarbons in soil. For this reason, and because of the history of the Terminal as a bulk fuel storage facility, diesel-range and gasoline-range petroleum hydrocarbons were included in the selected COIs. Of the PAHs detected in soil, benzo(a)anthracene concentrations most frequently exceeded the preliminary screening levels, and benzo(a)anthracene was also detected in 45 percent of the soil samples analyzed for PAHs. Although benzene and ethylbenzene were not the most frequently detected VOCs in soil, they were included in the selected COIs because the concentrations of benzene and ethylbenzene in soil most frequently exceed the preliminary screening levels. Very few of the concentrations for the other detected VOCs in soil exceed preliminary screening levels.

Except for mercury and nickel, each metal was detected in 98 percent or more of the soil samples analyzed. The frequency of metal detections is likely related to the ubiquitous occurrence of most metals analyzed in soil in this area. Therefore, instead of using the frequency of detection for identifying the metals of interest, the frequency that the metals concentrations exceed the preliminary screening levels, including site-specific background, was used. A comparison of the concentrations for individual metals to preliminary screening levels indicates that the metals that most frequently exceed the minimum preliminary screening level in soil are lead and zinc.

PCP was also included as in the selected COIs based on the historical uses of PCP in the specialty wood treating products blended and stored at the Terminal.

Preliminary screening levels for all detected constituents in soil are presented in Tables C-1 through C-6 of Appendix C of this report. COPCs/CPECs will be identified through the screening process defined by DEQ guidance (DEQ 1999, 2000) during the upcoming risk assessment.

7.1.2 CONTAMINANT DISTRIBUTION

To facilitate evaluation of the horizontal distribution of the selected COIs in the soil at the Terminal, the Terminal was divided into six subareas based on historical Terminal operations: the Main Terminal tank farm area, the Bell Terminal tank farm area, the loading rack/entrance area of the Main Terminal, the eastern portion of the Phase III study area, the asphalt-paved road area located north of the Bell Terminal, and the Phase II study area (Figure 1-2). To facilitate evaluation of the vertical distribution of the selected COIs in the soil at the Terminal, soil was divided into four depth intervals: 0 to 0.5 ft BGS, 1 to 1.5 ft BGS, 5 to 5.5 ft BGS, and the capillary fringe (and deeper). The distribution of

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the selected COIs in soil at these four depth intervals at arbitrary concentration ranges is presented on Figures 7-1 to 7-8, 7-9 to 7-16, 7-17 to 7-24, and 7-25 to 7-32, respectively. The remainder of this section discusses the distribution of the selected COIs at the four depth intervals for each subarea.

7.1.2.1 Main Terminal Tank Farm Area

Locations where soil samples were collected within the Main Terminal tank farm area are shown on Figure 2-7. Concentrations of detected constituents within this area are provided in Table C-1. In the Main Terminal tank farm area, most of the detected concentrations of the selected COIs occur in the soil located near the aboveground tanks.

In the surface soil at the Main Terminal tank farm area, diesel-range petroleum hydrocarbons are detected (typically at concentrations greater than 10 mg/kg) (Figure 7-1) throughout the main tank farm area, but gasoline-range petroleum hydrocarbons and benzene are not detected (Figures 7-2 and 7-4, respectively). PAHs and metals are detected at concentrations exceeding preliminary screening levels. Lead and zinc concentrations typically exceed 10 mg/kg (Figures 7-6 and 7-7, respectively) and detected concentrations of benzo(a)anthracene typically are less than 1 mg/kg (Figure 7-3), but in one composite sample (G13 (0-0.5). PAH concentrations were between about 4 and 15 mg/kg. PCP was analyzed for in the soil only at location LW-6D and was only detected in the surface soil at a concentration of 0.0056 mg/kg (Figure 7-8). Concentrations of these constituents and the frequency that these concentrations exceed preliminary screening levels significantly decreases with depth until the capillary fringe zone.

At the 1.5-ft-depth interval, diesel-range and gasoline-range petroleum hydrocarbons and benzo(a)anthracene are present; however, the presence of these constituents appears to be limited to the northern portion of the Main Terminal tank farm area (i.e., adjacent to the existing tanks) (Figures 7-9 through 7-11). The maximum diesel-range TPH concentration (2,330 mg/kg) was detected in the soil sample collected from boring HB-05 (Figure 7-9). Gasoline-range TPH was also detected in this soil sample at a concentration of 32.8 mg/kg (Figure 7-10).

At the 5.5-ft depth interval, concentrations of diesel-range and gasoline-range petroleum hydrocarbons increase and gasoline-related components (i.e., benzene and ethylbenzene) are detected (Figures 7-17, 7-18, 7-20, and 7-21). These constituents are observed at this depth interval at soil sampling locations HB-01 through HB-05 located primarily near petroleum conveyance pipelines. Diesel-range petroleum hydrocarbon concentrations range from nondetect to 7,170 mg/kg (Figure 7-17). Gasoline-range petroleum hydrocarbon concentrations range from 3.43 mg/kg to 8,120 mg/kg (Figure 7-18).

The highest concentrations of the selected COIs in the Main Terminal tank farm area are observed in soil at the capillary fringe depth interval. Diesel-range petroleum hydrocarbons

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concentrations range from nondetect to 36,100 mg/kg (Figure 7-25). Gasoline-range petroleum hydrocarbon concentrations range from nondetect to 8,920 mg/kg (Figure 7-26). Benzene and ethylbenzene concentrations range from nondetect to 5.29 mg/kg and nondetect to 39 mg/kg, respectively (Figures 7-28 and 7-29). Benzo(a)anthracene concentrations range from nondetect to 0.58 mg/kg (Figure 7-27), and lead and zinc concentrations range from nondetect to 37.1 mg/kg and 40.1 mg/kg to 1,020 mg/kg, respectively (Figures 7-30 and 7-31).

With the exception of benzo(a)anthracene, the selected COIs were not detected in the soil sampled along the western boundary of the Main Terminal tank farm area closest to the river (i.e., at soil sample locations LW-6D, LW-22D, LW-23D, LW-24D, LW-25D, and LW-35D) at concentrations exceeding the preliminary screening levels. Gasoline-range and diesel-range petroleum hydrocarbons were detected in the soil at only two locations along the western boundary of the Main Terminal tank farm (Figures 7-25 and 7-26, respectively). These detections occurred in soil collected from the capillary fringe and from soil below the groundwater table at locations LW-24D and LW-35D. The maximum gasoline-range and diesel-range concentrations (12.7 mg/kg and 44.3 mg/kg, respectively) occurred at location LW-35D. Concentrations of benzo(a)anthracene ranging from 0.0147 mg/kg to 0.115 mg/kg were observed in the soil collected from the capillary fringe at locations LW-6D, LW-25D, and LW-35D (Figure 7-27). Benzene and ethylbenzene were not detected in the soil along the western boundary (Figure 7-28 and Figure 7-29, respectively). Within the capillary fringe depth interval, lead was detected at locations LW-22D and LW-35D at concentrations of 4.49 mg/kg and 4.38 mg/kg, respectively (Figure 7-31). Zinc was detected at composite sample G8 and G12 at concentrations of 45.3 mg/kg and 44.5 mg/kg (Figure 7-31).

7.1.2.2 Bell Terminal Tank Farm Area

Locations where soil samples were collected within the Bell Terminal tank farm area are shown on Figure 2-7. Concentrations of detected constituents in this area are provided on Table C-2. Constituents detected in the soil within the Bell Terminal tank farm area include PAHs, VOCs, TPH, and metals. Each of these constituents, except VOCs, was detected in the surface soil at low to moderate concentrations. TPH in the surface soil is limited to diesel-range (Figure 7-1) and motor oil-range petroleum hydrocarbons at concentrations ranging from nondetect to 859 mg/kg and nondetect to 699 mg/kg, respectively. PAHs and metals were found in the surface soil at concentrations exceeding preliminary screening levels. Although some of the detected concentrations in the composite samples are associated with samples representing a grid area of approximately 40,000 ft^2, the extent of affected surface soil does not appear to be widespread throughout the Bell Terminal.

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The frequency of detected constituents and the concentration of these constituents decreases significantly just below the surface soil (i.e., 1 to 1.5 ft BGS depth interval). Diesel-range (Figure 7-9) and motor oil-range petroleum hydrocarbons were detected in only one sample at this depth interval at concentrations of 58.5 mg/kg and 65.5 mg/kg, respectively.

For samples collected at 5 to 6 ft BGS, laboratory analysis by NWTPH-HCID determined that there were no detectable concentrations of gasoline-range or diesel-range petroleum hydrocarbons at this depth.

In the capillary fringe, elevated concentrations of TPH are detected in the soil. These elevated concentrations appear to be focused in three areas: along the western property boundary adjacent to the east-west trending pipeline that was demolished by Schnitzer in the 1970s while still in use and containing petroleum product (Figure 2-1), along the western property boundary in an area previously used by operators of the adjacent Schnitzer property, and in the central portion of the Bell Terminal (Figures 7-25 and 7-26, for diesel-range and gasoline-range TPH, respectively). The TPH concentrations found in the capillary fringe soil near the pipeline appears to be localized at the western end of the pipeline (at and around sample location BT-05 and SCH-56 where the pipeline was ruptured). Diesel-range and gasoline-range petroleum hydrocarbons were found at concentrations of 12,700 mg/kg and 8,750 mg/kg, respectively, in this area at sample location SCH-56 within the capillary fringe depth interval. Other elevated concentrations of diesel-range and gasoline-range petroleum hydrocarbons were observed along the western property boundary at locations G21-1, LW-30S, SCH-63B, SCH-59, and SCH-61. Gasoline-range and diesel-range petroleum hydrocarbons were detected at these locations in the capillary fringe soil at concentrations ranging from 162 mg/kg to 4,620 mg/kg and 1,120 mg/kg to 10,200 mg/kg, respectively (Figures 7-25 and 7-26). Within the central portion of the Bell Terminal, diesel-range and gasoline-range petroleum hydrocarbons were found at locations BT-06 and LW32D, with maximum concentrations detected at LW32D at 6,450 and 4,200 mg/kg, respectively. Ethylbenzene was detected at several locations within the Bell Terminal at concentrations of less than 1 mg/kg (Figure 7-29), but benzene was not detected (Figure 7-28).

7.1.2.3 Loading Rack/Entrance Area of the Main Terminal

Locations where soil samples were collected within the loading rack/entrance area of the Main Terminal are shown on Figure 2-7. Concentrations of detected constituents in this area are provided on Table C-3. Because this area is covered with gravel fill, surface soil samples were not collected, except at location LW-7S. At this location, only PCP was detected in the surface soil at a concentration of 0.011 mg/kg (Figure 7-8). Results for soil samples collected from the 1 to 1.5-ft depth interval indicate that PAHs, TPH, and VOCs are not present in the soil in this area at this depth interval. Metals were detected

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in the soil at this depth, but only zinc concentrations (typically detected at concentrations between 10 and 100 mg/kg) exceeded the preliminary screening levels (Figure 7-15). The frequency of detected constituents in soil increases in this area at the capillary fringe depth interval. A few PAHs, several VOCs, diesel-range, gasoline-range, and kerosene-range petroleum hydrocarbons, and metals are detected in the soil at this depth. Gasoline-range petroleum hydrocarbons, a few PAHs, a few VOCs, and zinc exceeded preliminary screening levels. Concentration ranges for selected COIs are shown on Figures 7-25 through 7-31 for the capillary fringe depth interval.

7.1.2.4 Eastern Portion of the Phase III Study Area

Locations where soil samples were collected within the eastern portion of the Phase III study area are shown on Figure 2-7. Concentrations of detected constituents in this area are provided on Table C-4. Of the seven selected COIs, only benzo(a)anthracene, diesel-range petroleum hydrocarbons, lead, and zinc are present in soil in the eastern portion of the Phase III study area. Gasoline-range petroleum hydrocarbons, benzene, ethylbenzene, and PCP were not detected. Lead and zinc appear to be ubiquitous throughout the area in the top 2 ft of soil. The selected COIs appear to be present at higher concentrations in the surface soil (0 to 0.5 ft BGS) than in the deeper sample intervals. The concentrations of benzo(a)anthracene (Figure 7-3) and other PAHs, and lead (Figure 7-6), zinc (Figure 7-7), and other metals found at this depth interval are also typically greater than the preliminary screening levels. The detected concentrations of diesel-range hydrocarbons (ranging between about 25 and 500 mg/kg) (Figure 7-1) and cPAHS (typically greater than 1 mg/kg) appear to be associated with historical roads in this area.

At the next sample depth interval, 1.0 to 1.5 ft BGS, lead and zinc are frequently detected at concentrations exceeding 10 mg/kg (Figures 7-14 and 7-15, respectively), but the frequency that these metals are present at concentrations exceeding preliminary screening levels decreased significantly. TPH was not detected, except at one location, BA-11, where diesel-range petroleum hydrocarbons were detected at a concentration of 574 mg/kg (Figure 7-9). Because the capillary fringe in this area is shallow and close in depth to the 5.5-ft depth interval, only one composite sample (G-11) was collected at the 5.5-ft depth interval within this area; the results for this sample indicate that benzo(a)anthracene (Figure 7-19) and other PAHs are present at this depth at a concentration exceeding 1 mg/kg and preliminary screening levels. Metals were not analyzed at this depth interval.

At the capillary fringe depth interval, only a few PAHs and VOCs were detected, and only at composite sample BA-11, located adjacent to historical roads, did these concentrations exceed preliminary screening levels. Metals were frequently detected, but only occasionally exceeded the

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preliminary screening levels. TPH was not detected. Concentration ranges for selected COIs in the capillary fringe are shown on Figures 7-25 through 7-32.

7.1.2.5 Asphalt-Paved Road Area

Locations where soil samples were collected within the asphalt-paved road area are shown on Figure 2-7. Concentrations of detected constituents in this area are provided on Table C-5. Constituents detected in the soil within the asphalt-paved road area include PAHs and metals and a single occurrence of TPH. Metals were detected at each of the soil depth intervals sampled (i.e., 0 to 0.5 ft BGS, 1 to 1.5 ft BGS, and the capillary fringe). Concentrations of metals above the preliminary screening levels, however, were only detected in the surface soil (0 to 0.5 ft BGS; Figures 7-6 and 7-7 for lead and zinc, respectively). Also, PAHs and TPH were only detected in the surface soil sample. Three PAHs, including benzo(a)anthracene (Figure 7-3), were detected at concentrations above the preliminary screening levels. TPH, consisting of motor oil-range petroleum hydrocarbons, was detected at a concentration of 301 mg/kg. Samples collected in this area were collected below the asphalt surface and underlying roadbase material, with one exception at location G-20. The detected concentrations in the surface soil at this location likely result from the presence of these constituents in the roadbase material of the asphalt road.

7.1.2.6 Phase II Study Area

Locations where soil samples were collected that represent soil remaining in the Phase II study area are shown on Figure 2-7. Concentrations of PCP remaining in the soil following completion of the soil removal actions in the former soil stockpile area and former PCP mixing and warehouse areas are shown on Figure 2-3. Concentrations of detected constituents in this area are provided on Table C-6. PCP was the constituent used to determine extent of contamination and cleanup for the soil removal actions. Because of the limitations in excavating soil below the water table, the base of the excavation did not extend below about 13 ft BGS. Consequently, PCP concentrations ranging from greater than 2 mg/kg to 180 mg/kg remain within and adjacent to the former PCP mixing area at depths as shown on Figure 2-3. Because soil was removed from this area during the removal actions, only samples from four locations (LB16, LS1, LS2, and LW-1D) represent the existing surface soil. PAHs, PCP, TPH and metals are all detected in the surface soil in this area. A few PAHs [Figure 7-3 for benzo(a)anthracene], lead (Figure 7-6), and zinc (Figure 7-7) are present above the preliminary screening levels. Concentrations of diesel-range (Figure 7-1) and motor-oil range petroleum hydrocarbons range from nondetect to 140 mg/kg and

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130 mg/kg to 420 mg/kg, respectively. PCP was only detected at one location (LW-1D) at a concentration less than 1 mg/kg (Figure 7-8).

Seven samples represent the soil remaining at depths greater than 0.5 ft BGS, but above the capillary fringe in this area. At these depths (1.0 to 1.5 ft and 5.0 to 5.5 ft depth intervals), only pentachlorophenol (Figures 7-16 and 7-24) and one occurrence of benzo(b)fluoranthene exceed preliminary screening levels; however, these concentrations are all well below 1 mg/kg. No VOCs, except BETX, were analyzed for at this depth interval. BETX was not detected in the soil (Figures 7-12 and 7-20 for benzene; Figures 7-13 and 7-21 for ethylbenzene). Copper and zinc were the only metals analyzed and both were detected but at concentrations below the preliminary screening levels. (Figures 7-14 and 7-22 for lead; Figures 7-15 and 7-23 for zinc). TPH was detected in three samples from this depth interval at concentrations ranging from 6.4 mg/kg to 66 mg/kg for diesel-range petroleum hydrocarbons (Figures 7-9 and 7-17) and at a concentration of 98 mg/kg for motor oil-range petroleum hydrocarbons.

Sixty-one samples (including three blind field duplicate samples) represent the soil remaining at depths at, or below the capillary fringe in this area. At this depth interval, PAHs, PCP, VOCs, TPH and metals are all detected. PAHs at concentrations above the preliminary screening level are present at a few locations [LB13, LB14, LB15, LB17, LB23, and LW-5S; Figure 7-27 for benzo(a)anthracene]. VOCs, including ethylbenzene and xylenes, are present at concentrations above the preliminary screening levels at locations LB11 and LB14 (Figure 7-29 for ethylbenzene; Figure 7-28 for benzene). Metals are present at concentrations above the preliminary screening levels at LB3, LB6, LB18, and LW-3D (Figure 7-30 for lead; Figure 7-31 for zinc). Diesel-range petroleum hydrocarbons are detected in the soil at several locations (LB3, LB6, LB11, LB13, LB-14, LB-15, LB16, LB17, LB19, LB22, LW-2S and LW-5S) at concentrations ranging from 6.4 to 4,700 mg/kg (Figure 7-25). The maximum diesel-range petroleum hydrocarbon concentration (4,700 mg/kg) occurred at location LB14. Gasoline-range petroleum hydrocarbons are present at three locations, LW2S, LB11, and LB3 at concentrations of 80 mg/kg, 210 mg/kg, and 1,100 mg/kg respectively (Figure 7-26). Dioxins and furans were also detected at locations within the former PCP mixing area at concentrations ranging from about .011 ng/kg to 5,110 ng/kg (total TEQ). Residual PCP concentrations remaining following the removal action range from nondetect to 180 mg/kg at LB14. Residual PCP soil concentrations at this depth are expected to be addressed through use of the ISCO technique this area in spring-summer 2004.

7.2 GROUNDWATER

The nature and extent of contamination present in the groundwater at the Terminal was evaluated based on chemical results for groundwater samples collected from Phase II and Phase III monitoring

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wells, injection wells, and recovery wells in October 2003 and from discrete groundwater samples collected from soil borings during the preliminary evaluation and the interim subsurface investigation.

7.2.1 SELECTED CONTAMINANTS OF INTEREST

Tables summarizing the results for detected constituents in groundwater at the Terminal are provided in Appendix D. Consistent with the constituents detected in the soil at the Terminal, TPH and individual constituents that are commonly associated with petroleum products (e.g., PAHs and VOCs), or wood treatment formulation operations (e.g. PCP), and metals were detected in groundwater. Similar to soil, concentrations for only a few constituents from each of these groups of chemicals (i.e., TPH, PAHs, VOCs, and metals) expected to be risk drivers during the risk assessment were plotted on maps of the Terminal and presented on Figures 7-33 through 7-46. The constituents selected for presentation of groundwater concentrations and referred to throughout this discussion as selected COIs include: benzene, ethylbenzene, diesel-range and gasoline-range petroleum hydrocarbons, and PCP. These constituents were identified as the selected COIs based on the frequency that the constituents were detected in the groundwater and the frequency that the detected concentrations exceeded preliminary screening levels. Gasoline-range and diesel-range petroleum hydrocarbons were the most frequently detected petroleum hydrocarbons in groundwater. Each of these petroleum hydrocarbons was detected in more than 70 percent of the groundwater samples analyzed for TPH. For this reason, and because of the history of the Terminal as a bulk fuel storage facility, diesel-range and gasoline-range petroleum hydrocarbons were included in the selected COIs. Although benzene and ethylbenzene were not the most frequently detected VOCs in groundwater, they were included in the selected COIs because the concentrations of benzene and ethylbenzene in groundwater most frequently exceed the preliminary screening levels. PAHs were detected at a small number of wells (five upper zone wells and two lower zone wells) at concentrations exceeding preliminary screening levels. Of the PAHs detected in groundwater, no one constituent consistently exceeded the preliminary screening levels. Also, although present in soil, benzo(a)pyrene was not detected in groundwater at concentrations exceeding preliminary screening levels. Therefore, PAHs were not included in the selected COIs. Metals, which were often detected in soil, were generally not detected in upper zone groundwater exceeding site-specific background concentrations or the other preliminary screening levels and therefore, not included in the selected COIs. Lower zone metals concentrations tended to exceed preliminary screening levels more frequently for chromium, copper, nickel, and zinc. However, these were not included in the selected COIs because these concentrations are limited to lower zone groundwater and do not appear to be associated with operations at the Terminal. The appearance of these metals concentrations in lower zone groundwater may be related to greater overall background concentrations for metals in the lower zone.

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PCP was also included in the selected COIs based on the elevated concentrations detected in the groundwater in and downgradient of the former PCP mixing area over time.

Preliminary screening levels for detected constituents in groundwater are presented in Tables D-1 and D-2 of Appendix D of this report for the upper and lower zones, respectively.

7.2.2 CONTAMINANT DISTRIBUTION

As discussed in Section 6.2, two zones of groundwater are present below the Terminal: the upper zone and the lower zone. The distribution of the selected COIs in the two zones of groundwater is presented on Figures 7-33 to 7-39 and Figures 7-40 to 7-46, respectively, and discussed in the remainder of this section.

7.2.2.1 Upper Zone Groundwater

Over 65 groundwater samples were collected from the upper zone groundwater and evaluated for this report. A discussion of the distribution of contaminants in the upper zone groundwater by area is provided below.

Main Terminal Tank Farm Area

Results from 20 groundwater samples were used to evaluate the distribution of contaminants in the upper zone groundwater within the Main Terminal tank farm area. Twelve of these samples (including one blind field duplicate) were collected from temporary well points in October 2001 and 8 of these samples (including one blind field duplicate) were collected from permanent monitoring wells in October 2003. Upper zone monitoring wells only exist in the eastern half of the Main Terminal tank farm. In the western half of the Main Terminal tank farm area, the confining unit becomes discontinuous and the upper and lower groundwater zones converge. As described in Section 6.2, groundwater levels in the western half of the Main Terminal tank farm area are consistent with those typically observed at wells screened within the lower zone. Evaluation of the contaminant distribution in groundwater throughout the western portion of the Main Terminal tank farm, therefore, is provided in Section 7.2.2.2.

Results for upper zone groundwater in the Main Terminal tank farm area indicate the presence of diesel-range and gasoline-range petroleum hydrocarbons throughout this zone of groundwater (Figures 7-33 and 7-34). Concentrations of diesel-range and gasoline-range petroleum hydrocarbons range from 0.26 to 19.6 mg/L and 0.96 to 24 mg/L, respectively. The maximum concentrations of TPH in the upper zone groundwater occurred at locations LW-21S for gasoline-range petroleum hydrocarbons and at

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location GW9-1 for diesel-range petroleum hydrocarbons, both located near tanks and conveyance pipelines on the eastern side of the tank farm.

Constituents associated with the diesel-range and gasoline-range petroleum hydrocarbons (i.e., PAHs and VOCs) are also present in the upper zone groundwater in the Main Terminal tank farm area but are not as widespread as TPH (Figures 7-35, 7-36, and 7-37). The maximum concentrations of benzene (1,600 µg/L) and ethylbenzene (940 µg/L) occurred at the same location as the maximum gasoline-range petroleum hydrocarbon concentration (location LW-21S). PAH concentrations range from nondetect to 100 µg/L with six concentrations exceeding preliminary screening levels. For the metals analyzed, only arsenic was detected at each location sampled within the Main Terminal tank farm area. The concentrations of arsenic ranged from 0.001 to 0.046 mg/L. These concentrations are all significantly less than the site-specific background concentration of 1.5 mg/L. PCP was detected in upper zone groundwater in the Main Terminal tank farm area downgradient of the former PCP mixing area at concentrations ranging from 0.58 to 4.35 µg/L (Figure 7-38).

Bell Terminal Tank Farm Area

Results from 29 groundwater samples were used to evaluate the distribution of contaminants in upper zone groundwater within the Bell Terminal tank farm area. Twenty-three of these samples (including one blind field duplicate) were collected from temporary well points and six of these samples (including one blind field duplicate) were collected from permanent monitoring wells. The results indicate the presence of three distinct diesel-range and gasoline-range hydrocarbon plumes in upper zone groundwater in the Bell Terminal tank farm area, along the western portion of an east-west trending pipeline that was demolished by Schnitzer while still in use and containing product, along the western property boundary south of the pipeline in an area previously used by operators of the adjacent Schnitzer property, and in the central portion of the Bell Terminal (Figures 7-33 and 7-34). The plume distribution is based on the decrease of petroleum hydrocarbon concentrations between each plume and the information known regarding soil contamination (Section 7.1.2.2) and releases on the adjacent property. The highest concentration of diesel-range petroleum hydrocarbons in the Bell Terminal (796 mg/L) was detected in a groundwater sample collected from a temporary well point (SCH-63B) located along the western property boundary. Results for a groundwater sample collected from a monitoring well (LW-30S) located adjacent to SCH-63B indicate that diesel-range petroleum hydrocarbons are present in groundwater at this location at a much lower concentration (i.e., 0.87 mg/L). The significant difference between the diesel-range petroleum hydrocarbon results at these locations may be associated with sampling at SCH-63B using a temporary well point and the quantity of suspended particles in the sample. Constituents associated with diesel-range and gasoline-range petroleum hydrocarbons (i.e., PAHs and

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VOCs) are also present in the upper zone groundwater in the Bell Terminal; however, the area of impacted groundwater appears to be smaller (Figures 7-35, 7-36, and 7-37). A small plume of benzene and ethylbenzene with detected concentrations ranging between 1.08 µg/L to 24.9 µg/L is present in the central portion of the Bell Terminal tank farm. Other detections of benzene and ethylbenzene concentrations in groundwater are observed along the western portion of the Bell Terminal tank farm area (Figures 7-36 and 7-37). PAHs was detected even less frequently in the upper zone groundwater than benzene and ethylbenzene (Figure 7-35).

Phase II Study Area

Results from 13 groundwater samples were used to evaluate the distribution of contaminants in upper zone groundwater within the Phase II Study area. Each of the samples (including one blind field duplicate) was collected from permanent monitoring wells, recovery wells, or injection wells. The only significant plume of contamination in the upper zone groundwater in the Phase II study area is PCP, as shown on Figure 7-39. PCP concentrations in this plume range from 0.61 µg/L to 2,100 µg/L. These data are consistent with the information that has been collected in this area since 1998 (Section 8.0). TPH plumes originating within the Main Terminal do not appear to be associated with those in the Phase II areas. Concentrations of diesel-range and gasoline-range petroleum hydrocarbons and VOCs downgradient of the former PCP mixing area are likely related to the presence of PCP carrier oils (e.g. mineral spirits) in groundwater and as NAPL (see Section 7.3.2) (Figures 7-33, 7-34, 7-36, and 7-37).

Loading Rack/Entrance Area of the Main Terminal

Results for two groundwater samples collected from monitoring well LW-7S and temporary well point GW4-1 were used to evaluate the distribution of contaminants in the upper zone groundwater within the loading rack/entrance area. Based on these results, it appears that the extent of the gasoline-range hydrocarbon and ethylbenzene detections observed in the Main Terminal tank farm area extends into the western portion of the loading rack/entrance area (Figures 7-34 and 7-37, respectively).

Eastern Portion of the Phase III Study Area

Results for three groundwater samples collected from temporary well points (GW6-1, GW15-1, and GW17-1) were used to evaluate the distribution of contaminants in the upper zone groundwater within the eastern portion of the Phase III Study Area. TPH was not analyzed at these three locations; however, no VOCs or PAHs (except low concentrations of pyrene) were detected in the upper zone groundwater.

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Asphalt-Paved Road Area

Results for one groundwater sample collected from temporary well point, GW20-1, were used to evaluate the presence of contaminants in the upper zone groundwater within the asphalt-paved road area. No contaminants were detected in this sample.

7.2.2.2 Lower Zone Groundwater

Twenty-nine groundwater samples were collected from the lower zone groundwater and evaluated for this report. A discussion of the distribution of contaminants in the upper zone groundwater by area is provided below.

Main Terminal Tank Farm Area

Results from 19 groundwater samples (including one blind field duplicate) were used to evaluate the distribution of contaminants in lower zone groundwater within the Main Terminal tank farm area. Seventeen of these samples were collected from permanent monitoring wells. One sample was collected from recovery well RW-2. The results indicate that contaminants are present in the lower zone groundwater along the western portion of the Main Terminal tank farm where the confining unit is discontinuous or not present and the upper and lower groundwater zones converge. In this area, diesel-range petroleum hydrocarbons concentrations range from nondetect to 3.1 mg/L (Figure 7-39), gasoline-range petroleum hydrocarbon concentrations range from nondetect to 0.92 mg/L (Figure 7-40), and benzene concentrations range from nondetect to 40 µg/L (Figure 7-42). Concentrations of each of these constituents tend to increase to the west. Ethylbenzene was detected only at monitoring well R and recovery well RW-2 at concentrations of 3.8 and 2.6 µg/L, respectively (Figure 7-43). Only the concentrations of benzene, however, exceed preliminary screening levels.

Within the eastern portion of the Main Terminal tank farm, where the confining unit is present, fewer occurrences of contaminants in the lower zone groundwater are observed. Diesel-range petroleum hydrocarbons are detected most frequently; however, the concentrations observed are low (ranging from 0.4 mg/L to 1.6 mg/L) (Figure 7-39). Gasoline-range petroleum hydrocarbons are detected only at wells LW-26D and RW-2 at concentrations of 0.35 and 1.2 mg/L, respectively (Figure 7-40).

PCP is present, but only in the very southern portion of the Main Terminal tank farm area, and originates from downgradient migration of PCP from the Phase II area. Concentrations of PCP observed range from 0.58 µg/L to 8.1 µg/L. The maximum PCP concentration was detected at recovery well RW-2 and is the only concentration of PCP in the lower zone groundwater that exceeds preliminary screening levels. The distribution of the PCP plume in the lower zone reflects the influence of recovery well RW-2 on PCP concentrations in this area and downgradient movement from a historically high PCP

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concentration area. Also, the only occurrences of benzene and ethylbenzene in the eastern portion of the Main Terminal tank farm area for the lower zone groundwater are observed at recovery well RW-2. Because RW-2 has been recovering PCP-impacted groundwater in this area since fall of 2000, it is possible that the presence of benzene and ethylbenzene at this location could result from movement of these constituents from the tank farm area toward the pumping well.

As indicated above, detected concentrations of metals, including chromium, copper, lead, nickel, and zinc are present at concentrations exceeding preliminary screening levels. Metals concentrations range from nondetected to 0.93 mg/L. Because comparable concentrations are not found in the upper zone groundwater, it is unlikely that these concentrations are related to operations at the Terminal.

Bell Terminal Tank Farm Area

Results from three groundwater samples were used to evaluate the distribution of contaminants in the lower zone groundwater within the Bell Terminal tank farm area. Each sample was collected from a permanent monitoring well (LW-29D, LW-30D, and LW-32D). The results indicate that, except for diesel-range petroleum hydrocarbons and metals, contaminants are not present in the lower zone groundwater in the Bell Terminal tank farm area (Figures 7-40 to 7-46). A low level concentration of diesel-range petroleum hydrocarbons (0.35 mg/L) was observed at well LW-32D (Figure 7-39). Metals concentrations at the three lower zone wells ranged from 0.004 to 0.146 mg/L, with concentrations of chromium, copper, nickel, and zinc exceeding preliminary screening levels. As indicated earlier, metals concentrations in the lower zone do not appear to originate from operations conducted at the Terminal.

Phase II Area

Results from six groundwater samples were used to evaluate the distribution of contaminants in the lower zone groundwater within the Phase II area. Each of the samples was collected from permanent monitoring wells, recovery wells, or injection wells. PCP is detected at two wells (LW-3D and OX-8D) at concentrations less than 1 µg/L, as shown on Figure 7-46. Detections of diesel-range petroleum hydrocarbons (Figure 7-40) and metals are also observed in this area.

Loading Rack/Entrance Area of the Main Terminal

No lower zone groundwater monitoring wells exist in the loading rack/entrance area of the Main Terminal.

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Eastern Portion of the Phase III Study Area

No lower zone groundwater monitoring wells exist in the eastern portion of the Phase III study area.

Asphalt-Paved Road Area

Only one lower zone groundwater monitoring well, LW-10D, exists in the asphalt-paved road area. Only PCP and metals were detected in the groundwater at this location. PCP was detected at a concentration of 0.94 µg/L, less than preliminary screening levels for PCP. This detection represents the downgradient limit of the PCP plume in the lower zone, as discussed previously. Metals detected include arsenic, chromium, copper, lead, and zinc. All but zinc and arsenic were detected at concentrations exceeding preliminary screening levels.

7.3 OBSERVATIONS OF NAPL, SHEENS, AND ODORS

The presence or absence of NAPL, sheens, and odors in the soil was checked during drilling of soil borings, monitoring wells, and during Phase II CPT explorations. The presence of free product or light NAPL (LNAPL) on the water table was also checked during quarterly measurement of water levels, including the October 2003 groundwater sampling event.

7.3.1 SOIL

The presence of NAPL, sheens, and odors within the soil at the Terminal was used to indicate impacted soil conditions. NAPL was observed at one location during drilling: LW-27S at a depth of 22.5 ft BGS. Within the Main Terminal tank farm area, slight to heavy sheens on the soil were observed at depths ranging between 3.5 to 34 ft BGS during drilling and sample collection. These sheens were observed in soil borings LW-19S, LW-20S, LW-21S, LW-26D, N, P, and Q located within the northern portion of the Main Terminal tank farm and in one soil boring, LW-17D, located in the southern portion of the Main Terminal tank farm.

Diesel and/or petroleum-like odors in the soil were observed at 26 borings within the Main Terminal tank farm. At two of these locations, P and Q, the odors were described as strong gasoline and at one location, G14-1, the odor was described as a mild ethanol. At soil borings for monitoring wells, R and LW-35D, non-petroleum-like odors were observed from 15 to 29.5 ft BGS. These odors were described as faint, sweet, and soap-like at soil boring R and as a mild, rotten sewer-like odor at soil boring LW-35D.

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Within the Bell Terminal tank farm area, slight to strong sheens were observed at depths ranging between 12.5 to 19.5 ft BGS. These sheens were observed at one location along the east-west trending pipeline (BT-05), at two locations within the central portion of the Bell Terminal (LW-32S/-32D and at soil boring G25-1), and at soil boring LW-30S located along the western property fence line. Slight to strong diesel or petroleum-like odors were observed in the soil at 18 soil borings. At two of these locations, LW-28S and LW-31S, the odors were described as mild gasoline-like odors.

Within the Phase II study area, slight to heavy sheens on the soil were observed at depths ranging between 0.5 to 19.5 ft BGS. These sheens were observed in soil borings LB-2, LB-12, LB-13, LB-14, LB-17, LB-25, LW-2S, LW-8S, and RW-3. Slight to strong hydrocarbon odors were observed in the soil at 24 soil borings. At the soil borings for injection wells OX-6S, OX-7S, OX-8S, and OX-8D, monitoring wells LW-11S and LW-11D, and recovery well RW-3, the odors were described as strong, mineral-spirit-like odors. A summary of NAPL, sheen, and odor observations in soil is provided in Table 7-1.

7.3.2 GROUNDWATER

An evaluation of LNAPL observations documented since August 1993 indicate that LNAPL of varying thickness (0.01 to 1.2 ft) has been observed in upper zone groundwater monitoring wells N, P, and Q (also, based on the February 2004 event, LNAPL was observed in LW-21S and LW-27S at thicknesses of about 1 ft and 0.7 ft, respectively), located within the Main Terminal tank farm area, and at location GW8-1 (Figure 2-6) in the Main Terminal tank farm area during the preliminary evaluation. Occasional observations of LNAPL have also been recorded for upper zone groundwater monitoring wells within the Phase II Study area. These wells include OX-2S, LW-8S, and LW-11S and piezometer PZ-2. LNAPL thicknesses at these locations ranged from 0.04 to 0.37 ft. No LNAPL was observed in the upper zone groundwater in the Bell Terminal, the eastern portion of the Phase III study area, or the asphalt-paved area during past groundwater sampling events. The presence of LNAPL in the Main Terminal tank farm area is likely related to spills of petroleum products in this area. Based on the PCP content in a LNAPL sample collected at LW-11S, LNAPL observed within the Phase II area is related to historical spills associated with the PCP mixing area and unrelated to activities within the Main Terminal tank farm area. As discussed in Section 8.0, the variability in the presence of LNAPL in the Phase II area appears to be related to seasonal fluctuations in the water table.

Except for a slight sheen and a slight to moderate mineral spirits-like odor during the first sampling of well B2 in August 1993, no NAPL or odors have been reported for the lower zone groundwater at the Terminal.

A summary of LNAPL observations in groundwater is provided in Table 7-2.

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8.0 CONCEPTUAL SITE MODEL

This section provides the conceptual site model for the Time Oil Northwest Terminal based on the hydrogeological/geological system and the RI data presented in this report and data from previous investigations. The conceptual site model includes a description of the defined source areas; a discussion of the general release mechanisms and fate and transport processes, and site-specific fate and transport processes along the exposure pathways for the Terminal. The conceptual site model demonstrates that the existing data are sufficient to define the nature and extent of contamination from the defined source areas and to conduct the human health and ecological risk assessments.

8.1 SOURCE AREAS

Sources that have affected soil and groundwater quality at the Northwest Terminal were related to separate historical operations, including: 1) a wood treatment formulation operation in the former PCP mixing area and former PCP warehouse area; 2) petroleum handling and storage in the Main Terminal and the Bell Terminal tank farm areas, and associated loading rack and petroleum handling areas; 3) storage of waste oils in tanks in the former Crosby & Overton area; 4) oiling of roads on the East Property; 5) practices by operators of the adjacent Schnitzer property along the western property boundary of the Bell Terminal; and 6) a petroleum product release along the western property boundary of the Bell Terminal associated with the Schnitzer's demolition of a pipeline that trends east-west through the Bell Terminal while the pipeline was still in use and containing product. Contamination to soil on the East Property has been addressed through a soil remedial action and the soil to groundwater pathway has been effectively eliminated. DEQ has issued a conditional no further action for this portion of the property and further discussion of the conceptual site model is focused on the other areas of the Terminal.

8.1.1 FORMER PCP MIXING AREA AND WAREHOUSE

The primary contaminant of concern resulting from historical blending of specialty wood treating products is PCP. Two source areas for PCP-related contamination (e.g., PCP by-products and dioxins/ furans) were defined in the Phase II RI. These areas are the former PCP mixing area (including the area below the former PCP warehouse) and the northwestern portion of former Crosby & Overton tank area. As discussed in the Phase II RI report, releases of PCP, carriers, additives, and PCP formulations to soil in the PCP mixing area appear to have occurred during the mixing operations. These practices provided the primary source of PCP (and related constituents) contamination to soil in this area with historical PCP soil concentrations exceeding 100,000 mg/kg. Based on historical upper and lower zone groundwater data, the former PCP mixing area was also identified as a significant or primary source of PCP to

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groundwater with historical concentrations in the upper zone exceeding 60,000 µg/L. PCP concentrations in the lower zone have been as high as 18,000 µg/L. Based on the magnitude of PCP detections in the soil and groundwater in and downgradient of the PCP source area and the information known about the PCP formulations, it is possible that free phase PCP with a carrier or as a dense non-aqueous phase liquid (DNAPL) was used, providing a residual source of PCP. However, to date, no direct observation of DNAPL has occurred.

Contaminated soil was removed from the former PCP mixing area and below the footprint of the former PCP warehouse during a soil removal action in the fall of 2002. Where possible, soil exceeding PCP concentrations of 5 mg/kg was removed from these source areas and disposed offsite. However, soil containing PCP concentrations above 5 mg/kg still remain in some areas, mainly at or below the water table, as shown on Figure 2-3. An interim remedial action using the ISCO remediation technique is planned to address PCP-impacted soil and groundwater both in and downgradient of these source areas.

8.1.2 TANK FARM AREAS

As discussed in Section 7.0, contaminants in the soil and groundwater at the Terminal associated with petroleum storage and handling operations mainly include petroleum hydrocarbons, PAHs, VOCs, and metals. These contaminants are consistent with the historical uses of the Terminal for bulk storage of petroleum products.

Three primary source areas for diesel-range and gasoline-range petroleum hydrocarbon (and related constituents) have been identified based on current concentrations of these contaminants in soil and groundwater. These are the Main Terminal and Bell Terminal tank farm areas, and an area along the western boundary of the Bell Terminal tank farm area. Past releases of petroleum products have been documented in the Main Terminal tank farm area. Specifically, a release of diesel occurred in 1975 when a Tank 29508 (shown on Figure 2-1) split along a vertical weld. An unleaded gasoline spill occurring in 1994 was also reported in the Main Terminal tank farm area. Such releases have provided a source for diesel-range and gasoline-range petroleum hydrocarbons (and related constituents such as PAHs and VOCs) at concentrations exceeding 36,000 mg/kg and 8,000 mg/kg, respectively in soil and at concentrations exceeding 19 mg/L and 24 mg/L, respectively, in groundwater below the Main Terminal tank farm area. Leaks along pipelines conveying petroleum products may have also provided a source for the TPH contamination in soil and groundwater in this area. LNAPL has been observed at locations within the Main Terminal tank farm area in the area of the 1994 spill and more recently in the central portion of the tank farm area, which is likely related to periodic leaks along conveyance pipelines. To a lesser extent, inadvertent spills near the loading rack and entrance to the Terminal may have occurred

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during truck loading/unloading and may have provided a source of petroleum products to soil and groundwater in this area.

No past releases of petroleum are known resulting from petroleum storage and handling practices in the Bell Terminal. However, soil and groundwater concentrations reflect three separate sources in the Bell Terminal area: 1) along the western property boundary near the east-west trending pipeline, 2) along the western property boundary in an area used by operators of the adjacent Schnitzer property, and 3) in the central portion of the Bell Terminal. The maximum TPH concentrations and elevated PAH concentrations in soil and groundwater in the Bell Terminal occur at locations along the western property boundary, as discussed in Section 7.0. A conveyance pipeline that was used to convey petroleum products trends east-west through the center of the Bell Terminal. The western portion of the pipeline was demolished by Schnitzer during construction of the Premier Edible Oils facility in the mid-1970s while still in use and containing product. This demolition resulted in a release of petroleum product to soil in this area. Another source of petroleum hydrocarbons appears to occur along the western property boundary south of the pipeline. As documented in historical aerial photographs, an approximate 80-ft wide strip of land along the entire western property boundary was used by operators of the adjacent Schnitzer property between approximately the 1960s and 2000. Also, several diesel ASTs are located on the adjacent property just west of this area. Because the concentrations detected in soil and groundwater at sample locations in this area decrease dramatically to the east (upgradient) away from this area, the source area for these contaminants appears to be located on the property adjacent to the Bell Terminal or within the area previously used by operators of the adjacent Schnitzer property along the western property boundary. The source for soil and groundwater impacts in the central portion of the Terminal is likely related to minor, incidental releases associated with operations of the Terminal.

8.1.3 FORMER CROSBY & OVERTON TANK AREA

In the former Crosby & Overton area, releases of PCBs and PAHs apparently occurred to soil during storage, cleaning, and removal of oil stored in the tanks in that area and are the primary contaminants of concern in soil in this area. Contaminated soil was removed from this area as part of the removal actions for the east property and former PCP mixing area in the fall of 2002. PCB and cPAH contamination appeared to be limited to surface soil in the former Crosby & Overton source area and has not been detected in groundwater in that area. Soil was removed to depths ranging from 0.5 to 2.5 ft BGS, which removed PCBs and cPAHs to acceptable levels at most locations, as shown on Figures 2-4 and 2-5.

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8.2 GENERAL CONTAMINANT RELEASE AND TRANSPORT MECHANISMS/PATHWAYS

Source release mechanisms at the Terminal are predominantly related to historic spills to soil within each of the source areas. Chemicals can exist in soil in the solid or dissolved phase, or as non-aqueous phase liquids, either as a LNAPL or a dense non-aqueous phase liquid (DNAPL). Liquids released to the soil have infiltrated and percolated through the soil column to groundwater, or chemical or biochemical processes that mobilize chemicals in soil have caused migration to groundwater.

Properties of the soil that influence mobility of the contaminants include: soil heterogeneity, permeability, mineralogy, grain size, and pore geometry. As contaminants migrate through soil pores as NAPL, a portion of the NAPL is retained within the soil pores due to surface tension. The retained NAPL, referred to as residual NAPL, remains essentially immobile in the soil pores, but can constitute a long-term source of dissolved-phase contamination. If the release is of sufficient volume to exceed the retention capacity of the soil, the NAPL will continue to migrate downward to low-permeability zones or to the water table, where unrestricted. Therefore, the vertical distribution of NAPL in unsaturated soil is controlled by the depth of the water table, as well as the vertical permeability and soil sorptive capacity. At the top of the capillary fringe, NAPL with a density less than that of water (LNAPL) spreads laterally and typically migrates in the direction of groundwater flow. Migration of LNAPL is controlled by the groundwater gradient, the presence of higher permeability material in the groundwater zone (i.e., coarser-grained aquifer material or fill), the volume or rate of the release, the presence of constructed (i.e., fill along pipelines) or natural preferential pathways, and the physical characteristics of the LNAPL. NAPL with a density greater than that of water (DNAPL) can displace soil porewater and continue downward into the saturated zone, migrating along the surface of impermeable geologic boundaries (e.g., silt layers) and through relatively permeable pathways (e.g., sandy interlayers). The transport of DNAPL through the subsurface is based on the physical characteristics of the DNAPL, the volume and rate of the release, and the presence of lower permeability materials within the hydrogeologic system.

Dissolved phase contamination in groundwater results from contact between infiltrating groundwater and contaminated soil, and/or subsurface water and NAPL. This contact may occur through one or more of the following ways:

- Infiltration and movement of water by gravity through the unsaturated zone containing residual NAPL
- LNAPL in contact with groundwater at the water table surface
- DNAPL in contact with groundwater within the saturated zone.

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The presence of PCP detections in groundwater at concentrations above its reported solubility in water (14 mg/L at 25°C) and detections of petroleum products at similar locations are likely explained by the use of carrier compounds in the PCP formulations to increase the solubility of the PCP.

Certain constituents, such as the lower molecular weight aromatic hydrocarbons (e.g., BTEX) are relatively soluble and volatile and more readily enter the dissolved or air phase. Volatilization occurs more readily in the unsaturated zone than in the saturated zone. Higher molecular weight compounds (e.g., PAHs and PCBs) are less soluble and, therefore, do not enter the dissolved phase as readily. In comparison with PAH compounds, PCP tends to be more mobile. PCP generally exists in the dissolved phase at ambient groundwater pHs (6 to 8). Dioxins/furans partition very strongly to soil and are generally insoluble in water (although soluble in PCP and other organic liquids). Dioxins/furans are generally found in surface soil or near source areas, but NAPL and/or PCP in a separate phase may act as a carrier of these chemicals into the subsurface environment. Dioxins/furans will not tend to migrate in the dissolved phase in groundwater, but rather will resorb to soil. Partitioning of inorganic constituents (e.g., metals) between solid and dissolved phases is mainly controlled by a complex combination of precipitation and sorption reactions, which are influenced by the environment's redox conditions.

In addition to the chemical properties of the individual contaminants (e.g., solubility), the primary fate processes controlling advection, hydrodynamic dispersion, and adsorption are the movement of dissolved contaminants in groundwater downgradient from the source area. Advection is the transport of constituents by groundwater movement and is, therefore, dependent in part on the hydraulic conductivity of the formation. Hydrodynamic dispersion is the spread of a chemical constituent in directions other than those that would be expected from advection only. The effect of hydrodynamic dispersion is to dilute the contaminant concentrations within the dissolved plume by mechanical mixing and by molecular diffusion at low groundwater velocities. Adsorption is the partitioning of constituents from the dissolved phase onto organic matter within the formation. The most hydrophobic or least soluble compounds (e.g., PAHs and dioxins/furans) adsorb more readily onto soil surfaces than the more soluble compounds, resulting in a retardation or slowing or their transport velocity relative to groundwater flow. Other processes that may retard the transport of dissolved phase contamination include biodegradation and complexation or precipitation-dissolution reactions. The degree that these processes affect the migration of dissolved constituents depends on the characteristics of the hydrogeologic system and the type of organic or inorganic compound.

The primary fate processes controlling petroleum hydrocarbons in the subsurface are biodegradation and volatilization. Both aerobic and anaerobic biodegradation of petroleum constituents are known to occur in the subsurface. The degree of degradation that occurs is a function of the availability of the proper nutrients and an electron acceptor (e.g., oxygen). The lower molecular weight

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aromatic hydrocarbons (e.g., BTEX) are more readily degradable than the higher molecular weight compounds (e.g., PAH). Volatilization acts primarily on the low molecular weight volatile compounds (e.g., BTEX) as compared to the high molecular weight PAH. Aromatic volatile organic compounds, such as petroleum hydrocarbons and BTEX, may be strongly attenutated through geochemical and biodegradation processes, whereas attenuation of PCP along the migration pathway may be minor due to low partitioning affinity to the aquifer matrix and resistance to degradation under certain aquifer conditions. If contaminants remain in the dissolved phase, or as LNAPL, and are not attenuated, the impacted groundwater or NAPL discharges to a surface water body.

Based on hydrogeologic data at the Terminal, groundwater flow direction in the upper and lower zones is toward the Willamette River. Consequently, there is a potential for dissolved chemicals in groundwater or LNAPL from the Main Terminal tank farm to be transported to the river by groundwater flow. Because seeps have not been observed in the riverbank adjacent to the Terminal, groundwater likely discharges to the river below the water line. Additionally, the east-west trending storm drain could historically have provided a preferential pathway for the transport of impacted groundwater from the Phase II source areas to the river; however, operation of the groundwater intercept system (and the plan for use of the ISCO technique in the Phase II plume areas) provides capture of contaminant migration from the Phase II areas to the river. If impacted groundwater discharged to the river from the Terminal, the groundwater quality could have affected sediment or surface water quality. However, due to the large river flow volumes, the effects of any impacted groundwater discharges from the Terminal on surface water are expected to be minimal based on dilution, except potentially at the groundwater-surface water interface (transition zone). Collection of samples to evaluate sediment quality and potential impacts to ecological receptors at the river outfall and near the loading dock in the river is planned by the Lower Willamette Group as part of the RI for the Portland Harbor Superfund Site.

8.3 SITE-SPECIFIC FATE AND TRANSPORT PROCESSES

Based on the data presented in Section 7.0, releases of contaminants at the source areas have occurred during operation of the Terminal. Contamination of soil at each of the source areas appears to be the result of releases of hazardous substances directly onto the soil and subsequent migration. At the former PCP mixing area, these releases occurred during PCP formulation activities. At the former Crosby & Overton area, the releases occurred during lease operations. In the Main Terminal tank farm area and loading racks, these releases occurred due to spills and possibly leaking along conveyance pipelines and/or with activities associated with bulk fuel storage. In the Bell Terminal tank farm, these releases may have occurred due to demolition of the conveyance pipeline and/or with activities associated with

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bulk fuel storage. Along the western property boundary of the Bell Terminal, releases may likely be associated with activities by operators of the adjacent Schnitzer property.

A schematic of the source areas, release mechanisms and transport mechanisms for the Terminal is provided on Figure 8-1.

8.3.1 PCP Mixing Area

The majority of the contaminated soil from the former PCP mixing area and former soil stockpile area has been excavated and disposed offsite. However, residual amounts still remain at depths typically at or exceeding 13 ft BGS (the approximate water table elevation) within and directly adjacent to the mixing area. PCP formulations were likely introduced into the environment through spills of PCP-containing NAPL directly onto the ground surface and subsequent migration based on the fate and transport parameters discussed in the previous section. Historical information indicates that most of the PCP formulations were less dense than water (i.e., specific gravity of less than 1) and, therefore, would migrate through the environment as an LNAPL; however, at least one formulation had a density greater than 1 and could be transported as a DNAPL through the subsurface. LNAPL has been observed in wells LW-11S and OX-2S, located downgradient from the PCP mixing area. DNAPL has never been observed.

Elevated levels of PCP in the upper and lower zones groundwater at the Terminal indicate that PCP has partitioned from the soil and/or NAPL into the groundwater. PCP has been observed in groundwater in both zones in and to the south and southwest (downgradient) of the former PCP mixing area. Historically, low PCP concentrations were also detected at low concentrations within the deep sand unit near well LW-12D2, located within the former PCP mixing area. The available data suggest that the primary source of the groundwater contamination in the upper zone results from partitioning of PCP from the residual amounts remaining in the soil within and adjacent to the former PCP mixing area and subsequent advective migration from this area, or from partitioning from LNAPL that has migrated downgradient from the PCP mixing area along the water table surface. LNAPL in the downgradient wells is not observed consistently or over a wide area and is typically observed in conjunction with very low seasonal groundwater levels. This inconsistent occurrence suggests that the LNAPL exists in a residual phase below the water table over most of the year and then is released to the groundwater surface when water levels are low.

PCP in the lower zone likely results from downward migration of dissolved PCP via groundwater from the upper to the lower zone where the silt layer separating the upper and lower zones is heterogeneous and/or discontinuous. No DNAPL were encountered during any investigation. Therefore, downward migration across the confining unit likely occurs under a natural downward gradient at several locations along the upper zone plume alignment where elevated concentrations in the lower zone are

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observed (depending on how circuitous the route is between the upper and lower zones). Under this scenario, the PCP concentration distribution within the lower zone would appear to mimic that of the upper zone, while mean groundwater flow in the lower zone would still be toward the river. This distribution is reflected by the observation of the highest concentration of PCP in the lower zone at upper zone downgradient locations. Further migration of dissolved PCP in the lower zone groundwater would be primarily controlled by advective groundwater flow in a downgradient direction from the impacted area.

The storm drain (Figures 2-1 and 6-6) and backfill associated with its construction appear to affect groundwater flow and contaminant transport in the upper zone. The presence of the storm drain may partly explain the southerly components of upper zone groundwater flow in the Terminal area as groundwater flows toward the zone of higher hydraulic conductivity. As illustrated on Figure 6-6, the storm drain does not appear to fully penetrate the confining unit (where present) and thus is not thought to provide a vertical pathway for groundwater flow and contaminant transport to deeper aquifers. Groundwater samples collected from manholes in the storm drain and at the storm drain outfall in the river (Table 2-3) indicate that the storm drain was acting as a preferential pathway for upper zone groundwater to the river. The stormwater intercept system was installed to eliminate the potential for upper zone groundwater to migrate through the storm drain to the river. The influence of the stormdrain on groundwater quality will continue to be evaluated as part of the groundwater interim action.

Historical PCP concentrations in groundwater were used to evaluate potential contaminant migration pathways between the historical and current monitoring periods. Figures 8-2 through 8-5 show the approximate distribution of PCP in the upper zone in February 1991, March-April 1997, spring 1999, and February 2001, respectively. The PCP distribution in the upper zone for fall, 2003 is shown on Figure 7-39. Historically and currently, the PCP in the upper zone is limited to a narrow plume that extends from the former PCP mixing area downgradient about 450 ft to LW-13S. PCP concentrations in the upper zone are most elevated within and just downgradient of the former PCP mixing area, the identified source area for PCP. PCP appears to have migrated in a downgradient direction toward the south-southwest. Upper zone PCP concentrations within the mixing area source area have decreased significantly since first measured in 1991. This decrease may reflect the removal of contaminant source material during the 1989 soil excavation within the former PCP mixing area, as well as natural attenuation of the PCP (through adsorption, biodegradation, etc.) or downgradient movement past these monitoring points. By May 1999, PCP concentrations as high as 23,000 µg/L were observed at well LW-11S, but there were only slight increases at well LW-4S, the most downgradient well where there have been consistent low level PCP detections. PCP has not migrated in the upper zone farther downgradient to the south than well LW-13S, as indicated by nondetected concentrations in upper zone wells near the south

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property boundary (LW-10S, when saturated); however, low level PCP concentrations in lower zone wells on the western extent of the confining unit were detected during the last four sampling events as discussed below.

Decrease of PCP concentrations in the upper zone since 2002 is likely related to the removal of the majority of the remaining contaminated soil during the soil removal in the former PCP mixing area and from use of the ISCO technique during pilot testing. (Note that PCP distribution using the earlier data are more approximate than those constructed with the 2000-2004 data because of the difference in the number of data points as well as potential QA/QC issues). Implementation of full-scale *in situ* chemical oxidation (ISCO) as a interim remedial action for shallow groundwater and soil in and downgradient of the former PCP mixing area is planned to control migration of PCP contamination in groundwater from this area.

Figures 8-6 through 8-8 show the approximate distribution of PCP in the lower zone in March-April 1997, spring 1999, and February 2001. The PCP distribution in the lower zone in fall 2003 is shown on Figure 6-18. The PCP concentration contour maps indicate that groundwater contamination in the lower zone historically and currently consists of several discrete areas of contamination rather than a contiguous plume. Historically, the discrete areas were mainly located within and near the former PCP mixing area, in proximity to well LW-11D, and in an area including wells LW-4D and RW-2. The historically highest PCP concentrations in groundwater in the lower zone occurred at well LW-4D (18,000 ppb in October 1997) and decreased significantly at this location, such that since spring 1999, PCP concentrations have been mostly nondetect. Recently, (since November 2002) on an intermittent basis, low level PCP concentrations (generally less than 1 µg/L) have also been detected in wells LW-6D located between LW-4D and the river, and LW-10D located at the southern property boundary. These detections are not observed on a consistent basis, which may be related to dilution of groundwater by river water at the groundwater-surface water interface, (particularly in the lower zone where the river stage influence is greatest), natural attenuation processes (e.g., adsorption, biodegradation, etc.), or seasonal variability. Since October 2000, recovery well RW-2 has been recovering PCP-impacted groundwater from the lower zone. RW-2 has been generally effective in containing PCP-contaminated groundwater migration from the area of the well.

The most critical exposure pathway at the Terminal is migration of contaminants via groundwater to surface water. Even though impacts from discharge of groundwater from the Terminal are expected to be minimal because of dilution and other processes at the groundwater-surface water interface, there is a potential for impacted groundwater to affect sediment or surface water quality and, consequently, risk to ecological receptors in the river will be assessed.

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PCP detections in the deep sand unit at LW-12D2 occurred sporadically at low concentrations (1 to 3 µg/L) during quarterly sampling on three occasions between May 1999 and June 2002. This well was abandoned in advance of the soil removal action in the former PCP mixing area. The historical detections in this well could be attributed to downward vertical groundwater flow between units that has been attenuated through removal of source material during the 1989 soil excavation.

Concentrations of diesel-range and gasoline-range petroleum hydrocarbons and VOCs downgradient of the former PCP mixing area are likely related to the presence of PCP carrier oils (e.g. mineral spirits) as LNAPL and partitioning of these constituents into groundwater. The distribution of detected petroleum hydrocarbon concentrations in this area is consistent with the intermittent presence of LNAPL observed in well LW-11S and the recent occurrence of LNAPL at OX-2S and elevated PCP concentrations in groundwater. The intermittent nature of LNAPL occurrences at LW-11S appears to be related to seasonal groundwater fluctuations, such that residual LNAPL is released to the groundwater under low water table conditions.

8.3.2 TANK FARMS

Soil contamination in the Main Terminal and Bell Terminal tank farm areas occurs primarily at depth within the capillary fringe. Contamination in the soil above the capillary fringe is present but typically at lower concentrations. The elevated concentrations of contaminants at the capillary fringe depth interval in the tank farm areas indicates that releases of petroleum substances to the ground surface were historical and that NAPL has had sufficient time to migrate downward and spread laterally along the capillary fringe. The presence of the same contaminants found in groundwater as in soil, indicate that these contaminants have partitioned from the soil and/or NAPL into the groundwater. Most of the shallow soil samples containing elevated TPH levels did not contain elevated benzene or ethylbenzene, indicating that the low molecular weight aromatics (e.g., BTEX) that may have once been present have undergone biodegradation or volatilization, or have been removed by infiltrating precipitation.

In the Main Terminal tank farm area, contaminants are present in the upper and lower zone groundwater. However, contamination of the lower zone groundwater is typically found only in the western portion of the Main Terminal tank farm where a silt layer separating the upper and lower zones does not exist or is discontinuous. In this portion of the Main Terminal tank farm area, only a single unconfined groundwater zone exists. In the eastern portion of the Main Terminal tank farm, where a silt layer separating the upper and lower groundwater zones does exist, contaminant concentrations in the lower zone groundwater are typically low and are primarily detected near where the silt layer pinches out or becomes discontinuous. This suggests that the silt layer over much of the western portion of the Main Terminal tank farm area provides a natural geologic/hydrogeologic boundary between the upper zone

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groundwater and the lower zone groundwater, limiting the vertical migration of contaminants over this portion of the Main Terminal tank farm area, or that the characteristic of the contaminant does not lend itself to vertical migration. In the Bell Terminal tank farm area, contaminants are present in the upper zone groundwater, but not in the lower zone groundwater. The lack of contaminants in the lower zone groundwater indicates that the silt layer is acting as an impermeable boundary and the two groundwater zones are not interconnected in this area.

Concentration contours of selected contaminants in upper zone and lower zone groundwater discussed in Section 7.0 indicate that lateral migration in the downgradient groundwater direction has occurred. The lateral migration is likely a combination of the individual contaminant properties (e.g., solubility), and the processes of advection, hydrodynamic dispersion, and adsorption. The lack of contaminants in groundwater upgradient of the source areas indicates that contaminant migration in groundwater is primarily due to advection (transport of constituents by groundwater movement). Contamination in the groundwater along the western property boundary of the Bell Terminal, where the source area may occur on the adjacent property and downgradient of the property boundary, may be due to the nature of the release.

The limited extent of the diesel-range and gasoline-range hydrocarbon plumes in the Bell Terminal suggests that lateral movement of the contaminants is slow which may be due to a low rate of advection in this area, possible natural attenuation (through adsorption, biodegradation, etc., and/or volatilization.

8.3.3 Crosby & Overton Tank Area

As discussed above, contamination of soil within the former Crosby & Overton tank area presumably resulted from waste oil spills from the tanks historically located within this area. Because PAHs and PCBs tend to absorb or bind to soil, contamination in this area was limited to the upper few feet of surface soil. As part of the soil removal action conducted for the former PCP mixing area and soil stockpile, impacted soil was excavated from this area and disposed offsite. Remaining PCP and cPAH concentrations in soil at completion of the removal action are shown on Figures 2-4 and 2-5. Because historical releases in this area resulted in contamination that was limited to surface soil, and groundwater contamination has never been observed in this area, it is expected that the remaining concentrations will be protective of groundwater and additional cleanup in this area will not be necessary.

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9.0 SCOPE OF FUTURE ACTIVITIES

This section provides the scope of future activities to be conducted in support of the Phase II and Phase III RIs for the Terminal. Phase II RI future activities will include the continued monitoring of the Phase II site monitoring wells to assess the continued implementation of the groundwater interim action and the planned implementation of the full-scale ISCO technique within the extent of the PCP plume in the upper zone. Phase III RI future activities will include the quarterly sampling of the newly installed Phase III monitoring wells. With completion of the RI, a risk assessment and feasibility study will be initiated for the Terminal. A summary of these activities are provided in the following sections.

9.1 PHASE II/III GROUNDWATER MONITORING

For assessment of the Phase II groundwater interim action and for the planned implementation of the full-scale ISCO technique, groundwater monitoring will be continued at the Phase II monitoring locations. In a letter to DEQ dated February 2, 2004, a request was made to modify the Phase II sampling program beginning with the first quarter 2004 sampling event. These changes were implemented during the first quarter 2004 upon verbal approval by DEQ; final approval by DEQ is pending. Below is a summary of the changes to the Phase II sampling program:

- Elimination of eight wells from the Phase II sampling program for future events. These wells include five upper zone wells (H, K, L, LW-1S, and LW-5S), and three lower wells (O, R, LW-1D).

- Reduction of the monitoring frequency for selected Phase II wells from quarterly to semiannually. Twenty-four Phase II wells were proposed for semiannual sampling, including wells B1, B2, D, J1, J2, LW-3D, LW-4S, LW-4D, LW-11S, LW-11D, LW-13S, LW-14D, LW-15D, LW-16D, OX-1S through OX-8S, OX-8D, and RW-1. Any other Phase II wells not included in this list were retained for use in quarterly evaluations with wells installed as part of the Phase III RI, and for evaluation of performance of the groundwater interim action system.

In addition to the sampling of the Phase II monitoring wells, all newly installed Phase III monitoring wells will be sampled for four consecutive quarters (1 year), or as necessary, to adequately assess environmental conditions within the Phase III study area and to complete the hydrogeologic conceptual model. Following the review of analytical data collected from the first quarter 2004 sampling event, the list of analytes sampled at the Phase III well locations may be modified as outlined in the Phase III interim subsurface investigation technical memorandum. Analytical results from the Phase II and Phase III sampling events will continue to be documented to DEQ in quarterly groundwater monitoring reports for the Terminal.

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9.2 GROUNDWATER INTERIM ACTION

The objective of the groundwater interim action is to contain migration of the PCP plumes identified in the upper and lower zones at the Terminal from moving offsite across the southern property boundary or to the Willamette River. Capture of the PCP plume within the lower zone will be maintained by the continued pumping of recovery well RW-2. Seasonal pumping of horizontal well HRW-1 within the upper zone and continued pumping from the groundwater intercept system in the storm drain at SDM-1. Methods for full remediation of the plumes will be used to contain migration of the PCP plume in the upper zone and will be addressed in the feasibility study. Groundwater interim action activities will continue to be documented in the quarterly groundwater monitoring reports for the site.

9.3 FULL- SCALE ISCO IMPLEMENTATION

To further facilitate the remediation of PCP contamination in the groundwater and soil at the Terminal following the 2002 soil excavation in the lower PCP mixing area, a work plan is currently being developed to implement the ISCO technique as an interim remedial alternative for PCP in the upper zone. The ISCO plan will include the injection of hydrogen peroxide using direct-push technology within the PCP plume area and will include groundwater monitoring of select wells before and after each injection event. A discussion of the ISCO process and bench scale study is provided in Section 2.0. Implementation of the full-scale ISCO will be conducted following DEQ's approval of this work plan.

9.4 RISK ASSESSMENT

Following the approval of this Phase III RI report by DEQ, Time Oil will submit a proposed approach for conducting human health and ecological risk assessments for the Terminal. The risk assessments will be conducted in accordance with OAR 340-122-084 and DEQ's risk assessment guidance (DEQ 1999, 2000b). The risk assessment approach will provide the plan for use of the combined Phase II and III data sets for identification of COPCs/CPECs, and exposure scenarios for both human health and ecological risk. The approach will be provided to DEQ for approval before conducting further risk evaluations. Following approval of the risk assessment approach by DEQ, a document providing the results of the COPC/CPEC identification will be provided to DEQ with recommendations for completion of the risk assessment, followed by completion of the human health and ecological risk assessment. The risk assessment will also include identification of hot spots of contamination in soil and groundwater using acceptable risk levels identified for the Terminal.

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9.5 FEASIBILITY STUDY

In accordance with the Phase I/II RI/FS work plan and the VCP agreement with DEQ, a feasibility study (FS) will be conducted to develop and evaluate remedial action alternatives for contaminated media which will achieve remedial action objectives (RAOs) and are protective of human health and the environment. The FS will also be conducted in accordance with OAR 340-122-085 and DEQ's *Guidance for Conducting Feasibility Studies* (DEQ 1998d).

The FS evaluations will include assessment of remedial action alternatives for soil and groundwater contamination within the Phase II former PCP mixing area remaining after the soil removal action conducted in the fall of 2002, and for Phase III source areas identified in section 7.0.

As described in the Phase I/II RI/FS work plan and DEQ guidance, the FS process will include the following:

- Developing remedial action objectives
- Delineating affected media
- Developing and evaluating general response actions, technologies and process options
- Developing and evaluating specific remedial alternatives
- Recommending a preferred alternative
- Documenting the FS in a written report.

It is anticipated that evaluations for the Phase II and Phase III FS will be contingent on approval of the results from the risk assessment by DEQ.

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10.0 PROPOSED SCHEDULE

The proposed schedule for remaining elements of the RI/FS at the Terminal is provided below. Upon approval of this RI report, the subsequent elements for the project include: preparing an approach for the human health and ecological risk assessments for the combined Phase II and Phase III study areas of the terminal, implementing the risk assessments, and conducting the Terminal-wide feasibility study. Planned intermediate deliverables are provided in the schedule below. As described in Section 9.0, other planned activities include quarterly groundwater monitoring, continuation of the groundwater interim action, and implementation of full-scale ISCO remediation. The groundwater interim action is ongoing and not included in the schedule elements below.

The proposed schedule is based on assumptions consistent with current knowledge and experience; the schedule may change if deviations occur in the program implementation and in the assumptions for DEQ document review time. The schedule will be updated and provided to DEQ as shifts in the schedule occur.

RI/FS Deliverables:

Review/Approve the Phase III RI Report by DEQ	June 2004
Submit the Risk Assessment Approach to DEQ	August 2004
Review/Approve the Risk Assessment Work Approach by DEQ	September 2004
Submit the COPC/CPEC Screening Results Memorandum to DEQ:	November 2004
Review/Approve the COPC/CPEC Screening Memo by DEQ	January 2005
Submit the Human Health and Ecological Risk Assessments to DEQ	April 2005
Review/Approve the Risk Assessment by DEQ	July 2005
Submit the FS to DEQ	September 2005
Review/Approve the FS by DEQ	November 2005

Groundwater Monitoring:

Submit the Fourth Quarter 2003 Groundwater Report to DEQ	May 2004
Conduct the Second Quarter 2004 Groundwater Monitoring Event	May 2004
Submit the First Quarter 2004 Groundwater Report to DEQ	June 2004
Submit the Second Quarter 2004 Groundwater Monitoring Event	August 2004
Conduct the Third Quarter 2004 Groundwater Monitoring Event	August 2004
Submittal of the Third Quarter 2004 Groundwater Report to DEQ	October 2004
Assess Need for Additional Groundwater Events	November 2004

Full-Scale ISCO Remediation:

Submit the Full-Scale ISCO Work Plan to DEQ	May 2004
Review/Approve ISCO Work Plan by DEQ	June 2004
Full-Scale Implementation of ISCO	June 2004

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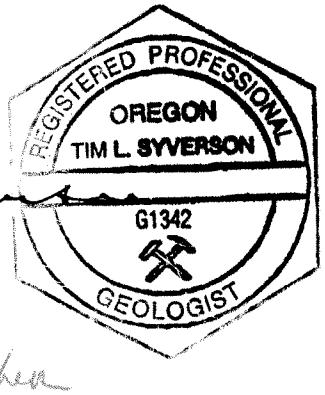
11.0 USE OF THIS REPORT

This Phase III Remedial Investigation Report has been prepared by Landau Associates for the exclusive use of Time Oil Co. for specific application to the Northwest Terminal. Services for this project were conducted in accordance with the Environmental Services Contract between Time Oil Co. and Landau Associates, Inc. Landau Associates has performed our services in accordance with generally accepted engineering and consulting standards for environmental work in effect at the time and locality services were performed. The reuse of information, conclusions, and recommendations provided herein by Time Oil Co. or others in connection with any site other than the Northwest Terminal without Landau Associates written permission shall be at the sole risk of Time Oil Co. and without liability to Landau Associates.

This document was prepared under the supervision and direction of the following key staff.

LANDAU ASSOCIATES, INC.

Rebekah Brooks
Project Manager



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Volume II - Appendices
Phase III Remedial Investigation Report
Time Oil Northwest Terminal
Portland, Oregon

April 30, 2004

Prepared for

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RECEIVED JAN 1 3 2005

LANDAU ASSOCIATES

January 10, 2005

Mr. Tom Roick
Oregon Department of Environmental Quality
2020 SW Fourth Avenue, Suite 400
Portland, OR 97201-4987

RE: TIME OIL NORTHWEST TERMINAL
PORTLAND, OREGON

Dear Mr. Roick:

On behalf of Time Oil, attached is the October through November 2004 quarterly report for Time Oil Northwest Terminal RI/FS.

LANDAU ASSOCIATES, INC.

Rebekah Brooks
Project Manager

RB/tam
1/10/05 \\Edmdata\wproc\231\TRANSMIT FAX\Quarterly Rpt_Ltr doc
Enclosure

cc: Mr. Mark Chandler, Time Oil Co.
Ms. Patricia Dost, Schwabe Williamson & Wyatt
Mr. Mike Tischuk, Beazer-East, Inc.

QUARTERLY REPORT TO DEQ
TIME OIL - NORTHWEST TERMINAL
October through December, 2004

SUMMARY OF WORK PERFORMED

- Prepared and submitted the July - September 2004 quarterly report to DEQ.
- Continued operation of the groundwater interim action in the lower zone at RW-2 at an average flow rate of 8.0 gpm.
- Continued operation of groundwater recovery in the upper zone at the groundwater intercept system at the east-west trending storm drain line (SDM-1) at an average flow rate of 1.0 gpm.
- Groundwater was not recovered in the upper zone from a horizontal recovery well (HRW-1) as water was not present in the well during this period.
- A total of approximately 19.33 million gallons of groundwater have been treated and discharged from the interim action system, with a total of about 0.96 million gallons treated during this quarter.
- Continued review of the system operations performance for the groundwater interim action system at RW-2 and HRW-1, the groundwater intercept system at SDM-1, and the onsite wastewater treatment plant (WWTP).
- Collected effluent samples from the WWTP throughout the quarter to evaluate the treatment system efficiency. Laboratory analysis of the effluent samples collected indicated that the system was operating within the established permit limitations.
- Installed and surveyed eleven new monitoring wells, four on the shoreline of the Willamette River, three at the northern boundary of the property, three in the Bell Terminal tank farm area, and one to replace LW-4D, which was damaged during the ISCO injection event.
- Conducted the fourth quarter 2004 groundwater monitoring event in November, 2004, including the first sampling event for the new wells installed in October-November 2004. Continued the sampling frequency recommended in our February 2, 2004 letter to DEQ, as approved by DEQ in an email from Tom Roick on February 3, 2004. Formal approval will occur after thorough review by DEQ.
- Completed preparation of the *Second Quarter 2004 Groundwater Monitoring and Groundwater Interim Action Status Report* and submitted to DEQ.
- Continued preparation of the *Third Quarter 2004 Groundwater Monitoring and Groundwater Interim Action Status Report*, including evaluation of analytical data from the first post-injection groundwater sampling event for the first full scale *in situ* chemical oxidation (ISCO) injection event conducted in July 2004.
- Received and began processing and validation of fourth quarter (November 2004) groundwater monitoring data.
- Provided a response letter to DEQ on its comments on the Phase III RI report. Continued revision of the draft Phase III RI report in response to DEQ's comments. As discussed with DEQ, the final Phase III RI report will incorporate the results of the new monitoring wells and is scheduled for submittal to DEQ in the first quarter 2005.

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- Received comments from DEQ on our proposal for the installation of the additional monitoring wells; submitted a response letter to DEQ on its comments on the proposal.

- Received a new well request from DEQ based on their review of the *First Quarter 2004 Groundwater Monitoring and Groundwater Interim Action Status Report;* participated in conference calls with DEQ on its request, and provided written comments to DEQ on its request.

- Revised the proposal for new well installation, based on discussions between DEQ and Time Oil representatives and submitted to DEQ. Received approval of the revised proposal from DEQ.

- Discussed the Oregon Water Resources Department's (OWRD) decision to deny a variance for construction of new lower zone wells with DEQ. Submitted a formal appeal with Cascade Drilling to OWRD. The appeal was rejected by OWRD (see discussion below under Problems Encountered).

- Coordinated with the Port of Portland on obtaining information on the Port's wells located on the property directly north of the Northwest Terminal.

- Coordinated with DEQ on performance of a hazardous waste inspection at the Northwest Terminal. Attended the hazardous waste inspection with DEQ. Received a notice of non-compliance from DEQ requesting information on materials stored in the warehouse at the Northwest Terminal. Provided a letter to DEQ indicating the types of materials currently being stored at the warehouse and the plan for future use/characterization/disposal of these materials.

- Continued passive product recovery in wells LW-21S and LW-27S using a passive bailer. The bailers are emptied on a quarterly basis. The product is temporarily being stored in a 55-gallon drum in a designated location at the terminal pending disposal. The product sock was reinstalled in well Q because product was observed during the fourth quarter 2004 monitoring event. The spent product socks are being temporarily stored in a 55-gallon drum in a designated location at the terminal pending disposal.

- Continued preparation of a work plan for performance of the terminal-wide human health and ecological risk assessments. As agreed with DEQ, the work plan will be submitted to DEQ after the data collected from the new wells along the shoreline are evaluated to determine whether there is a complete exposure pathway to the river via groundwater.

RESULTS COLLECTED

- Influent/effluent samples from the WWTP for October through December, 2004. The analytical results from the sampling events indicated that the WWTP was operating within the established permit limits. The results from the December 2004 sampling event have not been received yet. The data results will be presented in the *Fourth Quarter 2004 Groundwater Monitoring and Groundwater Interim Action Status Report.*

- Final groundwater data for the fourth quarter 2004 groundwater sampling events. Data results will be presented in the *Fourth Quarter 2004 Groundwater Monitoring and Groundwater Interim Action Status Report.*

PROBLEMS ENCOUNTERED AND STEPS TO RESOLVE

- The variance for installing the new lower zone wells (replacement for LW-4D and the new well at the north property boundary), as approved by DEQ, was denied by the Oregon Department of Water Resources. The methodology proposed was the same as conducted in the past at the Northwest Terminal for lower zone wells requiring step-down procedures where there were access limitations; however, because access was not an issue for these wells, OWRD denied use of the smaller drilling rig, which could not be used to construct the wells to the OWRD construction standards. The methodology proposed in the variance was preferred because there were other wells being installed during the same field event that required a limited-access rig for well installation (shoreline wells) and mobilizing another drilling rig would result in increased costs and schedule delays. Also, it was assumed that this method would be acceptable to OWRD because this method had been used in the past for other lower zone wells at the site and in the past had been considered to be protective of the environment. A formal appeal was filed by Schwabe, Williamson & Wyatt (on behalf of Time Oil) and Cascade Drilling. The appeal was rejected. The schedule for installation of these wells was delayed and the wells were installed during the week of November 15, 2004, using standard construction procedures.

WORK TO BE PERFORMED NEXT QUARTER

- Prepare and submit quarterly report to DEQ.
- Continue implementation of the groundwater interim action in the lower zone at RW-2. Continue to operate the groundwater intercept system at the storm drain (SDM-1). Continue groundwater treatment and discharge to POTW. Continue review of the system operations performance for the groundwater interim action system at RW-2, HRW-1, SDM-1 and the onsite wastewater treatment system.
- Continue to monitor the effluent from the WWTP.
- Complete preparation of the *Third Quarter 2004 Groundwater Monitoring and Groundwater Interim Action Report,* including post-injection groundwater results from the first full-scale ISCO injection event, and submit to DEQ.
- Prepare the *Fourth Quarter 2004 Groundwater Monitoring and Groundwater Interim Action Report.*
- Conduct the second ISCO injection event in January 2005.
- Continue passive product recovery in wells in the Main Tank Farm Area, as appropriate.
- Conduct the first quarter 2005 groundwater monitoring event in February 2004, including post-injection monitoring of the second ISCO injection event.
- Complete preparation of the risk assessment work plan and submit to DEQ.
- Revise and finalize the Phase III RI report and submit to DEQ.

BZTO104(e)020842

From: Martin Powers <MPowers@landauinc.com>
Sent: Tuesday, January 18, 2005 9:57 AM
To: Tischuk, Mike (Pittsburgh) NA <tischuk@hgm.com>
Cc: Rebekah Brooks <RBrooks@landauinc.com>; Terry McGourty <TMcGourty@landauinc.com>; Diane Morin <dmorin@landauinc.com>
Subject: Revision of Graphs for Time Oil NW Terminal
Attach: Copy of 3Q04 GW Rpt_App F.xls

Mike,
We looked over the graphs presented in Appendix F of the 3rd Quarter 2004 Status Report. I don't think we can or should make all of the penta scales the same for every graph. The reason is that our observation wells have penta concentrations that have ranged from near 0 to about 10 ppb for some wells and from about 500 to greater than 20,000 ppb for other wells. We may be able to clean up our penta concentration scale so that the look is a little more uniform, but I don't think we should try to have all of the scales show ranges from say 0 to 30,000 ppb because for some of our lower concentration wells the resulting graph would look like a straight line and would not show the effects of the ISCO injections. In an effort to make the presentation more uniform, we have adjusted our penta concentration and groundwater elevation y-axes scales so that the scales are more consistent and the data still shows the change in penta concentration and groundwater elevation.

As far as showing the Preliminary Screening Number on the graphs, I guess we could do this but we would kind of be setting a precedent by putting a surface water cleanup level on a graph where we are trying to exhibit our groundwater cleanup efforts. I don't think we are trying to achieve a groundwater cleanup goal equal to the surface water cleanup with our ISCO activities. In fact, we have not established a final target for groundwater cleanup until the risk assessment work has been completed. Unless we hear further from you and Mark Chandler, I think it would be advisable to not include the PSN on these graphs.

The revised graphs are attached. Please let us know your thoughts.
Thanks,
<<Copy of 3Q04 GW Rpt_App F.xls>>

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TABLE 1
ISCO PILOT TEST EVALUATION
DISSOLVED PCP CONCENTRATIONS AND WATER TABLE ELEVATIONS
TIME OIL NORTHWEST TERMINAL
PORTLAND, OREGON

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1																	
2	Monitoring Well	Distance From Closest Injection Point	06/24/2002 Baseline (µg/L)	06/27/2002 Water Elevation (ft)	09/19/2002 Post Injection (µg/L)	09/19/2002 Water Elevation (ft)	10/03/2002 Post Injection (µg/L)	10/03/2002 Water Elevation (ft)	10/29/2002 Post Injection (µg/L)	10/29/2002 Water Elevation (ft)	11/13/2002 Post Injection (µg/L)	11/13/2002 Water Elevation (ft)	02/11/2003 Post Injection (µg/L)	02/11/2003 Water Elevation (ft)	05/8/2003 Post Injection (µg/L)	05/8/2003 Water Elevation (ft)	08/27/2003 Post Injection (µg/L)
3	RW-1	17 ft.	1,700	14.13	NS	NR	140	13.36	1,500	12.78	5,400	12.61	2,800	14.96	1,700	15.23	1,400
4	PZ-1	38 ft.	12,000	13.54	NS	NR	7,000	13.14	NS	11.87	NS	12.21	700	14.46		14.79	
5	LW-11S	9 ft.	7,400	15.70	2,620	14.44	1,800	14.21	3,600	13.75	2,200	13.57	1,600	16.64	3,800	17.19	1,700
6	OX-1S	12 ft.	9,800	15.53	1,870	14.29	1,800	14.10	200	13.67	NS	13.46	620	16.42	67	16.90	19
7	OX-2S	16 ft.	2,300	15.47	NS	14.43	1,600	14.41	1,200	13.61	NS	13.42	5,400	16.42	6,700	16.91	5,800
8	OX-3S	33 ft.	17,000	15.36	NS	NR	8,200	13.95	1,200	13.54	NS	13.36	5,700	16.23	2,600	16.71	1,400
9	OX-4S	9 ft.	9,300	14.35	1,350	14.34	1,300	13.44	1,200	13.44	NS	12.81	880	15.15	8,300	14.47	2,200
10																	

BZTO104(e)020844

TABLE 1
ISCO PILOT TEST EVALUATION
DISSOLVED PCP CONCENTRATIONS AND WATER TABLE ELEVATIONS
TIME OIL NORTHWEST TERMINAL
PORTLAND, OREGON

	R	S	T	U
1				
2	08/27/2003 Water Elevation (ft)	10/22/2003 Post Injection (µg/L)	10/23/2003 Water Elevation (ft)	Baseline vs Third Quarter 2003 (% Reduction)
3	13.37	350	12.91	17.65
4	12.72		12.29	NA
5	14.78	900	13.98	77.03
6	14.62	0.69	13.87	99.81
7	14.26		13.59	-152.17
8	14.49	130	13.79	91.76
9	13.59			76.34
10				

TABLE 1
ISCO PILOT TEST EVALUATION
DISSOLVED PCP CONCENTRATIONS AND WATER TABLE ELEVATIONS
TIME OIL NORTHWEST TERMINAL
PORTLAND, OREGON

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Note: Non-detects are plotted at the reporting limit as noted in red below.																	
2																		
3	PCP																	
4	Monitoring Well	RW-1	PZ-1	LW-11S	OX-1S	OX-2S	OX-3S	OX-4S	OX-6S	OX-7S	OX-8S	LW-13S	LW-11D	OX-8D	SDM-1			
5	5/20/1999	150		24,000														
6	9/21/1999	3,100		9,400														
7	12/7/1999	4,100		7,200														
8	2/16/2000	6,400		11,000														
9	5/25/2000	11,000		7,700														
10	8/30/2000	6,300		3,900														
11	11/7/2000	4,000																
12	2/15/2001	11,000		460														
13	6/6/2001	2,000		560														
14	8/13/2001	410		4,700														
15	11/28/2001	17																
16	2/28/2002	1,200															9/9/2002	4
17	6/24/2002	1,700	12,000	7,400	9,800	2,300	17,000	9,300				0.250	0.250		190		9/9/2002	11
18	8/28/2002											0.260	0.260		25		9/9/2002	12
19	9/19/2002			2,620	1,870			1,350									9/9/2002	13
20	10/3/2002	140	7,000	1,800	1,800	1,600	8,200	1,300									9/9/2002	14
21	10/29/2002	1,500		3,600	200	1,200	1,200	1,200									9/9/2002	15
22	11/13/2002	5,400		2,200								0.49	0.250				9/9/2002	16
23	2/11/2003	2,800	700	1,600	620	5,400	5,700	880				0.25	0.260				9/9/2002	21
24	5/8/2003	1,700		3,800	67	6,700	2,600	8,300				0.25	0.260					
25	8/27/2003	1,400		1,700	19	5,800	1,400	2,200				1.1	5.6		120			
26	10/22/2003	350		900	0.69		130		2100	720	300	1.0	0.55	0.62	43			
27	2/18/2004	2630		6350	62.1	5320	344	1410	527	166	56.4	0.5	1.5	1.31	791			
28	6/10/2004	903		2130	58.2	5030	728	634	3280	634	206				1000			
29	8/4/2004	160		604	5	1500	59.2	96.7	604	130	76.8	0.5	0.5	5	158			
30																		
31																		
32																		
33	Water Elev																	
34	Monitoring Well	RW-1	PZ-1	LW-11S	OX-1S	OX-2S	OX-3S	OX-4S	OX-6S	OX-7S	OX-8S	LW-13S	LW-11D	OX-8D	SDM-1			
35	5/18/1999	15.76		17.63														
36	9/21/1999	13.44		14.87														
37	12/6/1999	13.73		15.10														
38	2/16/2000	15.32		17.16														
39	5/23/2000	14.37		16.09														
40	8/29/2000	13.17		14.59														
41	11/9/2000	12.79		13.92													15.23	13.37
42	2/12/2001	13.16		14.48													14.79	12.72
43	6/4/2001	13.24		14.45													17.19	14.78
44	8/16/2001			13.86													16.90	14.62
45	11/28/2001	12.91		14.00													16.91	14.26
46	2/27/2002	15.34		17.24													16.71	14.49
47	3/5/2002	15.13		17.14													14.47	13.59
48	4/5/2002	15.18		17.03														
49	5/29/2002	14.46		16.10														
50	6/27/2002	14.13	13.54	15.70	15.53	15.47	15.36	14.35				12.79	10.20					
51	08/26/2002											12.06	6.33					
52	9/19/2002			14.44	14.29	14.43		14.34										
53	10/3/2002	13.36	13.14	14.21	14.10	14.41	13.95	13.44										
54	10/29/2002	12.78	11.87	13.75	13.67	13.61	13.54	13.44										
55	11/13/2002	12.61	12.21	13.57	13.46	13.42	13.36	12.81				11.13	5.17					
56	2/11/2003	14.96	14.46	16.64	16.42	16.42	16.23	15.15				13.60	7.25					
57	5/8/2003	15.23	14.79	17.19	16.90	16.91	16.71	14.47				13.64	9.76					
58	8/27/2003	13.37	12.72	14.78	14.62	14.26	14.49	13.59				11.90	5.69					
59	10/23/2003	12.91	12.29	13.98	13.87	13.59	13.79		14.49	14.43	14.33	11.36	5.06	4.72				
60	02/19/2004	15.15	14.63	16.97	16.74	16.75	16.54	15.33	18.07	18.01	17.78	13.55	7.96	8.32				
61	06/09/2004	13.86	13.29	15.38	15.22	15.34	15.05	14.07	16.32	16.13	15.93	12.51	9.00	9.07				
62	08/10/2004	13.24	12.62	14.44	14.30	14.42	14.20	13.39	14.94	14.89	14.78	11.84	4.58	4.75				
63																		
64																		
65																		
66	2,4,5-Trichlorophenol																	
67	Monitoring Well	RW-1	PZ-1	LW-11S	OX-1S	OX-2S	OX-3S	OX-4S	OX-6S	OX-7S	OX-8S	LW-13S	LW-11D	OX-8D	SDM-1			
68	6/10/2004	5		5.1	9.9	5	5	7.59	5	5	5							
69	8/4/2004	5		5	5	5	5	5	5	5	5		5	5				
70																		

TABLE 1
ISCO PILOT TEST EVALUATION
DISSOLVED PCP CONCENTRATIONS AND WATER TABLE ELEVATIONS
TIME OIL NORTHWEST TERMINAL
PORTLAND, OREGON

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16	7/14/2004
17	7/14/2004
18	7/14/2004
19	7/14/2004
20	7/14/2004
21	7/14/2004
22	7/14/2004
23	7/14/2004
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	12.91
42	12.29
43	13.98
44	13.87
45	13.59
46	13.79
47	
48	
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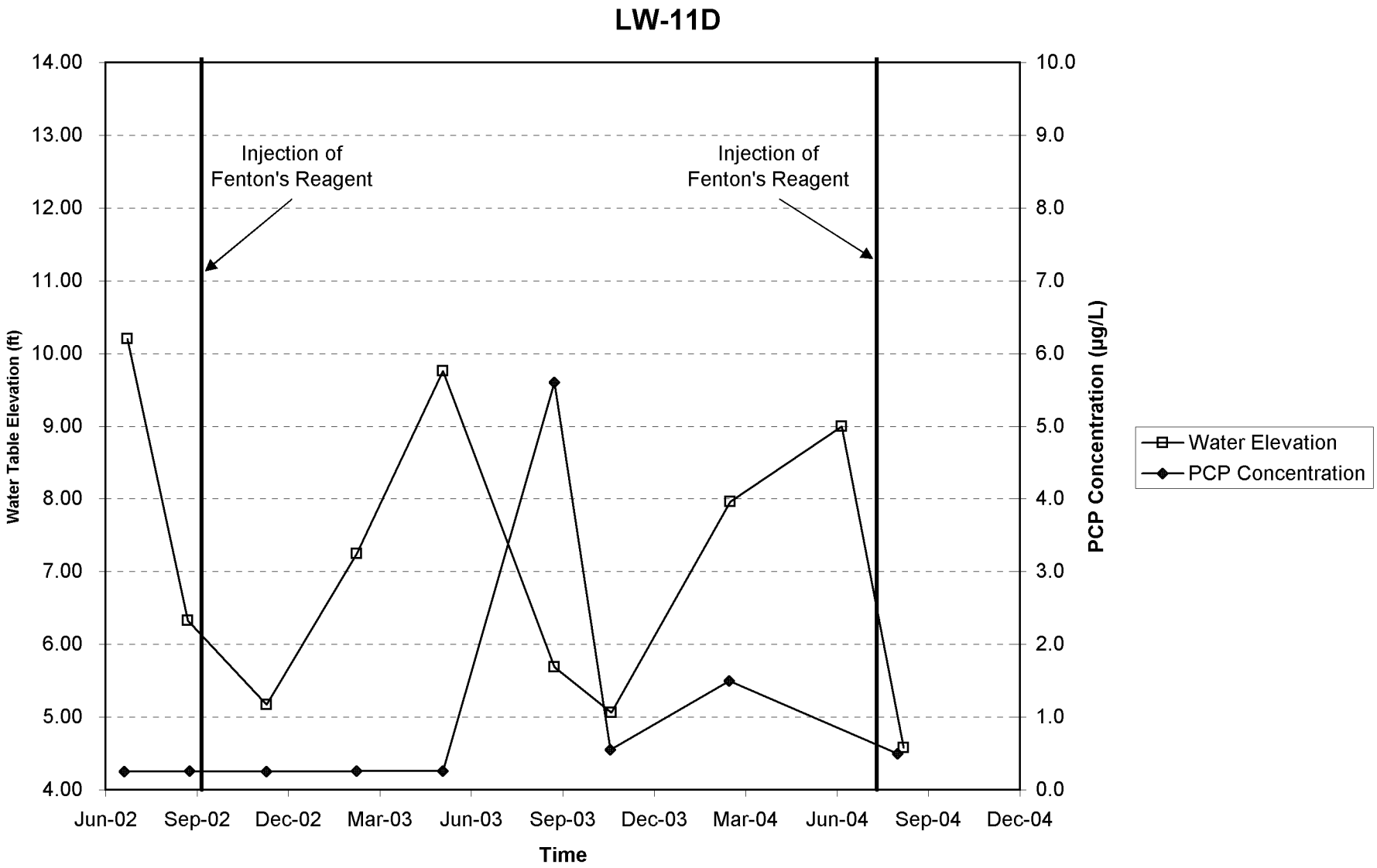
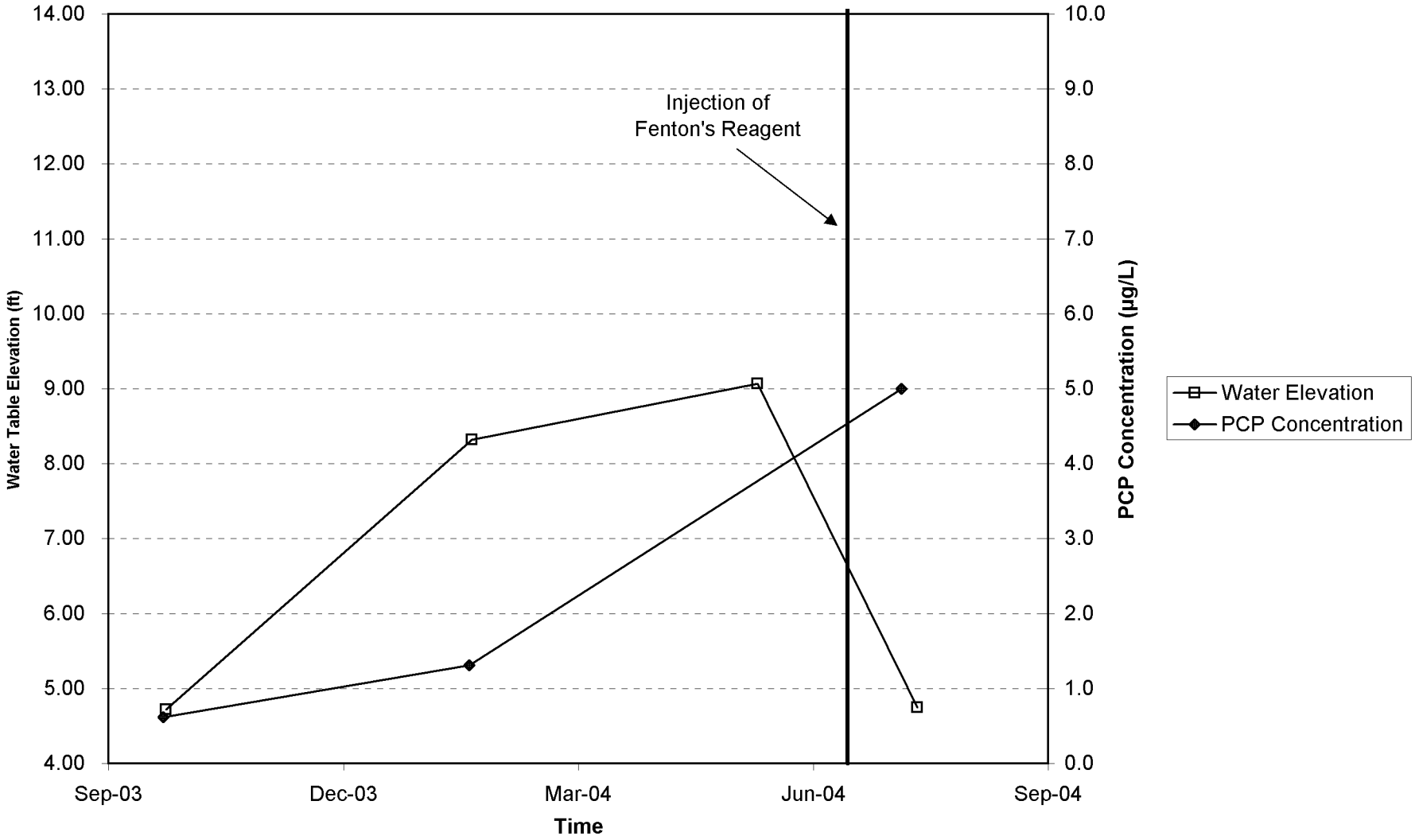
TABLE 1
ISCO PILOT TEST EVALUATION
DISSOLVED PCP CONCENTRATIONS AND WATER TABLE ELEVATIONS
TIME OIL NORTHWEST TERMINAL
PORTLAND, OREGON

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
71																		
72																		
73	2,4,6-Trichlorophenol																	
74	**Monitoring Well**	**RW-1**	**PZ-1**	**LW-11S**	**OX-1S**	**OX-2S**	**OX-3S**	**OX-4S**	**OX-6S**	**OX-7S**	**OX-8S**	**LW-13S**	**LW-11D**	**OX-8D**	**SDM-1**			
75	6/10/2004	5		5.1	5	5	5	5	5	5	5							
76	8/4/2004	19.9		5	5	5	5	5	5	5	5		5	5				
77																		
78																		
79																		
80	2,4-Dichlorophenol																	
81	**Monitoring Well**	**RW-1**	**PZ-1**	**LW-11S**	**OX-1S**	**OX-2S**	**OX-3S**	**OX-4S**	**OX-6S**	**OX-7S**	**OX-8S**	**LW-13S**	**LW-11D**	**OX-8D**	**SDM-1**			
82	6/10/2004	3		3.1	3	3	3	3	3	3	3							
83	8/4/2004	31.5		3	3	3	3	3	3	3	3		3	3				
84																		
85																		
86																		
87	2-Chlorophenol																	
88	**Monitoring Well**	**RW-1**	**PZ-1**	**LW-11S**	**OX-1S**	**OX-2S**	**OX-3S**	**OX-4S**	**OX-6S**	**OX-7S**	**OX-8S**	**LW-13S**	**LW-11D**	**OX-8D**	**SDM-1**			
89	6/10/2004	0.9		1	1	1	1	1	1	1	1							
90	8/4/2004	1		1	1	1	1	1	1	1	1		1	1				

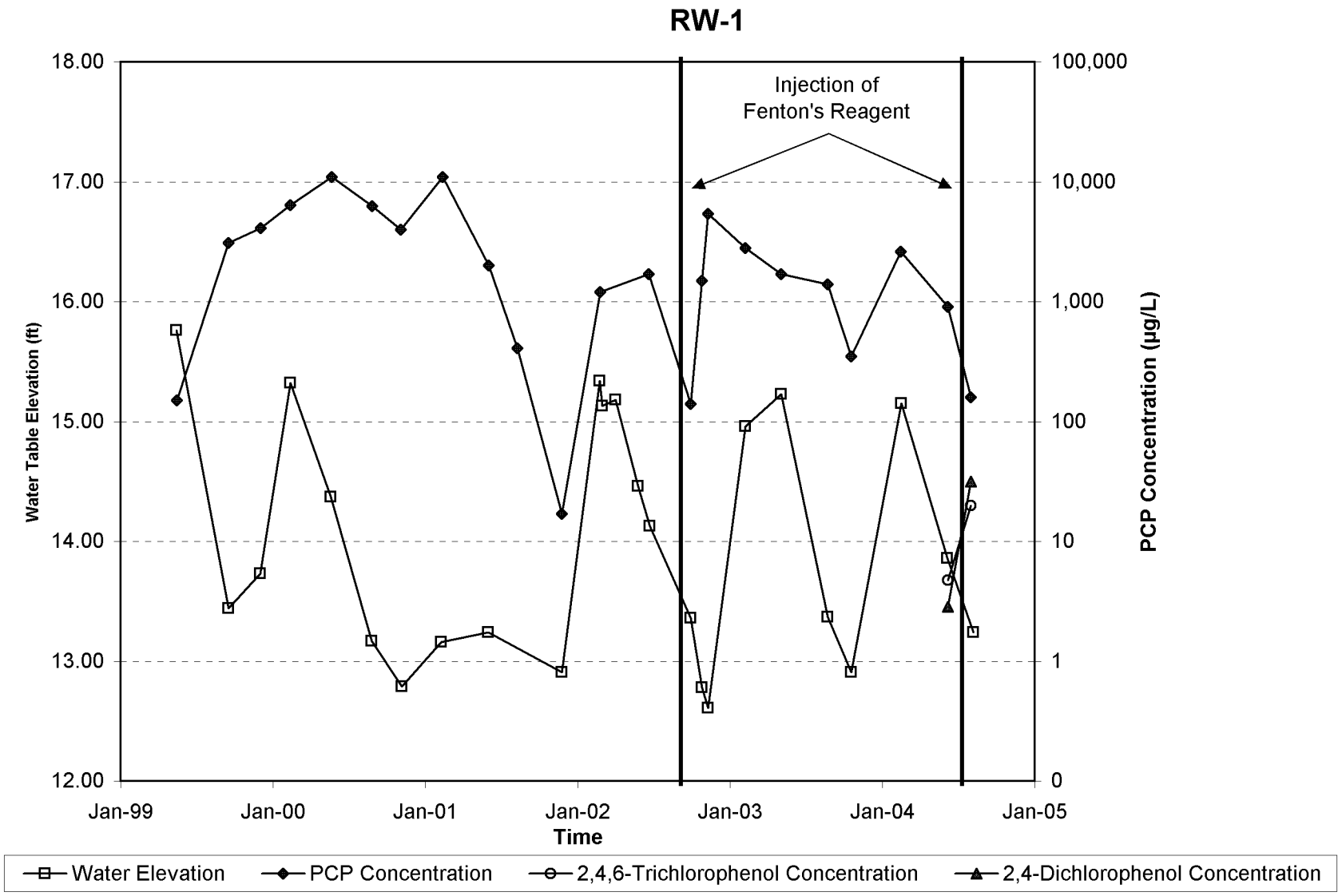


Note: PCP concentrations shown at 0.5 µg/L and below are nondetected concentrations.

OX-8D

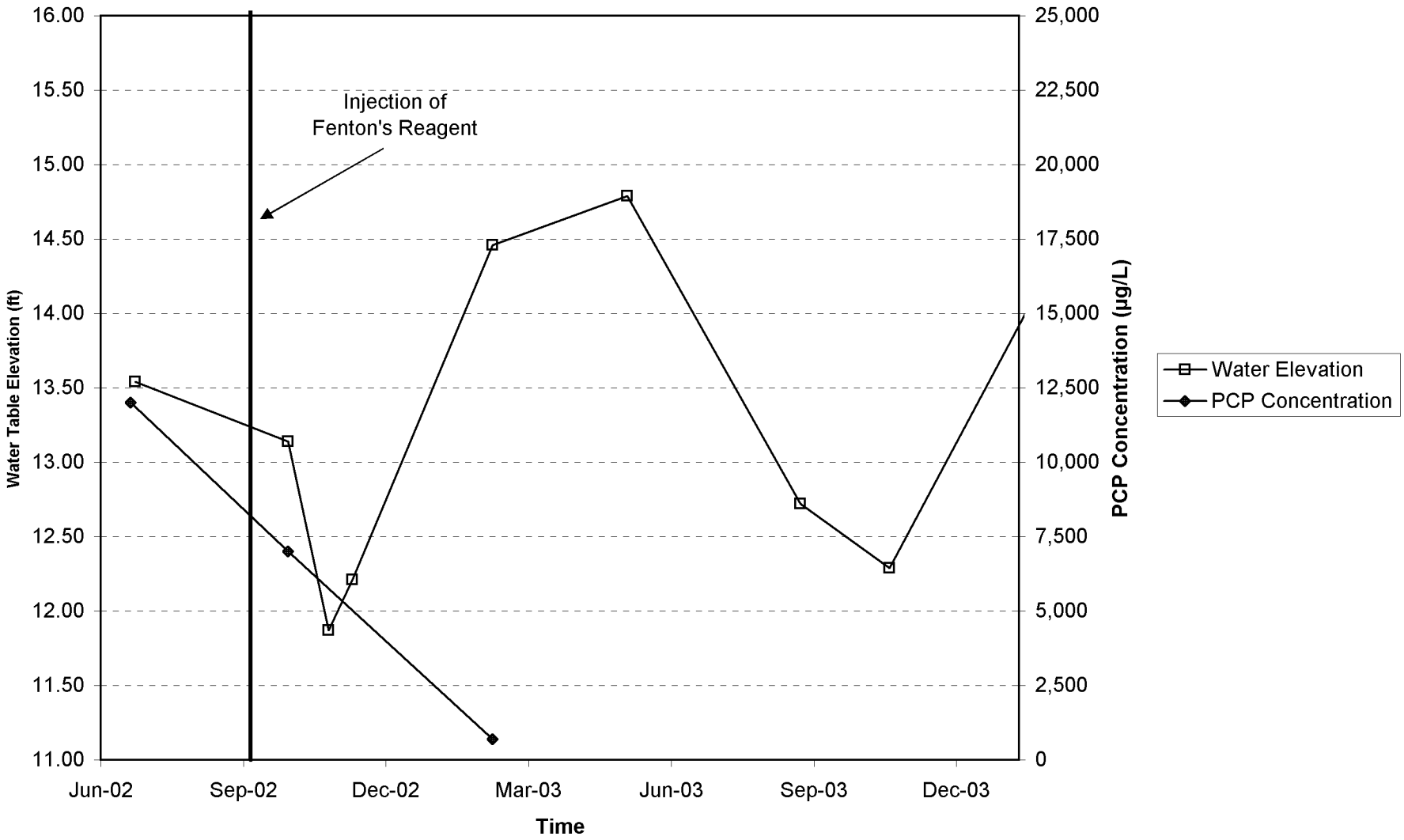


Notes: 1) Well installed in Fall 2003.
2) PCP concentrations shown at 0.5 µg/L and below are nondetected concentrations.

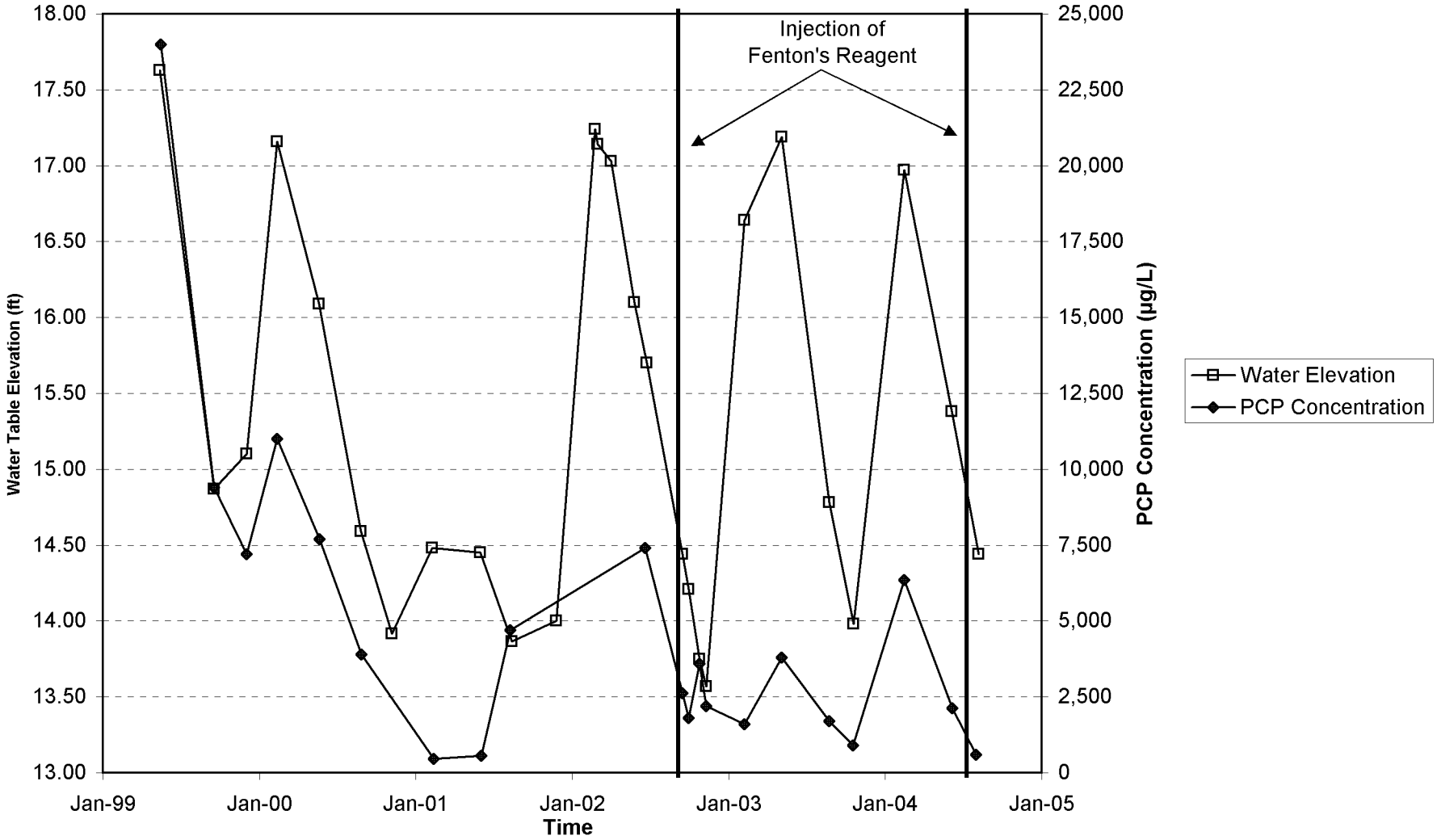


Notes: 1) 2,4,6-Trichlorophenol concentrations shown at 5 µg/L and below are nondetected concentrations.
2) 2,4-Dichlorophenol concentrations shown at 3 µg/L and below are nondetected concentrations.

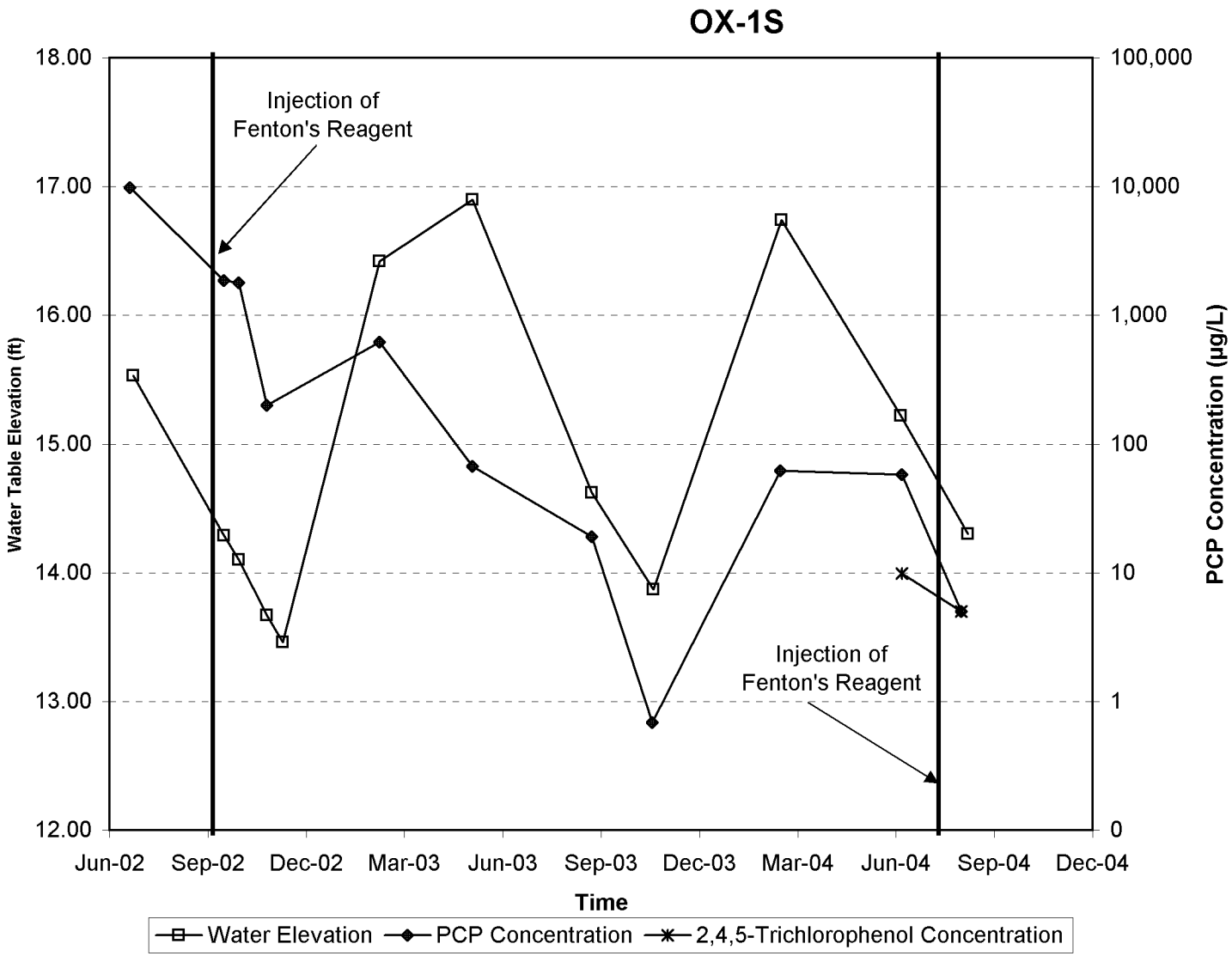
PZ-1


16.00
15.50
15.00
14.50
14.00
13.50
13.00
12.50
12.00
11.50
11.00
Water Table Elevation (ft)
25,000
22,500
20,000
17,500
15,000
12,500
10,000
7,500
5,000
2,500
0
PCP Concentration (µg/L)
Injection of
Fenton's Reagent
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Time
Water Elevation
PCP Concentration

LW-11S

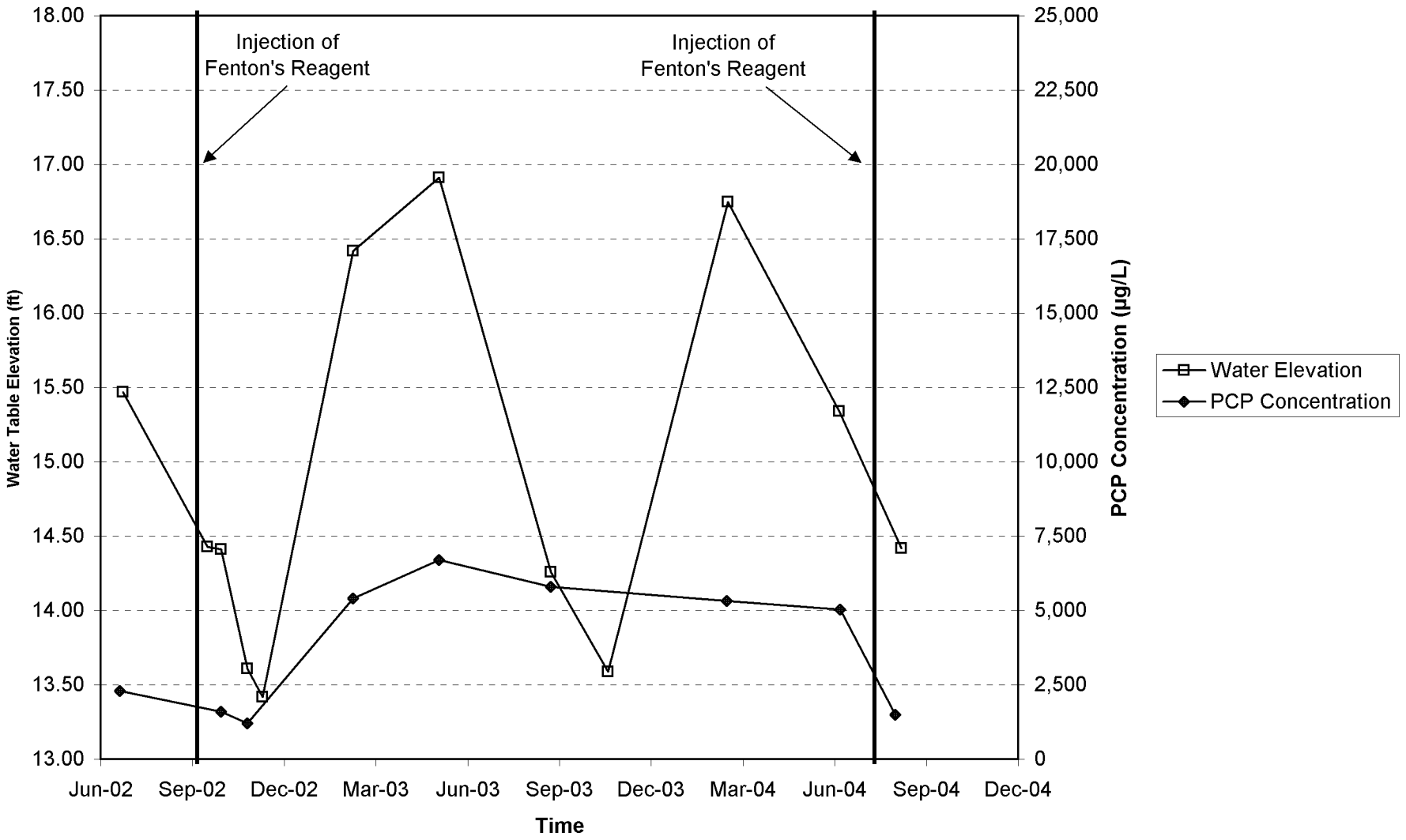


Note: Groundwater elevation without corresponding PCP concentration (e.g., December 2001, June 2002) is indicative of the presence of LNAPL and no sample was collected for analysis.



Notes: 1) PCP concentrations shown at 0.5 µg/L and below are nondetected concentrations.
2) 2,4,5-Trichlorophenol concentrations shown at 5 µg/L and below are nondetected concentrations.

OX-2S

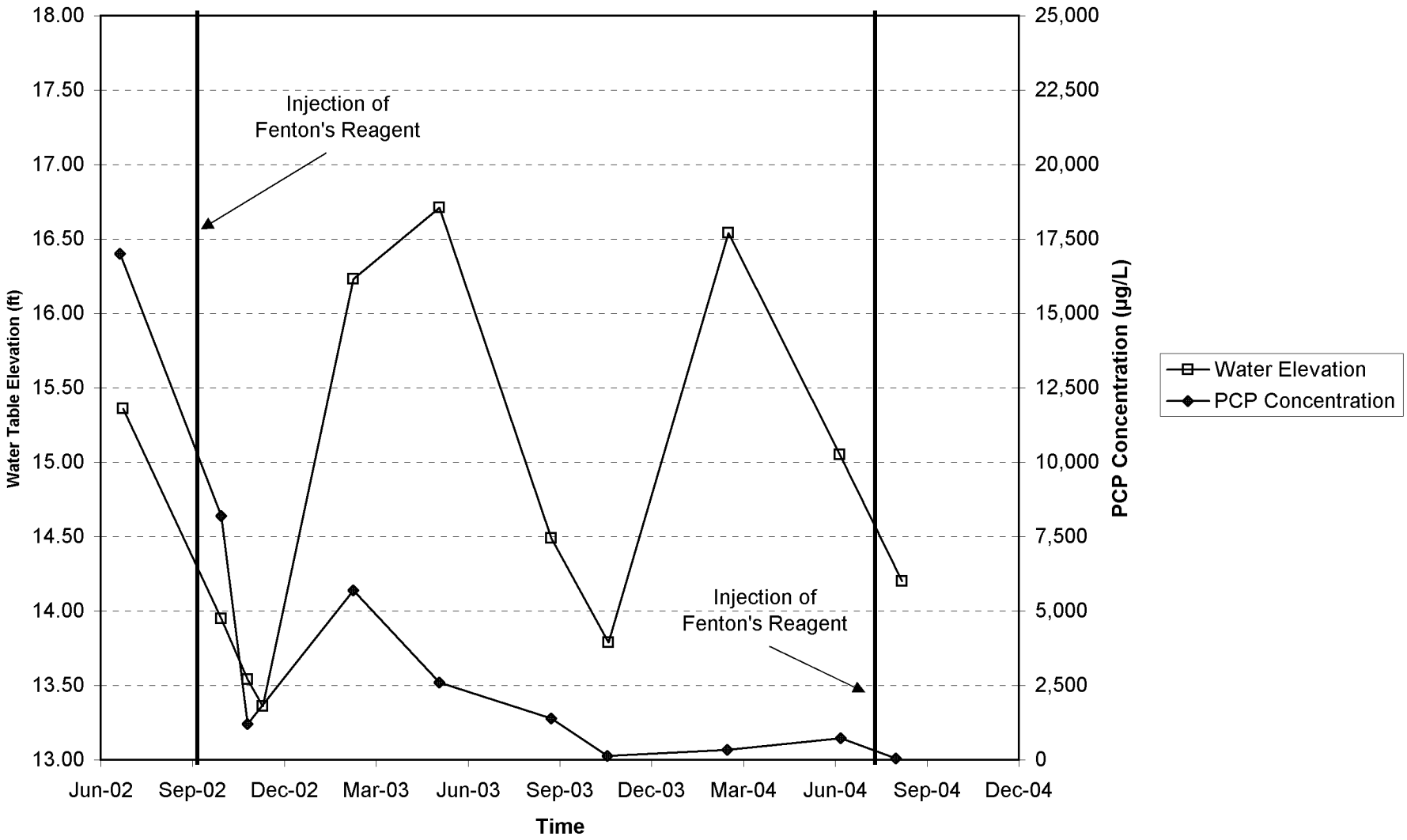


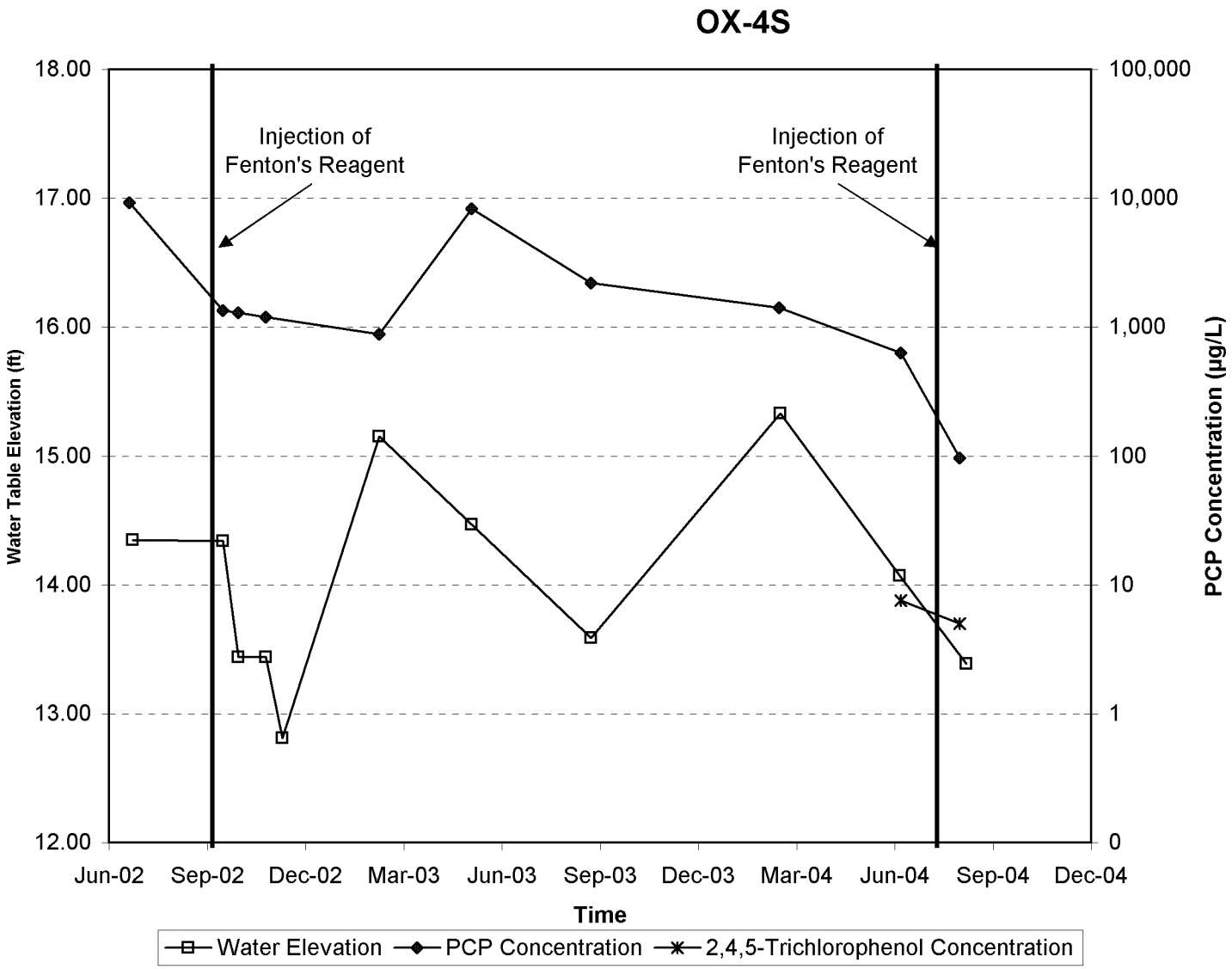
&[DATE] \\Edmdata\wproc\231\001\131\2004 Qrtly\&[FILE] OX-2S

Landau Associates

BZTO104(e)020855

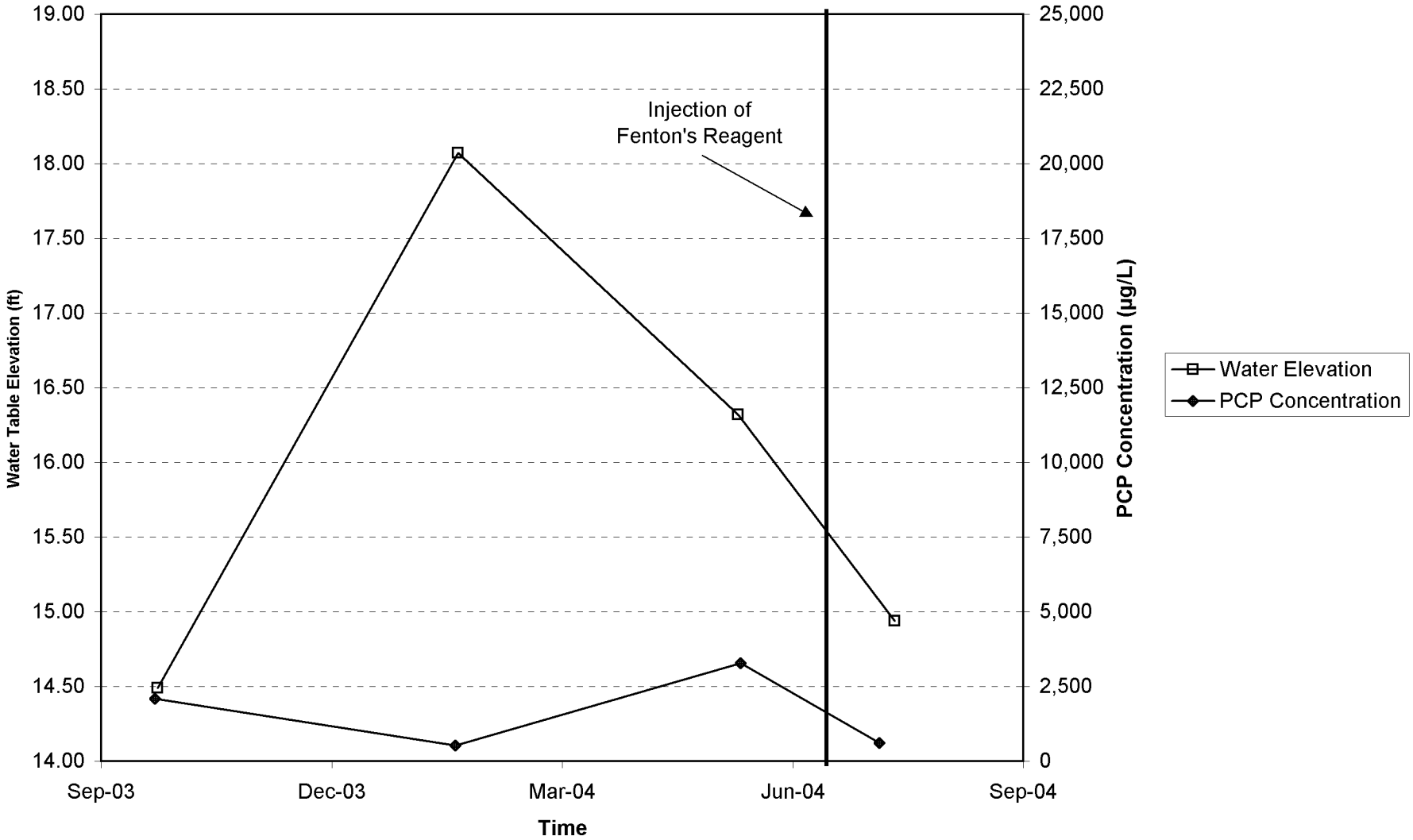
OX-3S


Injection of
Fenton's Reagent
Injection of
Fenton's Reagent
Water Table Elevation (ft)
PCP Concentration (µg/L)
Time
Water Elevation
PCP Concentration
18.00
17.50
17.00
16.50
16.00
15.50
15.00
14.50
14.00
13.50
13.00
25,000
22,500
20,000
17,500
15,000
12,500
10,000
7,500
5,000
2,500
0
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04

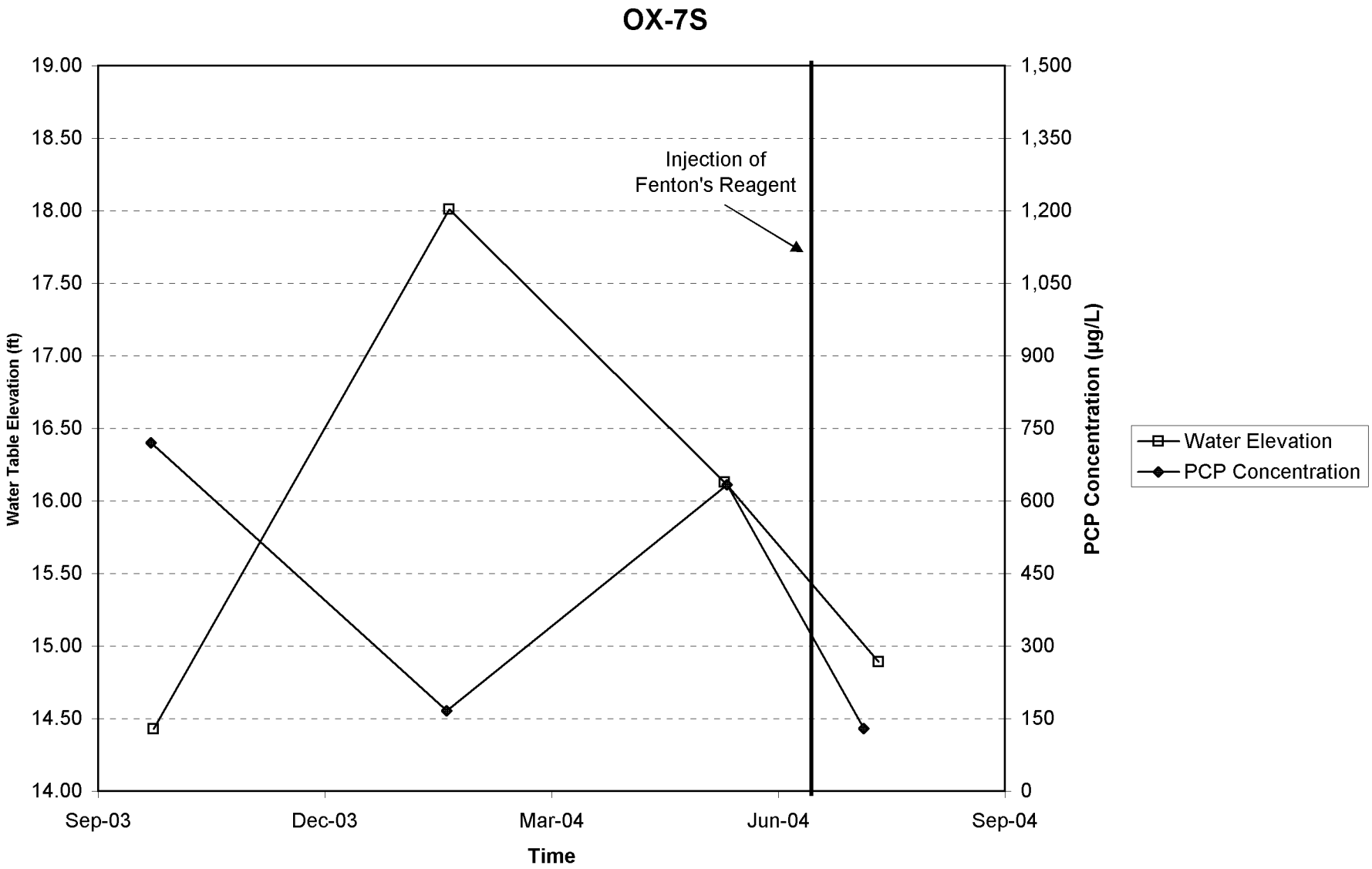


Note: 2,4,5-Trichlorophenol concentrations shown at 5 µg/L and below are nondetected concentrations.

OX-6S

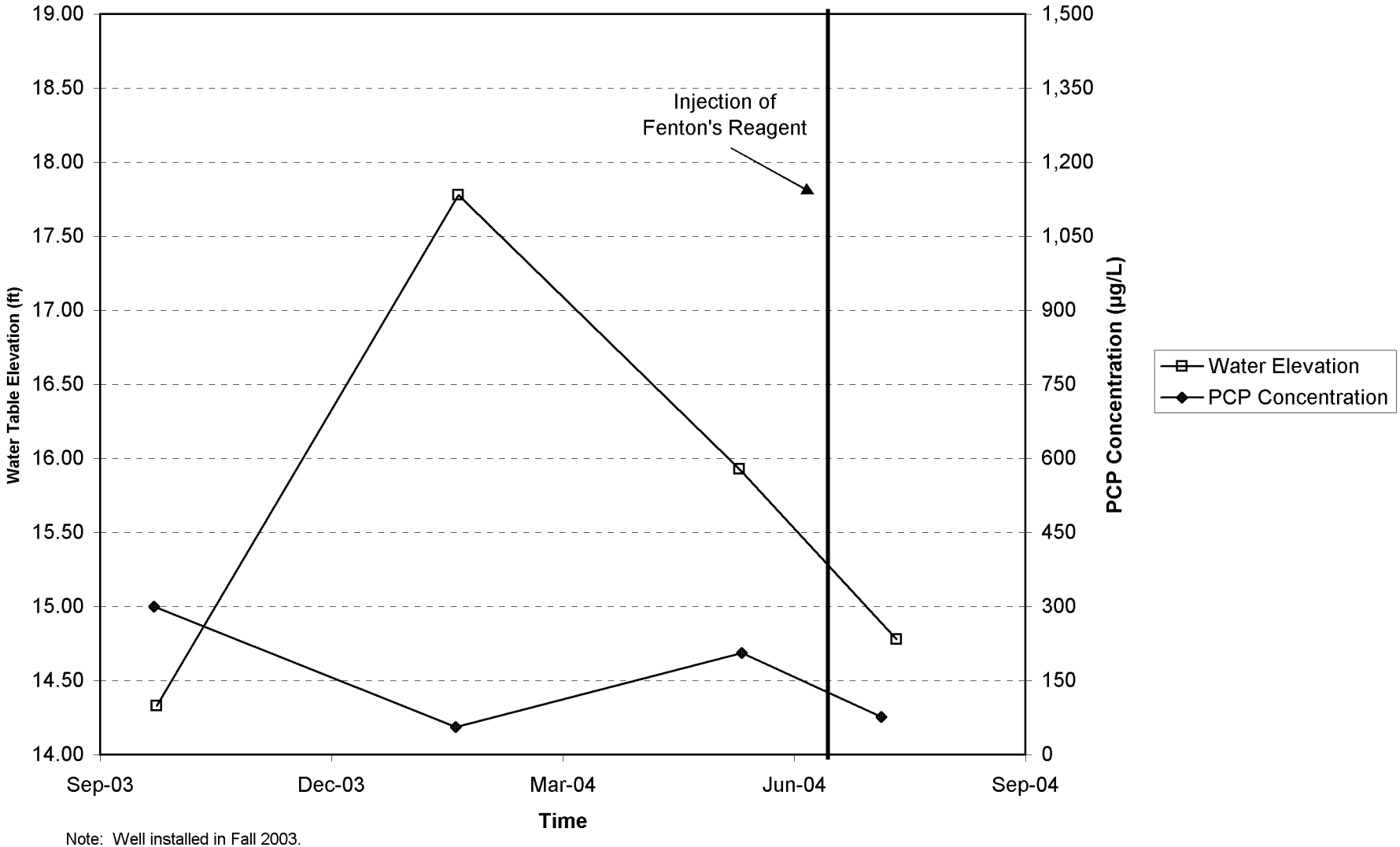


Note: Well installed in Fall 2003.



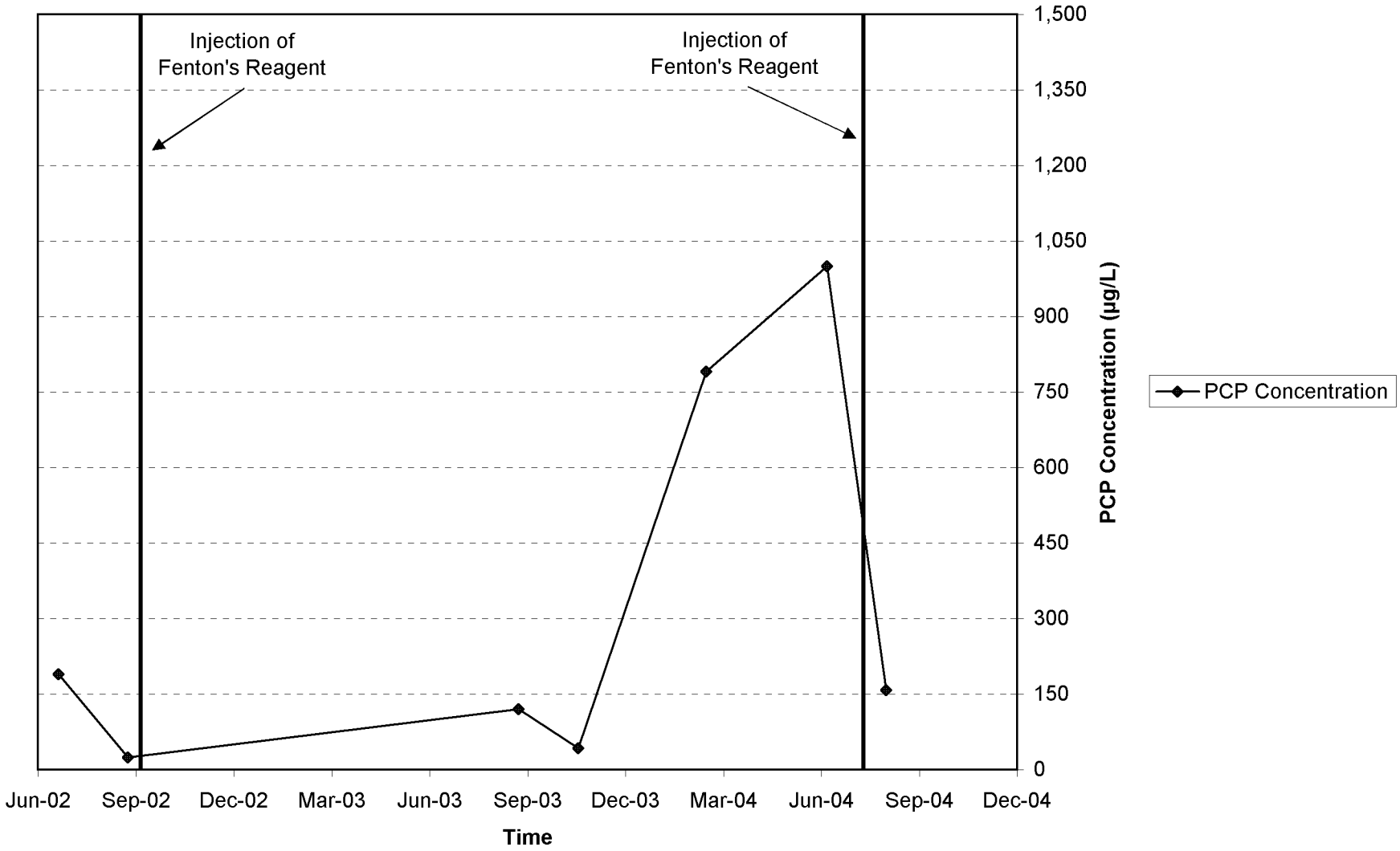
Note: Well installed in Fall 2003.

OX-8S

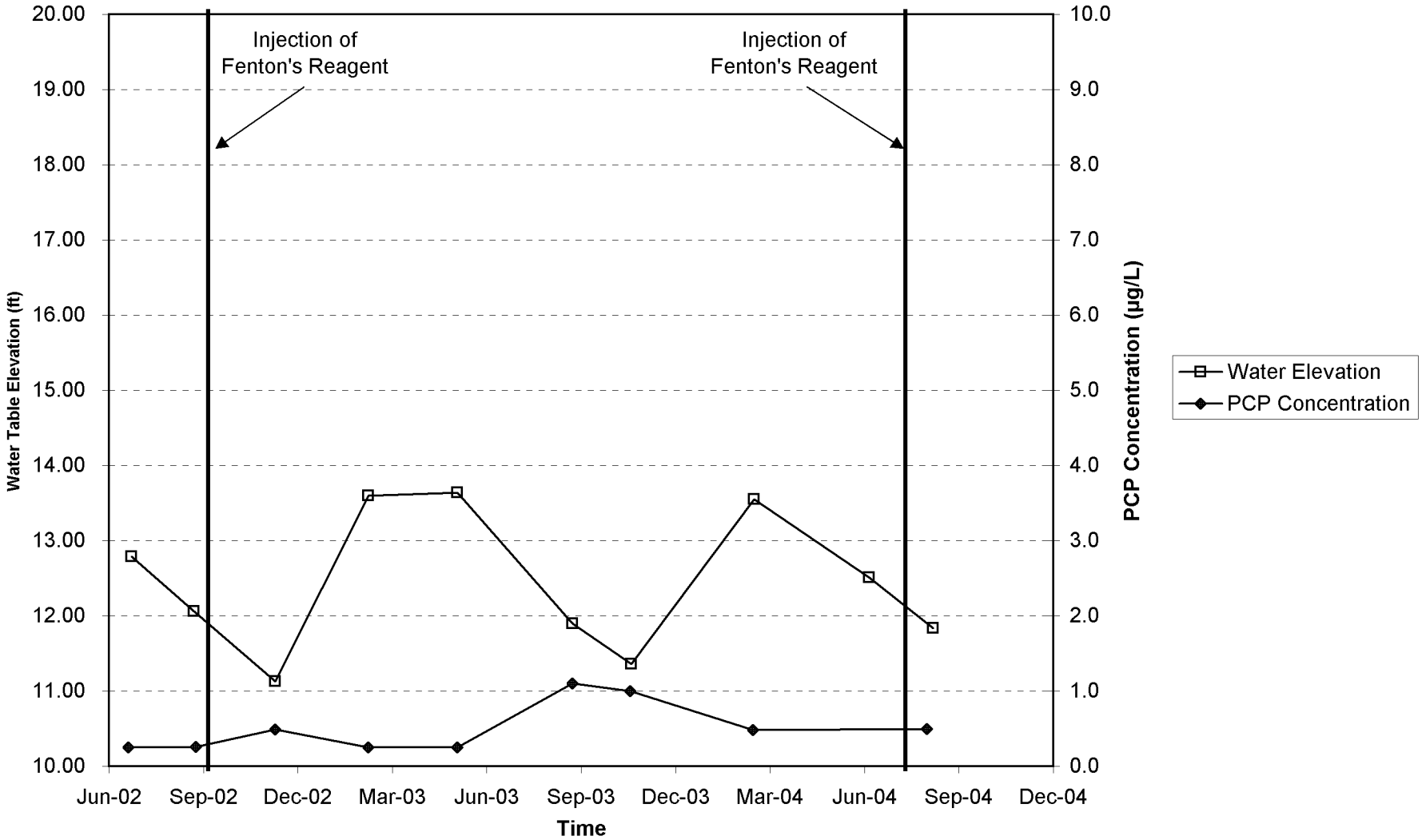


Note: Well installed in Fall 2003.

SDM-1


Injection of
Fenton's Reagent
Injection of
Fenton's Reagent
1,500
1,350
1,200
1,050
900
750
600
450
300
150
0
PCP Concentration (µg/L)
PCP Concentration
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Time

LW-13S



Note: PCP concentrations shown at 0.5 µg/L and below are nondetected concentrations.

LANDAU ASSOCIATES

RECEIVED OCT 1 1 2005

October 7, 2005

Mr. Tom Roick
Oregon Department of Environmental Quality
2020 SW Fourth Avenue, Suite 400
Portland, OR 97201-4987

RE: TIME OIL NORTHWEST TERMINAL
PORTLAND, OREGON

Dear Mr. Roick:

On behalf of Time Oil, attached is the July, August, and September 2005 quarterly report for Time Oil Northwest Terminal RI/FS.

LANDAU ASSOCIATES, INC.

Rebekah Brooks
Project Manager

RB/tam
10/7/05 \\Edmdata\wproc\231\TRANSMIT.FAX\Quarterly Rpt_Ltr.doc
Enclosure

cc: Mr. Mark Chandler, Time Oil Co.
Ms. Patricia Dost, Schwabe Williamson & Wyatt
Mr. Mike Tischuk, Beazer East, Inc.

QUARTERLY REPORT TO DEQ
TIME OIL - NORTHWEST TERMINAL
July through September, 2005

SUMMARY OF WORK PERFORMED

- Prepared and submitted the April – September 2005 quarterly report to DEQ.
- Continued operation of the groundwater interim action in the lower zone at RW-2 at an average flow rate of 7.4 gpm.
- Continued operation of groundwater recovery in the upper zone at the groundwater intercept system at the east-west trending storm drain line (SDM-1) at an average flow rate of 1.0 gpm.
- Conducted intermittent operation of groundwater recovery in the upper zone from horizontal recovery well (HRW-1) at an average flow rate of 0.01 gpm. Due to low groundwater elevation conditions, no groundwater was recovered from HRW-1 in August or September 2005.
- A total of approximately 21.99 million gallons of groundwater have been treated and discharged from the interim action system, with a total of about 0.80 million gallons treated during this quarter.
- Continued review of the system operations performance for the groundwater interim action system at RW-2 and HRW-1, the groundwater intercept system at SDM-1, and the onsite wastewater treatment plant (WWTP).
- Collected effluent samples from the WWTP throughout the quarter to evaluate the treatment system efficiency. Laboratory analysis of the effluent samples collected indicated that the system was operating within the established permit limitations.
- Updated the Storm Water Pollution Control Plan for the Terminal and provided to the Water Quality Division of DEQ.
- Conducted the third quarter 2005 groundwater monitoring event, August 15-23, 2005. Received final approval from DEQ for the February 2, 2004 revised sampling frequency proposal in a letter from Tom Roick, dated July 26, 2005.
- Measured natural attenuation parameters (e.g., pre-purge, down-hole, dissolved oxygen and oxidation reduction potential measurements) monthly during the third quarter 2005 for use in preparation of a source control evaluation approach.
- Completed preparation of the *First Quarter 2005 Groundwater Monitoring and Groundwater Interim Action Status Report*, and submitted to DEQ.
- Prepared the *Second Quarter 2005 Groundwater Monitoring and Groundwater Interim Action Report.*
- Began receiving the third quarter 2005 (August 2005) groundwater monitoring data.
- Submitted the final Phase III RI report to DEQ.

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- Continued passive product recovery in wells LW-21S and LW-27S using passive bailers. The product is temporarily being stored in a 55-gallon drum in a designated location at the terminal pending disposal. Product socks were not reinstalled at any of the wells in the Main Tank Farm area during the third quarter 2005 monitoring event, because product was not observed at any of the other wells. The spent product socks are being temporarily stored in a 55-gallon drum in a designated location at the terminal pending disposal.

- Continued preparation of a work plan for performance of the terminal-wide human health and ecological risk assessments. The work plan is expected to be submitted to DEQ in November 2005.

- Provided DEQ with an outline for a source control evaluation at the Terminal for discussion in our July 20, 2005 meeting.

- Met with DEQ on July 20, 2005, on the approach for a source control evaluation for the Terminal and a proposal for conducting a monitored natural attenuation evaluation as part of the source control evaluation.

- Prepared a proposal for conducting a monitored natural attenuation evaluation as part of a source control evaluation approach for the Terminal and submitted to DEQ.

RESULTS COLLECTED

- Influent/effluent samples from the WWTP for July, August, and September 2005. The analytical results from the sampling events indicated that the WWTP was operating within the established permit limits. The data results will be presented in the *Third Quarter 2005 Groundwater Monitoring and Groundwater Interim Action Status Report.*

- A portion of the final groundwater data for the third quarter 2005 groundwater sampling events. Data results will be presented in the *Third Quarter 2005 Groundwater Monitoring and Groundwater Interim Action Status Report.*

PROBLEMS ENCOUNTERED AND STEPS TO RESOLVE

- The pump at SDM-1 stopped operating on June 6, 2005. The pump was replaced and the new pump was operating as of July 7. The delay was caused by first trying to repair the existing pump and then assessing whether it was under warranty. To prevent a lapse in system operation in the future, 2 new pumps were purchased. One pump was installed at SDM-1 and the second pump serves as a backup. Flowmeter readings from August 23 and September 1 indicate no flow in that period, but it is likely due to lack of rain rather than a problem with the pump.

- A water leak in the pipeline leading from Tank 16804 to the wastewater treatment system was discovered by Time Oil personnel on July 5, 2005. A contractor was hired to uncover and repair the pipeline on July 6, 2005. The soil was sampled around the pipeline for TPH constituents (BTEX, TPH-G, and TPH-Dx) and PCP. PCP, BTEX, and TPH-G concentrations were nondetect and the TPH-Dx (diesel-range and motor-oil range) concentrations were less than the Oregon DEQ RBCs. Based on these results, the soil was used to backfill the trench around the pipeline.

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WORK TO BE PERFORMED NEXT QUARTER

- Prepare and submit quarterly report to DEQ.
- Continue implementation of the groundwater interim action in the lower zone at RW-2. Continue to operate the groundwater intercept system at the storm drain (SDM-1). Continue groundwater treatment and discharge to POTW. Continue review of the system operations performance for the groundwater interim action system at RW-2, HRW-1, SDM-1 and the onsite wastewater treatment system.
- Continue to monitor the effluent from the WWTP.
- Complete preparation of the *Second Quarter 2005 Groundwater Monitoring and Groundwater Interim Action Report* and submit to DEQ.
- Prepare the *Third Quarter 2005 Groundwater Monitoring and Groundwater Interim Action Report.*
- Continue passive product recovery in wells in the Main Tank Farm Area, as appropriate.
- Provide a technical memorandum to DEQ requesting a reduction in monitoring frequency requirements for future quarterly groundwater monitoring events.
- Conduct the fourth quarter 2005 groundwater monitoring event in November 2005. We will attempt to sample the wells on the Port of Portland to define the locality of facility at the north side of the Terminal property, if water levels have risen sufficiently and if access is approved by the Port.
- Complete preparation of the risk assessment work plan and submit to DEQ.
- Respond to DEQ's comments on the final Phase III RI report and receive approval of the report from DEQ.
- Receive approval from DEQ on the monitored natural attenuation evaluation proposal to be conducted as part of the source control evaluation at the Terminal. Begin implementation of the monitored natural attenuation evaluation.
- Continue monthly measurements of natural attenuation parameters through December 2005.

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Agency Review
Risk Assessment Work Plan
Time Oil Northwest Terminal
Portland, Oregon

December 28, 2005

Prepared for

Time Oil Co.
2737 W. Commodore Way
Seattle, WA 98199

LANDAU ASSOCIATES
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APPENDICES

Appendix	Title
A	Level I Ecological Scoping Evaluation

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LIST OF ACRONYMS

ADD	Average Daily Dose
ARL	Acceptable Risk Level
AST	Aboveground Storage Tank
ATSDR	Agency for Toxic Substance and Disease Registry
BAF	Bioaccumulation Factor
BGS	Below Ground Surface
BTF	Biotransfer Factors
CEEM	Conceptual Ecological Exposure Model
CEM	Conceptual Exposure Model
CESARS	Chemical Evaluation Search and Retrieval System
COI	Contaminant of Interest
COPC	Contaminant of Potential Concern
COPEC	Contaminant of Potential Ecological Concern
cPAH	Carcinogenic Polycyclic Aromatic Hydrocarbon
CRBG	Columbia River Basalt Group
CSM	Conceptual Site Model
DEQ	Oregon Department of Environmental Quality
D_{HR}	Home Range Diameter
EC	Environmental Concentration
EDD	Estimated Daily Dose
EPA	U.S. Environmental Protection Agency
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
ERBSC	Ecological Risk-Based Screening Concentration
ERfC	Ecological Reference Concentration
ERfD	Ecological Reference Dose
ESA	Endangered Species Act
ETCL	Ecological Target Cleanup Level
HHRA	Human Health Risk Assessment
IRIS	Integrated Risk Information System
ISCO	*In Situ* Chemical Oxidation
LADD	Lifetime Average Daily Dose

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LC_{50}	Lethal Concentration for 50 Percent of the Population
LD_{50}	Lethal Dose for 50 Percent of the Population
LOAEL	Lowest Observed Adverse Effect Level
LOEL	Lowest Observed Effect Level
MSL	Mean Sea Level
NFA	No Further Action
NOAEL	No Observed Adverse Effect Level
NOEL	No Observed Effect Level
OAR	Oregon Administrative Rule
OHM/TADS	Oil and Hazardous Materials/Technical Assistance Data System
ONHIC	Oregon National Heritage Information Center
PCB	Polychlorinated Biphenyl
PCP	Pentachlorophenol
PRG	Preliminary Remediation Goal
RBC	Risk-Based Concentration
RI	Remedial Investigation
RTECS	Registry of Toxic Effects of Chemical Substances
SLV	Screening Level Value
TBD	Toxicity Benchmark Dose
TUF	Temporal Use Factor
UCL	Upper Confidence Limit
UF	Uncertainty Factor
USFWS	U.S. Fish and Wildlife Service
VCP	Voluntary Cleanup Program
WWTS	Wastewater Treatment System

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1.0 INTRODUCTION

This document presents a work plan for a human health and ecological risk assessment for the Time Oil Co. (Time Oil) Northwest Terminal (Terminal or site) in Portland, Oregon. This work plan has been prepared to present the methods that will be used in evaluating site conditions relative to the potential risk posed to human and ecological receptors from environmentally impacted media in the uplands portion of the site. The risk assessment will be based on knowledge of the Terminal obtained through previous environmental investigations, with emphasis placed on the information presented in the final *Phase III Remedial Investigation Report* (Phase III RI, Landau Associates 2005). The risk calculation methods that will be used are prescribed by Oregon Department of Environmental Quality (DEQ) guidance documents (DEQ 2000, 2001).

This work plan also presents a conceptual site model (CSM) for the Terminal that identifies sources of contamination at the site, potential contaminant migration and transport pathways, and potential receptor populations and exposure pathways. The CSM was developed based on information obtained during previous site investigation activities at the Terminal (Landau Associates 1993, 1997, 2001, 2004) and information presented in the site summary for the CSM report for Portland Harbor (Integral Consulting, Inc. and Groundwater Solutions, Inc. 2004).

This work plan is organized into four sections and one appendix as follows:

- Section 1.0 presents an overview of the planned risk assessment for the Terminal, including a description of the Terminal, the local geology and hydrogeology, and the CSM.

- Section 2.0 describes the environmental investigations performed to date, identifies the data that will be used in conducting the human health and ecological risk assessments, and describes the status of data gaps.

- Section 3.0 describes how the data will be screened to identify contaminants that will be evaluated in the risk assessment process.

- Section 4.0 describes the methods that will be used in conducting the human health risk assessment, and presents the mathematical models and input parameters that will be used to evaluate site risk. This section also discusses how the uncertainty associated with the risk evaluation will be addressed and how risk-based concentrations will be developed.

- Section 5.0 describes the methods that will be used in conducting the ecological risk assessment, and presents the mathematical models and input parameters that will be used to evaluate site risk. This section also discusses how the uncertainty associated with the risk evaluation will be addressed and how ecologically protective risk-based concentrations will be developed.

- Appendix A includes the completed Level I Ecological Scoping Evaluation for the site, which is summarized in Section 5.0.

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1.1 TERMINAL DESCRIPTION

Time Oil's Northwest Terminal is described in detail in the final Phase III RI report (Landau Associates 2005). A brief overview is included here for context.

The Terminal is a former bulk petroleum storage and transfer facility currently owned by Time Oil. Time Oil ceased operations at the Terminal on October 31, 2001. From 1943 to 2001, the Terminal was operated by Time Oil as the Northwest Terminal petroleum products facility. Since operations began, the Terminal was used for the receipt, storage, and distribution of petroleum and petroleum-related products. Historically, Time Oil also leased tank space to Crosby & Overton for storage of waste oils, and Koppers Company Inc., n/k/a Beazer East, Inc., (Koppers) entered into an agreement with Time Oil which provided that Time Oil would formulate Koppers' pentachlorophenol (PCP)-containing wood treating products. Koppers owned tanks at the Terminal used for the formulation and blending of PCP-containing wood treatment products and owned all raw materials, products and wastes associated with the operation.

The site is located in Township 2 North, Range 1 West, Sections 34 and 35, in the industrialized Rivergate area of north Portland, Oregon (Figure 1). The Terminal is bordered to the east and south by heavy industrial complexes, to the north by heavy industrial property and Port of Portland undeveloped property, and to the west by the Willamette River. The Terminal is approximately 52 acres in size and is generally flat with an average land surface elevation of about 28 ft above mean sea level (MSL). The Terminal is enclosed by a terminal-wide chain link fence and access is through the main gate at the termination of Time Oil Road. Within the Terminal, there are several features that are distinguished by their historical uses, as shown on Figure 2.

1.2 GEOLOGY AND HYDROGEOLOGY

The Terminal is located on sand fill within the floodplain of the Willamette River. Prior to development of waterfront facilities, this region was characterized by alluvial river deposits consisting of sand and silt deposited by a series of braided channels, lowlands, and marshes. Specifically at the site, historical aerial photographs indicate that the area consisted of river floodplain and overbank deposits with no apparent historical river channels present. The Willamette River channel has historically been dredged to facilitate transport and moorage of shipping vessels for various industries along the riverfront. It is likely that shallow soil at the Terminal consists partly of historically dredged fill material that was placed in the upland areas. Geologic units at the Terminal, inferred from regional geologic information, consist of the undifferentiated Columbia River Basalt Group (CRBG), Sandy River Mudstone, the Troutdale Formation, alluvium, and imported fill, in order of decreasing age and depth.

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Four principal near-surface hydrogeologic units have been identified at the Terminal. In descending order from ground surface, these units include: 1) an upper water-bearing zone, comprised predominantly of shallow fill (10- to 20-ft thick, with less than 1- to 15-ft saturated thickness); 2) a silt confining unit (1- to 30-ft thick); 3) a lower water-bearing zone, comprised predominantly of native alluvium consisting of silty sand and sand interlayers (1- to 40-ft thick); and 4) a deep sand unit (greater than 40-ft thick). Depending on the continuity of the confining unit, the hydrogeologic units can act as distinct aquifer units with unconfined conditions in the upper zone and confined to semiconfined characteristics in the lower zone, or act as a single unconfined aquifer in the area beyond the extent of the confining unit to the west, toward the Willamette River. The hydrogeologic units are described in detail in the Phase III RI report.

1.3 CONCEPTUAL SITE MODEL

A complete pathway from the source of chemicals to human or ecological receptors is necessary for potential risk to be realized. Required elements for a complete exposure pathway include:

- A source of potentially toxic chemicals (i.e., primary sources, such as contents of tanks, or a secondary source, such as contaminated soil)
- A mechanism of chemical release to the environment (i.e., spillage to the ground)
- A mechanism of retention in, or transport to, an exposure medium (i.e., adsorption to soil, or leaching from soil to shallow subsurface groundwater)
- A point of contact between receptor and exposure medium (i.e., a person with uncovered skin working in the presence of contaminated soil or groundwater)
- An intake route for the receptor (i.e., a person handling contaminated soil with bare hands).

A CSM is a working hypothesis of how site-related contaminants might migrate through the environment to potential exposure media. It describes what is known about sources and the receiving environment, and is the basis for identifying the processes by which receptors may come to be exposed to contaminants in conceptual exposure models (CEMs) for human and ecological receptors.

The CEMs presented in this section describe contaminant sources, potential release mechanisms, transport pathways based on information obtained during previous environmental investigations at the Terminal, secondary source and exposure media, and potential exposure pathways to human and ecological receptors.

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1.3.1 CONTAMINANT SOURCES AND POTENTIAL RELEASE MECHANISMS

This section identifies confirmed and potential sources of environmental impacts at the Terminal. These sources have been described in detail in previous documents, and are summarized here for reference. The locations of confirmed and potential source areas are shown on Figure 2. A schematic of the CSM for the Terminal is provided on Figure 3. The CEMs for human and ecological risk are provided on Figures 4 and 5, respectively. As described below, soil removal actions have removed source material from areas including the former PCP mixing area, the former Crosby & Overton area, the former soil stockpile area, and the East Property. These actions effectively removed the potential exposure route for facility-related contaminants via surface soil in these areas. Based upon confirmation sampling data, there is no complete exposure pathway from surface soil in these interim removal areas, and surface soil exposures will not be considered for the human health and ecological risk assessments in these areas. Additional considerations for the East Property are also provided below.

1.3.1.1 Petroleum-Related Operations

Twenty-one aboveground storage tanks (ASTs) are located in the Main Terminal tank farm area. These ASTs historically provided storage for various petroleum products. All of the Main Terminal tank farm area tanks are currently empty, except for tank 16804, which stores groundwater recovered by the interim action recovery wells prior to treatment at the onsite wastewater treatment system. Product lines in this area have been flushed and cleaned. Based on data presented in the Phase III RI report, historical handling and storage of petroleum products in the Main Terminal tank farm area appear to have resulted in chemical releases to surface and/or subsurface soil and subsequent migration to groundwater. The Terminal historically received and distributed petroleum products via rail, truck, and marine vessel. Loading racks and docks are no longer in use, and all associated aboveground and underground distribution pipes have been flushed and cleaned. Historical use of onsite product receiving and distribution facilities onsite could have resulted in chemical releases to surface soil and/or subsurface soil. Two ASTs formerly used for storage of aviation gasoline and one AST formerly used for butane storage are located southeast of the Terminal office. Historical use of these ASTs could have resulted in petroleum releases to surface soil.

Ten ASTs are located in the Bell Terminal tank farm area. These ASTs historically provided storage for various petroleum products and are currently empty. Product lines in this area have been flushed and cleaned. Based on data presented in the Phase III RI report, historical handling and storage of petroleum products in the Bell Terminal tank farm area appear to have resulted in chemical releases to surface and/or subsurface soil; however, no past releases in the Bell Terminal tank farm area have been

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documented. Within the central portion of the Bell Terminal Tank Farm area, gasoline- and diesel-range petroleum hydrocarbon concentrations present in soil appear to have originated from different sources than those along the western property boundary because of the decreases in concentrations between the two areas. The TPH concentrations within the central portion of the tank farm are likely a result of minor, incidental releases related to operations within the Bell Terminal Tank Farm area. The source of TPH concentrations outside the operational area of the Bell Terminal Tank Farm near the western property boundary is unknown. Groundwater data collected within the Bell Terminal Tank Farm area and on the adjacent former PEO property suggest the presence of three commingled petroleum hydrocarbon plumes within this area: 1) one originating in the central portion of the Bell Terminal Tank Farm area near the east-west trending pipeline, 2) one originating along the western property boundary outside the walls of the tank farm, and 3) one originating on the eastern portion of the former PEO property where significant petroleum releases are known to have occurred, such as in the area where the former diesel ASTs were located. Even though it is likely that the plume originating from the central portion of the Bell Terminal commingles with the plume originating near the western property boundary, and that both of these plumes commingle with other contamination originating on the former PEO property in the area where the former diesel ASTs were located, it is unlikely that the elevated concentrations observed near the western property boundary or on the former PEO property originate from the Bell Terminal tank farm operations. This conclusion is based on the significant increase in both soil and groundwater concentrations for petroleum constituents across the western property boundary and on the former PEO property. Also, product has consistently been observed with thicknesses up to about 6 ft in wells on the eastern portion of the former PEO property (well MW-4) between 2001 and 2003, but no product has ever been observed within the Bell Terminal Tank Farm area. This contaminant distribution supports the presence of different sources than in the Bell Terminal Tank Farm area. Additional data are needed on the adjacent property to further characterize the nature and extent of contamination from activities along the western property boundary of the Bell Terminal or on the adjacent property.

1.3.1.2 PCP-Related Operations

Koppers used a portion of the site, identified as the former PCP mixing area and warehouse, for blending and storing specialty wood treating products containing PCP from 1967 to 1984. Historical activities in this area resulted in chemical releases to surface soil. Known soil contamination in this area at depths above the water table, approximately 13 ft below ground surface (BGS), was excavated for offsite treatment and disposal during an interim removal action (Landau Associates 2003). An interim action, using the *in situ* chemical oxidation (ISCO) technology, is currently ongoing to address environmental impacts from this operation to shallow groundwater and soil within the zone of

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groundwater fluctuation. In addition, shallow groundwater impacted by PCP entering the east-west trending storm drain is being captured by a storm drain intercept system installed in 2000, and a horizontal recovery well is being operated under seasonal high groundwater conditions. In the lower zone, since 2000, a vertical recovery well captures downgradient migration of PCP-impacted groundwater. Captured groundwater is treated at the onsite wastewater treatment system and discharged into the POTW under a permit with the City of Portland.

Soil excavated from the former PCP mixing area in 1989 and from the East Property during interim removal actions in 1996 and 1997 (see below) was temporarily stockpiled in an area south of the former PCP mixing area. Stockpiled soil was placed on top of a plastic liner to limit contact with the existing ground surface and was covered with plastic to limit stormwater runoff. The stockpile and any residual impacted soil below the stockpile was removed in 2002 as part of the soil removal action described above (Landau Associates 2003). Following soil removal, soil within the footprint of the former stockpile was tested and found to be unimpacted.

1.3.1.3 Other Miscellaneous Historical Uses

The former Crosby & Overton tank area historically contained two ASTs used for waste oil storage. Based on data in the Phase III RI report, storage and handling of chemicals in this area, including petroleum hydrocarbons, carcinogenic polycyclic aromatic hydrocarbons (cPAH), and polychlorinated biphenyls (PCBs), appear to have resulted in chemical releases to surface soil. ASTs in this area have been removed and all associated piping has been flushed and cleaned. Known soil contamination in this area was addressed by interim removal actions in 1987, 1989 (Landau Associates 2001), and 2002 (Landau Associates 2003). Groundwater was not adversely impacted by operations in this area.

A remedial action for the eastern 23 acres (East Property) of the Northwest Terminal resulted in a conditional (industrial use only) no further action (NFA) determination from DEQ (DEQ 2003). As part of this determination, DEQ found that because drinking water is not a current or reasonably likely future beneficial use of shallow groundwater at the site, contaminants historically detected in groundwater on the East Property are below concentrations of concern for human health, and do not pose a threat to ecological receptors in the Willamette River located over 1000 ft to the west (DEQ 2003). Therefore, the East Property has been excluded from the risk evaluations.

1.3.2 Potential Contaminant Fate and Transport

The primary fate and transport mechanisms that are likely to occur at the Terminal include transport and degradation.

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Transport mechanisms at the site, which have the potential to impact media that human and ecological receptors could be exposed to, include the following:

- **Disturbance and Air Transport Of Surface Soil.** This pathway is associated with the disturbance of surface soil, through human activity or wind erosion, and subsequent airborne transport of particulates. The transported particulates could be inhaled by human and ecological receptors or redeposited downwind.

- **Leaching to Groundwater from Surface and Subsurface Soil.** This pathway is associated with chemical constituents that are sorbed on upland soil and that dissolve or otherwise desorb into water passing through the soil (i.e., infiltrating water from the surface, migrating groundwater). The extent to which leaching occurs is a function of the amount of water passing through the soil, properties of the individual chemical constituents, and physical and chemical properties of the soil and water. Leaching is a reversible process, in that chemicals leached to groundwater can re-sorb onto soil farther along the flow path.

- **Transport of Volatile Contaminants to Ambient Air from Groundwater.** This pathway is associated with the volatilization and migration of volatile contaminants in shallow groundwater through the unsaturated zone to the ground surface, where these contaminants could impact ambient air. The resulting vapor phase contaminants could be inhaled by human and ecological receptors.

Hydrogeologic data show that groundwater underlying the site discharges to the Willamette River. However, data collected from shoreline wells that are used to monitor water quality near the point of discharge to the Willamette River show that, with the exception of chromium concentrations in three of the wells and a single copper concentration, no constituent exceeded the preliminary screening levels established for the RI (Landau Associates 2005) during the November 2004 quarterly groundwater sampling event, and all constituents were less than the preliminary screening levels during the February and June 2005 events. Diesel-range petroleum hydrocarbons (TPH-diesel) were detected in three of the four shoreline wells during each event, but no published risk-based screening level value is available for TPH-diesel. All other petroleum-related constituents were not detected or were detected at concentrations below preliminary screening values for protection of human and ecological receptors. The data collected from the shoreline wells indicate that even though there is a physical groundwater transport pathway between upland areas of the terminal to the river, there is not a current complete contaminant transport pathway to the river via groundwater; any potential for future migration is being addressed in a separate Source Control Evaluation. Therefore, the groundwater to surface water exposure pathway will not be considered in the risk assessment. Groundwater concentrations from the shoreline wells will be compared to Joint Source Control Strategy (DEQ and EPA 2005) screening level values to confirm the absence of a complete groundwater to surface water contaminant transport pathway in the upcoming source control evaluation to be provided to DEQ in spring 2006. Any historical impacts to surface water and sediments

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are being addressed through the risk assessment being conducted as part of the Portland Harbor RI/FS. Data from the shoreline wells will continue to be reported in quarterly groundwater reports.

1.3.3 SECONDARY SOURCE AND EXPOSURE MEDIA

This section describes environmental media with potential or confirmed impacts from contaminant sources at the Terminal. The relationship between site environmental media and the potential present and future exposure pathways for contaminant contact with human or ecological receptors, are summarized in the following subsections.

1.3.3.1 Upland Soil

Both surface and subsurface soil contain contaminants of interest (COIs) at the site, except in the areas where soil removal actions have occurred, as will be demonstrated in the risk assessment by screening procedures described in Section 3.0. Impacted surface soil at the site represents a potential source of direct contact by humans. Impacted surface soil also is a source of direct contact with and ingestion of COIs by ecological receptors that live or feed at the facility. These are complete and potentially significant pathways for current and potential future scenarios that will be considered in the risk assessment.

Impacted subsurface soil (defined as soil at depths between 3 ft and 13 ft for the purposes of this risk assessment) represents a potential source of direct human contact at the site for excavation workers. Although there are not any current activities or plans at the site for the excavation work, this is a complete and potentially significant pathway for possible future scenarios that will be considered in the risk assessment. Because ecological receptors are considered to inhabit soil depths of less than 3 ft BGS, there is an incomplete pathway for exposure of ecological receptors to subsurface soil. Therefore, this pathway will not be considered in the risk assessment.

1.3.3.2 Groundwater

Upper zone groundwater and, to a lesser degree, lower zone groundwater have been shown to contain COIs at the site. Based on the beneficial water use determination summarized in the Phase III RI report (Landau Associates 2005) and the NFA determination for the East Property (DEQ 2003), the current and likely future beneficial use of groundwater in surrounding areas is primarily industrial with some use for irrigation of ornamental vegetation (i.e., not food crops) and does not include use as drinking water. However, irrigation does not occur in direct proximity to the site, and groundwater flow patterns at the site are not impacted by pumping for irrigation; therefore, exposure to groundwater via irrigation is

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not considered a significant pathway. Groundwater at the Terminal is not currently used for any purposes; any potential future groundwater use at the terminal will be limited to industrial use. In potential future scenarios, human receptors could be exposed to chemicals in lower zone groundwater by dermal contact with groundwater used for industrial purposes, which is considered to be a complete and potentially significant pathway and will be considered in the risk assessment. There is insufficient yield of upper zone groundwater to facilitate its use for industrial purposes. In potential future scenarios, excavation workers could come into contact with upper zone groundwater exposed in open trenches. Ecological receptors are not expected to be exposed to groundwater at the Terminal and, therefore, this exposure pathway will not be considered in the ecological risk assessment.

1.3.3.3 Ambient Air

Volatile contaminants have been detected in upper zone groundwater at the Terminal. These contaminants have the potential to separate into soil gas at the surface of the groundwater table and then migrate to the ground surface and volatilize into ambient air. This pathway will be considered as complete and potentially significant for current and potential future scenarios in the risk assessment, although it may be determined that the potential risks associated with inhalation of impacted ambient air are insignificant in comparison to other exposure pathways at the Terminal.

1.3.3.4 Indoor Air

Volatile contaminants have been detected in upper zone groundwater at the Terminal. These contaminants have the potential to separate into soil gas at the surface of the groundwater table and then migrate to the ground surface and volatilize into indoor air. This pathway will be considered as complete and potentially significant in the risk assessment for potential future land use scenarios that could include indoor industrial activities, although it may be determined that the potential risks associated with inhalation of impacted indoor air are insignificant in comparison to other exposure pathways at the Terminal.

1.3.3.5 Willamette River Surface Water and Sediment

Groundwater samples collected from shoreline monitoring wells represent water quality conditions in shallow groundwater near the discharge point to the Willamette River. Data from samples collected in November 2004, February 2005 and June 2005 show that, with the exception of two metals in the first sampling event only, groundwater discharging to the Willamette River does not contain COIs above screening levels, and there is no complete contaminant pathway to the river; therefore, exposure to

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surface water and sediment in the river will not be considered in the risk assessment. The potential for future migration of site COIs to surface water or sediment will be addressed in a separate Source Control Evaluation. Any historical impacts to Willamette River surface water and sediment quality are being addressed in the Portland Harbor RI/FS.

1.3.4 Potential Receptors and Exposure Scenarios

Potential receptors are those human or ecological groups that, by virtue of their activities at a site (now or in the future) could be exposed to impacted environmental media. This section presents a summary of potential receptors identified for the site and surrounding area. Potential human receptors have been identified based on our understanding of current and potential future land use at the site and in the surrounding area from the results of land use and beneficial water use surveys completed for the site and summarized in the Phase III RI report (Landau Associates 2005). Ecological receptors have been identified based on a survey of ecological conditions at the terminal.

Three exposure scenarios for human receptors account for likely current or potential future contact with site COIs. These exposure scenarios are:

- Onsite Industrial Worker: The onsite industrial worker may work in an indoor or outdoor setting and is assumed to be involved in onsite occupational activities 250 days per year for up to 25 years.

- Onsite Construction Worker: The onsite construction worker is assumed to be involved in outdoor construction activities with a greater opportunity for direct contact with the upper 3 ft of soil. The construction worker is assumed to be engaged in work at the site for 250 days per year for up to one year.

- Onsite Excavation Worker: The onsite excavation worker is assumed to have a high level of contact with soil and potentially with upper zone groundwater in trenches extending to 13 ft BGS.

In addition to these human exposure scenarios, ecological exposure scenarios involving terrestrial and/or semi-aquatic receptors are possible based on both current and potential future site conditions. This section presents a preliminary evaluation of present and potential future exposure scenarios for the human and ecological receptors identified for the site, by environmental medium.

1.3.4.1 Upland Soil

The onsite industrial worker, onsite construction worker, and onsite excavation worker may contact contaminants in surface soil through incidental ingestion, dermal contact, and inhalation of airborne particulate matter. Only the onsite excavation worker could contact contaminants in subsurface

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soil; this would occur through future excavation activities that are expected to be limited to the soil within 13 ft of the surface.

Terrestrial and semi-aquatic animals are expected to come in contact only with surface soil; this contact could occur during burrowing or at the ground surface (dermal contact, incidental ingestion, and inhalation of airborne particulate matter). Ecological receptor exposure is expected to be limited to the upper 3 ft of soil. Terrestrial and semi-aquatic predators could also be exposed to COIs through ingestion of prey that inhabit contaminated surface soil. Terrestrial plants also could come in contact with surface soil contamination, primarily via uptake through their root systems.

1.3.4.2 Groundwater

As described in Section 1.3.3.2, neither drinking nor irrigation are current or reasonably likely future beneficial uses of groundwater at the Terminal. Furthermore, there are no groundwater seeps in the riverbank; therefore, direct exposure to groundwater is only possible when groundwater is pumped from the subsurface for specific purposes.

If future site activities involve the use of groundwater for industrial purposes, the onsite industrial worker could be exposed to impacted lower zone groundwater through dermal contact; incidental ingestion and inhalation of airborne water particles are considered potentially complete but insignificant pathways for exposure to industrial process water. The onsite excavation worker could be exposed to impacted upper zone groundwater in subsurface excavations through dermal contact; however, incidental ingestion and inhalation of airborne water particles are considered potentially complete but insignificant pathways for excavation worker exposure. The onsite construction worker is not expected to be exposed to groundwater.

1.3.4.3 Ambient Air

The onsite industrial worker, onsite construction worker, and onsite excavation worker may uptake vapor phase contaminants through the inhalation of impacted ambient air. As described in Section 1.3.3.3, ambient air could be impacted by the volatilization of COIs in upper zone groundwater.

1.3.4.4 Indoor Air

Although indoor air impacts are not a concern under the existing site configuration, the site may be redeveloped in the future. A future onsite industrial worker may uptake vapor phase contaminants through the inhalation of impacted indoor air. As described in Section 1.3.3.4, indoor air could be impacted by the volatilization of COIs in upper zone groundwater.

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1.3.5 SUMMARY

Figure 4 summarizes the CEM for human risk and Figure 5 summarizes the CEM for ecological risk. These figures identify known or suspected sources of contamination at the site, known or suspected contaminant release mechanisms and migration pathways, potential receptor populations, and potential exposure pathways.

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2.0 ENVIRONMENTAL DATA

This section describes the environmental investigations performed to date, identifies the data that will be used in conducting the baseline human health and ecological risk assessments, and describes the status of data gaps.

2.1 PREVIOUS INVESTIGATIONS

Beginning in 1984, a series of environmental investigations were conducted to evaluate the potential for soil and groundwater contamination due to former operations at the Terminal. These investigations included a site inspection by DEQ in 1984, several soil investigations in the former PCP mixing area between 1984 and 1994, removal of the Crosby & Overton truck-washing trough in 1986, test pit explorations near the Crosby & Overton truck-washing trough in 1989, and a groundwater and soil investigation in 1994 in response to an unleaded gasoline spill. These investigations are described in the Phase III RI report.

In addition to the soil and groundwater investigations conducted between 1984 and 1994, a phased RI was conducted at the Terminal from 1996 through 2004, including ongoing quarterly groundwater monitoring continuing to the present under a Voluntary Cleanup Program (VCP) agreement between Time Oil and DEQ. The Phase I RI focused on the former stockpile area, and the Phase II RI focused on the former PCP mixing area and the former Crosby & Overton area. The Phase III RI focused on areas of the Terminal where no extensive soil or groundwater investigations had previously been performed, including the former Main Terminal and Bell Terminal tank farm areas, the former loading racks, and other historical operational portions of the Terminal. Some additional investigations and a soil remedial action were also performed for the East Property, which is not an area of consideration for the risk assessment and is, therefore, not considered part of the Terminal, or site, for the purposes of this document as described above. Some interim removal actions, including removal of the stockpile and impacted soil from the former PCP mixing/warehouse areas and soil from the Crosby & Overton area, were also completed in 2002. A more complete description of environmental data collected to date, including data representative of residual soil concentrations remaining at the conclusion of the soil removal actions and contaminated soil that has already been removed, is presented in the Phase III RI report and the removal action completion report (Landau Associates 2003).

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2.2 RISK ASSESSMENT DATA SET

This section describes the data set collected during environmental investigations at the Terminal that will be the basis for evaluating potential risks to human and ecological receptors. Special approaches to handling environmental data for risk assessment purposes are also described.

2.2.1 DATA SET DESCRIPTION

The data set compiled in the Phase III RI report (Landau Associates 2005) presents data representative of existing site conditions. Soil samples collected throughout the Phase II and Phase III RIs, that are representative of soil remaining at the Terminal following the completed interim remedial or removal actions, are presented in the Phase III RI report and comprise the data set to be used for soil characterization in the risk assessment. Except for the excavation worker scenario, which involves exposure to soil from ground surface to 13 ft BGS, all other human and ecological receptors are potentially exposed only to surface soil from ground surface to 3 ft BGS, as specified in DEQ guidance. Soil data will be evaluated in two data sets for risk assessment purposes: surface soil will include all applicable data from 0 to 3 ft BGS, and surface and subsurface soil will include all applicable data from 0 to 13 ft BGS (the approximate water table).

The nature and extent of contamination present in groundwater at the Terminal was evaluated based on chemical results for groundwater samples collected from temporary borings during the Phase III preliminary evaluation, the Phase III interim subsurface investigation, the October-November 2004 well installation, and also the most recent year of quarterly groundwater monitoring data (fourth quarter 2004 through third quarter 2005); the most recent year of groundwater monitoring data will be used for those wells that have been discontinued from the quarterly monitoring program. Groundwater data will be evaluated in two data sets for risk assessment purposes, "upper zone groundwater" and "lower zone groundwater." In areas closer to the river beyond the confining unit boundary where only one unconfined groundwater zone exists, groundwater data will be considered representative of lower zone groundwater, because of the similarity with lower zone groundwater elevations.

2.2.2 DATA SET HANDLING

Data sets used for risk assessment purposes are subject to statistical evaluation. Data handling techniques used to facilitate such statistical evaluations in a manner that is reasonable, and also maintains a conservative nature (i.e., tendency to err on the side of overestimating potential risks), are described below.

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Due to limitations in the accuracy of available chemical analysis equipment, laboratories typically cannot determine whether a chemical is absent from a sample, but they can confirm that it is not present above some threshold concentration, called the laboratory reporting limit, at which the chemical analysis equipment is considered reliable. Deterministic risk assessment procedures require that some discrete concentration be used for each sample to estimate average exposure point concentrations (EPCs) for chemicals that are retained as contaminants of potential concern (COPCs). Samples with concentrations not detected at the reporting limit will be handled in accordance with guidance developed by the U.S. Environmental Protection Agency (EPA 1989). Generally, if a chemical is not detected above the reporting limit in some samples from the site, but is detected in other samples, then those samples in which the chemical is not detected will be assigned a "proxy" concentration of one-half the value of the reporting limit for use in the calculation of EPCs. These proxy values will not have any bearing on the screening process described in Section 3.0. For data sets with a lognormal distribution, which is characteristic of most environmental data sets, assuming a proxy concentration of one-half the value of the reporting limit will provide a conservative estimate of the actual average concentration of nondetect samples.

Blind field duplicate samples are often collected during environmental investigations for the purposes of evaluating data quality. To avoid a statistical bias toward concentrations from sample locations where duplicate samples were collected (i.e., effectively counting these sample locations twice in comparison to other sample locations), only a single chemical concentration from the original sample or its duplicate will be retained for use in data evaluation. The selected concentration will be the maximum detected concentration for detected chemicals, or one-half the value of the lowest achieved reporting limit for nondetected chemicals. In cases where a chemical is not detected, this approach allows the use of the most sensitive analytical run to estimate the concentration below the reporting limit. In cases where a chemical is detected and there is some variability in the reported concentration, this approach conservatively assumes that the actual concentration is the highest of the two concentrations.

2.3 DATA GAPS

Surface soil, subsurface soil, and groundwater have been adequately characterized for risk assessment purposes based on the data presented in the Phase III RI report. The installation and quarterly sampling of shoreline wells to monitor groundwater quality near the point of discharge to the Willamette River have filled what was previously a data gap at the Terminal. The only remaining data gaps include definition of the locality of facility at the north property boundary and assessment of the mobility of the product observed in monitoring wells in the Main Terminal tank farm area. Time Oil has obtained permission from the Port of Portland for sampling two wells located within 300 ft of the north property

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boundary to determine whether any groundwater contamination from the Terminal extends north of the property boundary. The wells were dry during the second quarter 2005 groundwater monitoring event in June 2005 and the fourth quarter 2005 event in November 2005. Time Oil will make a final attempt to sample the wells during the first quarter event in February 2006. If the wells are still dry during this next event, Time Oil will make a recommendation to DEQ on a methodology for determining the locality of facility in this area. Also, Time Oil is preparing a source control evaluation document that will provide information on the mobility of the product and whether remediation is necessary to address potential product migration, and if so, the remedial options. We expect this document to be submitted to DEQ in the spring 2006.

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3.0 DATA SCREENING

The potential exposures and risk(s) from contaminants at the Terminal will be assessed based on the data set described in Section 2.2. Constituents that are detected in less than 5 percent of the samples, or are detected with a maximum concentration that is less than site-specific background levels established for metals (Landau Associates 1999), are considered to have *de minimus* risk to human health and the environment and will be screened out of the risk assessment process (DEQ 2000). Constituents that are considered essential nutrients for human or ecological receptors (e.g., calcium, iron, magnesium, etc.) will not be retained for consideration in the risk assessment. All remaining constituents that are not rejected during data validation, are detected in at least 5 percent of the samples collected from a given environmental medium, and that are above background levels will be included in the database used in the human health and ecological risk assessments. Reporting limits for chemicals that were not detected, but considered to be reasonably likely to be present at the site, will be reviewed to verify that elevated reporting limits have not masked the potential presence of site contaminants. The resulting data set will constitute the COIs in all environmental media at the site.

A COPC/COPEC screening report was previously prepared for the Terminal based on Phase I and II investigations (Landau Associates 1999). The Phase III RI investigation and interim actions conducted at the Terminal since the COPC/COPEC screening report was prepared have resulted in significant changes to the data set that defines the nature and extent of contamination; therefore, the COPC/COPEC screening activities that will be performed as part of this risk assessment will supersede those presented in the previous report.

Data screening to identify COPCs for human health or COPECs for ecological receptors are discussed in Sections 4.0 and 5.0, respectively.

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4.0 HUMAN HEALTH RISK ASSESSMENT

A baseline human health risk assessment will be performed to estimate current and potential future risk to human health at the site using deterministic techniques outlined in DEQ cleanup regulations and guidance [Oregon Administrative Rule (OAR) 340-122-0084, DEQ 2000]. The following sections describe how site data will be used in evaluating human health risk based on our current understanding of the site, potential receptor populations, and exposure pathways. In addition, methods that will be used to quantify exposure and estimate risk are presented, and factors that will be qualitatively evaluated in assessing the uncertainty associated with the risk estimates are summarized.

4.1 CONTAMINANTS OF POTENTIAL CONCERN AND EXPOSURE POINT CONCENTRATIONS

As per DEQ (2000) guidance, the site data will be further refined after the screening process described in Section 3.0, to identify a subset of contaminants, the COPCs, that will be the focus of the baseline human health risk assessment. This screening for COPCs will eliminate from further consideration any contaminants with concentrations so low relative to risk-based criteria that the contaminants do not merit further evaluation. DEQ's risk-based concentrations (RBCs, DEQ 2003) and U.S. Environmental Protection Agency (EPA) Region 9 Preliminary Remediation Goals for industrial sites (PRGs, EPA 2002) will be used as the basis for screening COIs by risk to human health. The screening process will be conducted separately for COIs detected in onsite groundwater and soil. However, exposures to the same COI through multiple environmental media via multiple exposure pathways will also be evaluated. COIs at concentrations below these risk-based screening levels will not be evaluated further in the baseline human health risk assessment and the remaining constituents will be designated as COPCs and will be evaluated in subsequent steps in the risk assessments.

If a contaminant is a COPC in one medium and is detected in multiple media, the COPC will be retained in each medium to ensure consideration of potential exposures via multiple pathways. If a risk-based screening level is not available for a given COI, the COI will be identified as a COPC and discussed in the uncertainty analysis.

After COPCs have been identified for each environmental medium, a statistical evaluation will be conducted for each of the following data sets:

- Surface soil
- Surface and subsurface soil

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- Upper zone groundwater
- Lower zone groundwater.

The purpose of the statistical evaluation will be to identify a representative concentration, the EPC, of each COPC in each data set for use in evaluating chemical intake and risk through the relevant exposure scenarios and pathways identified in the exposure assessment. For each COPC in each data set, DEQ regulations require that both the arithmetic mean (central tendency) concentration and the 90 percent upper confidence limit (UCL), referred to as the plausible upper bound) be estimated for a given set of chemical concentration data. Calculations for contaminant intake by exposure pathway and risk estimates will be made using both resulting exposure concentrations in order to represent the required range of risks posed by the site.

4.2 EXPOSURE ASSESSMENT

Exposure assessment is the process of measuring or estimating the intensity, frequency, and duration of exposure. The exposure assessment step in the baseline human health risk assessment process involves identification of potential receptor populations and exposure pathways that could bring the receptors in contact with contamination at the site. The risk assessment process evaluates only complete exposure pathways. As noted in Section 1.3, in order for a human exposure pathway to be complete, each of the following elements must exist:

- A source and mechanism for chemical release
- An environmental transport medium (e.g., air, water, soil)
- A point of potential human contact with the medium
- A human exposure route at the point of contact (e.g., inhalation, ingestion, dermal contact).

For the purposes of this assessment, the environmental media through which exposure to the COPCs may occur is soil (surface and subsurface) and groundwater. Exposure to impacted soil could occur via incidental ingestion, dermal contact, and inhalation of suspended particulates. Exposure to impacted groundwater could occur via incidental ingestion, dermal contact, and inhalation of volatilized constituents. The diffusion/flux model described in DEQ guidance (DEQ 1999) was used to model contaminant migration from shallow groundwater to outdoor air (Figure 6). The Johnson and Ettinger model (Figure 7; DEQ 1999) was used to model indoor air concentrations.

The following sections present an evaluation of exposure pathways currently identified for each of the site receptor populations, exposure equations that will be used to calculate chemical intake for each of the pathways, and exposure parameters that will be used in calculating chemical intake.

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4.2.1 ONSITE INDUSTRIAL WORKER

The Terminal is currently an inactive facility; however, future industrial workers using the site could be responsible for a variety of duties. The onsite industrial worker could potentially become exposed to contaminated soil and groundwater through direct contact pathways during occupational activities. The specific pathways include:

- Surface soil (0 to 3 ft BGS): dermal contact, incidental ingestion, and inhalation of suspended soil particulates
- Lower zone groundwater as process water: dermal contact
- Ambient air: inhalation of chemicals that have volatilized out of upper zone groundwater
- Indoor air: inhalation of chemicals that have volatilized out of upper zone groundwater.

For the purposes of this risk assessment, the onsite industrial worker population will be adult and assumed to work primarily in the upland areas of the Terminal. Industrial workers could potentially come into dermal contact with lower zone groundwater if used as industrial process water; however, groundwater at the Terminal has not been historically used for such purposes. Intake of contaminants will be modeled by assuming that the industrial worker performs tasks in relatively close proximity to each medium, with intake occurring through dermal contact and incidental ingestion of surface soil, dermal contact with lower zone groundwater used as industrial process water, and inhalation of ambient or indoor air impacted by volatile COIs in upper zone groundwater. The equations that will be used to calculate exposure to contaminants in soil, groundwater, and ambient or indoor air through each of the exposure pathways are shown on Figures 8 through 12, the exposure parameters used in the calculations are presented in Table 1.

4.2.2 ONSITE CONSTRUCTION WORKER

There is currently no ongoing construction activity at the Terminal. However, future site uses (i.e., Terminal demolition or redevelopment of the site) may require consideration of the construction worker scenario. Construction worker activities could potentially expose construction workers to contaminants in surface soil (dermal contact, incidental ingestion, and inhalation of particulates) and ambient air (inhalation).

For the purposes of this risk assessment, the model will assume that the receptor population is adult working in close proximity to the soil, with chemical intake occurring through dermal contact and incidental ingestion of soil and through inhalation of suspended particulate matter. The equations that

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will be used to calculate exposure to contaminants in surface soil through dermal contact, incidental ingestion and/or inhalation of suspended soil particulates are shown on Figures 8 through 10. The equation to calculate exposure to contaminants in ambient air via inhalation is shown on Figure 12. Exposure parameters used in these calculations are presented in Table 1.

4.2.3 ONSITE EXCAVATION WORKER

There is currently no ongoing excavation activity at the Terminal. However, future site uses (i.e., Terminal demolition or redevelopment of the site) may require consideration of the excavation worker scenario. Movement of earthen material could potentially expose excavation workers to contaminants in surface and subsurface soil (dermal contact, incidental ingestion, and inhalation of particulates); shallow groundwater (dermal contact); and ambient air (inhalation).

For the purposes of this risk assessment, the model will assume that the receptor population is adult working in close proximity to the soil, with chemical intake occurring through dermal contact and incidental ingestion of soil and through inhalation of suspended particulate matter. It is also assumed that the excavation worker could come into dermal contact with shallow groundwater. The equations that will be used to calculate exposure to contaminants in surface and subsurface soil through dermal contact, incidental ingestion and/or inhalation of suspended soil particulates are shown on Figures 8 through 10. The equation to calculate exposure to contaminants in shallow groundwater via dermal contact is shown on Figure 11. The equation to calculate exposure to contaminants in ambient air via inhalation is shown on Figure 12. Exposure parameters used in these calculations are presented in Table 1.

4.3 DOSE-RESPONSE ASSESSMENT

The purpose of the dose-response assessment is to weigh available evidence regarding the potential for COPCs to cause adverse health effects in exposed individuals and to provide, where possible, an estimate of the relationship between the extent of exposure to a compound and the increased likelihood or severity of the adverse effect.

The bulk of knowledge about the dose-response relationship is based on data collected from animal studies and theoretical precepts about what might occur in humans. Mathematical models are used to estimate the potential human response at levels far below those tested in animals. These models contain several limitations that will be considered when the risk estimates are evaluated. Most of the COIs preliminarily identified for the site have toxicity criteria available for the dose-response assessment, and include both noncarcinogenic and carcinogenic compounds. For those COPCs for which toxicity

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criteria are not available to conduct a quantitative risk estimate, a qualitative evaluation of the risk will be presented.

The EPA online Integrated Risk Information System (IRIS, EPA 2004) will be accessed to identify toxicity criteria for the site COPCs. Reference dose values will be identified to evaluate noncarcinogenic health effects, and cancer potency factors will be identified to evaluate carcinogenic health risks. In some cases, both reference dose values and potency factors may be available for some compounds. In these cases, both noncarcinogenic and carcinogenic health effects will be evaluated. Information concerning the basis of the toxicity criteria used and their associated uncertainty will be presented in the baseline risk assessment report, as recommended by EPA guidance (EPA 1989).

4.4 RISK CHARACTERIZATION

The risk characterization will provide a quantitative and qualitative summary of the health risks posed to individuals by exposure to the COPCs in environmental media at the site. The risk characterization will address both noncarcinogenic and carcinogenic health effects.

Potential noncarcinogenic adverse health effects will be evaluated by comparing the predicted chemical intake values to reference dose values obtained from the EPA IRIS database. In order to evaluate the general acceptability of a particular dose relative to a reference dose value, a hazard quotient value is calculated, which is the ratio of the calculated average daily dose (ADD) to the reference dose value:

$$\text{Hazard Quotient} = \text{ADD}/\text{Reference Dose}$$

A hazard quotient less than or equal to 1 indicates that the predicted exposure would not pose an unacceptable level of noncarcinogenic health risk (EPA 1989). To account for the additive effects of individual chemicals for a given exposure pathway that could potentially act upon the same organs or result in the same physiological endpoint, additive effects are addressed by calculating a hazard index, which is the sum of all individual hazard quotients for a given pathway.

Carcinogenic risks are defined in terms of the probability of an individual developing cancer as the result of exposure to a given chemical at a given concentration. The incremental probability of developing cancer (i.e., the theoretical excess cancer risk) is that risk attributed to exposure to the COPCs present at the site. For each applicable COPC, the theoretical excess cancer risk is based on the lifetime average daily dose (LADD), which is defined as the total incremental dose of a chemical received as a

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result of the exposure averaged over a lifetime. Once the LADD has been calculated, the cancer risk is calculated as follows:

Estimated Cancer Risk = LADD x Potency Factor

As with hazard quotients, the estimated cancer risks for each chemical and exposure route will be summed to estimate the total excess cancer risk for the exposed individual per exposure pathway (EPA 1989).

4.5 UNCERTAINTY ANALYSIS

An uncertainty analysis will be conducted for the baseline human health risk assessment to examine the sources and magnitude(s) of potential uncertainty associated with the risk estimates. Sources of uncertainty include the data available for the site investigations, receptor population and exposure pathway identification, exposure parameter selection, and toxicity criteria used to characterize risk. Each of these potential sources of uncertainty will be evaluated qualitatively to determine the likely degree of uncertainty associated with the risk estimates, and whether the uncertainty has likely led to over- or under-estimates of risk.

4.6 BASELINE HUMAN HEALTH RISK ASSESSMENT – CONCLUSIONS AND RECOMMENDATIONS

The conclusions of the baseline human health risk assessment (HHRA), including acceptable risk levels for exposure of COPCs to human receptors at the terminal, and any recommendations for additional assessment of risk to human receptors will be provided in a baseline HHRA report, as described in Section 6.0.

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5.0 ECOLOGICAL RISK ASSESSMENT

An ecological risk assessment (ERA) will be performed to address current and potential future risks posed to ecological receptors at the site. As described in Sections 1.3.1 and 1.3.2 of this Work Plan, the ERA will focus on the western portion of the site and will specifically exclude the formerly remediated East Property and surface water and sediment within the Willamette River. As also described earlier, exposure of ecological receptors to COIs in surficial soil is not expected in areas where soil removal actions previously occurred within the former PCP mixing area and the former Crosby & Overton area.

The ERA will be conducted in accordance with OAR 340-122 and DEQ guidance for conducting Level II and III ERAs (DEQ 2000, 2001). Generally, ERAs conducted to meet Oregon DEQ guidelines are based on an EPA framework (EPA 1998). This framework follows a stepwise process that first includes problem formulation to determine the focus and scope of the assessment, followed by an exposure assessment, toxicity assessment, and risk characterization.

In accordance with DEQ guidance, a Level I Ecological Scoping Assessment was conducted based on an April 2005 site visit and is presented in Appendix A. The results of the Level I assessment indicate that terrestrial ecological habitat at the terminal is limited in quality and size because of the presence of the tank farms, buildings, predominantly gravel or dirt surfaces, and the overall lack of vegetation. However, the presence of COIs in media at the terminal could provide an exposure pathway to terrestrial ecological receptors (mainly through surficial soil). Therefore, potential ecological receptors and potentially complete exposure pathways exist within the locality of the facility and a Level II Screening ERA should be conducted.

As defined by DEQ guidance, the Level II Screening ERA is essentially a preliminary problem formulation that will determine the presence of contaminants of potential ecological concern (COPECs) at the Terminal, if any, and the ecological receptor groups likely to be exposed to these COPECs. The results of the Level II Screening ERA will be reported to DEQ with recommendations regarding the need for additional ecological assessment. If further ecological assessment is deemed necessary, species-specific and site-specific ecological risks will be calculated using one of two approaches. The first approach would be to calculate ecological target cleanup levels (ETCLs) based on individual-level risks for indicator species. This approach is a DEQ-accepted method that is somewhat conservative (i.e., more likely to predict risks when none actually exist) and is defined in a previous version of the DEQ Level II guidance (1999). The second approach is the current DEQ Level III baseline ERA method, as defined in the DEQ Level III guidance, which examines population-level risks for indicator species. The number of COPECs, the receptor groups of most concern, and the level of risks predicted during the Level II

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Screening ERA will be considered in the decision to proceed with a Level II individual-level ERA or a Level III population-level ERA. The overall process will allow for informed, stepwise decision-making in order to focus each subsequent and more complex level of ecological assessment on the most important ecological issues for the site. The following sections present the procedures to be followed for the Level II Screening ERA, a Level II species-specific individual-level ERA (if required), and a Level III baseline population-level ERA (if required).

5.1 LEVEL II SCREENING ASSESSMENT

This section documents the steps necessary to conduct the Level II screening assessment for the ERA. The Level II screening assessment will build on the information collected during the Level I scoping process and will initiate the problem formulation process for the ERA for the Terminal. The scope of an ERA is defined through problem formulation, during which the physical and contaminant characteristics of the site are described, including the important ecological habitats, plants, and wildlife that exist there. Along with the results of previously completed investigations and knowledge of the site, this information is used to identify the COIs (i.e., contaminants likely to be present at the site), the ecological receptors of concern (i.e., assessment species), and the COPECs. This information will also be used to incorporate ecological exposure information into the preliminary conceptual site model (Section 1.3) and to develop information needed for the ecological exposure model (CEEM) required for the Level III assessment, if necessary. The ecological exposure information will include the expected fate and transport of chemicals at the site, the potential exposure media, and exposure pathways for ecological receptors of potential concern. Specifically, the problem formulation will include:

- a site description
- a summary of the results of previous investigations
- description of the ecosystem components at the site
- selection of assessment species for the site
- a summary of complete ecological exposure pathways
- selection of the COPECs
- a summary of potential ecological effects of the COPECs
- presentation of the ecological exposure information for the preliminary CSM
- presentation of candidate assessment endpoints and measures based on the COPECs for the site and potentially effected ecological receptors.

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The site description, previous investigation summary, and preliminary conceptual site model are provided earlier in this work plan. Information to be used for preliminary problem formulation and identification of COPECs is provided below, including the current understanding of the ecological conditions at the Terminal. As described below, the preliminary problem formulation will conclude with identification of candidate assessment endpoints and measures that become the focus of the remainder of the ERA. Preliminary problem formulation will also provide for a qualitative understanding and ranking of which COPECs are of the most importance and in which media. The preliminary problem formulation information will be updated as part of the Level II COPEC determination and may be further modified or updated during the Level II ETCL calculation or Level III ERA, in accordance with the level of detail required by the selected approach, if determined necessary.

5.1.1 ECOSYSTEM COMPONENTS

The site encompasses terrestrial environments and borders riverine environments. This section summarizes and focuses the characteristics of the terrestrial environment that are relevant to the ERA. The riverine environment is being assessed as part of the Portland Harbor RI/FS.

5.1.1.1 Terrestrial Environment

The Terminal is dominated by two areas of ASTs known as the former Main and Bell Terminal tank farms. The former Main Terminal tank farm area is within a bermed area approximately 30 ft above the shoreline of the Willamette River in the northwest area of the site. Immediately east of the former Main Terminal tank farm area are the truck loading/unloading area and associated office and warehouse buildings. A few additional ASTs and the existing wastewater treatment system (WWTS) are also present near this Main Terminal complex. The former Bell Terminal tank farm area is several hundred feet south of the former Main Terminal tank farm area and several hundred feet east of the river, and is separated from the river by the Premier Edible Oils site currently owned by Schnitzer Steel Inc. The ASTs at the former Main and Bell Terminal tank farms are close together and surrounded by dirt berms designed for spill containment. Within the berms the ground is predominantly bare dirt with very little to no natural vegetation. Most of the area between the former Main Terminal tank farm area, the office and warehouse buildings, and the WWTS is either paved or covered with gravel. The areas where former soil removal actions occurred in the former PCP mixing area, the former Crosby & Overton tank area, and the former soil stockpile area are covered with sand and gravel fill. The area between the former Main Terminal complex and the former Bell Terminal tank farm area is mowed weedy vegetation or bare dirt surface. Therefore, the terrestrial habitat at the site currently provides little habitat for ecological receptors. A

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limited number of small terrestrial mammals (e.g., deer, mice), terrestrial invertebrates, and/or reptiles (e.g., garter snakes) may inhabit the mowed grassy area between the tank farms.

5.1.1.2 Riverine Environment

As described earlier in this work plan, there is no complete exposure pathway to the Willamette River. Therefore, ecological receptors in the riverine environment will be considered only insomuch as their normal activities would result in potential exposure to upland surface soil (i.e., semi-aquatic receptors with terrestrial foraging habits may be evaluated, but fully aquatic receptors will not). Aquatic receptors are being evaluated as part of the Portland Harbor RI/FS.

5.1.1.3 Sensitive Environments

No sensitive environments exist on the site. The Willamette River, located adjacent to the site, is a sensitive habitat as defined by OAR 340-122-045, due to the critical habitat designation for the federally listed Chinook salmon and steelhead and is being evaluated for the Portland Harbor RI/FS. While some restored wetlands are present north of the Terminal, the zoning and land use surrounding the site are industrial.

5.1.1.4 Sensitive Species

A sensitive species search via the Oregon Natural Heritage Information Center (ONHIC) has not yet been conducted. This search will be conducted and the results incorporated into the ERA. Evaluation of sensitive species for the ERA will be limited to terrestrial and possibly semi-aquatic receptors exposed to contaminants in terrestrial habitats. Currently available information on sensitive species is provided below.

Bald eagles have nested along the Willamette River upstream and downstream from the site. Due to successful recovery efforts, U.S. Fish and Wildlife Service (USFWS) recently proposed that the bald eagle be removed from the federal list of endangered and threatened wildlife in the lower 48 states under the Endangered Species Act (ESA). While the public comment period on the ruling to de-list closed in October 1999 and the de-listing was expected to have been completed within a year of the end of the public comment period (CH2M Hill 1999), the de-listing has not occurred to date.

State-listed terrestrial and semi-aquatic threatened, endangered, and sensitive-critical species in Multnomah County, Oregon include birds (i.e., bald eagle and peregrine falcon), bats, frogs, turtles, and snails. Given the general lack of suitable habitat, the birds and other protected species are unlikely to

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inhabit the Terminal or the site vicinity. There are no known rare, threatened, or endangered plant species at the Terminal.

5.1.1.5 Potential Ecological Receptor Types

For the purposes of this ERA, terrestrial plants, invertebrates, and wildlife are those species that forage on terrestrial plants, terrestrial invertebrates, and terrestrial wildlife (e.g., herbivorous, invertivorous, omnivorous, or carnivorous amphibians, reptiles, bird, or mammals) and, thus, are most likely to be exposed to site-related contamination in surface soil. Semi-aquatic wildlife are those species that live in the terrestrial environment, but obtain a significant portion of their diet from the aquatic environments, or vice versa, and may be exposed to site-related contamination in surface soil. Aquatic plants, invertebrates, fish, and wildlife are those species that obtain their sustenance from the aquatic environment and, thus, are unlikely to be exposed to site-related contamination in soil or groundwater at the Terminal. Representative terrestrial and semi-aquatic ecological receptors that are known or likely to be found at or adjacent to the site are listed in Tables 2 and 3, respectively. The receptor types (or functional groups) these species represent are summarized in Table 4. Some of these ecological receptors may be resident at the site while others may use the site on a seasonal basis, or as a resting or staging area along migration routes. These species were used to define the ecological functional groups of species at the site and to select the representative assessment communities and species that are evaluated in the ERA, as described in the next section. The functional grouping is described in the next section.

5.1.2 Selection of Assessment Communities and Assessment Species

In ERAs, it is impractical to address each individual species that may inhabit a given site. Therefore, similarly exposed species are classified into functional groups based primarily on their foraging habits, and then assessment communities or assessment species are chosen to represent these functional groups. Subsequently, predicted risk for one assessment community or assessment species is considered representative of risk to the other species within the represented functional groups.

The Time Oil Northwest Terminal functional groups were developed from site-specific species lists by grouping species by taxonomic class (e.g., birds, mammals, amphibians, etc.), foraging strategy (e.g., terrestrial or semi-aquatic), and trophic level (e.g., primary producer, herbivore, invertivore/detritivore, or carnivore/piscivore). Because different species of plants and invertebrates can be very numerous, these lower trophic level species are often combined according to DEQ guidance and assessed as communities because of their very similar exposure routes. In addition, toxicity data for plants and invertebrates are most often representative of groups of species. These combinations of lower

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trophic level species are termed assessment communities because they may represent numerous types of species. An assessment community may represent one or more functional groups. During the functional grouping process, semi-aquatic species were grouped into terrestrial or aquatic foraging strategies based on their expected primary foraging habits while they are present at the site. For example, raccoons were considered to be part of the terrestrial food web, because they are expected to forage primarily on terrestrial berries, seeds, and invertebrates that are common along the river; but not on aquatic prey items such as crawdads, which are uncommon or absent in the near-shore areas of the river where raccoons could wade. Preliminary functional groups selected for this ERA are presented in Table 5. This list was used to develop the terrestrial food web diagrams shown on Figure 13.

A representative assessment species was also selected to represent each of the upper trophic level functional groups, based primarily on the species within each functional group that would be expected to receive the highest exposure to contaminants at the site. Primary factors related to exposure potential that were considered included:

- body size
- population density and extent of home range
- foraging approach of the species
- contaminated media at the site
- ecological niche(s) represented by a species.

Other factors that influenced the selection of some assessment species included:

- sensitivity of the receptor to the site-related contaminants
- availability of exposure and toxicity data
- societal value/regulatory status of the species
- position of the species within the food web.

The selected assessment communities and species, and the functional groups they represent, are listed in Table 5. The rationale for selection of each assessment community and species is presented below.

5.1.2.1 Assessment Communities and Exposure Pathways

Terrestrial Plants

The terrestrial plant community is defined as all plants that obtain nutrients primarily from soil (including soil pore water). The primary production of these plants provides a foundation for the

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terrestrial food web. Negative impacts to primary production are likely to result in decreased abundance of soil invertebrates and upper trophic level species due to a lack of food and cover. A reduced diversity of particularly sensitive plant species may also result in similar detrimental effects to some upper trophic level species if plants that are a preferred food for particular herbivores are extirpated (made regionally extinct) from the site due to their exposure to contaminants in soil. Because plant toxicity data are not available for most wild plant species, these plant species were assessed as a community by applying the available toxicity data across all species at the site. This broad application assumes that the mechanism of toxic action is similar between plant species. The principal exposure pathway for terrestrial plants to contaminants at the site is via uptake from soil and soil pore water.

Terrestrial Invertebrates

The terrestrial invertebrate community is defined as all invertebrates that obtain nutrients primarily from soil or on the soil surface. The abundance and diversity of such invertebrates is similar in importance to that of plants because invertebrates are also a primary food source within the terrestrial food web. Declining numbers or types of terrestrial invertebrates may result in decreased abundance and/or diversity of insectivores. This, in turn, may result in lower diversity of upper trophic level wildlife because fewer numbers or types of insectivores means fewer food items for carnivores that prey on the insectivores. Thus, the dependent carnivores may starve or leave the site in search of their preferred food items. The principal exposure pathways for terrestrial invertebrates to COPECs at the site is via ingestion of and dermal contact with soil.

5.1.2.2 Assessment Species and Exposure Pathways

The assessment species and the functional groups they represent for the Terminal are summarized in Table 5. In some cases, one assessment species was considered to be representative of several functional groups. This was the case when a particular assessment species could be chosen that was similar to, but likely to be more highly exposed or sensitive to, contaminants than species in the other represented functional groups. Thus, using an assessment species approach protects other species in different functional groups and allows the number of assessment species to be reduced. The rationale for the selection of assessment species for multiple functional groups is described in the following sections.

Terrestrial Avian Invertivores

The American robin was chosen as an assessment species because it is likely to be the most exposed representative of the terrestrial invertivore functional group. The robin is small, has a high food

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intake rate for its weight, and would be susceptible to chemical exposure via ingestion of contaminated terrestrial invertebrates and incidental ingestion of soil. No perennial surface water is present at the site and therefore, exposure to contaminated drinking water is not considered a significant exposure pathway. Robins are present onsite during the spring and summer months (and potentially all year), have limited home ranges, and have adequate exposure and toxicological data.

The robin was considered to be representative of the potential exposure and effects for several other functional groups, including terrestrial avian herbivores, terrestrial avian omnivores, and terrestrial avian carnivores. The exposure of invertivores is usually higher than that of herbivores or omnivores, because plants generally take up contaminants to a lesser extent than invertebrates. For this reason, the robin will also represent terrestrial avian herbivores and omnivores. The robin is also a more conservative representative of terrestrial avian carnivores than a red-tailed hawk (the other choice for this site) because of its smaller body and home range, each of which increase the potential for exposure to chemicals at the site. Additional considerations that support this substitute include the fact that fewer hawks would be expected to inhabit the site because their home ranges extend farther, hawks would not be solely exposed to contaminants at the site as robins may be, and because methods of assessing toxicity are nearly identical for the robin and hawk.

Terrestrial Mammalian Invertivores

The masked shrew was chosen as a mammalian assessment species because it has a high potential for chemical exposure, it (or other similar shrew species) is a resident at the site, it is a prey species for avian and mammalian carnivores, and it has adequate toxicological and exposure data. The masked shrew is very small, is known to have a high food intake rate for its weight, and is potentially exposed to contaminants in surface soil via ingestion of contaminated invertebrates and incidental ingestion of soil. Shrews obtain most of their water requirements from their prey and there is no perennial surface water onsite; therefore, contaminant exposure via drinking water is considered negligible for the shrew and will not be assessed.

Similar to the robin, the shrew was considered representative of several functional groups, including terrestrial mammalian herbivores and terrestrial mammalian omnivores. The shrew is a conservative representative of terrestrial mammalian omnivores and herbivores because chemicals are most often expected to bioaccumulate to a greater extent in invertebrates than in plants. In addition, the shrew is the smallest terrestrial mammal at the site, so its food intake to weight ratio (i.e., exposure) is expected to be greater than any other small mammal.

The shrew is also a conservative representative of nutria and muskrat that are most frequently classified as aquatic mammalian herbivores. Because there is limited or no aquatic vegetation in the

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vicinity of the Terminal, aquatic mammalian herbivores such as nutria are most likely eating terrestrial vegetation or must swim to offsite areas where aquatic vegetation is present. Given either of these scenarios and the rationale that invertivores are more susceptible to contaminant exposure than herbivores, the shrew is a conservative representative of the nutria and muskrat that may inhabit the site.

Terrestrial Reptilian Carnivores

Garter snakes may inhabit the terrestrial environment at the site. Currently, exposure and toxicity data are inadequate to assess the potential risks for reptiles. Thus, although the garter snake is identified as an assessment species, its potential risks are only considered qualitatively, compared to risks predicted for other assessment species.

5.1.2.3 Summary of Assessment Communities and Species

The above-noted assessment species and the functional groups they represent are presented in Table 5. Of these, only the garter snake will be assessed in a purely qualitative manner, due to the lack of exposure and toxicity data for this species. The exposure pathways to be assessed for each of these receptors is presented in Table 6 and Figure 5.

5.1.3 ENVIRONMENTAL CONCENTRATIONS

The environmental concentrations (ECs) are concentrations of COIs in each exposure medium that are used to select the COPECs. As such, they are estimates of the environmental concentration to which ecological receptors are exposed over a relevant spatial area defined by their habitat. The ECs will be calculated as follows:

- For plants and soil invertebrates (assessment communities) that are immobile or nearly immobile, the maximum detected concentration of each COI in soil will be used as the EC.

- For terrestrial wildlife (assessment species: robin and shrew) consuming soil, vegetation, or prey, the 90UCL of each COI in soil will be the preferred EC. If fewer than 10 samples are available, the maximum detected concentration will be used as the EC. The data distribution will be tested for normality and lognormality and the 90UCL will be calculated appropriately for the distribution. If the data are neither normally nor lognormally distributed, the 90UCL will be calculated using the Z-statistic.

The ECs and calculation methods used in the ERA will be presented in the Level II ERA – Screening Assessment Report (see Section 6.0).

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5.1.4 CONTAMINANTS OF POTENTIAL ECOLOGICAL CONCERN

The COPECs determined during the Level II screening ERA will be applicable to all potential additional ERA evaluations conducted for the site. The screening procedures generally consider the frequency of detection, whether the chemicals are essential nutrients, background or reference chemical concentrations, ecological risk-based screening concentrations (ERBSCs), and bioaccumulation potential. In this manner, contaminants that are not expected to significantly contribute to risk are eliminated from the ERA data set. The frequency of detection and background screening procedures are described in Section 3.0. The COIs identified based on the procedures described in Section 3.0 will be subjected to the ecological risk-based and bioaccumulation screening procedures described in the following sections to select COPECs for the Terminal.

5.1.4.1 Risk-Based Screening

According to DEQ guidance, the risk-based screening steps eliminate COIs that are not detected at the site above ERBSCs. This screening will include comparison of maximum detected concentrations (for immobile species) or the 90 percent UCL concentrations (for mobile species) of each COI in each direct exposure medium to DEQ's risk-based Screening Level Values (SLVs; DEQ 2001), as described in Section 5.1.3. For COIs without corresponding SLVs, chemical-specific SLVs from other COIs will be used as surrogate values (based on similarity in chemical structure) where appropriate, or other ERBSCs will be selected from the literature, as available. For surface soil, the only ecological exposure medium at the site, these alternate ERBSCs may include Dutch soil screening values (DMHSPE 2001) and ecological soil screening levels developed by EPA (EPA 2003), or others. The SLVs and other ERBSCs used in this screening step for surface soil will be tabulated in the Level II ERA – Screening Assessment Report.

A COI will be retained as a COPEC in surface soil if it exceeds an SLV or other ERBSC by a factor of more than 5. The screening calculations will be tabulated for surface soil and presented in the Level II ERA – Screening Assessment Report.

5.1.4.2 Additional Screening Procedures

Three additional screening steps will be conducted. First, the bioaccumulation potential of the COIs will be assessed. Organic chemicals with a Log K_{ow} between 3 and 8 will be considered to have the potential to bioaccumulate. The bioaccumulative metals in surface soil will be selected in coordination with DEQ. The COIs listed as having the potential to bioaccumulate will be included in the ERA for further assessment.

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Second, the maximum detection limit for each of these COIs will be compared to the chemical-specific SLV or other pertinent ERBSC to verify that the analytical methods were sensitive enough to detect a potential impact (if the detection limit exceeds the SLV, the COI generally is retained as a COPEC).

Finally, following DEQ guidance (DEQ 2001), the chemical-specific ratios of each COI concentration to its corresponding SLV or ERBSC (i.e., the COI risk ratios) will be summed to calculate a medium-specific risk ratio and then the contribution of each COI to the medium-specific risk ratio will be calculated. Those COIs that, according to DEQ guidance, contributed excessively to the medium-specific risk ratio will be retained as COPECs. The site COPECs for surface soil, identified per the above steps, will be presented in the Level II ERA – Screening Assessment Report.

5.1.5 PRELIMINARY ECOLOGICAL EFFECTS ASSESSMENT

The COPECs developed per Section 5.1.4 will be grouped by type (i.e., metals, PAHs, chlorinated hydrocarbons, organochlorine compounds, etc.) and the general mode of action or known toxic effects to wildlife will be discussed qualitatively. This general description of potential ecological effects will be used to highlight the types of COPECs that may be more likely to effect particular types of ecological receptors (i.e., plants, terrestrial invertebrates, mammals, birds, or herpetiles). If necessary, additional receptors may be added to the ERA to assess particular ecological effects that may result due to particular COPECs at the Terminal.

5.1.6 PRELIMINARY CONCEPTUAL SITE MODEL – ECOLOGICAL EXPOSURES

The preliminary CSM presented in Section 1.3.5 above will be modified, as necessary, to accommodate findings of the preliminary problem formulation.

5.1.7 CANDIDATE ASSESSMENT ENDPOINTS

Assessment endpoints are written descriptions of the environmental characteristics of concern at a given site (EPA 1998). Generally, they represent ecological aspects that should be assessed in order to assure protection of the environment and allow informed site-specific risk management decisions. Developing assessment endpoints is an integral part of problem formulation because these endpoints link risk assessment results to risk-management actions. Primary considerations for selecting assessment endpoints will include ecological relevance, policy goals, societal/cultural values, and susceptibility to the environmental stressor (i.e., the site contaminant; EPA 1998). The selection of assessment endpoints also depends on:

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- the species present at the site and their interaction
- types of contaminated media at the site
- complete ecological exposure pathways
- types of contaminants present.

Generally, the assessment endpoints for the Terminal will be selected to be indicative of toxic effects to receptor populations. Because no terrestrial or semi-aquatic threatened or endangered species have been identified as inhabiting the site, assessment at the individual level will not be required. At least one assessment endpoint will be selected for each identified assessment community and species. For each endpoint, assessment measures will be defined that describe how the endpoint will be evaluated.

5.1.8 LEVEL II SCREENING ASSESSMENT - CONCLUSIONS AND RECOMMENDATIONS

Through the procedures described above, an ecological description of the site and an understanding of whether COPECs at the site may pose a risk to ecological receptors will be determined. If evaluations conducted for the Level II ERA – Screening Assessment indicate that the site is highly unlikely to pose a potential risk to ecological receptors, then no additional ERA evaluations will be conducted and the ERA will be complete. If it is determined that additional ecological assessment is necessary to better assess the potential for ecological risk to receptors due to exposure to COPECs at the Terminal, species potentially at risk and the identified COPECs will become the focus of a Level II ETCL calculation or Level III baseline ERA, whichever is determined to be most appropriate, as described in the following sections. The results of the Level II COPEC determination and recommendations for further assessment will be presented to DEQ in a Level II ERA – Screening Report as described in Section 6.0.

5.2 LEVEL II SPECIES-SPECIFIC ECOLOGICAL TARGET CLEANUP LEVELS

Based on the results of the Level II Screening Assessment, a recommendation will be made regarding whether to perform further Level II species-specific individual-level ecological assessment or to complete a Level III baseline population-level ERA. This decision will be based primarily on the number and types of COPECs and assessment species that are potentially at risk resulting from historical activities at the Terminal. This section describes the methods that would be used for determining Level II ETCLs if this method is used. Most of the preliminary problem formulation completed during the determination of COPECs will be considered adequate for the individual-level risk determination. However, representative indicator or assessment species will be selected from the bird and mammal receptor groups for which

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risks were predicted during the Level II Screening Assessment. Then, the determination of ETCLs protective of these individual assessment species would include exposure assessment, toxicity assessment, and risk characterization.

5.2.1 EXPOSURE ASSESSMENT

Generally, exposure assessment involves mathematically expressing the exposure of assessment species (i.e., developing site-specific exposure models for assessment species) and identifying species-specific and chemical-specific exposure parameters. The EPCs from the Level II Screening Assessment and selected exposure parameters are then used within the exposure equations to calculate the estimated daily dose (EDD) of COPECs for each of the assessment species.

5.2.1.1 Exposure Models

The exposure media, assessment species, and significant exposure pathways selected during the problem formulation define the exposure models required to calculate an estimated daily intake of the COPECs. For all assessment species, the estimated daily intake can generally be expressed as:

$$EDD_{total} = \frac{EDI_{soil} + EDI_{food}}{BW} \qquad \text{(Equation 5-1)}$$

where:

EDD_{total} = Total estimated daily dose of COPECs for the assessment species [mg/kg body weight (bw) per day]
EDI_{soil} = Estimated daily intake of COPECs from incidental ingestion of soil (mg COPEC per day)
EDI_{food} = Estimated daily intake of COPECs from ingestion of food/prey items (mg COPEC per day)
BW = Body weight of the assessment species (kg).

This equation is modified to be species-specific by mathematically expressing the estimated daily intake of COPECs via food and soil for a particular species. The species-specific equation for robins and shrews is:

$$EDD_t = \frac{[(BAF \times IR_e)+IR_s] \times EPC_s \times DC_f \times SUF}{BW} \qquad \text{(Equation 5-2)}$$

where:

EDD_t = Estimated total daily dose (mg/kg-bw per day)
EPC_s = Exposure point concentration of COPEC in soil (mg/kg)
BAF = Soil-to-earthworm bioaccumulation factor (kg soil/kg worm)
DC_f = Percent of diet comprised of selected food items (unitless)
IR_e = Ingestion rate of earthworms by the assessment species (kg/day)
IR_s = Incidental soil ingestion rate by the assessment species (kg/day)

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SUF = Site use factor for the assessment species, comprised of areal and seasonal partitioning of the use of the site by the assessment species (unitless).

BW = Body weight of the assessment species (kg).

Given that the calculation of risk for assessment species is the ratio of the total estimated daily dose of a COPEC to the ecological reference dose (ERfD) calculated as:

$$TQ_{species} = \frac{EDD_t}{ERfD} \quad \text{(Equation 5-3)}$$

where:

$TQ_{species}$ = Toxicity quotient for a particular COPEC, assessment species, and exposure medium (unitless)

EDD_t = The total estimated daily dose of a given COPEC by an assessment species from a particular exposure medium (mg COPEC/kg body weight per day)

ERfD = The ecological reference dose for a given COPEC and assessment species (mg COPEC/kg body weight per day).

Then by setting the TQ to 1 and combining equations 5-2 and 5-3, the ETCL (a.k.a. the EPC at which the TQ=1) for the robin and shrew can be calculated as:

$$ETCL_{species} = \frac{ERfD \times BW}{[IR_s + (BAF \times IR_e)] \times DC_e \times SUF} \quad \text{(Equation 5-4)}$$

The resulting ETCLs would then be reported. The following sections define the required species-specific and chemical-specific exposure parameters.

5.2.1.2 Species-Specific Exposure Parameters

The species-specific parameters required for equation 5-4 include:

- total dietary intake (kg dw/day)
- plant matter intake (kg dw/day)
- animal matter intake (kg dw/day)
- incidental soil ingestion (kg dw/day)
- Dietary composition of selected food items (%)
- body weight (kg)
- home range (acres)
- migration factor (%).

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Various sources in the scientific literature will be reviewed for information on these species-specific parameters. The Wildlife Exposure Factors Handbook (EPA 1993) will be the preferred source for these exposure parameters. If particular exposure parameters are not reported in the handbook, other literature will be used to obtain the necessary exposure factors. In general, average values found in or calculated from the literature will be used for each exposure parameter. Any variations from this approach will be noted in a Level II species-specific ERA document.

5.2.1.3 Chemical-Specific Exposure Parameters

In order to calculate the COPEC concentrations in each medium (including prey items), the following chemical-specific exposure parameters may be required:

- soil-to-biota bioaccumulation factors (BAFs)
- dose-to-tissue biotransfer factors (BTFs).

Bioaccumulation is the adsorption of chemicals into tissue via all exposure routes (e.g., direct absorption, inhalation, or ingestion). The BAF is a measure of the transfer and accumulation of COPECs from a medium (e.g., surface soil) into the tissue of a receptor that resides in the soil or forages on invertebrates or other soil-dependent prey items (excluding plants). For example, an earthworm BAF is the ratio of chemical in worm tissue to that found in the surrounding soil (mg chemical/kg tissue per mg chemical/kg soil = kg soil/kg tissue). Earthworm BAFs for inorganic chemicals and PCBs will consist of median values provided by Sample et al. (1998). The BAFs for other organic chemicals will be estimated from the lipid content of soil invertebrates (2 percent) and an average site-specific surface soil organic carbon content, using the following predictive BAF model (Menzie et al. 1992):

BAF = Earthworm Lipid Content / (0.66 x Fraction Organic Carbon in Soil) Equation 5-5

BTFs are ratios of the concentrations of chemicals in food items to the concentrations in receptor tissues. These will be obtained, as necessary, from various species-specific and chemical-specific peer-reviewed literature.

5.2.2 TOXICITY ASSESSMENT

The toxicity data to be used in the Level II species-specific calculations include toxicity benchmark doses (TBDs) selected from appropriate references for the COPECs. The TBDs representative of the lowest observed adverse effect level (LOAEL) or no observed adverse effect level (NOAEL) may be used directly as ecological reference doses (ERfDs) or otherwise are converted to

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ERfDs representative of LOAELs or NOAELs as appropriate, using uncertainty factors that are defined by DEQ (2001). The TBDs selected for this ERA, and the process to convert TBDs to ERfDs, will be described in the ERA report.

The principal data sources for TBDs will be:

- EPA's Ecological Soil Screening Level reports (EPA 2003)
- Summary reviews of available toxicity data (Sample et al. 1996; Oak Ridge National Laboratories' On-line Ecotoxicological Databases)
- Peer-reviewed literature sources (journal articles and scientific publications)
- EPA's IRIS
- Chemical-specific Toxicological Profiles produced by Agency for Toxic Substances and Disease Registry (ATSDR)
- The National Institute of Occupational Safety and Health Registry of Toxic Effects of Chemical substances (RTECS).

Oral dose studies will be the only sources used for the selection of TBDs. Some of the toxicity studies from these sources provide toxicity information in the form of a food or drinking water concentration (i.e., mg chemical/kg food or mg chemical/L water). In this case, the food or drinking water concentration will be transformed to a dose (mg chemical/kg body weight per day). This conversion requires knowledge of the amount of food eaten per day by the test species and its body weight. Preferably, this information was obtained from the text in which the toxicity information was found. However, such information was not always provided. In this event, daily food ingestion rates and body weights for the test species will be obtained from other sources (e.g., EPA 1988, 1993, or Dunning 1993) and used to convert the chemical content of a food item into a TBD. For this conversion, it will be assumed that the effective dose of a chemical is 100 percent of the ingested dose (i.e., 100 percent bioavailability was assumed). When possible, mean ingestion rate or body weight values will be used or calculated, but discrete values will be used in the absence of a mean or the data to calculate one. An attempt also will be made to only use ingestion rate and body weight parameters for the same species as used in the pertinent toxicity study, but this is not always possible and parameters for similar species will be substituted as required.

When possible, a chronic NOAEL will be selected as the TBD for protected species and a LOAEL will be selected as the TBD for other species. In the absence of a LOAEL or NOAEL, a no-observed-effect-level (NOEL), lowest-observed-effect-level (LOEL), or other toxicity endpoint will be selected and converted to NOAELs or LOAELs using uncertainty factors. The actual effects threshold is likely to fall between the NOAEL or LOAEL, but these two values were substituted as the threshold

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doses for this ERA because most often it is not possible to predict the actual effects threshold from the available literature.

Data for chronic toxicity will be chosen when available; however, subchronic and/or acute data will be used if chronic data are unavailable, and converted to chronic data using uncertainty factors. If no TBD can be obtained or calculated for a particular chemical and/or indicator species and a TBD for a surrogate chemical cannot be applied, that contaminant will not be evaluated quantitatively for that species.

For many chemicals there will be several toxicity studies identified in various sources. Most often, the different studies investigated provide data regarding different toxicological endpoints. The process of selecting an appropriate TBD requires an assessment of the appropriateness of the various endpoints. In general, data indicative of overt health effects to individual organisms that results in population level effects will be preferred. These may include reproductive effects, survival, or mortality. Other less adverse effects endpoints, such as changes in organ weight or subtle physiological effects, will be used only in the absence of the preferred endpoints. Preference for particular endpoints will be established as follows:

- **Primary Significance** – Reproductive effects such as decreased fertility, teratogenicity, and developmental/fetal mortality, which could impact the species population; survival, which could impact population numbers in future generations; and severe histopathological effects such as necrosis of or serious damage to organs such as the liver, kidneys, brain/central nervous system, and lungs, which could impact primary body functions and result in mortality.

- **Secondary Significance** – Alterations in function of organs and/or behavior that could result in decreased survival.

- **Tertiary Significance** – Alterations such as decreased liver size, increased chemical concentration in blood, or increased body weight that are not readily associated with decreased reproduction, reduced survival, or increased mortality.

Carcinogenic endpoints are not considered appropriate for the selection of TBDs. This is in accordance with the current understanding that cancer is not generally considered to be a threat for free-ranging wildlife species because they are relatively short-lived and cancers do not have time to develop.

Chronic LOAELs will be selected as the TBDs for non-threatened or endangered species. The actual effects threshold is likely to fall between the NOAEL or LOAEL, but these two values will be substituted as the threshold doses for this ERA because most often it is not possible to predict the actual effects threshold from the available literature.

Because toxicity data are unavailable for many species, a body weight adjustment (Sample et al. 1996; Sample and Arenal 1999) will be made as necessary to extrapolate an ERfD for an assessment species when the ERfD is available for another species in the same taxonomic class. This body weight

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extrapolation will occur according to the appropriate body weight scaling equations provided by the EPA (1993).

$$ERfD_r = TBD_t \times (BW_t / BW_r)^P \qquad \text{(Equation 5-6)}$$

where:

$ERfD_r$	=	Ecological reference dose for the robin (mg/kg-bw per day)
TBD_t	=	Toxicity Benchmark Dose for the test species (mg/kg-bw per day)
BW_t	=	Body weight of the test species (kg)
BW_r	=	Body weight of the robin (kg)
P	=	Appropriate exponent for the assessment species (unitless; EPA 1993)

5.2.3 Ecological Target Cleanup Levels

The calculated species-specific ETCLs will be presented and the lowest ETCL for each chemical and medium will be compared to chemical concentrations at sample locations across the Terminal. The sample locations with COPEC concentrations greater than the lowest ETCL will be described.

5.2.4 Hot Spots

The Oregon cleanup rules require the remedial investigation to evaluate hot spots of contamination. In soil, the acceptable hot spot concentration for exposure by ecological receptors to each individual substance is 10 times the acceptable risk level, or where COPECs are reasonably likely to migrate such that a hot spot would be created in another medium, or when COPECs are not reliably able to be contained. Sample locations that have COPEC concentrations that exceed these criteria will be described as hot spots.

5.2.5 Risk Characterization

The risk characterization will be used to present and discuss uncertainties associated with the predicted ecological risks and hot spot locations. The impact of the uncertainties on the predicted risks will be described and the likelihood of the predicted risks being realized will be discussed.

5.2.6 Level II Conclusions and Recommendations

If a Level II species-specific ERA is completed, the evaluation and its conclusions will be provided in a report to be submitted to DEQ, as described in Section 6.0. The calculated ETCLs could then be used to develop conservative remedial actions that would be protected of ecological receptors.

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5.3 LEVEL III ECOLOGICAL RISK ASSESSMENT

In accordance with DEQ (2001) guidance, if the Level III ERA is completed, it would include problem formulation, exposure assessment, toxicity assessment, and risk characterization. The problem formulation completed during the Level II COPEC screening would be incorporated into the Level III ERA with updates, as necessary given any additional information acquired during the Level III assessment. The following sections describe the procedures to be used for the exposure assessment, toxicity assessment, and risk characterization.

5.3.1 LEVEL III EXPOSURE ASSESSMENT

The exposure assessment includes mathematically expressing the methods for quantifying exposure of assessment species (i.e., site-specific exposure models), definition of the local populations of assessment communities and species, determination of exposure areas and/or habitat patches for each assessment species, definition of the relative habitat quality for each habitat patch, calculation of EPCs for exposure areas and/or habitat patches, and presentation of the exposure parameters. The EPCs and exposure parameters are then used within the exposure models to calculate the EDD of COPECs for each of the indicator species.

5.3.1.1 Exposure Dose Equations

The exposure media, indicator species, and significant exposure pathways selected during the problem formulation will be used to create the exposure models (i.e., equations) to calculate an estimated daily intake of the COPECs for each indicator species. Exposure models generally are not developed for indicator communities because potential risks to communities are assessed by direct comparison of EPCs in each medium to ERBSCs. For assessment species, an ingestion rate and body weight are included in the equation, resulting in calculation of an exposure dose, as follows:

$$D_j = \sum_{k=1}^{q} \sum_{i=1}^{d} \left[\left(\frac{IR_i \times C_{ijk}}{BW} \right) \times \left(\frac{Ha_k Hq_k}{\sum_{k=1}^{q} (Ha_k Hq_k)} \right) \right] \times TUF \qquad \text{Equation 6-7}$$

where:

D_j = Dose for a given assessment species for the jth contaminant (mg/kg body weight [bw] per day)

q = Total number of kth habitat patches within local population boundary (unitless)

d = Total number of ith media (unitless)

IR_i = Intake rate for the ith medium (kg/d or L/d)

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C_{ijk} = Concentration of jth contaminant in i^{th} medium in k^{th} habitat patch (mg COPEC/kg)

BW = Body weight of the assessment species (kg)

Ha_k = Area of kth habitat patch (square meters)

Hq_k = Relative habitat quality of kth habitat patch for a given assessment species (unitless)

TUF = Temporal utilization factor (unitless).

Ingestion rates and body weights for each assessment species (i.e., species-specific exposure parameters); COPEC concentrations in each media (including prey items); local population boundaries; habitat patch size and quality; and species specific temporal use factors must be determined to support these calculations. These procedures are defined in the following sections.

5.3.1.2 Exposure Parameters

Exposure parameters are species-specific and chemical-specific measures that determine the extent of exposure for the assessment communities and species. These parameters will be the same as described above for the Level II ETCL calculation.

5.3.1.3 Exposure Point Concentrations

The EPCs for COPECs in surface soil will be the 90 percent UCL, and will be used to calculate exposure of the assessment species to COPECs. If particular exposure areas, habitat patches, or groups of habitat patches (for a given species) include a subset of all samples that were used to calculate EPCs for the Level II COPEC screening assessment, then the appropriate subset of samples will be used to re-calculate a 90 percent UCL for the particular exposure area or habitat patch(es). The same methodology as used in the Level II COPEC screening will be employed to calculate these more specific EPCs.

5.3.1.4 Local Receptor Population Boundaries

Establishing local population boundaries for assessment communities and species limits the number of individuals considered in the ERA to those likely to be exposed to site-related contamination. For sessile assessment communities (i.e., plants and terrestrial invertebrates), the local population will be all the individuals within habitat patches (determined as described in the next section). If habitat patches for these sessile receptors cannot be clearly defined, then the local population will be all individuals within areas where the receptors could be exposed to site-related COPECs.

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For assessment species, the local population will include all individuals within five home-range diameters (D_{HR}) from the outer boundary of the area of site-related contamination. This will be approximated using the following equation from DEQ (2001):

$$A = \frac{100 \times HR}{\pi} \qquad \text{Equation 5-8}$$

where:

A = Areal extent of the study population (m^2)
HR = Home range area (m^2)
π = Pi (3.14).

Actual residency of transient or migratory species within the local population boundaries may be adjusted using the temporal utilization factor as described in Section 5.3.1.6 below.

5.3.1.5 Determination of Habitat Patches

Following determination of the areal extent of the study populations, the number, size, and quality of habitat patches will be determined within the local population boundaries. The different habitat types present at the Terminal will be mapped and described. The expected use of these habitats by each assessment community and species will be described with regard to the extent of each habitat (or habitats) likely to be inhabited. These areas will become the habitat patches for each receptor. Then the spatial extent of each species' habitat patch(es) will be estimated. The relative quality of the habitat patches used by each assessment community and species will also be rated as unsuitable (0), poor (0.25), average (0.5), good (0.75), or excellent (1.0) based on site surveys, professional judgment, and species requirements. The number, area, and quality of habitat patches are all factors within equation 5-7 above.

5.3.1.6 Temporal Use Factors

Some of the assessment species are expected to be transient or migratory. These species travel from place to place and are not exposed throughout the year to site-related contamination at the Terminal. For these species, a temporal use factor (TUF) will be applied to the exposure dose calculation to quantify the number of days per year the species is expected to be exposed to contaminated media at the site. Non-hibernating, non-migratory species will have a TUF of 1. Other species will have a TUF between 0 and 1.

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5.3.2 TOXICITY ASSESSMENT

The ecological toxicity assessment will provide estimates of the ERfD of each COPEC. This is the concentration, above which significant effects would be expected for the assessment species. TBDs will be selected from the literature and converted to species-specific doses (ERfDs) using uncertainty factors. The sources for the TBDs may include:

- Oak Ridge National Laboratory (Sample et al. 1996)
- ATSDR toxicity profiles
- USFWS synoptic reviews of hazards to fish, wildlife, and invertebrates
- EPA's IRIS database
- RTECS, a National Institute of Occupational Safety and Health on-line database
- Health and Safety Databank, a National Library of Medicine on-line database
- Oil and Hazardous Materials/Technical Assistance Data System (OHM/TADS), an EPA on-line database
- The Michigan Department of Natural Resources' Chemical Evaluation Search and Retrieval System (CESARS)
- Other peer-reviewed technical publications.

The toxicity endpoint for assessment species will be the lethal dose for 50 percent of the population (LD_{50}). When such values are not available, different effects levels such as NOAELs or LOAELs will be used, as available, and converted to preferred toxicity benchmark values using uncertainty factors (UFs). When more than one UF is necessary for a particular TBD, UFs will be multiplied together or applied in sequence. The UFs for converting effects levels and their application (DEQ 2001) include:

- NOAEL to LOAEL: UF = 5
- Subchronic to Chronic: UF = 10
- Acute to Chronic: UF = 33
- Chronic NOAEL to LD_{50}= 100.

Data for species of the same family, order, genus, or species will be preferentially selected when available. If this is not possible, toxicity data for species within the same taxonomic class will be used and extrapolated to the assessment communities and species using uncertainty factors. No extrapolations between taxonomic classes (e.g., from birds to mammals) will be performed. The uncertainty factors will

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be applied to calculate TBDs that are considered equivalent to chronic lethal concentration for 50 percent of the population (LC_{50}) or LD_{50} values. Taxonomic extrapolations will be performed as follows:

- Different taxonomic family: UF = 2
- Different taxonomic genus: UF = 2.

The concentrations and doses of COPECs that result following application of the uncertainty factors will be the ecological reference concentrations (ERfCs) and ERfDs used in the risk calculations.

Within certain classes of chemicals (e.g., butylbenzenes, PAHs, and pesticides), toxicity values for one COPEC (i.e., surrogate chemicals) may be substituted for another COPEC when a chemical-specific toxicity value is not available for the latter COPEC. All surrogate chemical substitutions will be noted within the Level III baseline ERA report, as described in Section 6.0.

5.3.3 RISK CHARACTERIZATION

Risk characterization involves calculation, presentation, and description of the potential risks for the assessment communities and species. The risk characterization also includes discussion of the uncertainties associated with the predicted risks and of the potential for the predicted risks to represent significant population level effects at the site.

5.3.3.1 Risk Estimation

The acceptable risk level (ARL) for populations of ecological receptors is a 10 percent chance, or less, that 20 percent or more of the total local population would have an exposure greater than the ERfC or ERfD for each COPEC. Risk estimation will involve the following:

- Estimating the local population abundance of the assessment communities and species
- Estimating the probability that an individual of an endpoint species will experience an exposure in excess of the ERfC or ERfD
- Using a cumulative binomial distribution function to estimate the number of individuals likely to have a greater than 10 percent chance of being exposed at a concentration greater than the ERfC for assessment communities or the ERfD for assessment species
- Determining whether the number of exposed individuals is greater than 20 percent of the local population.

If fewer than 20 percent of the individuals within the local population of each assessment community and species are predicted to be exposed, or if there is less than a 10 percent chance of exposure above the ERfC or ERfD, then acceptable risks exist at the site.

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5.3.3.2 Local Population Abundance

The local population includes all individuals within the local population boundary and will be determined using population density estimates. These estimates will be obtained from available literature or local biologists. For assessment communities, the density of expected dominant species within each community will be used. If reliable population density estimates cannot be obtained from these sources, onsite surveys may be conducted for the assessment communities. For assessment species, if site-specific density estimates are not available, then scaling relationships will be used to estimate population density based on the species body mass (Damuth 1993; Juanes 1986).

5.3.3.3 Probability of Exposure Exceeding Toxicity Reference Values

The probability of exposure exceeding the ERfC or ERfD will be estimated using the following equation:

$$p = \phi_Z\left(\frac{x_{EXP} - \ln(EBV)}{s_{EXP}}\right) \qquad \text{Equation 5-9}$$

where:

P = Probability of exposure (unitless)
$\emptyset_Z$ = Cumulative distribution function of a standard normal random variable
x_{exp} = Mean of natural logarithms of exposure (mg/kg, mg/L, or mg/kg per day)
EBV= Point value of the calculated exposure (mg/kg, mg/L, or mg/kg per day)
s_{exp} = Standard deviation of natural logarithms of exposure (unitless).

5.3.3.4 Acceptability of Risk

The probability that 20 percent of the individuals in a population experience an exposure greater than a toxicity reference value will be determined using the following binomial probability function:

$$b(y,n,p) = \binom{n}{y} p^y (1-p)^{n-y} \qquad \text{Equation 5-10}$$

where:

b = Probability of 20 percent of the individuals in a population experiencing an exposure greater than the toxicity reference value
y = 20 percent of the population

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n = The number of individuals in the local population

p = Probability of an individual experiencing an exposure greater than the toxicity reference value.

As noted above, this probability will be used to determine whether the exposure of assessment communities and species meets the ARL.

5.3.4 Uncertainty Analysis

An uncertainty analysis will be conducted for the baseline ERA to examine the sources and magnitude(s) of potential uncertainty associated with the risk estimates. Sources of uncertainty include the data available for the site investigations, receptor population and exposure pathway identification, exposure parameter selection, and toxicity criteria used to characterize risk. Each of these potential sources of uncertainty will be evaluated qualitatively to determine the likely degree of uncertainty associated with the risk estimates, and whether the uncertainty has likely led to over- or under-estimates of risk.

5.3.5 Predicted Ecological Risks

The effects of the uncertainties on predicted ecological risks will be described to determine whether the risk estimates need adjustment given the uncertainties. In this manner, a better understanding is provided regarding the likelihood of the predicted effects being realized in local receptor populations.

5.3.6 Level III Ecological Target Cleanup Levels

Media-specific ETCLs will be calculated for each of the final COPECs that contribute a majority of the predicted ecological risks. Finally, to the extent possible given the sampling design, the areal extent of chemical concentrations that exceed ETCLs will be plotted to aid in the determination of any remedial action at the site.

5.3.7 Level III Conclusions and Recommendations

The primary goals of the baseline ERA are to document whether a potential exists for significant ecological risk at the site and to determine ETCLs. The risks will be summarized and discussed in the context of the assessment endpoints identified during completion of the problem formulation in a Level III baseline ERA report, as described in Section 6.0.

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6.0 RISK ASSESSMENT DELIVERABLES

The deliverables to be submitted to DEQ for review and comment for the human health and ecological risk assessments are described in the following sections. It is anticipated that the risk assessment reporting will be completed in 2006.

6.1 BASELINE HUMAN HEALTH RISK ASSESSMENT REPORT

The baseline HHRA report will include identification of COPCs and the results of EPC calculation for human receptors, as well as provide the results of the exposure assessment, dose-response assessment, risk characterization, and uncertainty analysis. The results of the baseline HHRA will be used to define acceptable risk levels for human receptors for development of remedial alternatives for the Terminal, as part of the feasibility study.

6.2 LEVEL II ECOLOGICAL RISK ASSESSMENT – SCREENING ASSESSMENT REPORT

The Level II ERA – Screening Assessment Report will include identification of COPECs and exposure pathways for ecological receptors, an ecological description of the site, as well as the uncertainties associated with each identified risk and the assumptions made in the assessment. This information will be used to make recommendations as to whether COPECs at the site pose a risk to ecological receptors and whether additional ecological assessment is required. Recommendations will include one of the following: 1) no further evaluation, 2) performance of a Level II species-specific individual-level ERA, or 3) performance of a baseline ERA.

6.3 LEVEL II SPECIES-SPECIFIC ECOLOGICAL RISK ASSESSMENT

If completed, the Level II species-specific ERA report will provide the results of the Level II species-specific exposure assessment, toxicity assessment, and risk characterization, as well as EPCs, assumptions used in the ERA, and uncertainties associated with the assessment. The Level II ETCLs will also be reported to allow development of conservative remedial alternatives for protection of ecological receptors.

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6.4 LEVEL III BASELINE ECOLOGICAL RISK ASSESSMENT (IF REQUIRED)

The Level III baseline ERA report will provide the results of the Level III ERA baseline exposure assessment, toxicity assessment, and risk characterization, as well as EPC values, assumptions used in the evaluations, and the uncertainties analysis. The report will also provide a description of which, if any, COPECs are likely to require remediation for the protection of ecological receptors.

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7.0 USE OF THIS REPORT

This risk assessment work plan has been prepared by Landau Associates for the exclusive use of Time Oil Co. for specific application to the Northwest Terminal. Services for this project were conducted in accordance with the Environmental Services Contract between Time Oil Co. and Landau Associates, Inc. Landau Associates has performed our services in accordance with generally accepted engineering and consulting standards for environmental work in effect at the time and locality services were performed. The reuse of information, conclusions, and recommendations provided herein by Time Oil Co. or others in connection with any site other than the Northwest Terminal without Landau Associates written permission shall be at the sole risk of Time Oil Co. and without liability to Landau Associates.

This document was prepared under the supervision and direction of the following key staff.

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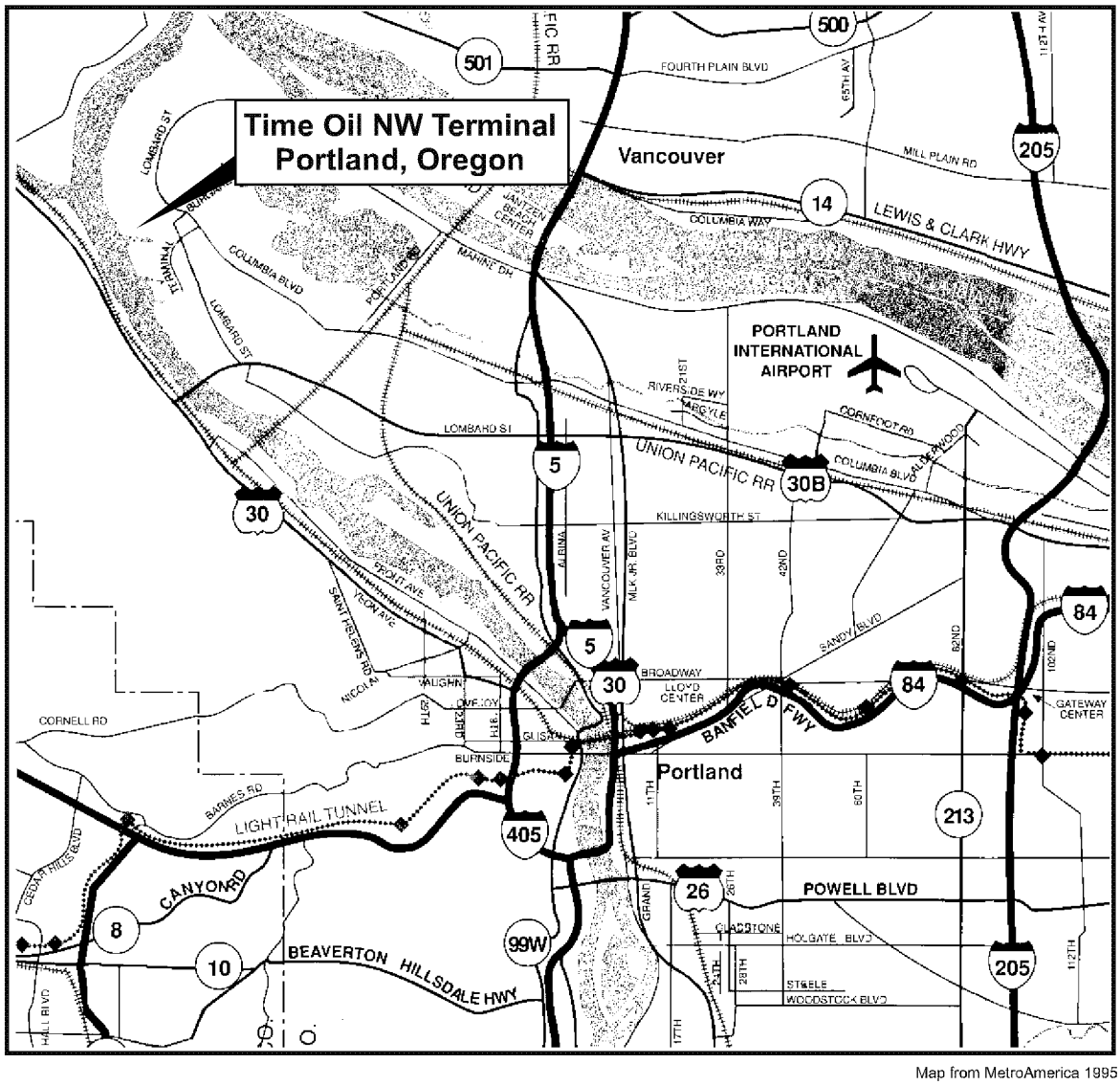
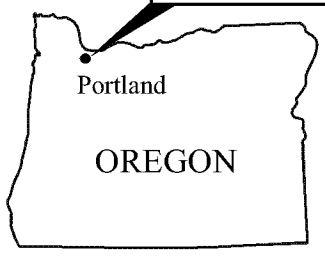


Map from MetroAmerica 1995

SITE LOCATION
(see enlarged map area above)



0 2 4
Approximate Scale in Miles

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Time Oil NW Terminal Portland, Oregon	**Vicinity Map**	Figure 1

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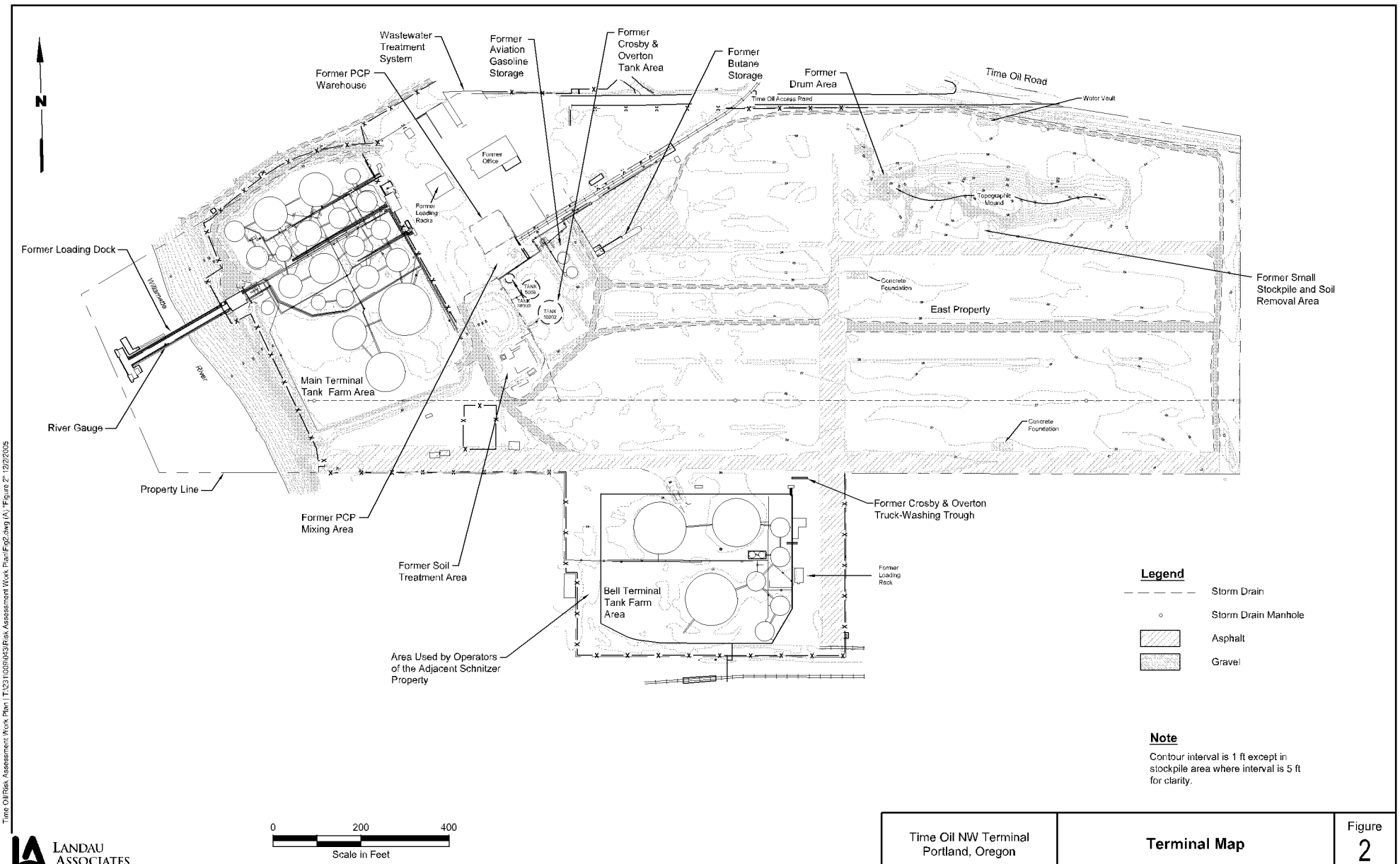

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Time Oil NW Terminal Portland, Oregon	**Terminal Map**	Figure 2

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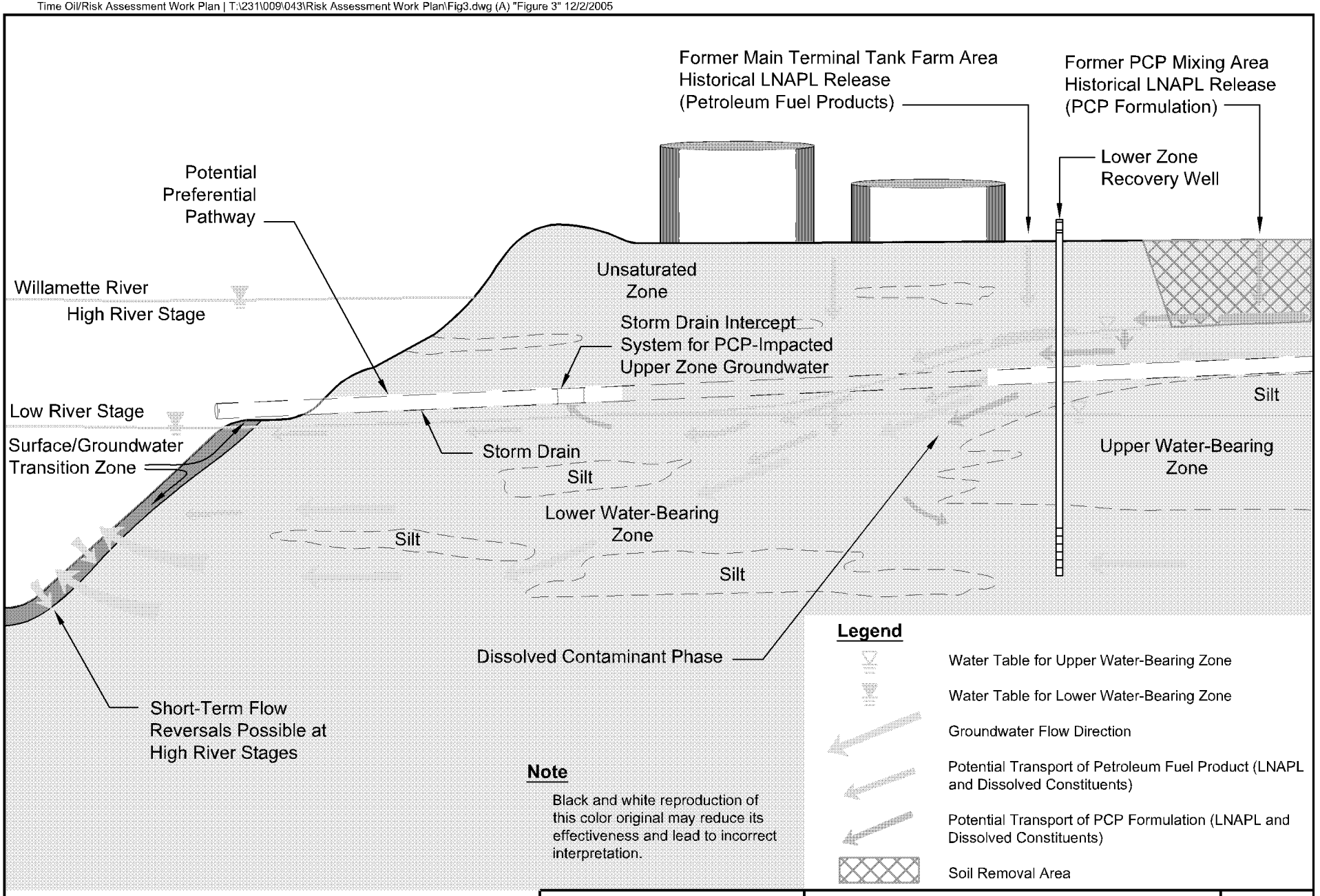

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Not to Scale

Time Oil NW Terminal
Portland, Oregon

Conceptual Site Model

Figure
3

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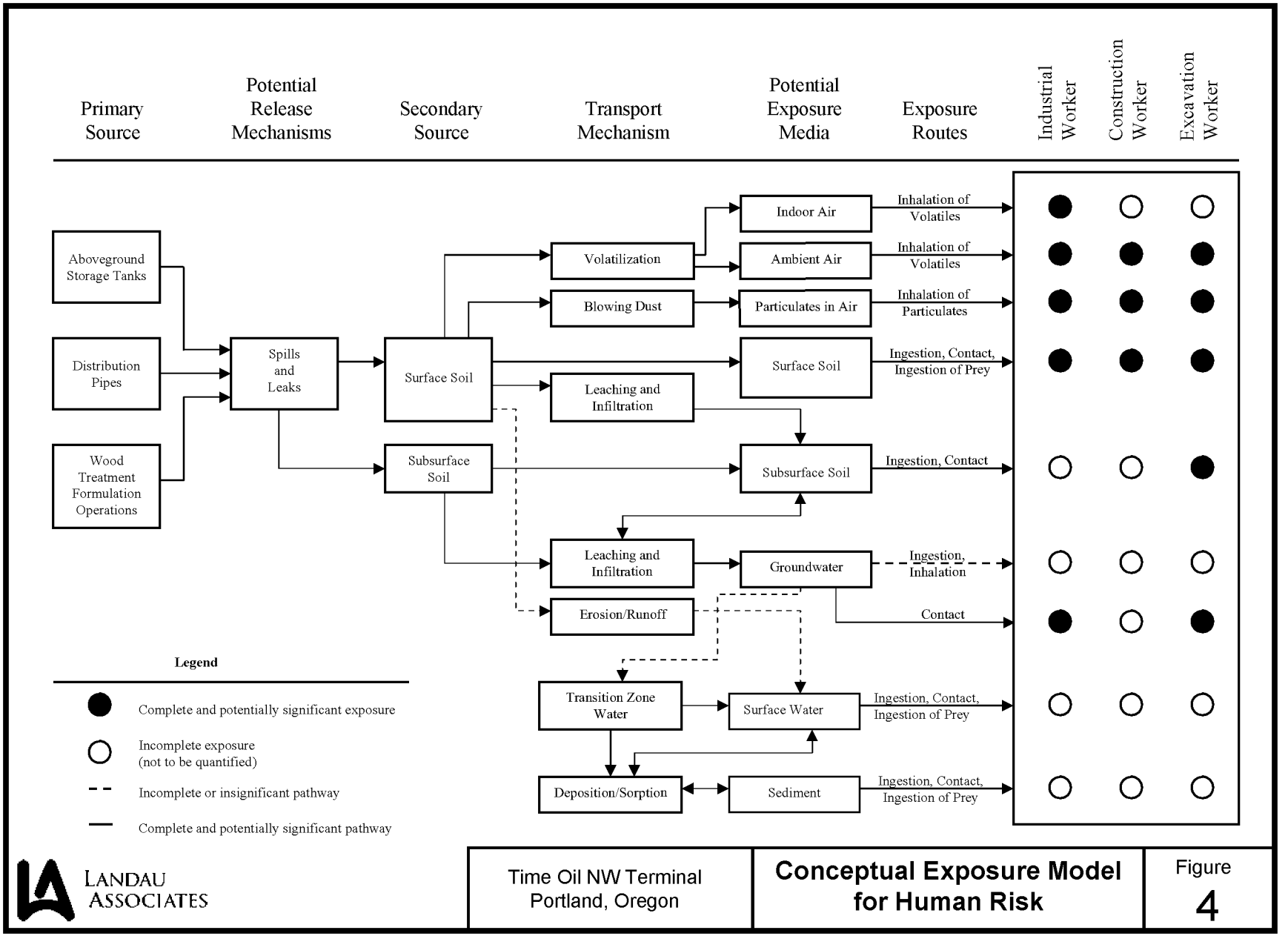

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Time Oil NW Terminal
Portland, Oregon

Conceptual Exposure Model for Human Risk

Figure 4

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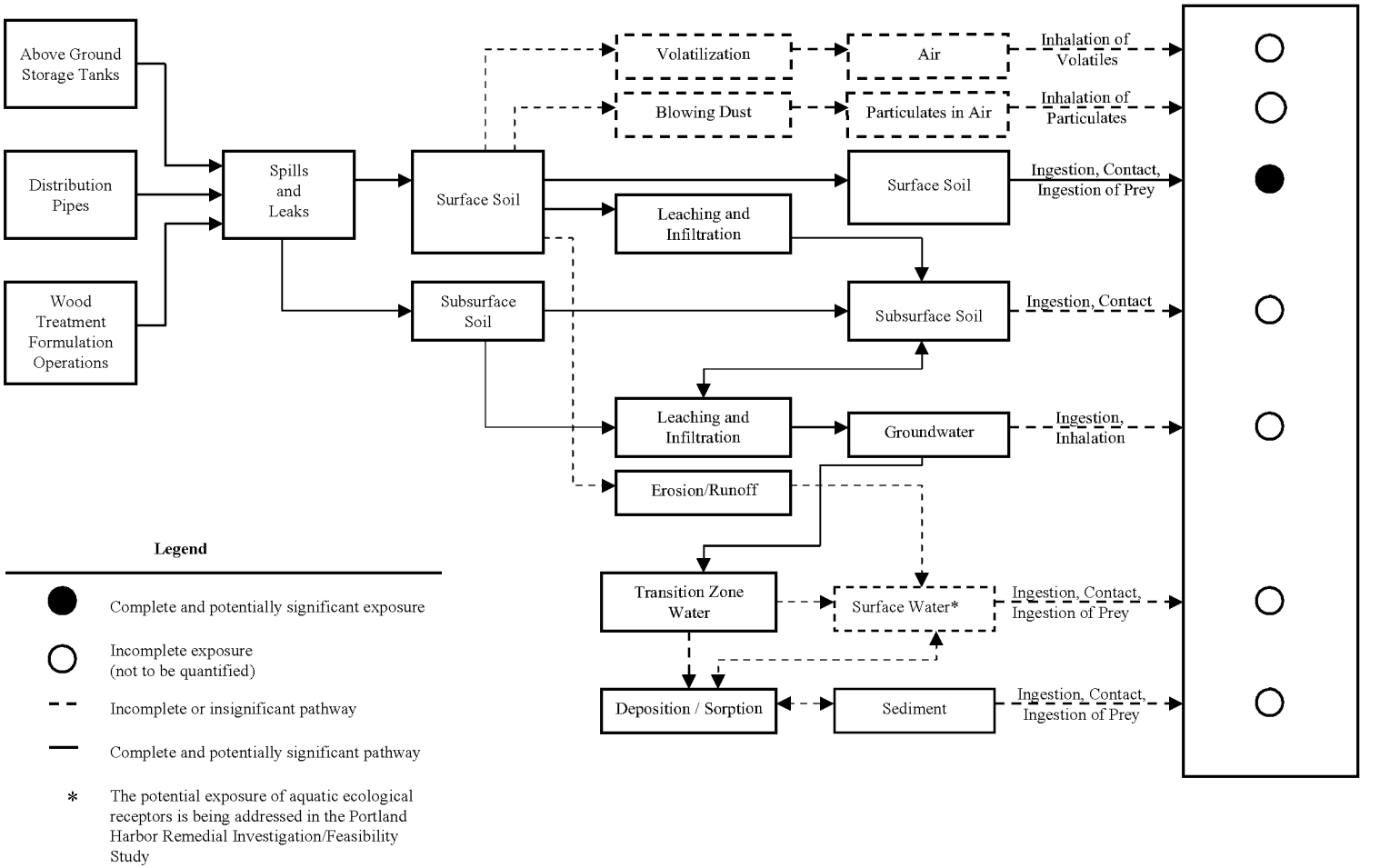

Time Oil NW Terminal
Portland, Oregon

Conceptual Exposure Model for Ecological Risk

Figure 5

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Contaminant Concentration in Air

$$C_a = C_w \cdot VF_{wo} \cdot F_w$$

Volatilization Factor

$$VF_{wo} = \frac{D_T eff \cdot H \cdot \left(10^3 \frac{g}{kg}\right) \cdot \left(10^3 \frac{L}{m^3}\right)}{(Q/C) \cdot L_w \cdot \left(10^2 \frac{cm}{m}\right)}$$

Diffusion Coefficients

$$D_T eff = \frac{L_w}{\left(\frac{L_v}{D_v eff}\right) + \left(\frac{L_{cap}}{D_{cap} eff}\right)}$$

$$D_v eff = \frac{D_{air} \cdot n_a^{10/3} \cdot H + D_w \cdot n_w^{10/3}}{H \cdot n^2}$$

$$D_{cap} eff = \frac{D_{air} \cdot n_{acap}^{10/3} \cdot H + D_w \cdot n_{wcap}^{10/3}}{H \cdot n^2}$$

Where:

C_a = Contaminant concentration in air (mg/m^3)
C_w = Contaminant concentration in water (mg/L)
VF_{wo} = Volatilization factor for groundwater to ambient air pathway (L/m^3)
$D_T$eff = Total effective diffusion coefficient (cm^2/s)
H = Henry's Law constant (unitless)
Q/C = Inverse of mean concentration at center of source area (g/m^2-s / kg/m^3)
L_w = Depth to groundwater (cm)
L_v = Thickness of vadose zone (cm)
L_{cap} = Thickness of capillary fringe (cm)
$D_v$eff = Effective diffusion coefficient of vadose zone (cm^2/s)
D_{cap}eff = Effective diffusion coefficient of capillary fringe (cm^2/s)
D_{air} = Diffusion coefficient in air (cm^2/s)
D_w = Diffusion coefficient in water (cm^2/s)
n = Total soil porosity (unitless)
n_a = Air-filled porosity (unitless)
n_w = Water-filled porosity (unitless)
n_{acap} = Air-filled porosity in capillary fringe (unitless)
n_{wcap} = Water-filled porosity in capillary fringe (unitless)

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Time Oil NW Terminal Portland, Oregon	**Diffusion/Flux Model – Upper Zone Groundwater to Ambient Air**	Figure 6

Contaminant Concentration in Air

$$C_a = C_w \cdot VF_{wi}$$

Volatilization Factor

$$VF_{wi} = \frac{H \cdot \left[\frac{D_T eff \cdot \left(86400 \frac{s}{d} \right)}{L_B \cdot ER \cdot L_w} \right] \cdot \left(10^3 \frac{L}{m^3} \right)}{1 + \left[\frac{D_T eff \cdot \left(86400 \frac{s}{d} \right)}{L_B \cdot ER \cdot L_w} \right] + \left[\frac{D_T eff \cdot L_{crk}}{D_v eff \cdot L_w \cdot f_{crk}} \right]}$$

Diffusion Coefficients

$$D_T eff = \frac{L_w}{\left(\frac{L_v}{D_v eff} \right) + \left(\frac{L_{cap}}{D_{cap} eff} \right)}$$

$$D_v eff = \frac{D_{air} \cdot n_a^{10/3} \cdot H + D_w \cdot n_w^{10/3}}{H \cdot n^2}$$

$$D_{cap} eff = \frac{D_{air} \cdot n_{acap}^{10/3} \cdot H + D_w \cdot n_{wcap}^{10/3}}{H \cdot n^2}$$

Where:

C_a = Contaminant concentration in air (mg/m^3)
C_w = Contaminant concentration in water (mg/L)
VF_{wi} = Volatilization factor for groundwater to indoor air pathway (L/m^3)
$D_T$eff = Total effective diffusion coefficient (cm^2/s)
H = Henry's Law constant (unitless)
Q/C = Inverse of mean concentration at center of source area (g/m^2-s / kg/m^3)
L_w = Depth to groundwater (cm)
L_v = Thickness of vadose zone (cm)
L_{cap} = Thickness of capillary fringe (cm)
L_B = Height of building (cm)
L_{crk} = Thickness of foundation crack (cm)
f_{crk} = Fraction of foundation available for transport (unitless)
ER = Building air exchange rate (1/day)
$D_v$eff = Effective diffusion coefficient of vadose zone (cm^2/s)
D_{cap}eff = Effective diffusion coefficient of capillary fringe (cm^2/s)
D_{air} = Diffusion coefficient in air (cm^2/s)
D_w = Diffusion coefficient in water (cm^2/s)
n = Total soil porosity (unitless)
n_a = Air-filled porosity (unitless)
n_w = Water-filled porosity (unitless)
n_{acap} = Air-filled porosity in capillary fringe (unitless)
n_{wcap} = Water-filled porosity in capillary fringe (unitless)

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Time Oil NW Terminal
Portland, Oregon

Johnson-Ettinger Model – Upper Zone Groundwater to Indoor Air

Figure 7

Carcinogens

$$ADD_{dc} = \frac{DA_{soil} \cdot SA \cdot EF_{evd} \cdot EF_{dy} \cdot ED}{BW \cdot AT_c}$$

Noncarcinogens

$$ADD_{dc} = \frac{DA_{soil} \cdot SA \cdot EF_{evd} \cdot EF_{dy} \cdot ED}{BW \cdot AT_n}$$

Dose Absorbed per Unit Area per Water Contact Event

$$DA_{soil} = C_s \cdot AF \cdot DAF \cdot CF_{km}$$

Where:

ADD_{dc} = Absorbed daily dose from contact with soil (mg/[kg·d])

DA_{soil} = Absorbed dose per soil contact event (mg/cm^2·event)

SA = Exposed skin surface area (cm^2)

EF_{evd} = Event frequency (events/d)

EF_{dy} = Exposure frequency (d/yr)

ED = Exposure duration (yr)

BW = Body weight (kg)

AT_c = Averaging time, carcinogens (d)

AT_n = Averaging time, noncarcinogens (d)

C_s = Contaminant concentration in soil (mg/kg)

AF = Soil-to-skin adherence factor (mg/cm^2·event)

DAF = Dermal absorption factor (unitless)

CF_{km} = Conversion factor (10^{-6} kg/mg)

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Time Oil NW Terminal Portland, Oregon	**Exposure Model – Dermal Contact with Soil**	Figure 8

Carcinogens

$$ADD_{si} = \frac{C_s \cdot IRS \cdot CF_{km} \cdot EF_{dy} \cdot ED}{BW \cdot AT_c}$$

Noncarcinogens

$$ADD_{si} = \frac{C_s \cdot IRS \cdot CF_{km} \cdot EF_{dy} \cdot ED}{BW \cdot AT_n}$$

Where:

ADD_{si} = Average daily dose from incidental soil ingestion (mg/[kg·d])
C_s = Contaminant concentration in soil (mg/kg)
IRS = Incidental soil ingestion rate (mg/d)
CF_{km} = Conversion factor (10^{-6} kg/mg)
EF_{dy} = Exposure frequency (d/yr)
ED = Exposure duration (yr)
BW = Body weight (kg)
AT_c = Averaging time, carcinogens (d)
AT_n = Averaging time, noncarcinogens (d)

[Source: DEQ 2000]

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Time Oil NW Terminal Portland, Oregon	**Exposure Model – Ingestion of Soil**	Figure 9

Carcinogens

$$ADD_{ip} = \frac{PM_{10} \cdot IRA \cdot \left(EF_{evd} \cdot t_{event} / CF_{hd}\right) \cdot EF_{dy} \cdot ED}{BW \cdot AT_c}$$

Noncarcinogens

$$ADD_{ip} = \frac{PM_{10} \cdot IRA \cdot \left(EF_{evd} \cdot t_{event} / CF_{hd}\right) \cdot EF_{dy} \cdot ED}{BW \cdot AT_n}$$

$$PM_{10} = \left(\frac{C_s}{PEF}\right) \cdot F_s$$

Where:

ADD_{ip} = Average daily dose from inhalation of particulates (mg/[kg·d])

PM_{10} = Concentration of respirable particulates in air (mg/m^3)

IRA = Inhalation rate (m^3/d)

EF_{evd} = Event frequency (events/d)

t_{event} = Exposure time (hr/event)

CF_{hd} = Conversion factor (24 hr/d)

EF_{dy} = Exposure frequency (d/yr)

ED = Exposure duration (yr)

BW = Body weight (kg)

AT_c = Averaging time, carcinogens (d)

AT_n = Averaging time, noncarcinogens (d)

C_s = Contaminant concentration in soil (mg/kg)

PEF = Particulate emission factor (1.32×10^9 m^3/kg)

F_s = Fraction of soil contaminated (unitless)

[Source: DEQ 2000]

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Time Oil NW Terminal
Portland, Oregon

Exposure Model – Inhalation of Soil Particulates

Figure 10

Carcinogens

$$ADD_{sd} = \frac{DA_{water} \cdot SA \cdot EF_{evd} \cdot EF_{dy} \cdot ED}{BW \cdot AT_c}$$

Noncarcinogens

$$ADD_{sd} = \frac{DA_{water} \cdot SA \cdot EF_{evd} \cdot EF_{dy} \cdot ED}{BW \cdot AT_n}$$

Dose Absorbed per Unit Area per Water Contact Event

$$DA_{water} = 2 \cdot K_p \cdot (C_w \cdot CF_{cl}) \cdot \sqrt{\frac{6 \cdot \tau \cdot t_{event}}{\pi}}, \text{for } t_{event} < t^*$$

$$DA_{water} = K_p \cdot (C_w \cdot CF_{cl}) \cdot \left[\frac{t_{event}}{1+B} + 2\tau \cdot \left(\frac{1+3B}{1+B} \right) \right], \text{for } t_{event} > t^*$$

Where:

ADD_{sd}	=	Absorbed daily dose from contact with water (mg/[kg·d])
DA_{water}	=	Dose absorbed per unit area per water contact event (mg/cm^2·event)
SA	=	Exposed skin surface area (cm^2)
EF_{evd}	=	Event frequency (events/d)
EF_{dy}	=	Exposure frequency (d/yr)
ED	=	Exposure duration (yr)
BW	=	Body weight (kg)
AT_c	=	Averaging time, carcinogens (d)
AT_n	=	Averaging time, noncarcinogens (d)
K_p	=	Dermal permeability coefficient (cm/hr)
C_w	=	Contaminant concentration in water (mg/L)
CF_{cl}	=	Conversion factor (10^{-3} L/cm^3)
τ	=	Lag time (hr/event)
t_{event}	=	Exposure time (hr/event)
t*	=	Time to reach steady-state (hr)
B	=	Relative contribution of permeability coefficients (unitless)

[Source: DEQ 2000]

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Time Oil NW Terminal Portland, Oregon	**Exposure Model – Dermal Contact with Water**	Figure 11

Carcinogens

$$ADD_a = \frac{C_a \cdot IRA \cdot (EF_{hd}/CF_{hd}) \cdot EF_{dy} \cdot ED}{BW \cdot AT_c}$$

Noncarcinogens

$$ADD_a = \frac{C_w \cdot IRA \cdot (EF_{hd}/CF_{hd}) \cdot EF_{dy} \cdot ED}{BW \cdot AT_n}$$

$$C_a = [C_w \cdot VF_w \cdot F_w]$$

Where:

ADD_a	=	Average daily dose from inhalation of ambient or indoor air (mg/[kg·d])
C_a	=	Contaminant concentration in air (mg/m^3)
IRA	=	Inhalation rate (m^3/d)
EF_{hd}	=	Exposure frequency (hr/d)
CF_{hd}	=	Conversion factor (24 hr/d)
EF_{dy}	=	Exposure frequency (d/yr)
ED	=	Exposure duration (yr)
BW	=	Body weight (kg)
AT_c	=	Averaging time, carcinogens (d)
C_w	=	Contaminant concentration in water (mg/L)
AT_n	=	Averaging time, noncarcinogens (d)
VF_w	=	Volatilization factor for water (L/m^3)
F_w	=	Fraction of water contaminated (unitless)

[Source: DEQ 2000]

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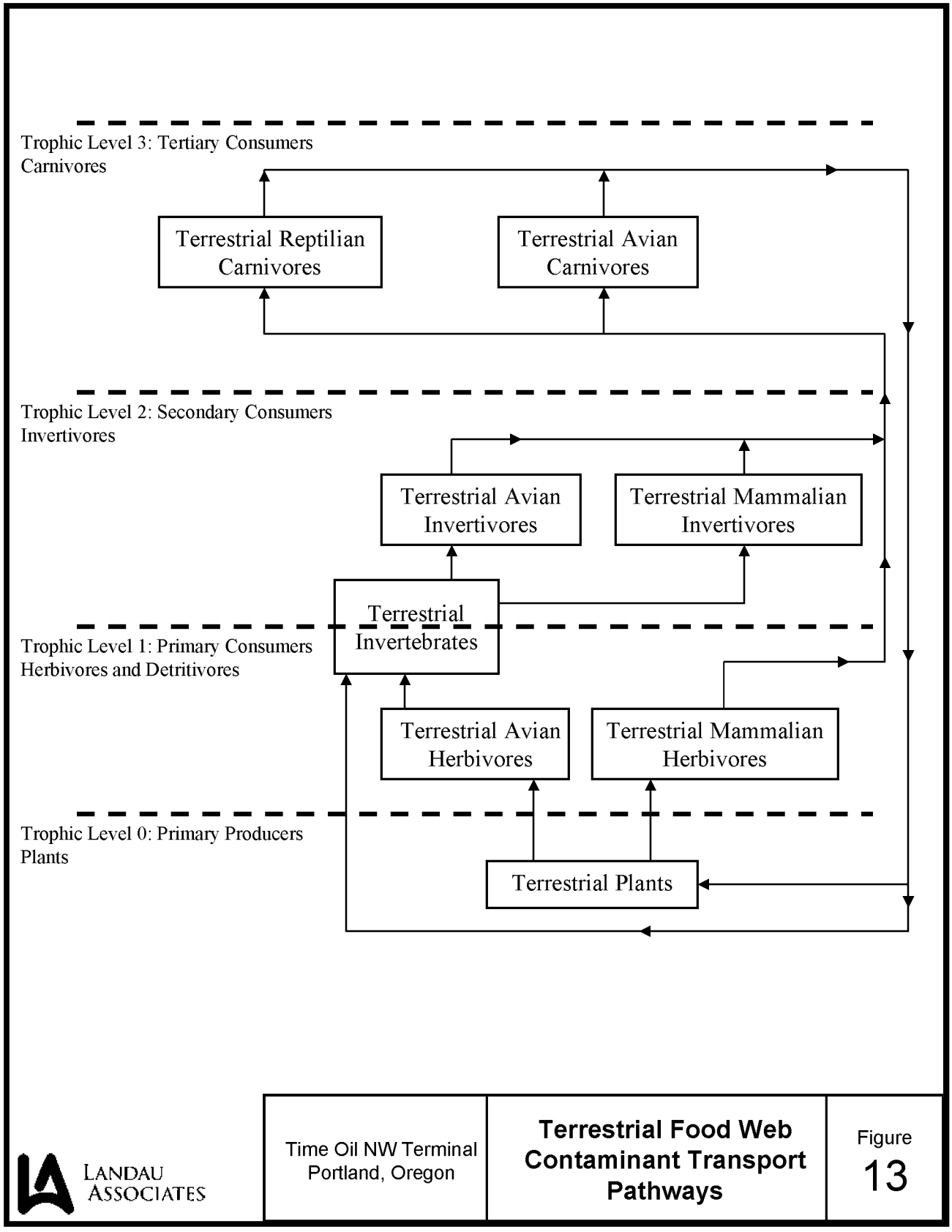
Time Oil NW Terminal Portland, Oregon	**Exposure Model – Inhalation of Ambient or Indoor Air**	Figure 12



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Time Oil NW Terminal
Portland, Oregon

Terrestrial Food Web Contaminant Transport Pathways

Figure
13

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TABLE 1
HUMAN EXPOSURE FACTORS
TIME OIL NORTHWEST TERMINAL

Exposure Factor (Symbol)	Units	Industrial Worker Adult CTE		Industrial Worker Adult RME		Construction Worker Adult CTE		Construction Worker Adult RME		Excavation Worker Adult CTE		Excavation Worker Adult RME	
Body Weight (BW)	kg	70	(a)	70	(a)	70	(b)	70	(b)	70	(a)	70	(a)
Incidental soil/sed ingestion rate (IRS)	mg/d	50	(a)	100	(a)	100	(b)	480	(b)	100	(a)	480	(a)
Water ingestion rate (IRW)	L/d	--		--		--		--		--		--	
Exposed Surface Area (SA)													
Soil Contact	cm^2	3200	(a)	4100	(a)	3200	(b)	4100	(b)	3200	(a)	4100	(a)
Water	cm^2	3200	(c,d)	4100	(c,d)	5200	(b)	7000	(b)	5200	(a,e)	7000	(a,e)
Inhalation rate (IRA)	m^3/d	20	(f)	20	(f)	20	(b)	20	(b)	20	(f)	20	(f)
Soil/sed to skin adherence factor (AF_s)	mg/cm^2-even	0.08	(a)	0.08	(a)	0.3	(b)	1	(b)	0.3	(a)	1	(a)
Exposure frequency (EF_{hd})	hr/d	8	(h)	8	(h)	8	(h)	8	(h)	8	(h)	8	(h)
Exposure frequency (EF_{dv})	d/yr	250	(a)	250	(a)	250	(i)	250	(i)	9	(a)	9	(a)
Event frequency (EF_{evd})	events/d	1	(h)	1	(h)	2	(i)	2	(i)	2	(a)	2	(a)
Event time, water (t_{event})	hr/event	2	(d,h)	2	(d,h)	--		--		2	(a,e)	2	(a,e)
Event time, air (t_{event})	hr/event	8	(h)	8	(h)	8	(h)	8	(h)	8	(h)	8	(h)
Exposure duration (ED)	yr	6	(a)	25	(a)	0.5	(b)	1	(b)	0.5	(a)	1	(a)
Averaging time, carcinogens (AT_c)	d	25550	(a)	25550	(a)	25550	(b)	25550	(b)	25550	(a)	25550	(a)
Averaging time, noncarcinogens (AT_n)	d	2190	(a)	9125	(a)	180	(b)	365	(b)	180	(a)	365	(a)
Fraction of soil contaminated (F_s)	unitless	1	(a)	1	(a)	1	(b)	1	(b)	1	(a)	1	(a)
Fraction of water contaminated (F_w)	unitless	1	(a,d)	1	(a,d)	--		--		1	(a,e)	1	(a,e)
Dermal absorption factor (DAF)	unitless	chem-specific		chem-specific		chem-specific		chem-specific		chem-specific		chem-specific	
Dermal permeability coefficient (K_p)	cm/hr	chem-specific		chem-specific		chem-specific		chem-specific		chem-specific		chem-specific	
Lag time (τ)	hr/event	chem-specific		chem-specific		chem-specific		chem-specific		chem-specific		chem-specific	
Time to reach steady state (t^*)	hr	chem-specific		chem-specific		chem-specific		chem-specific		chem-specific		chem-specific	
Relative contribution of Ks (B)	unitless	chem-specific		chem-specific		chem-specific		chem-specific		chem-specific		chem-specific	
Particulate emission factor (PEF)	m^3/kg	1.32E+09	(a)	1.32E+09	(a)	1.32E+09	(a)	1.32E+09	(a)	1.32E+09	(a)	1.32E+09	(a)
Fraction of organic carbon in soil (f_{oc})	unitless	0.006	(a)	0.006	(a)	0.006	(a)	0.006	(a)	0.006	(a)	0.006	(a)

-- Exposure factor not presented because the associated pathway is inapplicable or insignificant for the scenario shown.

(a) DEQ 2000, Guidance for Conduct of Deterministic Human Health Risk Assessments.
(b) Construction worker exposure factor assumed to be the same as that identified for excavation workers.
(c) Surface area for industrial worker exposure to process water assumed to include heads, hands, and forearms (DEQ 2000).
(d) Exposure to groundwater as process water only.
(e) Exposure to shallow groundwater only.
(f) DEQ 2002, recommendation in letter date October 7, 2002 regarding the risk assessment approach.
(h) Based on best professional judgment.
(i) DEQ 2003, Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites.

TABLE 2
POTENTIAL TERRESTRIAL ECOLOGICAL RECEPTORS
TIME OIL NORTHWEST TERMINAL

Common Name	Scientific Name	Common Name	Scientific Name	Common Name	Scientific Name
Plants					
Abronia	*Abronia sp.*	European Teasel	*Dipsacus fullonum*	Heartweed	*Polygonum persicaria*
Vine Maple	*Acer circinatum*	Fireweed	*Epilobium augustifolium*	Fern	*Polypodium sp.*
Big Leaf Maple	*Acer macrophyllum*	Watson's willow-herb	*Epilobium watsonii*	Sword-fern	*Polystichum munitum*
Cultivated Maple	*Acer sp.*	Horsetail	*Equisetum telmateia*	Black Cottonwood	*Populus trichocarpa*
Bentgrass	*Agrostis sp.*	Thyme-leaf Spurge	*Euphorbia serpyllifolia*	Cottonwood (tree/seedling)	*Populus trichocarpa*
Tumbleweed Amaranth	*Amaranthus graecizans*	Oregon Ash	*Fraxinus latifolia*	Oak	*Quercus sp.*
Serviceberry	*Amelanchier alnifolia*	Bedstraw	*Galium sp.*	Wild Rose	*Rosa sp.*
False Indigo	*Amorpha fruticosa*	Goldenweed	*Haplopappus sp.*	Himalayan Blackberry	*Rubus discolor*
Water Birch	*Betula occidentalis*	English Ivy	*Hedera helix*	Trailing Blackberry	*Rubus ursinus*
Nodding Beggar-tick	*Bidens cernua*	Velvet Grass	*Holcus lanatus*	Curly Dock	*Rumex crispus*
Three-lobed Beggar-tick	*Bidens tripartita*	Creambush Oceanspray	*Holodiscus discolor*	Willow	*Salix sp.*
Sedge	*Carex sp.*	Klamath Weed	*Hypericum perforatum*	Russian Thistle	*Salsola kali*
Common Centaury	*Centaurium umbellatum*	Peavine (introduced)	*Lathyrus sp.*	Skullcap	*Scutellaria sp.*
Hornwort	*Ceratophyllum demersum*	Spanish-clover	*Lotus purshiana*	Black Nightshade	*Solanum nigrum*
Redbud	*Cercis occidentalis*	No common name	*Lythryum portula*	Western Goldenrod	*Solidago occidentalis*
Lambsquarter	*Chenopodium album*	Mallow	*Malva sp.*	Bittersweet Nigntshade	*Solanum dulcamara*
Mexican Tea Wormseed	*Chenopodium ambroisoides*	Alfalfa	*Medicago sativa*	Saltmarsh Sandspurry	*Spergularia marima*
Jerusalem-oak	*Chenopodium botrys*	White Sweet-clover	*Melilotus alba*	Snowberry	*Symphoricarpus albus*
Glaucous Goosefoot	*Chenopodium glaucum*	Beebalm	*Melissa officinalis*	Common Tansy	*Tanacetum vulgare*
Chickory	*Cichorium intybus*	Indian Plum	*Oemlaria cerasiformis*	Common Dandelion	*Taraxacum officinale*
Western Clematis	*Clematis lingusticifolia*	Common Evening-primrose	*Oenothera strigosa*	Poison Oak	*Toxicodendron pubescens*
Red Osier Dogwood	*Cornus sericea*	Marjoram	*Origanum sp.*	Moss	Unidentified
Creek Dogwood	*Cornus stolonifera*	Reed Canary Grass	*Phalaris arundinacea*	Stinging Nettle	*Utrica dioica*
Scot's Broom	*Cytiscus scoparius*	English Plantain	*Plantago lanceolata*	Mullein	*Verbascum sp.*
Bleeding Heart	*Dicentra spectabilis*	Kentucky Bluegrass	*Poa pretensis*	Oregon Viburnum	*Viburnum ellipticum*
Crabgrass	*Digitalis sp.*	Willow Weed	*Polygonum lapathifolium*		
Birds					
American Robin	*Turdus migratorius*	Common Raven	*Corvus corax*	Northern Flicker	*Colaptes auratus*
Belted Kingfisher	*Megaceryle alcyon*	Dark-eyed Junco	*Junco Hyemalis*	Prairie Falcon	*Falco mexicanus*
Blackcapped Chickadee	*Parus atricapillus*	American Goldfinch	*Carduelis pinus*	Purple Finch	*Carpodacus purpureus*
Brown Creepers	*Certhia familiaris*	House Finch	*Carpodacus mexicanus*	Red Breasted Nuthatch	*Sitla canadensis*
Brownheaded Cowbird	*Molothrus ater*	House Sparrow	*Passer domesticus*	Redtail Hawk	*Buteo jamaicensis*
Bushtit	*Psaltriparus minimus*	Hummingbird	*Various spp.*	Rufous-sided Towhee	*Pipilo erthrophthalmus*
California Quail	*Callipepla californica*	Mourning Dove	*Zenaida macroura*	Winter Wren	*Troglodytes troglodytes*
Cedar Waxwing	*Bombycilla cedrorum*				
Mammals					
Feral Domestic Cat	*Felis domestica*	Masked shrew	*Sorex cinerius*	Raccoon	*Procyon lotor*
Deer mouse	*Peromyscus maniculatus*	Mink	*Mustela vison*	Beaver	*Castor canadensis*
Reptiles					
Garter Snake	*Thamnophis sp.*				

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TABLE 3
POTENTIAL SEMI-AQUATIC ECOLOGICAL RECEPTORS
TIME OIL NORTHWEST TERMINAL

Common Name	Scientific Name
Birds	
Mallard Duck	*Anas platyrhynchos*
Great Basin Canada Goose	*Branta canadensis*
Mammals	
Raccoon	*Procyon lotor*
River Otter	*Lutra canadensis*
Mink	*Mustela viscon*

TABLE 4
ECOLOGICAL RECEPTOR FUNCTIONAL GROUPS
AND REPRESENTATIVE INDICATOR SPECIES
TIME OIL NORTHWEST TERMINAL

Functional Group	Potential Assessment Communities/Species
Terrestrial Plants	Terrestrial Plants
Terrestrial Invertebrates	Terrestrial Invertebrates
Terrestrial Avian Herbivores	Dark-Eyed Junco
	Mourning Dove
	Canada Goose
	California Quail
Terrestrial Mammalian Herbivores	Meadow Vole
	Beaver
	Deer
	Nutria (a)
	Muskrat (a)
Terrestrial Avian Omnivores	Fox Sparrow
Terrestrial Mammalian Omnivores	Raccoon
	Deer Mouse
Terrestrial Avian Invertivores	American Robin
Terrestrial Mammalian Invertivores	Masked Shrew
Terrestrial Avian Carnivores	Pygmy Owl
	Great Horned Owl
Terrestrial Reptilian Carnivores	Garter Snake

(a) While the nutria and muskrat are most often classified as aquatic mammalian herbivores, as described in the work plan, there is no aquatic vegetation in the vicinity of the Terminal. Thus, at this site, these ecological receptors could only be eating terrestrial vegetation.

TABLE 5
SELECTED INDICATOR COMMUNITIES, INDICATOR SPECIES
AND ECOLOGICAL RECEPTOR FUNCTIONAL GROUPS
TIME OIL NORTHWEST TERMINAL

Selected Assessment Communities/Species	Represented Functional Groups
Terrestrial plants	Terrestrial Plants
Terrestrial Invertebrates	Terrestrial Invertebrates
American Robin	Terrestrial Avian Herbivores
	Terrestrial Avian Omnivores
	Terrestrial Avian Invertivores
	Terrestrial Avian Carnivores
Masked Shrew	Terrestrial Mammalian Herbivores
	Terrestrial Mammalian Omnivores
	Terrestrial Mammalian Invertivores
Garter Snake	Terrestrial Reptilian Carnivores

TABLE 6
EXPOSURE MEDIA FOR THE SELECTED INDICATOR COMMUNITIES AND SPECIES
TIME OIL NORTHWEST TERMINAL

Indicator Communities/Species	Uptake From Soil	Uptake From Surface Water	Uptake From River Sediment	Incidental Soil Ingestion	Surface Water Ingestion	Incidental River Sediment Ingestion	Prey Ingestion	Maternal Transfer
Terrestrial Plants	X							
Terrestrial Invertebrates	X							
American Robin				X			X (a)	
Masked Shrew				X			X (a)	
Garter Snake*				O			O (b)	

X = Primary exposure route will be addressed quantitatively in the ecological risk assessment.
O = Primary exposure route will be addressed qualitatively in the ecological risk assessment.
* = Assessed qualitatively in the ecological risk assessment due to a lack of exposure and toxicity data.
(a) Preys on terrestrial invertebrates.
(b) Preys on amphibians and terrestrial invertebrates.

BZTO104(e)020944

APPENDIX A

Level I Ecological Scoping Evaluation

Ecological Scoping Checklist

Site Name	Time Oil Northwest Terminal
Date of Site Visit	4/05
Site Location	Portland, Oregon
Site Visit Conducted by	Rone Brewer, Sound Ecological Endeavors

Part ❶

CONTAMINANTS OF INTEREST Types, Classes, Or Specific Hazardous Substances‡ Known Or Suspected	Onsite	Adjacent to or In locality of the facility †
Metals	X	
PAHs	X	
Petroleum Hydrocarbons	X	
Pentachlorophenol	X	

‡ As defined by OAR 340-122-115(34) † As defined by OAR 340-122-115(38)

Part ❷

OBSERVED CHEMICAL IMPACTS ASSOCIATED WITH THE SITE	Finding
Onsite vegetation (**N**one, **L**imited, **E**xtensive)	L
Vegetation in the locality of the site (**N**one, **L**imited, **E**xtensive)	N
Onsite wildlife such as macroinvertebrates, reptiles, amphibians, birds, mammals, other (**N**one, **L**imited, **E**xtensive)	N
Wildlife such as macroinvertebrates, reptiles, amphibians, birds, mammals, other in the locality of the site (**N**one, **L**imited, **E**xtensive)	N
Other readily observable impacts (**N**one, **D**iscuss below)	D
Discussion: The property is predominantly covered by aboveground storage tanks, buildings, asphalt roadways, and gravel. These and other physical impacts to vegetation have occurred since the site was developed. The current areas of vegetation have been repeatedly disturbed over the years and include mowed grassy and weedy species.	

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ATTACHMENT 1
Ecological Scoping Checklist (cont'd)
Part ❸

SPECIFIC EVALUATION OF ECOLOGICAL RECEPTORS / HABITAT	Finding
Terrestrial – Wooded	
Percentage of site that is wooded	<5
Dominant vegetation type (**E**vergreen, **D**eciduous, **M**ixed)	D
Prominent tree size at breast height, i.e., four feet (<6", 6" to 12", >12")	6" to 12"
Evidence / observation of wildlife (**M**acroinvertebrates, **R**eptiles, **A**mphibians, **B**irds, **Ma**mmals, **O**ther)	B, Ma
Terrestrial – Scrub/Shrub/Grasses	
Percentage of site that is scrub/shrub/grass	35
Dominant vegetation type (**Sc**rub, **Sh**rub, **G**rasses, **O**ther)	Grass/ Shrub
Prominent height of vegetation (<2', 2' to 5', >5')	2' to 5'
Density of vegetation (**D**ense, **P**atchy, **S**parse)	P to D
Evidence / observation of wildlife (**M**acroInvertebrates, **R**eptiles, **A**mphibians, **B**irds, **M**ammals, **O**ther)	B, M
Terrestrial – Ruderal	
Percentage of site that is ruderal	60
Dominant vegetation type (**L**andscaped, **A**griculture, **B**are ground)	B
Height of dominant vegetation (0', >0' to <2', 2' to 5', >5')	<2'
Density of vegetation (**D**ense, **P**atchy, **S**parse)	S
Evidence / observation of wildlife (**M**acroinvertebrates, **R**eptiles, **A**mphibians, **B**irds, **M**ammals, **O**ther)	B
Aquatic - Non-flowing (lentic)	
Percentage of site that is covered by lakes or ponds	0
Type of water bodies (**L**akes, **P**onds, **V**ernal pools, **I**mpoundments, **Lag**oon, **R**eservoir, **C**anal)	NA
Size (acres), average depth (feet), trophic status of water bodies	NA
Source water (**R**iver, **St**ream, **G**roundwater, **I**ndustrial discharge, **Su**rface water runoff)	NA
Water discharge point (**N**one, **R**iver, **St**ream, **G**roundwater, **W**etlands impoundment)	NA
Nature of bottom (**M**uddy, **R**ocky, **S**and, **C**oncrete, **O**ther)	NA
Vegetation present (**S**ubmerged, **E**mergent, **F**loating)	NA
Obvious wetlands present (**Y**es / **N**o)	NA
Evidence / observation of wildlife (**M**acroinvertebrates, **R**eptiles, **A**mphibians, **B**irds, **M**ammals, **O**ther)	NA
Aquatic - Flowing (lotic)	
Percentage of site that is covered by rivers, streams (brooks, creeks), intermittent streams, dry wash, arroyo, ditches, or channel waterway	0
Type of water bodies (**R**ivers, **S**treams, **I**ntermittent Streams, Dry **W**ash, **A**rroyo, **D**itches, **C**hannel waterway)	Willamette River addressed in the Portland Harbor RI/FS
Size (acres), average depth (feet), approximate flow rate (cfs) of water bodies	NA

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SPECIFIC EVALUATION OF ECOLOGICAL RECEPTORS / HABITAT	Finding
Bank environment (cover: **V**egetated, **B**are / slope: **S**teep, **G**radual / height (in feet))	
Source water (**R**iver, **St**ream, **G**roundwater, **I**ndustrial discharge, **Su**rface water runoff)	NA
Tidal influence (**Y**es / **N**o)	NA
Water discharge point (**N**one, **R**iver, **St**ream, **G**roundwater, **W**etlands impoundment)	NA
Nature of bottom (**M**uddy, **R**ocky, **S**and, **C**oncrete, **O**ther)	NA
Vegetation present (**S**ubmerged, **E**mergent, **F**loating)	NA
Obvious wetlands present (**Y**es / **N**o)	NA
Evidence / observation of wildlife (**M**acroinvertebrates, **R**eptiles, **A**mphibians, **B**irds, **Ma**mmals, **O**ther)	NA
Aquatic – Wetlands	
Obvious or designated wetlands present (**Y**es / **N**o)	N
Wetlands suspected at site is/has (**A**djacent to water body, in **F**loodplain, **S**tanding water, **D**ark wet soils, **M**ud cracks, **D**ebris line, **W**ater marks)	NA
Vegetation present (**S**ubmerged, **E**mergent, **S**crub/shrub, **W**ooded)	NA
Size (acres) and depth (feet) of suspected wetlands	NA
Source water (**R**iver, **St**ream, **G**roundwater, **I**ndustrial discharge, **Su**rface water runoff)	NA
Water discharge point (**N**one, **R**iver, **St**ream, **G**roundwater, **I**mpoundment)	NA
Tidal influence (**Y**es / **N**o)	NA
Evidence / observation of wildlife (**M**acroinvertebrates, **R**eptiles, **A**mphibians, **B**irds, **M**ammals, **O**ther)	NA

Photographic documentation is provided in Attachment D2

Part ❹

ECOLOGICALLY IMPORTANT SPECIES / HABITATS OBSERVED
None observed. On-site terrestrial habitats minimal in quality and size. Anadromous fish, resident fish (e,g., sculpins), fish-eating birds, and other aquatic species are likely within Willamette River adjacent to the site, but are not considered in this ERA as are being investigated as part of the Portland Harbor Remedial Investigation/Feasibility Study (RI/FS).

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ATTACHMENT 2
Evaluation of Receptor-Pathway Interactions

EVALUATION OF RECEPTOR-PATHWAY INTERACTIONS	Y	N	U
Are hazardous substances present or potentially present in surface waters? **AND** **Are ecologically important species or habitats present?** **AND** **Could hazardous substances reach these receptors via surface water?**		X X X	
When answering the above questions, consider the following: • Known or suspected presence of hazardous substances in surface waters. • Ability of hazardous substances to migrate to surface waters. • Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters. Aquatic receptors may be exposed through osmotic exchange, respiration or ventilation of surface waters. • Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters. • Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.			
Are hazardous substances present or potentially present in groundwater? **AND** **Are ecologically important species or habitats present?** **AND** **Could hazardous substances reach these receptors via groundwater?**	X X	 X	
When answering the above questions, consider the following: • Known or suspected presence of hazardous substances in groundwater. • Ability of hazardous substances to migrate to groundwater. • Potential for hazardous substances to migrate via groundwater and discharge into habitats and/or surface waters. • Contaminants may be taken-up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1m depth). • Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.			

"Y" = yes; "N" = No, "U" = Unknown (counts as a "Y")

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ATTACHMENT 2
Evaluation of Receptor-Pathway Interactions (cont'd)

EVALUATION OF RECEPTOR-PATHWAY INTERACTIONS	Y	N	U
Are hazardous substances present or potentially present in sediments? **AND** **Are ecologically important species or habitats present?** **AND** **Could hazardous substances reach these receptors via contact with sediments?**		X X X	
When answering the above questions, consider the following: • Known or suspected presence of hazardous substances in sediment. • Ability of hazardous substances to leach or erode from surface soils and be carried into sediment via surface runoff. • Potential for contaminated groundwater to upwell through, and deposit contaminants in, sediments. • If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods. Aquatic receptors may be directly exposed to sediments or may be exposed through osmotic exchange, respiration or ventilation of sediment pore waters. • Terrestrial plants may be exposed to sediment in an area that is only periodically inundated with water. • If sediments are present in an area that is only periodically inundated with water, terrestrial species may have direct access to sediments for the purposes of incidental ingestion. Aquatic receptors may regularly or incidentally ingest sediment while foraging.			
Are hazardous substances present or potentially present in prey or food items of ecologically important receptors? **AND** **Are ecologically important species or habitats present?** **AND** **Could hazardous substances reach these receptors via consumption of food items?**	 X X		X
When answering the above questions, consider the following: • Higher trophic level terrestrial and aquatic consumers and predators may be exposed through consumption of contaminated food sources. • In general, organic contaminants with log K_{ow} > 3.5 may accumulate in terrestrial mammals and those with a log K_{ow} > 5 may accumulate in aquatic vertebrates.			

"Y" = yes; "N" = No, "U" = Unknown (counts as a "Y")

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ATTACHMENT 2
Evaluation of Receptor-Pathway Interactions (cont'd)

EVALUATION OF RECEPTOR-PATHWAY INTERACTIONS	Y	N	U
Are hazardous substances present or potentially present in surficial soils? **AND** **Are ecologically important species or habitats present?** **AND** **Could hazardous substances reach these receptors via incidental ingestion of or dermal contact with surficial soils?**	X X X		
When answering the above questions, consider the following: • Known or suspected presence of hazardous substances in surficial (~1m depth) soils. • Ability of hazardous substances to migrate to surficial soils. • Significant exposure via dermal contact would generally be limited to organic contaminants which are lipophilic and can cross epidermal barriers. • Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash). • Contaminants in bulk soil may partition into soil solution, making them available to roots. • Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.			
Are hazardous substances present or potentially present in subsurface soils? **AND** **Are ecologically important species or habitats present?** **AND** **Could hazardous substances reach these receptors via vapors or fugitive dust carried in surface air or confined in burrows?**	X	 X X	
When answering the above questions, consider the following: • Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant > 10^{-5} atm-m^3/mol and molecular weight < 200 g/mol). • Exposure via inhalation is most important to organisms that burrow in contaminated soils, given the limited amounts of air present to dilute vapors and an absence of air movement to disperse gases. • Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that could be exposed to dust disturbed by their foraging or burrowing activities or by wind movement. • Foliar uptake of organic vapors would be limited to those contaminants with relatively high vapor pressures. • Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces.			

"Y" = yes; "N" = No, "U" = Unknown (counts as a "Y")

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LANDAU ASSOCIATES

April 8, 2005

RECEIVED APR 1 1 2005

Mr. Tom Roick
Oregon Department of Environmental Quality
2020 SW Fourth Avenue, Suite 400
Portland, OR 97201-4987

RE: TIME OIL NORTHWEST TERMINAL
PORTLAND, OREGON

Dear Mr. Roick:

On behalf of Time Oil, attached is the January through March 2005 quarterly report for Time Oil Northwest Terminal RI/FS.

LANDAU ASSOCIATES, INC.

Rebekah Brooks
Project Manager

RB/tam
4/8/05 \\Edmdata\wproc\231\TRANSMIT FAX\Quarterly Rpt_Ltr doc
Enclosure

cc: Mr. Mark Chandler, Time Oil Co.
Ms. Patricia Dost, Schwabe Williamson & Wyatt
Mr. Mike Tischuk, Beazer East, Inc.

QUARTERLY REPORT TO DEQ
TIME OIL - NORTHWEST TERMINAL
January through March, 2005

SUMMARY OF WORK PERFORMED

- Prepared and submitted the October - December 2004 quarterly report to DEQ.
- Continued operation of the groundwater interim action in the lower zone at RW-2 at an average flow rate of 8.3 gpm.
- Continued operation of groundwater recovery in the upper zone at the groundwater intercept system at the east-west trending storm drain line (SDM-1) at an average flow rate of 2.2 gpm.
- Conducted intermittent operation of groundwater recovery in the upper zone from horizontal recovery well (HRW-1) at an average flow rate of 0.12 gpm.
- A total of approximately 20.63 million gallons of groundwater have been treated and discharged from the interim action system, with a total of about 1.3 million gallons treated during this quarter.
- Continued review of the system operations performance for the groundwater interim action system at RW-2 and HRW-1, the groundwater intercept system at SDM-1, and the onsite wastewater treatment plant (WWTP).
- Collected effluent samples from the WWTP throughout the quarter to evaluate the treatment system efficiency. Laboratory analysis of the effluent samples collected indicated that the system was operating within the established permit limitations.
- Conducted the second full-scale ISCO injection event in January 2005.
- Conducted the first quarter 2005 groundwater monitoring event in February 2005, including post-injection monitoring for the second ISCO event. Continued the sampling frequency recommended in our February 2, 2004 letter to DEQ, as approved by DEQ in an email from Tom Roick on February 3, 2004. Formal approval will occur after thorough review by DEQ.
- Completed preparation of the *Third Quarter 2004 Groundwater Monitoring and Groundwater Interim Action Status Report*, including evaluation of analytical data from the first post-injection groundwater sampling event for the first full scale *in situ* chemical oxidation (ISCO) injection event conducted in July 2004 and submitted to DEQ.
- Continued preparation of the *Fourth Quarter 2004 Groundwater Monitoring and Groundwater Interim Action Report.*
- Received and began processing and validation of first quarter 2005 (February 2005) groundwater monitoring data.
- Continued revision of the draft Phase III RI report in response to DEQ's comments. As provided in an email to DEQ on March 30, 2005, the schedule for submittal of the final Phase III RI report was delayed with the intent of incorporating results from wells on the Port of Portland property to the north of the terminal for definition of the locality of facility in this area. We have not yet received

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access approval from the Port but will proceed with submitting the final report to DEQ in the second quarter 2005.

- Continued coordination with the Port of Portland on obtaining access to sample two of the Port's wells located on the property directly north of the Northwest Terminal.

- Continued passive product recovery in wells LW-21S and LW-27S using a passive bailer. The product is temporarily being stored in a 55-gallon drum in a designated location at the terminal pending disposal. The product sock was reinstalled in well Q because product was observed during the fourth quarter 2004 monitoring event. The spent product socks are being temporarily stored in a 55-gallon drum in a designated location at the terminal pending disposal.

- Continued preparation of a work plan for performance of the terminal-wide human health and ecological risk assessments. The work plan is expected to be submitted to DEQ in April 2005.

RESULTS COLLECTED

- Influent/effluent samples from the WWTP for January through March, 2005. The analytical results from the sampling events indicated that the WWTP was operating within the established permit limits. The data results will be presented in the *First Quarter 2005 Groundwater Monitoring and Groundwater Interim Action Status Report.*

- Final groundwater data for the first quarter 2005 groundwater sampling events. Data results will be presented in the *First Quarter 2005 Groundwater Monitoring and Groundwater Interim Action Status Report.*

PROBLEMS ENCOUNTERED AND STEPS TO RESOLVE

- No problems were encountered.

WORK TO BE PERFORMED NEXT QUARTER

- Prepare and submit quarterly report to DEQ.

- Continue implementation of the groundwater interim action in the lower zone at RW-2. Continue to operate the groundwater intercept system at the storm drain (SDM-1). Continue groundwater treatment and discharge to POTW. Continue review of the system operations performance for the groundwater interim action system at RW-2, HRW-1, SDM-1 and the onsite wastewater treatment system.

- Continue to monitor the effluent from the WWTP.

- Complete preparation of the *Fourth Quarter 2004 Groundwater Monitoring and Groundwater Interim Action Report* and submit to DEQ.

- Prepare the *First Quarter 2005 Groundwater Monitoring and Groundwater Interim Action Report* including post-injection groundwater results from the second full-scale ISCO injection event.

- Continue passive product recovery in wells in the Main Tank Farm Area, as appropriate.
- Conduct the second quarter 2005 groundwater monitoring event in May 2005.
- Complete preparation of the risk assessment work plan and submit to DEQ.
- Begin implementation of the risk assessment.
- Revise and finalize the Phase III RI report and submit to DEQ.

From: Rhonda Moon <rgmoon@landauinc.com>
Sent: Tuesday, May 17, 2005 10:10 AM
To: mchandler@timeoil.com; Tischuk, Mike (Pittsburgh) NA <tischuk@hgm.com>
Cc: Rebekah Brooks <RBrooks@landauinc.com>; Terry McGourty <TMcGourty@landauinc.com>
Subject: Revised Draft Risk Assessment Work Plan
Attach: Draft Risk Assessmt WP Rev.doc

As requested, attached is a Word version of the text of the draft Risk Assessment Work Plan for the Time Oil NW Terminal. Please let me know if I can provide further assistance.

<<Draft Risk Assessmt WP Rev.doc>>

Rhonda Moon
Project Coordinator
Landau Associates
(425) 329-0299

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APPENDICES

Appendix	Title
A	Level I Ecological Scoping Evaluation

LIST OF ACRONYMS

ADD	Average Daily Dose
ARL	Acceptable Risk Level
AST	Aboveground Storage Tank
ATSDR	Agency for Toxic Substance and Disease Registry
AWQC	Ambient Water Quality Criteria
BAF	Bioaccumulation Factor
BCF	Bioconcentration Factor
BGS	Below Ground Surface
BSAF	Sediment to Biota Accumulation Factor
BTF	Biotransfer Factors
CEEM	Conceptual Ecological Exposure Model
CEM	Conceptual Exposure Model
CESARS	Chemical Evaluation Search and Retrieval System
COI	Contaminant of Interest
COPC	Contaminant of Potential Concern
COPEC	Contaminant of Potential Ecological Concern
cPAH	Carcinogenic Polycyclic Aromatic Hydrocarbon
CRBG	Columbia River Basalt Group
CSM	Conceptual Site Model
DEQ	Oregon Department of Environmental Quality
D_{HR}	Home Range Diameter
EDD	Estimated Daily Dose
EPA	U.S. Environmental Protection Agency
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
ERBSC	Ecological Risk-Based Screening Concentration
ERfC	Ecological Reference Concentration
ERfD	Ecological Reference Dose
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
ETCL	Ecological Target Cleanup Level
HHRA	Human Health Risk Assessment

HSDB	Health and Safety Databank
IRIS	Integrated Risk Information System
ISCO	*In Situ* Chemical Oxidation
K_d	Sediment Partition Coefficient
LADD	Lifetime Average Daily Dose
LC_{50}	Lethal Concentration for 50 Percent of the Population
LD_{50}	Lethal Dose for 50 Percent of the Population
LOAEL	Lowest Observed Adverse Effect Level
MSL	Mean Sea Level
MTCA	Model Toxics Control Act
NMS	National Marine Fisheries Service
NOAEL	No Observed Adverse Effect Level
OAR	Oregon Administrative Rule
OHM/TADS	Oil and Hazardous Materials/Technical Assistance Data System
ONHIC	Oregon National Heritage Information Center
PCB	Polychlorinated Biphenyl
PCP	Pentachlorophenol
PRG	Preliminary Remediation Goal
RBC	Risk-Based Concentration
RI	Remedial Investigation
RTECS	Registry of Toxic Effects of Chemical Substances
SLV	Screening Level Value
TBC	Toxicity Benchmark Concentration
TBD	Toxicity Benchmark Dose
TUF	Temporal Utilization Factor
UCL	Upper Confidence Limit
UF	Uncertainty Factor
USFWS	U.S. Fish and Wildlife Service
WWTS	Wastewater Treatment System

1.0 INTRODUCTION

This document presents a work plan for a human health and ecological risk assessment for the Time Oil Co. (Time Oil) Northwest Terminal (Terminal or site) in Portland, Oregon. This work plan has been prepared to present the methods that will be used in evaluating site conditions relative to the potential risk posed to human and ecological receptors from environmentally impacted media in the uplands portion of the site. The risk assessment will be based on knowledge of the Terminal obtained through previous environmental investigations, with emphasis placed on the information presented in the draft *Phase III Remedial Investigation Report* (Phase III RI, Landau Associates 2004) and subsequent investigations to be included in the upcoming final Phase III RI report. The risk calculation methods that will be used are prescribed by Oregon Department of Environmental Quality (DEQ) guidance documents (DEQ 2000, 2001).

This work plan also presents a conceptual site model (CSM) for the Terminal that identifies sources of contamination at the site, potential contaminant migration and transport pathways, and potential receptor populations and exposure pathways. The CSM was developed based on information obtained during previous site investigation activities at the Terminal (Landau Associates 1993, 1997, 2001, 2004) and information presented in the site summary for the CSM report for Portland Harbor (Integral Consulting, et. al. 2004).

This work plan is organized into four sections and one appendix as follows:

- Section 1.0 presents an overview of the planned risk assessment for the Terminal, including a description of the Terminal, the local geology and hydrogeology, and the CSM.

- Section 2.0 describes the environmental investigations performed to date, identifies the data that will be used in conducting the human health and ecological risk assessments, and describes the status of data gaps.

- Section 3.0 describes how the data will be screened to identify contaminants that will be evaluated in the risk assessment process.

- Section 4.0 describes the methods that will be used in conducting the human health risk assessment, and presents the mathematical models and input parameters that will be used to evaluate site risk. This section also discusses how the uncertainty associated with the risk evaluation will be addressed and how risk-based concentrations will be developed.

- Section 5.0 describes the methods that will be used in conducting the ecological risk assessment, and presents the mathematical models and input parameters that will be used to evaluate site risk. This section also discusses how the uncertainty associated with the risk evaluation will be addressed and how ecologically protective risk-based concentrations will be developed.

- Appendix A includes the completed Level I Ecological Scoping Evaluation for the site, which is summarized in Section 5.0.

1.1 TERMINAL DESCRIPTION

Time Oil's Northwest Terminal is described in detail in the draft Phase III RI report (Landau Associates 2004). A brief overview is included here for context.

The Terminal is a former bulk petroleum storage and transfer facility currently owned by Time Oil. Time Oil ceased operations at the Terminal on October 31, 2001. From 1943 to 2001, the Terminal was operated by Time Oil as the Northwest Terminal petroleum products facility. Since operations began, the Terminal was used for the receipt, storage, and distribution of petroleum and petroleum-related products. Historically, Time Oil also leased tank space to Crosby & Overton for storage of waste oils, and the Koppers Company leased tanks and property at the Terminal for the formulation and blending of pentachlorophenol (PCP)-containing wood treatment products.

The site is located in Township 2 North, Range 1 West, Sections 34 and 35, in the industrialized Rivergate area of north Portland, Oregon (Figure 1). The Terminal is bordered to the east and south by heavy industrial complexes, to the north by heavy industrial property and Port of Portland undeveloped property, and to the west by the Willamette River. The Terminal is approximately 52 acres in size and is generally flat with an average land surface elevation of about 28 ft above mean sea level (MSL). The Terminal is enclosed by a terminal-wide chain link fence and access is through the main gate at the termination of Time Oil Road. Within the Terminal, there are several features that are distinguished by their historical uses, as shown on Figure 2.

1.2 GEOLOGY AND HYDROGEOLOGY

The Terminal is located on sand fill within the floodplain of the Willamette River. Prior to development of waterfront facilities, this region was characterized by alluvial river deposits consisting of sand and silt deposited by a series of braided channels, lowlands, and marshes. Specifically at the site, historical aerial photographs indicate that the area consisted of river floodplain and overbank deposits with no apparent historical river channels present. The Willamette River channel has historically been dredged to facilitate transport and moorage of shipping vessels for various industries along the riverfront. It is likely that shallow soil at the Terminal consists partly of historically dredged fill material that was placed in the upland areas. Geologic units at the Terminal, inferred from regional geologic information, consist of the undifferentiated Columbia River Basalt Group (CRBG), Sandy River Mudstone, the Troutdale Formation, alluvium, and imported fill, in order of decreasing age and depth.

Four principal near-surface hydrogeologic units have been identified at the Terminal. In descending order from ground surface, these units include: 1) an upper water-bearing zone, comprised predominantly of shallow fill (10- to 20-ft thick, with less than 1- to 15-ft saturated thickness); 2) a silt confining unit (1- to 30-ft thick); 3) a lower water-bearing zone, comprised predominantly of native alluvium consisting of silty sand and sand interlayers (1- to 40-ft thick); and 4) a deep sand unit (greater than 40-ft thick). Depending on the continuity of the confining unit, the hydrogeologic units can act as distinct aquifer units with unconfined conditions in the upper zone and confined to semiconfined characteristics in the lower zone, or act as a single unconfined aquifer in the area beyond the extent of the confining unit to the west, toward the Willamette River. The hydrogeologic units are described in detail in the draft Phase III RI report.

1.3 CONCEPTUAL SITE MODEL

A complete pathway from the source of chemicals to human or ecological receptors is necessary for potential risk to be realized. Required elements for a complete exposure pathway include:

- A source of potentially toxic chemicals (i.e., primary sources, such as contents of tanks, or a secondary source, such as contaminated soil)
- A mechanism of chemical release to the environment (i.e., spillage to the ground)
- A mechanism of retention in, or transport to, an exposure medium (i.e., adsorption to soil, or leaching from soil to shallow subsurface groundwater)
- A point of contact between receptor and exposure medium (i.e., a person with uncovered skin working in the presence of contaminated soil or groundwater)
- An intake route for the receptor (i.e., a person handling contaminated soil with bare hands).

A CSM is a working hypothesis of how site-related contaminants might migrate through the environment to potential exposure media. It describes what is known about sources and the receiving environment, and is the basis for identifying the processes by which receptors may come to be exposed to contaminants in conceptual exposure models (CEMs) for human and ecological receptors.

The CEMs presented in this section describe contaminant sources, potential release mechanisms, transport pathways based on information obtained during previous environmental investigations at the Terminal, secondary source and exposure media, and potential exposure pathways to human and ecological receptors.

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1.3.1 CONTAMINANT SOURCES AND POTENTIAL RELEASE MECHANISMS

This section identifies confirmed and potential sources of environmental impacts at the Terminal. These sources have been described in detail in previous documents, and are summarized here for reference. The locations of confirmed and potential source areas are shown on Figure 2. A schematic of the CSM for the Terminal is provided on Figure 3. The CEMs for human and ecological risk are provided on Figures 4 and 5, respectively.

Twenty-one aboveground storage tanks (ASTs) are located in the Main Terminal tank farm area. These ASTs historically provided storage for various petroleum products. All of the Main Terminal tank farm area tanks are currently empty, except for tank 16804, which stores groundwater recovered by the interim action recovery wells prior to treatment at the onsite wastewater treatment system. Product lines in this area have been flushed and cleaned. Based on data presented in the draft Phase III RI report, historical handling and storage of petroleum products in the Main Terminal tank farm area appear to have resulted in chemical releases to surface and/or subsurface soil. The Terminal historically received and distributed petroleum products via rail, truck, and marine vessel. Loading racks and docks are no longer in use, and all associated aboveground and underground distribution pipes have been flushed and cleaned. Historical use of onsite product receiving and distribution facilities onsite could have resulted in chemical releases to surface soil and/or subsurface soil. Two ASTs formerly used for storage of aviation gasoline and one AST formerly used for butane storage are located southeast of the Terminal office. Historical use of these ASTs could have resulted in petroleum releases to surface soil.

The Koppers Company used a portion of the site, identified as the former PCP mixing area and warehouse, for blending and storing specialty wood treating products containing PCP from 1967 to 1984. Historical activities in this area resulted in chemical releases to surface soil. Known soil contamination in this area at depths above the water table, approximately 13 ft below ground surface (BGS), was excavated for offsite treatment and disposal during an interim removal action (Landau Associates 2003). An interim action, using the *in situ* chemical oxidation (ISCO) technology, is currently ongoing to address environmental impacts from this operation to shallow groundwater and soil within the zone of groundwater fluctuation. In addition, shallow groundwater impacted by PCP entering the east-west trending storm drain is being captured by a storm drain intercept system installed in 2000, and a horizontal recovery well is being operated under seasonal high groundwater conditions. In the lower zone, since 2000, a vertical recovery well captures downgradient migration of PCP-impacted groundwater. Captured groundwater is treated at the onsite wastewater treatment system and discharged into the POTW under a permit with the City of Portland.

Soil excavated from the former PCP mixing area in 1989 and from the East Property during interim removal actions in 1996 and 1997 (see below) was temporarily stockpiled in an area south of the former PCP mixing area. Stockpiled soil was placed on top of a plastic liner to limit contact with the existing ground surface and was covered with a plastic liner to limit stormwater runoff. The stockpile and any residual impacted soil below the stockpile was removed in 2002 as part of the soil removal action described above (Landau Associates 2003). Following soil removal, soil within the footprint of the former stockpile was tested and found to be unimpacted.

The former Crosby & Overton tank area historically contained two ASTs used for waste oil storage. Based on data in the draft Phase III RI report, storage and handling of chemicals in this area, including petroleum hydrocarbons, carcinogenic polycyclic aromatic hydrocarbons (cPAH), and polychlorinated biphenyls (PCBs), appear to have resulted in chemical releases to surface soil. ASTs in this area have been removed and all associated piping has been flushed and cleaned. Known soil contamination in this area was addressed by interim removal actions in 1987, 1989 (Landau Associates 2001), and 2002 (Landau Associates 2003). Groundwater was not adversely impacted by operations in this area.

Ten ASTs are located in the Bell Terminal tank farm area. These ASTs historically provided storage for various petroleum products and are currently empty. Product lines in this area have been flushed and cleaned. Based on data presented in the draft Phase III RI report, historical handling and storage of petroleum products in the Bell Terminal tank farm area appear to have resulted in chemical releases to surface and/or subsurface soil; however, no past releases in the Bell Terminal tank farm area have been documented. The groundwater data collected from the Bell Terminal and from the eastern portion of the adjacent property to the west, currently owned by Schnitzer, suggest the presence of at least two commingled petroleum hydrocarbon plumes within this area: 1) one originating in the central portion of the Bell Terminal tank farm area near the east-west trending pipeline, and 2) one originating along the western property boundary outside the walls of the tank farm where activities not associated with the Bell Terminal were conducted by others between the 1960s and 2000, as documented in historical aerial photographs. Another possible contaminant source is on the eastern portion of the adjacent property where several diesel ASTs were historically located. Additional data is needed on the adjacent property to further characterize the nature and extent of contamination from activities along the western property boundary of the Bell Terminal or on the adjacent property.

A remedial action for the eastern 23 acres (East Property) of the Northwest Terminal resulted in a conditional (industrial use only) no further action (NFA) determination from DEQ (DEQ 2003). As part of this determination, it was recognized by DEQ that shallow soil contamination on the East Property did

not adversely impact groundwater quality. On the basis that drinking water is not a reasonably likely use of shallow groundwater at the site (DEQ 2003; Landau Associates 2004), the contaminants historically detected in groundwater on the East Property were below concentrations of concern for human health, and do not pose a threat to ecological receptors in the Willamette River. Therefore, the East Property has been excluded from the risk evaluations.

1.3.2 POTENTIAL CONTAMINANT FATE AND TRANSPORT

The primary fate and transport mechanisms that are likely to occur at the Terminal include transport and degradation.

Transport mechanisms at the site, which have the potential to impact media that human and ecological receptors could be exposed to, include the following:

- **Disturbance and Air Transport Of Surface Soil.** This pathway is associated with the disturbance of surface soil, through human activity or wind erosion, and subsequent airborne transport of particulates. The transported particulates could be inhaled by human and ecological receptors or redeposited downwind.

- **Leaching to Groundwater from Surface and Subsurface Soil.** This pathway is associated with chemical constituents that are sorbed on upland soil and that dissolve or otherwise desorb into water passing through the soil (i.e., infiltrating water from the surface, migrating groundwater). The extent to which leaching occurs is a function of the amount of water passing through the soil, properties of the individual chemical constituents, and physical and chemical properties of the soil and water. Leaching is a reversible process, in that chemicals leached to groundwater can re-sorb onto soil farther along the flow path.

- **Transport of Volatile Contaminants to Ambient Air from Groundwater.** This pathway is associated with the volatilization and migration of volatile contaminants in shallow groundwater through the unsaturated zone to the ground surface, where these contaminants could impact ambient air. The resulting vapor phase contaminants could be inhaled by human and ecological receptors.

Hydrogeologic data show that groundwater underlying the site discharges to the Willamette River. However, data collected from shoreline wells that are used to monitor water quality near the point of discharge to the Willamette River show that, with the exception of chromium concentrations in three of the wells and a single copper concentration, no constituent exceeded the preliminary screening levels established for the RI (Landau Associates 2004) during the November 2004 quarterly groundwater sampling event, and all constituents were less than the preliminary screening levels during the February 2005 event. Diesel-range petroleum hydrocarbons were detected in three of the four shoreline wells during each event, but a published risk-based screening level value is not available for this constituent. All other petroleum-related constituents were not detected or detected at concentrations below

preliminary screening values for protection of human and ecological receptors. The data collected from the shoreline wells indicate that there is not a current complete exposure pathway to the river via groundwater; therefore, this pathway will not be considered in the risk assessment. Any historical impacts to surface water and sediments are being addressed through the risk assessment being conducted as part of the Portland Harbor RI/FS. Data from the shoreline wells will be reported in the final Phase III RI and subsequent quarterly groundwater reports.

1.3.3 SECONDARY SOURCE AND EXPOSURE MEDIA

This section describes environmental media with potential or confirmed impacts from contaminant sources at the Terminal. The relationship between site environmental media and the potential present and future exposure pathways for contaminant contact with human or ecological receptors, are summarized in the following subsections.

1.3.3.1 Upland Soil

Both surface and subsurface soil contain chemicals of interest (COIs) at the site, as will be demonstrated in the risk assessment by screening procedures described in Section 3.0. Surface soil at the site represents a potential source of direct contact by humans. Surface soil also is a source of direct contact with and ingestion of COIs by ecological receptors that live or feed at the facility. These are complete and potentially significant pathways that will be considered in the risk assessment

Subsurface soil (defined as soil at depths between 3 ft and 13 ft for the purposes of this risk assessment) represents a potential source of direct human contact at the site for excavation workers; this is a complete and potentially significant pathway that will be considered in the risk assessment. Because ecological receptors are considered to inhabit soil depths of less than 3 ft BGS, there is an incomplete pathway for exposure of ecological receptors to subsurface soil. Therefore, this pathway will not be considered in the risk assessment.

1.3.3.2 Groundwater

Upper zone groundwater and, to a lesser degree, lower zone groundwater have been shown to contain COIs at the site. Based on the beneficial water use determination summarized in the draft Phase III RI report (Landau Associates 2004), the current and likely future beneficial use of groundwater in surrounding areas is primarily industrial with some use for irrigation of ornamental vegetation (i.e., not food crops) and does not include use as drinking water. However, irrigation does not occur in direct

proximity to the site, and groundwater flow patterns at the site are not impacted by pumping for irrigation; therefore, exposure to groundwater via irrigation is not considered a significant pathway. Groundwater at the Terminal is not currently used for any purposes; future groundwater use at the terminal is expected to be limited to industrial use. Human receptors could be exposed to chemicals in lower zone groundwater by dermal contact with groundwater used for industrial purposes, which is considered to be a complete and potentially significant pathway and will considered in the risk assessment. There is insufficient yield of upper zone groundwater to facilitate its use for industrial purposes. Excavation workers could come into contact with upper zone groundwater exposed in open trenches. Ecological receptors are not expected to be exposed to groundwater at the Terminal and, therefore, this exposure pathway will not be considered in the risk assessment.

1.3.3.3 Ambient Air

Volatile contaminants have been detected in upper zone groundwater at the Terminal. These contaminants have the potential to separate into soil gas at the surface of the groundwater table and then migrate to the ground surface and volatilize into ambient air. This pathway will be considered as complete and potentially significant in the risk assessment, and it may be determined that the potential risks associated with inhalation of impacted ambient air are insignificant in comparison to other exposure pathways at the Terminal.

1.3.3.4 Indoor Air

Volatile contaminants have been detected in upper zone groundwater at the Terminal. These contaminants have the potential to separate into soil gas at the surface of the groundwater table and then migrate to the ground surface and volatilize into indoor air. This pathway will be considered as complete and potentially significant in the risk assessment for future land use scenarios that could include indoor industrial activities, and it may be determined that the potential risks associated with inhalation of impacted indoor air are insignificant in comparison to other exposure pathways at the Terminal.

1.3.3.5 Willamette River Surface Water and Sediment

Groundwater samples collected from shoreline monitoring wells represent water quality conditions in shallow groundwater before discharging to the Willamette River. Data from samples collected in November 2004 and February 2005 show that impacts to water discharging to the Willamette River are not significant, and indicate that there is not a current complete contaminant transport pathway to the river; therefore, exposure to surface water and sediment in the river will not be considered in the

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risk assessment. Any historical impacts to Willamette River surface water and sediment quality are being addressed in the Portland Harbor RI/FS.

1.3.4 POTENTIAL RECEPTORS AND EXPOSURE SCENARIOS

Potential receptors are those human or ecological groups that, by virtue of their activities at a site (now or in the future) could be exposed to impacted environmental media. This section presents a summary of potential receptors identified for the site and surrounding area. Potential human receptors have been identified based on our understanding of current and potential future land use at the site and in the surrounding area from the results of land use and beneficial water use surveys completed for the site and summarized in the draft Phase III RI report (Landau Associates 2004). Ecological receptors have been identified based on a survey of ecological conditions at the terminal.

Three exposure scenarios for human receptors account for likely current or future contact with site COIs. These exposure scenarios are:

- Onsite Industrial Worker: The onsite industrial worker may work in an indoor or outdoor setting and is assumed to be involved in onsite occupational activities 250 days per year for up to 25 years.

- Onsite Construction Worker: The onsite construction worker is assumed to be involved in outdoor construction activities with a greater opportunity for direct contact with the upper 3 ft of soil. The construction worker is assumed to be engaged in work at the site for 250 days per year for up to one year.

- Onsite Excavation Worker: The onsite excavation worker is assumed to have a high level of contact with soil and potentially with upper zone groundwater in trenches extending to 13 ft BGS.

In addition to these human exposure scenarios, ecological exposure scenarios involving terrestrial and/or semi-aquatic receptors are possible based on both current and potential future site conditions. This section presents a preliminary evaluation of present and potential future exposure scenarios for the human and ecological receptors identified for the site, by environmental medium.

1.3.4.1 Upland Soil

The onsite industrial worker, onsite construction worker, and onsite excavation worker may contact contaminants in surface soil through incidental ingestion, dermal contact, and inhalation of airborne particulate matter. Only the onsite excavation worker could contact contaminants in subsurface soil; this would occur through future excavation activities that are expected to be limited to the soil within 13 ft of the surface.

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Terrestrial and semi-aquatic animals are expected to come in contact only with surface soil; this contact could occur during burrowing or at the ground surface (dermal contact, incidental ingestion, and inhalation of airborne particulate matter). Ecological receptor exposure is expected to be limited to the upper 3 ft of soil. Terrestrial and semi-aquatic predators could also be exposed to COIs through ingestion of prey that inhabit contaminated surface soil. Terrestrial plants also could come in contact with surface soil contamination, primarily via uptake through their root systems.

1.3.4.2 Groundwater

As described in Section 1.3.3.2, use of groundwater as drinking water or irrigation water are not anticipated at the Terminal. Furthermore, there are no groundwater seeps in the riverbank; therefore, direct exposure to groundwater is only possible when groundwater is pumped from the subsurface for specific purposes.

If future site activities involve the use of groundwater for industrial purposes, the onsite industrial worker could be exposed to lower zone groundwater through dermal contact; incidental ingestion and inhalation of airborne water particles are considered potentially complete but insignificant pathways for exposure to industrial process water. The onsite excavation worker could be exposed to upper zone groundwater in subsurface excavations through dermal contact; however, incidental ingestion and inhalation of airborne water particles are considered potentially complete but insignificant pathways for excavation worker exposure. The onsite construction worker is not expected to be exposed to groundwater.

1.3.4.3 Ambient Air

The onsite industrial worker, onsite construction worker, and onsite excavation worker may uptake vapor phase contaminants through the inhalation of impacted ambient air. As described in Section 1.3.3.3, ambient air could be impacted by the volatilization of COIs in upper zone groundwater.

1.3.4.4 Indoor Air

Although indoor air impacts are not a concern under the existing site configuration, future site use may include indoor industrial applications. The onsite industrial worker may uptake vapor phase contaminants through the inhalation of impacted indoor air. As described in Section 1.3.3.4, indoor air could be impacted by the volatilization of COIs in upper zone groundwater.

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1.3.5 SUMMARY

Figure 4 summarizes the CEM for human risk and Figure 5 summarizes the CEM for ecological risk. These figures identify known or suspected sources of contamination at the site, known or suspected contaminant release mechanisms and migration pathways, potential receptor populations, and potential exposure pathways.

2.0 ENVIRONMENTAL DATA

This section describes the environmental investigations performed to date, identifies the data that will be used in conducting the baseline human health and ecological risk assessments, and describes the status of data gaps.

2.1 PREVIOUS INVESTIGATIONS

Beginning in 1984, a series of environmental investigations were conducted to evaluate the potential for soil and groundwater contamination due to former operations at the Terminal. These investigations included a site inspection by DEQ in 1984, several soil investigations in the former PCP mixing area, removal of the Crosby & Overton truck-washing trough in 1986, test pit explorations near the Crosby & Overton truck-washing trough in 1989, and a groundwater and soil investigation in 1994 in response to an unleaded gasoline spill. These investigations are described in the draft Phase III RI report.

In addition to the soil and groundwater investigations conducted between 1984 and 1994, a phased RI was conducted at the Terminal from 1996 through 2004, including ongoing quarterly groundwater monitoring continuing to the present under a Voluntary Cleanup Program (VCP) agreement between Time Oil and DEQ. The Phase I RI focused on the former stockpile area, and the Phase II RI focused on the former PCP mixing area and the former Crosby & Overton area. The Phase III RI focused on areas of the Terminal where no extensive soil or groundwater investigations had previously been performed, including the former Main Terminal and Bell Terminal tank farm areas, the former loading racks, and other operational portions of the Terminal. Some additional investigations and a soil remedial action were also performed for the East Property, which is not an area of consideration for the risk assessment and is, therefore, not considered part of the Terminal, or site, for the purposes of this document as described above. Some remedial actions, including removal of the stockpile and impacted soil from the former PCP mixing/warehouse areas and soil from the Crosby & Overton area, were also completed in 2002. A more complete description of environmental data collected to date, including data representative of residual soil concentrations remaining at the conclusion of the soil removal actions and contaminated soil that has already been removed, is presented in the draft Phase III RI report and the removal action completion report (Landau Associates 2003). Data collected during new well installation completed in late October and early November 2004, including shoreline wells, will be included in the final Phase III RI report, scheduled to be submitted to DEQ in spring 2005.

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2.2 RISK ASSESSMENT DATA SET

This section describes the data set collected during environmental investigations at the Terminal that will be the basis for evaluating potential risks to human and ecological receptors. Special approaches to handling environmental data for risk assessment purposes are also described.

2.2.1 DATA SET DESCRIPTION

The data set compiled in the draft Phase III RI report (Landau Associates 2004) and in the upcoming final Phase III RI report presents data representative of existing site conditions. Soil samples collected throughout the Phase II and Phase III RIs, that are representative of soil remaining at the Terminal following the completed interim remedial or removal actions, are presented in the draft Phase III RI report and comprise the data set to be used for soil characterization in the risk assessment. Except for the excavation worker scenario, which involves exposure to soil from ground surface to 13 ft BGS, all other human and ecological receptors are potentially exposed only to surface soil from ground surface to 3 ft BGS. Soil data will be evaluated in two data sets for risk assessment purposes: surface soil will include all applicable data from 0 to 3 ft BGS, and surface and subsurface soil will include all applicable data from 0 to 13 ft BGS (the approximate water table).

The nature and extent of contamination present in groundwater at the Terminal was evaluated based on chemical results for groundwater samples collected from temporary borings during the Phase III preliminary evaluation, the Phase III interim subsurface investigation, the October-November 2004 new well installation, and also the most recent year of quarterly groundwater monitoring data (first quarter through fourth quarter 2004); the most recent year of groundwater monitoring data will be used for those wells that have been discontinued from the quarterly monitoring program. Groundwater data will be evaluated in two data sets for risk assessment purposes, "upper zone groundwater" and "lower zone groundwater." In areas closer to the river beyond the confining unit boundary where only one unconfined groundwater zone exists, groundwater data will be considered representative of lower zone groundwater, because of the similarity with lower zone groundwater elevations.

2.2.2 DATA SET HANDLING

Data sets used for risk assessment purposes are subject to statistical evaluation. Data handling techniques used to facilitate such statistical evaluations in a manner that is reasonable, and also maintains a conservative nature (i.e., tendency to err on the side of overestimating potential risks), are described below.

Due to limitations in the accuracy of available chemical analysis equipment, laboratories typically cannot determine whether a chemical is absent from a sample, but they can confirm that it is not present above some threshold concentration, called the laboratory reporting limit, at which the chemical analysis equipment is considered reliable. Deterministic risk assessment procedures require that some discrete concentration be used for each sample to estimate average exposure point concentrations (EPCs) for chemicals that are retained as contaminants of potential concern (COPCs). Samples with concentrations not detected at the reporting limit will be handled in accordance with guidance developed by the U.S. Environmental Protection Agency (EPA 1989). Generally, if a chemical is not detected above the reporting limit in some samples from the site, but is detected in other samples, then those samples in which the chemical is not detected will be assigned a "proxy" concentration of one-half the value of the reporting limit for use in the calculation of EPCs. These proxy values will not have any bearing on the screening process described in Section 3.0. For data sets with a lognormal distribution, which is characteristic of most environmental data sets, assuming a proxy concentration of one-half the value of the reporting limit will provide a conservative estimate of the actual average concentration of nondetect samples.

Blind field duplicate samples are often collected during environmental investigations for the purposes of evaluating data quality. To avoid a statistical bias toward concentrations from sample locations where duplicate samples were collected (i.e., effectively counting these sample locations twice in comparison to other sample locations), only a single chemical concentration from the original sample or its duplicate will be retained for use in data evaluation. The selected concentration will be the maximum detected concentration for detected chemicals, or one-half the value of the lowest achieved reporting limit for nondetected chemicals. In cases where a chemical is not detected, this approach allows the use of the most sensitive analytical run to estimate the concentration below the reporting limit. In cases where a chemical is detected and there is some variability in the reported concentration, this approach conservatively assumes that the actual concentration is the highest of the two concentrations.

2.3 DATA GAPS

Surface soil, subsurface soil, and groundwater have been adequately characterized for risk assessment purposes based on the data presented in the draft Phase III RI report. The recent installation and sampling of shoreline wells to monitor groundwater quality near the point of discharge to the Willamette River have filled what was previously a data gap at the Terminal. The only remaining data gaps include definition of the locality of facility at the north property boundary and assessment of the mobility of the product observed in monitoring wells in the Main Terminal tank farm area. Time Oil is

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currently in the process of obtaining an access agreement from the Port of Portland for sampling two wells located with 300 ft of the north property boundary to determine whether any groundwater contamination from the Terminal extends north of the property boundary. Sampling is expected in occur in conjunction with the second quarter 2005 groundwater monitoring event in June, 2005. Also, Time Oil is preparing a source control evaluation document that will provide information on the mobility of the product and whether remediation is necessary to address potential product migration, and if so, the remedial options. We expect this document to be submitted to DEQ in the summer 2005.

3.0 DATA SCREENING

The potential exposures and risk(s) from contaminants at the Terminal will be assessed based on the data set described in Section 2.2. Constituents that are detected in less than 5 percent of the samples, or are detected with a maximum concentration that is less than site-specific background levels established for metals (Landau Associates 1999), are considered to have *de minimus* risk to human health and the environment and will be screened out of the risk assessment process (DEQ 2000). Constituents that are considered essential nutrients for human receptors (e.g., calcium, iron, magnesium, etc.) will not be retained for consideration in the risk assessment. All remaining constituents that are not rejected during data validation, are detected in at least 5 percent of the samples collected from a given environmental medium, and that are above background levels will be included in the database used in the human health and ecological risk assessments. Reporting limits for chemicals that were not detected, but considered to be reasonably likely to be present at the site, will be reviewed to verify that elevated reporting limits have not masked the potential presence of site contaminants. The resulting data set will constitute the COIs in all environmental media at the site.

A COPC/COPEC screening report was previously prepared for the Terminal based on Phase I and II investigations (Landau Associates 1999). The Phase III RI investigation and interim actions conducted at the Terminal since the COPC/COPEC screening report was prepared have resulted in significant changes to the data set that defines the nature and extent of contamination; therefore, the COPC/COPEC screening activities that will be performed as part of this risk assessment will supersede those presented in the previous report.

Data screening to identify COPCs for human health or COPECs for ecological receptors are discussed in Sections 4.0 and 5.0, respectively.

4.0 HUMAN HEALTH RISK ASSESSMENT

A baseline human health risk assessment will be performed to estimate current and potential future risk to human health at the site using deterministic techniques outlined in DEQ cleanup regulations and guidance [Oregon Administrative Rule (OAR) 340-122-0084, DEQ 2000]. The following sections describe how site data will be used in evaluating human health risk based on our current understanding of the site, potential receptor populations, and exposure pathways. In addition, methods that will be used to quantify exposure and estimate risk are presented, and factors that will be qualitatively evaluated in assessing the uncertainty associated with the risk estimates are summarized.

4.1 COPCS AND EXPOSURE POINT CONCENTRATIONS

As per DEQ (2000) guidance, the site data will be further refined after the screening process described in Section 3.0, to identify a subset of contaminants, the COPCs, that will be the focus of the baseline human health risk assessment. This screening for COPCs will eliminate from further consideration any contaminants with concentrations so low relative to risk-based criteria that the contaminants do not merit further evaluation. DEQ's risk-based concentrations (RBCs, DEQ 2003) and EPA Region 9 Preliminary Remediation Goals for industrial sites (PRGs, EPA 2002) will be used as the basis for screening COIs by risk to human health. The screening process will be conducted separately for COIs detected in onsite groundwater and soil. However, exposures to the same COI through multiple environmental media via multiple exposure pathways will also be evaluated. COIs at concentrations below these risk-based screening levels will not be evaluated further in the baseline human health risk assessment and the remaining constituents will be designated as COPCs and will be evaluated in subsequent steps in the risk assessments.

If a contaminant is a COPC in one medium and is detected in multiple media, the COPC will be retained in each medium to ensure consideration of potential exposures via multiple pathways. If a risk-based screening level is not available for a given COI, the COI will be identified as a COPC and discussed in the uncertainty analysis.

After COPCs have been identified for each environmental medium, a statistical evaluation will be conducted for each of the following data sets:

- Surface soil
- Surface and subsurface soil
- Upper zone groundwater
- Lower zone groundwater.

The purpose of the statistical evaluation will be to identify a representative concentration, the EPC, of each COPC in each data set for use in evaluating chemical intake and risk through the relevant exposure scenarios and pathways identified in the exposure assessment. For each COPC in each data set, DEQ regulations require that both the arithmetic mean (central tendency) concentration and the 90% upper confidence limit (90% UCL, referred to as the plausible upper bound) be estimated for a given set of chemical concentration data. Calculations for contaminant intake by exposure pathway and risk estimates will be made using both resulting exposure concentrations in order to represent the required range of risks posed by the site.

4.2 EXPOSURE ASSESSMENT

Exposure assessment is the process of measuring or estimating the intensity, frequency, and duration of exposure. The exposure assessment step in the baseline human health risk assessment process involves identification of potential receptor populations and exposure pathways that could bring the receptors in contact with contamination at the site. The risk assessment process evaluates only complete exposure pathways. As noted in Section 1.3, in order for a human exposure pathway to be complete, each of the following elements must exist:

- A source and mechanism for chemical release
- An environmental transport medium (e.g., air, water, soil)
- A point of potential human contact with the medium
- A human exposure route at the point of contact (e.g., inhalation, ingestion, dermal contact).

For the purposes of this assessment, the environmental media through which exposure to the COPCs may occur is soil (surface and subsurface) and groundwater. Exposure to soil could occur via incidental ingestion, dermal contact, and inhalation of suspended particulates. Exposure to groundwater could occur via incidental ingestion, dermal contact, and inhalation of volatilized constituents. The diffusion/flux model described in DEQ guidance (DEQ 1999) was used to model contaminant migration from shallow groundwater to outdoor air (Figure 6). The Johnson and Ettinger model (Figure 7; DEQ 1999) was used to model indoor air concentrations.

The following sections present an evaluation of exposure pathways currently identified for each of the site receptor populations, exposure equations that will be used to calculate chemical intake for each of the pathways, and exposure parameters that will be used in calculating chemical intake.

4.2.1 ONSITE INDUSTRIAL WORKER

The Terminal is currently an inactive facility; however, future industrial workers using the site could be responsible for a variety of duties. The onsite industrial worker could potentially become exposed to contaminated soil and groundwater through direct contact pathways during occupational activities. The specific pathways include:

- Surface soil (0 to 3 ft BGS): dermal contact, incidental ingestion, and inhalation of suspended soil particulates
- Lower zone groundwater as process water: dermal contact
- Ambient air: inhalation of chemicals that have volatilized out of upper zone groundwater
- Indoor air: inhalation of chemicals that have volatilized out of upper zone groundwater.

For the purposes of this risk assessment, the onsite industrial worker population will be adult and assumed to work primarily in the upland areas of the Terminal. Industrial workers could potentially come into dermal contact with lower zone groundwater if used as industrial process water; however, groundwater at the Terminal has not been historically used for such purposes. Intake of contaminants will be modeled by assuming that the industrial worker performs tasks in relatively close proximity to each medium, with intake occurring through dermal contact and incidental ingestion of surface soil, dermal contact with lower zone groundwater used as industrial process water, and inhalation of ambient or indoor air impacted by volatile COIs in upper zone groundwater. The equations that will be used to calculate exposure to contaminants in soil, groundwater, and ambient or indoor air through each of the exposure pathways are shown on Figures 8 through 12, the exposure parameters used in the calculations are presented in Table 1.

4.2.2 ONSITE CONSTRUCTION WORKER

There is currently no ongoing construction activity at the Terminal. However, future plans (i.e., Terminal demolition or redevelopment of the site) may require consideration of the construction worker scenario. Construction worker activities could potentially expose construction workers to contaminants in surface soil (dermal contact, incidental ingestion, and inhalation of particulates) and ambient air (inhalation).

For the purposes of this risk assessment, the model will assume that the receptor population is adult working in close proximity to the soil, with chemical intake occurring through dermal contact and incidental ingestion of soil and through inhalation of suspended particulate matter. The equations that will be used to calculate exposure to contaminants in surface soil through dermal contact, incidental

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ingestion and/or inhalation of suspended soil particulates are shown on Figures 8 through 10. The equation to calculate exposure to contaminants in ambient air via inhalation is shown on Figure 12. Exposure parameters used in these calculations are presented in Table 1.

4.2.3 ONSITE EXCAVATION WORKER

There is currently no ongoing construction activity at the Terminal. However, future plans (i.e., Terminal demolition or redevelopment of the site) may require consideration of the excavation worker scenario. Movement of earthen material could potentially expose excavation workers to contaminants in surface and subsurface soil (dermal contact, incidental ingestion, and inhalation of particulates); shallow groundwater (dermal contact); and ambient air (inhalation).

For the purposes of this risk assessment, the model will assume that the receptor population is adult working in close proximity to the soil, with chemical intake occurring through dermal contact and incidental ingestion of soil and through inhalation of suspended particulate matter. It is also assumed that the excavation worker could come into dermal contact with shallow groundwater. The equations that will be used to calculate exposure to contaminants in surface and subsurface soil through dermal contact, incidental ingestion and/or inhalation of suspended soil particulates are shown on Figures 8 through 10. The equation to calculate exposure to contaminants in shallow groundwater via dermal contact is shown on Figure 11. The equation to calculate exposure to contaminants in ambient air via inhalation is shown on Figure 12. Exposure parameters used in these calculations are presented in Table 1.

4.3 DOSE-RESPONSE ASSESSMENT

The purpose of the dose-response assessment is to weigh available evidence regarding the potential for COPCs to cause adverse health effects in exposed individuals and to provide, where possible, an estimate of the relationship between the extent of exposure to a compound and the increased likelihood or severity of the adverse effect.

The bulk of knowledge about the dose-response relationship is based on data collected from animal studies and theoretical precepts about what might occur in humans. Mathematical models are used to estimate the potential human response at levels far below those tested in animals. These models contain several limitations that will be considered when the risk estimates are evaluated. Most of the COIs preliminarily identified for the site have toxicity criteria available for the dose-response assessment, and include both noncarcinogenic and carcinogenic compounds. For those COPCs for which toxicity criteria are not available to conduct a quantitative risk estimate, a qualitative evaluation of the risk will be presented.

The EPA online Integrated Risk Information System (IRIS, EPA 2004) will be accessed to identify toxicity criteria for the site COPCs. Reference dose values will be identified to evaluate noncarcinogenic health effects, and cancer potency factors will be identified to evaluate carcinogenic health risks. In some cases, both reference dose values and potency factors may be available for some compounds. In these cases, both noncarcinogenic and carcinogenic health effects will be evaluated. Information concerning the basis of the toxicity criteria used and their associated uncertainty will be presented in the baseline risk assessment report, as recommended by EPA guidance (EPA 1989).

4.4 RISK CHARACTERIZATION

The risk characterization will provide a quantitative and qualitative summary of the health risks posed to individuals by exposure to the COPCs in environmental media at the site. The risk characterization will address both noncarcinogenic and carcinogenic health effects.

Potential noncarcinogenic adverse health effects will be evaluated by comparing the predicted chemical intake values to reference dose values obtained from the EPA IRIS database. In order to evaluate the general acceptability of a particular dose relative to a reference dose value, a hazard quotient value is calculated, which is the ratio of the calculated average daily dose (ADD) to the reference dose value:

$$\text{Hazard Quotient} = \text{ADD}/\text{Reference Dose}$$

A hazard quotient less than or equal to 1 indicates that the predicted exposure would not pose an unacceptable level of noncarcinogenic health risk (EPA 1989). To account for the additive effects of individual chemicals for a given exposure pathway that could potentially act upon the same organs or result in the same physiological endpoint, additive effects are addressed by calculating a hazard index, which is the sum of all individual hazard quotients for a given pathway.

Carcinogenic risks are defined in terms of the probability of an individual developing cancer as the result of exposure to a given chemical at a given concentration. The incremental probability of developing cancer (i.e., the theoretical excess cancer risk) is that risk attributed to exposure to the COPCs present at the site. For each applicable COPC, the theoretical excess cancer risk is based on the lifetime average daily dose (LADD), which is defined as the total incremental dose of a chemical received as a result of the exposure averaged over a lifetime. Once the LADD has been calculated, the cancer risk is calculated as follows:

$$\text{Estimated Cancer Risk} = \text{LADD} \times \text{Potency Factor}$$

As with hazard quotients, the estimated cancer risks for each chemical and exposure route will be summed to estimate the total excess cancer risk for the exposed individual per exposure pathway (EPA 1989).

4.5 UNCERTAINTY ANALYSIS

An uncertainty analysis will be conducted for the baseline human health risk assessment to examine the sources and magnitude(s) of potential uncertainty associated with the risk estimates. Sources of uncertainty include the data available for the site investigations, receptor population and exposure pathway identification, exposure parameter selection, and toxicity criteria used to characterize risk. Each of these potential sources of uncertainty will be evaluated qualitatively to determine the likely degree of uncertainty associated with the risk estimates, and whether the uncertainty has likely led to over- or under-estimates of risk.

4.6 BASELINE HHRA – CONCLUSIONS AND RECOMMENDATIONS

The conclusions of the baseline HHRA, including acceptable risk levels for exposure of COPCs to human receptors at the terminal ,and any recommendations for additional assessment of risk to human receptors will be provided in a baseline HHRA report, as described in Section 6.0.

5.0 ECOLOGICAL RISK ASSESSMENT

A ecological risk assessment (ERA) will be performed to address current and potential future risks posed to ecological receptors at the site. The ERA will be conducted in accordance with OAR 340-122 and DEQ guidance for conducting ERAs, Levels I, II, and III (DEQ 2000, 2001). Generally, ERAs, which are conducted to meet Oregon DEQ guidelines, are based on an EPA framework (EPA 1998). This framework follows a stepwise process that first includes problem formulation to determine the focus and scope of the assessment, followed by an exposure assessment, toxicity assessment, and risk characterization. In accordance with DEQ guidance, a Level I Ecological Scoping Assessment was conducted based on an April 2005 site visit and is presented in Appendix A. The results of the Level I assessment indicated that potential ecological receptors and potentially complete exposure pathways exist at the site and a Level II Screening ERA should be conducted. The Level II Screening ERA is planned for the Terminal to determine the presence of contaminants of potential ecological concern (COPECs), if any. This Level II COPEC screening process is essentially a preliminary problem formulation. The results of the Level II COPEC screening will be reported to DEQ with recommendations regarding the need for additional ecological assessment. If further assessment is deemed necessary, a Level II calculation of ecological target cleanup levels (ETCLs) or a Level III Baseline ERA will be proposed. The overall process will allow for informed, stepwise decision-making in order to focus each subsequent and more complex level of ecological assessment on the most important ecological issues for the site. The following sections present the procedures to be followed for the Level II determination of COPECs, a Level II calculation of ETCLs (if required), and a Level III Baseline ERA (if required).

5.1 LEVEL II SCREENING ASSESSMENT

This section documents the steps necessary to conduct the Level II screening assessment for the ERA. The Level II screening assessment will build on the information collected during the Level I scoping process and will initiate the problem formulation process for the ERA for the Terminal. The scope of an ERA is defined through problem formulation, during which the physical and contaminant characteristics of the site are described, including the important ecological habitats, plants, and wildlife that exist there. Along with the results of previously completed investigations and knowledge of the site, this information is used to identify the COIs (i.e., contaminants likely to be present at the site), the ecological receptors of concern (i.e., assessment species), and the contaminants of potential ecological concern (COPECs). This information will also be used to develop the conceptual ecological exposure model (CEEM) that depicts the expected fate and transport of chemicals at the site, the potential exposure

media, and exposure pathways for ecological receptors of potential concern. Specifically, the problem formulation will include:

- a site description
- a summary of the results of previous investigations
- description of the ecosystem components at the site
- selection of assessment species for the site
- a summary of complete ecological exposure pathways
- selection of the COPECs
- a summary of potential ecological effects of the COPECs
- presentation of the CEEM
- presentation of assessment endpoints and measures based on the COPECs for the site and potentially effected ecological receptors.

The site description, previous investigation summary, and preliminary conceptual site model are provided earlier in this work plan. Information to be used for preliminary problem formulation and identification of COPECs is provided below, including the current understanding of the ecological conditions at the Terminal. As described below, the preliminary problem formulation will conclude with identification of the assessment endpoints and measures that become the focus of the remainder of the ERA. Preliminary problem formulation will also provide for a qualitative understanding and ranking of which COPECs are of the most importance and in which media. The preliminary problem formulation information will be updated as part of the Level II COPEC determination and may be further modified or updated during the Level II ETCL calculation or Level III ERA, in accordance with the level of detail required by the selected approach, if determined necessary.

5.1.1 ECOSYSTEM COMPONENTS

The site encompasses terrestrial environments and borders riverine environments. This section summarizes and focuses the characteristics of the terrestrial environment that are relevant to the ERA. The riverine environment is being assessed as part of the Portland Harbor RI/FS.

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5.1.1.1 Terrestrial Environment

The Terminal is dominated by two areas of ASTs including the former Main and Bell Terminal tank farms. The former Main Terminal tank farm area is within a bermed area approximately 30 ft above the shoreline of the Willamette River in the northwest area of the site. Immediately east of the former Main Terminal tank farm area are the truck loading/unloading area and associated office and warehouse buildings. A few additional ASTs and the existing wastewater treatment system (WWTS) are also present near this Main Terminal complex. The former Bell Terminal tank farm area is several hundred feet south of the former Main Terminal tank farm area and several hundred feet east of the river, separated by an offsite industrial complex. The ASTs at the former Main and Bell Terminal tank farms are close together and surrounded by dirt berms designed for spill containment. Within the berms the ground is predominantly bare dirt with very little to no natural vegetation. Most of the area between the former Main Terminal tank farm area, the office and warehouse buildings, the WWTS, and the Crosby & Overton tanks is either paved or covered with gravel. The area between the former Main Terminal complex and the former Bell Terminal tank farm area is mowed weedy vegetation or bare dirt surface. The terrestrial habitat at the site currently provides little habitat for ecological receptors. A limited number of small terrestrial mammals (e.g., deer, mice), terrestrial invertebrates, and/or reptiles (e.g., garter snakes) may inhabit the mowed grassy area between the tank farms.

5.1.1.2 Riverine Environment

As described earlier in this work plan, the contaminant transport pathway to the Willamette River is considered incomplete for impacted media at the Terminal. Therefore, ecological receptors in the riverine environment will be considered only insomuch as their normal activities would result in potential exposure to upland surface soil (i.e., semi-aquatic receptors with terrestrial foraging habits may be evaluated, but fully aquatic receptors will not). Aquatic receptors are being evaluated as part of the Portland Harbor RI/FS.

5.1.1.3 Sensitive Environments

No sensitive environments exist on the site. The Willamette River, located adjacent to the site, is a sensitive habitat as defined by OAR 340-122-045, due to the critical habitat designation for the federally listed Chinook salmon and steelhead. While some restored wetlands are present north of the Terminal, the zoning and land use surrounding the site are industrial.

5.1.1.4 Sensitive Species

A sensitive species search via the Oregon Natural Heritage Information Center (ONHIC) has not yet been conducted. This search will be conducted and the results incorporated into the ERA. Evaluation of sensitive species for the ERA will be limited to terrestrial and possibly semi-aquatic receptors exposed to contaminants in terrestrial habitats. Currently available information on sensitive species is provided below.

Bald eagles have nested along the Willamette River upstream and downstream from the site. Due to successful recovery efforts, U.S. Fish and Wildlife Service (USFWS) recently proposed that the bald eagle be removed from the federal list of endangered and threatened wildlife in the lower 48 states under the Endangered Species Act (ESA). While the public comment period on the ruling to de-list closed in October 1999 and the de-listing was expected to have been completed within a year of the end of the public comment period (CH2M Hill 1999), the de-listing has not occurred to date.

State-listed terrestrial and semi-aquatic threatened, endangered, and sensitive-critical species in Multnomah County, Oregon include birds (i.e., bald eagle and peregrine falcon), bats, frogs, turtles, and snails. Given the general lack of suitable habitat, the birds and other protected species are unlikely to inhabit the Terminal or the site vicinity. There are no known rare, threatened, or endangered plant species at the Terminal.

5.1.1.5 Potential Ecological Receptor Types

For the purposes of this ERA, terrestrial plants, invertebrates, and wildlife are those species that forage on terrestrial plants, terrestrial invertebrates, and terrestrial wildlife (e.g., herbivorous, invertivorous, omnivorous, or carnivorous amphibians, reptiles, bird, or mammals) and, thus, are most likely to be exposed to site-related contamination in surface soil. Semi-aquatic wildlife are those species that live in the terrestrial environment, but obtain a significant portion of their diet from the aquatic environments, or vice versa, and may be exposed to site-related contamination in surface soil. Aquatic plants, invertebrates, fish, and wildlife are those species that obtain their sustenance from the aquatic environment and, thus, are unlikely to be exposed to site-related contamination in soil or groundwater at the Terminal. Representative terrestrial and semi-aquatic ecological receptors that are known or likely to be found at or adjacent to the site are listed in Tables 2 and 3, respectively. The receptor types (or functional groups) these species represent are summarized in Table 4. Some of these ecological receptors may be resident at the site while others may use the site on a seasonal basis, or as a resting or staging area along migration routes. These species were used to define the ecological functional groups of species at

the site and to select the representative assessment communities and species that are evaluated in the ERA, as described in the next section. The functional grouping is described in the next section.

5.1.2 SELECTION OF ASSESSMENT COMMUNITIES AND ASSESSMENT SPECIES

In ERAs, it is impractical to address each individual species that may inhabit a given site. Therefore, similarly exposed species are classified into functional groups based primarily on their foraging habits, and then assessment communities or assessment species are chosen to represent these functional groups. Subsequently, predicted risk for one assessment community or assessment species is considered representative of risk to the other species within the represented functional groups.

The Time Oil Northwest Terminal functional groups were developed from site-specific species lists by grouping species by taxonomic class (e.g., birds, mammals, amphibians, etc.), foraging strategy (e.g., terrestrial or semi-aquatic), and trophic level (e.g., primary producer, herbivore, invertivore/detritivore, or carnivore/piscivore). Because different species of plants and invertebrates can be very numerous, these lower trophic level species are often combined according to DEQ guidance and assessed as communities because of their very similar exposure routes. In addition, toxicity data for plants and invertebrates are most often representative of groups of species. These combinations of lower trophic level species are termed assessment communities because they may represent numerous types of species. An assessment community may represent one or more functional groups. During the functional grouping process, semi-aquatic species were grouped into terrestrial or aquatic foraging strategies based on their expected primary foraging habits while they are present at the site. For example, raccoons were considered to be part of the terrestrial food web, because they are expected to forage primarily on terrestrial berries, seeds, and invertebrates that are common along the river; but not on aquatic prey items such as crawdads, which are uncommon or absent in the near-shore areas of the river where raccoons could wade. Preliminary functional groups selected for this ERA are presented in Table 5. This list was used to develop the terrestrial food web diagrams shown on Figure 13.

A representative assessment species was also selected to represent each of the upper trophic level functional groups, based primarily on the species within each functional group that would be expected to receive the highest exposure to contaminants at the site. Primary factors related to exposure potential that were considered included:

- body size
- population density and extent of home range
- foraging approach of the species
- contaminated media at the site

- ecological niche(s) represented by a species.

Other factors that influenced the selection of some assessment species included:

- sensitivity of the receptor to the site-related contaminants
- availability of exposure and toxicity data
- societal value/regulatory status of the species
- position of the species within the food web.

The selected assessment communities and species, and the functional groups they represent, are listed in Table 5. The rationale for selection of each assessment community and species is presented below.

5.1.2.1 Assessment Communities and Exposure Pathways

Terrestrial Plants

The terrestrial plant community is defined as all plants that obtain nutrients primarily from soil (including soil pore water). The primary production of these plants provides a foundation for the terrestrial food web. Negative impacts to primary production are likely to result in decreased abundance of soil invertebrates and upper trophic level species due to a lack of food and cover. A reduced diversity of particularly sensitive plant species may also result in similar detrimental effects to some upper trophic level species if plants that are a preferred food for particular herbivores are extirpated (made regionally extinct) from the site due to their exposure to contaminants in soil. Because plant toxicity data are not available for most wild plant species, these plant species were assessed as a community by applying the available toxicity data across all species at the site. This broad application assumes that the mechanism of toxic action is similar between plant species. The principal exposure pathway for terrestrial plants to contaminants at the site is via uptake from soil and soil pore water.

Terrestrial Invertebrates

The terrestrial invertebrate community is defined as all invertebrates that obtain nutrients primarily from soil or on the soil surface. The abundance and diversity of such invertebrates is similar in importance to that of plants because invertebrates are also a primary food source within the terrestrial food web. Declining numbers or types of terrestrial invertebrates may result in decreased abundance and/or diversity of insectivores. This, in turn, may result in lower diversity of upper trophic level wildlife because fewer numbers or types of insectivores means fewer food items for carnivores that prey on the insectivores. Thus, the dependent carnivores may starve or leave the site in search of their preferred food

items. The principal exposure pathways for terrestrial invertebrates to COPECs at the site is via ingestion of and dermal contact with soil.

5.1.2.2 Assessment Species and Exposure Pathways

The assessment species and the functional groups they represent for the Terminal are summarized in Table 5. In some cases, one assessment species was considered to be representative of several functional groups. This was the case when a particular assessment species could be chosen that was similar to, but likely to be more highly exposed or sensitive to, contaminants than species in the other represented functional groups. Thus, using an assessment species approach protects other species in different functional groups and allows the number of assessment species to be reduced. The rationale for the selection of assessment species for multiple functional groups is described in the following sections.

Terrestrial Avian Invertivores

The American robin was chosen as an assessment species because it is likely to be the most exposed representative of the terrestrial invertivore functional group. The robin is small, has a high food intake rate for its weight, and would be susceptible to chemical exposure via ingestion of contaminated terrestrial invertebrates and incidental ingestion of soil. No perennial surface water is present at the site and therefore, exposure to contaminated drinking water is not considered a significant exposure pathway. Robins are present onsite during the spring and summer months (and potentially all year), have limited home ranges, and have adequate exposure and toxicological data.

The robin was considered to be representative of the potential exposure and effects for several other functional groups, including terrestrial avian herbivores, terrestrial avian omnivores, and terrestrial avian carnivores. The exposure of invertivores is usually higher than that of herbivores or omnivores, because plants generally take up contaminants to a lesser extent than invertebrates. For this reason, the robin will also represent terrestrial avian herbivores and omnivores. The robin is also a more conservative representative of terrestrial avian carnivores than a red-tailed hawk (the other choice for this site) because of its smaller body and home range, each of which increase the potential for exposure to chemicals at the site. Additional considerations that support this substitute include the fact that fewer hawks would be expected to inhabit the site because their home ranges extend farther, hawks would not be solely exposed to contaminants at the site as robins may be, and because methods of assessing toxicity are nearly identical for the robin and hawk.

Terrestrial Mammalian Invertivores

The masked shrew was chosen as a mammalian assessment species because it has a high potential for chemical exposure, it (or other similar shrew species) is a resident at the site, it is a prey species for avian and mammalian carnivores, and it has adequate toxicological and exposure data. The masked shrew is very small, is known to have a high food intake rate for its weight, and is potentially exposed to contaminants in surface soil via ingestion of contaminated invertebrates and incidental ingestion of soil. Shrews obtain most of their water requirements from their prey and there is no perennial surface water onsite; therefore, contaminant exposure via drinking water is considered negligible for the shrew and will not be assessed.

Similar to the robin, the shrew was considered representative of several functional groups, including terrestrial mammalian herbivores and terrestrial mammalian omnivores. The shrew is a conservative representative of terrestrial mammalian omnivores and herbivores because chemicals are most often expected to bioaccumulate to a greater extent in invertebrates than in plants. In addition, the shrew is the smallest terrestrial mammal at the site, so its food intake to weight ratio (i.e., exposure) is expected to be greater than any other small mammal.

The shrew is also a conservative representative of nutria and muskrat that are most frequently classified as aquatic mammalian herbivores. Because there is limited or no aquatic vegetation in the vicinity of the Terminal, aquatic mammalian herbivores such as nutria are most likely eating terrestrial vegetation or must swim to offsite areas where aquatic vegetation is present. Given either of these scenarios and the rationale that invertivores are more susceptible to contaminant exposure than herbivores, the shrew is a conservative representative of the nutria and muskrat that may inhabit the site.

Terrestrial Reptilian Carnivores

Garter snakes may inhabit the terrestrial environment at the site. Currently, exposure and toxicity data are inadequate to assess the potential risks for reptiles. Thus, although the garter snake is identified as an assessment species, its potential risks are only considered qualitatively, compared to risks predicted for other assessment species.

5.1.2.3 Summary of Assessment Communities and Species

The above-noted assessment species and the functional groups they represent are presented in Table 5. Of these, only the garter snake will be assessed in a purely qualitative manner, due to the lack of exposure and toxicity data for this species. The exposure pathways to be assessed for each of these receptors is presented in Table 6 and Figure 5.

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5.1.3 ENVIRONMENTAL CONCENTRATIONS

The environmental concentrations (ECs) are concentrations of COIs in each exposure medium that are used to select the COPECs. As such, they are estimates of the environmental concentration to which ecological receptors are exposed over a relevant spatial area defined by their habitat. The ECs will be calculated as follows:

- For plants and soil invertebrates (assessment communities) that are immobile or nearly immobile, the maximum detected concentration of each COI in soil will be used as the EC.

- For terrestrial wildlife (assessment species: robin and shrew) consuming soil, vegetation, or prey, the 90UCL of each COI in soil will be the preferred EC. If fewer than 10 samples are available, the maximum detected concentration will be used as the EC. The data distribution will be tested for normality and lognormality and the 90UCL will be calculated appropriately for the distribution. If the data is neither normally nor lognormally distributed, the 90UCL will be calculated using the Z-statistic.

The ECs and calculation methods used in the ERA will be presented in the Level II ERA – Screening Assessment Report (see Section 6.0).

5.1.4 CONTAMINANTS OF POTENTIAL ECOLOGICAL CONCERN

The COPECs are chosen from the larger group of site-related and medium-specific COIs. The selection of COPECs for a DEQ Level III Baseline ERA is the same process as for calculation of Level II ETCLs. Therefore, COPECs determined during the Level II screening ERA will be applicable to all potential additional ERA evaluations conducted for the site. The screening procedures generally consider the frequency of detection, whether the chemicals are essential nutrients, background or reference chemical concentrations, ecological risk-based screening concentrations (ERBSCs), and bioaccumulation potential. In this manner, contaminants that are not expected to significantly contribute to risk are eliminated from the ERA data set. The frequency of detection and background screening procedures are described in Section 3.0. The COIs identified based on the procedures described in Section 3.0 will be subjected to the ecological risk-based and bioaccumulation screening procedures described in the following sections to select COPECs for the Terminal.

5.1.4.1 Risk-Based Screening

According to DEQ guidance, the risk-based screening steps eliminate COIs that are not detected at the site above ERBSCs. This screening will include comparison of maximum detected concentrations (for immobile species) or the 90% UCL concentrations (for mobile species) of each COI in each direct

exposure medium to DEQ's risk-based Screening Level Values (SLVs; DEQ 2001), as described in Section 5.1.3. For COIs without corresponding SLVs, chemical-specific SLVs from other COIs will be used as surrogate values (based on similarity in chemical structure) where appropriate, or other ERBSCs will be selected from the literature, as available. For surface soil, the only ecological exposure medium at the site, these alternate ERBSCs may include Dutch soil screening values (DMHSPE 2001) and ecological soil screening levels developed by EPA (EPA 2003). The SLVs and other ERBSCs used in this screening step for surface soil will be tabulated in the Level II ERA – Screening Assessment Report.

A COI will be retained as a COPEC in surface soil if it exceeds an SLV or other ERBSC by a factor of more than 5, because no protected species are expected to be exposed to site surface soil. These calculations will be tabulated for surface soil and presented in the Level II ERA – Screening Assessment Report.

5.1.4.2 Additional Screening Procedures

Three additional screening steps will be conducted. First, the bioaccumulation potential of the COIs will be assessed. The COIs in surface soil will be considered to bioaccumulate if they were listed in DEQ's Sediment Assessment Methodology described in Appendix G of the Portland Harbor Sediment Management Plan (DEQ 1999). All COIs listed as having the potential to bioaccumulate will be included in the ERA for further assessment.

Second, the maximum detection limit for each of these COIs will be compared to the chemical-specific SLV or other pertinent ERBSC to verify that the analytical methods were sensitive enough to detect a potential impact (if the detection limit exceeds the SLV, the COI generally is retained as a COPEC).

Finally, following DEQ guidance (DEQ 2001), the chemical-specific ratios of each COI concentration to its corresponding SLV or ERBSC (i.e., the COI risk ratios) will be summed to calculate a medium-specific risk ratio and then the contribution of each COI to the medium-specific risk ratio will be calculated. Those COIs that, according to DEQ guidance, contributed excessively to the medium-specific risk ratio will be retained as COPECs. The site COPECs for surface soil, identified per the above steps, will be presented in the Level II ERA – Screening Assessment Report.

5.1.5 PRELIMINARY ECOLOGICAL EFFECTS ASSESSMENT

The COPECs developed per Section 5.1.4 will be grouped by type (i.e., metals, PAHs, chlorinated hydrocarbons, organochlorine compounds, etc.) and the general mode of action or known toxic effects to wildlife will be discussed qualitatively. This general description of potential ecological

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effects will be used to highlight the types of COPECs that may be more likely to effect particular types of ecological receptors (i.e., plants, terrestrial invertebrates, mammals, birds, or herpetiles). If necessary, additional receptors may be added to the ERA to assess particular ecological effects that may result due to particular COPECs at the Terminal.

5.1.6 CONCEPTUAL ECOLOGICAL EXPOSURE MODEL

The preliminary CEEM presented in Section 1.3.5 above will be modified, as necessary, to accommodate findings of the preliminary problem formulation.

5.1.7 ASSESSMENT ENDPOINTS

Assessment endpoints are written descriptions of the environmental characteristics of concern at a given site (EPA 1998). Generally, they represent ecological aspects that should be assessed in order to assure protection of the environment and allow informed site-specific risk management decisions. Developing assessment endpoints is an integral part of problem formulation because these endpoints link risk assessment results to risk-management actions. Primary considerations for selecting assessment endpoints will include ecological relevance, policy goals, societal/cultural values, and susceptibility to the environmental stressor (i.e., the site contaminant; EPA 1998). The selection of assessment endpoints also depends on:

- the species present at the site and their interaction
- types of contaminated media at the site
- complete ecological exposure pathways
- types of contaminants present.

Generally, the assessment endpoints for the Terminal will be selected to be indicative of toxic effects to receptor populations. Because no terrestrial or semi-aquatic threatened or endangered species have been identified as inhabiting the site, assessment at the individual level will not be required. At least one assessment endpoint will be selected for each identified assessment community and species. For each endpoint, assessment measures will be defined that describe how the endpoint will be evaluated.

5.1.8 LEVEL II SCREENING ASSESSMENT - CONCLUSIONS AND RECOMMENDATIONS

Through the procedures described above, an ecological description of the site and an understanding of whether COPECs at the site pose a risk to ecological receptors will be determined. If

evaluations conducted for the Level II ERA – Screening Assessment indicate that the site is highly unlikely to pose a potential risk to ecological receptors, then no additional ERA evaluations will be conducted and the ERA will be complete. If it is determined that additional ecological assessment is necessary to better assess the potential for ecological risk to receptors due to exposure to COPECs at the Terminal, species potentially at risk and the identified COPECs will become the focus of a Level II ETCL calculation or Level III Baseline ERA, whichever is determined to be most appropriate, as described in the following sections. The results of the Level II COPEC determination and recommendations for further assessment will be presented to DEQ in a Level II ERA – Screening Report will be provided to DEQ, as described in Section 6.0.

5.2 CALCULATION OF LEVEL II ECOLOGICAL TARGET CLEANUP LEVELS

Based on the results of the Level II COPEC determination, a recommendation will be made regarding the need for further Level II ecological assessment, or a Level III ERA. This decision will be made in coordination with DEQ and will be based primarily on the number and types of COPECs and assessment species that are potentially at risk resulting from historical activities at the Terminal. This section describes the methods that, if necessary, will be used for determining Level II ETCLs. The preliminary problem formulation completed during the determination of COPECs will be considered adequate for the ETCL determination. Therefore, the determination of ETCLs will include exposure assessment, toxicity assessment, and risk characterization. However, the ETCLs will be calculated directly without presenting site-specific risks for the assessment species. Therefore, the risk characterization section will be shortened accordingly.

5.2.1 EXPOSURE ASSESSMENT

Generally, exposure assessment involves mathematically expressing the exposure of assessment species (i.e., developing site-specific exposure models for assessment species) and identifying species-specific and chemical-specific exposure parameters. The EPCs from the Level II COPEC determination and exposure parameters are then used within the exposure equations to calculate the estimated daily dose (EDD) of COPECs for each of the assessment species.

5.2.1.1 Exposure and Ecological Target Cleanup Level Equations

The exposure media, assessment species, and significant exposure pathways selected during the problem formulation define the exposure models required to calculate an estimated daily intake of the

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COPECs by the robin. For all assessment species, the estimated daily intake can generally be expressed as:

$$EDD_{total} = \frac{EDI_{soil} + EDI_{food}}{BW} \quad \text{(Equation 5-1)}$$

where:

EDD_{total} = Total estimated daily dose of COPECs for the assessment species [mg/kg body weight (bw) per day]
EDI_{soil} = Estimated daily intake of COPECs from incidental ingestion of soil (mg COPEC per day)
EDI_{food} = Estimated daily intake of COPECs from ingestion of food/prey items (mg COPEC per day)
BW = Body weight of the assessment species (kg).

This equation is modified to be species-specific by mathematically expressing the estimated daily intake of COPECs via food and soil for a particular species. The species-specific equation is for robins and shrews is:

$$EDD_t = \frac{[(BAF \times IR_e)+IR_s] \times EPC_s \times DC_f \times SUF}{BW} \quad \text{(Equation 5-2)}$$

where:

EDD_t = Estimated total daily dose (mg/kg-bw per day)
EPC_s = Exposure point concentration of COPEC in soil (mg/kg)
BAF = Soil-to-earthworm bioaccumulation factor (kg soil/kg worm)
DC_f = Percent of diet comprised of selected food items (unitless)
IR_e = Ingestion rate of earthworms by the assessment species (kg/day)
IR_s = Incidental soil ingestion rate by the assessment species (kg/day)
SUF = Site use factor for the assessment species, comprised of areal and seasonal partitioning of the use of the site by the assessment species (unitless).
BW = Body weight of the assessment species (kg).

Given that the calculation of risk for assessment species is the ratio of the total estimated daily dose of a COPEC to the ERfD calculated as:

$$TQ_{species} = \frac{EDD_t}{ERfD} \quad \text{(Equation 5-3)}$$

where:

$TQ_{species}$ = Toxicity quotient for a particular COPEC, assessment species, and exposure medium (unitless)
EDD_t = The total estimated daily dose of a given COPEC by an assessment species from a particular exposure medium (mg COPEC/kg body weight per day)
ERfD = The ecological reference dose for a given COPEC and assessment species (mg COPEC/kg body weight per day).

Then by setting the TQ to 1 and combining equations 5-2 and 5-3, the ETCL (a.k.a. the EPC at which the TQ=1) for the robin can be calculated as:

$$ETCL_{robin} = \frac{ERfD \times BW}{[IR_s + (BAF \times IR_e)] \times DC_e \times SUF} \quad \text{(Equation 5-4)}$$

This equation is used in the Level II ETCL calculation. The following sections define the required species-specific and chemical-specific exposure parameters.

5.2.1.2 Species-Specific Exposure Parameters

The species-specific parameters required for equation 5-4 include:

- total dietary intake (kg dw/day)
- plant matter intake (kg dw/day)
- animal matter intake (kg dw/day)
- incidental soil ingestion (kg dw/day)
- Dietary composition of selected food items (%)
- body weight (kg)
- home range (acres)
- migration factor (%).

Various sources in the scientific literature will be reviewed for information on these species-specific parameters. The Wildlife Exposure Factors Handbook (EPA 1993) will be the preferred source for these exposure parameters. If particular exposure parameters are not reported in the handbook, other literature will be used to obtain the necessary exposure factors. In general, average values found in or calculated from the literature will be used for each exposure parameter. Any variations from this approach will be noted in a Level II ERA ETCL Determination Report.

5.2.1.3 Chemical-Specific Exposure Parameters

In order to calculate the COPEC concentrations in each medium (including prey items), the following chemical-specific exposure parameters may be required:

- soil-to-biota bioaccumulation factors (BAFs)

- dose-to-tissue biotransfer factors (BTFs).

Bioaccumulation is the adsorption of chemicals into tissue via all exposure routes (e.g., direct absorption, inhalation, or ingestion). The BAF is a measure of the transfer and accumulation of COPECs from a medium (e.g., surface soil) into the tissue of a receptor that resides in the soil or forages on invertebrates or other soil-dependent prey items (excluding plants). For example, an earthworm BAF is the ratio of chemical in worm tissue to that found in the surrounding soil (mg chemical/kg tissue per mg chemical/kg soil = kg soil/kg tissue). Earthworm BAFs for inorganic chemicals and PCBs will consist of median values provided by Sample et al. (1998). The BAFs for other organic chemicals will be estimated from the lipid content of soil invertebrates (2 percent) and an average site-specific surface soil organic carbon content, using the following predictive BAF model (Menzie et al. 1992):

BAF = Earthworm Lipid Content / (0.66 x Fraction Organic Carbon in Soil) Equation 5-5

BTFs are ratios of the concentrations of chemicals in food items to the concentrations in receptor tissues. These will be obtained, as necessary, from various species-specific and chemical-specific peer-reviewed literature.

5.2.2 TOXICITY ASSESSMENT

The toxicity data to be used in the Level II ETCL calculation include toxicity benchmark doses (TBDs) selected from appropriate references for the COPECs. The TBDs may be used directly as ecological reference doses (ERfDs) or are converted to ERfDs, as appropriate using uncertainty factors that are defined by DEQ (2001). The TBDs selected for this ERA, and the process to convert TBDs to ERfDs, will be described in the ERA report.

The principal data sources for TBDs will be:

- EPA's Ecological Soil Screening Level reports (EPA 2003)
- Summary reviews of available toxicity data (Sample et al. 1996)
- Peer-reviewed literature sources (journal articles and scientific publications)
- EPA's Integrated Risk Information System (IRIS)
- Chemical-specific Toxicological Profiles produced by Agency for Toxic Substances and Disease Registry (ATSDR)
- The National Institute of Occupational Safety and Health [NIOSH] Registry of Toxic Effects of Chemical substances (RTECS).

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Oral dose studies will be the only sources used for the selection of TBDs. Some of the toxicity studies from these sources provide toxicity information in the form of a food or drinking water concentration (i.e., mg chemical/kg food or mg chemical/L water). In this case, the food or drinking water concentration will be transformed to a dose (mg chemical/kg body weight per day). This conversion requires knowledge of the amount of food eaten per day by the test species and its body weight. Preferably, this information was obtained from the text in which the toxicity information was found. However, such information was not always provided. In this event, daily food ingestion rates and body weights for the test species will be obtained from other sources (e.g., EPA 1988, 1993, or Dunning 1993) and used to convert the chemical content of a food item into a TBD. For this conversion, it will be assumed that the effective dose of a chemical is 100 percent of the ingested dose (i.e., 100% bioavailability was assumed). When possible, mean ingestion rate or body weight values will be used or calculated, but discrete values will be used in the absence of a mean or the data to calculate one. An attempt also will be made to only use ingestion rate and body weight parameters for the same species as used in the pertinent toxicity study, but this is not always possible and parameters for similar species will be substituted as required.

When possible, a chronic NOAEL will be selected as the TBD for protected species and a LOAEL will be selected as the TBD for other species. In the absence of a LOAEL or NOAEL, a no-observed-effect-level (NOEL), lowest-observed-effect-level (LOEL), or other toxicity endpoint will be selected an converted to NOAELs or LOAELs using uncertainty factors. The actual effects threshold is likely to fall between the NOAEL or LOAEL, but these two values were substituted as the threshold doses for this ERA because most often it is not possible to predict the actual effects threshold from the available literature.

Data for chronic toxicity will be chosen when available; however, subchronic and/or acute data will be used if chronic data are unavailable, and converted to chronic data using uncertainty factors. If no TBD can be obtained or calculated for a particular chemical and/or indicator species and a TBD for a surrogate chemical cannot be applied. that contaminant will not be evaluated quantitatively for that species.

For many chemicals there will be several toxicity studies identified in various sources. Most often, the different studies investigated provided data regarding different toxicological endpoints. The process of selecting an appropriate TBD required an assessment of the appropriateness of the various endpoints. In general, data indicative of overt health effects to individual organisms that resulted in population level effects will be preferred. These may include reproductive effects, survival, or mortality. Other less adverse effects endpoints, such as changes in organ weight or subtle physiological effects, will

be used only in the absence of the preferred endpoints. Preference for particular endpoints will be established as follows:

- **Primary Significance** – Reproductive effects such as decreased fertility, teratogenicity, and developmental/fetal mortality, which could impact the species population; survival, which could impact population numbers in future generations; and severe histopathological effects such as necrosis of or serious damage to organs such as the liver, kidneys, brain/central nervous system, and lungs, which could impact primary body functions and result in mortality.

- **Secondary Significance** – Alterations in function of organs and/or behavior that could result in decreased survival.

- **Tertiary Significance** – Alterations such as decreased liver size, increased chemical concentration in blood, or increased body weight that are not readily associated with decreased reproduction, reduced survival, or increased mortality.

Carcinogenic endpoints are not considered appropriate for the selection of TBDs. This is in accordance with the current understanding that cancer is not generally considered to be a threat for free-ranging wildlife species because they are relatively short-lived and cancers do not have time to develop.

Chronic LOAELs will be selected as the TBDs for non-protected species. The actual effects threshold is likely to fall between the NOAEL or LOAEL, but these two values will be substituted as the threshold doses for this ERA because most often it is not possible to predict the actual effects threshold from the available literature.

Because toxicity data are unavailable for many species, a body weight adjustment (Sample et al., 1996; Sample and Arenal, 1999) will be made as necessary to extrapolate an ERfD for an assessment species when the ERfD is available for another species in the same taxonomic class. This body weight extrapolation will occur according to the appropriate body weight scaling equations provided by the EPA (1993)

$$ERfD_r = TBD_t \times (BW_t / BW_r)^P \qquad \text{(Equation 5-6)}$$

where:

$ERfD_r$ = Ecological reference dose for the robin (mg/kg-bw per day)

TBD_t = Toxicity Benchmark Dose for the test species (mg/kg-bw per day)

BW_t = Body weight of the test species (kg)

BW_r = Body weight of the robin (kg)

P = Appropriate exponent for the assessment species (unitless; EPA 1993)

5.2.3 ECOLOGICAL TARGET CLEANUP LEVELS

Site-specific ETCLs will be calculated using the equations and input parameters described above.

5.2.4 HOT SPOTS

The Oregon cleanup rules require the remedial investigation to evaluate hot spots of contamination for media other than water [OAR 340-122-080(7)]. The Oregon cleanup rules dictate that a hot spot in water be defined during the feasibility study and, therefore, will not be addressed in the ERA. The acceptable hot spot concentration for exposure to individual ecological receptors or population of receptors to each individual substance is 10 times the acceptable risk level, or where COPECs are reasonably likely to migrate such that a hot spot would be created in another medium, or when COPECs are not reliably able to be contained. Sample locations that have COPEC concentrations that exceed these criteria will be described as hot spots.

5.2.5 RISK CHARACTERIZATION

Typically the risk characterization section is used to present and discuss uncertainties associated with the predicted ecological risks. However, for the Level II ERA, no toxicity quotients or indices will be calculated. Therefore, the risk characterization will summarize the locations where COPEC concentrations exceed ETCLs and hot spot locations in surface soil. In addition, the uncertainties associated with the Level II ERA process will be presented and discussed with regard to their potential to result in over or under estimation of the actual ecological risks.

5.2.6 LEVEL II ERA – ETCL DETERMINATION - CONCLUSIONS AND RECOMMENDATIONS

If required, the procedures and results of the Level II ERA – ETCL determination will be provided in a report to be submitted to DEQ, as described in Section 6.0. It is anticipated that the ETCLs will be used to determine the need for site remediation for protection of ecological receptors and where remedial actions may be necessary to reduce risk to acceptable levels.

5.3 LEVEL III ECOLOGICAL RISK ASSESSMENT

In accordance with DEQ (2001) guidance, the Level III ERA will include problem formulation, exposure assessment, toxicity assessment, and risk characterization. The problem formulation completed during the Level II COPEC screening will incorporated into the Level III ERA with updates, as necessary given any additional information acquired during the Level III assessment. The following sections

describe the procedures to be used for the exposure assessment, toxicity assessment, and risk characterization.

5.3.1 LEVEL III EXPOSURE ASSESSMENT

The exposure assessment includes mathematically expressing the methods for quantifying exposure of assessment species (i.e., site-specific exposure models), definition of the local populations of assessment communities and species, determination of exposure areas and/or habitat patches for each assessment species, definition of the relative habitat quality for each habitat patch, calculation of exposure point concentrations (EPCs) for exposure areas and/or habitat patches, and presentation of the exposure parameters. The EPCs and exposure parameters are then used within the exposure models to calculate the estimated daily dose (EDD) of COPECs for each of the indicator species.

5.3.1.1 Exposure Dose Equations

The exposure media, indicator species, and significant exposure pathways selected during the problem formulation will be used to create the exposure models (i.e., equations) to calculate an estimated daily intake of the COPECs for each indicator species. Exposure models generally are not developed for indicator communities because potential risks to communities are assessed by direct comparison of EPCs in each medium to ERBSCs. For assessment species, an ingestion rate and body weight are included in the equation, resulting in calculation of an exposure dose, as follows:

$$D_j = \sum_{k=1}^{q}\sum_{i=1}^{d}\left[\left(\frac{IR_i \times C_{ijk}}{BW}\right)\times\left(\frac{Ha_k Hq_k}{\sum_{k=1}^{q}(Ha_k Hq_k)}\right)\right]\times TUF \qquad \text{Equation 6-7}$$

where:

D_j = Dose for a given assessment species for the jth contaminant (mg/kg body weight [bw] per day)

q = Total number of kth habitat patches within local population boundary (unitless)

d = Total number of ith media (unitless)

IR_i = Intake rate for the ith medium (kg/d or L/d)

C_{ijk} = Concentration of jth contaminant in i^{th} medium in k^{th} habitat patch (mg COPEC/kg)

BW = Body weight of the assessment species (kg)

Ha_k = Area of kth habitat patch (square meters)

Hq_k = Relative habitat quality of kth habitat patch for a given assessment species (unitless)

TUF = Temporal utilization factor (unitless).

Ingestion rates and body weights for each assessment species (i.e., species-specific exposure parameters); COPEC concentrations in each media (including prey items); local population boundaries; habitat patch size and quality; and species specific temporal use factors must be determined to support these calculations. These procedures are defined in the following sections.

5.3.1.2 Exposure Parameters

Exposure parameters are species-specific and chemical-specific measures that determine the extent of exposure for the assessment communities and species. These parameters will be the same as described above for the Level II ETCL calculation.

5.3.1.3 Exposure Point Concentrations

The EPCs for COPECs in surface soil will be the 90% UCL, and will be used to calculate exposure of the assessment species to COPECs. If particular exposure areas, habitat patches, or groups of habitat patches (for a given species) include a subset of all samples that were used to calculate EPCs for the Level II COPEC screening assessment, then the appropriate subset of samples will be used to re-calculate a 90% UCL for the particular exposure area or habitat patch(es). The same methodology as used in the Level II COPEC screening will be employed to calculate these more specific EPCs.

5.3.1.4 Local Receptor Population Boundaries

Establishing local population boundaries for assessment communities and species, limits the number of individuals considered in the ERA to those likely to be exposed to site-related contamination. For sessile assessment communities (i.e., plants and terrestrial invertebrates), the local population will be all the individuals within habitat patches (determined as described in the next section). If habitat patches for these sessile receptors cannot be clearly defined, then the local population will be all individuals within areas where the receptors could be exposed to site-related COPECs.

For assessment species, the local population will include all individuals within five home-range diameters (D_{HR}) from the outer boundary of the area of site-related contamination. This will be approximated using the following equation from DEQ (2001):

$$A = \frac{100 \times HR}{\pi} \qquad \text{Equation 5-8}$$

where:

A = Areal extent of the study population (m^2)
HR = Home range area (m^2)
π = Pi (3.14).

Actual residency of transient or migratory species within the local population boundaries may be adjusted using the temporal utilization factor as described in Section 5.3.1.6 below.

5.3.1.5 Determination of Habitat Patches

Following determination of the areal extent of the study populations, the number, size, and quality of habitat patches will be determined within the local population boundaries. The different habitat types present at the Terminal will be mapped and described. The expected use of these habitats by each assessment community and species will be described with regard to the extent of each habitat (or habitats) likely to be inhabited. These areas will become the habitat patches for each receptor. Then the spatial extent of each species' habitat patch(es) will be estimated. The relative quality of the habitat patches used by each assessment community and species will also be rated as unsuitable (0), poor (0.25), average (0.5), good (0.75), or excellent (1.0) based on site surveys, professional judgment, and species requirements. The number, area, and quality of habitat patches are all factors within equation 5-7 above.

5.3.1.6 Temporal Use Factors

Some of the assessment species are expected to be transient or migratory. These species travel from place to place and are not exposed throughout the year to site-related contamination at the Terminal. For these species, a temporal use factor (TUF) will be applied to the exposure dose calculation to quantify the number of days per year the species is expected to be exposed to contaminated media at the site. Non-hibernating, non-migratory species will have a TUF of 1. Other species will have a TUF between 0 and 1.

5.3.2 TOXICITY ASSESSMENT

The ecological toxicity assessment will provide estimates of the ERfD of each COPEC. This is the concentration, above which significant effects would be expected for the assessment species. Toxicity benchmark doses (TBDs) will be selected from the literature and converted to species-specific doses (ERfDs) using uncertainty factors. The sources for the TBDs may include:

- Oak Ridge National Laboratory (Sample et. al., 1996)
- Agency for Toxic Substances and Disease Registry (ATSDR) toxicity profiles
- USFWS synoptic reviews of hazards to fish, wildlife, and invertebrates

- EPA's IRIS database
- Registry of Toxic Effects of Chemical Substances (RTECS), a National Institute of Occupational Safety and Health on-line database
- Health and Safety Databank (HSDB), a National Library of Medicine on-line database
- Oil and Hazardous Materials/Technical Assistance Data System (OHM/TADS), an EPA on-line database
- The Michigan Department of Natural Resources' Chemical Evaluation Search and Retrieval System (CESARS)
- Other peer-reviewed technical publications.

The toxicity endpoint for assessment species, will be the dose that is lethal to 50% of the population (LD_{50}). When such values are not available, different effects levels such as no-observed-adverse-effect-levels (NOAELs) or lowest-observed-adverse-effect levels (LOAELs) will be used, as available, and converted to preferred toxicity benchmark values using uncertainty factors (UFs). When more than one UF is necessary for a particular TBD, UFs will be multiplied together or applied in sequence. The UFs for converting effects levels and their application (DEQ 2001) include:

- NOAEL to LOAEL: UF = 5
- Subchronic to Chronic: UF = 10
- Acute to Chronic: UF = 33
- Chronic NOAEL to LD_{50}= 100.

Data for species of the same family, order, genus, or species will be preferentially selected when available. If this is not possible, toxicity data for species within the same taxonomic class will be used and extrapolated to the assessment communities and species using uncertainty factors. No extrapolations between taxonomic classes (e.g., from birds to mammals) will be performed. The uncertainty factors will be applied to calculate TBDs that are considered equivalent to chronic LC_{50} or LD_{50} values. Taxonomic extrapolations will be performed as follows:

- Different taxonomic family: UF = 2
- Different taxonomic genus: UF = 2.

The concentrations and doses of COPECs that result following application of the uncertainty factors will be the ERfCs and ERfDs used in the risk calculations.

Within certain classes of chemicals (e.g., butylbenzenes, PAHs, and pesticides), toxicity values for one COPEC (i.e., surrogate chemicals) may be substituted for another COPEC when a chemical-specific toxicity value is not available for the latter COPEC. All surrogate chemical substitutions will be noted within the Level III Baseline ERA Report, as described in Section 6.0.

5.3.3 RISK CHARACTERIZATION

Risk characterization involves calculation, presentation, and description of the potential risks for the assessment communities and species. The risk characterization also includes discussion of the uncertainties associated with the predicted risks and of the potential for the predicted risks to represent significant population level effects at the site.

5.3.3.1 Risk Estimation

The acceptable risk level (ARL) for populations of ecological receptors is a 10 percent chance, or less, that 20 percent or more of the total local population would have an exposure greater than the ERfC or ERfD for each COPEC. Risk estimation will involve the following:

- Estimating the local population abundance of the assessment communities and species
- Estimating the probability that an individual of an endpoint species will experience an exposure in excess of the ERfC or ERfD
- Using a cumulative binomial distribution function to estimate the number of individuals likely to have a greater than 10 percent chance of being exposed at a concentration greater than the ERfC for assessment communities or the ERfD for assessment species
- Determining whether the number of exposed individuals is greater than 20 percent of the local population.

If fewer than 20 percent of the individuals within the local population of each assessment community and species are predicted to be exposed, or if there is less than a 10 percent chance of exposure above the ERfC or ERfD, then acceptable risks exist at the site.

5.3.3.2 Local Population Abundance

The local population includes all individuals within the local population boundary and will be determined using population density estimates. These estimates will be obtained from available literature or local biologists. For assessment communities, the density of expected dominant species within each community will be used. If reliable population density estimates cannot be obtained from these sources,

onsite surveys may be conducted for the assessment communities. For assessment species, if site-specific density estimates are not available, then scaling relationships will be used to estimate population density based on the species body mass (Damuth 1993; Juanes 1986).

5.3.3.3 Probability of Exposure Exceeding Toxicity Reference Values

The probability of exposure exceeding the ERfC or ERfD will be estimated using the following equation:

$$p = \Phi_Z\left(\frac{x_{EXP} - \ln(EBV)}{s_{EXP}}\right) \qquad \text{Equation 5-9}$$

where:

P = Probability of exposure (unitless)
Φ_Z = Cumulative distribution function of a standard normal random variable
x_{exp} = Mean of natural logarithms of exposure (mg/kg, mg/L, or mg/kg per day)
EBV= Point value of the calculated exposure (mg/kg, mg/L, or mg/kg per day)
s_{exp} = Standard deviation of natural logarithms of exposure (unitless).

5.3.3.4 Acceptability of Risk

The probability that 20 percent of the individuals in a population experience an exposure greater than a toxicity reference value will be determined using the following binomial probability function:

$$b(y,n,p) = \binom{n}{y} p^y (1-p)^{n-y} \qquad \text{Equation 5-10}$$

where:

b = Probability of 20 percent of the individuals in a population experiencing an exposure greater than the toxicity reference value
y = 20 percent of the population
n = The number of individuals in the local population
p = Probability of an individual experiencing an exposure greater than the toxicity reference value.

As noted above, this probability will be used to determine whether the exposure of assessment communities and species meets the ARL.

5.3.4 UNCERTAINTY ANALYSIS

An uncertainty analysis will be conducted for the baseline ERA to examine the sources and magnitude(s) of potential uncertainty associated with the risk estimates. Sources of uncertainty include the data available for the site investigations, receptor population and exposure pathway identification, exposure parameter selection, and toxicity criteria used to characterize risk. Each of these potential sources of uncertainty will be evaluated qualitatively to determine the likely degree of uncertainty associated with the risk estimates, and whether the uncertainty has likely led to over- or under-estimates of risk.

5.3.5 PREDICTED ECOLOGICAL RISKS

The affects of the uncertainties on predicted ecological risks will be described to determine whether the risk estimates need adjustment given the uncertainties. In this manner, a better understanding is provided regarding the likelihood of the predicted effects being realized in local receptor populations.

5.3.6 LEVEL III ECOLOGICAL TARGET CLEANUP LEVELS

Media-specific ecological target cleanup levels (ETCLs) will be calculated for each of the final COPECs that contribute a majority of the predicted ecological risks. Finally, to the extent possible given the sampling design, the areal extent of chemical concentrations that exceed ETCLs will be plotted to aid in the determination of any remedial action at the site.

5.3.7 LEVEL III CONCLUSIONS AND RECOMMENDATIONS

The primary goals of the baseline ERA are to document whether a potential exists for significant ecological risk at the site and to determine ETCLs. The risks will be summarized and discussed in the context of the assessment endpoints identified during completion of the problem formulation in a Level III Baseline ERA report, as described in Section 6.0.

6.0 RISK ASSESSMENT DELIVERABLES

The deliverables to be submitted to DEQ for review and comment for the human health and ecological risk assessments are described in the following sections. It is anticipated that the risk assessment reporting will be completed in 2005.

6.1 HUMAN HEALTH BASELINE RISK ASSESSMENT (HHRA) REPORT

The baseline HHRA report will include identification of COPCs and the results of EPC calculation for human receptors, as well as provide the results of the exposure assessment, dose-response assessment, risk characterization, and uncertainty analysis. The results of the baseline HHRA will be used to define acceptable risk levels for human receptors for development of remedial alternative for the Terminal, as part of the feasibility study.

6.2 LEVEL II ECOLOGICAL RISK ASSESSMENT – SCREENING ASSESSMENT REPORT

The Level II ERA – Screening Assessment Report will include identification of COPECs and exposure pathways for ecological receptors, an ecological description of the site, as well as the uncertainties associated with each identified risk and the assumptions made in the assessment. Also, if data gaps were identified during the Level II – Screening Assessment, recommendations may be made regarding collection of additional data. This information will be used to make recommendations as to whether COPECs at the site pose a risk to ecological receptors and whether additional ecological assessment is required. Recommendations will include either of the following: 1) no further evaluation, 2) calculation of ETCLs, or 3) performance of a baseline ERA.

6.3 LEVEL II ECOLOGICAL RISK ASSESSMENT – TARGET CLEANUP LEVELS DETERMINATION (IF REQUIRED)

If required, the Level II ERA – Target Cleanup Levels Determination Report will provide the ETCLs calculated using the methodology described in Section 5.2. It is anticipated that the ETCLs will be used during the development of remedial alternatives for the feasibility study to determine the need for site remediation for protection of ecological receptors and where remedial actions may be necessary to reduce risk to ecological receptors to acceptable levels.

6.4 LEVEL III BASELINE ECOLOGICAL RISK ASSESSMENT (IF REQUIRED)

The Level III Baseline ERA report will provide the results of the Level III ERA baseline exposure assessment, toxicity assessment, and risk characterization, as well as EPC values, assumptions used in the evaluations, and the uncertainties analysis. The report will also provide a description of which, if any, COPECs are likely to require remediation for the protection of ecological receptors and recommend areas where remediation would prove most effective. Any such recommendations will also take into account other remedial actions that may be identified within the overall Phase III RI/FS process. Additionally, any data gaps that are identified during the Level III ERA will be reported and recommendations will be made regarding the need to address the data gaps and whether further ecological assessment is required.

7.0 USE OF THIS REPORT

This risk assessment work plan has been prepared by Landau Associates for the exclusive use of Time Oil Co. for specific application to the Northwest Terminal. Services for this project were conducted in accordance with the Environmental Services Contract between Time Oil Co. and Landau Associates, Inc. Landau Associates has performed our services in accordance with generally accepted engineering and consulting standards for environmental work in effect at the time and locality services were performed. The reuse of information, conclusions, and recommendations provided herein by Time Oil Co. or others in connection with any site other than the Northwest Terminal without Landau Associates written permission shall be at the sole risk of Time Oil Co. and without liability to Landau Associates.

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Subject: FW: Preliminary comments
Attach: Draft Risk Assessmt WP Rev.doc

-----Original Message-----
From: Tischuk, Mike (Pittsburgh) NA
Sent: Monday, June 13, 2005 1:02 PM
To: Mark Chandler
Cc: pdost@schwabe.com; hopp@wildmanharrold.com; Blundon, Jill (Pittsburgh) NA
Subject: Preliminary comments

Mark, attached are Beazer's preliminary comments on the Risk Assessment workplan. We have serious concerns regarding the way this is taking shape. Please give me a call to discuss.
Regards
Mike Tischuk

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LIST OF ACRONYMS

ADD	Average Daily Dose
ARL	Acceptable Risk Level
AST	Aboveground Storage Tank
ATSDR	Agency for Toxic Substance and Disease Registry
AWQC	Ambient Water Quality Criteria
BAF	Bioaccumulation Factor
BCF	Bioconcentration Factor
BGS	Below Ground Surface
BSAF	Sediment to Biota Accumulation Factor
BTF	Biotransfer Factors
CEEM	Conceptual Ecological Exposure Model
CEM	Conceptual Exposure Model
CESARS	Chemical Evaluation Search and Retrieval System
COI	Contaminant of Interest
COPC	Contaminant of Potential Concern
COPEC	Contaminant of Potential Ecological Concern
cPAH	Carcinogenic Polycyclic Aromatic Hydrocarbon
CRBG	Columbia River Basalt Group
CSM	Conceptual Site Model
DEQ	Oregon Department of Environmental Quality
D_{HR}	Home Range Diameter
EDD	Estimated Daily Dose
EPA	U.S. Environmental Protection Agency
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
ERBSC	Ecological Risk-Based Screening Concentration
ERfC	Ecological Reference Concentration
ERfD	Ecological Reference Dose
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
ETCL	Ecological Target Cleanup Level
HHRA	Human Health Risk Assessment

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HSDB	Health and Safety Databank
IRIS	Integrated Risk Information System
ISCO	*In Situ* Chemical Oxidation
K_d	Sediment Partition Coefficient
LADD	Lifetime Average Daily Dose
LC_{50}	Lethal Concentration for 50 Percent of the Population
LD_{50}	Lethal Dose for 50 Percent of the Population
LOAEL	Lowest Observed Adverse Effect Level
MSL	Mean Sea Level
MTCA	Model Toxics Control Act
NMS	National Marine Fisheries Service
NOAEL	No Observed Adverse Effect Level
OAR	Oregon Administrative Rule
OHM/TADS	Oil and Hazardous Materials/Technical Assistance Data System
ONHIC	Oregon National Heritage Information Center
PCB	Polychlorinated Biphenyl
PCP	Pentachlorophenol
PRG	Preliminary Remediation Goal
RBC	Risk-Based Concentration
RI	Remedial Investigation
RTECS	Registry of Toxic Effects of Chemical Substances
SLV	Screening Level Value
TBC	Toxicity Benchmark Concentration
TBD	Toxicity Benchmark Dose
TUF	Temporal Utilization Factor
UCL	Upper Confidence Limit
UF	Uncertainty Factor
USFWS	U.S. Fish and Wildlife Service
WWTS	Wastewater Treatment System

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1.0 INTRODUCTION

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It needs to be clear throughout this document that there is minimal/no exposure under current site conditions…..the scenarios to be evaluated are future, potential hypothetical scenarios if the property would be developed at some future time…

This document presents a work plan for a human health and ecological risk assessment for the Time Oil Co. (Time Oil) Northwest Terminal (Terminal or site) in Portland, Oregon. This work plan has been prepared to present the methods that will be used in evaluating site conditions relative to the potential risk posed to human and ecological receptors from environmentally impacted media in the uplands portion of the site. The risk assessment will be based on knowledge of the Terminal obtained through previous environmental investigations, with emphasis placed on the information presented in the draft *Phase III Remedial Investigation Report* (Phase III RI, Landau Associates 2004) and subsequent investigations to be included in the upcoming final Phase III RI report. The risk calculation methods that will be used are prescribed by Oregon Department of Environmental Quality (DEQ) guidance documents (DEQ 2000, 2001).

This work plan also presents a conceptual site model (CSM) for the Terminal that identifies sources of contamination at the site, potential contaminant migration and transport pathways, and potential receptor populations and exposure pathways. The CSM was developed based on information obtained during previous site investigation activities at the Terminal (Landau Associates 1993, 1997, 2001, 2004) and information presented in the site summary for the CSM report for Portland Harbor (Integral Consulting, et. al. 2004).

This work plan is organized into four sections and one appendix as follows:

- Section 1.0 presents an overview of the planned risk assessment for the Terminal, including a description of the Terminal, the local geology and hydrogeology, and the CSM.
- Section 2.0 describes the environmental investigations performed to date, identifies the data that will be used in conducting the human health and ecological risk assessments, and describes the status of data gaps.
- Section 3.0 describes how the data will be screened to identify contaminants that will be evaluated in the risk assessment process.
- Section 4.0 describes the methods that will be used in conducting the human health risk assessment, and presents the mathematical models and input parameters that will be used to evaluate site risk. This section also discusses how the uncertainty associated with the risk evaluation will be addressed and how risk-based concentrations will be developed.
- Section 5.0 describes the methods that will be used in conducting the ecological risk assessment, and presents the mathematical models and input parameters that will be used to

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evaluate site risk. This section also discusses how the uncertainty associated with the risk evaluation will be addressed and how ecologically protective risk-based concentrations will be developed.

- Appendix A includes the completed Level I Ecological Scoping Evaluation for the site, which is summarized in Section 5.0.

1.1 TERMINAL DESCRIPTION

Time Oil's Northwest Terminal is described in detail in the draft Phase III RI report (Landau Associates 2004). A brief overview is included here for context.

The Terminal is a former bulk petroleum storage and transfer facility currently owned by Time Oil. Time Oil ceased operations at the Terminal on October 31, 2001. From 1943 to 2001, the Terminal was operated by Time Oil as the Northwest Terminal petroleum products facility. Since operations began, the Terminal was used for the receipt, storage, and distribution of petroleum and petroleum-related products. Historically, Time Oil also leased tank space to Crosby & Overton for storage of waste oils, Koppers Company, Inc. (n/k/a Beazer East, Inc.) entered into an agreements with Time Oil which provided that Time Oil would formulate penta-containing wood treating products at its Portland, Oregon plant.

Deleted: , and the Koppers Company leased tanks and property at the Terminal for the formulation and blending of pentachlorophenol (PCP)-containing wood treatment products.¶

The site is located in Township 2 North, Range 1 West, Sections 34 and 35, in the industrialized Rivergate area of north Portland, Oregon (Figure 1). The Terminal is bordered to the east and south by heavy industrial complexes, to the north by heavy industrial property and Port of Portland undeveloped property, and to the west by the Willamette River. The Terminal is approximately 52 acres in size and is generally flat with an average land surface elevation of about 28 ft above mean sea level (MSL). The Terminal is enclosed by a terminal-wide chain link fence and access is through the main gate at the termination of Time Oil Road. Within the Terminal, there are several features that are distinguished by their historical uses, as shown on Figure 2.

1.2 GEOLOGY AND HYDROGEOLOGY

The Terminal is located on sand fill within the floodplain of the Willamette River. Prior to development of waterfront facilities, this region was characterized by alluvial river deposits consisting of sand and silt deposited by a series of braided channels, lowlands, and marshes. Specifically at the site, historical aerial photographs indicate that the area consisted of river floodplain and overbank deposits with no apparent historical river channels present. The Willamette River channel has historically been dredged to facilitate transport and moorage of shipping vessels for various industries along the riverfront.

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It is likely that shallow soil at the Terminal consists partly of historically dredged fill material that was placed in the upland areas. Geologic units at the Terminal, inferred from regional geologic information, consist of the undifferentiated Columbia River Basalt Group (CRBG), Sandy River Mudstone, the Troutdale Formation, alluvium, and imported fill, in order of decreasing age and depth.

Four principal near-surface hydrogeologic units have been identified at the Terminal. In descending order from ground surface, these units include: 1) an upper water-bearing zone, comprised predominantly of shallow fill (10- to 20-ft thick, with less than 1- to 15-ft saturated thickness); 2) a silt confining unit (1- to 30-ft thick); 3) a lower water-bearing zone, comprised predominantly of native alluvium consisting of silty sand and sand interlayers (1- to 40-ft thick); and 4) a deep sand unit (greater than 40-ft thick). Depending on the continuity of the confining unit, the hydrogeologic units can act as distinct aquifer units with unconfined conditions in the upper zone and confined to semiconfined characteristics in the lower zone, or act as a single unconfined aquifer in the area beyond the extent of the confining unit to the west, toward the Willamette River. The hydrogeologic units are described in detail in the draft Phase III RI report.

1.3 CONCEPTUAL SITE MODEL

A complete pathway from the source of chemicals to human or ecological receptors is necessary for potential risk to be realized. Required elements for a complete exposure pathway include:

- A source of potentially toxic chemicals (i.e., primary sources, such as contents of tanks, or a secondary source, such as contaminated soil)
- A mechanism of chemical release to the environment (i.e., spillage to the ground)
- A mechanism of retention in, or transport to, an exposure medium (i.e., adsorption to soil, or leaching from soil to shallow subsurface groundwater)
- A point of contact between receptor and exposure medium (i.e., a person with uncovered skin working in the presence of contaminated soil or groundwater)
- An intake route for the receptor (i.e., a person handling contaminated soil with bare hands).

A CSM is a working hypothesis of how site-related contaminants might migrate through the environment to potential exposure media. It describes what is known about sources and the receiving environment, and is the basis for identifying the processes by which receptors may come to be exposed to contaminants in conceptual exposure models (CEMs) for human and ecological receptors.

The CEMs presented in this section describe contaminant sources, potential release mechanisms, transport pathways based on information obtained during previous environmental investigations at the

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Terminal, secondary source and exposure media, and potential exposure pathways to human and ecological receptors.

1.3.1 CONTAMINANT SOURCES AND POTENTIAL RELEASE MECHANISMS

This section identifies confirmed and potential sources of environmental impacts at the Terminal. These sources have been described in detail in previous documents, and are summarized here for reference. The locations of confirmed and potential source areas are shown on Figure 2. A schematic of the CSM for the Terminal is provided on Figure 3. Source areas that have been remediated, eg PCP mixing area, need to be shown as such on this figure. Also, this figure clearly suggests that the storm drain is a complete pathway…… revise.The CEMs for human and ecological risk are provided on Figures 4 and 5, respectively.

Twenty-one aboveground storage tanks (ASTs) are located in the Main Terminal tank farm area. These ASTs historically provided storage for various petroleum products. All of the Main Terminal tank farm area tanks are currently empty, except for tank 16804, which stores groundwater recovered by the interim action recovery wells prior to treatment at the onsite wastewater treatment system. Product lines in this area have been flushed and cleaned. Based on data presented in the draft Phase III RI report, historical handling and storage of petroleum products in the Main Terminal tank farm area appear to have resulted in chemical releases to surface and/or subsurface soil. The Terminal historically received and distributed petroleum products via rail, truck, and marine vessel. Loading racks and docks are no longer in use, and all associated aboveground and underground distribution pipes have been flushed and cleaned. Historical use of onsite product receiving and distribution facilities onsite could have resulted in chemical releases to surface soil and/or subsurface soil. Two ASTs formerly used for storage of aviation gasoline and one AST formerly used for butane storage are located southeast of the Terminal office. Historical use of these ASTs could have resulted in petroleum releases to surface soil.

The Koppers Company used a portion of the site, identified as the former PCP mixing area and warehouse, for blending and storing specialty wood treating products containing PCP from 1967 to 1984. Historical activities in this area resulted in chemical releases to surface soil. Known soil contamination in this area at depths above the water table, approximately 13 ft below ground surface (BGS), was excavated for offsite treatment and disposal during an interim removal action (Landau Associates 2003). An interim action, using the *in situ* chemical oxidation (ISCO) technology, is currently ongoing to address environmental impacts from this operation to shallow groundwater and soil within the zone of groundwater fluctuation. In addition, shallow groundwater impacted by PCP entering the east-west trending storm drain is being captured by a storm drain intercept system installed in 2000, and a

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horizontal recovery well is being operated under seasonal high groundwater conditions. In the lower zone, since 2000, a vertical recovery well captures downgradient migration of PCP-impacted groundwater. Captured groundwater is treated at the onsite wastewater treatment system and discharged into the POTW under a permit with the City of Portland.

Soil excavated from the former PCP mixing area in 1989 and from the East Property during interim removal actions in 1996 and 1997 (see below) was temporarily stockpiled in an area south of the former PCP mixing area. Stockpiled soil was placed on top of a plastic liner to limit contact with the existing ground surface and was covered with a plastic liner to limit stormwater runoff. The stockpile and any residual impacted soil below the stockpile was removed in 2002 as part of the soil removal action described above (Landau Associates 2003). Following soil removal, soil within the footprint of the former stockpile was tested and found to be unimpacted.

The former Crosby & Overton tank area historically contained two ASTs used for waste oil storage. Based on data in the draft Phase III RI report, storage and handling of chemicals in this area, including petroleum hydrocarbons, carcinogenic polycyclic aromatic hydrocarbons (cPAH), and polychlorinated biphenyls (PCBs), appear to have resulted in chemical releases to surface soil. ASTs in this area have been removed and all associated piping has been flushed and cleaned. Known soil contamination in this area was addressed by interim removal actions in 1987, 1989 (Landau Associates 2001), and 2002 (Landau Associates 2003). Groundwater was not adversely impacted by operations in this area.

Ten ASTs are located in the Bell Terminal tank farm area. These ASTs historically provided storage for various petroleum products and are currently empty. Product lines in this area have been flushed and cleaned. Based on data presented in the draft Phase III RI report, historical handling and storage of petroleum products in the Bell Terminal tank farm area appear to have resulted in chemical releases to surface and/or subsurface soil; however, no past releases in the Bell Terminal tank farm area have been documented. The groundwater data collected from the Bell Terminal and from the eastern portion of the adjacent property to the west, currently owned by Schnitzer, suggest the presence of at least two commingled petroleum hydrocarbon plumes within this area: 1) one originating in the central portion of the Bell Terminal tank farm area near the east-west trending pipeline, and 2) one originating along the western property boundary outside the walls of the tank farm where activities not associated with the Bell Terminal were conducted by others between the 1960s and 2000, as documented in historical aerial photographs. Another possible contaminant source is on the eastern portion of the adjacent property where several diesel ASTs were historically located. Additional data is needed on the

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adjacent property to further characterize the nature and extent of contamination from activities along the western property boundary of the Bell Terminal or on the adjacent property.

A remedial action for the eastern 23 acres (East Property) of the Northwest Terminal resulted in a conditional (industrial use only) no further action (NFA) determination from DEQ (DEQ 2003). As part of this determination, it was recognized by DEQ that shallow soil contamination on the East Property did not adversely impact groundwater quality. On the basis that drinking water is not a reasonably likely use of shallow groundwater at the site (DEQ 2003; Landau Associates 2004), the contaminants historically detected in groundwater on the East Property were below concentrations of concern for human health, and do not pose a threat to ecological receptors in the Willamette River. Therefore, the East Property has been excluded from the risk evaluations.

1.3.2 POTENTIAL CONTAMINANT FATE AND TRANSPORT

The primary fate and transport mechanisms that are likely to occur at the Terminal include transport and degradation.

Transport mechanisms at the site, which have the potential to impact media that human and ecological receptors could be exposed to, include the following:

- **Disturbance and Air Transport Of Surface Soil.** This pathway is associated with the disturbance of surface soil, through human activity or wind erosion, and subsequent airborne transport of particulates. The transported particulates could be inhaled by human and ecological receptors or redeposited downwind.

- **Leaching to Groundwater from Surface and Subsurface Soil.** This pathway is associated with chemical constituents that are sorbed on upland soil and that dissolve or otherwise desorb into water passing through the soil (i.e., infiltrating water from the surface, migrating groundwater). The extent to which leaching occurs is a function of the amount of water passing through the soil, properties of the individual chemical constituents, and physical and chemical properties of the soil and water. Leaching is a reversible process, in that chemicals leached to groundwater can re-sorb onto soil farther along the flow path.

- **Transport of Volatile Contaminants to Ambient Air from Groundwater.** This pathway is associated with the volatilization and migration of volatile contaminants in shallow groundwater through the unsaturated zone to the ground surface, where these contaminants could impact ambient air. The resulting vapor phase contaminants could be inhaled by human and ecological receptors.

Hydrogeologic data show that groundwater underlying the site discharges to the Willamette River. However, data collected from shoreline wells that are used to monitor water quality near the point of discharge to the Willamette River show that, with the exception of chromium concentrations in three of the wells and a single copper concentration, no constituent exceeded the preliminary screening levels

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established for the RI (Landau Associates 2004) during the November 2004 quarterly groundwater sampling event, and all constituents were less than the preliminary screening levels during the February 2005 event. Diesel-range petroleum hydrocarbons were detected in three of the four shoreline wells during each event, but a published risk-based screening level value is not available for this constituent. All other petroleum-related constituents were not detected or detected at concentrations below preliminary screening values for protection of human and ecological receptors. The data collected from the shoreline wells indicate that there is not a current complete exposure pathway to the river via groundwater; therefore, this pathway will not be considered in the risk assessment. Any historical impacts to surface water and sediments are being addressed through the risk assessment being conducted as part of the Portland Harbor RI/FS. Data from the shoreline wells will be reported in the final Phase III RI and subsequent quarterly groundwater reports.

1.3.3 SECONDARY SOURCE AND EXPOSURE MEDIA

This section describes environmental media with potential or confirmed impacts from contaminant sources at the Terminal. The relationship between site environmental media and the potential present and future exposure pathways for contaminant contact with human or ecological receptors, are summarized in the following subsections. The section needs to clearly distinguish between current and future potential exposures….

1.3.3.1 Upland Soil

Both surface and subsurface soil contain chemicals of interest (COIs) at the site, as will be demonstrated in the risk assessment by screening procedures described in Section 3.0. Surface soil at the site represents a potential source of direct contact by humans. Surface soil also is a source of direct contact with and ingestion of COIs by ecological receptors that live or feed at the facility. These are complete and potentially significant pathways that will be considered in the risk assessment Surface should be 0-6" only

Subsurface soil (defined as soil at depths between 3 ft and 13 ft for the purposes of this risk assessment) represents a potential source of direct human contact at the site for excavation workers; this is a complete and potentially significant pathway that will be considered in the risk assessment 3-13 ft is excessive…… 1 to 4-5 ft is practicable and realistic. It needs to be made clear that these are not current pathways but future potential pathways…..Because ecological receptors are considered to inhabit soil depths of less than 3 ft BGS(1-2 ft not 3 ft), there is an incomplete pathway for exposure of ecological

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receptors to subsurface soil. Therefore, this pathway will not be considered in the risk assessment. DEQ does not require a trespasser scenario?

1.3.3.2 Groundwater

Upper zone groundwater and, to a lesser degree, lower zone groundwater have been shown to contain COIs at the site. Based on the beneficial water use determination summarized in the draft Phase III RI report (Landau Associates 2004), the current and likely future beneficial use of groundwater in surrounding areas is primarily industrial with some use for irrigation of ornamental vegetation (i.e., not food crops) and does not include use as drinking water. However, irrigation does not occur in direct proximity to the site, and groundwater flow patterns at the site are not impacted by pumping for irrigation; therefore, exposure to groundwater via irrigation is not considered a significant pathway. Groundwater at the Terminal is not currently used for any purposes; future groundwater use at the terminal is expected is it expected or is a potential.....wording needs to be revised..to be limited to industrial use. Human receptors could be exposed to chemicals in lower zone groundwater by dermal contact with groundwater used for industrial purposes, which is considered to be a complete and potentially significant pathway and will considered in the risk assessment.....This is a stretch.....how can you realistically estimate the future exposure if don't know the specific use of groundwater under a future hypothetical industrial setting There is insufficient yield of upper zone groundwater to facilitate its use for industrial purposes. Excavation workers could come into contact with upper zone groundwater exposed in open trenches...this is a stretch and should be eliminated.... Ecological receptors are not expected to be exposed to groundwater at the Terminal and, therefore, this exposure pathway will not be considered in the risk assessment.

1.3.3.3 Ambient Air

Volatile contaminants have been detected in upper zone groundwater at the Terminal. These contaminants have the potential to separate into soil gas at the surface of the groundwater table and then migrate to the ground surface and volatilize into ambient air. This pathway will be considered as complete and potentially significant in the risk assessment, and it may be determined that the potential risks associated with inhalation of impacted ambient air are insignificant in comparison to other exposure pathways at the Terminal.

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1.3.3.4 Indoor Air

Volatile contaminants have been detected in upper zone groundwater at the Terminal. These contaminants have the potential to separate into soil gas at the surface of the groundwater table and then migrate to the ground surface and volatilize into indoor air. This pathway will be considered as complete and potentially significant in the risk assessment for future land use scenarios that could include indoor industrial activities, and it may be determined that the potential risks associated with inhalation of impacted indoor air are insignificant in comparison to other exposure pathways at the Terminal.

1.3.3.5 Willamette River Surface Water and Sediment

Groundwater samples collected from shoreline monitoring wells represent water quality conditions in shallow groundwater before discharging to the Willamette River. Data from samples collected in November 2004 and February 2005 show that impacts to water discharging to the Willamette River are not significant, and indicate that there is not a current complete contaminant transport pathway to the river; therefore, exposure to surface water and sediment in the river will not be considered in the risk assessment. Any historical impacts to Willamette River surface water and sediment quality are being addressed in the Portland Harbor RI/FS.

1.3.4 POTENTIAL RECEPTORS AND EXPOSURE SCENARIOS

Potential receptors are those human or ecological groups that, by virtue of their activities at a site (now or in the future) could be exposed to impacted environmental media. This section presents a summary of potential receptors identified for the site and surrounding area. Potential human receptors have been identified based on our understanding of current and potential future land use at the site and in the surrounding area from the results of land use and beneficial water use surveys completed for the site and summarized in the draft Phase III RI report (Landau Associates 2004). Ecological receptors have been identified based on a survey of ecological conditions at the terminal.

Three exposure scenarios for human receptors account for likely current or future contact with site COIs. These exposure scenarios are:

- Onsite Industrial Worker: The onsite industrial worker may work in an indoor or outdoor setting and is assumed to be involved in onsite occupational activities 250 days per year for up to 25 years. Surface soil exposure(0-6") only

- Onsite Construction Worker: The onsite construction worker is assumed to be involved in outdoor construction activities with a greater opportunity for direct contact with the upper 3 ft of soil. The construction worker is assumed to be engaged in work at the site for 250 days per year for up to one year.

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- Onsite Excavation Worker: The onsite excavation worker is assumed to have a high level of contact with soil and potentially with upper zone groundwater in trenches extending to 13 ft see previous commentBGS.

In addition to these human exposure scenarios, ecological exposure scenarios involving terrestrial and/or semi-aquatic receptors are possible based on both current and potential future site conditions. This section presents a preliminary evaluation of present and potential future exposure scenarios for the human and ecological receptors identified for the site, by environmental medium.

1.3.4.1 Upland Soil

The onsite industrial worker, onsite construction worker, and onsite excavation worker may contact contaminants in surface soil through incidental ingestion, dermal contact, and inhalation of airborne particulate matter. Only the onsite excavation worker could contact contaminants in subsurface soil; this would occur through future excavation activities that are expected to be limited to the soil within 13 ft of the surface. See previous comments…

Terrestrial and semi-aquatic animals are expected to come in contact only with surface soil; this contact could occur during burrowing or at the ground surface (dermal contact, incidental ingestion, and inhalation of airborne particulate matter). Ecological receptor exposure is expected to be limited to the upper 3 ft 1-2 of soil. Terrestrial and semi-aquatic predators could also be exposed to COIs through ingestion of prey that inhabit contaminated surface soil. Terrestrial plants also could come in contact with surface soil contamination, primarily via uptake through their root systems.

1.3.4.2 Groundwater

As described in Section 1.3.3.2, use of groundwater as drinking water or irrigation water are not anticipated at the Terminal. Furthermore, there are no groundwater seeps in the riverbank; therefore, direct exposure to groundwater is only possible when groundwater is pumped from the subsurface for specific purposes.

If future site activities involve the use of groundwater for industrial purposes, the onsite industrial worker could be exposed to lower zone groundwater through dermal contact; incidental ingestion and inhalation of airborne water particles are considered potentially complete but insignificant pathways for exposure to industrial process water. _The onsite excavation worker could be exposed to upper zone groundwater in subsurface excavations through dermal contact; however, incidental ingestion and inhalation of airborne water particles are considered potentially complete but insignificant pathways for

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excavation worker exposure. The onsite construction worker is not expected to be exposed to groundwater. See previous comments.

1.3.4.3 Ambient Air

The onsite industrial worker, onsite construction worker, and onsite excavation worker may uptake vapor phase contaminants through the inhalation of impacted ambient air. As described in Section 1.3.3.3, ambient air could be impacted by the volatilization of COIs in upper zone groundwater.

1.3.4.4 Indoor Air

Although indoor air impacts are not a concern under the existing site configuration, future site use may include indoor industrial applications. The onsite industrial worker may uptake vapor phase contaminants through the inhalation of impacted indoor air. As described in Section 1.3.3.4, indoor air could be impacted by the volatilization of COIs in upper zone groundwater.

1.3.5 SUMMARY

Figure 4 summarizes the CEM for human risk and Figure 5 summarizes the CEM for ecological risk. These figures identify known or suspected sources of contamination at the site, known or suspected contaminant release mechanisms and migration pathways, potential receptor populations, and potential exposure pathways.

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2.0 ENVIRONMENTAL DATA

This section describes the environmental investigations performed to date, identifies the data that will be used in conducting the baseline human health and ecological risk assessments, and describes the status of data gaps.

2.1 PREVIOUS INVESTIGATIONS

Beginning in 1984, a series of environmental investigations were conducted to evaluate the potential for soil and groundwater contamination due to former operations at the Terminal. These investigations included a site inspection by DEQ in 1984, several soil investigations in the former PCP mixing area, removal of the Crosby & Overton truck-washing trough in 1986, test pit explorations near the Crosby & Overton truck-washing trough in 1989, and a groundwater and soil investigation in 1994 in response to an unleaded gasoline spill. These investigations are described in the draft Phase III RI report.

In addition to the soil and groundwater investigations conducted between 1984 and 1994, a phased RI was conducted at the Terminal from 1996 through 2004, including ongoing quarterly groundwater monitoring continuing to the present under a Voluntary Cleanup Program (VCP) agreement between Time Oil and DEQ. The Phase I RI focused on the former stockpile area, and the Phase II RI focused on the former PCP mixing area and the former Crosby & Overton area. The Phase III RI focused on areas of the Terminal where no extensive soil or groundwater investigations had previously been performed, including the former Main Terminal and Bell Terminal tank farm areas, the former loading racks, and other operational portions of the Terminal. Some additional investigations and a soil remedial action were also performed for the East Property, which is not an area of consideration for the risk assessment and is, therefore, not considered part of the Terminal, or site, for the purposes of this document as described above. Some remedial actions, including removal of the stockpile and impacted soil from the former PCP mixing/warehouse areas and soil from the Crosby & Overton area, were also completed in 2002. A more complete description of environmental data collected to date, including data representative of residual soil concentrations remaining at the conclusion of the soil removal actions and contaminated soil that has already been removed, is presented in the draft Phase III RI report and the removal action completion report (Landau Associates 2003). Data collected during new well installation completed in late October and early November 2004, including shoreline wells, will be included in the final Phase III RI report, scheduled to be submitted to DEQ in spring 2005.

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2.2 RISK ASSESSMENT DATA SET

This section describes the data set collected during environmental investigations at the Terminal that will be the basis for evaluating potential risks to human and ecological receptors. Special approaches to handling environmental data for risk assessment purposes are also described.

2.2.1 DATA SET DESCRIPTION

The data set compiled in the draft Phase III RI report (Landau Associates 2004) and in the upcoming final Phase III RI report presents data representative of existing site conditions. Soil samples collected throughout the Phase II and Phase III RIs, that are representative of soil remaining at the Terminal following the completed interim remedial or removal actions, are presented in the draft Phase III RI report and comprise the data set to be used for soil characterization in the risk assessment. Except for the excavation worker scenario, which involves exposure to soil from ground surface to 13 ft BGS, all other human and ecological receptors are potentially exposed only to surface soil from ground surface to 3 ft BGS. Soil data will be evaluated in two data sets for risk assessment purposes: surface soil will include all applicable data from 0 to 3 ft BGS, and surface and subsurface soil will include all applicable data from 0 to 13 ft BGS (the approximate water table). ditto

The nature and extent of contamination present in groundwater at the Terminal was evaluated based on chemical results for groundwater samples collected from temporary borings during the Phase III preliminary evaluation, the Phase III interim subsurface investigation, the October-November 2004 new well installation, and also the most recent year of quarterly groundwater monitoring data (first quarter through fourth quarter 2004); the most recent year of groundwater monitoring data will be used for those wells that have been discontinued from the quarterly monitoring program. Groundwater data will be evaluated in two data sets for risk assessment purposes, "upper zone groundwater" and "lower zone groundwater." In areas closer to the river beyond the confining unit boundary where only one unconfined groundwater zone exists, groundwater data will be considered representative of lower zone groundwater, because of the similarity with lower zone groundwater elevations.

2.2.2 DATA SET HANDLING

Data sets used for risk assessment purposes are subject to statistical evaluation. Data handling techniques used to facilitate such statistical evaluations in a manner that is reasonable, and also maintains a conservative nature (i.e., tendency to err on the side of overestimating potential risks), are described below.

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Due to limitations in the accuracy of available chemical analysis equipment, laboratories typically cannot determine whether a chemical is absent from a sample, but they can confirm that it is not present above some threshold concentration, called the laboratory reporting limit, at which the chemical analysis equipment is considered reliable. Deterministic risk assessment procedures require that some discrete concentration be used for each sample to estimate average exposure point concentrations (EPCs) for chemicals that are retained as contaminants of potential concern (COPCs). Samples with concentrations not detected at the reporting limit will be handled in accordance with guidance developed by the U.S. Environmental Protection Agency (EPA 1989). Generally, if a chemical is not detected above the reporting limit in some samples from the site, but is detected in other samples, then those samples in which the chemical is not detected will be assigned a "proxy" concentration of one-half the value of the reporting limit for use in the calculation of EPCs. These proxy values will not have any bearing on the screening process described in Section 3.0. For data sets with a lognormal distribution, which is characteristic of most environmental data sets, assuming a proxy concentration of one-half the value of the reporting limit will provide a conservative estimate of the actual average concentration of nondetect samples.

Blind field duplicate samples are often collected during environmental investigations for the purposes of evaluating data quality. To avoid a statistical bias toward concentrations from sample locations where duplicate samples were collected (i.e., effectively counting these sample locations twice in comparison to other sample locations), only a single chemical concentration from the original sample or its duplicate will be retained for use in data evaluation. The selected concentration will be the maximum detected concentration for detected chemicals, or one-half the value of the lowest achieved reporting limit for nondetected chemicals. In cases where a chemical is not detected, this approach allows the use of the most sensitive analytical run to estimate the concentration below the reporting limit. In cases where a chemical is detected and there is some variability in the reported concentration, this approach conservatively assumes that the actual concentration is the highest of the two concentrations.

2.3 DATA GAPS

Surface soil, subsurface soil, and groundwater have been adequately characterized for risk assessment purposes based on the data presented in the draft Phase III RI report. The recent installation and sampling of shoreline wells to monitor groundwater quality near the point of discharge to the Willamette River have filled what was previously a data gap at the Terminal. The only remaining data gaps include definition of the locality of facility at the north property boundary and assessment of the mobility of the product observed in monitoring wells in the Main Terminal tank farm area. Time Oil is

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currently in the process of obtaining an access agreement from the Port of Portland for sampling two wells located with 300 ft of the north property boundary to determine whether any groundwater contamination from the Terminal extends north of the property boundary. Sampling is expected in occur in conjunction with the second quarter 2005 groundwater monitoring event in June, 2005. Also, Time Oil is preparing a source control evaluation document that will provide information on the mobility of the product and whether remediation is necessary to address potential product migration, and if so, the remedial options. We expect this document to be submitted to DEQ in the summer 2005.

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3.0 DATA SCREENING

The potential exposures and risk(s) from contaminants at the Terminal will be assessed based on the data set described in Section 2.2. Constituents that are detected in less than 5 percent of the samples, or are detected with a maximum concentration that is less than site-specific background levels established for metals (Landau Associates 1999), are considered to have *de minimus* risk to human health and the environment and will be screened out of the risk assessment process (DEQ 2000). Constituents that are considered essential nutrients for human receptors (e.g., calcium, iron, magnesium, etc.) will not be retained for consideration in the risk assessment. All remaining constituents that are not rejected during data validation, are detected in at least 5 percent of the samples collected from a given environmental medium, and that are above background levels will be included in the database used in the human health and ecological risk assessments. Reporting limits for chemicals that were not detected, but considered to be reasonably likely to be present at the site, will be reviewed to verify that elevated reporting limits have not masked the potential presence of site contaminants. The resulting data set will constitute the COIs in all environmental media at the site.

A COPC/COPEC screening report was previously prepared for the Terminal based on Phase I and II investigations (Landau Associates 1999). The Phase III RI investigation and interim actions conducted at the Terminal since the COPC/COPEC screening report was prepared have resulted in significant changes to the data set that defines the nature and extent of contamination; therefore, the COPC/COPEC screening activities that will be performed as part of this risk assessment will supersede those presented in the previous report.

Data screening to identify COPCs for human health or COPECs for ecological receptors are discussed in Sections 4.0 and 5.0, respectively.

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4.0 HUMAN HEALTH RISK ASSESSMENT

A baseline human health risk assessment will be performed to estimate current and potential future risk to human health at the site using deterministic techniques outlined in DEQ cleanup regulations and guidance [Oregon Administrative Rule (OAR) 340-122-0084, DEQ 2000]. The following sections describe how site data will be used in evaluating human health risk based on our current understanding of the site, potential receptor populations, and exposure pathways. In addition, methods that will be used to quantify exposure and estimate risk are presented, and factors that will be qualitatively evaluated in assessing the uncertainty associated with the risk estimates are summarized.

4.1 COPCS AND EXPOSURE POINT CONCENTRATIONS

As per DEQ (2000) guidance, the site data will be further refined after the screening process described in Section 3.0, to identify a subset of contaminants, the COPCs, that will be the focus of the baseline human health risk assessment. This screening for COPCs will eliminate from further consideration any contaminants with concentrations so low relative to risk-based criteria that the contaminants do not merit further evaluation. DEQ's risk-based concentrations (RBCs, DEQ 2003) and EPA Region 9 Preliminary Remediation Goals for industrial sites (PRGs, EPA 2002) will be used as the basis for screening COIs by risk to human health. The screening process will be conducted separately for COIs detected in onsite groundwater and soil. However, exposures to the same COI through multiple environmental media via multiple exposure pathways will also be evaluated. COIs at concentrations below these risk-based screening levels will not be evaluated further in the baseline human health risk assessment and the remaining constituents will be designated as COPCs and will be evaluated in subsequent steps in the risk assessments.

If a contaminant is a COPC in one medium and is detected in multiple media, the COPC will be retained in each medium to ensure consideration of potential exposures via multiple pathways. If a risk-based screening level is not available for a given COI, the COI will be identified as a COPC and discussed in the uncertainty analysis.

After COPCs have been identified for each environmental medium, a statistical evaluation will be conducted for each of the following data sets:

- Surface soil
- Surface and subsurface soil
- Upper zone groundwater
- Lower zone groundwater.

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The purpose of the statistical evaluation will be to identify a representative concentration, the EPC, of each COPC in each data set for use in evaluating chemical intake and risk through the relevant exposure scenarios and pathways identified in the exposure assessment. For each COPC in each data set, DEQ regulations require that both the arithmetic mean (central tendency) concentration and the 90% upper confidence limit (90% UCL, referred to as the plausible upper bound) be estimated for a given set of chemical concentration data. Calculations for contaminant intake by exposure pathway and risk estimates will be made using both resulting exposure concentrations in order to represent the required range of risks posed by the site.

4.2 EXPOSURE ASSESSMENT

Exposure assessment is the process of measuring or estimating the intensity, frequency, and duration of exposure. The exposure assessment step in the baseline human health risk assessment process involves identification of potential receptor populations and exposure pathways that could bring the receptors in contact with contamination at the site. The risk assessment process evaluates only complete exposure pathways. As noted in Section 1.3, in order for a human exposure pathway to be complete, each of the following elements must exist:

- A source and mechanism for chemical release
- An environmental transport medium (e.g., air, water, soil)
- A point of potential human contact with the medium
- A human exposure route at the point of contact (e.g., inhalation, ingestion, dermal contact).

For the purposes of this assessment, the environmental media through which exposure to the COPCs may occur is soil (surface and subsurface) and groundwater. Exposure to soil could occur via incidental ingestion, dermal contact, and inhalation of suspended particulates. Exposure to groundwater could occur via incidental ingestion, dermal contact, and inhalation of volatilized constituents. The diffusion/flux model described in DEQ guidance (DEQ 1999) was used to model contaminant migration from shallow groundwater to outdoor air (Figure 6). The Johnson and Ettinger model (Figure 7; DEQ 1999) was used to model indoor air concentrations.

The following sections present an evaluation of exposure pathways currently identified for each of the site receptor populations, exposure equations that will be used to calculate chemical intake for each of the pathways, and exposure parameters that will be used in calculating chemical intake.

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4.2.1 ONSITE INDUSTRIAL WORKER

The Terminal is currently an inactive facility; however, future industrial workers using the site could be responsible for a variety of duties. The onsite industrial worker could potentially become exposed to contaminated soil and groundwater through direct contact pathways during occupational activities. The specific pathways include:

- Surface soil (0 to 3 ft BGS): dermal contact, incidental ingestion, and inhalation of suspended soil particulates
- Lower zone groundwater as process water: dermal contact
- Ambient air: inhalation of chemicals that have volatilized out of upper zone groundwater
- Indoor air: inhalation of chemicals that have volatilized out of upper zone groundwater.

For the purposes of this risk assessment, the onsite industrial worker population will be adult and assumed to work primarily in the upland areas of the Terminal. Industrial workers could potentially come into dermal contact with lower zone groundwater if used as industrial process water; however, groundwater at the Terminal has not been historically used for such purposes. Intake of contaminants will be modeled by assuming that the industrial worker performs tasks in relatively close proximity to each medium, with intake occurring through dermal contact and incidental ingestion of surface soil, dermal contact with lower zone groundwater used as industrial process water, and inhalation of ambient or indoor air impacted by volatile COIs in upper zone groundwater. The equations that will be used to calculate exposure to contaminants in soil, groundwater, and ambient or indoor air through each of the exposure pathways are shown on Figures 8 through 12, the exposure parameters used in the calculations are presented in Table 1.

4.2.2 ONSITE CONSTRUCTION WORKER

There is currently no ongoing construction activity at the Terminal. However, future plans (i.e., Terminal demolition or redevelopment of the site) may require consideration of the construction worker scenario. It should be noted that such exposures can be controlled with appropriate PPEConstruction worker activities could potentially expose construction workers to contaminants in surface soil (dermal contact, incidental ingestion, and inhalation of particulates) and ambient air (inhalation).

For the purposes of this risk assessment, the model will assume that the receptor population is adult working in close proximity to the soil, with chemical intake occurring through dermal contact and incidental ingestion of soil and through inhalation of suspended particulate matter. The equations that will be used to calculate exposure to contaminants in surface soil through dermal contact, incidental

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ingestion and/or inhalation of suspended soil particulates are shown on Figures 8 through 10. The equation to calculate exposure to contaminants in ambient air via inhalation is shown on Figure 12. Exposure parameters used in these calculations are presented in Table 1.

4.2.3 ONSITE EXCAVATION WORKER

There is currently no ongoing construction activity at the Terminal. However, future plans (i.e., Terminal demolition or redevelopment of the site) may require consideration of the excavation worker scenario. Movement of earthen material could potentially expose excavation workers to contaminants in surface and subsurface soil (dermal contact, incidental ingestion, and inhalation of particulates); shallow groundwater (dermal contact); and ambient air (inhalation).

For the purposes of this risk assessment, the model will assume that the receptor population is adult working in close proximity to the soil, with chemical intake occurring through dermal contact and incidental ingestion of soil and through inhalation of suspended particulate matter. It is also assumed that the excavation worker could come into dermal contact with shallow groundwater. The equations that will be used to calculate exposure to contaminants in surface and subsurface soil through dermal contact, incidental ingestion and/or inhalation of suspended soil particulates are shown on Figures 8 through 10. The equation to calculate exposure to contaminants in shallow groundwater via dermal contact is shown on Figure 11. The equation to calculate exposure to contaminants in ambient air via inhalation is shown on Figure 12. Exposure parameters used in these calculations are presented in Table 1.

4.3 DOSE-RESPONSE ASSESSMENT

The purpose of the dose-response assessment is to weigh available evidence regarding the potential for COPCs to cause adverse health effects in exposed individuals and to provide, where possible, an estimate of the relationship between the extent of exposure to a compound and the increased likelihood or severity of the adverse effect.

The bulk of knowledge about the dose-response relationship is based on data collected from animal studies and theoretical precepts about what might occur in humans. Mathematical models are used to estimate the potential human response at levels far below those tested in animals. These models contain several limitations that will be considered when the risk estimates are evaluated. Most of the COIs preliminarily identified for the site have toxicity criteria available for the dose-response assessment, and include both noncarcinogenic and carcinogenic compounds. For those COPCs for which toxicity criteria are not available to conduct a quantitative risk estimate, a qualitative evaluation of the risk will be presented.

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The EPA online Integrated Risk Information System (IRIS, EPA 2004) will be accessed to identify toxicity criteria for the site COPCs. Reference dose values will be identified to evaluate noncarcinogenic health effects, and cancer potency factors will be identified to evaluate carcinogenic health risks. In some cases, both reference dose values and potency factors may be available for some compounds. In these cases, both noncarcinogenic and carcinogenic health effects will be evaluated. Information concerning the basis of the toxicity criteria used and their associated uncertainty will be presented in the baseline risk assessment report, as recommended by EPA guidance (EPA 1989).

4.4 RISK CHARACTERIZATION

The risk characterization will provide a quantitative and qualitative summary of the health risks posed to individuals by exposure to the COPCs in environmental media at the site. The risk characterization will address both noncarcinogenic and carcinogenic health effects.

Potential noncarcinogenic adverse health effects will be evaluated by comparing the predicted chemical intake values to reference dose values obtained from the EPA IRIS database. In order to evaluate the general acceptability of a particular dose relative to a reference dose value, a hazard quotient value is calculated, which is the ratio of the calculated average daily dose (ADD) to the reference dose value:

Hazard Quotient = ADD/Reference Dose

A hazard quotient less than or equal to 1 indicates that the predicted exposure would not pose an unacceptable level of noncarcinogenic health risk (EPA 1989). To account for the additive effects of individual chemicals for a given exposure pathway that could potentially act upon the same organs or result in the same physiological endpoint, additive effects are addressed by calculating a hazard index, which is the sum of all individual hazard quotients for a given pathway.

Carcinogenic risks are defined in terms of the probability of an individual developing cancer as the result of exposure to a given chemical at a given concentration. The incremental probability of developing cancer (i.e., the theoretical excess cancer risk) is that risk attributed to exposure to the COPCs present at the site. For each applicable COPC, the theoretical excess cancer risk is based on the lifetime average daily dose (LADD), which is defined as the total incremental dose of a chemical received as a result of the exposure averaged over a lifetime. Once the LADD has been calculated, the cancer risk is calculated as follows:

Estimated Cancer Risk = LADD x Potency Factor

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As with hazard quotients, the estimated cancer risks for each chemical and exposure route will be summed to estimate the total excess cancer risk for the exposed individual per exposure pathway (EPA 1989).

4.5 UNCERTAINTY ANALYSIS

An uncertainty analysis will be conducted for the baseline human health risk assessment to examine the sources and magnitude(s) of potential uncertainty associated with the risk estimates. Sources of uncertainty include the data available for the site investigations, receptor population and exposure pathway identification, exposure parameter selection, and toxicity criteria used to characterize risk. Each of these potential sources of uncertainty will be evaluated qualitatively to determine the likely degree of uncertainty associated with the risk estimates, and whether the uncertainty has likely led to over- or under-estimates of risk.

4.6 BASELINE HHRA – CONCLUSIONS AND RECOMMENDATIONS

The conclusions of the baseline HHRA, including acceptable risk levels for exposure of COPCs to human receptors at the terminal ,and any recommendations for additional assessment of risk to human receptors will be provided in a baseline HHRA report, as described in Section 6.0.

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5.0 ECOLOGICAL RISK ASSESSMENT

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A ecological risk assessment (ERA) will be performed to address current and potential future risks posed to ecological receptors at the site. The ERA will be conducted in accordance with OAR 340-122 and DEQ guidance for conducting ERAs, Levels I, II, and III (DEQ 2000, 2001). Generally, ERAs, which are conducted to meet Oregon DEQ guidelines, are based on an EPA framework (EPA 1998). This framework follows a stepwise process that first includes problem formulation to determine the focus and scope of the assessment, followed by an exposure assessment, toxicity assessment, and risk characterization. In accordance with DEQ guidance, a Level I Ecological Scoping Assessment was conducted based on an April 2005 site visit and is presented in Appendix A. The results of the Level I assessment indicated that potential ecological receptors and potentially complete exposure pathways exist at the site and a Level II Screening ERA should be conducted. The Level II Screening ERA is planned for the Terminal to determine the presence of contaminants of potential ecological concern (COPECs), if any. This Level II COPEC screening process is essentially a preliminary problem formulation. The results of the Level II COPEC screening will be reported to DEQ with recommendations regarding the need for additional ecological assessment. If further assessment is deemed necessary, a Level II calculation of ecological target cleanup levels (ETCLs) or a Level III Baseline ERA will be proposed. The overall process will allow for informed, stepwise decision-making in order to focus each subsequent and more complex level of ecological assessment on the most important ecological issues for the site. The following sections present the procedures to be followed for the Level II determination of COPECs, a Level II calculation of ETCLs (if required), and a Level III Baseline ERA (if required).

5.1 LEVEL II SCREENING ASSESSMENT

This section documents the steps necessary to conduct the Level II screening assessment for the ERA. The Level II screening assessment will build on the information collected during the Level I scoping process and will initiate the problem formulation process for the ERA for the Terminal. The scope of an ERA is defined through problem formulation, during which the physical and contaminant characteristics of the site are described, including the important ecological habitats, plants, and wildlife

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that exist there. Along with the results of previously completed investigations and knowledge of the site, this information is used to identify the COIs (i.e., contaminants likely to be present at the site), the ecological receptors of concern (i.e., assessment species), and the contaminants of potential ecological concern (COPECs). This information will also be used to develop the conceptual ecological exposure model (CEEM) that depicts the expected fate and transport of chemicals at the site, the potential exposure media, and exposure pathways for ecological receptors of potential concern. Specifically, the problem formulation will include:

- a site description
- a summary of the results of previous investigations
- description of the ecosystem components at the site
- selection of assessment species for the site
- a summary of complete ecological exposure pathways
- selection of the COPECs
- a summary of potential ecological effects of the COPECs
- presentation of the CEEM
- presentation of assessment endpoints and measures based on the COPECs for the site and potentially effected ecological receptors.

The site description, previous investigation summary, and preliminary conceptual site model are provided earlier in this work plan. Information to be used for preliminary problem formulation and identification of COPECs is provided below, including the current understanding of the ecological conditions at the Terminal. As described below, the preliminary problem formulation will conclude with identification of the assessment endpoints and measures that become the focus of the remainder of the ERA. Preliminary problem formulation will also provide for a qualitative understanding and ranking of which COPECs are of the most importance and in which media. The preliminary problem formulation information will be updated as part of the Level II COPEC determination and may be further modified or updated during the Level II ETCL calculation or Level III ERA, in accordance with the level of detail required by the selected approach, if determined necessary.

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5.1.1 ECOSYSTEM COMPONENTS

The site encompasses terrestrial environments and borders riverine environments. This section summarizes and focuses the characteristics of the terrestrial environment that are relevant to the ERA. The riverine environment is being assessed as part of the Portland Harbor RI/FS.

5.1.1.1 Terrestrial Environment

The Terminal is dominated by two areas of ASTs including the former Main and Bell Terminal tank farms. The former Main Terminal tank farm area is within a bermed area approximately 30 ft above the shoreline of the Willamette River in the northwest area of the site. Immediately east of the former Main Terminal tank farm area are the truck loading/unloading area and associated office and warehouse buildings. A few additional ASTs and the existing wastewater treatment system (WWTS) are also present near this Main Terminal complex. The former Bell Terminal tank farm area is several hundred feet south of the former Main Terminal tank farm area and several hundred feet east of the river, separated by an offsite industrial complex. The ASTs at the former Main and Bell Terminal tank farms are close together and surrounded by dirt berms designed for spill containment. Within the berms the ground is predominantly bare dirt with very little to no natural vegetation. Most of the area between the former Main Terminal tank farm area, the office and warehouse buildings, the WWTS, and the Crosby & Overton tanks is either paved or covered with gravel. The area between the former Main Terminal complex and the former Bell Terminal tank farm area is mowed weedy vegetation or bare dirt surface. The terrestrial habitat at the site currently provides little habitat for ecological receptors. A limited number of small terrestrial mammals (e.g., deer, mice), terrestrial invertebrates, and/or reptiles (e.g., garter snakes) may inhabit the mowed grassy area between the tank farms.

5.1.1.2 Riverine Environment

As described earlier in this work plan, the contaminant transport pathway to the Willamette River is considered incomplete for impacted media at the Terminal. Therefore, ecological receptors in the riverine environment will be considered only insomuch as their normal activities would result in potential exposure to upland surface soil (i.e., semi-aquatic receptors with terrestrial foraging habits may be evaluated, but fully aquatic receptors will not). Aquatic receptors are being evaluated as part of the Portland Harbor RI/FS.

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5.1.1.3 Sensitive Environments

No sensitive environments exist on the site. The Willamette River, located adjacent to the site, is a sensitive habitat as defined by OAR 340-122-045, due to the critical habitat designation for the federally listed Chinook salmon and steelhead. While some restored wetlands are present north of the Terminal, the zoning and land use surrounding the site are industrial.

5.1.1.4 Sensitive Species

A sensitive species search via the Oregon Natural Heritage Information Center (ONHIC) has not yet been conducted. This search will be conducted and the results incorporated into the ERA. Evaluation of sensitive species for the ERA will be limited to terrestrial and possibly semi-aquatic receptors exposed to contaminants in terrestrial habitats. Currently available information on sensitive species is provided below.

Bald eagles have nested along the Willamette River upstream and downstream from the site. Due to successful recovery efforts, U.S. Fish and Wildlife Service (USFWS) recently proposed that the bald eagle be removed from the federal list of endangered and threatened wildlife in the lower 48 states under the Endangered Species Act (ESA). While the public comment period on the ruling to de-list closed in October 1999 and the de-listing was expected to have been completed within a year of the end of the public comment period (CH2M Hill 1999), the de-listing has not occurred to date.

State-listed terrestrial and semi-aquatic threatened, endangered, and sensitive-critical species in Multnomah County, Oregon include birds (i.e., bald eagle and peregrine falcon), bats, frogs, turtles, and snails. Given the general lack of suitable habitat, the birds and other protected species are unlikely to inhabit the Terminal or the site vicinity. There are no known rare, threatened, or endangered plant species at the Terminal.

5.1.1.5 Potential Ecological Receptor Types

For the purposes of this ERA, terrestrial plants, invertebrates, and wildlife are those species that forage on terrestrial plants, terrestrial invertebrates, and terrestrial wildlife (e.g., herbivorous, invertivorous, omnivorous, or carnivorous amphibians, reptiles, bird, or mammals) and, thus, are most likely to be exposed to site-related contamination in surface soil. Semi-aquatic wildlife are those species that live in the terrestrial environment, but obtain a significant portion of their diet from the aquatic environments, or vice versa, and may be exposed to site-related contamination in surface soil. Aquatic plants, invertebrates, fish, and wildlife are those species that obtain their sustenance from the aquatic environment and, thus, are unlikely to be exposed to site-related contamination in soil or groundwater at

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the Terminal. Representative terrestrial and semi-aquatic ecological receptors that are known or likely to be found at or adjacent to the site are listed in Tables 2 and 3, respectively. The receptor types (or functional groups) these species represent are summarized in Table 4. Some of these ecological receptors may be resident at the site while others may use the site on a seasonal basis, or as a resting or staging area along migration routes. These species were used to define the ecological functional groups of species at the site and to select the representative assessment communities and species that are evaluated in the ERA, as described in the next section. The functional grouping is described in the next section.

5.1.2 Selection of Assessment Communities and Assessment Species

In ERAs, it is impractical to address each individual species that may inhabit a given site. Therefore, similarly exposed species are classified into functional groups based primarily on their foraging habits, and then assessment communities or assessment species are chosen to represent these functional groups. Subsequently, predicted risk for one assessment community or assessment species is considered representative of risk to the other species within the represented functional groups.

The Time Oil Northwest Terminal functional groups were developed from site-specific species lists by grouping species by taxonomic class (e.g., birds, mammals, amphibians, etc.), foraging strategy (e.g., terrestrial or semi-aquatic), and trophic level (e.g., primary producer, herbivore, invertivore/detritivore, or carnivore/piscivore). Because different species of plants and invertebrates can be very numerous, these lower trophic level species are often combined according to DEQ guidance and assessed as communities because of their very similar exposure routes. In addition, toxicity data for plants and invertebrates are most often representative of groups of species. These combinations of lower trophic level species are termed assessment communities because they may represent numerous types of species. An assessment community may represent one or more functional groups. During the functional grouping process, semi-aquatic species were grouped into terrestrial or aquatic foraging strategies based on their expected primary foraging habits while they are present at the site. For example, raccoons were considered to be part of the terrestrial food web, because they are expected to forage primarily on terrestrial berries, seeds, and invertebrates that are common along the river; but not on aquatic prey items such as crawdads, which are uncommon or absent in the near-shore areas of the river where raccoons could wade. Preliminary functional groups selected for this ERA are presented in Table 5. This list was used to develop the terrestrial food web diagrams shown on Figure 13.

A representative assessment species was also selected to represent each of the upper trophic level functional groups, based primarily on the species within each functional group that would be expected to

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receive the highest exposure to contaminants at the site. Primary factors related to exposure potential that were considered included:

- body size
- population density and extent of home range
- foraging approach of the species
- contaminated media at the site
- ecological niche(s) represented by a species.

Other factors that influenced the selection of some assessment species included:

- sensitivity of the receptor to the site-related contaminants
- availability of exposure and toxicity data
- societal value/regulatory status of the species
- position of the species within the food web.

The selected assessment communities and species, and the functional groups they represent, are listed in Table 5. The rationale for selection of each assessment community and species is presented below.

5.1.2.1 Assessment Communities and Exposure Pathways

Terrestrial Plants

The terrestrial plant community is defined as all plants that obtain nutrients primarily from soil (including soil pore water). The primary production of these plants provides a foundation for the terrestrial food web. Negative impacts to primary production are likely to result in decreased abundance of soil invertebrates and upper trophic level species due to a lack of food and cover. A reduced diversity of particularly sensitive plant species may also result in similar detrimental effects to some upper trophic level species if plants that are a preferred food for particular herbivores are extirpated (made regionally extinct) from the site due to their exposure to contaminants in soil. Because plant toxicity data are not available for most wild plant species, these plant species were assessed as a community by applying the available toxicity data across all species at the site. This broad application assumes that the mechanism of toxic action is similar between plant species. The principal exposure pathway for terrestrial plants to contaminants at the site is via uptake from soil and soil pore water.

Terrestrial Invertebrates

The terrestrial invertebrate community is defined as all invertebrates that obtain nutrients primarily from soil or on the soil surface. The abundance and diversity of such invertebrates is similar in

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importance to that of plants because invertebrates are also a primary food source within the terrestrial food web. Declining numbers or types of terrestrial invertebrates may result in decreased abundance and/or diversity of insectivores. This, in turn, may result in lower diversity of upper trophic level wildlife because fewer numbers or types of insectivores means fewer food items for carnivores that prey on the insectivores. Thus, the dependent carnivores may starve or leave the site in search of their preferred food items. The principal exposure pathways for terrestrial invertebrates to COPECs at the site is via ingestion of and dermal contact with soil.

5.1.2.2 Assessment Species and Exposure Pathways

The assessment species and the functional groups they represent for the Terminal are summarized in Table 5. In some cases, one assessment species was considered to be representative of several functional groups. This was the case when a particular assessment species could be chosen that was similar to, but likely to be more highly exposed or sensitive to, contaminants than species in the other represented functional groups. Thus, using an assessment species approach protects other species in different functional groups and allows the number of assessment species to be reduced. The rationale for the selection of assessment species for multiple functional groups is described in the following sections.

Terrestrial Avian Invertivores

The American robin was chosen as an assessment species because it is likely to be the most exposed representative of the terrestrial invertivore functional group. The robin is small, has a high food intake rate for its weight, and would be susceptible to chemical exposure via ingestion of contaminated terrestrial invertebrates and incidental ingestion of soil. No perennial surface water is present at the site and therefore, exposure to contaminated drinking water is not considered a significant exposure pathway. Robins are present onsite during the spring and summer months (and potentially all year), have limited home ranges, and have adequate exposure and toxicological data.

The robin was considered to be representative of the potential exposure and effects for several other functional groups, including terrestrial avian herbivores, terrestrial avian omnivores, and terrestrial avian carnivores. The exposure of invertivores is usually higher than that of herbivores or omnivores, because plants generally take up contaminants to a lesser extent than invertebrates. For this reason, the robin will also represent terrestrial avian herbivores and omnivores. The robin is also a more conservative representative of terrestrial avian carnivores than a red-tailed hawk (the other choice for this site) because of its smaller body and home range, each of which increase the potential for exposure to chemicals at the site. Additional considerations that support this substitute include the fact that fewer

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hawks would be expected to inhabit the site because their home ranges extend farther, hawks would not be solely exposed to contaminants at the site as robins may be, and because methods of assessing toxicity are nearly identical for the robin and hawk.

Terrestrial Mammalian Invertivores

The masked shrew was chosen as a mammalian assessment species because it has a high potential for chemical exposure, it (or other similar shrew species) is a resident at the site, it is a prey species for avian and mammalian carnivores, and it has adequate toxicological and exposure data. The masked shrew is very small, is known to have a high food intake rate for its weight, and is potentially exposed to contaminants in surface soil via ingestion of contaminated invertebrates and incidental ingestion of soil. Shrews obtain most of their water requirements from their prey and there is no perennial surface water onsite; therefore, contaminant exposure via drinking water is considered negligible for the shrew and will not be assessed.

Similar to the robin, the shrew was considered representative of several functional groups, including terrestrial mammalian herbivores and terrestrial mammalian omnivores. The shrew is a conservative representative of terrestrial mammalian omnivores and herbivores because chemicals are most often expected to bioaccumulate to a greater extent in invertebrates than in plants. In addition, the shrew is the smallest terrestrial mammal at the site, so its food intake to weight ratio (i.e., exposure) is expected to be greater than any other small mammal.

The shrew is also a conservative representative of nutria and muskrat that are most frequently classified as aquatic mammalian herbivores. Because there is limited or no aquatic vegetation in the vicinity of the Terminal, aquatic mammalian herbivores such as nutria are most likely eating terrestrial vegetation or must swim to offsite areas where aquatic vegetation is present. Given either of these scenarios and the rationale that invertivores are more susceptible to contaminant exposure than herbivores, the shrew is a conservative representative of the nutria and muskrat that may inhabit the site.

Terrestrial Reptilian Carnivores

Garter snakes may inhabit the terrestrial environment at the site. Currently, exposure and toxicity data are inadequate to assess the potential risks for reptiles. Thus, although the garter snake is identified as an assessment species, its potential risks are only considered qualitatively, compared to risks predicted for other assessment species.

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5.1.2.3 Summary of Assessment Communities and Species

The above-noted assessment species and the functional groups they represent are presented in Table 5. Of these, only the garter snake will be assessed in a purely qualitative manner, due to the lack of exposure and toxicity data for this species. The exposure pathways to be assessed for each of these receptors is presented in Table 6 and Figure 5.

5.1.3 ENVIRONMENTAL CONCENTRATIONS

The environmental concentrations (ECs) are concentrations of COIs in each exposure medium that are used to select the COPECs. As such, they are estimates of the environmental concentration to which ecological receptors are exposed over a relevant spatial area defined by their habitat. The ECs will be calculated as follows:

- For plants and soil invertebrates (assessment communities) that are immobile or nearly immobile, the maximum detected concentration of each COI in soil will be used as the EC.

- For terrestrial wildlife (assessment species: robin and shrew) consuming soil, vegetation, or prey, the 90UCL of each COI in soil will be the preferred EC. If fewer than 10 samples are available, the maximum detected concentration will be used as the EC. The data distribution will be tested for normality and lognormality and the 90UCL will be calculated appropriately for the distribution. If the data is neither normally nor lognormally distributed, the 90UCL will be calculated using the Z-statistic.

The ECs and calculation methods used in the ERA will be presented in the Level II ERA – Screening Assessment Report (see Section 6.0).

5.1.4 CONTAMINANTS OF POTENTIAL ECOLOGICAL CONCERN

The COPECs are chosen from the larger group of site-related and medium-specific COIs. The selection of COPECs for a DEQ Level III Baseline ERA is the same process as for calculation of Level II ETCLs. Therefore, COPECs determined during the Level II screening ERA will be applicable to all potential additional ERA evaluations conducted for the site. The screening procedures generally consider the frequency of detection, whether the chemicals are essential nutrients, background or reference chemical concentrations, ecological risk-based screening concentrations (ERBSCs), and bioaccumulation potential. In this manner, contaminants that are not expected to significantly contribute to risk are eliminated from the ERA data set. The frequency of detection and background screening procedures are described in Section 3.0. The COIs identified based on the procedures described in Section 3.0 will be subjected to the ecological risk-based and bioaccumulation screening procedures described in the following sections to select COPECs for the Terminal.

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5.1.4.1 Risk-Based Screening

According to DEQ guidance, the risk-based screening steps eliminate COIs that are not detected at the site above ERBSCs. This screening will include comparison of maximum detected concentrations (for immobile species) or the 90% UCL concentrations (for mobile species) of each COI in each direct exposure medium to DEQ's risk-based Screening Level Values (SLVs; DEQ 2001), as described in Section 5.1.3. For COIs without corresponding SLVs, chemical-specific SLVs from other COIs will be used as surrogate values (based on similarity in chemical structure) where appropriate, or other ERBSCs will be selected from the literature, as available. For surface soil, the only ecological exposure medium at the site, these alternate ERBSCs may include Dutch soil screening values (DMHSPE 2001) and ecological soil screening levels developed by EPA (EPA 2003). The SLVs and other ERBSCs used in this screening step for surface soil will be tabulated in the Level II ERA – Screening Assessment Report.

A COI will be retained as a COPEC in surface soil if it exceeds an SLV or other ERBSC by a factor of more than 5, because no protected species are expected to be exposed to site surface soil. These calculations will be tabulated for surface soil and presented in the Level II ERA – Screening Assessment Report.

5.1.4.2 Additional Screening Procedures

Three additional screening steps will be conducted. First, the bioaccumulation potential of the COIs will be assessed. The COIs in surface soil will be considered to bioaccumulate if they were listed in DEQ's Sediment Assessment Methodology described in Appendix G of the Portland Harbor Sediment Management Plan (DEQ 1999). All COIs listed as having the potential to bioaccumulate will be included in the ERA for further assessment.

Second, the maximum detection limit for each of these COIs will be compared to the chemical-specific SLV or other pertinent ERBSC to verify that the analytical methods were sensitive enough to detect a potential impact (if the detection limit exceeds the SLV, the COI generally is retained as a COPEC).

Finally, following DEQ guidance (DEQ 2001), the chemical-specific ratios of each COI concentration to its corresponding SLV or ERBSC (i.e., the COI risk ratios) will be summed to calculate a medium-specific risk ratio and then the contribution of each COI to the medium-specific risk ratio will be calculated. Those COIs that, according to DEQ guidance, contributed excessively to the medium-specific risk ratio will be retained as COPECs. The site COPECs for surface soil, identified per the above steps, will be presented in the Level II ERA – Screening Assessment Report.

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5.1.5 PRELIMINARY ECOLOGICAL EFFECTS ASSESSMENT

The COPECs developed per Section 5.1.4 will be grouped by type (i.e., metals, PAHs, chlorinated hydrocarbons, organochlorine compounds, etc.) and the general mode of action or known toxic effects to wildlife will be discussed qualitatively. This general description of potential ecological effects will be used to highlight the types of COPECs that may be more likely to effect particular types of ecological receptors (i.e., plants, terrestrial invertebrates, mammals, birds, or herpetiles). If necessary, additional receptors may be added to the ERA to assess particular ecological effects that may result due to particular COPECs at the Terminal.

5.1.6 CONCEPTUAL ECOLOGICAL EXPOSURE MODEL

The preliminary CEEM presented in Section 1.3.5 above will be modified, as necessary, to accommodate findings of the preliminary problem formulation.

5.1.7 ASSESSMENT ENDPOINTS

Assessment endpoints are written descriptions of the environmental characteristics of concern at a given site (EPA 1998). Generally, they represent ecological aspects that should be assessed in order to assure protection of the environment and allow informed site-specific risk management decisions. Developing assessment endpoints is an integral part of problem formulation because these endpoints link risk assessment results to risk-management actions. Primary considerations for selecting assessment endpoints will include ecological relevance, policy goals, societal/cultural values, and susceptibility to the environmental stressor (i.e., the site contaminant; EPA 1998). The selection of assessment endpoints also depends on:

- the species present at the site and their interaction
- types of contaminated media at the site
- complete ecological exposure pathways
- types of contaminants present.

Generally, the assessment endpoints for the Terminal will be selected to be indicative of toxic effects to receptor populations. Because no terrestrial or semi-aquatic threatened or endangered species have been identified as inhabiting the site, assessment at the individual level will not be required. At least

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one assessment endpoint will be selected for each identified assessment community and species. For each endpoint, assessment measures will be defined that describe how the endpoint will be evaluated.

5.1.8 LEVEL II SCREENING ASSESSMENT - CONCLUSIONS AND RECOMMENDATIONS

Through the procedures described above, an ecological description of the site and an understanding of whether COPECs at the site pose a risk to ecological receptors will be determined. If evaluations conducted for the Level II ERA – Screening Assessment indicate that the site is highly unlikely to pose a potential risk to ecological receptors, then no additional ERA evaluations will be conducted and the ERA will be complete. If it is determined that additional ecological assessment is necessary to better assess the potential for ecological risk to receptors due to exposure to COPECs at the Terminal, species potentially at risk and the identified COPECs will become the focus of a Level II ETCL calculation or Level III Baseline ERA, whichever is determined to be most appropriate, as described in the following sections. The results of the Level II COPEC determination and recommendations for further assessment will be presented to DEQ in a Level II ERA – Screening Report will be provided to DEQ, as described in Section 6.0.

5.2 CALCULATION OF LEVEL II ECOLOGICAL TARGET CLEANUP LEVELS

Based on the results of the Level II COPEC determination, a recommendation will be made regarding the need for further Level II ecological assessment, or a Level III ERA. This decision will be made in coordination with DEQ and will be based primarily on the number and types of COPECs and assessment species that are potentially at risk resulting from historical activities at the Terminal. This section describes the methods that, if necessary, will be used for determining Level II ETCLs. The preliminary problem formulation completed during the determination of COPECs will be considered adequate for the ETCL determination. Therefore, the determination of ETCLs will include exposure assessment, toxicity assessment, and risk characterization. However, the ETCLs will be calculated directly without presenting site-specific risks for the assessment species. Therefore, the risk characterization section will be shortened accordingly.

5.2.1 EXPOSURE ASSESSMENT

Generally, exposure assessment involves mathematically expressing the exposure of assessment species (i.e., developing site-specific exposure models for assessment species) and identifying species-

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specific and chemical-specific exposure parameters. The EPCs from the Level II COPEC determination and exposure parameters are then used within the exposure equations to calculate the estimated daily dose (EDD) of COPECs for each of the assessment species.

5.2.1.1 Exposure and Ecological Target Cleanup Level Equations

The exposure media, assessment species, and significant exposure pathways selected during the problem formulation define the exposure models required to calculate an estimated daily intake of the COPECs by the robin. For all assessment species, the estimated daily intake can generally be expressed as:

$$EDD_{total} = \frac{EDI_{soil} + EDI_{food}}{BW} \qquad \text{(Equation 5-1)}$$

where:

EDD_{total} = Total estimated daily dose of COPECs for the assessment species [mg/kg body weight (bw) per day]
EDI_{soil} = Estimated daily intake of COPECs from incidental ingestion of soil (mg COPEC per day)
EDI_{food} = Estimated daily intake of COPECs from ingestion of food/prey items (mg COPEC per day)
BW = Body weight of the assessment species (kg).

This equation is modified to be species-specific by mathematically expressing the estimated daily intake of COPECs via food and soil for a particular species. The species-specific equation is for robins and shrews is:

$$EDD_t = \frac{[(BAF \times IR_e)+IR_s] \times EPC_s \times DC_f \times SUF}{BW} \qquad \text{(Equation 5-2)}$$

where:

EDD_t = Estimated total daily dose (mg/kg-bw per day)
EPC_s = Exposure point concentration of COPEC in soil (mg/kg)
BAF = Soil-to-earthworm bioaccumulation factor (kg soil/kg worm)
DC_f = Percent of diet comprised of selected food items (unitless)
IR_e = Ingestion rate of earthworms by the assessment species (kg/day)
IR_s = Incidental soil ingestion rate by the assessment species (kg/day)
SUF = Site use factor for the assessment species, comprised of areal and seasonal partitioning of the use of the site by the assessment species (unitless).
BW = Body weight of the assessment species (kg).

Given that the calculation of risk for assessment species is the ratio of the total estimated daily dose of a COPEC to the ERfD calculated as:

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$$TQ_{species} = \frac{EDD_t}{ERfD} \quad \text{(Equation 5-3)}$$

where:

$TQ_{species}$ = Toxicity quotient for a particular COPEC, assessment species, and exposure medium (unitless)

EDD_t = The total estimated daily dose of a given COPEC by an assessment species from a particular exposure medium (mg COPEC/kg body weight per day)

ERfD = The ecological reference dose for a given COPEC and assessment species (mg COPEC/kg body weight per day).

Then by setting the TQ to 1 and combining equations 5-2 and 5-3, the ETCL (a.k.a. the EPC at which the TQ=1) for the robin can be calculated as:

$$ETCL_{robin} = \frac{ERfD \times BW}{[IR_s + (BAF \times IR_e)] \times DC_e \times SUF} \quad \text{(Equation 5-4)}$$

This equation is used in the Level II ETCL calculation. The following sections define the required species-specific and chemical-specific exposure parameters.

5.2.1.2 Species-Specific Exposure Parameters

The species-specific parameters required for equation 5-4 include:

- total dietary intake (kg dw/day)
- plant matter intake (kg dw/day)
- animal matter intake (kg dw/day)
- incidental soil ingestion (kg dw/day)
- Dietary composition of selected food items (%)
- body weight (kg)
- home range (acres)
- migration factor (%).

Various sources in the scientific literature will be reviewed for information on these species-specific parameters. The Wildlife Exposure Factors Handbook (EPA 1993) will be the preferred source for these exposure parameters. If particular exposure parameters are not reported in the handbook, other literature will be used to obtain the necessary exposure factors. In general, average values found in or

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calculated from the literature will be used for each exposure parameter. Any variations from this approach will be noted in a Level II ERA ETCL Determination Report.

5.2.1.3 Chemical-Specific Exposure Parameters

In order to calculate the COPEC concentrations in each medium (including prey items), the following chemical-specific exposure parameters may be required:

- soil-to-biota bioaccumulation factors (BAFs)
- dose-to-tissue biotransfer factors (BTFs).

Bioaccumulation is the adsorption of chemicals into tissue via all exposure routes (e.g., direct absorption, inhalation, or ingestion). The BAF is a measure of the transfer and accumulation of COPECs from a medium (e.g., surface soil) into the tissue of a receptor that resides in the soil or forages on invertebrates or other soil-dependent prey items (excluding plants). For example, an earthworm BAF is the ratio of chemical in worm tissue to that found in the surrounding soil (mg chemical/kg tissue per mg chemical/kg soil = kg soil/kg tissue). Earthworm BAFs for inorganic chemicals and PCBs will consist of median values provided by Sample et al. (1998). The BAFs for other organic chemicals will be estimated from the lipid content of soil invertebrates (2 percent) and an average site-specific surface soil organic carbon content, using the following predictive BAF model (Menzie et al. 1992):

BAF = Earthworm Lipid Content / (0.66 x Fraction Organic Carbon in Soil) Equation 5-5

BTFs are ratios of the concentrations of chemicals in food items to the concentrations in receptor tissues. These will be obtained, as necessary, from various species-specific and chemical-specific peer-reviewed literature.

5.2.2 TOXICITY ASSESSMENT

The toxicity data to be used in the Level II ETCL calculation include toxicity benchmark doses (TBDs) selected from appropriate references for the COPECs. The TBDs may be used directly as ecological reference doses (ERfDs) or are converted to ERfDs, as appropriate using uncertainty factors that are defined by DEQ (2001). The TBDs selected for this ERA, and the process to convert TBDs to ERfDs, will be described in the ERA report.

The principal data sources for TBDs will be:

- EPA's Ecological Soil Screening Level reports (EPA 2003)

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- Summary reviews of available toxicity data (Sample et al. 1996)
- Peer-reviewed literature sources (journal articles and scientific publications)
- EPA's Integrated Risk Information System (IRIS)
- Chemical-specific Toxicological Profiles produced by Agency for Toxic Substances and Disease Registry (ATSDR)
- The National Institute of Occupational Safety and Health [NIOSH] Registry of Toxic Effects of Chemical substances (RTECS).

Oral dose studies will be the only sources used for the selection of TBDs. Some of the toxicity studies from these sources provide toxicity information in the form of a food or drinking water concentration (i.e., mg chemical/kg food or mg chemical/L water). In this case, the food or drinking water concentration will be transformed to a dose (mg chemical/kg body weight per day). This conversion requires knowledge of the amount of food eaten per day by the test species and its body weight. Preferably, this information was obtained from the text in which the toxicity information was found. However, such information was not always provided. In this event, daily food ingestion rates and body weights for the test species will be obtained from other sources (e.g., EPA 1988, 1993, or Dunning 1993) and used to convert the chemical content of a food item into a TBD. For this conversion, it will be assumed that the effective dose of a chemical is 100 percent of the ingested dose (i.e., 100% bioavailability was assumed). When possible, mean ingestion rate or body weight values will be used or calculated, but discrete values will be used in the absence of a mean or the data to calculate one. An attempt also will be made to only use ingestion rate and body weight parameters for the same species as used in the pertinent toxicity study, but this is not always possible and parameters for similar species will be substituted as required.

When possible, a chronic NOAEL will be selected as the TBD for protected species and a LOAEL will be selected as the TBD for other species. In the absence of a LOAEL or NOAEL, a no-observed-effect-level (NOEL), lowest-observed-effect-level (LOEL), or other toxicity endpoint will be selected an converted to NOAELs or LOAELs using uncertainty factors. The actual effects threshold is likely to fall between the NOAEL or LOAEL, but these two values were substituted as the threshold doses for this ERA because most often it is not possible to predict the actual effects threshold from the available literature.

Data for chronic toxicity will be chosen when available; however, subchronic and/or acute data will be used if chronic data are unavailable, and converted to chronic data using uncertainty factors. If no TBD can be obtained or calculated for a particular chemical and/or indicator species and a TBD for a

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surrogate chemical cannot be applied. that contaminant will not be evaluated quantitatively for that species.

For many chemicals there will be several toxicity studies identified in various sources. Most often, the different studies investigated provided data regarding different toxicological endpoints. The process of selecting an appropriate TBD required an assessment of the appropriateness of the various endpoints. In general, data indicative of overt health effects to individual organisms that resulted in population level effects will be preferred. These may include reproductive effects, survival, or mortality. Other less adverse effects endpoints, such as changes in organ weight or subtle physiological effects, will be used only in the absence of the preferred endpoints. Preference for particular endpoints will be established as follows:

- **Primary Significance** – Reproductive effects such as decreased fertility, teratogenicity, and developmental/fetal mortality, which could impact the species population; survival, which could impact population numbers in future generations; and severe histopathological effects such as necrosis of or serious damage to organs such as the liver, kidneys, brain/central nervous system, and lungs, which could impact primary body functions and result in mortality.

- **Secondary Significance** – Alterations in function of organs and/or behavior that could result in decreased survival.

- **Tertiary Significance** – Alterations such as decreased liver size, increased chemical concentration in blood, or increased body weight that are not readily associated with decreased reproduction, reduced survival, or increased mortality.

Carcinogenic endpoints are not considered appropriate for the selection of TBDs. This is in accordance with the current understanding that cancer is not generally considered to be a threat for free-ranging wildlife species because they are relatively short-lived and cancers do not have time to develop.

Chronic LOAELs will be selected as the TBDs for non-protected species. The actual effects threshold is likely to fall between the NOAEL or LOAEL, but these two values will be substituted as the threshold doses for this ERA because most often it is not possible to predict the actual effects threshold from the available literature.

Because toxicity data are unavailable for many species, a body weight adjustment (Sample et al., 1996; Sample and Arenal, 1999) will be made as necessary to extrapolate an ERfD for an assessment species when the ERfD is available for another species in the same taxonomic class. This body weight extrapolation will occur according to the appropriate body weight scaling equations provided by the EPA (1993)

$$ERfD_r = TBD_t \times (BW_t / BW_r)^P \qquad \text{(Equation 5-6)}$$

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where:

$ERfD_r$	=	Ecological reference dose for the robin (mg/kg-bw per day)
TBD_t	=	Toxicity Benchmark Dose for the test species (mg/kg-bw per day)
BW_t	=	Body weight of the test species (kg)
BW_r	=	Body weight of the robin (kg)
P	=	Appropriate exponent for the assessment species (unitless; EPA 1993)

5.2.3 ECOLOGICAL TARGET CLEANUP LEVELS

Site-specific ETCLs will be calculated using the equations and input parameters described above.

5.2.4 HOT SPOTS

The Oregon cleanup rules require the remedial investigation to evaluate hot spots of contamination for media other than water [OAR 340-122-080(7)]. The Oregon cleanup rules dictate that a hot spot in water be defined during the feasibility study and, therefore, will not be addressed in the ERA. The acceptable hot spot concentration for exposure to individual ecological receptors or population of receptors to each individual substance is 10 times the acceptable risk level, or where COPECs are reasonably likely to migrate such that a hot spot would be created in another medium, or when COPECs are not reliably able to be contained. Sample locations that have COPEC concentrations that exceed these criteria will be described as hot spots.

5.2.5 RISK CHARACTERIZATION

Typically the risk characterization section is used to present and discuss uncertainties associated with the predicted ecological risks. However, for the Level II ERA, no toxicity quotients or indices will be calculated. Therefore, the risk characterization will summarize the locations where COPEC concentrations exceed ETCLs and hot spot locations in surface soil. In addition, the uncertainties associated with the Level II ERA process will be presented and discussed with regard to their potential to result in over or under estimation of the actual ecological risks.

5.2.6 LEVEL II ERA – ETCL DETERMINATION - CONCLUSIONS AND RECOMMENDATIONS

If required, the procedures and results of the Level II ERA – ETCL determination will be provided in a report to be submitted to DEQ, as described in Section 6.0. It is anticipated that the ETCLs

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will be used to determine the need for site remediation for protection of ecological receptors and where remedial actions may be necessary to reduce risk to acceptable levels.

5.3 LEVEL III ECOLOGICAL RISK ASSESSMENT

In accordance with DEQ (2001) guidance, the Level III ERA will include problem formulation, exposure assessment, toxicity assessment, and risk characterization. The problem formulation completed during the Level II COPEC screening will incorporated into the Level III ERA with updates, as necessary given any additional information acquired during the Level III assessment. The following sections describe the procedures to be used for the exposure assessment, toxicity assessment, and risk characterization.

5.3.1 LEVEL III EXPOSURE ASSESSMENT

The exposure assessment includes mathematically expressing the methods for quantifying exposure of assessment species (i.e., site-specific exposure models), definition of the local populations of assessment communities and species, determination of exposure areas and/or habitat patches for each assessment species, definition of the relative habitat quality for each habitat patch, calculation of exposure point concentrations (EPCs) for exposure areas and/or habitat patches, and presentation of the exposure parameters. The EPCs and exposure parameters are then used within the exposure models to calculate the estimated daily dose (EDD) of COPECs for each of the indicator species.

5.3.1.1 Exposure Dose Equations

The exposure media, indicator species, and significant exposure pathways selected during the problem formulation will be used to create the exposure models (i.e., equations) to calculate an estimated daily intake of the COPECs for each indicator species. Exposure models generally are not developed for indicator communities because potential risks to communities are assessed by direct comparison of EPCs in each medium to ERBSCs. For assessment species, an ingestion rate and body weight are included in the equation, resulting in calculation of an exposure dose, as follows:

$$D_j = \sum_{k=1}^{q} \sum_{i=1}^{a} \left[\left(\frac{IR_i \times C_{ijk}}{BW} \right) \times \left(\frac{Ha_k Hq_k}{\sum_{k=1}^{q} (Ha_k Hq_k)} \right) \right] \times TUF \qquad \text{Equation 6-7}$$

where:

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D_j = Dose for a given assessment species for the jth contaminant (mg/kg body weight [bw] per day)

q = Total number of kth habitat patches within local population boundary (unitless)

d = Total number of ith media (unitless)

IR_i = Intake rate for the ith medium (kg/d or L/d)

C_{ijk} = Concentration of jth contaminant in i^{th} medium in k^{th} habitat patch (mg COPEC/kg)

BW = Body weight of the assessment species (kg)

Ha_k = Area of kth habitat patch (square meters)

Hq_k = Relative habitat quality of kth habitat patch for a given assessment species (unitless)

TUF = Temporal utilization factor (unitless).

Ingestion rates and body weights for each assessment species (i.e., species-specific exposure parameters); COPEC concentrations in each media (including prey items); local population boundaries; habitat patch size and quality; and species specific temporal use factors must be determined to support these calculations. These procedures are defined in the following sections.

5.3.1.2 Exposure Parameters

Exposure parameters are species-specific and chemical-specific measures that determine the extent of exposure for the assessment communities and species. These parameters will be the same as described above for the Level II ETCL calculation.

5.3.1.3 Exposure Point Concentrations

The EPCs for COPECs in surface soil will be the 90% UCL, and will be used to calculate exposure of the assessment species to COPECs. If particular exposure areas, habitat patches, or groups of habitat patches (for a given species) include a subset of all samples that were used to calculate EPCs for the Level II COPEC screening assessment, then the appropriate subset of samples will be used to re-calculate a 90% UCL for the particular exposure area or habitat patch(es). The same methodology as used in the Level II COPEC screening will be employed to calculate these more specific EPCs.

5.3.1.4 Local Receptor Population Boundaries

Establishing local population boundaries for assessment communities and species, limits the number of individuals considered in the ERA to those likely to be exposed to site-related contamination. For sessile assessment communities (i.e., plants and terrestrial invertebrates), the local population will be all the individuals within habitat patches (determined as described in the next section). If habitat patches

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for these sessile receptors cannot be clearly defined, then the local population will be all individuals within areas where the receptors could be exposed to site-related COPECs.

For assessment species, the local population will include all individuals within five home-range diameters (D_{HR}) from the outer boundary of the area of site-related contamination. This will be approximated using the following equation from DEQ (2001):

$$A = \frac{100 \times HR}{\pi} \qquad \text{Equation 5-8}$$

where:

A = Areal extent of the study population (m^2)
HR = Home range area (m^2)
π = Pi (3.14).

Actual residency of transient or migratory species within the local population boundaries may be adjusted using the temporal utilization factor as described in Section 5.3.1.6 below.

5.3.1.5 Determination of Habitat Patches

Following determination of the areal extent of the study populations, the number, size, and quality of habitat patches will be determined within the local population boundaries. The different habitat types present at the Terminal will be mapped and described. The expected use of these habitats by each assessment community and species will be described with regard to the extent of each habitat (or habitats) likely to be inhabited. These areas will become the habitat patches for each receptor. Then the spatial extent of each species' habitat patch(es) will be estimated. The relative quality of the habitat patches used by each assessment community and species will also be rated as unsuitable (0), poor (0.25), average (0.5), good (0.75), or excellent (1.0) based on site surveys, professional judgment, and species requirements. The number, area, and quality of habitat patches are all factors within equation 5-7 above.

5.3.1.6 Temporal Use Factors

Some of the assessment species are expected to be transient or migratory. These species travel from place to place and are not exposed throughout the year to site-related contamination at the Terminal. For these species, a temporal use factor (TUF) will be applied to the exposure dose calculation to quantify the number of days per year the species is expected to be exposed to contaminated media at the site. Non-hibernating, non-migratory species will have a TUF of 1. Other species will have a TUF between 0 and 1.

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5.3.2 TOXICITY ASSESSMENT

The ecological toxicity assessment will provide estimates of the ERfD of each COPEC. This is the concentration, above which significant effects would be expected for the assessment species. Toxicity benchmark doses (TBDs) will be selected from the literature and converted to species-specific doses (ERfDs) using uncertainty factors. The sources for the TBDs may include:

- Oak Ridge National Laboratory (Sample et. al., 1996)
- Agency for Toxic Substances and Disease Registry (ATSDR) toxicity profiles
- USFWS synoptic reviews of hazards to fish, wildlife, and invertebrates
- EPA's IRIS database
- Registry of Toxic Effects of Chemical Substances (RTECS), a National Institute of Occupational Safety and Health on-line database
- Health and Safety Databank (HSDB), a National Library of Medicine on-line database
- Oil and Hazardous Materials/Technical Assistance Data System (OHM/TADS), an EPA on-line database
- The Michigan Department of Natural Resources' Chemical Evaluation Search and Retrieval System (CESARS)
- Other peer-reviewed technical publications.

The toxicity endpoint for assessment species, will be the dose that is lethal to 50% of the population (LD_{50}). When such values are not available, different effects levels such as no-observed-adverse-effect-levels (NOAELs) or lowest-observed-adverse-effect levels (LOAELs) will be used, as available, and converted to preferred toxicity benchmark values using uncertainty factors (UFs). When more than one UF is necessary for a particular TBD, UFs will be multiplied together or applied in sequence. The UFs for converting effects levels and their application (DEQ 2001) include:

- NOAEL to LOAEL: UF = 5
- Subchronic to Chronic: UF = 10
- Acute to Chronic: UF = 33
- Chronic NOAEL to LD_{50}= 100.

Data for species of the same family, order, genus, or species will be preferentially selected when available. If this is not possible, toxicity data for species within the same taxonomic class will be used and extrapolated to the assessment communities and species using uncertainty factors. No extrapolations

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between taxonomic classes (e.g., from birds to mammals) will be performed. The uncertainty factors will be applied to calculate TBDs that are considered equivalent to chronic LC_{50} or LD_{50} values. Taxonomic extrapolations will be performed as follows:

- Different taxonomic family: UF = 2
- Different taxonomic genus: UF = 2.

The concentrations and doses of COPECs that result following application of the uncertainty factors will be the ERfCs and ERfDs used in the risk calculations.

Within certain classes of chemicals (e.g., butylbenzenes, PAHs, and pesticides), toxicity values for one COPEC (i.e., surrogate chemicals) may be substituted for another COPEC when a chemical-specific toxicity value is not available for the latter COPEC. All surrogate chemical substitutions will be noted within the Level III Baseline ERA Report, as described in Section 6.0.

5.3.3 RISK CHARACTERIZATION

Risk characterization involves calculation, presentation, and description of the potential risks for the assessment communities and species. The risk characterization also includes discussion of the uncertainties associated with the predicted risks and of the potential for the predicted risks to represent significant population level effects at the site.

5.3.3.1 Risk Estimation

The acceptable risk level (ARL) for populations of ecological receptors is a 10 percent chance, or less, that 20 percent or more of the total local population would have an exposure greater than the ERfC or ERfD for each COPEC. Risk estimation will involve the following:

- Estimating the local population abundance of the assessment communities and species
- Estimating the probability that an individual of an endpoint species will experience an exposure in excess of the ERfC or ERfD
- Using a cumulative binomial distribution function to estimate the number of individuals likely to have a greater than 10 percent chance of being exposed at a concentration greater than the ERfC for assessment communities or the ERfD for assessment species
- Determining whether the number of exposed individuals is greater than 20 percent of the local population.

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If fewer than 20 percent of the individuals within the local population of each assessment community and species are predicted to be exposed, or if there is less than a 10 percent chance of exposure above the ERfC or ERfD, then acceptable risks exist at the site.

5.3.3.2 Local Population Abundance

The local population includes all individuals within the local population boundary and will be determined using population density estimates. These estimates will be obtained from available literature or local biologists. For assessment communities, the density of expected dominant species within each community will be used. If reliable population density estimates cannot be obtained from these sources, onsite surveys may be conducted for the assessment communities. For assessment species, if site-specific density estimates are not available, then scaling relationships will be used to estimate population density based on the species body mass (Damuth 1993; Juanes 1986).

5.3.3.3 Probability of Exposure Exceeding Toxicity Reference Values

The probability of exposure exceeding the ERfC or ERfD will be estimated using the following equation:

$$p = \phi_Z\left(\frac{x_{EXP} - \ln(EBV)}{s_{EXP}}\right) \qquad \text{Equation 5-9}$$

where:

P = Probability of exposure (unitless)
$\emptyset_Z$ = Cumulative distribution function of a standard normal random variable
x_{exp} = Mean of natural logarithms of exposure (mg/kg, mg/L, or mg/kg per day)
EBV= Point value of the calculated exposure (mg/kg, mg/L, or mg/kg per day)
s_{exp} = Standard deviation of natural logarithms of exposure (unitless).

5.3.3.4 Acceptability of Risk

The probability that 20 percent of the individuals in a population experience an exposure greater than a toxicity reference value will be determined using the following binomial probability function:

$$b(y,n,p) = \binom{n}{y} p^y (1-p)^{n-y} \qquad \text{Equation 5-10}$$

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where:

- b = Probability of 20 percent of the individuals in a population experiencing an exposure greater than the toxicity reference value
- y = 20 percent of the population
- n = The number of individuals in the local population
- p = Probability of an individual experiencing an exposure greater than the toxicity reference value.

As noted above, this probability will be used to determine whether the exposure of assessment communities and species meets the ARL.

5.3.4 UNCERTAINTY ANALYSIS

An uncertainty analysis will be conducted for the baseline ERA to examine the sources and magnitude(s) of potential uncertainty associated with the risk estimates. Sources of uncertainty include the data available for the site investigations, receptor population and exposure pathway identification, exposure parameter selection, and toxicity criteria used to characterize risk. Each of these potential sources of uncertainty will be evaluated qualitatively to determine the likely degree of uncertainty associated with the risk estimates, and whether the uncertainty has likely led to over- or under-estimates of risk.

5.3.5 PREDICTED ECOLOGICAL RISKS

The affects of the uncertainties on predicted ecological risks will be described to determine whether the risk estimates need adjustment given the uncertainties. In this manner, a better understanding is provided regarding the likelihood of the predicted effects being realized in local receptor populations.

5.3.6 LEVEL III ECOLOGICAL TARGET CLEANUP LEVELS

Media-specific ecological target cleanup levels (ETCLs) will be calculated for each of the final COPECs that contribute a majority of the predicted ecological risks. Finally, to the extent possible given the sampling design, the areal extent of chemical concentrations that exceed ETCLs will be plotted to aid in the determination of any remedial action at the site.

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5.3.7 LEVEL III CONCLUSIONS AND RECOMMENDATIONS

The primary goals of the baseline ERA are to document whether a potential exists for significant ecological risk at the site and to determine ETCLs. The risks will be summarized and discussed in the context of the assessment endpoints identified during completion of the problem formulation in a Level III Baseline ERA report, as described in Section 6.0.

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6.0 RISK ASSESSMENT DELIVERABLES

The deliverables to be submitted to DEQ for review and comment for the human health and ecological risk assessments are described in the following sections. It is anticipated that the risk assessment reporting will be completed in 2005.

6.1 HUMAN HEALTH BASELINE RISK ASSESSMENT (HHRA) REPORT

The baseline HHRA report will include identification of COPCs and the results of EPC calculation for human receptors, as well as provide the results of the exposure assessment, dose-response assessment, risk characterization, and uncertainty analysis. The results of the baseline HHRA will be used to define acceptable risk levels for human receptors for development of remedial alternative for the Terminal, as part of the feasibility study.

6.2 LEVEL II ECOLOGICAL RISK ASSESSMENT – SCREENING ASSESSMENT REPORT

The Level II ERA – Screening Assessment Report will include identification of COPECs and exposure pathways for ecological receptors, an ecological description of the site, as well as the uncertainties associated with each identified risk and the assumptions made in the assessment. Also, if data gaps were identified during the Level II – Screening Assessment, recommendations may be made regarding collection of additional data. This information will be used to make recommendations as to whether COPECs at the site pose a risk to ecological receptors and whether additional ecological assessment is required. Recommendations will include either of the following: 1) no further evaluation, 2) calculation of ETCLs, or 3) performance of a baseline ERA.

6.3 LEVEL II ECOLOGICAL RISK ASSESSMENT – TARGET CLEANUP LEVELS DETERMINATION (IF REQUIRED)

If required, the Level II ERA – Target Cleanup Levels Determination Report will provide the ETCLs calculated using the methodology described in Section 5.2. It is anticipated that the ETCLs will be used during the development of remedial alternatives for the feasibility study to determine the need for site remediation for protection of ecological receptors and where remedial actions may be necessary to reduce risk to ecological receptors to acceptable levels.

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6.4 LEVEL III BASELINE ECOLOGICAL RISK ASSESSMENT (IF REQUIRED)

The Level III Baseline ERA report will provide the results of the Level III ERA baseline exposure assessment, toxicity assessment, and risk characterization, as well as EPC values, assumptions used in the evaluations, and the uncertainties analysis. The report will also provide a description of which, if any, COPECs are likely to require remediation for the protection of ecological receptors and recommend areas where remediation would prove most effective. Any such recommendations will also take into account other remedial actions that may be identified within the overall Phase III RI/FS process. Additionally, any data gaps that are identified during the Level III ERA will be reported and recommendations will be made regarding the need to address the data gaps and whether further ecological assessment is required.

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7.0 USE OF THIS REPORT

This risk assessment work plan has been prepared by Landau Associates for the exclusive use of Time Oil Co. for specific application to the Northwest Terminal. Services for this project were conducted in accordance with the Environmental Services Contract between Time Oil Co. and Landau Associates, Inc. Landau Associates has performed our services in accordance with generally accepted engineering and consulting standards for environmental work in effect at the time and locality services were performed. The reuse of information, conclusions, and recommendations provided herein by Time Oil Co. or others in connection with any site other than the Northwest Terminal without Landau Associates written permission shall be at the sole risk of Time Oil Co. and without liability to Landau Associates.

This document was prepared under the supervision and direction of the following key staff.

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LANDAU ASSOCIATES

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July 15, 2005

Mr. Tom Roick
Oregon Department of Environmental Quality
2020 SW Fourth Avenue, Suite 400
Portland, OR 97201-4987

RE: TIME OIL NORTHWEST TERMINAL
PORTLAND, OREGON

Dear Mr. Roick:

On behalf of Time Oil, attached is the April, May, and June 2005 quarterly report for Time Oil Northwest Terminal RI/FS.

LANDAU ASSOCIATES, INC.

Rebekah Brooks
Project Manager

RB/tam
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Enclosure

cc: Mr. Mark Chandler, Time Oil Co.
Ms. Patricia Dost, Schwabe Williamson & Wyatt
Mr. Mike Tischuk, Beazer East, Inc.

QUARTERLY REPORT TO DEQ
TIME OIL - NORTHWEST TERMINAL
April through June, 2005

SUMMARY OF WORK PERFORMED

- Prepared and submitted the January – March 2005 quarterly report to DEQ.
- Continued operation of the groundwater interim action in the lower zone at RW-2 at an average flow rate of 8.9 gpm.
- Continued operation of groundwater recovery in the upper zone at the groundwater intercept system at the east-west trending storm drain line (SDM-1) at an average flow rate of 1.2 gpm.
- Conducted intermittent operation of groundwater recovery in the upper zone from horizontal recovery well (HRW-1) at an average flow rate of 0.41 gpm.
- A total of approximately 21.19 million gallons of groundwater have been treated and discharged from the interim action system, with a total of about 0.56 million gallons treated during this quarter.
- Continued review of the system operations performance for the groundwater interim action system at RW-2 and HRW-1, the groundwater intercept system at SDM-1, and the onsite wastewater treatment plant (WWTP).
- Collected effluent samples from the WWTP throughout the quarter to evaluate the treatment system efficiency. Laboratory analysis of the effluent samples collected indicated that the system was operating within the established permit limitations.
- Conducted the second quarter 2005 groundwater monitoring event in June 2005. Continued the sampling frequency recommended in our February 2, 2004 letter to DEQ, as approved by DEQ in an email from Tom Roick on February 3, 2004. We understand that Time Oil will receive final approval for the revised sampling frequency soon.
- Measured natural attenuation parameters (e.g., pre-purge, down-hole, dissolved oxygen and oxidation reduction potential measurements) during the second quarter 2005 groundwater monitoring event for use in preparation of a source control evaluation approach.
- Obtained access from the Port of Portland to sample two monitoring wells located on the Port property directly to the north of the Northwest Terminal for definition of the northern boundary of the locality of facility. We attempted to sample the wells during the second quarter 2005 groundwater monitoring event, but the wells were dry. We will coordinate with the Port on another sampling attempt during the fourth quarter 2005 groundwater monitoring event when water levels are expected to rise.
- Completed preparation of the *Fourth Quarter 2004 Groundwater Monitoring and Groundwater Interim Action Status Report*, July 2004 and submitted to DEQ.
- Began preparation of the *First Quarter 2005 Groundwater Monitoring and Groundwater Interim Action Report*, including evaluation of analytical data from the post-injection groundwater sampling event for the second full scale *in situ* chemical oxidation (ISCO) injection event conducted in January 2005.

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- Received and began processing and validation of second quarter 2005 (June 2005) groundwater monitoring data.

- Continued revision of the draft Phase III RI report in response to DEQ's comments. The final Phase III RI report will be provided to DEQ on July 20, 2005.

- Continued passive product recovery in wells LW-21S and LW-27S using passive bailers. The product is temporarily being stored in a 55-gallon drum in a designated location at the terminal pending disposal. Product socks were not reinstalled at any of the wells in the Main Tank Farm area during the second quarter 2005 monitoring event, because product was not observed at any of the other wells. The spent product socks are being temporarily stored in a 55-gallon drum in a designated location at the terminal pending disposal.

- Continued preparation of a work plan for performance of the terminal-wide human health and ecological risk assessments. The work plan is expected to be submitted to DEQ in July 2005.

- Prepared an outline for a source control evaluation approach for discussion in our meeting with DEQ on July 20, 2005.

RESULTS COLLECTED

- Influent/effluent samples from the WWTP for April and May 2005. The analytical results from the sampling events indicated that the WWTP was operating within the established permit limits. The data results will be presented in the *Second Quarter 2005 Groundwater Monitoring and Groundwater Interim Action Status Report.*

- Final groundwater data for the second quarter 2005 groundwater sampling events. Data results will be presented in the *Second Quarter 2005 Groundwater Monitoring and Groundwater Interim Action Status Report.*

PROBLEMS ENCOUNTERED AND STEPS TO RESOLVE

- The motor for the water recovery pump in operation at SDM-1 developed operational problems and was replaced in late June 2005.

WORK TO BE PERFORMED NEXT QUARTER

- Prepare and submit quarterly report to DEQ.

- Continue implementation of the groundwater interim action in the lower zone at RW-2. Continue to operate the groundwater intercept system at the storm drain (SDM-1). Continue groundwater treatment and discharge to POTW. Continue review of the system operations performance for the groundwater interim action system at RW-2, HRW-1, SDM-1 and the onsite wastewater treatment system.

- Continue to monitor the effluent from the WWTP.

- Complete preparation of the *First Quarter 2005 Groundwater Monitoring and Groundwater Interim Action Report,* including post-injection groundwater results from the second full-scale ISCO injection event, and submit to DEQ.

- Prepare the *Second Quarter 2005 Groundwater Monitoring and Groundwater Interim Action Report.*

- Continue passive product recovery in wells in the Main Tank Farm Area, as appropriate.

- Conduct the third quarter 2005 groundwater monitoring event in August 2005.

- Complete preparation of the risk assessment work plan and submit to DEQ.

- Revise and finalize the Phase III RI report and submit to DEQ.

- Provide an outline of a source control evaluation approach to DEQ. Meet with DEQ on July 20, 2005, to discuss the approach. Prepare and begin implementation of a source control evaluation work plan, based upon an agreed approach.

First Quarter 2005 Groundwater Monitoring and Groundwater Interim Action Status Report Time Oil Northwest Terminal Portland, Oregon

August 1, 2005

Prepared for

Time Oil Co.
2737 W. Commodore Way
Seattle, Washington 98199

LANDAU ASSOCIATES
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1.0 INTRODUCTION

This report provides the results of the first quarter 2005 groundwater monitoring event conducted as part of the ongoing Phase II and III remedial investigation (RI) activities at the Time Oil Northwest Terminal (terminal) in Portland, Oregon. This report also provides performance and status information for the Phase II groundwater interim action currently ongoing at the terminal. Prior to the fourth quarter 2003 event, groundwater monitoring was focused on wells drilled for the Phase II RI at locations within and downgradient of the former pentachlorophenol (PCP) mixing area. Quarterly groundwater monitoring of the Phase II wells has been ongoing at the terminal since April 1997. Within the Phase II area, groundwater monitoring also continued this quarter to evaluate the effectiveness of the full-scale *in situ* chemical oxidation (ISCO) activities conducted in July 2004 and January 2005. Starting with the fourth quarter 2003 event, groundwater monitoring data were collected from wells installed as part of the Phase III RI within the Main Terminal tank farm, Bell Terminal tank farm areas and other areas of the terminal not covered under previous investigations. Also, in October-November 2004, 12 additional monitoring wells were installed: 4 along the shoreline of the Willamette River, 4 in the Bell Terminal tank farm area, 3 in the Main Terminal tank farm area, and 1 in the Phase II RI area to replace a damaged well. The data presented in this report include the results of the second sampling event for these new wells. Details on the installation and well construction of the 12 new wells are provided in the final Phase III RI report (Landau Associates 2005a).

Data from the quarterly monitoring events are used to assess contaminant distribution and groundwater level trends across the terminal. Additional discussion of the Phase III RI activities through the fourth quarter 2004 sampling event are included in the final Phase III RI report (Landau Associates 2005a).

The terminal is a former bulk petroleum storage and transfer facility owned by Time Oil Co. (Time Oil) that is located in the industrialized Rivergate area of north Portland, Oregon (Figure 1). Time Oil ceased operations at the terminal on October 31, 2001. Groundwater monitoring is conducted in accordance with the *Phase I/II Remedial Investigation/Feasibility Study (RI/FS)* work plan (Landau Associates 1996), and the Phase III RI work plan (Landau Associates 2001). The groundwater monitoring locations at the terminal are shown on Figure 2.

The first quarter 2005 groundwater monitoring event was conducted from February 14 through February 24, 2005. This report summarizes groundwater elevation and groundwater quality data for the first quarter 2005, transmits analytical laboratory data packages and the associated data validation report, presents results of the ISCO interim action activities conducted in January 2005, and presents an evaluation of data collected during the first quarter 2005 (January 1 through March 31, 2005) for the

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groundwater interim action in the upper and lower water-bearing zones relative to compliance with defined performance criteria.

The chemical analyses conducted during this monitoring event for each groundwater sampling location are summarized in Appendix A, Table A-1. Groundwater level measurements collected at the terminal for the first quarter 2005 event and for the previous RI quarterly events since March 1997 are provided in Appendix A, Table A-2. Groundwater quality data for the first quarter 2005 event are provided in Tables A-3 and A-4 for the upper and lower zone wells, respectively. Data validation qualifiers included in Tables A-3 and A-4 are defined in Table A-5. A summary of the first quarter 2005 groundwater interim action recovery data is provided in Appendix B. Procedures for collection of water level measurements and groundwater samples and methods for evaluation are provided in Appendix C. A summary of all modifications to the Phase II groundwater quality sampling and analysis requirements, as approved by Oregon Department of Environmental Quality (DEQ), are documented and referenced in Appendix D. The data validation report for the first quarter 2005 data is provided in Appendix E. Laboratory data packages for these data are provided in Appendix F. Groundwater elevation and chlorinated phenol concentrations vs. time graphs are presented in Appendix G. PCP mass removal calculations are provided in Appendix H.

As requested by DEQ, a summary of the quarterly water quality data (detected constituents) since March 1997 for the upper and lower zone wells is being provided to DEQ on computer diskette. These tables will continue to be updated following each quarterly event.

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2.0 FIRST QUARTER 2005 GROUNDWATER MONITORING EVENT

The first quarter 2005 groundwater monitoring event was conducted from February 14 through February 24, 2005. The quarterly event included measurement of water levels at a majority of the groundwater monitoring wells, well points, and recovery wells, and at a river gauge established on the south side of the dock extending into the Willamette River (Figure 2); measurement of product thickness in all terminal wells, if observed; and collection of groundwater quality samples. The first quarter 2005 event included the sampling of the routine Phase II monitoring wells (B1, B2, D, G1A, HRW-1, J1, J2, LW-1S, LW-1D, LW-3D, LW-4S, LW-4DR, LW-6D, LW-8S, LW-9D, LW-10D, LW-11D, LW-14D, and RW-2); the storm drain intercept system (SDM-1); selected monitoring wells associated with the Phase II ISCO activities (OX-1S, OX-3S, OX-5S through OX-9S and OX-8D, LW-11S, and RW-1); wells monitored as part of the Phase II groundwater interim action (LW-13S, LW-17D, and LW-18D); and monitoring wells from the Phase III RI.

In October and November 2004, 11 additional wells were installed to address data gaps within the Main Terminal and Bell Terminal tank farm areas, including: 4 upper zone wells within the Bell Terminal tank farm area (LW-41S, LW-42S, LW-43S, and LW-44S); 5 wells located beyond the extent of the confining unit, either on the Willamette River shoreline (LW-36D through LW-39D), or on the north side of the Main Terminal tank farm area (LW-45D); and 1 upper/lower zone well pair located on the north side of the Main Terminal tank farm area (LW-40S/D). The 11 wells were sampled in the first quarter 2005, with the exception of LW-40S, which was dry during sampling.

Because the Phase II and Phase III wells were installed to monitor groundwater quality in different areas of the terminal with different historical uses, the Phase II and Phase III groundwater quality data are discussed in separate sections (Sections 2.2 and 2.3, respectively). For discussion purposes, Phase II refers to monitoring locations within and downgradient of the former PCP mixing area and warehouse, and Phase III refers to monitoring locations within and downgradient of the Main Terminal and Bell Terminal tank farm areas and associated petroleum storage operation areas.

For reference, the site monitoring wells, well points, recovery wells, and monitoring points are grouped as follows:

- Phase II: B1, B2, D, G1A, H, HRW-1, J1, J2, J3, L, LW-1S/1D, LW-3D, LW-4S/4DR, LW-5S, LW-6D, LW-8S, LW-9S/9D, LW-10S/10D, LW-11S/11D, LW-13S, LW-14D, LW-15D, LW-16D, LW-17D, LW-18D, OX-1S through OX-7S, OX-8S/8D, OX-9S, PZ-1 through PZ-4, RW-1, RW-2, SDM-1, and river outfall.

- Phase III: K, N, P, Q, O, R, LW-7S, LW-19S, LW-20S/20D, LW-21S, LW-22D, LW-23D, LW-24D, LW-25D, LW-26D, LW-27S/27D, LW-28S, LW-29S/29D, LW-30S/30D, LW-31S, LW-32S/32D, LW-33S, LW-34S, LW-35D, LW-36D, LW-37D, LW-38D, LW-39D, LW-40S/40D, LW-41S, LW-42S, LW-43S, LW-44S, and LW-45D.

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A summary of the analyses conducted at each sample location scheduled for the first quarter 2005 event is provided in Table A-1. As shown in Table A-1, only select Phase II monitoring wells were sampled during the first quarter of 2005 per the recommendations to DEQ for reduction of sample frequency the for Phase II monitoring wells (Landau Associates 2004b), with the exception of those used to monitor the ISCO injection events. The modifications to the Phase II groundwater quality sampling and analysis requirements to date, as approved by DEQ, are documented and referenced in Appendix D. Section 2.1 presents a summary of the results for the groundwater level measurements for the monitoring locations at the terminal. The groundwater quality data and evaluations of groundwater flow and contaminant occurrence and trends for the Phase II wells and the Phase III wells are presented in Sections 2.2 and 2.3, respectively. The performance and status of the groundwater recovery interim action are discussed in Section 3.0 and of the ISCO groundwater interim action are discussed in Section 4.0.

2.1 GROUNDWATER LEVEL AND PRODUCT MEASUREMENTS

Groundwater levels were measured at each well for the first quarter 2005 event on February 15, 2005. Each well was also checked for the presence of product. The measurement and evaluation results are provided in the following sections. The measurement and evaluation procedures are provided in Appendix C. The groundwater measurement locations are shown on Figure 2. Groundwater level measurements conducted for the quarterly groundwater sampling events since March 1997 are provided in Table A-2. Historical (pre-Phase II RI) groundwater level measurements conducted from 1993 through 1996 were provided in the Phase II RI report (Landau Associates 2000a).

2.1.1 PRODUCT MEASUREMENTS AND PRODUCT RECOVERY

During the first quarter 2005 event, measurable product was observed at Phase II well OX-2S, located downgradient of the former PCP mixing area. During the previous quarterly sampling event, measurable product was also observed in wells OX-1S, OX-3S, and LW-11S; no product was observed in those wells during first quarter 2005, but a petroleum odor was noted. Measurable product was observed at Phase III wells LW-21S, and LW-27S, located within the Main Terminal tank farm area during the first quarter 2005. Product was observed in well Q during fourth quarter of 2004, but was not observed during first quarter 2005. Wells LW-21S and LW-27S were installed in September 2003, and measurable product was first observed in these wells in the first quarter of 2004. Keck passive product recovery bailers were installed at LW-21S and LW-27S in March 2004. The product recovery bailer at LW-27S was removed during the second quarter 2004 sampling event because no measurable product was noted at the time the water level was measured and to allow the collection of a groundwater quality sample. The

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product bailer was reinstalled at LW-27S during the third quarter 2004 sampling event to continue the product recovery efforts. There was not enough product accumulated in these wells to conduct any product recovery during this quarter. The recovered product is temporarily contained in a 55-gal drum onsite pending appropriate offsite disposal. Monitoring wells at the terminal will continue to be monitored for the presence of product during future quarterly monitoring events.

2.1.2 UPPER WATER-BEARING ZONE

Groundwater elevations measured in the upper water-bearing zone (upper zone) wells were used to estimate groundwater flow. Groundwater elevation contours for the upper zone are presented on Figure 3. Groundwater elevations measured during the first quarter 2005 indicate that groundwater flow in the upper zone is generally to the west-southwest toward the Willamette River across the Main Terminal and Bell Terminal tank farm areas. The localized southward shift in groundwater flow that is apparent within and downgradient of the former PCP mixing area appears to be due to the influence of the east-west trending storm drain located about 170 ft north of the southern property boundary (Figure 2). The overall groundwater flow pattern observed in the upper zone does not show significant seasonal variation. Groundwater elevations measured at Phase III wells located along the confining unit boundary in the western portion of the terminal reflect the change from two water-bearing zones (upper and lower) to a single unconfined water-bearing zone. For example, wells LW-9S and LW-10S and piezometers PZ-3 and PZ-4, located near or beyond the extent of the confining unit, are typically dry during summer and fall months. During the wetter winter and spring months, groundwater is typically observed within the upper zone along this boundary. At well LW-27S, the water level appears to represent an intermediate groundwater elevation between the upper zone and lower zone, thereby indicating the edge of the confining unit and the transition from two groundwater zones to one in this area. The groundwater flow patterns in this area mirror the western extent of the confining unit boundary and groundwater gradients increase sharply where the upper and lower zones converge. In the Bell Terminal tank farm area, well LW-41S, which is located where the confining unit is thin and likely discontinuous, was dry during the fourth quarter 2004 and first quarter 2005 quarterly sampling events.

Overall, the data collected to date show that the upper zone groundwater levels are influenced by seasonal variations in precipitation, but the groundwater flow patterns do not appear to vary significantly seasonally.

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2.1.3 LOWER WATER-BEARING ZONE

Groundwater elevations measured in the lower water-bearing zone (lower zone) wells were used to estimate groundwater flow in the lower zone and in the area where the confining zone is absent. Groundwater elevation contours for the lower zone are presented on Figure 4. The groundwater flow pattern in the lower zone likely represents the combined influence of two factors: 1) upper zone groundwater flow over the confining unit boundary, and 2) the resulting hydrostatic pressure change when transitioning between confined-semiconfined conditions to unconfined conditions west of the confining unit boundary.

Groundwater recovery well RW-2 pumped continuously during the first quarter 2005 for the groundwater interim action, except for periodic shutdowns for system maintenance. The contours indicate that pumping of recovery well RW-2 has modified groundwater flow in the lower zone in proximity to the pumping well. Groundwater flow outside the well RW-2 capture zone is generally west/southwest toward the Willamette River.

2.2 PHASE II GROUNDWATER QUALITY

Analytical results for groundwater collected from the Phase II wells are used to evaluate groundwater quality within and downgradient of the former PCP mixing area and warehouse. The contaminants associated with historical operations in these areas include predominantly PCP and associated carrier compounds. The Phase II wells are currently being sampled on a semiannual basis, as described earlier, except those wells used to monitor the ISCO injection events. For this monitoring event, the analytical results for groundwater samples collected from selected Phase II wells were used to evaluate the performance of the groundwater interim action, to document water quality conditions following the January 2005 ISCO injection event in the upper zone, and to assess long-term contaminant concentrations and trends in the Phase II wells in conjunction with sampling conducted within the Phase III areas of the terminal. For the first quarter 2005 event, groundwater from 18 upper zone Phase II wells and 15 lower zone Phase II wells was sampled and analyzed. Monitoring wells LW-9S, LW-10S, and OX-4S were dry and, therefore were not sampled as part of this event. In addition, monitoring location OX-2S contained measurable product and, therefore was not sampled as part of this event. Discussions of the groundwater interim action and ISCO activities are provided in Sections 3.0 and 4.0, respectively.

Phase II groundwater samples were analyzed for some or all of the following constituents, as shown in Table A-1: semivolatile organic compounds [SVOCs; U.S. Environmental Protection Agency (EPA) Method 8270]; volatile organic compounds (VOCs; EPA Method 8260) including methyl tert-butyl ether (MTBE) at select wells; PAHs (EPA Method 8270 SIM); diesel-range and motor oil-range

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TPH (NWTPH-Dx); gasoline-range TPH (NWTPH-Gx); six priority pollutant metals (arsenic, chromium, copper, lead, nickel, and zinc; EPA Methods 6010/7000 series); ferrous iron (EPA Method SM3500); selenium (EPA Method 6010); total dissolved solids (TDS; EPA Method 160.1); chloride (EPA Method 325.2); major ions (EPA Method 9056), and field parameters (pH, conductivity, dissolved oxygen, turbidity, and temperature). Analysis for PCP using EPA Method 8270 SIM was also conducted on samples where PCP was not detected above the reporting limit using EPA Method 8270 and for monitoring of the ISCO event. The laboratory analyses were conducted by Specialty Analytical, Inc., in Tualatin, Oregon, except as follows: the ferrous iron analysis (EPA Method SM3500) for samples collected at the ISCO monitoring locations was performed by Analytical Resources Inc., in Seattle, Washington. Dioxin and furan analysis on groundwater samples from wells OX-1S, OX-6S, and RW-1 (EPA Method SW8290) was performed by Columbia Analytical, Inc. in Houston, Texas.

Analytical results for the first quarter 2005 event are provided in Table A-3 for the upper zone wells and in Table A-4 for the lower zone wells. A summary of the Phase II results is provided in the following sections.

2.2.1 Upper Water-Bearing Zone

The first quarter 2005 analytical results for the Phase II upper zone wells indicate the following:

- Samples from 6 wells and from storm drain manhole SDM-1, where the storm drain intercept system is located, contained concentrations of PCP greater than the laboratory reporting limits (Figure 5). The highest concentrations were detected in the samples from wells RW-1 and LW-11S [205 and 178 micrograms per liter (µg/L), respectively], located within and downgradient of the former PCP mixing area. In addition, groundwater from downgradient monitoring wells OX-3S, OX-6S, OX-7S, and OX-8S, and from SDM-1 contained PCP concentrations ranging from 7.2 (SDM-1) to 127 (OX-6S) µg/L. During the previous quarterly event, PCP concentrations were highest with samples from wells OX-2S (1,150 µg/L), OX-6S (624 µg/L), and LW-11S (184 µg/L). The decreasing PCP concentrations in groundwater within and downgradient of the former PCP mixing area during this event appear to reflect the impact of the July 2004 and January 2005 ISCO events. In addition to PCP, 2,3,4,6-tetrachlorophenol and 2,3,5,6-tetrachlorophenol (breakdown byproducts of PCP) were detected at concentrations ranging from 7.77 µg/L (OX-6S) to 566 µg/L (RW-1).

- Other SVOCs were detected at low concentrations; however, none were greater than 23.8 µg/L (naphthalene at OX-3S).

- VOCs, including benzene, chloroform, ethylbenzene, isopropylbenzene, 4-isopropyltoluene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, n-,sec-, and tert-butlybenzene n-propylbenzene, naphthalene, toluene, and xylenes, were detected in samples collected from 11 Phase II well locations (B1, LW-7S, -8S, -11S, OX-1S, OX-3S, OX-5S through OX-8S, and RW-1).

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- The highest concentrations of diesel-range TPH and gasoline-range TPH were observed at wells B1 [9.29 milligrams per liter (mg/L)] and LW-8S (6.16 mg/L), respectively.

- The highest individual concentrations of metals (arsenic, chromium, copper, lead, nickel, selenium, and zinc) were detected in samples collected at wells OX-6S, OX-8S, and LW-1S. Arsenic concentrations detected in samples from the upper zone Phase II wells ranged from less than the laboratory reporting limit (i.e., nondetect) at well LW-4S to 53.1 µg/L at well OX-6S. Chromium concentrations ranged from nondetect (LW-8S, OX-8S, and OX-9S) to 10.4 µg/L at well LW-1S (Figure 6); copper concentrations ranged from nondetect in all wells except OX-6S and OX-7S (44.4 µg/L and 12.1 µg/L, respectively (Figure 6); lead concentrations ranged from nondetect (D, LW-8S, LW-11S, and OX-9S) to 2.87 µg/L in OX-6S; nickel concentrations ranged from nondetect (B1, D, LW-1S, LW-7S, LW-8S, and OX-5S) to 170 µg/L in OX-8S; and zinc concentrations ranged from nondetect in most wells to 96.4 µg/L in OX-6S. Selenium was not detected in any of the samples analyzed.

- Dioxin and furan analyses were performed on samples from wells OX-1S, OX-6S and RW-1, which are located within and downgradient of the former PCP mixing area. Results from these analyses indicated concentrations, as total equivalency quotient (TEQ), ranging from 0.00256 nanograms per liter (ng/L) at RW-1 to 0.0.03724 ng/L at OX-6S.

2.2.2 Lower Water-Bearing Zone

During the first quarter 2005, PCP was detected above the laboratory reporting limit in groundwater from lower zone wells LW-6D (0.607 µg/L) and RW-2 (1.13 µg/L), as shown on Figure 7. Other SVOCs detections were limited to bis(2-ethylhexyl)phthalate, detected at well OX-8D (20.9 µg/L), and 2-methylnapthalene (1.47 µg/L at RW-2). The highest concentrations of VOCs were detected in the samples collected from wells G1A and RW-2; however, none of the detected concentrations were greater than 218 µg/L (isopropylbenzene at G1A). The highest detected concentration of diesel-range TPH was 3.6 mg/L at well G1A and the highest detected concentration of gasoline-range TPH was 3.37 mg/L at LW-17D. The highest concentrations of metals (arsenic and lead) were detected in samples collected from wells G1A, RW-2, LW-9D, LW-10D, and OX-8D. Arsenic concentrations from the lower zone Phase II wells ranged from nondetect to 4.67 µg/L at well LW-3D. Lead concentrations in the same wells ranged from nondetect to 23.6 µg/L at well OX-8D.

2.2.3 Water Level and Contaminant Trends

The first quarter 2005 data from the Phase II wells were also used to evaluate long-term groundwater level and contaminant trends for groundwater impacted by former PCP-related operations at the terminal. PCP concentrations were evaluated by generating time versus groundwater elevation and time versus concentration plots for the period covered by the Phase II RI quarterly sampling events (April

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1997, or first available, through the current quarterly event). Plots of PCP concentrations (maximum concentrations of EPA Methods 8270 and 8040 for events prior to the second quarter 2001 event) versus time for selected upper zone wells (LW-4S, LW-11S, LW-13S, and RW-1) and selected lower zone wells (LW-4D, LW-11D, and RW-2) are provided on Figures 8 and 9. Plots of groundwater elevations and PCP concentrations for upper zone wells LW-4S and LW-11S are shown on Figures 10 and 11. Figure 12 shows groundwater elevations and PCP concentrations at lower zone well LW-11D plotted with the Willamette River stage through the previous quarterly event as mentioned earlier. In addition, PCP concentrations from the first quarter 2005 event for the upper and lower water-bearing zones are shown on Figures 8 and 9 and discussed above.

As shown on Figure 8, the PCP concentrations at the selected upper zone wells show variable concentration trends over time. PCP concentrations at RW-1 decreased from first quarter 2004 through fourth quarter 2004, but increased slightly in first quarter 2005 to a concentration of 205 µg/L (from 123 µg/L in fourth quarter 2004). The concentration of PCP in RW-1 is above the historic low observed during November 2001 (17 µg/L), but well below the historic high (11,000 µg/L) observed in April, 2001. PCP concentrations at well LW-11S have continued to decrease since February 2004 (from 2,130 to 178 µg/L), and the PCP concentration for this quarter is the lowest observed at this location since well installation in 1999. Historically, PCP concentrations detected at well LW-11S appear to reflect a response to seasonal groundwater fluctuations, as shown on Figure 11; however, this trend is not apparent in first quarter 2005, possibly due to influence from the ISCO injection. PCP concentrations at LW-13S have typically been reported at less than 1 µg/L since the fourth quarter 2001 event, except during the fourth quarter of 2004. PCP was not detected at LW-13S during this quarter, and the laboratory reporting limit decreased slightly to 0.479 µg/L from 0.481 µg/L. PCP concentrations at well LW-4S appear to reflect seasonal changes in groundwater elevation and resulting changes in PCP concentrations at upgradient locations (Figure 10). The overall reductions in PCP concentrations at monitoring wells within and downgradient of the former PCP mixing area appear to be due to the July 2004 and January 2005 ISCO injection events. Further discussion on the impact of the ISCO injection event on the PCP plume is provided in Section 4.0.

As shown on Figure 9, the PCP concentration in the lower zone at RW-2 has continued to decrease since the May 2004 event (from 46.7 to 1.13 µg/L), but is still greater than the historic low PCP concentration recorded at this well in June 2001 (0.68 µg/L). Historically, sporadic detections of PCP have been observed in both LW-11D and G1A; however, during this quarterly event, PCP was not detected in either well. PCP was detected in LW-6D during first quarter 2005 at a concentration of 0.607 µg/L, for the first time since fourth quarter 2003. PCP has been detected in LW-6D five times historically, at concentrations ranging from 0.42 µg/L to 1.1 µg/L.

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Fluctuations in groundwater elevations in the upper zone reflect typical seasonal variability with seasonal lows during the fall months (October-November) and seasonal highs during the winter and early spring months (January-March) since monitoring began in March 1997. The groundwater levels during the past year are similar to those observed during previous years. Trends in PCP concentrations correlate with groundwater elevations at some locations. Figure 10 shows that there appears to be a historical correlation between the water level and PCP concentration in the upper zone at well LW-4S since the first quarter of 2002. Figure 11 shows that the PCP concentration in the upper zone at well LW-11S generally follows the water level trends in that zone over time. In the lower zone, groundwater levels show trends similar to the seasonal fluctuations in the Willamette River, as shown by the plot of groundwater elevations at LW-11D with river stage on Figure 12. However, there appears to be no correlation between PCP concentrations and groundwater/river stage elevations at LW-11D.

Concentration contours for the upper and lower water-bearing zones (Figure 8 and 9, respectively) indicate that the overall extent of the PCP plume has narrowed and the PCP concentrations are significantly lower than in previous quarters at all well locations, except for well OX-2S, where free product was observed. This reduction appears to be due to effects from the ISCO injection event, as discussed in Section 4.0.

Contaminant and groundwater level trends will continue to be evaluated and discussed as part of future quarterly events.

2.3 PHASE III GROUNDWATER QUALITY

Analytical results for groundwater collected from the Phase III wells are used to evaluate groundwater quality in the former petroleum operations areas of the terminal, mainly focusing on the Main Terminal tank farm and Bell Terminal tank farm areas. The contaminants associated with historical operations in these areas predominantly include petroleum hydrocarbons (gasoline and diesel range); volatile compounds [e.g., benzene, toluene, ethylbenzene, and xylenes (BTEX)]; polycyclic aromatic hydrocarbons (PAHs); and other associated petroleum-related compounds. For the first quarter 2005 event, groundwater from 15 upper zone Phase III wells and 17 lower zone Phase III wells was sampled and analyzed. These wells are identified in Table A-1. Monitoring wells LW-28S and LW-40S were dry and, therefore, were not sampled as part of this event. In addition, monitoring wells LW-21S and LW-27S were not sampled due to the presence of product at these well locations. The first quarter 2005 sampling event is the sixth consecutive quarterly monitoring event for the Phase III wells that were installed in September 2003 and the second sampling event for the 12 new monitoring wells installed in October 2004, as discussed previously.

Except as shown in Table A-1, all groundwater samples were analyzed for the following constituents: SVOCs (EPA Method 8270); VOCs (EPA Method 8260) including MTBE; PAHs (EPA

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Method 8270 SIM); diesel-range, motor oil-range, and gasoline-range TPH (NWTPH-Dx and NWTPH-Gx); six priority pollutant metals (arsenic, chromium, copper, lead, nickel, and zinc; EPA Methods 6010/7000 series); total dissolved solids (TDS; EPA Method 160.1); chloride (EPA Method 325.2); and field parameters (pH, conductivity, dissolved oxygen, turbidity, and temperature). The Phase III laboratory analyses were conducted by Specialty Analytical, Inc.

Analytical results for the first quarter 2005 event are provided in Table A-3 for the upper zone wells and Table A-4 for the lower zone wells. A summary of the Phase III results is provided in the following sections.

2.3.1 Upper Water-Bearing Zone

The first quarter 2005 results for the Phase III monitoring wells installed in the upper zone indicate the following:

- SVOCs (acenaphthene, bis(2-ethylhexyl)phthalate, carbazole, dibenzofuran, di-n-butyl phthalate, 2,4-dimethylphenol, fluoranthene, fluorene, 2-methylnapthalene, 2-methylphenol, 3-&-4-methylphenol, naphthalene, pentachlorophenol, phenanthrene, and pyrene) were detected in a majority of the Phase III monitoring wells, with the highest concentrations at wells LW-19S, LW-20S, LW-42S, N, P, and Q. SVOCs ranged from nondetect to 81.8 µg/L (3-&4-methylphenol at well P).

- VOCs (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 4-isopropyltoluene, benzene, ethylbenzene, isopropylbenzene, m,p-xylene, naphthalene, n-butylbenzene, n-propylbenzene, o-xylene, sec-butylbenzene, and toluene) were detected in 11 of the 15 wells sampled for these constituents. The detected VOC concentrations ranged from 1.43 µg/L (4-isopropyltoluene) at well N to 1480 µg/L (benzene) at well P. The highest ethylbenzene concentration was detected at well N (24.6 µg/L), the highest toluene concentration was detected at well N (14.3 µg/L), and the highest total xylenes concentration was detected at well N (62.4 µg/L). MTBE was not detected above the laboratory reporting limit in any of the upper zone well samples analyzed. Benzene and ethylbenzene concentrations at the upper zone monitoring locations are shown on Figures 13 and 14.

- Gasoline-range TPH was detected at six upper zone Phase III well locations (LW-7S, LW-19S, LW-20S, N, P, and Q) within the Main Terminal tank farm area. Diesel-range TPH was detected at the same wells, with exception of LW-7S. Within the Bell Terminal tank farm area, samples from six wells (LW-29S, LW-30S, LW-32S, LW-42S, LW-43S, and LW-44S) contained concentrations of diesel-range and gasoline-range TPH above the laboratory reporting limits. The highest diesel-range TPH concentration was detected at well P (16.2 mg/L) and the highest gasoline-range TPH concentration was detected at well LW-32S (4.67 mg/L). Diesel-range TPH and gasoline-range TPH concentrations at the upper zone monitoring locations are shown on Figures 15 and 16, respectively.

- The highest individual concentrations of metals (arsenic and lead) were detected in samples collected at 10 of the 15 Phase III upper zone well locations. Arsenic concentrations ranged from nondetect at wells LW-33S and LW-34S to 43.4 µg/L at well LW-19S. Lead concentrations ranged from nondetect (LW-20S, LW-29S, LW-31S, LW-32S and LW-34S)

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to 72.8 µg/L at well P. Chromium was detected in 10 of the 15 Phase III upper zone well locations, with a maximum concentration of 9.3 µg/L at well LW-44S. Copper was not detected above laboratory reporting limits in the Phase III upper zone wells. Chromium and copper concentrations at the upper zone monitoring locations are shown on Figure 6.

2.3.2 LOWER WATER-BEARING ZONE

The first quarter 2005 results for the Phase III monitoring wells installed in the lower zone indicate the following:

- PAHs (acenaphthene, acenaphthylene, anthracene, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, pyrene) were detected in 10 Phase III lower zone wells with individual concentrations ranging from 0.00509 µg/L (acenaphthene and naphthalene at well LW-20D) to 3.75 µg/L (anthracene at well LW-45D).

- Other SVOC detections were limited to bis(2-ethylhexyl)phthalate detected at 10 Phase III lower zone wells. The detected concentrations ranged from 1.26 µg/L at well LW-23D to 32.8 µg/L at LW-26D.

- Concentrations of VOCs (benzene, isopropylbenzene, naphthalene, n-butylbenzene, n-propylbenzene, sec-butylbenzene, and toluene) were detected in 6 of the 17 wells sampled, at concentrations ranging from 1.02 µg/L (toluene; LW-26D) to 8.96 µg/L (isopropylbenzene; LW-23D). MTBE was detected in two Phase III lower zone wells (LW-26D and LW-27D) located within the Main Terminal tank farm area at concentrations of 5.38 µg/L (LW-26D) and 7.68 µg/L (LW-27D). Benzene and ethylbenzene concentrations at the lower zone monitoring locations are shown on Figures 17 and 18, respectively.

- Diesel-range TPH was detected in 12 of the lower zone Phase III wells sampled. Gasoline-range TPH was detected in seven of the lower zone Phase III wells. The sample from monitoring well LW-24D, located on the river bank along the western berm of the Main Terminal tank farm area, contained both the highest diesel-range TPH concentration (4.92 mg/L) and the highest gasoline-range TPH concentration (1.64 mg/L). Diesel-range TPH and gasoline-range TPH concentrations at the lower zone monitoring locations are shown on Figures 19 and 20, respectively.

- Arsenic was detected in 15 of the 17 Phase III lower zone wells at concentrations ranging from 2.92 µg/L at well LW-39D to 95.1 µg/L at well LW-25D. Five or more priority pollutant metals (arsenic, chromium, copper, lead, nickel and zinc) were detected at 6 of the 17 lower zone wells. Chromium and copper concentrations at the lower zone monitoring locations are shown on Figure 21.

2.3.3 WATER LEVEL AND CONTAMINANT TRENDS

The six quarters of data collected from the Phase III wells between November 2003 and February 2005 were used to evaluate contaminant trends within areas of the terminal historically used for petroleum operations. The analytes detected in the Phase III wells during the first quarter 2005 and

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previous quarters are predominantly constituents commonly associated with petroleum products. This contaminant trend discussion focuses on total petroleum hydrocarbons (gasoline- and diesel-range) and VOCs (benzene and ethylbenzene) because these constituents are related to former petroleum operations at the terminal and are indicative of the nature and extent of contamination for petroleum-related compounds; however, other constituents were detected, as described in the previous section. The diesel-range and gasoline-range TPH, benzene, and ethylbenzene concentrations for the upper and lower water-bearing zones for the first quarter 2005 are shown on Figures.

Since the primary groundwater transport pathway of concern at the terminal is from groundwater to surface water, the groundwater analytical results were contoured using preliminary screening levels. The preliminary screening levels were based on the most conservative published value from the EPA National Recommended Water Quality Criteria (organism only; EPA 2002); DEQ ecological risk screening level values (SLVs; DEQ 2001); Oregon Ambient Water Quality Criteria for Freshwater (fish consumption only; DEQ 2004); and DEQ generic risk-based concentrations for petroleum constituents and total petroleum hydrocarbons (DEQ 2003). As shown in Table A-5 and on Figure 22, the analytical results indicate that none of the concentrations detected in the groundwater samples from the shoreline wells were greater than the preliminary screening levels. This information confirms that there is not a current complete exposure pathway to receptors in the river via groundwater.

Trends of TPH and associated petroleum-related VOC concentrations were also evaluated using time versus groundwater elevation and time versus concentration plots for the period covered by the Phase III RI quarterly sampling events (October 2003 through the latest quarterly event) and quarterly events since February 1999 for well LW-8S. Plots of diesel-range and gasoline-range TPH concentrations for selected upper zone and lower zone wells in the Main Terminal tank farm area are shown on Figures 23 through 26. These same constituents for upper zone wells in the Bell Terminal tank farm area are shown on Figures 27 and 28. Plots of TPH (diesel- and gasoline-range), benzene, and ethylbenzene including groundwater elevation and Willamette River stage (lower zone wells only) for one upper zone well (LW-8S) and selected lower zone wells (LW-23D and LW-25D) in the Main Terminal tank farm area and upper zone well (LW-32S) in the Bell Terminal tank farm area are provided on Figures 29 through 32 (note the logarithmic scale on these figures). Plots of diesel- and gasoline-range TPH concentrations versus groundwater elevation for paired wells in the Main Terminal tank farm area (LW-20S/D) and in the Bell Terminal tank farm area (LW-30S/D) are shown on Figures 33 and 34.

Concentrations of diesel- and gasoline-range TPH in the samples from the upper and lower zone Phase III wells generally decreased or were similar to those detected during the previous quarter, with the exception of gasoline- and diesel-range TPH concentrations in well LW-8S in the Main Terminal tank farm area, diesel-range TPH concentrations in well LW-19S in the Main Terminal tank farm area, and

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gasoline- and diesel-range TPH concentrations at wells LW-32S and LW-44S in the Bell Terminal tank farm area, respectively. The TPH concentrations in samples from these wells increased slightly since last quarter. Upper zone well LW-27S located within the Main Terminal tank farm area has contained product during four of the last five quarters ranging in thickness from 0.69 ft in February 2004 to 0.02 ft in November 2004 and February 2005. Also, during the last five quarters, measurable product was observed at LW-21S at thicknesses ranging from 1.03 ft in February 2004 to 0.02 ft this quarter. Based on information collected for the Phase III RI, the potential sources of product within the Main Terminal tank farm area include a diesel spill resulting from the rupture of Tank 29508 in 1975; an unleaded gasoline spill in the vicinity of wells N, P, and Q in 1994; and, to a lesser extent, incidental leakage along conveyance pipelines. Based on the available information, the two distinct diesel-range TPH plumes in the upper and lower zones (Figures 15 and 19) and the ethylbenzene plumes in the upper zone (Figure 14) within and near the southeast corner of the Main Terminal tank farm area represent groundwater concentrations associated with separate historic activities conducted at the terminal. The plumes to the west including upper zone monitoring location LW-8S and the other Main Terminal tank farm area wells are likely associated with spills related to former petroleum operations within the Main Terminal tank farm area. The plumes to the east including monitoring locations RW-1 and LW-11S in the upper zone, and B2 and RW-2 in the lower zone, are likely associated with carrier fluids used with PCP during wood treatment formulation activities within the former PCP mixing area. This interpretation is supported by the results for the product sample collected from well LW-11S in November 2000, which contained 3.2 percent PCP in addition to other petroleum constituents, versus the results for the product samples collected from wells LW-21S and LW-27S in April 2004, which contained only petroleum constituents (e.g., gasoline-, diesel-, and motor oil-range TPH). The plumes in the area around well LW-8S are considered to be associated with the former petroleum operations in the Main Terminal tank farm area because upper zone groundwater flow in this area appears to be to the south-southwest (Figure 3) and constituents originating in the former PCP mixing area (e.g., PCP) have not been observed at well LW-8S.

Benzene and ethylbenzene concentrations for the upper zone are presented on Figures 13 and 14, and those for the lower zone are presented on Figures 17 and 18. In general, the overall distribution of these compounds has remained unchanged over the previous five quarters based on the available data. Benzene concentrations at lower zone monitoring location LW-23D located on the riverbank to the west of the Main Terminal tank farm area continued the decreasing trend to 8.76 µg/L this quarter following the high detected during the second quarter 2004 sampling event (132 µg/L). The only other detection of benzene observed in the lower zone was at well LW-26D at a concentration of 5.6 µg/L; the only detections of ethylbenzene were at RW-2 (3.04 µg/L) and G1A (1.06 µg/L).

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The diesel-range TPH concentrations in the upper zone within the Main Terminal tank farm area have ranged between about 3,000 to 12,000 µg/L, with the highest concentration detected at well LW-19S during first quarter 2005 (Figure 23). Gasoline-range TPH concentrations in the upper zone within the Main Tank Farm area are consistently greatest at well LW-8S with concentrations over time ranging from greater than 4,000 to 15,000 µg/L since this well was first sampled in May 1999 (Figures 24 and 29). Diesel-range TPH concentrations in the lower zone within the Main Terminal tank farm area tend to be significantly greater than gasoline-range TPH concentrations at the same locations over time (Figures 25 and 26), but less overall than the upper zone concentrations for these constituents (Figures 23 and 24). Also, TPH concentrations in groundwater from lower zone wells located beyond the extent of the confining unit in the Main Terminal tank farm area tend to be greater than from wells farther to the east where the confining unit is present. This is likely the result of upper zone groundwater with higher TPH concentrations mixing with lower zone groundwater downgradient of the confining unit boundary. The highest concentration of diesel-range TPH detected since quarterly monitoring began at these wells occurred at well LW-25D in February 2004 (6,700 µg/L). The concentration detected at LW-25D this quarter was 2,200 µg/L (Figure 31). Overall, the diesel-range concentrations at this well and the other lower zone wells in the Main Terminal tank farm area were slightly lower this quarter (Figure 25). The gasoline-range concentrations for the lower zone wells in the Main Terminal tank farm area showed similar overall trends to the diesel-range concentrations (Figure 26).

In the Bell Terminal tank farm area, diesel-range TPH concentrations in the upper zone are slightly greater than the gasoline-range concentrations, with the highest concentrations occurring this quarter at LW-32S (3,130 µg/L for diesel-range TPH) and LW-44S (9,380 µg/L for gasoline-range TPH) (Figures 27 and 28). Similar or slightly higher concentration trends for both of these constituents were observed in the other upper zone wells between the fourth quarter 2004 and first quarter 2005. Gasoline-range TPH concentrations have shown an increasing trend in well LW-32S since first quarter 2004 (1,100 µg/L) through first quarter 2005 (4,670 µg/L). In addition, diesel-range TPH concentrations increased in well LW-44S from a concentration of 3,770 µg/L in fourth quarter 2004 to 9,380 µg/L in first quarter 2005. Lower zone groundwater concentrations in the Bell Terminal tank farm area for these constituents are much less than the upper zone concentrations, as shown on Figures 25 and 26. Also, diesel- and gasoline-range TPH concentrations are much less in upper zone groundwater in the Bell Terminal tank farm area than in the Main Terminal tank farm area (Figures 15 and 16).

Comparison of the diesel- and gasoline-range TPH, benzene, and ethylbenzene concentrations with groundwater elevations at selected well locations in the Main Terminal tank farm area indicates that groundwater concentrations in upper zone wells are likely influenced by seasonal fluctuations in groundwater levels, as demonstrated by the long-term data from well LW-8S (Figure 29). At well

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LW-8S, the detected diesel-range concentrations appear to show a slight increasing trend, benzene and ethylbenzene concentrations are decreasing, and gasoline-range TPH concentrations have been relatively consistent since about February 2002. At lower zone wells LW-23D and LW-25D (Figures 30 and 31), groundwater elevations correlate with river stage fluctuations, as expected; however, any trend in groundwater concentrations in response to fluctuations in groundwater level or river stage is not apparent from the available data. Diesel-range TPH concentrations at well pair LW-20S/-20D in the Main Terminal tank farm area indicate that the concentrations in the upper and lower zones for this constituent are relatively similar at this location, and are all less than 1.0 mg/L (Figure 33). Also, there does not seem to be a direct correlation between diesel-range TPH concentrations and groundwater levels at these wells based on the available data.

In the Bell Terminal tank farm area, concentrations of benzene and ethylbenzene in upper zone well LW-32S have remained relatively consistent over time and no correlation between groundwater concentrations and groundwater levels is apparent from the available data (Figure 32). This quarter, the diesel-range TPH concentration decreased slightly from 4.44 to 3.13 mg/L, and the gasoline-range TPH concentration increased slightly from 2.87 to 4.67 mg/L. At well pair LW-30S/LW-30D, trends in diesel-range TPH concentrations and groundwater levels at lower zone well LW-30D do not correlate; however, there may be some correlation at the upper zone well LW-30S (Figure 34). Diesel-range TPH concentrations have been slightly greater in the upper zone than the lower zone at this well pair, except in the data from the third quarter 2004 and the current sampling event.

Concentrations of total chromium and copper in Phase III wells exceeded the preliminary screening level in multiple lower zone wells and wells located beyond the confining unit boundary in the Main Terminal tank farm area. However, none of the total metals concentrations in the shoreline wells, located along the river (LW-36D through LW-39D), or in the upper zone Phase III wells exceeded the preliminary screening levels. In addition, none of total metals concentrations in the wells in the Bell Terminal tank farm area exceeded the preliminary screening levels.

Samples collected from the shoreline wells were also analyzed for dissolved metals during the first quarter 2005. The dissolved metals results were used to assess whether the presence of total chromium and copper observed in groundwater at concentrations exceeding preliminary screening levels during the fourth quarter 2004 event was the result of suspended material present in the samples from the shoreline wells. Field turbidity measurements collected during the fourth quarter 2004 were low (between 31 and 33 NTU) for three of the shoreline wells, but was high (800 NTU) for well LW-37D. Field turbidity measurements collected during the first quarter 2005 were 0 NTU for all four shoreline wells. The first quarter 2005 data indicate that dissolved chromium was detected in all four shoreline wells and dissolved arsenic was detected in two of the four shoreline wells (LW-38D and LW-39D).

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None of the total or dissolved metals concentrations in the shoreline wells for the first quarter 2005 event exceeded the preliminary screening levels, as shown in Table A-6. Comparison of the dissolved and total metals concentrations indicate that dissolved concentrations in three of the wells (LW-36D, -37D, and -38D) were slightly less than the total metals concentrations and in one well (LW-39D) were slightly more; however, the concentrations do not vary by more than 2.8 mg/L at any one location. These data indicate that metals concentrations in the groundwater samples in the shoreline wells were unlikely influenced by the presence of any suspended material in the groundwater samples during the first quarter of 2005. However, during the fourth quarter 2004 event, the total chromium, copper, lead and nickel concentrations at well LW-37D were at least twice as much as at the other shoreline wells; therefore, the turbidity measured in this well during this event could be indicative of suspended material in the well that could have influenced the total metals concentrations. During the fourth quarter 2004 event, well LW-37D was the only well where groundwater concentrations exceeded the preliminary screening levels for both chromium and copper. (Chromium concentrations slightly exceeded the preliminary screening levels during the fourth quarter 2004 event at wells LW-38D and LW-39D by 0.001 and 0.002 mg/L, respectively.)

Long-term trends in the upper and lower zones will continue to be evaluated as part of the quarterly monitoring events.

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3.0 GROUNDWATER RECOVERY INTERIM ACTION

This section presents a summary of the performance and status of the groundwater interim action system at the terminal for the first quarter of 2005 (January 1 through March 31, 2005). System operation data for the groundwater interim action were evaluated in accordance with the startup monitoring plan (Landau Associates 2000b) to determine compliance with performance criteria for the upper zone and the lower zone at the terminal. Specific performance criteria include: 1) groundwater recovery from an upper zone recovery well (HRW-1) when the pump is operating or when sufficient groundwater is present in the upper zone; 2) continuous pumping from a lower zone recovery well (RW-2), except for brief periods of system maintenance; 3) groundwater flow toward HRW-1 and RW-2 from the downgradient and upgradient directions; 4) reversal of the lower zone groundwater flow direction at the leading edge of the PCP plume; 5) chemical confirmation that continued migration of PCP in groundwater downgradient of RW-2 and HRW-1 is not occurring; and 6) compliance with the requirements of the existing discharge permit. In addition to the six criteria listed above, information is also presented in this section regarding the operation of an upper zone groundwater intercept system located in a storm drain (SDM-1) at the site.

Specific operational information for the first quarter 2005, as it relates to the criteria identified above, is as follows:

- As discussed in Section 2.1, groundwater elevation data were collected from the upper zone monitoring wells on February 15, 2005. The groundwater elevation data are summarized in Table A-2 and presented on Figure 3.

- During the first quarter 2005, groundwater was extracted from the upper zone recovery well (HRW-1) when sufficient water was present in the extraction well. A total of approximately 18,000 gallons of groundwater was recorded as being recovered from HRW-1 during the first quarter of 2005 at an estimated rate of 0.14 gallon per minute (gpm). Extracted water is discharged into Tank 16804 for temporary storage until treated by the wastewater treatment system located at the terminal and is subsequently discharged to the sanitary sewer under a permit with the City of Portland. Pentachlorophenol was detected in groundwater at HRW-1 at a concentration of 10.2 µg/L on February 18, 2005. A summary of groundwater recovery data for HRW-1 is included in Appendix B, Table B-1.

- With the exception of periodic shutdowns for system maintenance, groundwater was extracted continuously from the lower zone during the period from January 1 through March 31, 2005 by operating the groundwater recovery pump in RW-2. A total of approximately 1,238,800 gallons of groundwater was recorded as being recovered from RW-2 during the first quarter of 2005 at an estimated average rate of 9.6 gpm. The recovery pump in RW-2 discharged water to Tank 16804 for temporary storage until treated by the wastewater treatment system located at the terminal and subsequent discharge to the sanitary sewer under a permit with the City of Portland. A summary of the groundwater recovery data for RW-2 is included in Appendix B, Table B-1.

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- As discussed in Section 2.1, groundwater elevation data were collected from the lower zone wells on February 15, 2005. The groundwater elevation data are summarized in Table A-2 and presented on Figure 4. Based on the groundwater elevation data collected, the groundwater flow direction was reversed locally downgradient of the leading edge of the PCP plume in the lower zone when RW-2 was in operation during this quarter.

- As previously discussed in Section 2.2, groundwater samples were collected at the site on February 14 through February 24, 2005. Historically, the extent of groundwater impact has been estimated based on the extent of dissolved-phase PCP. The extent of PCP in the upper and lower zones is depicted on Figures 5 and 7, based on data collected during the February 2005 groundwater sampling event. The lateral extent of PCP from north to south in the upper zone is consistent with previous quarterly events. The lateral extent of PCP from east to west in the upper zone appears to be similar in comparison to the fourth quarter 2004 event, but diminished compared to events prior to fourth quarter 2004. The first quarter lower zone analytical data indicate that monitoring wells LW-10D, LW-14D, LW-16D and LW-18D, located south and west of RW-2, did not contain concentrations of PCP greater that the laboratory reporting limit for this sampling event.

- Between January 1 and March 31, 2005, 327,600 gallons of groundwater were recorded as being pumped by the groundwater intercept system at storm drain manhole SDM-1 to Tank 16804 for temporary storage and subsequent treatment by the onsite wastewater treatment system. During operation, the pump extracted water from SDM-1 at a rate of approximately 2.5 gpm. Groundwater collected from the storm drain contained a PCP concentration of 7.2 µg/L on February 18, 2005 (Appendix B, Table B-1). During the first quarter 2005 sampling event, the Willamette River level was above the elevation of the outfall of the storm drain line; therefore, no water quality sample was collected for PCP analysis during this sampling event.

The industrial wastewater discharge permit (City of Portland Permit No. 400.121) for discharge of the extracted groundwater following treatment at the terminal's wastewater treatment plant includes the following discharge limitations:

Parameter	Permitted Limit
PCP	40 µg/L
Benzene	50 µg/L
BTEX (1)	750 µg/L
pH	5 to 11.5

(1) Sum of detected concentrations of Benzene, Toluene, Ethylbenzene, Xylenes (BTEX).

Samples of the treated groundwater discharge were collected periodically during the first quarter 2005 for analyses of PCP following discharge exceedances that occurred during previous quarters. In addition, the pH of the discharge was monitored throughout the quarter. Sampling results indicated that PCP concentrations were nondetect and pH ranged from 7.4 to 8.7 during the first quarter 2005.

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Currently, Landau Associates and Time Oil Co. are monitoring the discharge concentration of PCP on a monthly basis and pH readings are collected at least once per week. A sample collected on January 10, 2005 indicated that no BTEX constituents were detected. The analytical results for the treatment system discharge are provided in Appendix B, Table B-1.

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4.0 ISCO GROUNDWATER INTERIM ACTION

The primary objectives of the ISCO interim remedial action are to reduce the concentration of PCP present in upper zone groundwater within the PCP source area, to reduce the extent of the PCP plume in the upper zone groundwater, and to reduce the concentration of PCP in the soil located within the zone of groundwater fluctuation (i.e., smear zone). Target cleanup concentrations for PCP in groundwater have not yet been established for the site. Following the documentation of a successful pilot study using ISCO techniques (ISOTEC 2003), Landau Associates prepared a work plan for implementation of a full-scale ISCO interim remedial action approach at the site (Landau Associates 2004c). The work plan was approved by DEQ on July 6, 2004 (DEQ 2004b).

Section 4.0 presents the results for the second full scale ISCO injection event conducted in January 2005, including a description of the methods used for the ISCO injection and the post-injection groundwater sampling event, and an evaluation of the data used to assess the performance of the ISCO technique. The first full-scale injection event was conducted in July 2004, and the results were presented in the *Third Quarter 2004 Groundwater Monitoring and Groundwater Interim Action Status Report* (Landau Associates 2005b).

4.1 DESCRIPTION OF INJECTION METHOD

On January 11 through 14, 2005, Time Oil's contractor (ISOTEC) injected ISCO reagents (17 percent hydrogen peroxide, complexed iron catalyst, and tap water) at 38 direct-push injection points (IP-1-B through IP-38-B) located in the former source area of PCP impacts and downgradient of the source area. In addition, ISCO reagents were pumped into six lateral injection wells (MPLINE-01, -02E, -02W, -03E, -03W, and -04) located in the former PCP source area. The approximate locations of the direct-push ISCO injection points and lateral injection wells are shown on Figure 35.

4.1.1 DIRECT-PUSH INJECTION POINTS

The injection points were direct-push probes installed by the drilling contractor (Cascade Drilling, Inc.) and consisted of 1.5-inch diameter, 3-ft long injection screens attached to the bottom of the direct-push rods. The injection points were driven to a depth of approximately 17 to 19 feet below ground surface (BGS) and spaced approximately 40-ft apart. The ISCO reagents were delivered at a depth of approximately 16 to 19 ft BGS (1 to 4 ft below the groundwater table). The ISCO injection consisted of approximately 200 gallons of hydrogen peroxide, 200 gallons of iron catalyst, and 60 gallons of water at each direct push point, with the following exceptions:

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- Approximately 120 gallons of hydrogen peroxide and no iron catalyst or tap water were injected at injection point IP-3-B. The lower volume of reagents was used at this point because hydrogen peroxide surfaced at injection point IP-2-B during injection at IP-3-B.

- Approximately 130 gallons of hydrogen peroxide and no iron catalyst or tap water were injected at injection point IP-9-B. The lower volume of reagents was used at this point because hydrogen peroxide surfaced at the eastern end of MPLINE03W during injection at this location.

- Approximately 75 gallons of hydrogen peroxide and 75 gallons of iron catalyst were injected at injection point IP-11-B. The lower volume of reagents was used at this point because hydrogen peroxide surfaced during injection at this location.

A total of approximately 7,325 gallons of 17 percent hydrogen peroxide, 7,075 gallons of iron catalyst, and 2,100 gallons of tap water were injected into the subsurface using the direct-push points.

4.1.2 LATERAL INJECTION WELLS

The six lateral injection wells are constructed of 4-inch diameter, schedule 40 PVC pipe with solid wall risers and horizontal sections comprised of alternating sections of solid wall pipe and well screen pipe. ISCO reagents were pumped into the lateral injection wells through the solid wall risers to diffuse into the groundwater formation through the well screen pipe. The horizontal portion of each of these lateral injection wells is located at approximately 12.5 ft BGS. Approximately 100 gallons of hydrogen peroxide, 100 gallons of iron catalyst, and 60 gallons of tap water were pumped into each of the two vertical risers at each lateral injection wells, with the following exceptions:

- Approximately 40 gallons of iron catalyst were injected at MPLINE03W because hydrogen peroxide surfaced between MPLINE03W and MPLINE03E during injection at this location.

- Approximately 200 gallons of iron catalyst were injected at MPLINE03E to utilize the remaining iron catalyst that had not been used during the event.

A total of approximately 1,200 gallons of 17 percent hydrogen peroxide, 1,080 gallons of iron catalyst, and 720 gallons of water were pumped into the subsurface using the lateral injection wells.

4.2 POST GROUNDWATER INJECTION MONITORING

The first quarter 2005 groundwater monitoring event was conducted on February 14 through 24, 2005. In accordance with the ISCO work plan and the "Response to Work Plan Comments" letter (Landau Associates 2004d), the following monitoring wells were evaluated to determine the effectiveness of the ISCO injection: RW-1, LW-11S, LW-13S, OX-1S through OX-9S, and LW-11D. For the purpose of evaluating the effects of the ISCO injection, samples from each of these wells were analyzed using the following methods:

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Constituents	Analytical Method
SVOCs[(a)]	EPA Method 8270
Ferrous Iron (Fe^{2+}) [(b)]	SM 3500-Fe
Chloride	EPA Method 325.2
Selenium	EPA Method 6010

(a) Specifically, PCP and its daughter products (2,4,5-trichlorophenol; 2,4,6-trichlorophenol, 2,4-dichlorophenol, and 2-chlorophenol) were quantified; tetrachlorophenol (another breakdown product) was reported as a qualitative measure only.
(b) Ferrous iron analysis was completed by Analytical Resources, Inc.; all other analyses were completed by Specialty Analytical.

In addition to the groundwater samples, a water sample was collected from the groundwater intercept system installed in the storm drain (SDM-1) located near the southwestern edge of the site. The SDM-1 water sample was analyzed for PCP by Specialty Analytical using EPA Method 8270. The groundwater sampling methods were conducted in accordance with the SAP provided within the ISCO work plan.

Groundwater samples collected from RW-1, OX-1S, and OX-6S were also analyzed for dioxin/furan compounds by Columbia Analytical Services of Houston, Texas using EPA Method 8290.

4.3 DATA EVALUATION

Based on the data collected prior to (fourth quarter 2004) and following the ISCO injection event, an evaluation was performed to assess the effects of the ISCO injection program on upper zone groundwater. The data evaluation included assessment and/or calculation of the following:

- PCP concentration changes in upper zone groundwater and changes in the extent of the PCP plume area
- PCP mass removal in upper zone groundwater and estimated dosage rate required to meet specific PCP mass removal goals
- Estimated area of influence observed
- Effect of the ISCO injection on dioxin/furan concentrations in groundwater
- Potential health and safety risks
- Formation of undesired reaction by-products (e.g., selenium and ferrous iron) in groundwater.

With respect to the first and last items on the list above, we limited the evaluation to those sample points within the injection area as referenced in Section 4.2. However, we chose not to include wells OX-5S and OX-9S because these wells appear to be outside of the lateral extent of the PCP impacts in the groundwater. A discussion of each of the evaluation criteria is provided in the following sections.

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4.3.1 EFFECTS ON PCP CONCENTRATION IN UPPER ZONE GROUNDWATER

Data collected during the fourth quarter 2004 event in November (Landau Associates 2005c) were used in the following discussion for comparison purposes to assess groundwater conditions before and after the January 2005 ISCO injection event. The fourth quarter 2004 data were chosen to represent conditions immediately prior to the January 2005 ISCO injection event. Appendix G Figures G-1 through G-13 present dissolved-phase PCP concentrations before and after the ISCO injection for RW-1, LW-11S, LW-13S, OX-1S through 4S, OX-6S, OX-7S, OX-8S, OX-8D, LW-11D, and SDM-1.

Based on the analytical data presented in Appendix G, the PCP concentration in the upper zone groundwater monitoring wells (RW-1, LW-11S, and OX-1S through 4S, OX-6S, OX-7S, and OX-8S) was reduced by 3 percent (LW-11S) to 80 percent (OX-6S) between fourth quarter 2004 and first quarter 2005. PCP concentrations increased slightly between fourth quarter 2004 and first quarter 2005 in groundwater monitoring wells RW-1 and OX-8S. The PCP concentration in the deep groundwater monitoring well (LW-11D) was reduced from 4.95 µg/L in fourth quarter 2004 to less than 0.49 µg/L in first quarter 2005. The PCP concentration in the water collected from SDM-1 increased from 1.61 µg/L to 7.2 µg/L between fourth quarter 2004 and first quarter 2005.

Other chlorinated phenol compounds (2,4,6-TCP; 2,4,5-TCP, 2,4-DCP, and 2-chlorophenol) are included in the Appendix G graphs for groundwater monitoring wells RW-1, OX-1S, and OX-4S. None of the other wells had concentrations of other chlorinated phenol compounds above the laboratory detection limits, and, therefore, these compounds were not added to the concentration graphs. Concentrations of the other chlorinated phenol compounds in first quarter 2005 samples were similar to concentrations observed in samples collected in fourth quarter 2004. Based on information provided in the pilot test summary report (ISOTEC 2003) the oxidation process induced by the ISCO injection typically does not result in the formation of PCP daughter products as is common in a chemical reduction process.

The ISCO injection conducted in January 2005 introduced a total of approximately 19,500 gallons of ISCO reagents (hydrogen peroxide, complexed iron catalyst, and tap water) into the subsurface. The estimated groundwater volume into which the ISCO reagents were injected is estimated to be approximately 240,000 gallons. On a volumetric basis, if the chemical oxidation process were ineffective in reducing PCP mass, the effects of dilution would have reduced PCP concentrations by approximately 8 percent.

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4.3.2 MASS REMOVAL OF PCP IN GROUNDWATER

The mass of PCP in the upper zone groundwater one year prior to the ISCO injection in January 2005, and one month prior to that injection, was estimated to be approximately 1.12 pounds and 0.55 pounds, based on the groundwater samples collected in February and November 2004, respectively. The mass of PCP in the upper zone groundwater following the ISCO injection in January 2005 was estimated to be approximately 0.27 pounds, based on the groundwater samples collected in February 2005. The PCP mass calculations are provided in Appendix H. Based on the mass calculations, it appears that the ISCO injections in both July 2004 and January 2005 may have effected a mass reduction of PCP of approximately 0.85 pounds, or 76 percent over a one year period. If a direct correlation could be assumed from the dosage of 17 percent hydrogen peroxide and complexed iron catalyst (approximately 16,000 gallons of each reagent) utilized during the July 2004 and January 2005 ISCO injection events to achieve the 76 percent reduction in the mass of PCP in the upper zone groundwater, then an additional dosage of approximately 3,000 gallons of 17 percent hydrogen peroxide and complexed iron catalyst may effectively reduce the PCP mass in the upper zone groundwater by approximately 90 percent. This correlation is provided for informational purposes only and is not expected to be fully accurate based on subsurface conditions (e.g., metals and naturally occurring organic compounds) that may diminish the oxidative effects of ISCO on the contaminants of concern.

4.3.3 ESTIMATED AREA OF INFLUENCE

Results of the pilot test completed in September 2002 indicated a radius of influence (ROI) of approximately 17 to 33 ft (ISOTEC 2003). Based on the apparent effectiveness of the July 2004 and January 2005 ISCO events in reducing PCP concentrations in the upper zone groundwater, a ROI of approximately 25 ft appears to be accurate.

4.3.4 EFFECTS ON DIOXIN/FURANS IN GROUNDWATER

Prior to the January 2005 ISCO injection event, groundwater samples were collected in November 2004 from monitoring wells RW-1, OX-2S, and OX-6S to establish pre-injection conditions for dioxin/furan compounds. Following the ISCO injection event, groundwater samples were collected from RW-1, OX-1S, and OX-6S in February 2005 to establish post-injection conditions for dioxin/furan compounds. A groundwater sample was not collected from well OX-2S during the February 2005 event because the well contained product; well OX-1S will be sampled for comparison purposes during future events. After calculating the TEQ for dioxin/furans in the groundwater samples (Table A-3), the change in concentrations of dioxin/furan compounds in RW-1 and OX-6S were as follows:

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- The TEQ in RW-1 decreased from 0.006964 ng/L to 0.00256 ng/L.
- The TEQ in OX-6S increased from 0.006561 ng/L to 0.03724 ng/L.

At this time, it cannot be definitively determined if the change in dioxin/furan compound concentrations can be attributed to the ISCO injection, however the concentration of dioxin/furan compounds will be monitored in these two wells and in OX-1S in the future to determine if there are concentration trends change that can be attributed to future ISCO injection events.

4.3.5 Potential Health and Safety Risks

During the ISCO injection event, Landau Associates personnel complied with the site-specific health and safety plan (HASP; Landau Associates 2002) and no issues detrimental to site personnel health and safety were observed during the injection event.

4.3.6 Formation of Undesired By-Products

As referenced in the ISCO work plan, the concentration of selenium and iron were monitored to determine if the ISCO injection would cause an unacceptable increase in concentrations of these two metals in groundwater. Prior to (November 2004) and following (February 2005) the January 2005 ISCO injection event, water samples were collected from monitoring wells RW-1, LW-11S, OX-5S through OX-8S, LW-11D, and OX-8D for ferrous iron and selenium using Standard Method 3500-Fe and EPA Method 6010, respectively. In addition, in February 2005, water samples were collected from well OX-1S and OX-3S and analyzed for ferrous iron and selenium. However, no comparison to previous analytical data was possible, because well OX-1S and OX-3S were not sampled during the November 2004 sampling event.

Based on the analytical data presented in Table A-3 the ferrous iron concentration in the upper zone groundwater increased in wells OX-5S, OX-6S, and OX-7S and decreased in monitoring wells OX-8S, LW-11S, and RW-1. The maximum concentration of ferrous iron observed in the post-injection groundwater in the upper zone was collected from OX-8S (44.7 mg/L). The lower zone groundwater from LW-11D was not analyzed for ferrous iron after the injection event, but ferrous iron sample from OX-8D decreased from 37.6 mg/L (pre-injection) to 31.5 mg/L after the injection event.

The analytical data presented in Table A-3 indicates that selenium was not present after the ISCO injection event in the upper or lower zone groundwater samples collected. In addition, selenium was not present prior to the ISCO injection.

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5.0 FUTURE GROUNDWATER TASKS

5.1 GROUNDWATER MONITORING

The second quarter 2005 groundwater sampling event will be conducted during the first half of June 2005. The groundwater monitoring and analytical program for the second quarter 2005 event includes the following: 1) monitoring at Phase II quarterly well locations per the approved modifications outlined in Appendix D; 2) monitoring of ISCO injection monitoring wells as per the ISCO work plan (Landau Associates 2004c); and 3) monitoring of all Phase III RI monitoring wells installed in September 2003 and October 2004. The results for the Phase II and Phase III second quarter 2005 groundwater monitoring event and the second quarter groundwater interim action status will be provided in the *Second Quarter 2005 Groundwater Monitoring and Groundwater Interim Action Status Report.*

5.2 GROUNDWATER RECOVERY INTERIM ACTION

The groundwater recovery interim action system appears to exhibit continued effectiveness at limiting further migration of impacted groundwater in the upper and lower zones. The groundwater recovery system will continue to be operated in the second quarter of 2005. The effectiveness of the current onsite treatment system methodology will be evaluated relative to the potential effectiveness of a granular activated carbon (GAC) treatment system. A cost-benefit analysis will be conducted to assess the potential replacement of the current treatment system with a GAC system.

5.3 ISCO GROUNDWATER INTERIM ACTION

Based on the data evaluation discussed in Section 4.0, the ISCO interim action appears to be beneficial in the reduction of PCP concentrations in the upper zone groundwater, therefore an additional ISCO injection event is planned in fourth quarter 2005 or first quarter 2006 when water elevations rise. The higher elevation of the groundwater table should allow for better distribution of ISCO reagents into the upper zone groundwater.

The next ISCO injection event is anticipated to occur in late 2005 or early 2006. The number and proposed locations for the injection points will be identified following a review of the third quarter 2005 groundwater analytical data.

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6.0 USE OF THIS REPORT

This quarterly groundwater report has been prepared by Landau Associates for the exclusive use of Time Oil Co. for specific application to the Northwest Terminal. Services for this project were conducted in accordance with the Environmental Services Contract between Time Oil Co. and Landau Associates, Inc. Landau Associates has performed our services in accordance with generally accepted engineering and consulting standards for environmental work in effect at the time and locality services were performed. The reuse of information, conclusions, and recommendations provided herein by Time Oil Co. or others in connection with any site other than the Northwest Terminal without Landau Associates' written permission shall be at the sole risk of Time Oil Co. and without liability to Landau Associates.

This document was prepared under the supervision and direction of the following key staff.

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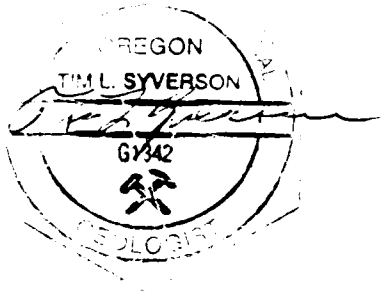

EIA/RB/TLS/rgm

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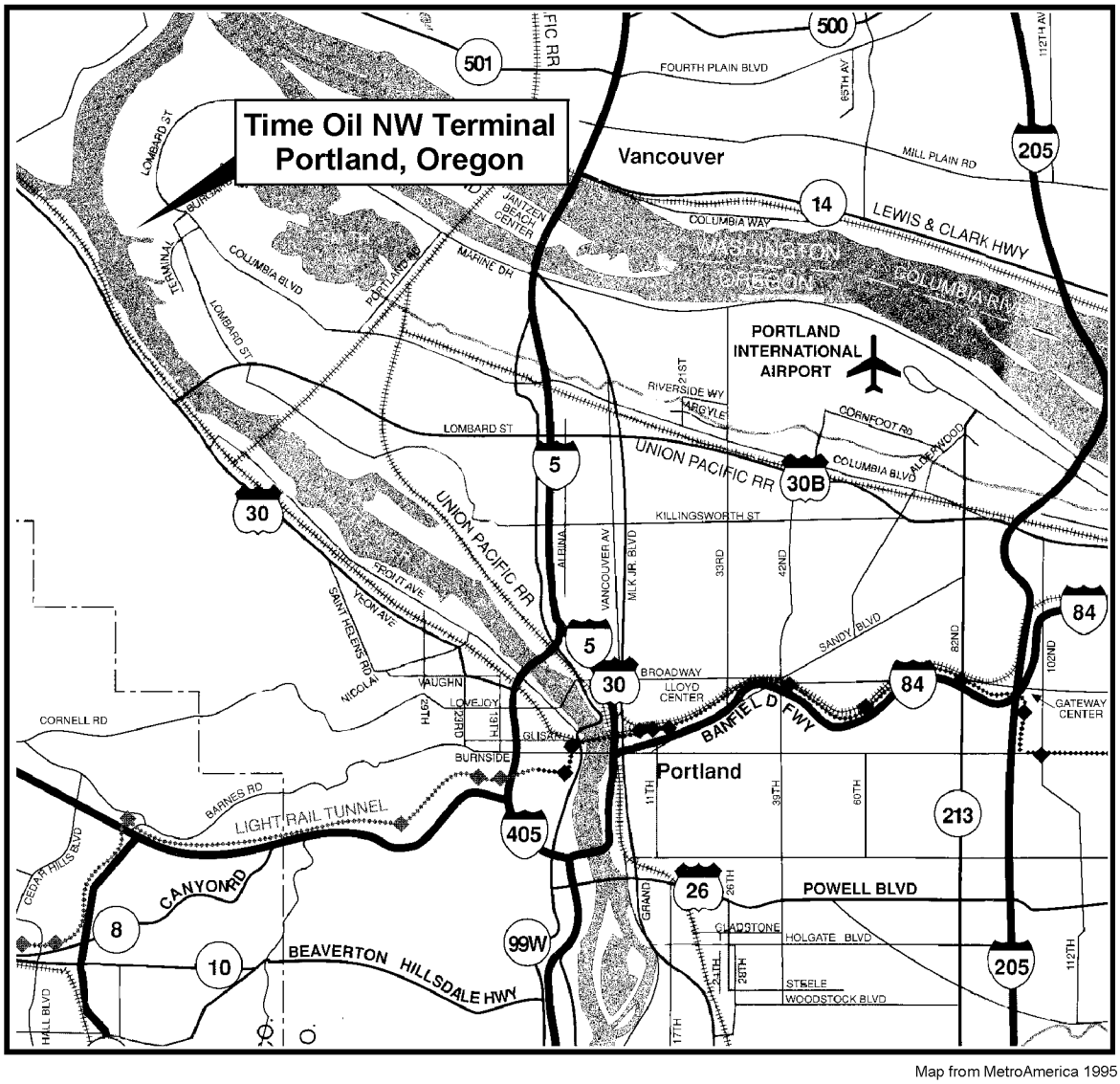
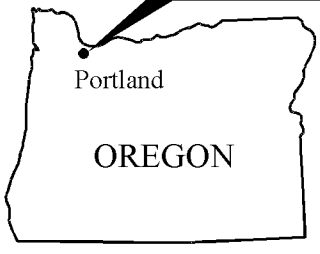


Map from MetroAmerica 1995

SITE LOCATION
(see enlarged map area above)



0 2 4
Approximate Scale in Miles

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Time Oil NW Terminal Portland, Oregon	**Vicinity Map**	Figure 1

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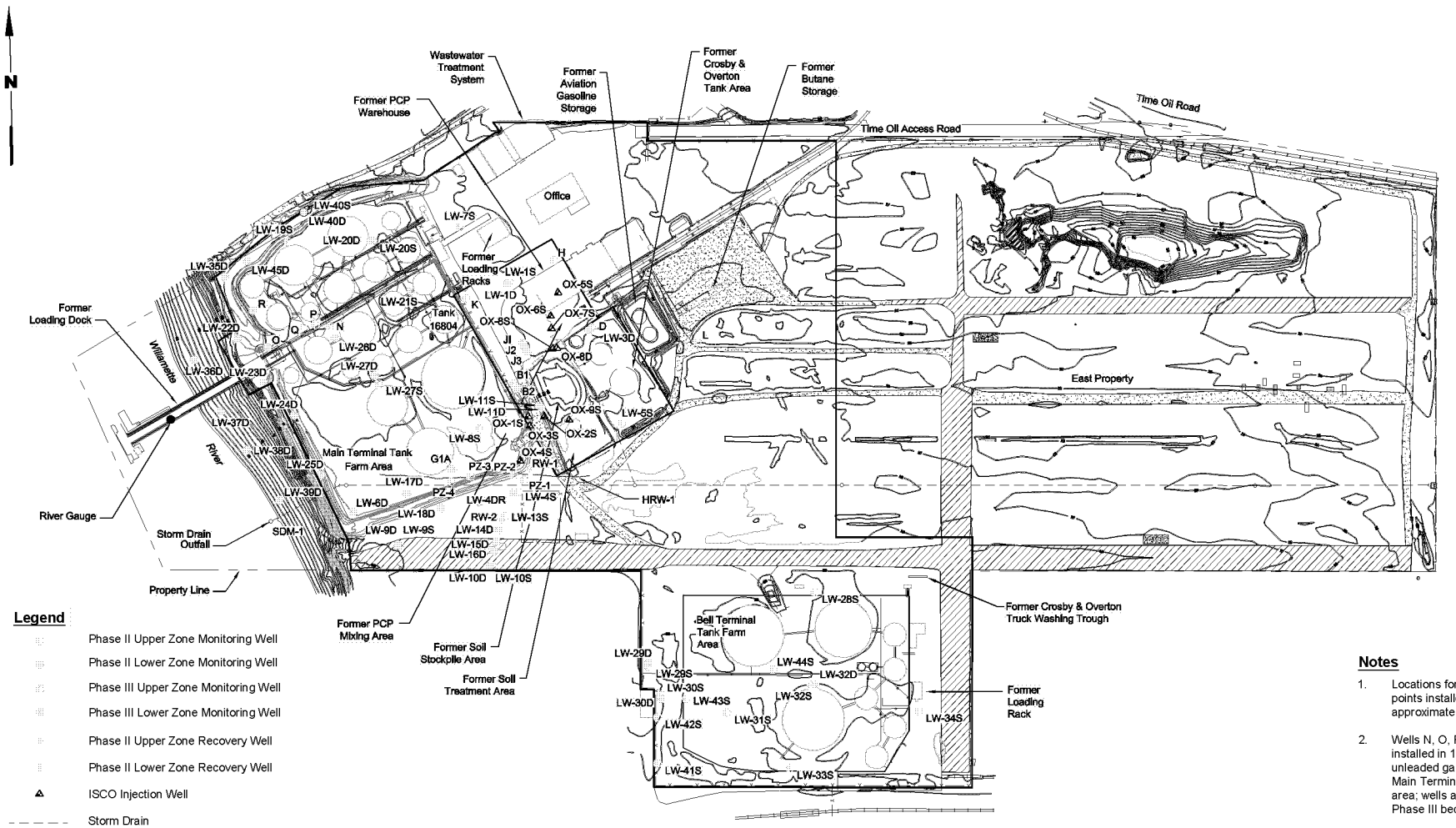

Legend

- Phase II Upper Zone Monitoring Well
- Phase II Lower Zone Monitoring Well
- Phase III Upper Zone Monitoring Well
- Phase III Lower Zone Monitoring Well
- Phase II Upper Zone Recovery Well
- Phase II Lower Zone Recovery Well
- ISCO Injection Well
- Storm Drain
- Manhole
- Asphalt
- Gravel
- HRW-1 — Horizontal Recovery Well-Upper Zone (Dashes Denote Screened Interval)

Notes

1. Locations for some wells/well points installed pre-1996 are approximate.
2. Wells N, O, R, P, and Q were installed in 1994 following an unleaded gasoline spill in the Main Terminal tank farm area; wells are designated as Phase III because of location.
3. Black and white reproduction of this color original may reduce its effectivness and lead to incorrect interpretation.

0 200 400
Scale in Feet

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Time Oil NW Terminal Portland, Oregon	**Well Locations**	Figure 2

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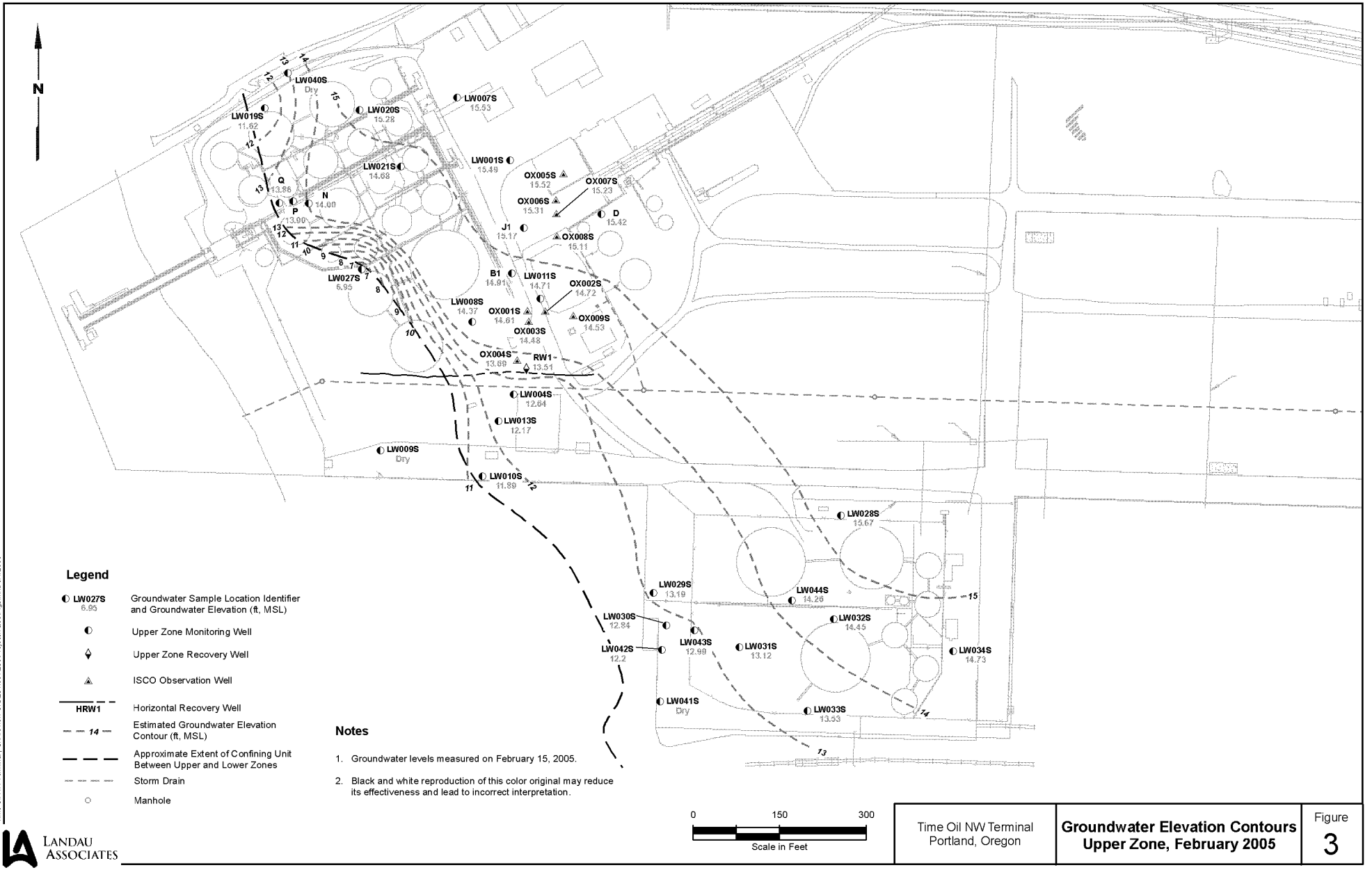

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Time Oil NW Terminal Portland, Oregon	**Groundwater Elevation Contours Upper Zone, February 2005**	Figure 3

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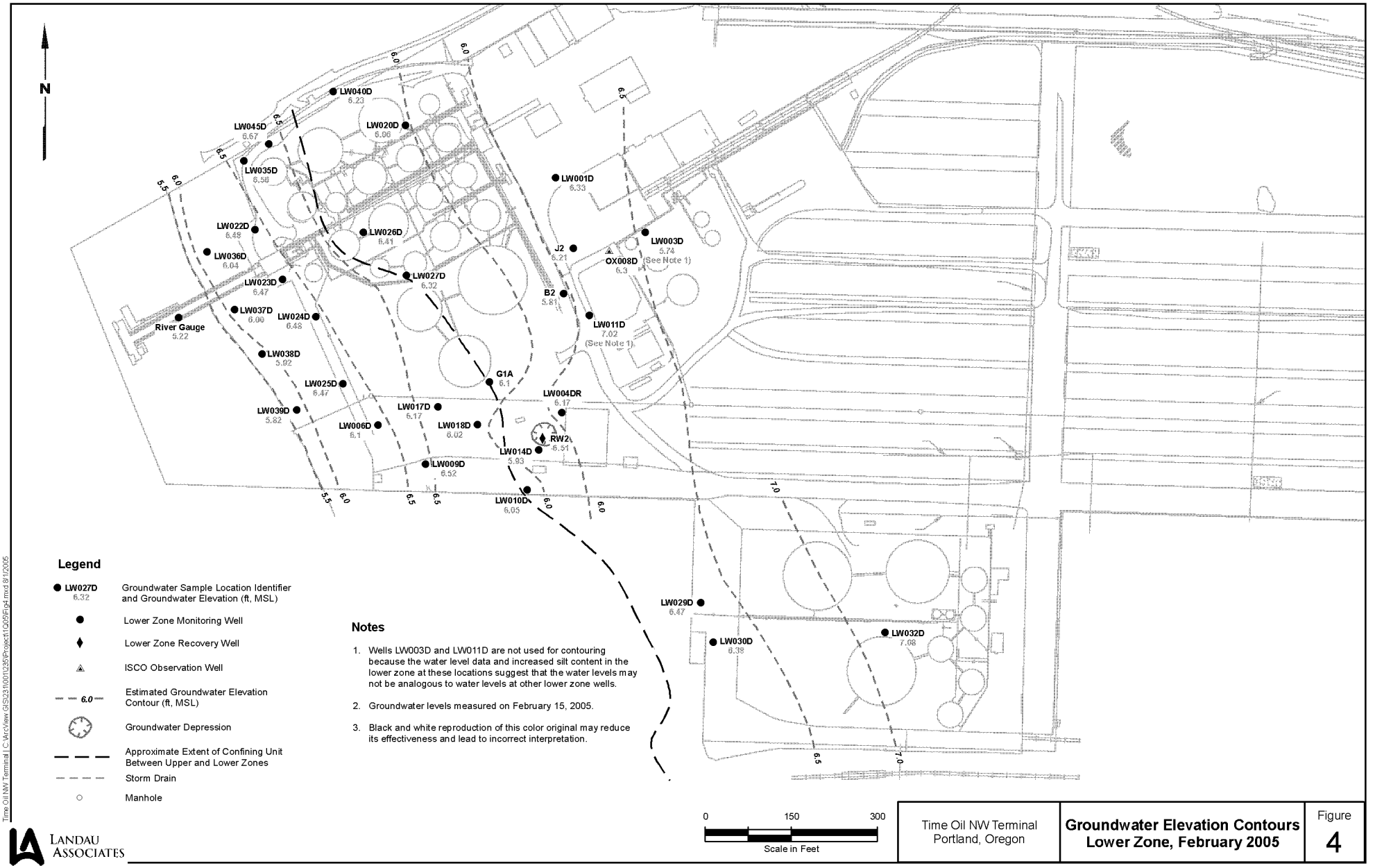

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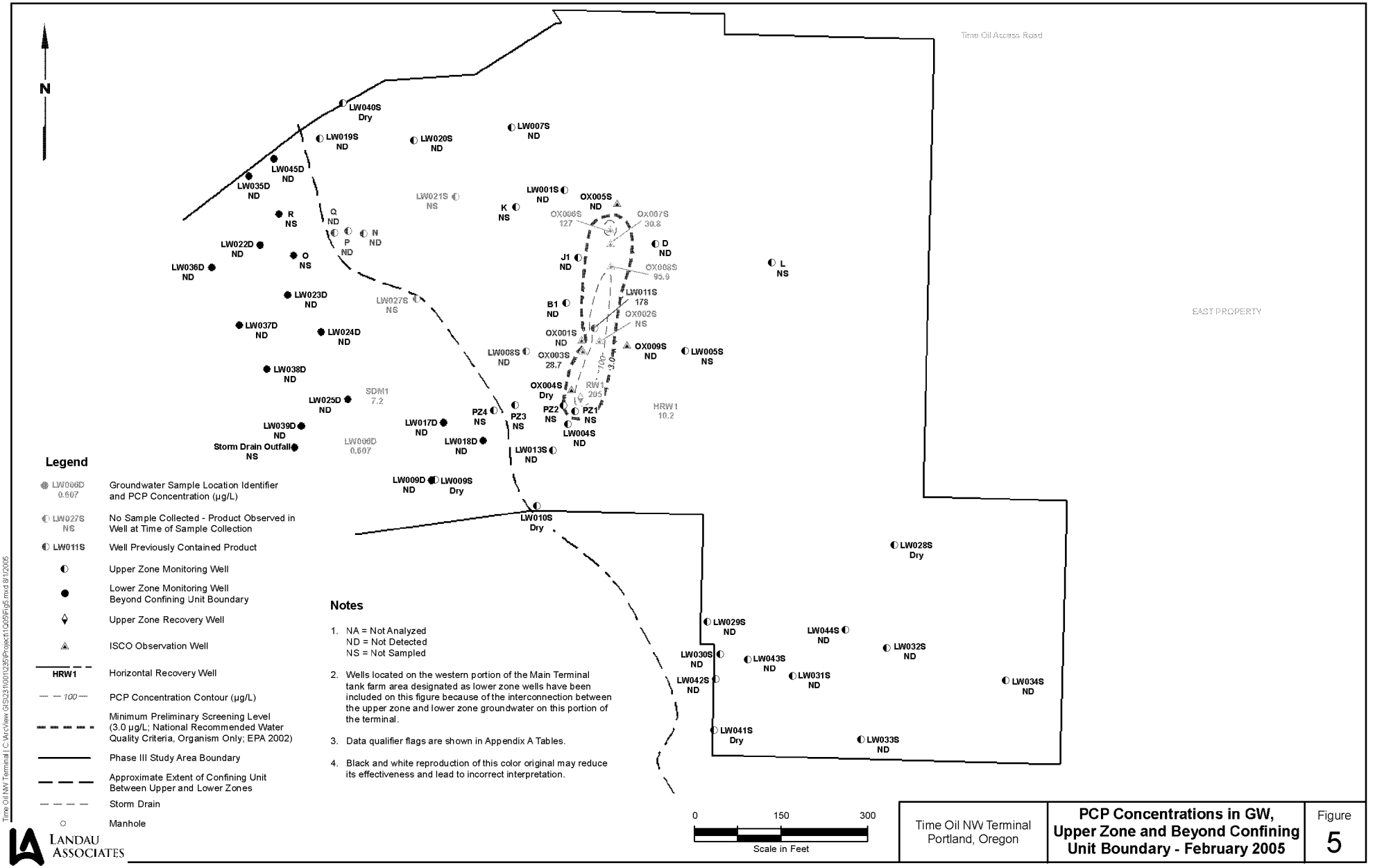

Legend

- LW006D 0.607 — Groundwater Sample Location Identifier and PCP Concentration (µg/L)
- LW027S NS — No Sample Collected - Product Observed in Well at Time of Sample Collection
- LW011S — Well Previously Contained Product
- Upper Zone Monitoring Well
- Lower Zone Monitoring Well Beyond Confining Unit Boundary
- Upper Zone Recovery Well
- ISCO Observation Well
- HRW1 — Horizontal Recovery Well
- 100 — PCP Concentration Contour (µg/L)
- Minimum Preliminary Screening Level (3.0 µg/L; National Recommended Water Quality Criteria, Organism Only; EPA 2002)
- Phase III Study Area Boundary
- Approximate Extent of Confining Unit Between Upper and Lower Zones
- Storm Drain
- Manhole

Notes

1. NA = Not Analyzed
   ND = Not Detected
   NS = Not Sampled
2. Wells located on the western portion of the Main Terminal tank farm area designated as lower zone wells have been included on this figure because of the interconnection between the upper zone and lower zone groundwater on this portion of the terminal.
3. Data qualifier flags are shown in Appendix A Tables.
4. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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Time Oil NW Terminal
Portland, Oregon

PCP Concentrations in GW, Upper Zone and Beyond Confining Unit Boundary - February 2005

Figure 5

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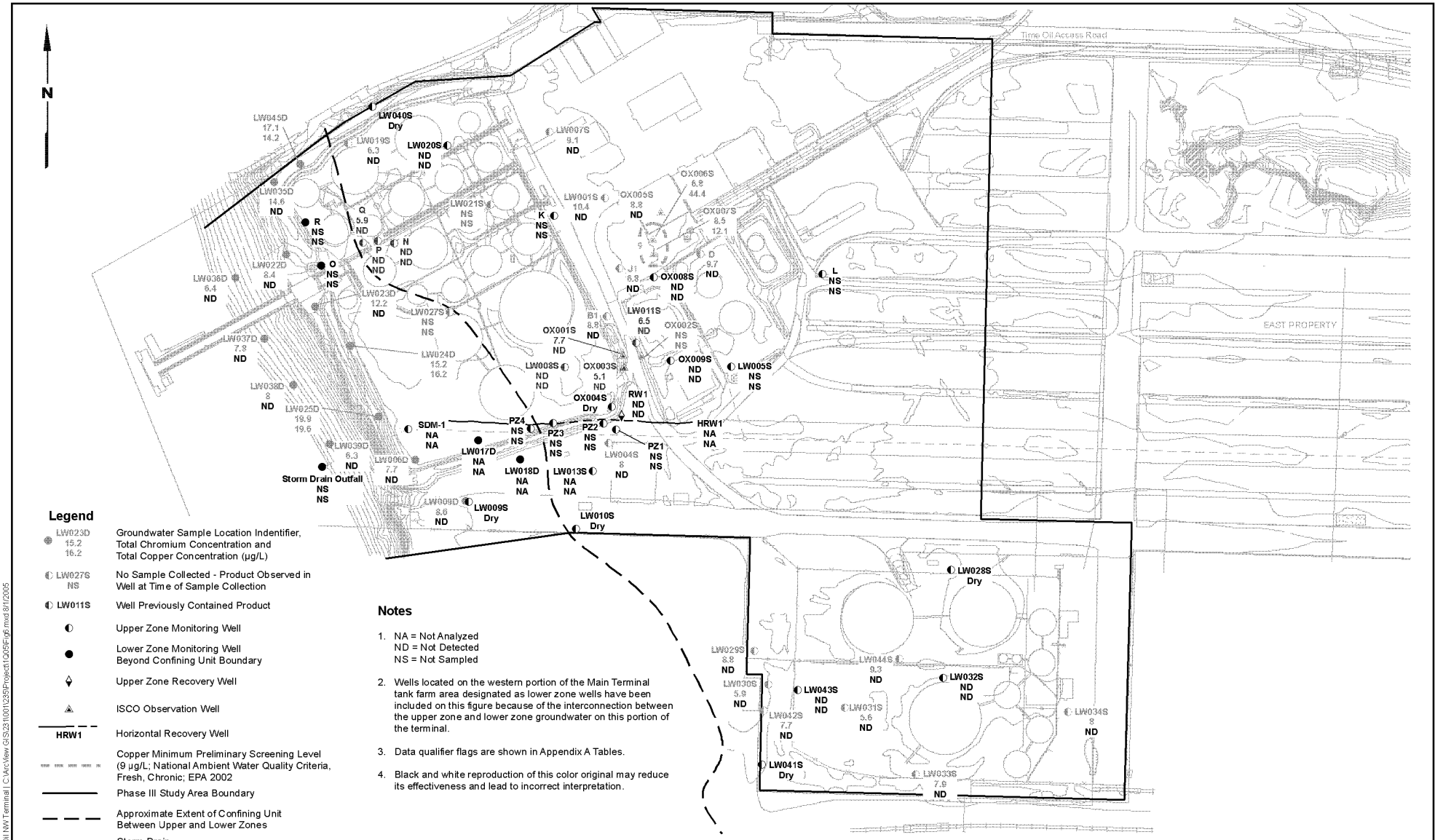

Legend

LW023D 15.2 16.2	Groundwater Sample Location Indentifier, Total Chromium Concentration and Total Copper Concentration (µg/L)
LW027S NS	No Sample Collected - Product Observed in Well at Time of Sample Collection
LW011S	Well Previously Contained Product
	Upper Zone Monitoring Well
	Lower Zone Monitoring Well Beyond Confining Unit Boundary
	Upper Zone Recovery Well
	ISCO Observation Well
HRW1	Horizontal Recovery Well
	Copper Minimum Preliminary Screening Level (9 µg/L; National Ambient Water Quality Criteria, Fresh, Chronic; EPA 2002
	Phase III Study Area Boundary
	Approximate Extent of Confining Unit Between Upper and Lower Zones
	Storm Drain
	Manhole

Notes

1. NA = Not Analyzed
   ND = Not Detected
   NS = Not Sampled
2. Wells located on the western portion of the Main Terminal tank farm area designated as lower zone wells have been included on this figure because of the interconnection between the upper zone and lower zone groundwater on this portion of the terminal.
3. Data qualifier flags are shown in Appendix A Tables.
4. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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Time Oil NW Terminal Portland, Oregon	**Total Chromium and Copper in GW, Upper Zone and Beyond Confining Unit Boundary - February 2005**	Figure 6

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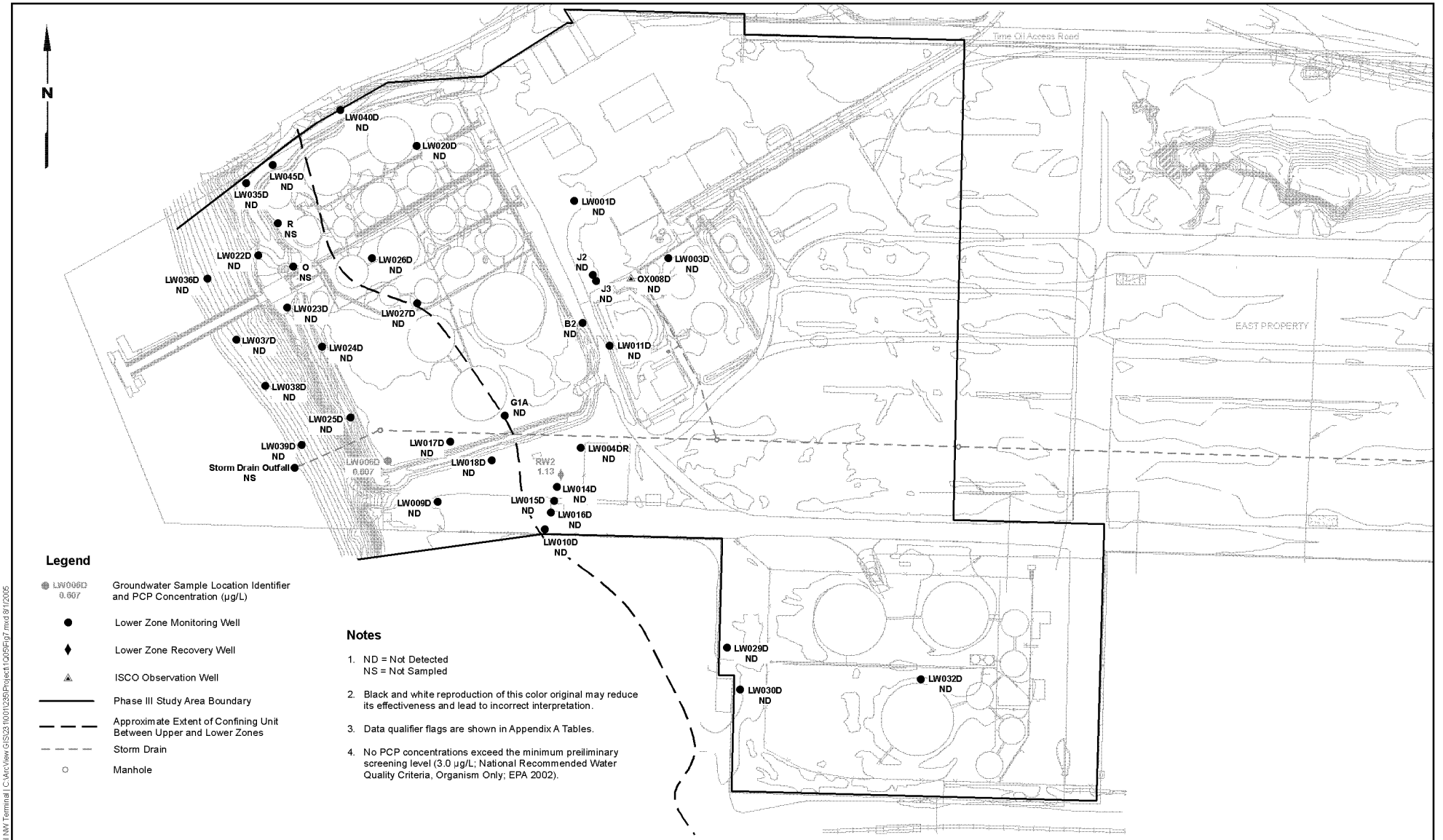
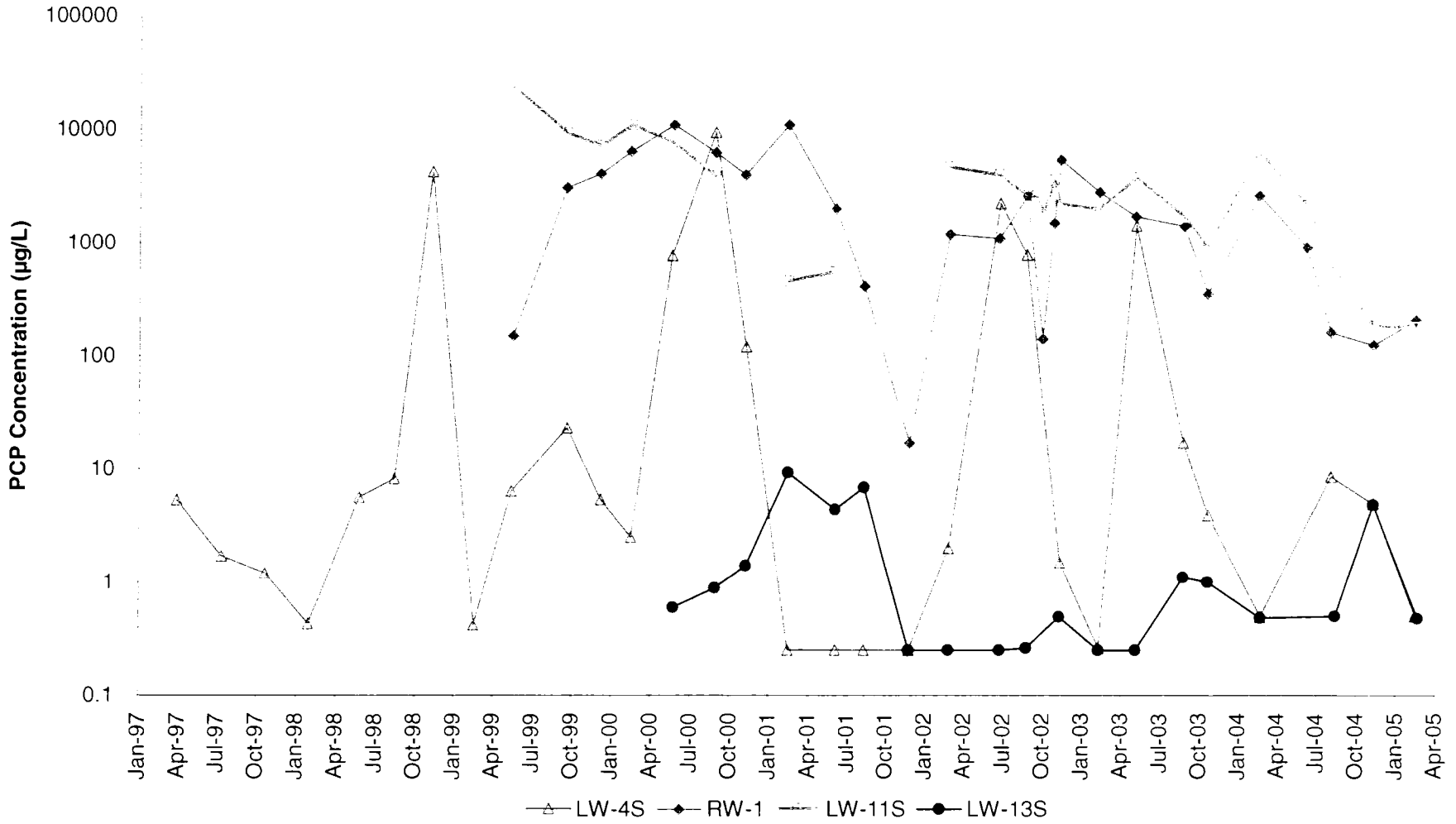


BZTO104(e)021116

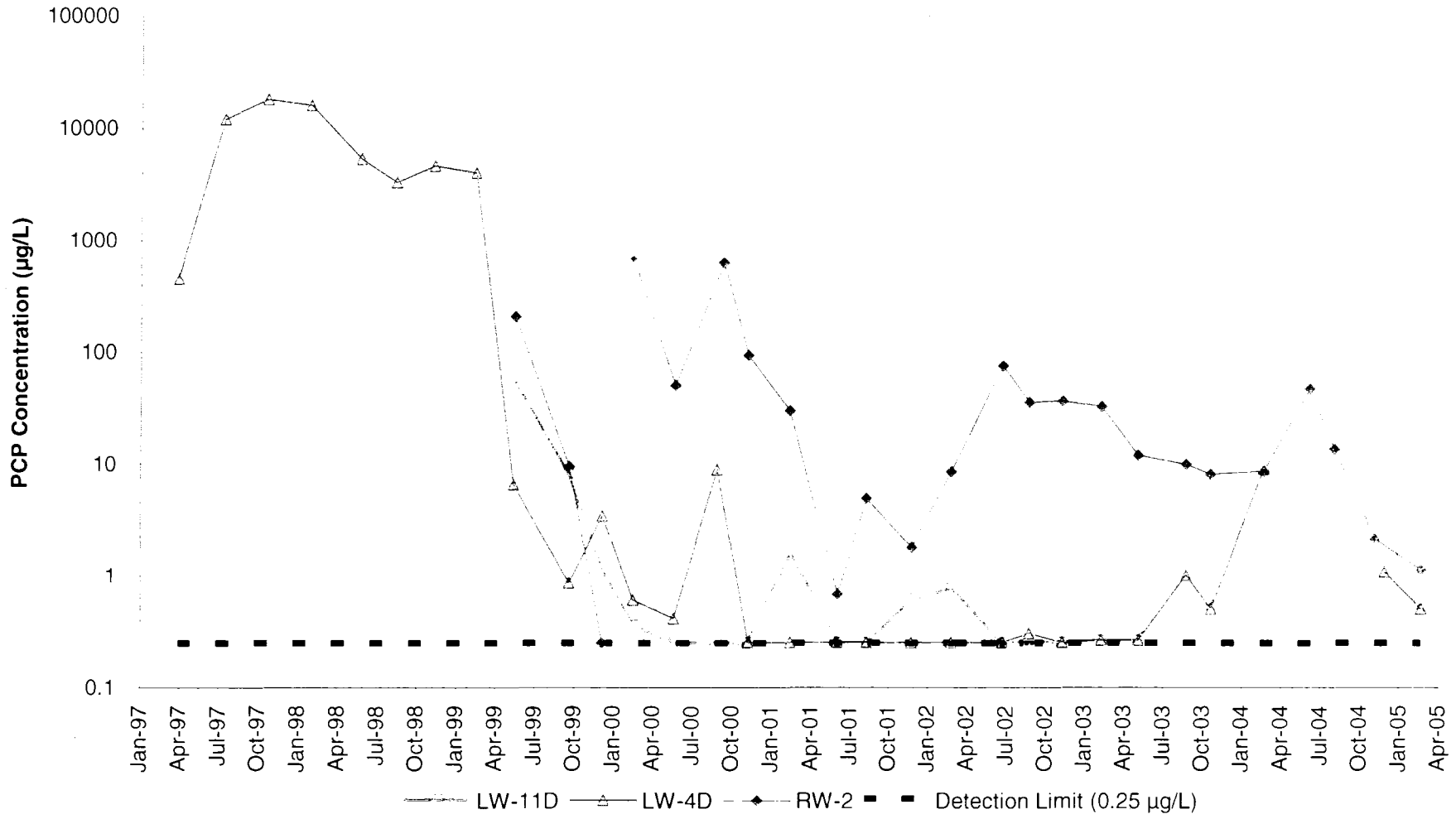


Nondetect values are plotted at the laboratory reporting limit value.

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**PCP Concentrations, Selected Upper Zone Wells April 1997 – February 2005**	Figure 8

BZT0104(e)021117



Note: LW-4DR was installed 11/19/04 to replace the damaged LW-4D. Nondetect values are plotted at the laboratory reporting limit value.

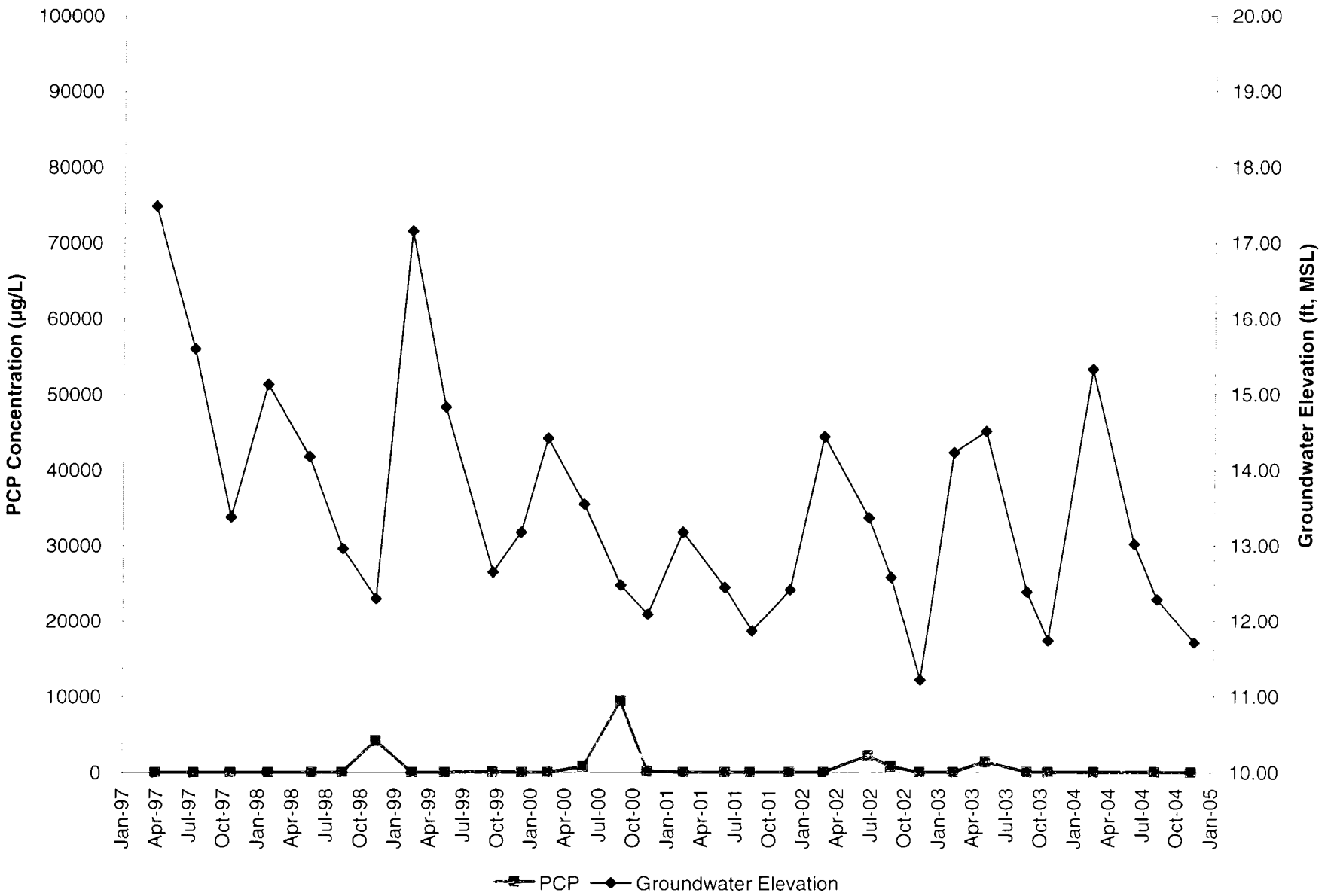
LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**PCP Concentrations, Selected Lower Zone Wells April 1997 – February 2005**	Figure 9

BZT0104(e)021118

7.7.05 - Edmdata:wproc:231.001:131:2005 Qrtly:1Q05 GW Rpt Fig 10.doc

Source: S:\SHEETS\timeoil.ph2r: PLOTS2005 - LW4S PCP-WL



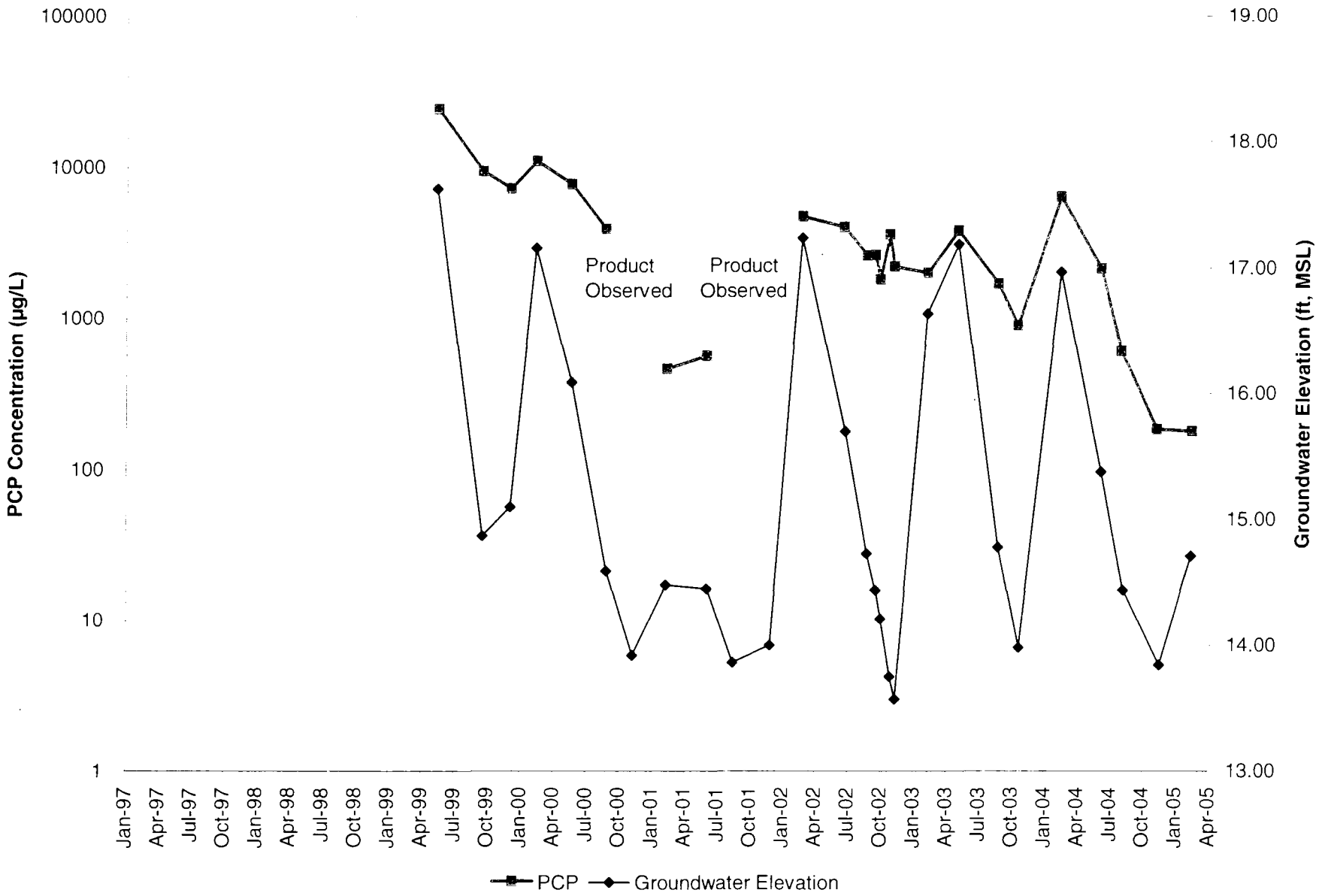
LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

PCP Concentrations and Groundwater Elevations, LW-4S
April 1997 – February 2005

Figure
10

BZTO104(e)021119



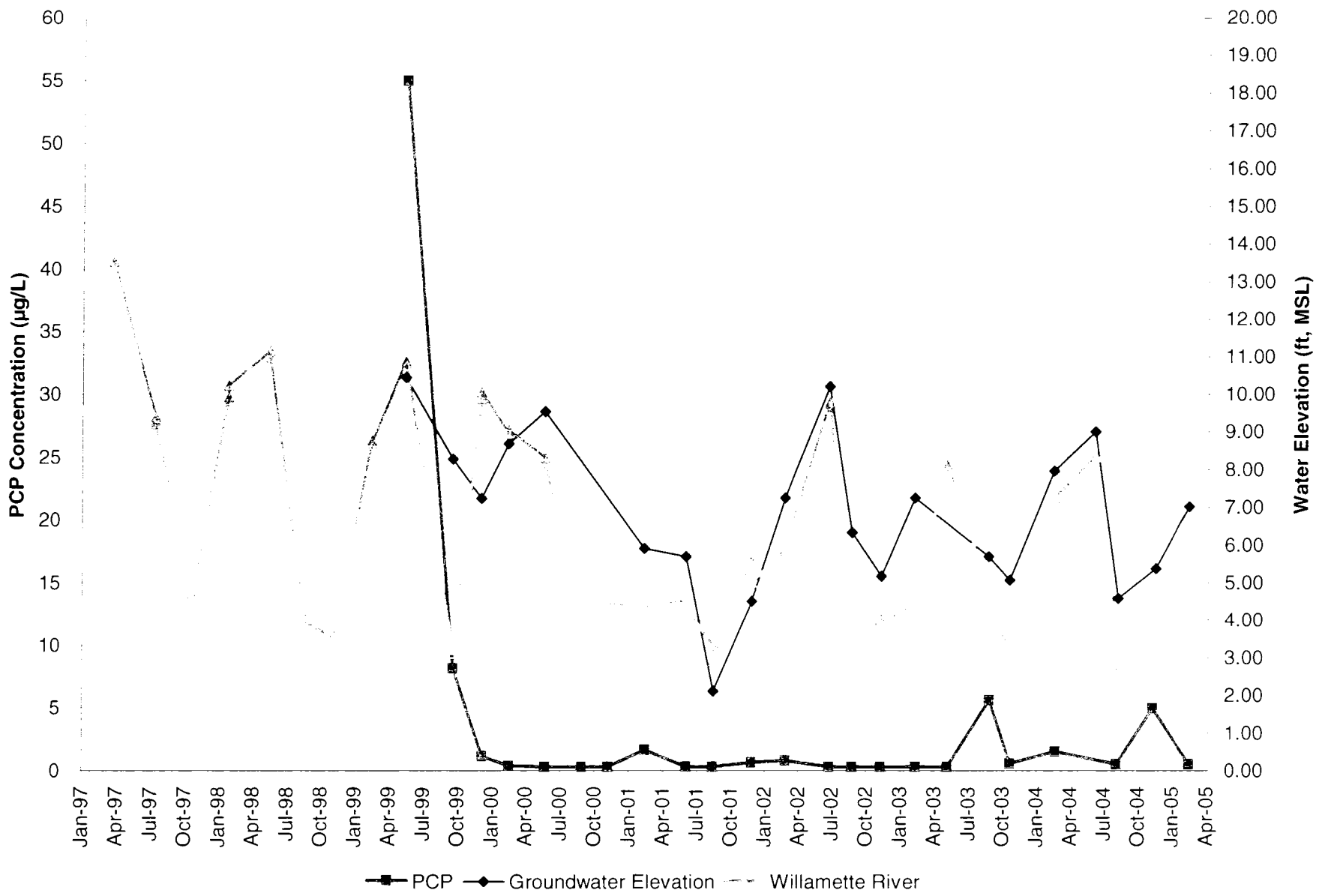
LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**PCP Concentrations and Groundwater Elevations, LW-11S April 1997 – February 2005**	Figure 11

BZTO104(e)021120

7.7.05 \Edmdata wproc\231.001.131.2005 Qrtly 1Q05 GW Rpt Fig 12.doc

Source: S:\SHEETS\timeoil\ph2ri\PLOTS2005\LW-11D PCP-WL-RIVER



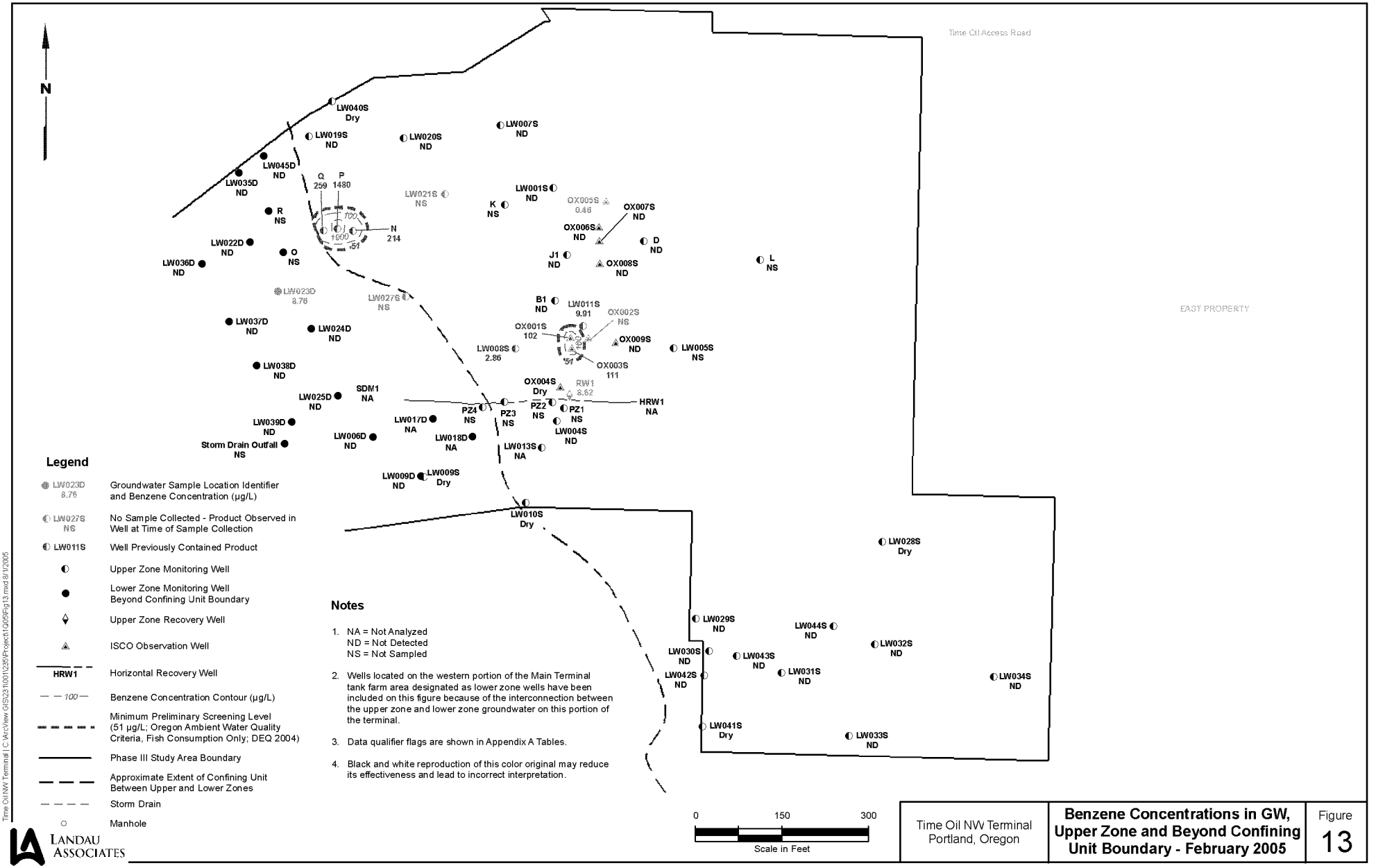
LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

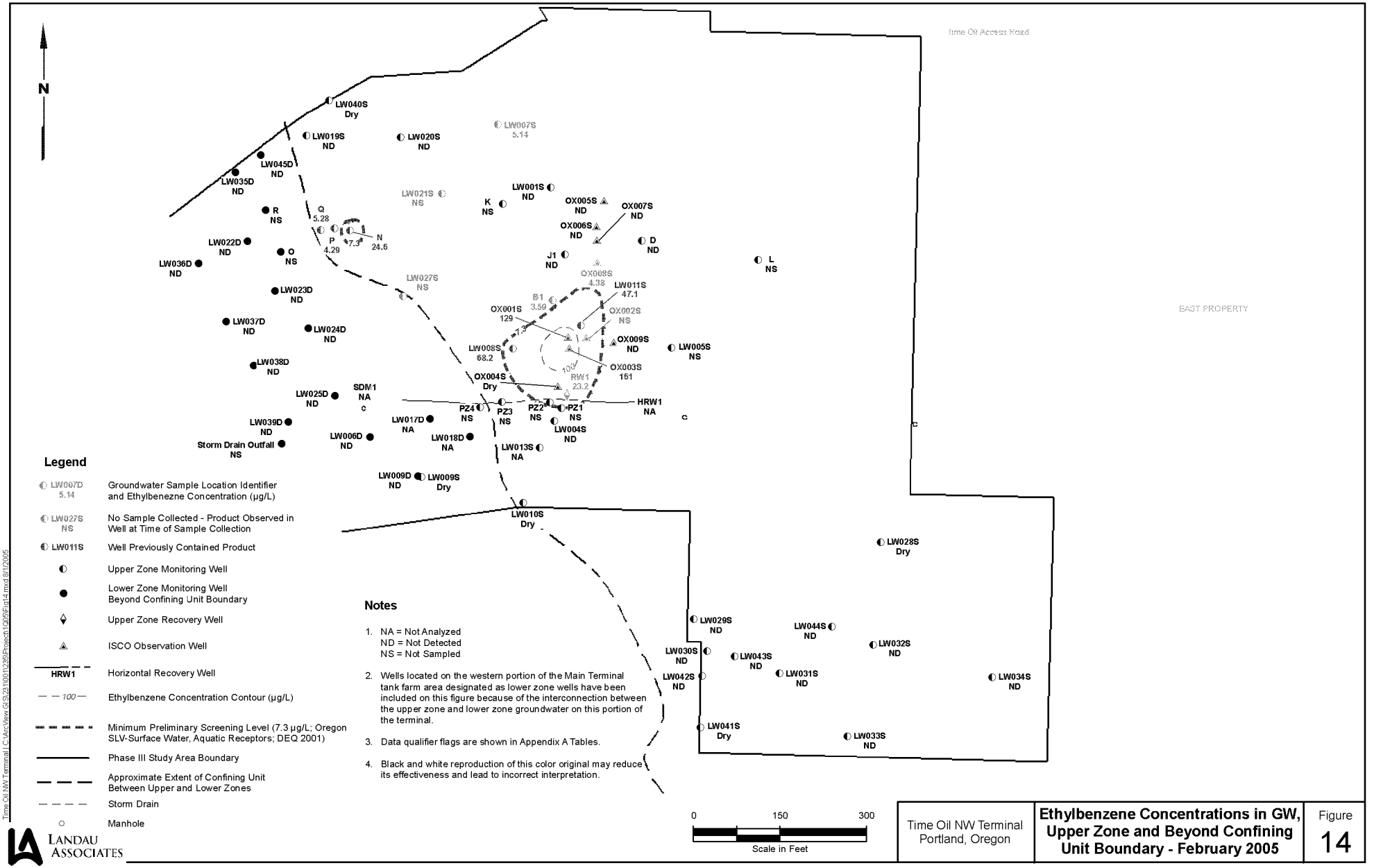
PCP Concentrations, Groundwater Elevations, and River Stage, LW-11D
April 1997 – February 2005

Figure
12

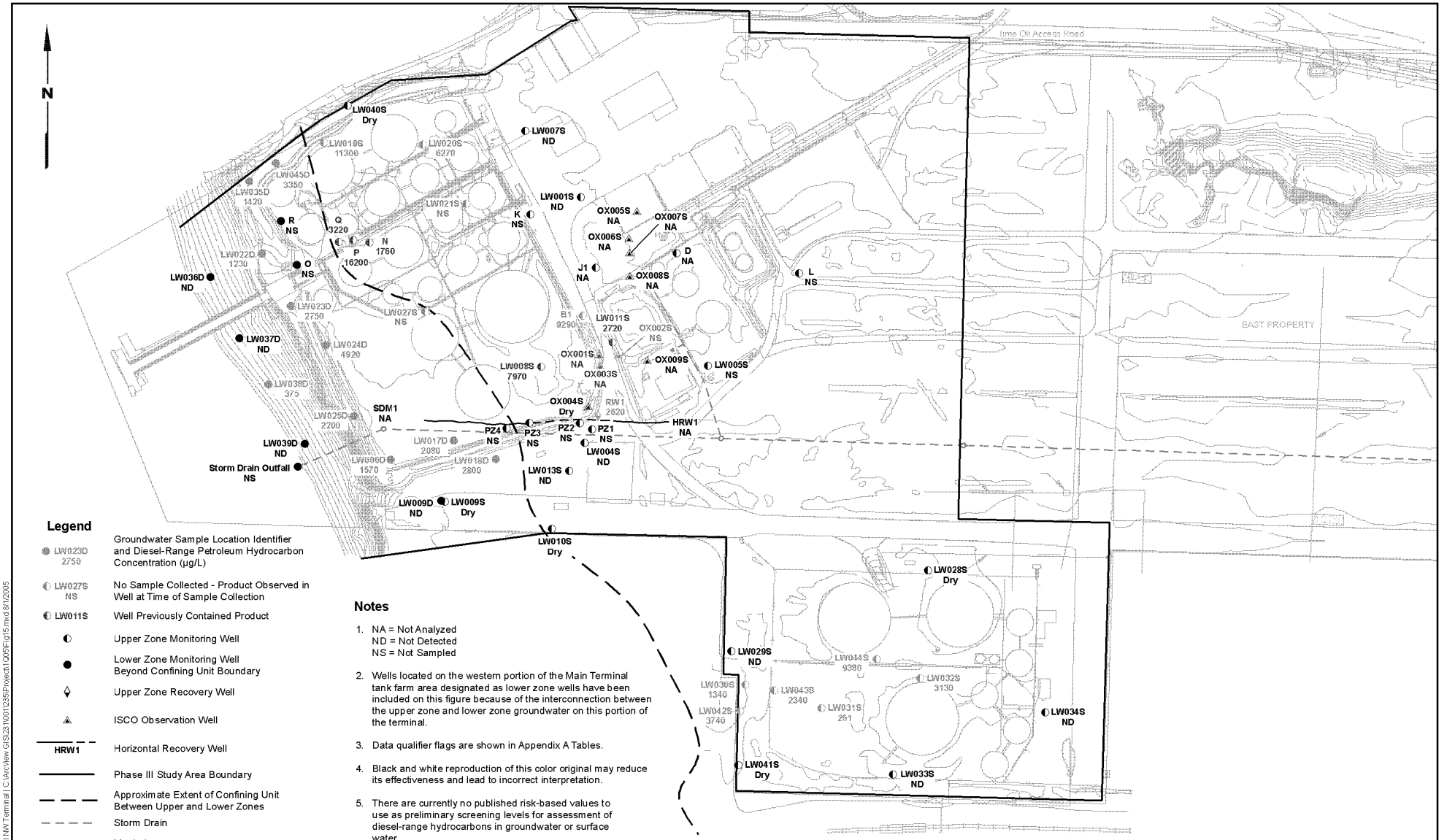
BZT0104(e)021121



BZTO104(e)021122



BZTO104(e)021123



Legend

- LW023D 2750 — Groundwater Sample Location Identifier and Diesel-Range Petroleum Hydrocarbon Concentration (µg/L)
- LW027S NS — No Sample Collected - Product Observed in Well at Time of Sample Collection
- LW011S — Well Previously Contained Product
- Upper Zone Monitoring Well
- Lower Zone Monitoring Well Beyond Confining Unit Boundary
- Upper Zone Recovery Well
- ISCO Observation Well
- HRW1 — Horizontal Recovery Well
- Phase III Study Area Boundary
- Approximate Extent of Confining Unit Between Upper and Lower Zones
- Storm Drain
- Manhole

Notes

1. NA = Not Analyzed
   ND = Not Detected
   NS = Not Sampled
2. Wells located on the western portion of the Main Terminal tank farm area designated as lower zone wells have been included on this figure because of the interconnection between the upper zone and lower zone groundwater on this portion of the terminal.
3. Data qualifier flags are shown in Appendix A Tables.
4. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
5. There are currently no published risk-based values to use as preliminary screening levels for assessment of diesel-range hydrocarbons in groundwater or surface water.

0 150 300
Scale in Feet

LANDAU ASSOCIATES

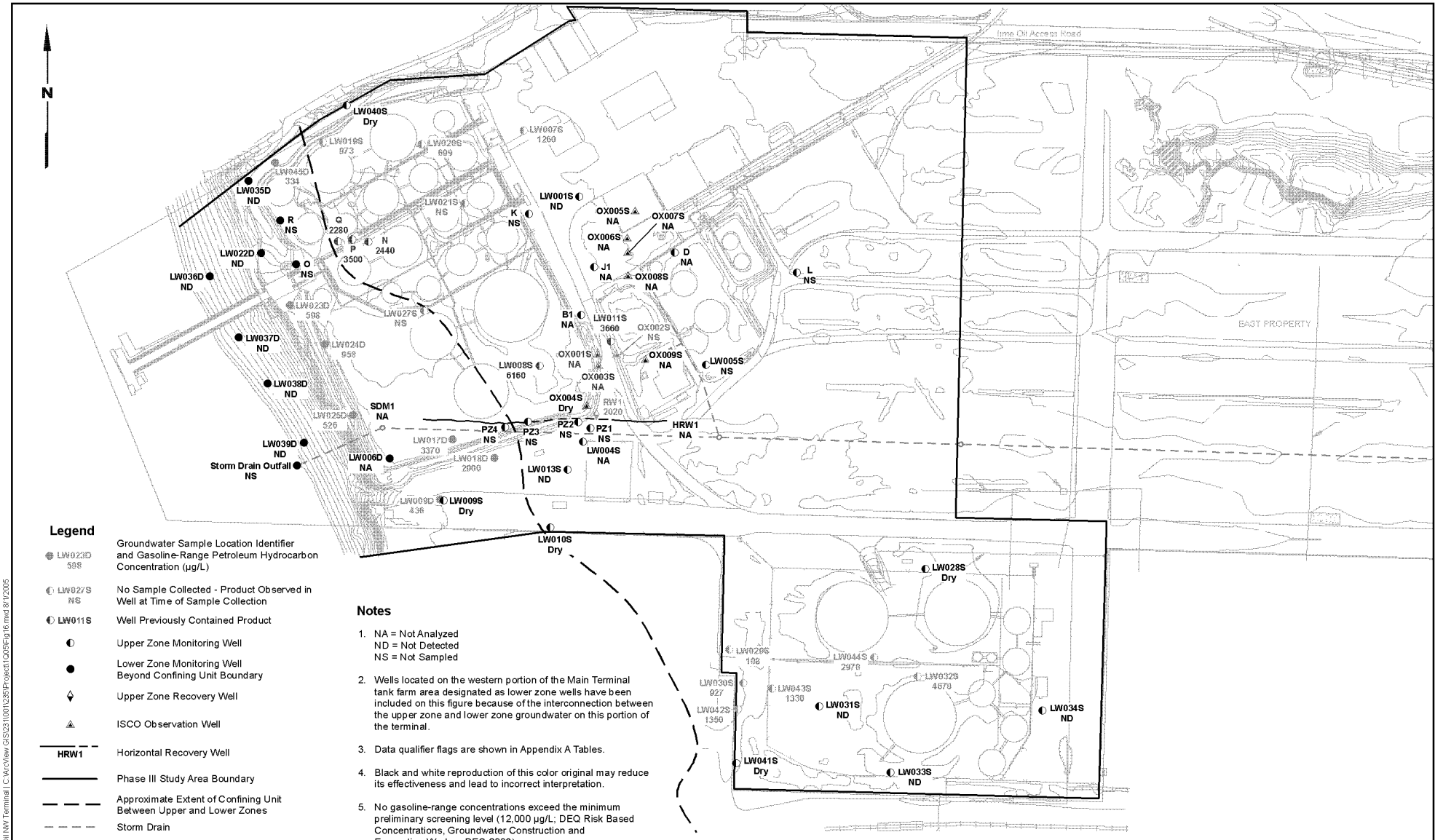
Time Oil NW Terminal
Portland, Oregon

Diesel-Range Hydrocarbons in GW, Upper Zone and Beyond Confining Unit Boundary - February 2005

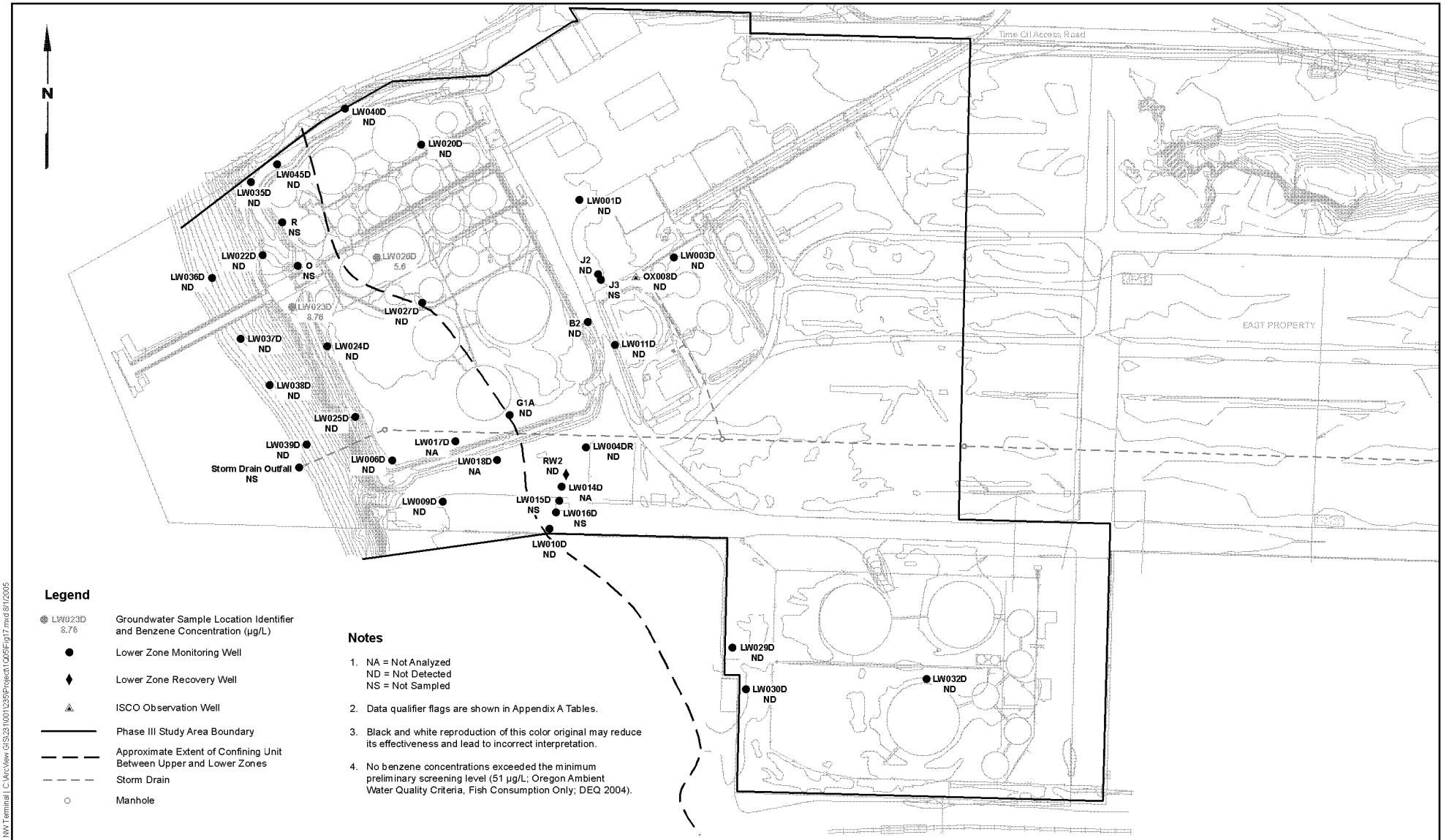
Figure 15

Time Oil NW Terminal | C:\ArcView GIS\23\100123\Project\100\Fig15.mxd 8/1/2005

BZT0104(e)021124



BZTO104(e)021125

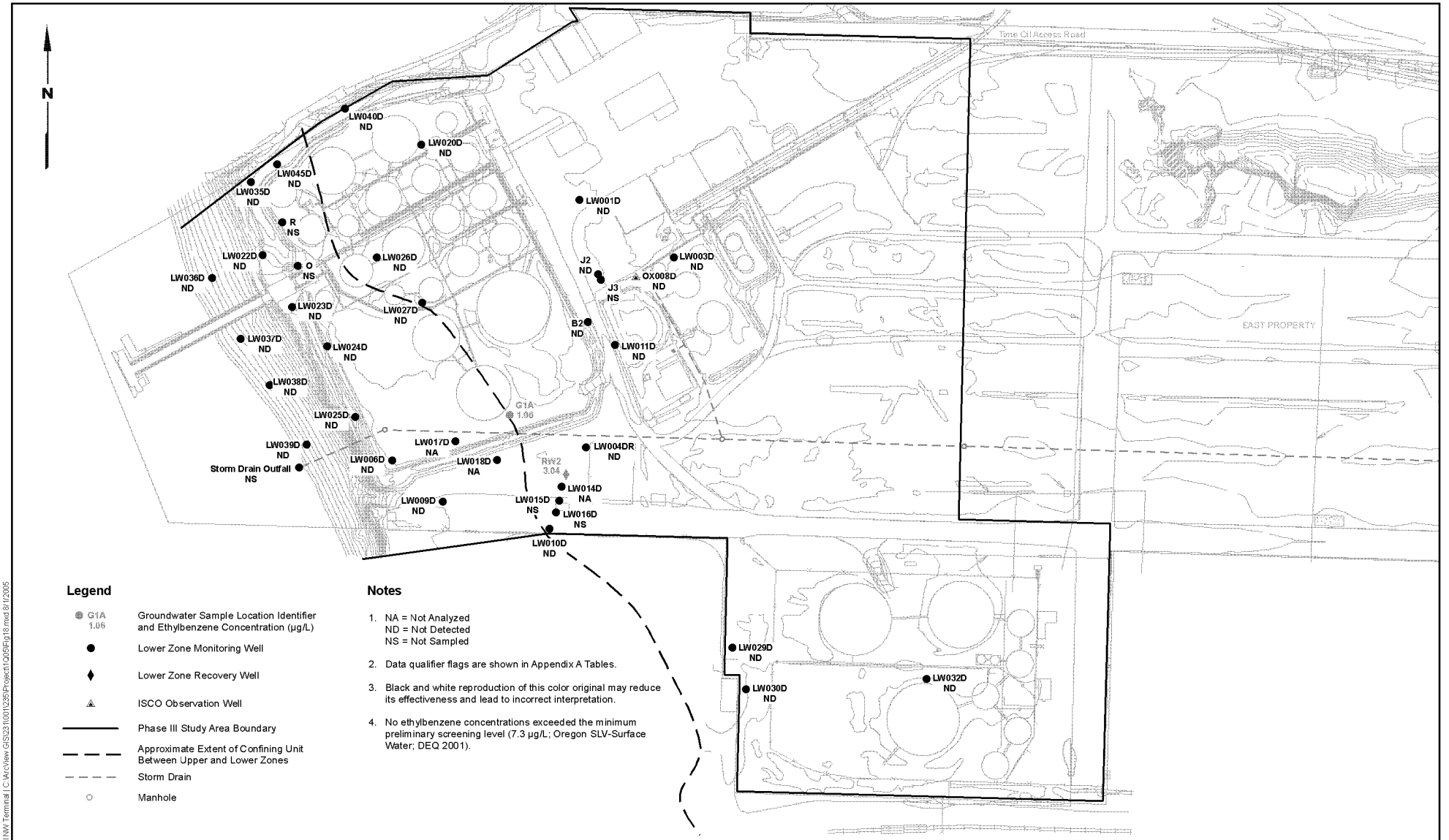


Time Oil NW Terminal | C:\ArcView GIS\23\100123\Project\123Fig17.mxd 8/1/2005

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Benzene Concentrations in Groundwater, Lower Zone February 2005**	Figure 17

BZTO104(e)021126



Legend

- G1A 1.06 — Groundwater Sample Location Identifier and Ethylbenzene Concentration (µg/L)
- Lower Zone Monitoring Well
- Lower Zone Recovery Well
- ISCO Observation Well
- Phase III Study Area Boundary
- Approximate Extent of Confining Unit Between Upper and Lower Zones
- Storm Drain
- Manhole

Notes

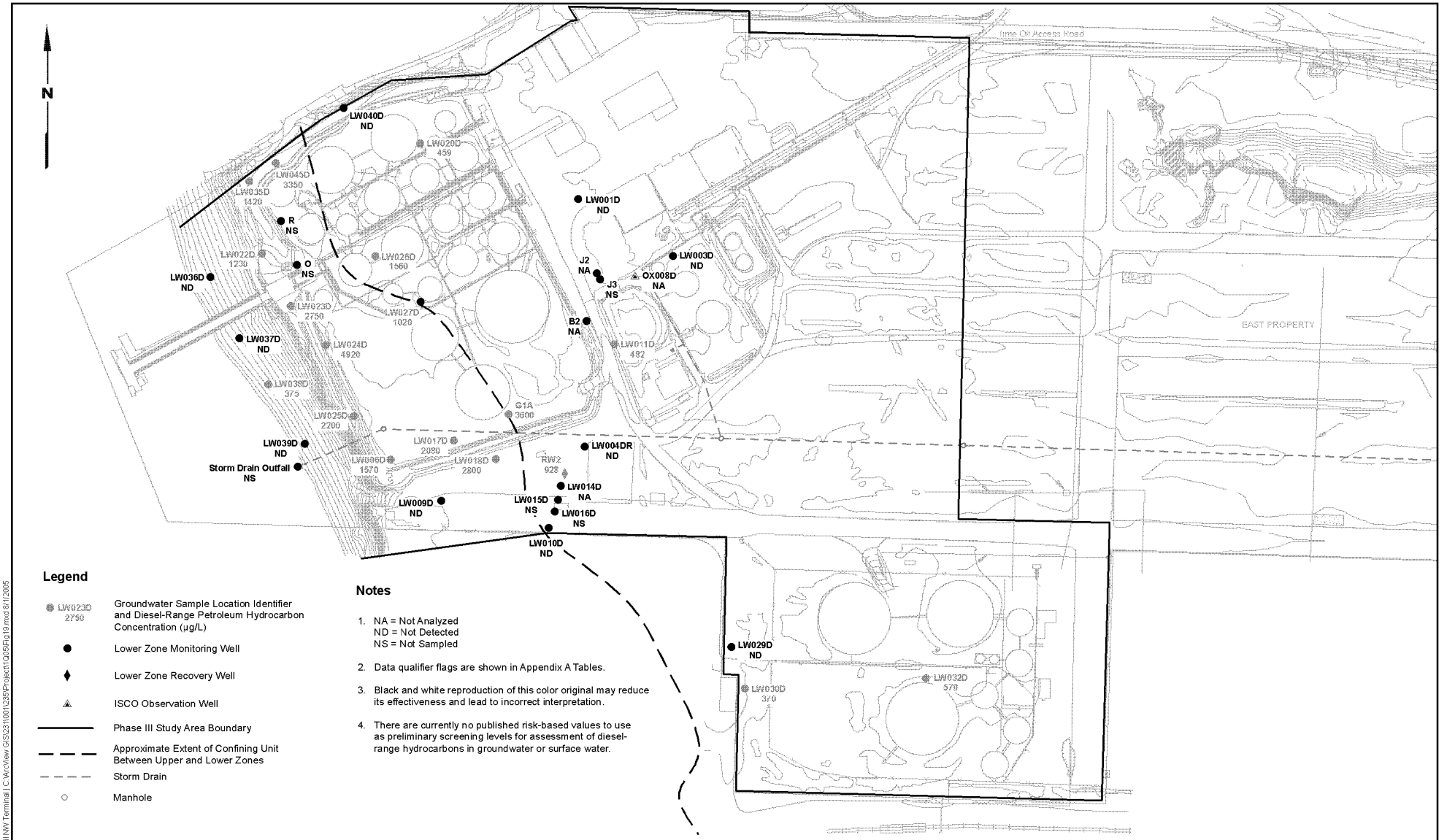
1. NA = Not Analyzed
   ND = Not Detected
   NS = Not Sampled
2. Data qualifier flags are shown in Appendix A Tables.
3. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
4. No ethylbenzene concentrations exceeded the minimum preliminary screening level (7.3 µg/L; Oregon SLV-Surface Water; DEQ 2001).

Time Oil NW Terminal | C:\ArcView GIS\231\001\235\Project1Q05\Fig18.mxd 8/1/2005

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Ethylbenzene Concentrations in Groundwater, Lower Zone February 2005**	Figure 18

BZTO104(e)021127

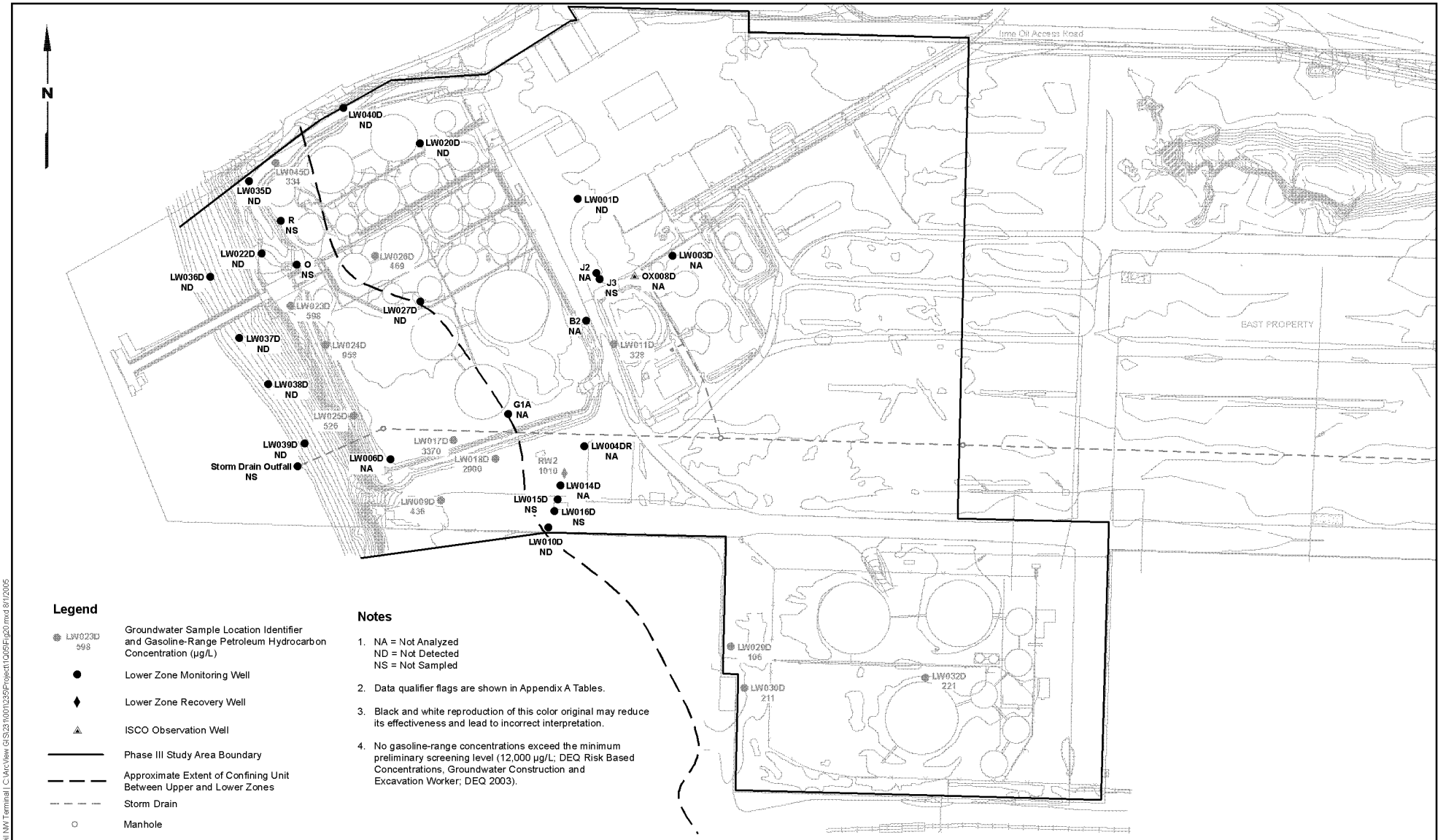


Time Oil NW Terminal | C:\ArcView GIS\23100\1235\Project\1Q05\Fig19.mxd 8/1/2005

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Diesel-Range Petroleum Hydrocarbons in Groundwater, Lower Zone, February 2005**	Figure 19

BZTO104(e)021128

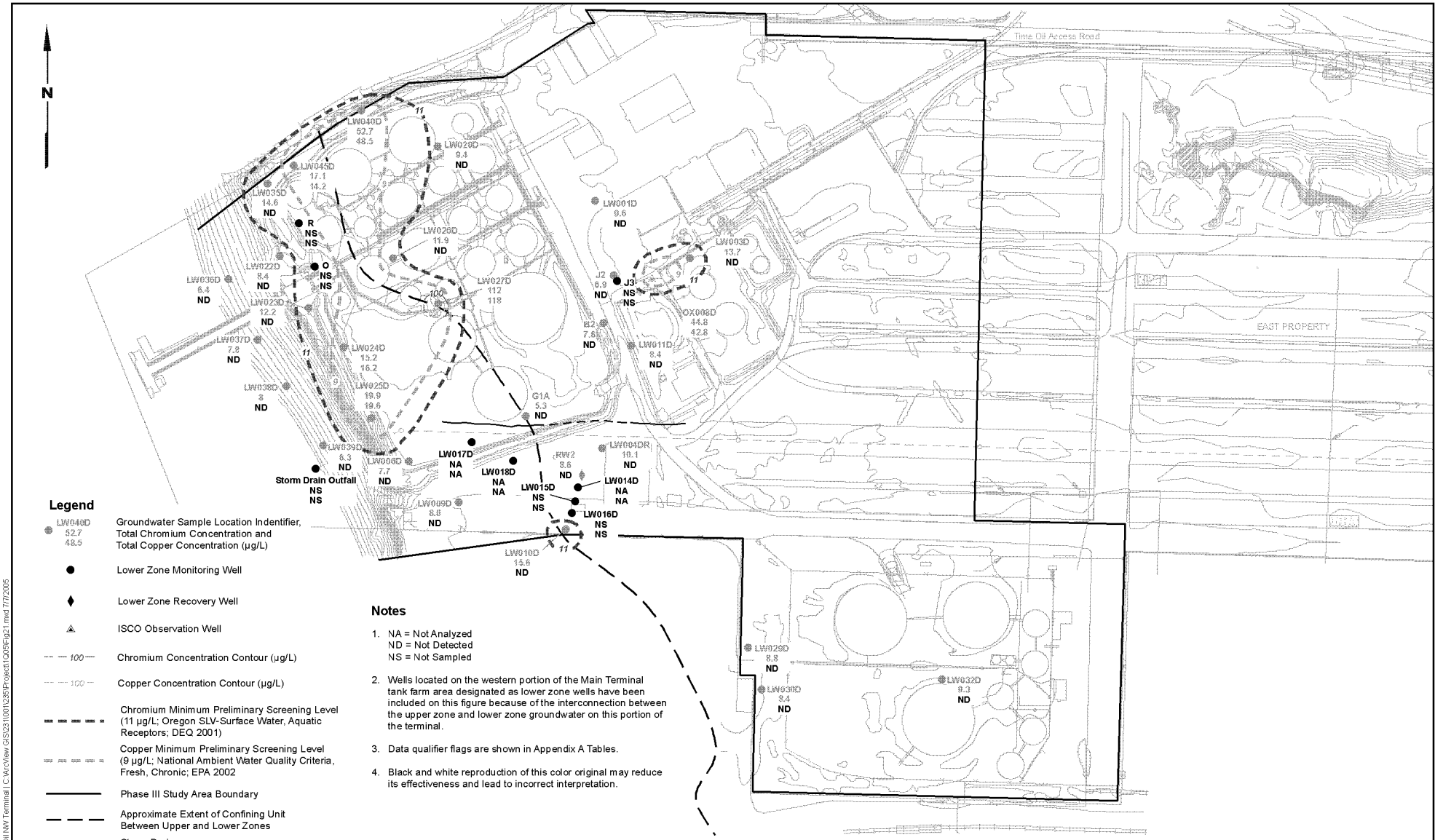


Time Oil NW Terminal | C:\ArcView GIS\23100\01235\Project\1Q05\Fig20.mxd 8/1/2005

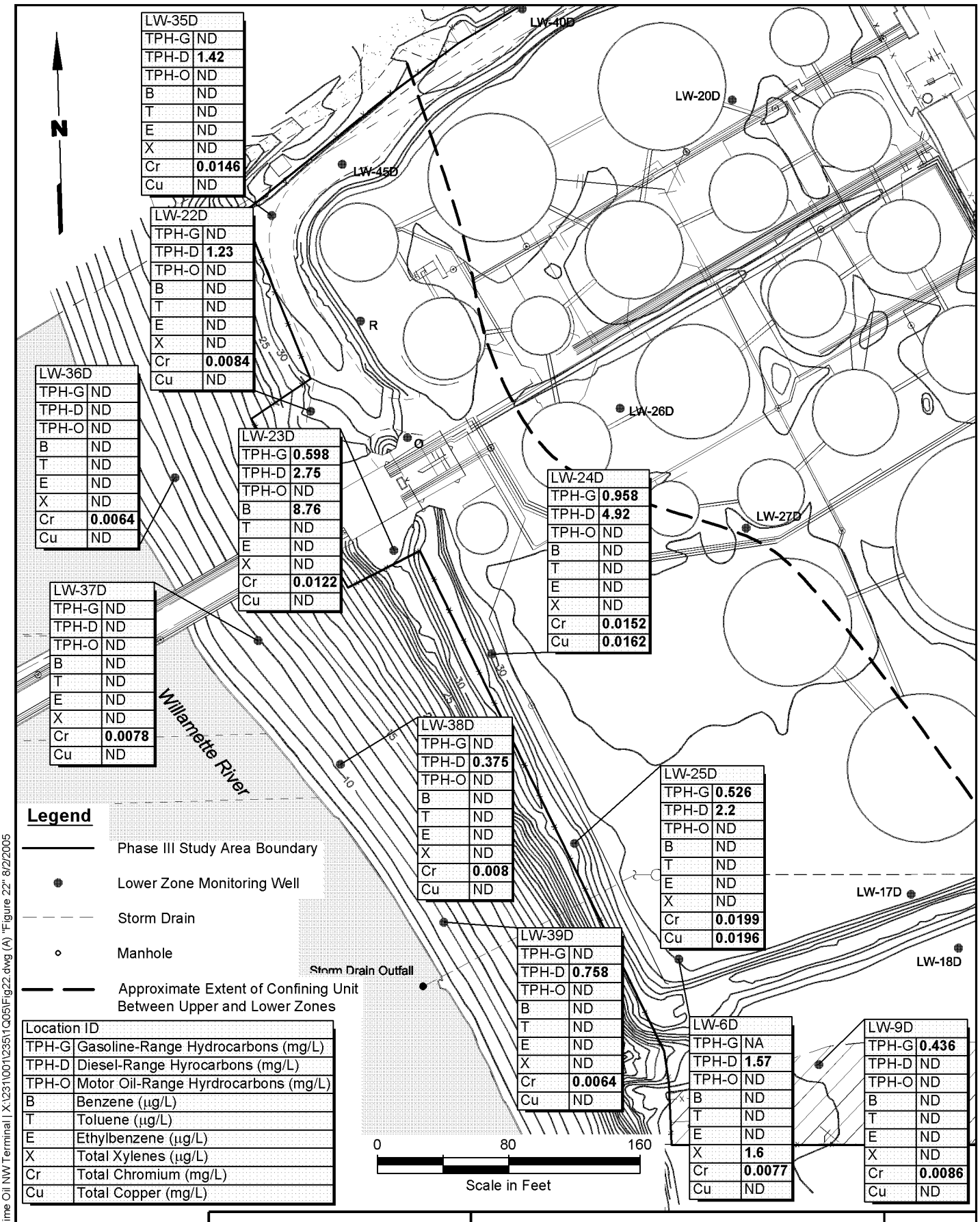
LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Gasoline-Range Petroleum Hydrocarbons in Groundwater, Lower Zone, February 2005**	Figure 20

BZTO104(e)021129



BZTO104(e)021130



Location ID	
TPH-G	Gasoline-Range Hydrocarbons (mg/L)
TPH-D	Diesel-Range Hyrocarbons (mg/L)
TPH-O	Motor Oil-Range Hyrdrocarbons (mg/L)
B	Benzene (µg/L)
T	Toluene (µg/L)
E	Ethylbenzene (µg/L)
X	Total Xylenes (µg/L)
Cr	Total Chromium (mg/L)
Cu	Total Copper (mg/L)

Time Oil NW Terminal | X:\231\001\235\1Q05\Fig22.dwg (A) "Figure 22" 8/2/2005

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Time Oil NW Terminal
Portland, Oregon

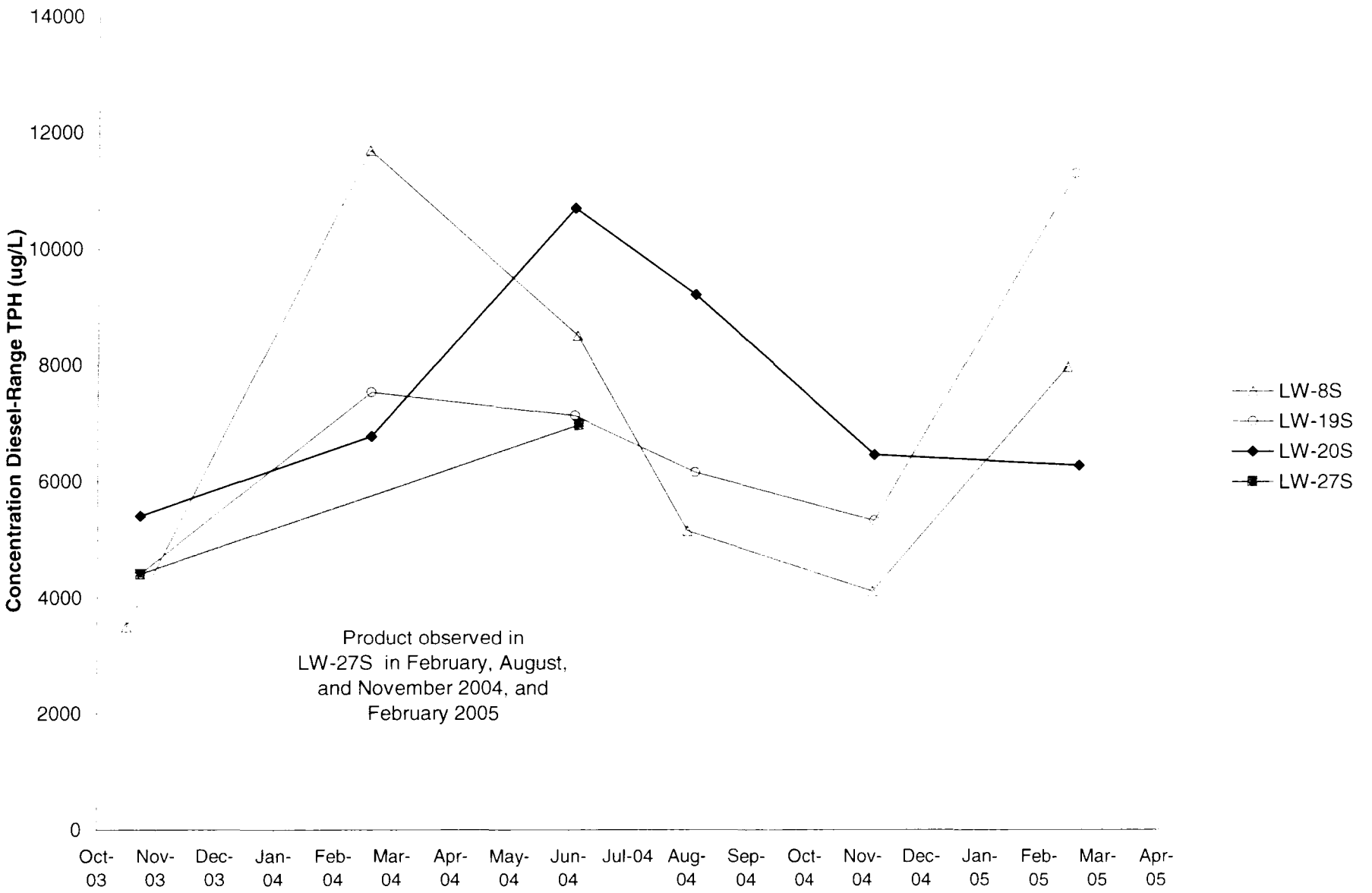
Groundwater Concentrations, Nearshore Wells, Selected Analytes 1st Quarter 2005

Figure 22

BZTO104(e)021131

7.7.05 - Edmdata wproc 231.001 131.2005 Qrtly 1Q05 GW Rpt Fig 23.doc

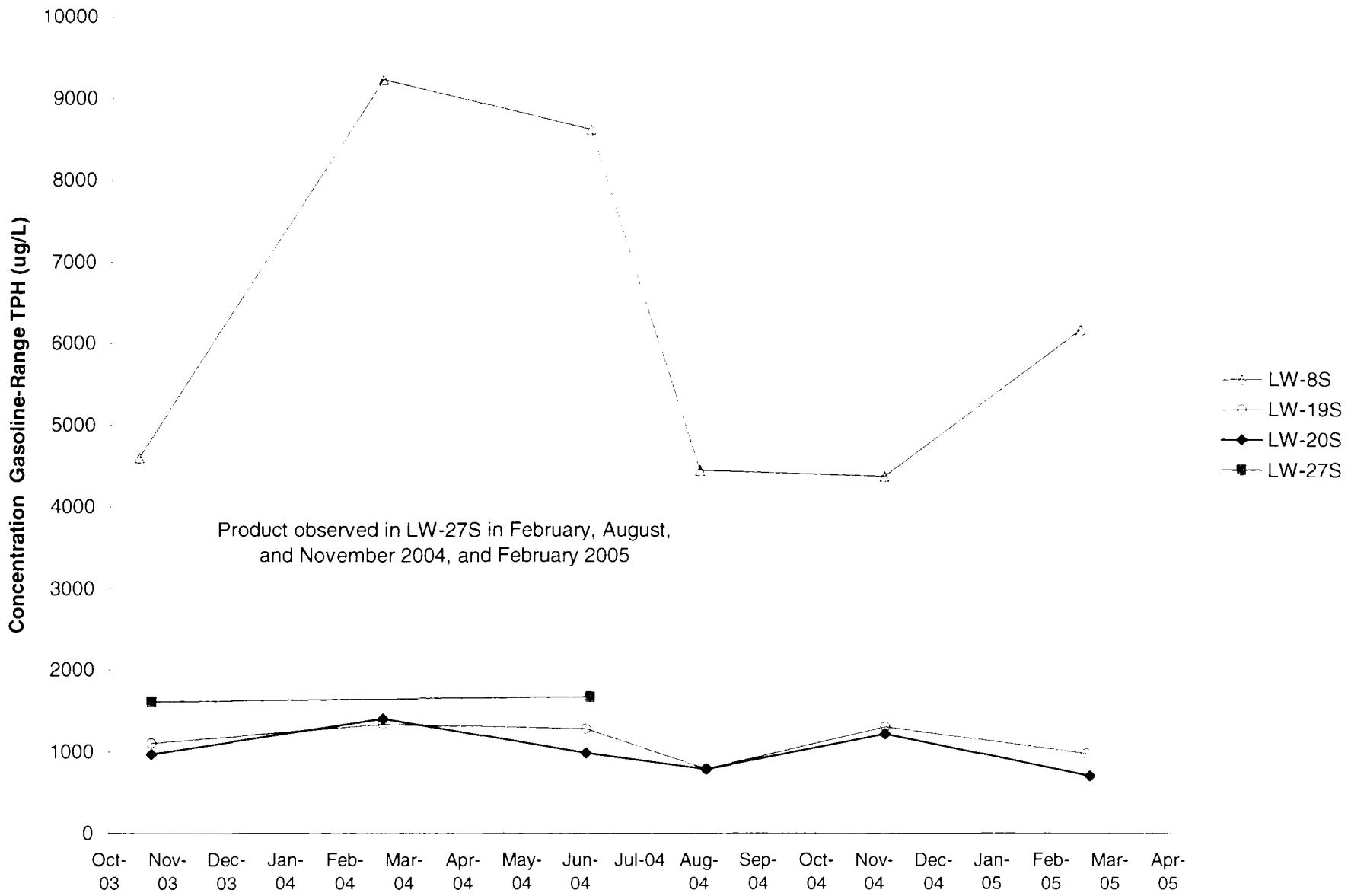
Source: Edmdata sheets TIMEOIL PH2R PLOTS2005.xls: MTF Upper Diesel



LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Diesel-Range Hydrocarbons Selected Upper Zone Wells Main Tank Farm Area**	Figure 23

BZTO104(e)021132

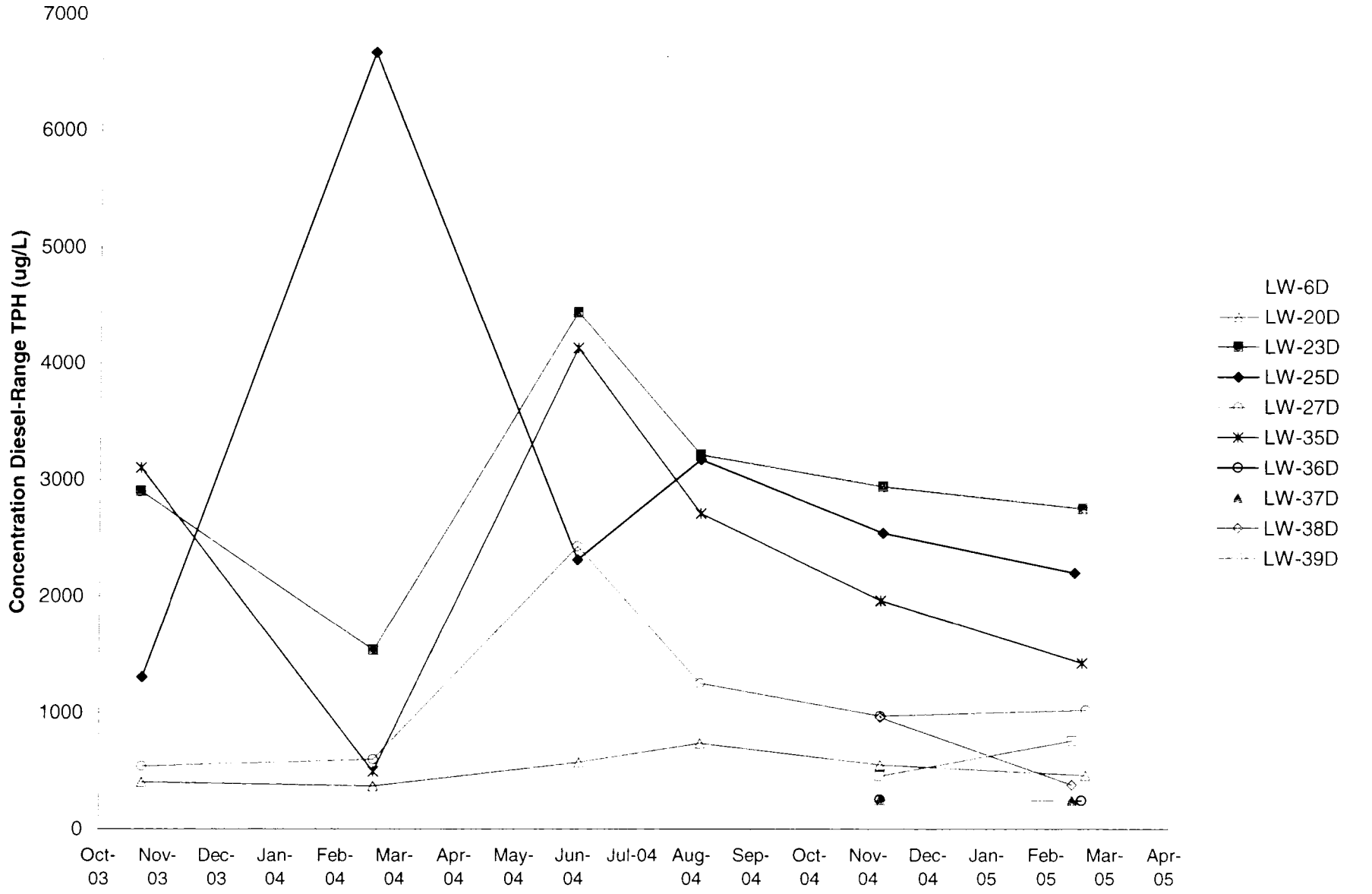


LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

Gasoline-Range Hydrocarbons
Selected Upper Zone Wells
Main Tank Farm Area

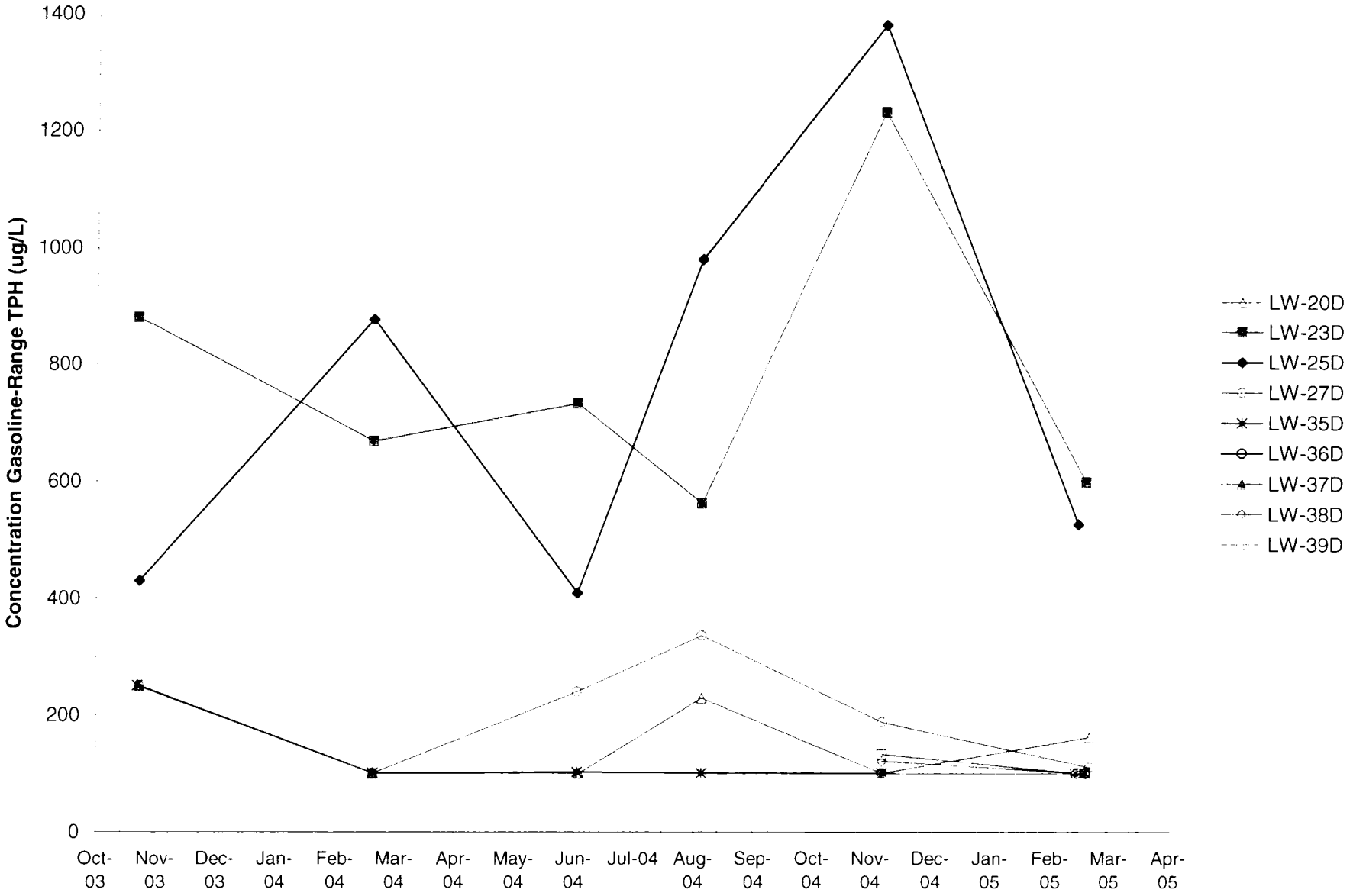
Figure
24



LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Diesel-Range Hydrocarbons Selected Lower Zone Wells Main Tank Farm Area**	Figure 25

BZTO104(e)021134

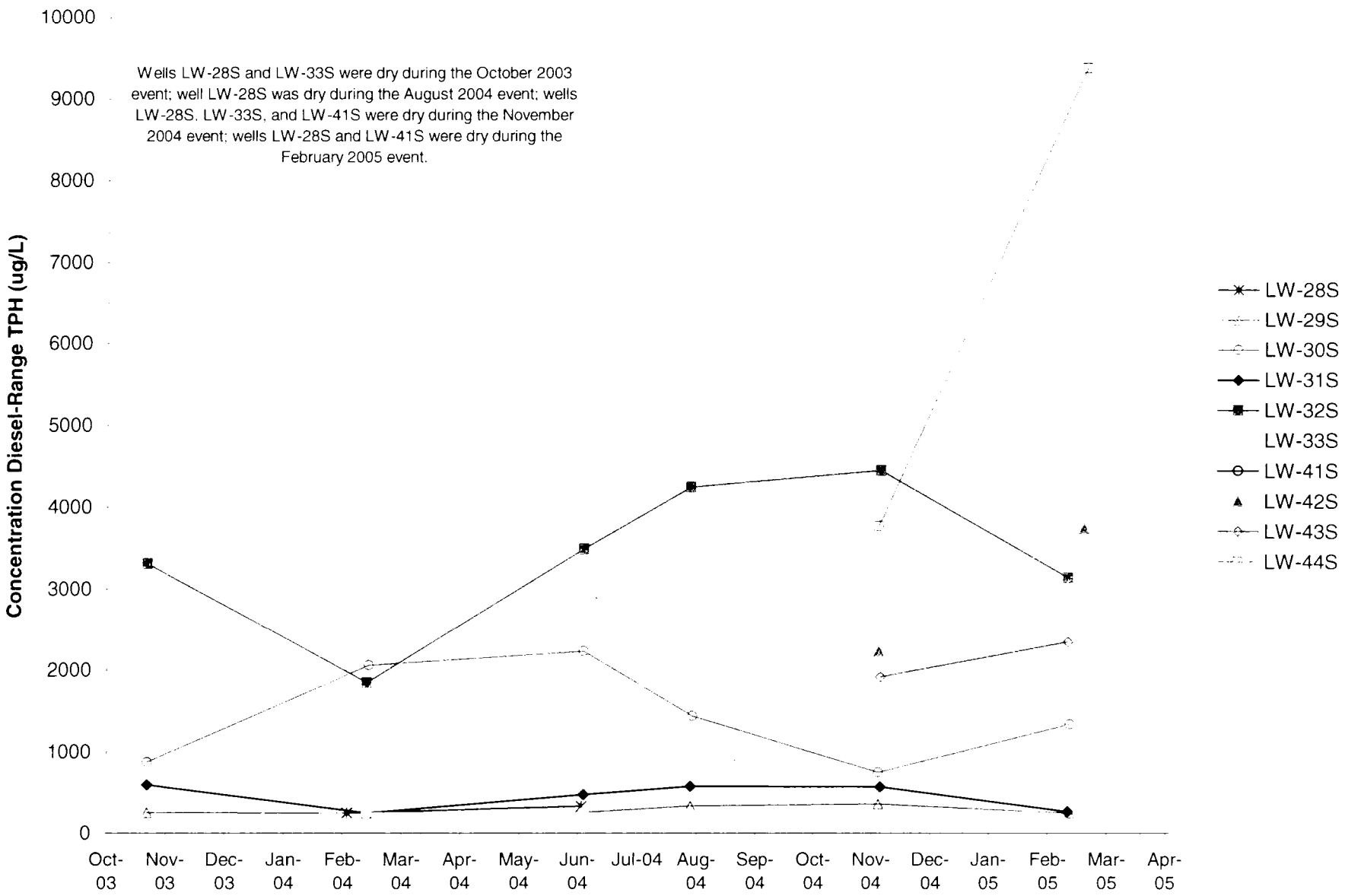


LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

Gasoline-Range Hydrocarbons
Selected Lower Zone Wells
Main Tank Farm Area

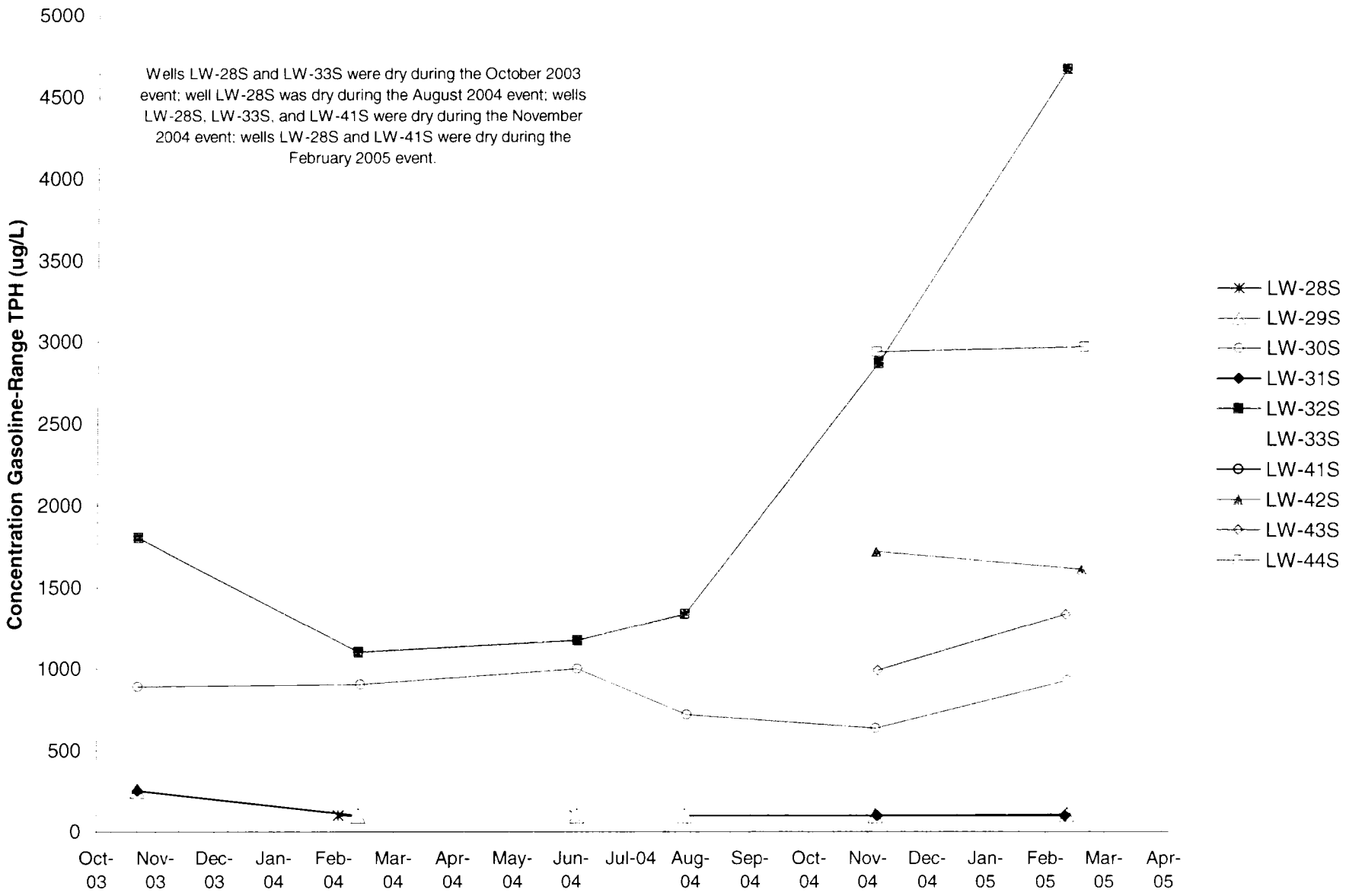
Figure
26



LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Diesel-Range Hydrocarbons Upper Zone Wells Bell Terminal**	Figure 27

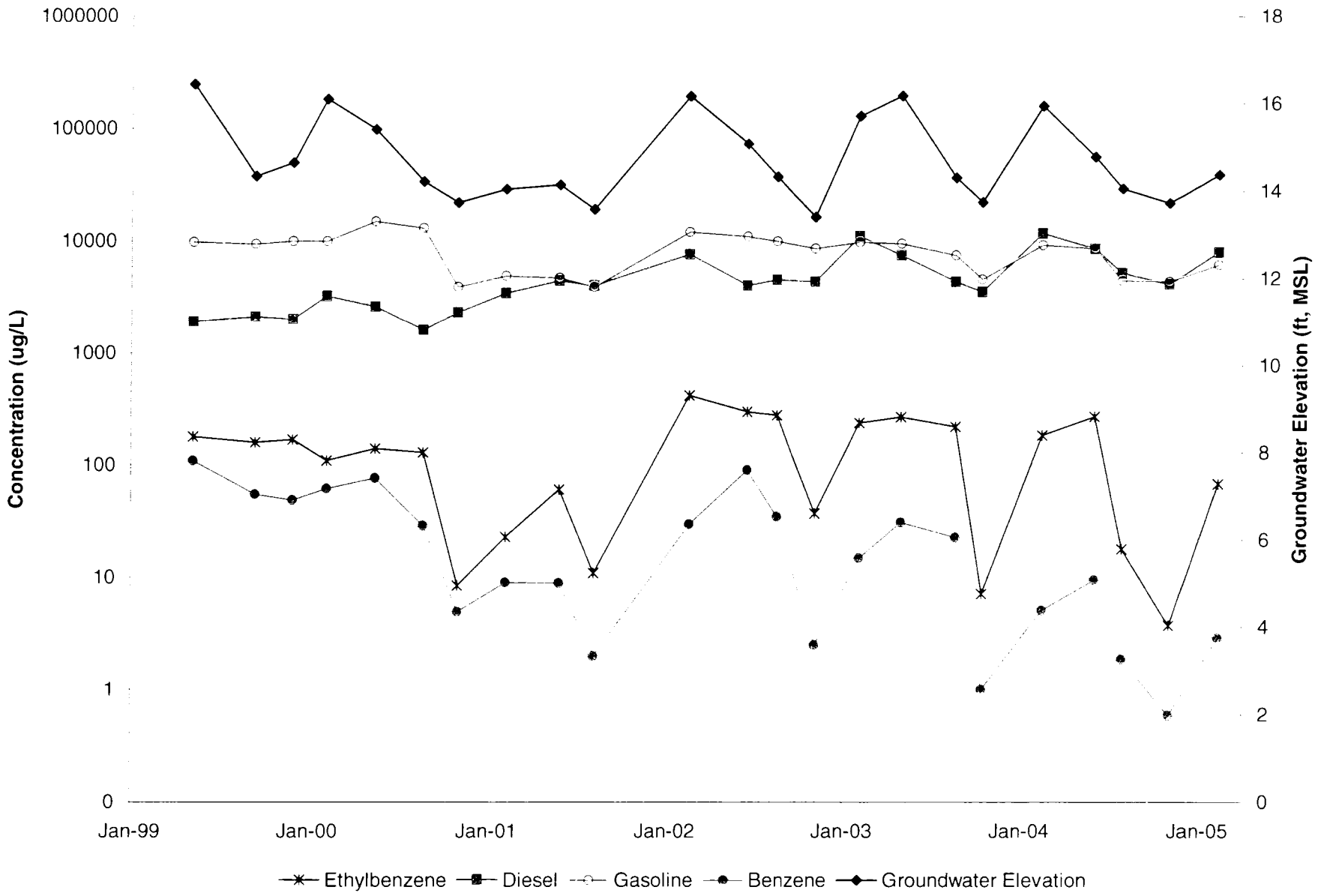
BZT0104(e)021136



LANDAU ASSOCIATES

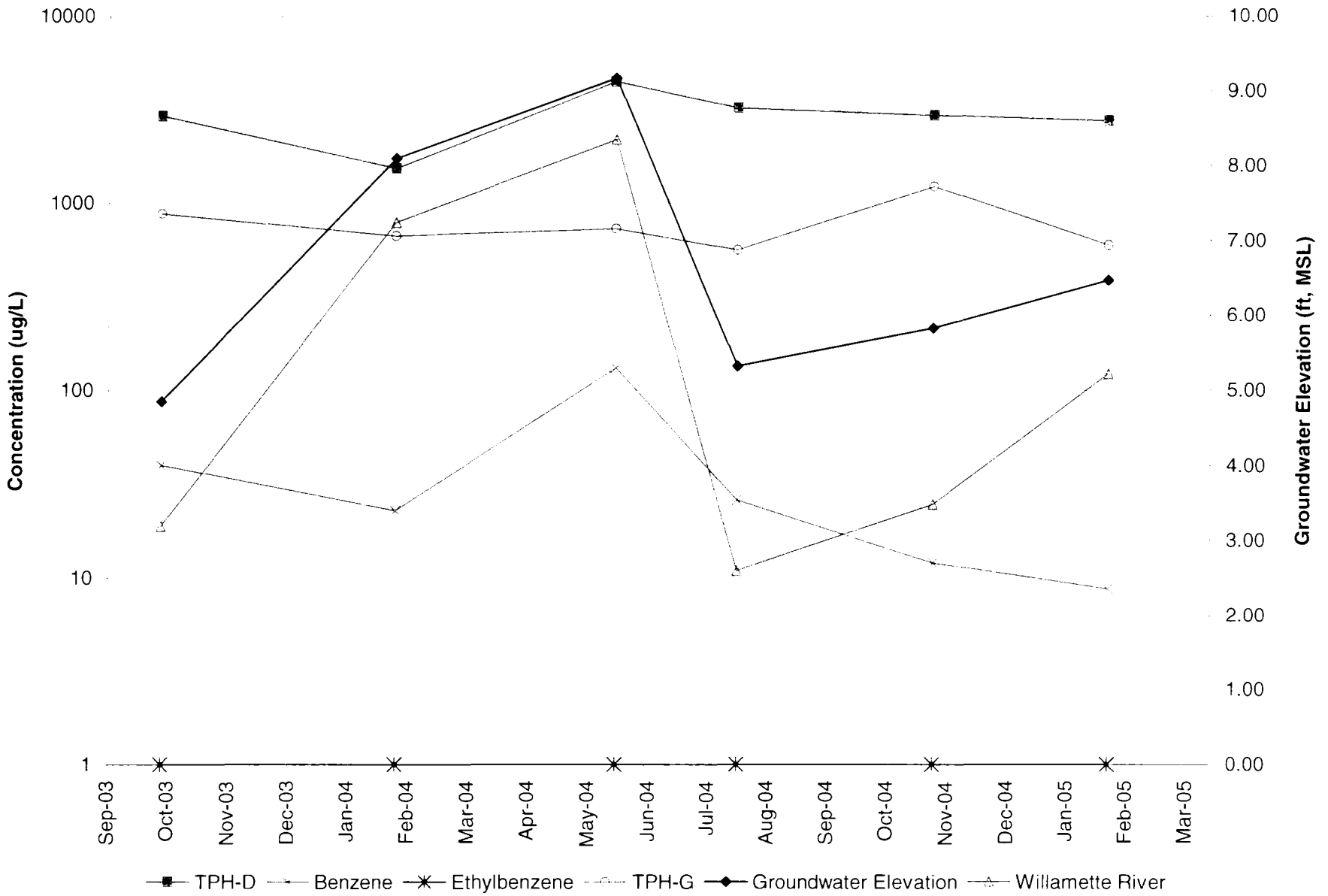
Time Oil NW Terminal Portland, Oregon	**Gasoline-Range Hydrocarbons Upper Zone Wells Bell Terminal**	Figure 28

BZTO104(e)021137



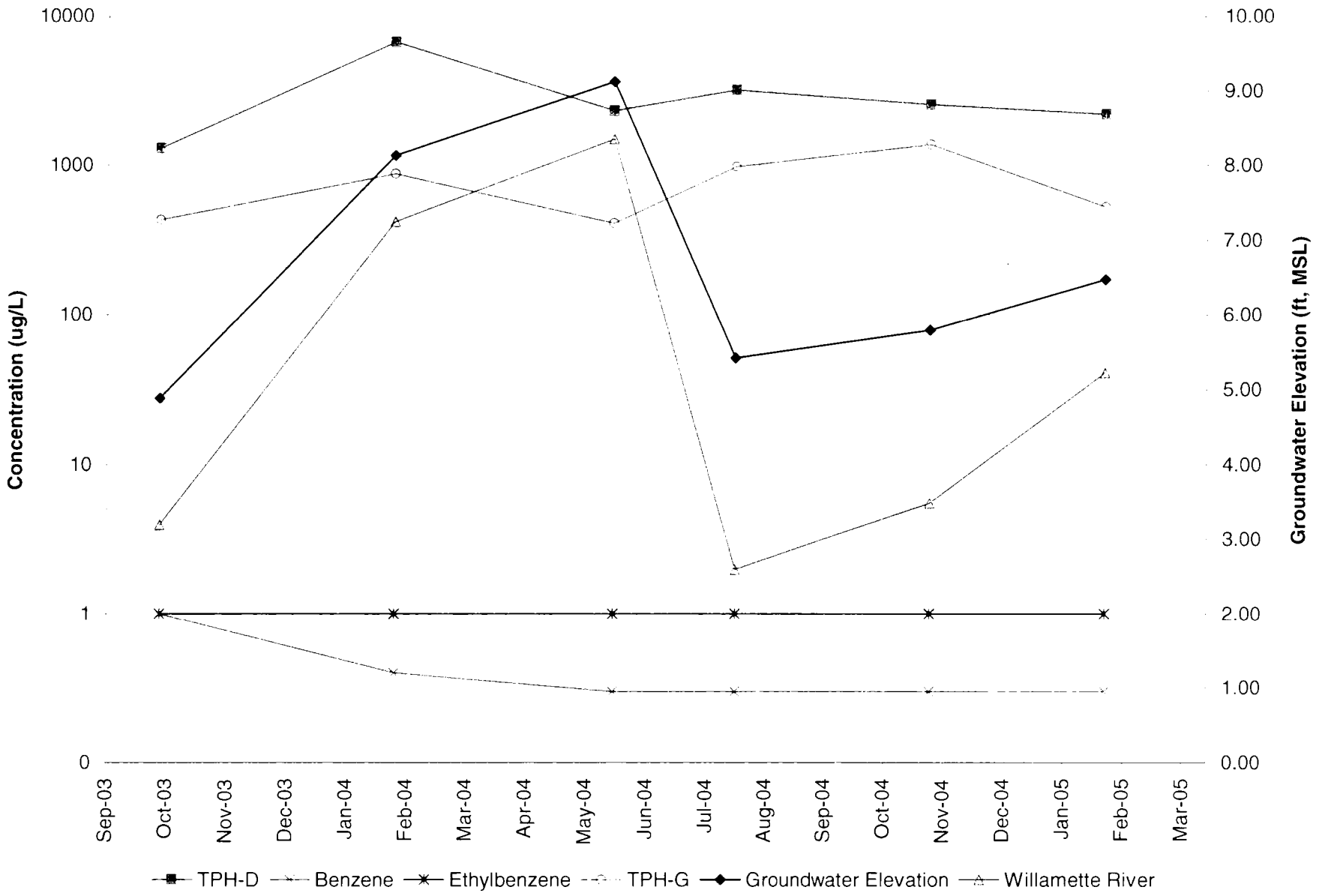
LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Selected Constituents Well LW-8S, Upper Zone Main Tank Farm Area**	Figure 29



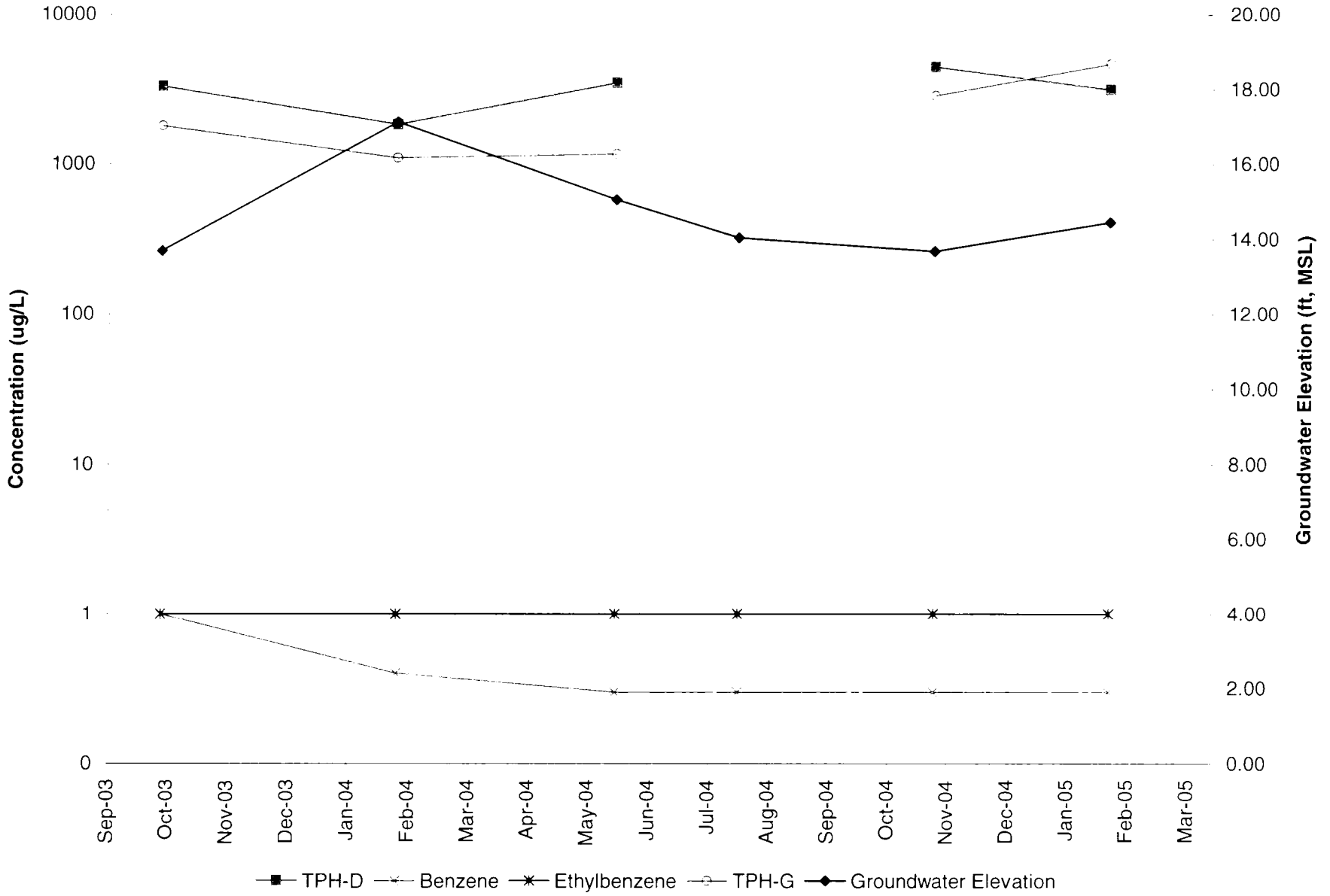
LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Selected Constituents, Well LW-23D Lower Zone Main Tank Farm Area**	Figure 30



LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Selected Constituents Well LW-25D, Lower Zone Main Tank Farm Area**	Figure 31

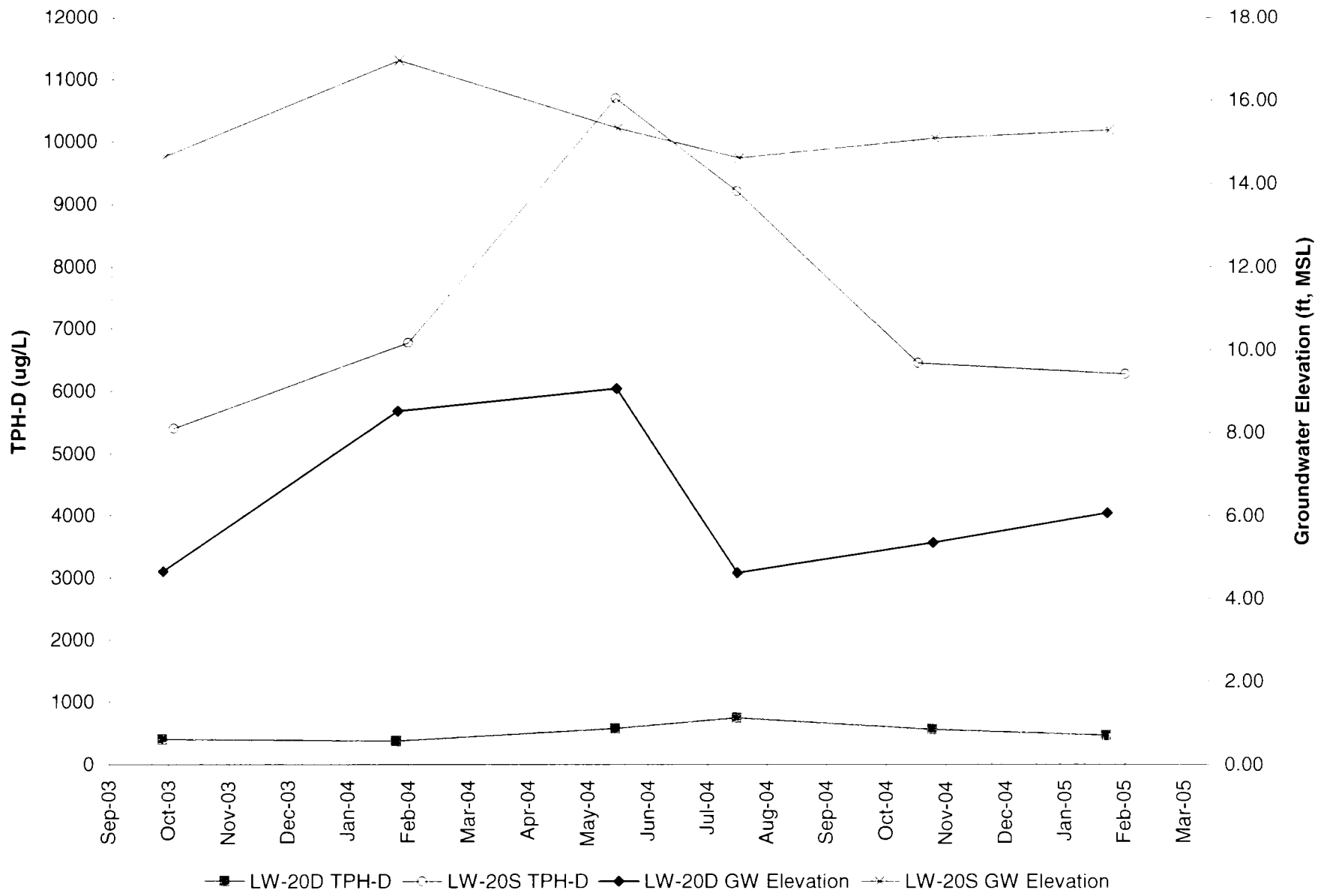


LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

Selected Constituents
Well LW-32S, Upper Zone Bell Terminal

Figure
32



LANDAU ASSOCIATES

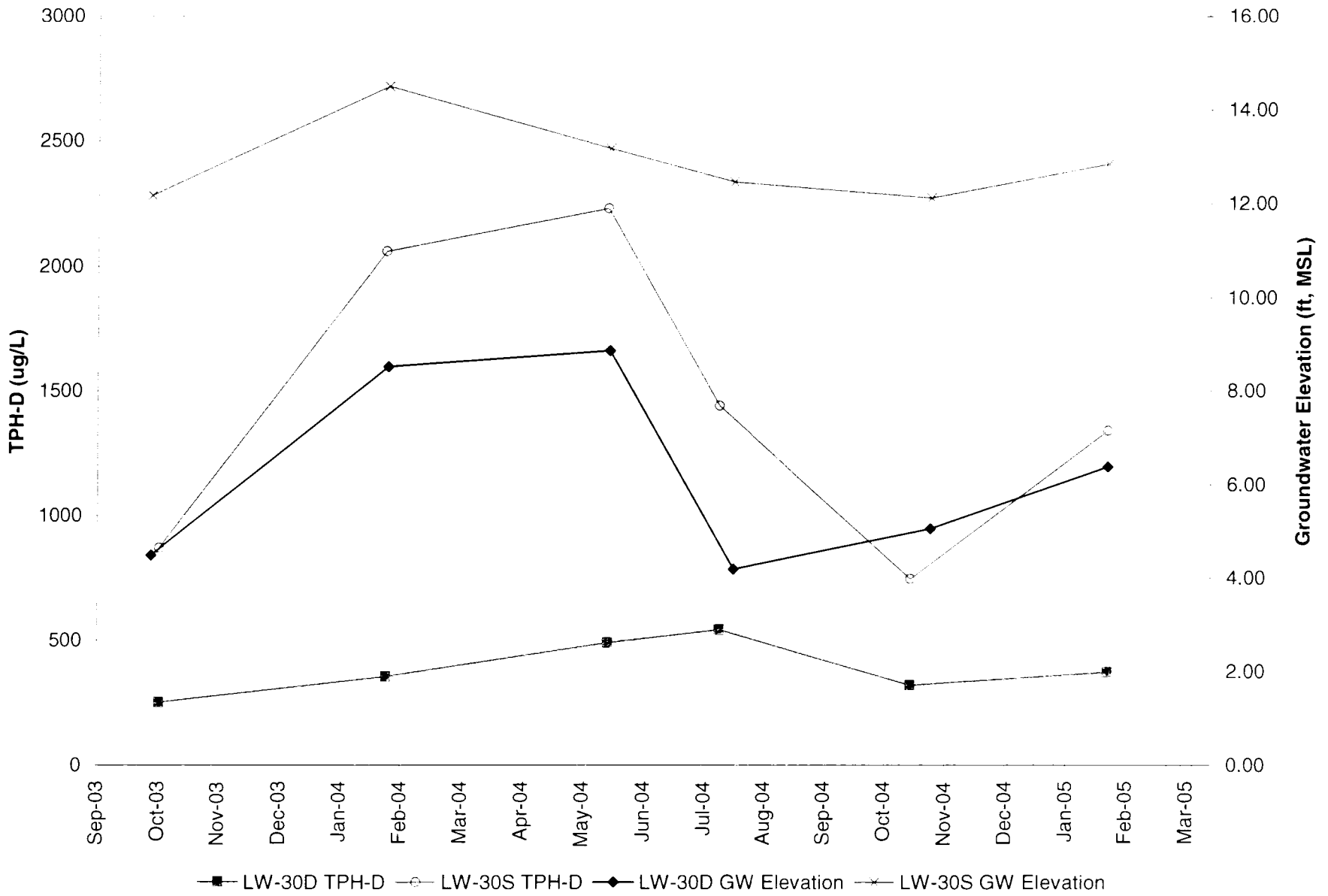
Time Oil NW Terminal
Portland, Oregon

Diesel-Range TPH vs. Groundwater Elevation
LW-20S and LW-20D
Main Tank Farm Area

Figure
33

7/7/05 J:\Edmdata\wproc\231.001\131\2005 Qrtly 1Q05 GW Rpt Fig 34.doc

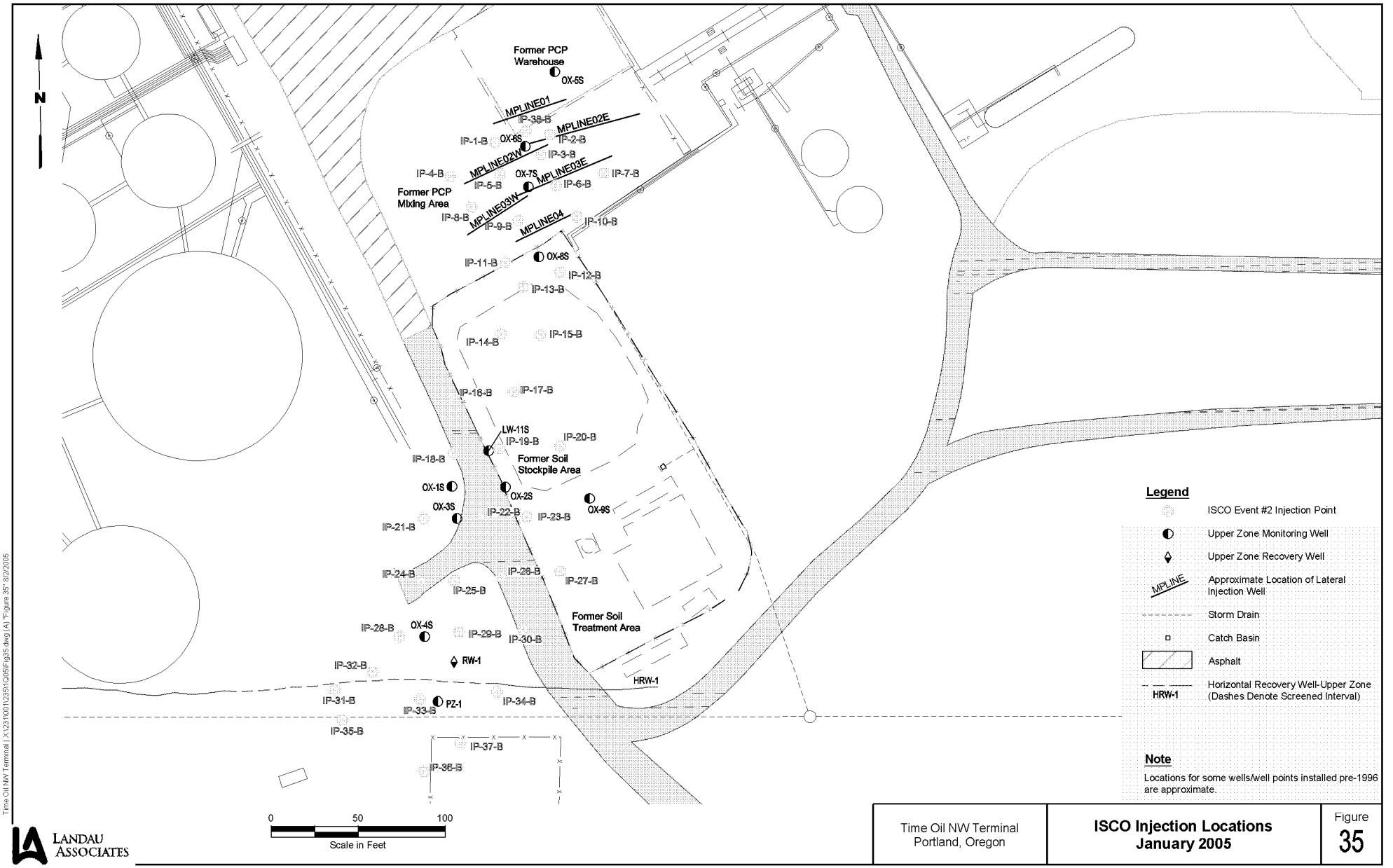
Source: edmdata sheets TIMEOIL PH2RI PLOTS2005 LW30D-S



LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Diesel-Range TPH vs. Groundwater Elevation LW-30S and LW-30D Main Tank Farm Area**	Figure 34

BZT0104(e)021143



Time Oil NW Terminal | X:\2310011235\10\05Fig35.dwg (A) "Figure 35" 8/2/2005

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**ISCO Injection Locations January 2005**	Figure **35**

BZTO104(e)021144

APPENDIX A

Groundwater Level Measurements and Quality Data

TABLE A-1
GROUNDWATER MONITORING LOCATIONS AND ANALYTICAL METHODS
FIRST QUARTER EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Semivolatiles (EPA 8270)	Volatiles (EPA 8260)	MTBE (EPA 8260)	PCP (EPA 8270 SIM)	PAH (EPA0 SIM)	TPH-Dx (NWTPH-Dx)	TPH-Gx (NWTPH-G)	PP Metals (a) (EPA 6010/7000)	Dissolved Metals (EPA 6010/7000)	TDS (EPA 160.1)	Chloride (EPA 9056)	Selenium (EPA 6010)	Major Ions (EPA 9056)	Ferrous Iron (EPA SM3500)	Dioxin/Furans (EPA 8290)
B1 (b)	X	X		X		X		X		X	X		X		
B2 (b)	X	X		X				X		X	X		X		
D (b)	X	X		X				X		X	X		X		
G1A	X	X		X		X		X		X	X		X		
H (b)															
HRW-1				X											
J1 (b)	X	X		X				X		X	X		X		
J2 (b)	X	X		X				X		X	X		X		
J3 (b)															
K															
L (b)															
LW-10D	X	X		X		X	X	X		X	X		X		
LW-10S (e)															
LW-11D	X	X		X		X	X	X		X	X		X		
LW-11S	X	X				X	X	X		X	X	X	X	X	
LW-13S				X		X	X								
LW-14D (f)				X											
LW-15D (f)															
LW-16D (f)															
LW-17D				X		X	X								
LW-18D				X		X	X								
LW-19S	X	X	X		X	X	X	X		X	X		X		
LW-1D	X	X	X		X	X	X	X		X	X		X		
LW-1S	X	X	X		X	X	X	X		X	X		X		
LW-20D	X	X	X		X	X	X	X		X	X		X		
LW-20S	X	X	X		X	X	X	X		X	X		X		
LW-21S (c)															
LW-22D	X	X	X		X	X	X	X		X	X		X		
LW-23D	X	X	X		X	X	X	X		X	X		X		
LW-24D	X	X	X		X	X	X	X		X	X		X		
LW-25D	X	X	X		X	X	X	X		X	X		X		
LW-26D	X	X	X		X	X	X	X		X	X		X		
LW-27D	X	X	X		X	X	X	X		X	X		X		
LW-27S (c)															
LW-28S (e)															
LW-29D	X	X	X		X	X	X	X		X	X		X		
LW-29S	X	X	X		X	X	X	X		X	X		X		
LW-30D	X	X	X		X	X	X	X		X	X		X		
LW-30S	X	X	X		X	X	X	X		X	X		X		
LW-31S	X	X	X		X	X	X	X		X	X		X		
LW-32D	X	X	X		X	X	X	X		X	X		X		
LW-32S	X	X	X		X	X	X	X		X	X		X		
LW-33S	X	X	X		X	X	X	X		X	X		X		
LW-34S	X	X	X		X	X	X	X		X	X		X		
LW-35D	X	X	X		X	X	X	X		X	X		X		
LW-36D	X	X	X		X	X	X	X	X	X	X		X		
LW-37D	X	X	X		X	X	X	X	X	X	X		X		
LW-38D	X	X	X		X	X	X	X	X	X	X		X		
LW-39D	X	X	X		X	X	X	X	X	X	X		X		
LW-3D (b)	X	X		X				X		X	X		X		
LW-40D	X	X	X		X	X	X	X		X	X		X		
LW-40S (e)															

BZTO104(e)021146

TABLE A-1
GROUNDWATER MONITORING LOCATIONS AND ANALYTICAL METHODS
FIRST QUARTER EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Semivolatiles (EPA 8270)	Volatiles (EPA 8260)	MTBE (EPA 8260)	PCP (EPA 8270 SIM)	PAH (EPA0 SIM)	TPH-Dx (NWTPH-Dx)	TPH-Gx (NWTPH-G)	PP Metals (a) (EPA 6010/7000)	Dissolved Metals (EPA 6010/7000)	TDS (EPA 160.1)	Chloride (EPA 9056)	Selenium (EPA 6010)	Major Ions (EPA 9056)	Ferrous Iron (EPA SM3500)	Dioxin/Furans (EPA 8290)
LW-41S	X	X	X		X	X	X	X		X	X		X		
LW-42S	X	X	X		X	X	X	X		X	X		X		
LW-43S	X	X	X		X	X	X	X		X	X		X		
LW-44S	X	X	X		X	X	X	X		X	X		X		
LW-45D	X	X	X		X	X	X	X		X	X		X		
LW-4DR	X	X		X		X		X		X	X		X		
LW-4S	X	X		X		X		X		X	X		X		
LW-5S															
LW-6D	X	X		X		X		X		X	X		X		
LW-7S	X	X	X	X	X	X	X	X		X	X		X		
LW-8S	X	X		X		X	X	X		X	X		X		
LW9D	X	X		X		X	X	X		X	X		X		
LW-9S (e)															
N	X	X	X		X	X	X	X		X	X		X		
O (b)															
OX-1S	X	X						X				X	X	X	X
OX-2S (c)															
OX-3S	X	X						X				X	X	X	
OX-4S (e)															
OX-5S	X	X						X				X	X	X	
OX-6S	X	X						X				X	X	X	X
OX-7S	X	X						X				X	X	X	
OX-8D	X	X						X				X	X	X	
OX-8S	X	X						X				X	X	X	
OX-9S	X	X						X				X	X	X	
P	X	X	X		X	X	X	X		X	X		X		
PZ-1 (b)															
PZ-2 (b)															
PZ-3 (b)															
PZ-4 (b)															
Q	X	X	X		X	X	X	X		X	X		X		
R (b)															
River-Outfall (g)															
RW1	X	X		X		X	X	X		X	X	X	X	X	X
RW2	X	X		X		X	X	X		X	X		X		
SDM-1				X											
W	X	X		X		X	X	X		X	X	X	X	X	X
Y	X	X	X		X	X	X	X	X	X	X		X		
Z	X	X	X		X	X	X	X		X	X		X		

Notes:

Well locations in regular text are part of the Phase II RI sampling program, wells in bold text are part of the Phase III RI sampling program.

(a) Metals analyzed include: arsenic, chromium, copper, nickel, lead, and zinc.

(b) Wells not part of the Phase II monitoring program per the modifications outlined in Appendix D.

(c) Well contained product and not sampled.

(d) Well damaged during the first ISCO injection event and not sampled. Well has been abandoned and replaced by well location LW-4DR on November 18, 2004.

(e) Well dry and not sampled.

(f) Well not sampled per the Groundwater Interim Action Startup Plan dated July 14, 2000.

(g) River outfall not observed during this quarterly groundwater sampling event.

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TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
Shallow Wells:							
B	03/25/1997	----	29.04	NM	----	NM	Couldn't remove cap
B	03/31/1997	----	29.04	NM	----	NM	Couldn't remove cap
B	07/16/1997	08:30	29.04	11.02	18.02	----	
B	10/21/1997	16:35	29.04	13.39	15.65	----	
B	01/27/1998	12:15	29.04	11.53	17.51	----	
B	05/18/1998	17:56	29.04	12.51	16.53	----	
B	08/17/1998	11:02	29.04	14.40	14.64	----	
B	11/13/1998	10:24	29.04	14.38	14.66	----	
B	02/16/1999	13:36	29.04	9.69	19.35	----	
B	05/18/1999	15:52	29.04	11.72	17.32	----	
B	09/21/1999	12:21	29.04	15.18	13.86	----	
B	12/06/1999	14:37	29.04	13.00	16.04	----	
B	02/16/2000	10:57	29.04	11.84	17.20	----	
B	05/23/2000	17:31	29.04	13.22	15.82	----	
B	08/29/2000	14:23	29.04	15.32	13.72	----	
B	11/09/2000	13:31	29.04	15.29	13.75	----	
B	02/12/2001	15:25	29.04	13.68	15.36	----	
B	06/04/2001	12:49	29.04	14.18	14.86	----	
B	08/16/2001	11:54	29.04	15.80	13.24	----	
B	11/28/2001	12:44	29.04	13.80	15.24	----	
B	02/27/2002	14:33	29.04	12.27	16.77	----	
B	06/27/2002	15:05	29.04	13.38	15.66	----	
B	08/26/2002	16:59	29.04	14.02	15.02	----	
B	11/13/2002	09:01	29.04	13.90	15.14	----	
B	02/11/2003	10:13	29.04	12.85	16.19	----	
B	05/08/2003	08:11	29.04	12.27	16.77	----	
B	08/27/2003	15:30	29.04	14.70	14.34	----	
B1	03/25/1997	10:48	29.74	----	----	----	Couldn't remove cap
B1	03/31/1997	----	29.74	----	----	----	Couldn't remove cap
B1	07/16/1997	07:49	29.74	11.01	18.73	----	
B1	10/21/1997	16:33	29.74	13.56	16.18	----	
B1	01/27/1998	12:10	29.74	11.68	18.06	----	
B1	05/18/1998	17:55	29.74	12.76	16.98	----	
B1	08/17/1998	11:04	29.74	14.15	15.59	----	
B1	11/13/1998	10:21	29.74	15.05	14.69	----	
B1	02/16/1999	13:33	29.74	9.59	20.15	----	
B1	05/18/1999	15:51	29.74	11.79	17.95	----	
B1	09/21/1999	12:19	29.74	14.63	15.11	----	
B1	12/06/1999	14:38	29.74	14.25	15.49	----	
B1	02/16/2000	10:55	29.74	12.20	17.54	----	
B1	05/23/2000	17:32	29.74	13.25	16.49	----	
B1	08/29/2000	14:22	29.74	14.93	14.81	----	
B1	11/09/2000	13:30	29.74	15.56	14.18	----	
B1	02/12/2001	15:26	29.74	15.19	14.55	----	
B1	06/04/2001	12:50	29.74	15.06	14.68	----	
B1	08/16/2001	11:55	29.74	15.72	14.02	----	
B1	11/28/2001	12:45	29.74	15.47	14.27	----	
B1	02/27/2002	14:34	29.74	12.15	17.59	----	
B1	03/05/2002	11:06	29.74	12.28	17.46	----	
B1	04/05/2002	08:42	29.74	12.40	17.34	----	
B1	05/29/2002	00:00	29.74	13.20	16.54	----	
B1	06/27/2002	15:06	29.74	13.77	15.97	----	
B1	08/26/2002	17:00	29.74	14.79	14.95	----	
B1	11/13/2002	09:02	29.74	16.00	13.74	----	
B1	02/11/2003	10:15	29.74	12.86	16.88	----	
B1	05/08/2003	08:12	29.74	12.25	17.49	----	
B1	08/27/2003	15:31	29.74	14.79	14.95	----	
B1	10/23/2003	14:07	29.74	15.61	14.13	----	
B1	02/19/2004	14:13	29.74	12.39	17.35	----	
B1	06/09/2004	09:01	29.74	14.10	15.64	----	
B1	08/10/2004	12:21	29.74	15.18	14.56	----	
B1	11/18/2004	09:04	29.74	15.70	14.04	----	
B1	02/15/2005	10:04	29.74	14.83	14.91	----	Slight product odor
C	03/25/1997	12:32	28.89	5.56	23.33	----	
C	03/31/1997	11:38	28.89	6.16	22.73	----	
C	07/16/1997	08:47	28.89	8.28	20.61	----	
C	10/21/1997	15:15	28.89	10.00	18.89	----	
C	01/27/1998	13:41	28.89	7.98	20.91	----	
C	05/18/1998	18:08	28.89	9.54	19.35	----	
C	08/17/1998	11:11	28.89	dry	----	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
C	11/13/1998	10:36	28.89	10.36	18.53	----	
C	02/16/1999	13:58	28.89	5.91	22.98	----	
C	05/18/1999	16:04	28.89	7.90	20.99	----	
C	09/21/1999	12:44	28.89	dry	----	----	
C	12/06/1999	14:50	28.89	9.82	----	----	Water in endcap
C	02/16/2000	09:51	28.89	8.78	20.11	----	
C	05/23/2000	17:55	28.89	dry	----	----	
C	08/29/2000	14:33	28.89	dry	----	----	
C	11/09/2000	13:47	28.89	9.94	18.95	----	Dry?
C	02/12/2001	15:08	28.89	dry	----	----	
C	06/04/2001	13:25	28.89	dry	----	----	
C	08/16/2001	12:11	28.89	dry	----	----	
C	11/28/2001	13:03	28.89	dry	----	----	
C	02/27/2002	14:44	28.89	8.94	19.95	----	
C	06/27/2002	15:36	28.89	dry	----	----	
C	08/26/2002	17:31	28.89	dry	----	----	
C	11/13/2002	09:25	28.89	dry	----	----	
C	02/11/2003	10:46	28.89	dry	----	----	1" water
C	05/08/2003	08:35	28.89	8.53	20.36	----	
C	08/27/2003	15:08	28.89	dry	----	----	
D	03/25/1997	12:25	30.04	8.32	21.72	----	
D	03/31/1997	11:31	30.04	8.66	21.38	----	
D	07/16/1997	08:35	30.04	10.45	19.59	----	
D	10/21/1997	17:10	30.04	13.27	16.77	----	
D	01/27/1998	13:31	30.04	10.72	19.32	----	
D	05/18/1998	17:36	30.04	12.23	17.81	----	
D	08/17/1998	10:57	30.04	13.83	16.21	----	
D	11/13/1998	09:05	30.04	15.01	15.03	----	
D	02/16/1999	13:45	30.04	8.50	21.54	----	
D	05/18/1999	15:59	30.04	11.00	19.04	----	
D	09/21/1999	12:37	30.04	14.41	15.63	----	
D	12/06/1999	14:46	30.04	14.04	16.00	----	
D	02/16/2000	09:55	30.04	11.50	18.54	----	
D	05/23/2000	12:56	30.04	12.74	17.30	----	
D	08/29/2000	14:35	30.04	14.70	15.34	----	
D	11/09/2000	13:43	30.04	15.49	14.55	----	
D	02/12/2001	15:12	30.04	14.99	15.05	----	
D	06/04/2001	12:35	30.04	14.95	15.09	----	
D	08/16/2001	11:46	30.04	15.64	14.40	----	
D	11/28/2001	12:43	30.04	15.45	14.59	----	
D	02/27/2002	14:21	30.04	11.37	18.67	----	
D	03/05/2002	11:00	30.04	11.51	18.53	----	
D	04/05/2002	08:45	30.04	11.65	18.39	----	
D	05/29/2002	00:00	30.04	12.73	17.31	----	
D	06/27/2002	15:00	30.04	13.43	16.61	----	
D	08/26/2002	17:04	30.04	14.68	15.36	----	
D	11/13/2002	09:19	30.04	15.96	14.08	----	
D	02/11/2003	10:41	30.04	12.10	17.94	----	
D	05/08/2003	08:30	30.04	11.48	18.56	----	
D	08/27/2003	15:03	30.04	14.60	15.44	----	
D	10/23/2003	13:50	30.04	15.54	14.50	----	
D	02/19/2004	14:22	30.04	11.83	18.21	----	
D	06/09/2004	09:28	30.04	13.78	16.26	----	
D	08/10/2004	12:13	30.04	15.02	15.02	----	
D	11/18/2004	09:30	30.04	15.69	14.35	----	
D	02/15/2005	09:42	30.04	14.62	15.42	----	
F	08/18/1998	08:10	NA	14.77	NA		
F							Abandoned August 2003
G	03/25/1997	11:57	30.24	14.49	15.75	----	
G	03/31/1997	09:13	30.24	14.01	16.23	----	
G	07/16/1997	07:37	30.24	14.30	15.94	----	
G	10/21/1997	16:20	30.24	dry	----	----	
G	01/27/1998	11:49	30.24	dry	----	----	
G	05/18/1998	17:30	30.24	dry	----	----	
G	08/17/1998	11:06	30.24	dry	----	----	
G	11/13/1998	09:53	30.24	dry	----	----	
G	02/16/1999	13:14	30.24	dry	----	----	
G	05/18/1999	14:50	30.24	dry	----	----	
G	09/21/1999	11:30	30.24	dry	----	----	
G	12/06/1999	14:07	30.24	dry	----	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
G	02/16/2000	10:19	30.24	dry	----	----	
G	05/23/2000	16:33	30.24	dry	----	----	
G	08/29/2000	13:18	30.24	dry	----	----	
G	11/09/2000	12:30	30.24	dry	----	----	
G	02/12/2001	16:02	30.24	dry	----	----	
G	06/04/2001	11:41	30.24	dry	----	----	
G	08/16/2001	10:50	30.24	dry	----	----	
G	11/28/2001	11:33	30.24	dry	----	----	
G	02/27/2002	13:38	30.24	dry	----	----	
G	06/27/2002	14:13	30.24	dry	----	----	
G	08/26/2002	16:05	30.24	dry	----	----	
G	11/13/2002	07:37	30.24	dry	----	----	
G	02/11/2003	08:58	30.24	dry	----	----	
G	05/08/2003	06:57	30.24	dry	----	----	
G	08/27/2003	13:38	30.24	dry	----	----	
G	10/23/2003	12:38	30.24	dry	----	----	
G	02/19/2004	12:58	30.24	dry	----	----	
G	06/09/2004	07:54	30.24	dry	----	----	
G	08/10/2004	12:01	30.24	dry	----	----	
G	11/18/2004	09:16	30.24	dry	----	----	
H	03/31/1997	11:51	27.08	5.42	21.66	----	
H	07/16/1997	08:44	27.08	7.29	19.79	----	
H	10/21/1997	17:45	27.08	10.08	17.00	----	
H	01/27/1998	13:45	27.08	7.56	19.52	----	
H	05/18/1998	17:50	27.08	9.06	18.02	----	
H	08/17/1998	09:15	27.08	10.68	16.40	----	
H	11/13/1998	10:54	27.08	11.84	15.24	----	
H	02/16/1999	13:50	27.08	5.35	21.73	----	
H	05/18/1999	15:41	27.08	7.78	19.30	----	
H	09/21/1999	12:15	27.08	11.23	15.85	----	
H	12/06/1999	15:13	27.08	10.91	16.17	----	
H	02/16/2000	10:52	27.08	8.28	18.80	----	
H	05/23/2000	17:20	27.08	9.48	17.60	----	
H	08/29/2000	14:06	27.08	11.55	15.53	----	
H	11/09/2000	13:23	27.08	12.34	14.74	----	
H	02/12/2001	15:36	27.08	11.88	15.20	----	
H	06/04/2001	12:27	27.08	11.81	15.27	----	
H	08/16/2001	11:41	27.08	12.57	14.51	----	
H	11/28/2001	12:34	27.08	12.39	14.69	----	
H	02/27/2002	14:18	27.08	8.14	18.94	----	
H	03/05/2002	10:58	27.08	8.28	18.80	----	
H	04/05/2002	09:10	27.08	8.45	18.63	----	
H	05/29/2002	00:00	27.08	9.38	17.70	----	
H	06/27/2002	14:51	27.08	10.25	16.83	----	
H	08/26/2002	17:00	27.08	11.54	15.54	----	
H	11/13/2002	09:12	27.08	12.83	14.25	----	
H	02/11/2003	10:33	27.08	8.96	18.12	----	
H	05/08/2003	08:24	27.08	8.24	18.84	----	
H	08/27/2003	15:02	27.08	11.48	15.60	----	
H	10/23/2003	13:42	27.08	12.41	14.67	----	
H	02/19/2004	14:35	27.08	9.71	17.37	----	
H	06/09/2004	09:16	27.08	10.61	16.47	----	
H	08/10/2004	11:33	27.08	11.93	15.15	----	
H	11/18/2004	09:36	27.08	12.54	14.54	----	
J1	03/25/1997	12:15	29.70	8.78	20.92	----	Orange/brown algae
J1	03/31/1997	11:19	29.70	9.02	20.68	----	
J1	07/16/1997	08:22	29.70	10.49	19.21	----	
J1	10/21/1997	16:58	29.70	13.10	16.60	----	
J1	01/27/1998	13:15	29.70	11.03	18.67	----	
J1	05/18/1998	18:01	29.70	12.27	17.43	----	
J1	08/17/1998	11:00	29.70	13.78	15.92	----	
J1	11/13/1998	10:30	29.70	14.77	14.93	----	
J1	02/16/1999	13:37	29.70	8.91	20.79	----	
J1	05/18/1999	15:46	29.70	11.19	18.51	----	
J1	09/21/1999	12:28	29.70	14.36	15.34	----	
J1	12/06/1999	15:07	29.70	13.95	15.75	----	
J1	02/16/2000	11:05	29.70	11.67	18.03	----	
J1	05/23/2000	17:27	29.70	12.78	16.92	----	
J1	08/29/2000	14:14	29.70	14.58	15.12	----	
J1	11/09/2000	13:25	29.70	15.30	14.40	----	
J1	02/12/2001	15:22	29.70	14.87	14.83	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
J1	06/04/2001	12:39	29.70	14.83	14.87	----	
J1	08/16/2001	11:52	29.70	15.48	14.22	----	
J1	11/28/2001	12:35	29.70	15.23	14.47	----	
J1	02/27/2002	14:30	29.70	11.62	18.08	----	
J1	03/05/2002	11:04	29.70	11.76	17.94	----	
J1	04/05/2002	08:40	29.70	11.87	17.83	----	
J1	05/29/2002	00:00	29.70	12.77	16.93	----	
J1	06/27/2002	15:02	29.70	13.40	16.30	----	
J1	08/26/2002	16:54	29.70	14.51	15.19	----	
J1	11/13/2002	09:00	29.70	15.71	13.99	----	
J1	02/11/2003	10:18	29.70	12.33	17.37	----	
J1	05/08/2003	08:14	29.70	11.65	18.05	----	
J1	08/27/2003	14:47	29.70	14.46	15.24	----	
J1	10/23/2003	13:52	29.70	15.31	14.39	----	
J1	02/19/2004	14:18	29.70	11.88	17.82	----	
J1	06/09/2004	09:08	29.70	13.71	15.99	----	
J1	08/10/2004	12:20	29.70	14.86	14.84	----	On 8/03, DTW was 14.75; 8/10/04 reading changed - 15.86 to 14.86
J1	11/18/2004	09:03	29.70	15.45	14.25	----	
J1	02/15/2005	09:50	29.70	14.53	15.17	----	
K	03/25/1997	12:08	29.42	8.20	21.22	----	
K	03/31/1997	09:32	29.42	8.46	20.96	----	
K	07/16/1997	08:00	29.42	10.03	19.39	----	
K	10/21/1997	16:45	29.42	12.71	16.71	----	
K	01/27/1998	12:37	29.42	10.46	18.96	----	
K	05/18/1998	17:52	29.42	11.77	17.65	----	
K	08/17/1998	10:50	29.42	13.34	16.08	----	
K	11/13/1998	10:14	29.42	14.30	15.12	----	
K	02/16/1999	13:55	29.42	8.41	21.01	----	
K	05/18/1999	15:30	29.42	10.68	18.74	----	
K	09/21/1999	12:08	29.42	13.91	15.51	----	
K	12/06/1999	14:32	29.42	13.44	15.98	----	
K	02/16/2000	10:48	29.42	11.15	18.27	----	
K	05/23/2000	17:12	29.42	12.25	17.17	----	
K	08/29/2000	13:56	29.42	14.16	15.26	----	
K	11/09/2000	13:16	29.42	14.84	14.58	----	
K	02/12/2001	15:41	29.42	14.35	15.07	----	
K	06/04/2001	12:20	29.42	14.22	15.20	----	
K	08/16/2001	11:35	29.42	15.12	14.30	----	
K	11/28/2001	12:26	29.42	14.68	14.74	----	
K	02/27/2002	14:17	29.42	11.05	18.37	----	
K	03/05/2002	10:55	29.42	11.25	18.17	----	
K	04/05/2002	08:55	29.42	11.30	18.12	----	
K	05/29/2002	00:00	29.42	12.22	17.20	----	
K	06/27/2002	14:47	29.42	12.92	16.50	----	
K	08/26/2002	17:17	29.42	14.12	15.30	----	
K	11/13/2002	09:11	29.42	15.18	14.24	----	
K	02/11/2003	10:29	29.42	11.80	17.62	----	
K	05/08/2003	08:21	29.42	11.14	18.28	----	
K	08/27/2003	14:52	29.42	14.08	15.34	----	
K	10/23/2003	13:40	29.42	14.91	14.51	----	
K	02/19/2004	14:39	29.42	11.41	18.01	----	
K	06/09/2004	09:23	29.42	13.26	16.16	----	
K	08/10/2004	11:28	29.42	14.35	15.07	----	
K	11/18/2004	09:31	29.42	15.01	14.41	----	
L	03/25/1997	12:35	28.10	4.98	23.12	----	
L	03/31/1997	11:40	28.10	5.24	22.86	----	
L	07/16/1997	08:49	28.10	7.50	20.60	----	
L	10/21/1997	15:18	28.10	9.55	18.55	----	
L	01/27/1998	13:39	28.10	6.45	21.65	----	
L	05/18/1998	18:07	28.10	9.21	18.89	----	
L	08/17/1998	11:10	28.10	11.59	16.51	----	
L	11/13/1998	10:35	28.10	13.02	15.08	----	
L	02/16/1999	13:57	28.10	4.78	23.32	----	
L	05/18/1999	16:03	28.10	7.62	20.48	----	
L	09/21/1999	12:43	28.10	12.30	15.80	----	
L	12/06/1999	14:49	28.10	9.51	18.59	----	
L	02/16/2000	09:49	28.10	7.13	20.97	----	
L	05/23/2000	17:54	28.10	9.11	18.99	----	
L	08/29/2000	14:32	28.10	12.66	15.44	----	
L	11/09/2000	13:46	28.10	13.56	14.54	----	
L	02/12/2001	15:07	28.10	13.04	15.06	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
L	06/04/2001	13:24	28.10	12.78	15.32	----	
L	08/16/2001	12:10	28.10	13.66	14.44	----	
L	11/28/2001	13:02	28.10	12.34	15.76	----	
L	02/27/2002	14:42	28.10	7.16	20.94	----	
L	03/05/2002	11:12	28.10	7.39	20.71	----	
L	04/05/2002	08:39	28.10	7.63	20.47	----	
L	05/29/2002	00:00	28.10	9.09	19.01	----	
L	06/27/2002	10:38	28.10	10.11	17.99	----	
L	08/26/2002	17:30	28.10	12.56	15.54	----	
L	11/13/2002	09:26	28.10	14.00	14.10	----	
L	02/11/2003	10:47	28.10	7.17	20.93	----	
L	05/08/2003	08:34	28.10	7.01	21.09	----	
L	08/27/2003	15:09	28.10	15.20	12.90	----	
L	10/23/2003	14:20	28.10	13.56	14.54	----	
L	02/19/2004	13:57	28.10	6.84	21.26	----	
L	06/09/2004	09:35	28.10	11.10	17.00	----	
L	08/10/2004	12:27	28.10	13.00	15.10	----	
L	11/18/2004	09:42	28.10	13.77	14.33	----	
N	03/25/1997	11:48	31.40	14.05	17.35	----	
N	03/31/1997	08:59	31.40	14.26	17.14	----	Hydrocarbon odor, product
N	07/16/1997	07:20	31.40	16.03	16.33	1.20	Light brown color; thick coating on probe
N	10/21/1997	16:09	31.40	16.46	14.94	----	No product - strong petroleum odor
N	10/23/1997	17:20	31.40	16.48	14.92	----	No product - strong petroleum odor
N	01/27/1998	11:13	31.40	15.01	16.41	0.02	
N	05/18/1998	17:20	31.40	16.39	15.06	0.06	
N	08/17/1998	10:40	31.40	17.16	14.26	0.02	Thin coat of thick product
N	11/13/1998	09:48	31.40	17.83	13.58	0.01	
N	02/16/1999	12:55	31.40	14.09	17.53	0.27	Strong petroleum odor
N	05/18/1999	14:47	31.40	15.79	15.64	0.04	
N	09/21/1999	11:23	31.40	17.39	14.02	0.01	
N	12/06/1999	14:00	31.40	16.57	14.83	----	
N	02/16/2000	10:10	31.40	15.69	15.71	----	
N	05/23/2000	16:24	31.40	16.42	14.98	----	Strong petroleum odor, no product
N	08/29/2000	13:07	31.40	17.61	13.79	----	
N	11/09/2000	12:26	31.40	18.23	13.19	0.03	
N	02/12/2001	15:49	31.40	17.64	13.76	----	
N	06/04/2001	11:31	31.40	17.58	13.82	----	
N	08/16/2001	10:29	31.40	18.08	13.32	----	Trace product
N	11/28/2001	11:27	31.40	18.06	13.34	----	Trace product
N	02/27/2002	13:25	31.40	15.76	15.64	----	
N	04/05/2002	08:09	31.40	15.88	15.52	----	
N	05/29/2002	00:00	31.40	16.42	14.98	----	
N	06/27/2002	14:12	31.40	16.80	14.60	----	
N	08/26/2002	15:56	31.40	17.51	13.89	----	
N	11/13/2002	07:27	31.40	18.44	12.98	0.03	Product present
N	02/11/2003	08:49	31.40	15.33	16.07	----	
N	05/08/2003	06:51	31.40	15.71	15.69	----	
N	08/27/2003	13:33	31.40	17.54	13.86	----	
N	10/23/2003	12:08	31.40	18.18	13.22	----	
N	02/19/2004	12:21	31.40	15.79	15.61	----	
N	06/09/2004	07:36	31.40	17.04	14.36	----	
N	08/10/2004	10:55	31.40	17.72	13.68	----	
N	11/18/2004	08:38	31.40	dry	----	----	
N	02/15/2005	10:38	31.40	17.40	14.00	----	Slight product odor
P	03/25/1997	11:45	29.96	12.88	17.08	----	
P	03/31/1997	08:55	29.96	12.94	17.02	----	Hydrocarbon odor, product
P	07/16/1997	07:15	29.96	14.02	16.08	0.17	Light coating on probe; light brown color
P	10/21/1997	16:05	29.96	15.23	14.73	----	No product - strong petroleum odor
P	10/23/1997	17:25	29.96	15.21	14.75	----	No product - strong petroleum odor
P	01/27/1998	11:09	29.96	13.87	16.09	----	
P	05/18/1998	17:18	29.96	13.08	16.88	----	Trace of product on probe
P	08/17/1998	10:37	29.96	15.82	14.15	0.01	Sheen on probe, strong petroleum odor
P	11/13/1998	09:46	29.96	16.63	13.37	0.05	Strong gasoline odor
P	02/16/1999	12:52	29.96	12.91	17.10	0.06	Strong petroleum odor
P	05/18/1999	14:43	29.96	14.68	15.38	0.13	
P	09/21/1999	11:20	29.96	16.08	13.89	0.01	
P	12/06/1999	13:55	29.96	15.41	14.55	----	
P	02/16/2000	10:08	29.96	14.51	15.45	----	
P	05/23/2000	16:21	29.96	15.15	14.81	----	Trace of product on surface
P	08/29/2000	13:04	29.96	16.26	13.71	0.01	
P	11/09/2000	12:24	29.96	16.98	13.00	0.03	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
P	02/12/2001	15:46	29.96	16.31	13.65	----	
P	06/04/2001	11:27	29.96	16.26	13.70	----	Trace product
P	08/16/2001	10:28	29.96	16.75	13.21	----	
P	11/28/2001	11:24	29.96	17.01	12.95	----	
P	02/27/2002	13:22	29.96	14.60	15.44	0.10	Strong ethanol-like odor
P	04/05/2002	08:07	29.96	14.70	15.34	0.10	
P	05/29/2002	00:00	29.96	15.00	14.96	----	Trace product
P	06/27/2002	14:11	29.96	15.49	14.47	----	
P	08/26/2002	15:54	29.96	16.15	13.81	----	
P	11/13/2002	07:25	29.96	16.99	13.00	0.04	Product present
P	02/11/2003	08:44	29.96	14.13	15.84	0.01	Product present
P	05/08/2003	06:47	29.96	15.53	14.44	0.01	Product barely present
P	08/27/2003	13:30	29.96	16.19	13.77	----	
P	10/23/2003	12:05	29.96	16.60	13.38	0.02	Trace product
P	02/19/2004	12:19	29.96	14.56	15.40	----	
P	06/09/2004	07:35	29.98	15.70	14.28	----	New reference elevation July 2004
P	08/10/2004	10:53	29.98	16.40	13.58	----	
P	11/18/2004	08:37	29.98	dry	----	----	
P	02/15/2005	10:43	29.98	16.08	13.90	----	Slight product odor
Q	03/25/1997	11:42	30.36	13.55	16.81	----	
Q	03/31/1997	08:52	30.36	13.54	16.82	----	Hydrocarbon odor
Q	07/16/1997	07:10	30.36	14.55	15.83	0.02	Light coating on probe; light brown color
Q	10/21/1997	16:04	30.36	15.70	14.66	----	No product - strong petroleum odor
Q	10/23/1997	17:29	30.36	15.69	14.67	----	No product - strong petroleum odor
Q	01/27/1998	11:05	30.36	14.48	15.88	----	
Q	05/18/1998	17:16	30.36	15.58	14.78	----	
Q	08/17/1998	10:35	30.36	16.27	14.09	----	Slight sheen on probe; no product, strong petroleum odor
Q	11/13/1998	09:44	30.36	17.01	13.36	0.01	Strong gasoline odor
Q	02/16/1999	12:49	30.36	13.61	16.76	0.01	Strong petroleum odor
Q	05/18/1999	14:40	30.36	15.13	15.23	----	Strong odor when cap removed
Q	09/21/1999	11:17	30.36	16.51	13.85	----	
Q	12/06/1999	13:53	30.36	15.88	14.48	----	
Q	02/16/2000	10:06	30.36	15.02	15.34	----	Film of product
Q	05/23/2000	16:19	30.36	15.64	14.72	----	Strong petroleum odor, no product
Q	08/29/2000	13:01	30.36	16.69	13.67	----	
Q	11/09/2000	12:23	30.36	17.50	12.86	----	Trace of product
Q	02/12/2001	15:45	30.36	16.71	13.65	----	
Q	06/04/2001	11:25	30.36	16.66	13.70	----	
Q	08/16/2001	10:26	30.36	17.15	13.21	----	Trace product
Q	11/28/2001	11:21	30.36	17.76	12.94	0.42	
Q	02/27/2002	13:20	30.36	15.07	15.29	----	Strong petroleum odor, no product
Q	04/05/2002	08:05	30.36	15.23	15.13	----	Trace product
Q	05/29/2002	00:00	30.36	15.53	14.83	----	Trace product
Q	06/27/2002	14:10	30.36	15.95	14.41	----	Trace product
Q	08/26/2002	15:52	30.36	16.60	13.76	----	
Q	11/13/2002	07:30	30.36	17.50	12.87	0.01	Product present
Q	02/11/2003	08:47	30.36	14.67	15.69	----	
Q	05/08/2003	06:48	30.36	15.00	15.54	0.22	
Q	08/27/2003	13:28	30.36	16.60	13.76	----	
Q	10/23/2003	12:03	30.36	17.50	13.05	0.24	
Q	02/19/2004	12:17	30.36	15.07	15.29	----	Trace product
Q	06/09/2004	07:34	30.36	16.15	14.21	----	
Q	08/10/2004	10:52	30.36	16.81	13.55	----	
Q	11/18/2004	08:35	30.36	17.55	13.01	0.25	
Q	02/15/2005	10:46	30.36	16.50	13.86	----	Strong product odor
LW001S	03/31/1997	11:12	27.96	6.65	21.31		
LW001S	07/16/1997	08:15	27.96	8.34	19.62	----	
LW001S	10/21/1997	16:53	27.96	11.02	16.94	----	
LW001S	01/27/1998	13:00	27.96	8.75	19.21	----	
LW001S	05/18/1998	17:40	27.96	9.15	18.81	----	
LW001S	08/17/1998	10:54	27.96	11.67	16.29	----	
LW001S	11/13/1998	10:02	27.96	12.76	15.20	----	
LW001S	02/16/1999	13:24	27.96	6.60	21.36	----	
LW001S	05/18/1999	15:38	27.96	8.92	19.04	----	
LW001S	09/21/1999	12:10	27.96	12.20	15.76	----	
LW001S	12/06/1999	14:33	27.96	11.86	16.10	----	
LW001S	02/16/2000	10:50	27.96	9.42	18.54	----	
LW001S	05/23/2000	17:18	27.96	10.52	17.44	----	
LW001S	08/29/2000	13:58	27.96	12.51	15.45	----	
LW001S	11/09/2000	13:17	27.96	13.26	14.70	----	
LW001S	02/12/2001	15:33	27.96	12.82	15.14	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
LW001S	06/04/2001	12:24	27.96	12.77	15.19	----	
LW001S	08/16/2001	11:37	27.96	13.45	14.51	----	
LW001S	11/28/2001	12:28	27.96	13.25	14.71	----	
LW001S	02/27/2002	14:19	27.96	9.31	18.65	----	
LW001S	03/05/2002	10:56	27.96	9.45	18.51	----	
LW001S	04/05/2002	09:08	27.96	9.60	18.36	----	
LW001S	05/29/2002	00:00	27.96	10.49	17.47	----	
LW001S	06/27/2002	14:50	27.96	11.26	16.70	----	
LW001S	08/26/2002	17:11	27.96	12.47	15.49	----	
LW001S	11/13/2002	09:07	27.96	13.72	14.24	----	
LW001S	02/11/2003	10:25	27.96	10.11	17.85	----	
LW001S	05/08/2003	08:20	27.96	9.41	18.55	----	
LW001S	08/27/2003	14:51	27.96	12.46	15.50	----	
LW001S	10/23/2003	13:58	27.96	13.32	14.64	----	
LW001S	02/19/2004	14:28	27.96	9.81	18.15	----	
LW001S	06/09/2004	09:20	27.96	11.60	16.36	----	
LW001S	08/10/2004	11:30	27.96	12.86	15.10	----	
LW001S	11/18/2004	08:57	27.96	13.42	14.54	----	
LW001S	02/15/2005	09:24	27.96	12.47	15.49	----	
LW002S	03/25/1997	12:22	29.56	8.06	21.50	----	
LW002S	03/31/1997	11:27	29.56	8.34	21.22	----	
LW002S	07/16/1997	08:33	29.56	10.05	19.51	----	
LW002S	10/21/1997	17:04	29.56	12.77	16.79	----	
LW002S	01/27/1998	13:25	29.56	10.39	19.17	----	
LW002S	05/18/1998	18:02	29.56	11.78	17.78	----	
LW002S	08/17/1998	10:56	29.56	13.38	16.18	----	
LW002S	11/13/1998	10:32	29.56	14.47	15.09	----	
LW002S	02/16/1999	13:42	29.56	8.27	21.29	----	
LW002S	05/18/1999	15:45	29.56	10.63	18.93	----	
LW002S	09/21/1999	12:34	29.56	13.95	15.61	----	
LW002S	12/06/1999	15:11	29.56	13.54	16.02	----	
LW002S	02/16/2000	10:38	29.56	11.08	18.48	----	
LW002S	05/23/2000	17:24	29.56	12.29	17.27	----	
LW002S	08/29/2000	14:12	29.56	14.23	15.33	----	
LW002S	11/09/2000	13:04	29.56	15.00	14.56	----	
LW002S	02/12/2001	15:30	29.56	14.52	15.04	----	
LW002S	06/04/2001	12:34	29.56	14.46	15.10	----	
LW002S	08/16/2001	11:45	29.56	15.16	14.40	----	
LW002S	11/28/2001	12:41	29.56	14.90	14.66	----	
LW002S	02/27/2002	14:19	29.56	11.02	18.54	----	
LW002S	03/05/2002	10:59	29.56	11.17	18.39	----	
LW002S	04/05/2002	08:47	29.56	11.33	18.23	----	
LW002S	05/29/2002	00:00	29.56	12.22	17.34	----	
LW002S	06/27/2002	14:56	29.56	13.00	16.56	----	
LW004S	03/31/1997	09:20	30.26	12.77	17.49	----	
LW004S	07/16/1997	07:40	30.26	14.66	15.60	----	
LW004S	10/21/1997	16:25	30.26	16.88	13.38	----	
LW004S	01/27/1998	12:00	30.26	15.13	15.13	----	
LW004S	05/18/1998	17:32	30.26	16.08	14.18	----	
LW004S	08/17/1998	11:07	30.26	17.30	12.96	----	
LW004S	11/13/1998	09:56	30.26	17.96	12.30	----	
LW004S	02/16/1999	13:16	30.26	13.10	17.16	----	
LW004S	05/18/1999	15:03	30.26	15.43	14.83	----	
LW004S	09/21/1999	11:44	30.26	17.61	12.65	----	
LW004S	12/06/1999	14:19	30.26	17.08	13.18	----	
LW004S	02/16/2000	10:31	30.26	15.84	14.42	----	
LW004S	05/23/2000	16:55	30.26	16.71	13.55	----	
LW004S	08/29/2000	13:39	30.26	17.78	12.48	----	
LW004S	11/09/2000	12:53	30.26	18.17	12.09	----	
LW004S	02/12/2001	16:38	30.26	17.08	13.18	----	
LW004S	06/04/2001	12:08	30.26	17.81	12.45	----	
LW004S	08/16/2001	11:14	30.26	18.39	11.87	----	
LW004S	11/28/2001	12:05	30.26	17.84	12.42	----	
LW004S	02/27/2002	14:01	30.26	15.82	14.44	----	
LW004S	03/05/2002	11:35	30.26	15.95	14.31	----	
LW004S	04/05/2002	08:20	30.26	16.02	14.24	----	
LW004S	05/29/2002	00:00	30.26	16.74	13.52	----	
LW004S	06/27/2002	14:39	30.26	16.89	13.37	----	
LW004S	08/26/2002	16:31	30.26	17.68	12.58	----	
LW004S	11/13/2002	08:22	30.26	19.04	11.22	----	
LW004S	02/11/2003	09:31	30.26	16.03	14.23	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
LW004S	05/08/2003	07:43	30.26	15.75	14.51	----	
LW004S	08/27/2003	13:59	30.26	17.87	12.39	----	
LW004S	10/23/2003	13:18	30.26	18.52	11.74	----	
LW004S	02/19/2004	13:46	30.26	16.49	13.77	----	
LW004S	06/09/2004	08:31	30.32	17.24	13.08	----	New reference elevation July 2004
LW004S	08/10/2004	11:57	30.32	18.03	12.29	----	
LW004S	11/18/2004	09:23	30.32	18.61	11.71	----	
LW004S	02/15/2005	10:21	30.32	17.68	12.64	----	
LW005S	03/25/1997	12:29	30.79	10.57	20.22	----	
LW005S	03/31/1997	11:35	30.79	10.84	19.95	----	
LW005S	07/16/1997	08:53	30.79	12.29	18.50	----	
LW005S	10/21/1997	15:16	30.79	15.00	15.79	----	
LW005S	01/27/1998	13:36	30.79	12.90	17.89	----	
LW005S	05/18/1998	18:05	30.79	14.19	16.60	----	
LW005S	08/17/1998	11:09	30.79	15.54	15.25	----	
LW005S	11/13/1998	10:38	30.79	16.55	14.24	----	
LW005S	02/16/1999	13:16	30.79	10.59	20.20	----	
LW005S	05/18/1999	16:01	30.79	13.12	17.67	----	
LW005S	09/21/1999	12:40	30.79	16.00	14.79	----	
LW005S	12/06/1999	14:47	30.79	15.64	15.15	----	
LW005S	02/16/2000	09:56	30.79	13.54	17.25	----	
LW005S	05/23/2000	17:51	30.79	14.80	15.99	----	
LW005S	08/29/2000	14:37	30.79	16.35	14.44	----	
LW005S	11/09/2000	13:45	30.79	16.98	13.81	----	
LW005S	02/12/2001	15:13	30.79	16.51	14.28	----	
LW005S	06/04/2001	13:23	30.79	16.43	14.36	----	
LW005S	08/16/2001	12:07	30.79	17.03	13.76	----	
LW005S	11/28/2001	13:01	30.79	16.94	13.85	----	
LW005S	02/27/2002	14:39	30.79	13.48	17.31	----	
LW005S	03/05/2002	11:13	30.79	13.62	17.17	----	
LW005S	04/05/2002	08:38	30.79	13.60	17.19	----	
LW005S	05/29/2002	00:00	30.79	14.81	15.98	----	
LW005S	06/27/2002	10:43	30.79	15.15	15.64	----	
LW005S	08/26/2002	17:08	30.79	16.12	14.67	----	
LW005S	11/13/2002	09:22	30.79	17.39	13.40	----	
LW005S	02/11/2003	10:43	30.79	13.95	16.84	----	
LW005S	05/08/2003	08:32	30.79	13.58	17.21	----	
LW005S	08/27/2003	15:07	30.79	16.11	14.68	----	
LW005S	10/23/2003	14:17	30.79	16.92	13.87	----	
LW005S	02/19/2004	14:00	30.79	13.76	17.03	----	
LW005S	06/09/2004	09:34	30.79	15.50	15.29	----	
LW005S	08/10/2004	12:25	30.79	16.48	14.31	----	
LW005S	11/18/2004	09:40	30.79	17.05	13.74	----	
LW007S	03/31/1997	11:05	28.10	6.75	21.35	----	
LW007S	07/16/1997	08:05	28.10	8.62	19.48	----	
LW007S	10/21/1997	16:45	28.10	11.26	16.84	----	
LW007S	01/27/1998	12:47	28.10	8.85	19.25	----	
LW007S	05/18/1998	17:48	28.10	10.34	17.76	----	
LW007S	08/17/1998	10:48	28.10	11.85	16.25	----	
LW007S	11/13/1998	10:12	28.10	12.90	15.20	----	Strong gasoline odor
LW007S	02/16/1999	13:53	28.10	6.81	21.29	----	
LW007S	05/18/1999	15:23	28.10	9.14	18.96	----	
LW007S	09/21/1999	12:03	28.10	12.37	15.73	----	
LW007S	12/06/1999	14:27	28.10	12.00	16.10	----	
LW007S	02/16/2000	10:46	28.10	9.60	18.50	----	
LW007S	05/23/2000	17:09	28.10	10.70	17.40	----	
LW007S	08/29/2000	13:53	28.10	12.64	15.46	----	
LW007S	11/09/2000	13:14	28.10	13.36	14.74	----	
LW007S	02/12/2001	15:39	28.10	12.94	15.16	----	
LW007S	06/04/2001	12:17	28.10	12.87	15.23	----	
LW007S	08/16/2001	11:33	28.10	13.58	14.52	----	
LW007S	11/28/2001	12:22	28.10	13.34	14.76	----	
LW007S	02/27/2002	14:15	28.10	9.47	18.63	----	
LW007S	03/05/2002	10:52	28.10	9.62	18.48	----	
LW007S	04/05/2002	08:57	28.10	9.73	18.37	----	
LW007S	05/29/2002	00:00	28.10	10.63	17.47	----	
LW007S	06/27/2002	14:45	28.10	11.36	16.74	----	
LW007S	08/26/2002	17:18	28.10	12.69	15.41	----	
LW007S	11/13/2002	09:16	28.10	13.82	14.28	----	
LW007S	02/11/2003	10:37	28.10	10.18	17.92	----	
LW007S	05/08/2003	08:27	28.10	9.54	18.56	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
LW007S	08/27/2003	14:58	28.10	12.62	15.48	----	
LW007S	10/23/2003	13:39	28.10	13.45	14.65	----	
LW007S	02/19/2004	14:42	28.10	10.01	18.09	----	
LW007S	06/09/2004	09:25	28.10	11.75	16.35	----	
LW007S	08/10/2004	11:26	28.10	13.00	15.10	----	
LW007S	11/18/2004	08:55	28.10	15.53	12.57	----	
LW007S	02/15/2005	09:02	28.10	12.57	15.53	----	
LW008S	05/18/1999	14:55	31.28	14.84	16.44	----	
LW008S	09/21/1999	12:24	31.28	16.94	14.34	----	
LW008S	12/06/1999	14:40	31.28	16.63	14.65	----	
LW008S	02/16/2000	10:16	31.28	15.18	16.10	----	
LW008S	05/23/2000	17:42	31.28	15.88	15.40	----	
LW008S	08/29/2000	14:26	31.28	17.06	14.22	----	
LW008S	11/09/2000	13:32	31.28	17.55	13.73	----	
LW008S	02/12/2001	15:58	31.28	17.24	14.04	----	
LW008S	06/04/2001	13:05	31.28	17.14	14.14	----	
LW008S	08/16/2001	12:00	31.28	17.70	13.58	----	
LW008S	11/28/2001	12:57	31.28	17.63	13.68	0.04	
LW008S	02/27/2002	14:37	31.28	15.12	16.16	----	
LW008S	03/05/2002	11:09	31.28	15.26	16.02	----	
LW008S	04/05/2002	08:17	31.28	15.34	15.94	----	
LW008S	05/29/2002	00:00	31.28	15.91	15.37	----	
LW008S	06/27/2002	15:21	31.28	16.21	15.07	----	
LW008S	08/26/2002	16:38	31.28	16.95	14.33	----	
LW008S	11/13/2002	08:50	31.28	17.88	13.40	----	
LW008S	02/11/2003	09:48	31.28	15.57	15.71	----	
LW008S	05/08/2003	08:00	31.28	15.11	16.17	----	
LW008S	08/27/2003	14:25	31.28	16.97	14.31	----	
LW008S	10/23/2003	12:42	31.28	17.54	13.74	----	
LW008S	02/19/2004	15:03	31.28	15.34	15.94	----	
LW008S	06/09/2004	08:43	31.28	16.50	14.78	----	
LW008S	08/10/2004	12:05	31.28	17.23	14.05	----	
LW008S	11/18/2004	09:15	31.28	17.56	13.72	----	
LW008S	02/15/2005	09:59	31.28	16.91	14.37	----	
LW009S	05/18/1999	14:57	31.04	19.58	11.46	----	Water level appears to be more representative of lower zone
LW009S	09/21/1999	11:36	31.04	dry	----	----	
LW009S	12/06/1999	14:13	31.04	19.64	----	----	Water in endcap
LW009S	02/16/2000	10:24	31.04	19.59	----	----	Water in endcap
LW009S	05/23/2000	16:39	31.04	dry	----	----	
LW009S	08/29/2000	13:28	31.04	dry	----	----	
LW009S	11/09/2000	12:42	31.04	dry	----	----	
LW009S	02/12/2001	16:12	31.04	dry	----	----	
LW009S	06/04/2001	11:50	31.04	dry	----	----	
LW009S	08/16/2001	11:01	31.04	dry	----	----	
LW009S	11/28/2001	11:52	31.04	dry	----	----	
LW009S	02/27/2002	13:48	31.04	dry	----	----	
LW009S	03/05/2002	11:15	31.04	dry	----	----	
LW009S	04/05/2002	08:26	31.04	dry	----	----	
LW009S	05/29/2002	00:00	31.04	dry	----	----	
LW009S	06/27/2002	14:24	31.04	dry	----	----	
LW009S	08/26/2002	16:09	31.04	dry	----	----	
LW009S	11/13/2002	07:49	31.04	dry	----	----	
LW009S	02/11/2003	09:06	31.04	dry	----	----	Recorded DTW of 19.58; well most likely dry
LW009S	05/08/2003	07:11	31.04	dry	----	----	
LW009S	08/27/2003	13:48	31.04	dry	----	----	
LW009S	10/23/2003	12:46	31.04	dry	----	----	
LW009S	02/19/2004	13:04	31.04	dry	----	----	
LW009S	06/09/2004	08:12	31.04	dry	----	----	
LW009S	08/10/2004	11:53	31.04	dry	----	----	
LW009S	11/18/2004	09:28	31.04	dry	----	----	
LW009S	02/15/2005	----	31.04	dry	----	----	
LW010S	05/18/1999	14:59	30.75	17.24	13.51	----	
LW010S	09/21/1999	11:38	30.75	19.13	11.62	----	
LW010S	12/06/1999	14:14	30.75	18.54	12.21	----	
LW010S	02/16/2000	10:26	30.75	17.62	13.13	----	
LW010S	05/23/2000	16:41	30.75	18.25	12.50	----	
LW010S	08/29/2000	13:30	30.75	dry	----	----	
LW010S	11/09/2000	12:45	30.75	dry	----	----	
LW010S	02/12/2001	16:14	30.75	dry	----	----	
LW010S	06/04/2001	11:53	30.75	dry	----	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
LW010S	08/16/2001	11:03	30.75	dry	----	----	
LW010S	11/28/2001	11:54	30.75	dry	----	----	
LW010S	02/27/2002	13:50	30.75	17.77	12.98	----	
LW010S	03/05/2002	11:32	30.75	17.84	12.91	----	
LW010S	04/05/2002	08:24	30.75	17.82	12.93	----	
LW010S	05/29/2002	00:00	30.75	18.22	12.53	----	
LW010S	06/27/2002	14:28	30.75	18.27	12.48	----	
LW010S	08/26/2002	16:15	30.75	dry	----	----	
LW010S	11/13/2002	08:00	30.75	dry	----	----	
LW010S	02/11/2003	09:20	30.75	17.50	13.25	----	
LW010S	05/08/2003	07:32	30.75	17.68	13.07	----	
LW010S	08/27/2003	13:51	30.75	dry	----	----	
LW010S	10/23/2003	12:51	30.75	dry	----	----	
LW010S	02/19/2004	13:26	30.75	17.77	12.98	----	
LW010S	06/09/2004	08:22	30.75	18.67	12.08	----	
LW010S	08/10/2004	11:54	30.75	dry	----	----	
LW010S	11/18/2004	09:26	30.75	dry	----	----	
LW010S	02/15/2005	10:09	30.75	18.86	11.89	----	
LW011S	05/18/1999	15:10	29.10	11.47	17.63	----	
LW011S	09/21/1999	11:51	29.10	14.23	14.87	----	
LW011S	12/06/1999	15:05	29.10	14.00	15.10	----	
LW011S	02/16/2000	11:01	29.10	11.94	17.16	----	
LW011S	05/23/2000	11:01	29.10	13.01	16.09	----	
LW011S	08/29/2000	14:55	29.10	14.51	14.59	----	
LW011S	11/09/2000	13:36	29.10	15.48	13.92	0.37	First occurrence of product in well.
LW011S	02/12/2001	15:18	29.10	14.62	14.48	----	
LW011S	06/04/2001	13:12	29.10	14.65	14.45	----	
LW011S	08/16/2001	11:24	29.10	15.46	13.86	0.28	
LW011S	11/28/2001	12:51	29.10	15.10	14.00	----	Trace product
LW011S	02/27/2002	14:59	29.10	11.86	17.24	----	
LW011S	03/05/2002	11:40	29.10	11.96	17.14	----	
LW011S	04/05/2002	08:34	29.10	12.07	17.03	----	
LW011S	05/29/2002	00:00	29.10	13.00	16.10	----	
LW011S	06/27/2002	15:09	29.10	13.40	15.70	----	
LW011S	08/26/2002	16:48	29.10	14.37	14.73	----	
LW011S	11/13/2002	08:54	29.10	15.53	13.57	----	
LW011S	02/11/2003	10:03	29.10	12.46	16.64	----	
LW011S	05/08/2003	08:07	29.10	11.91	17.19	----	
LW011S	08/27/2003	14:36	29.10	14.32	14.78	----	
LW011S	10/23/2003	14:12	29.10	15.12	13.98	----	
LW011S	02/19/2004	14:02	29.10	12.13	16.97	----	
LW011S	06/09/2004	08:56	29.10	13.72	15.38	----	
LW011S	08/10/2004	12:08	29.10	14.66	14.44	----	
LW011S	11/18/2004	09:08	29.10	15.33	13.84	0.09	
LW011S	02/15/2005	11:03	29.10	14.39	14.71	----	Product odor
LW013S	05/23/2000	16:51	30.17	17.23	12.94	----	
LW013S	08/29/2000	13:37	30.17	18.27	11.90	----	
LW013S	11/09/2000	12:51	30.17	18.75	11.42	----	
LW013S	02/12/2001	16:30	30.17	18.26	11.91	----	
LW013S	06/04/2001	12:06	30.17	18.30	11.87	----	
LW013S	08/16/2001	11:13	30.17	18.81	11.36	----	
LW013S	11/28/2001	12:03	30.17	18.37	11.80	----	
LW013S	02/27/2002	13:58	30.17	16.60	13.57	----	
LW013S	03/05/2002	11:33	30.17	16.68	13.49	----	
LW013S	04/05/2002	08:22	30.17	16.73	13.44	----	
LW013S	05/29/2002	00:00	30.17	17.30	12.87	----	
LW013S	06/27/2002	14:37	30.17	17.38	12.79	----	
LW013S	08/26/2002	16:30	30.17	18.11	12.06	----	
LW013S	11/13/2002	08:14	30.17	19.04	11.13	----	
LW013S	02/11/2003	09:30	30.17	16.57	13.60	----	
LW013S	05/08/2003	07:41	30.17	16.53	13.64	----	
LW013S	08/27/2003	13:57	30.17	18.27	11.90	----	
LW013S	10/23/2003	13:14	30.17	18.81	11.36	----	
LW013S	02/19/2004	13:40	30.17	16.62	13.55	----	
LW013S	06/09/2004	08:30	30.17	17.66	12.51	----	
LW013S	08/10/2004	11:55	30.17	18.33	11.84	----	
LW013S	11/18/2004	09:24	30.17	18.92	11.25	----	
LW013S	02/15/2005	10:13	30.17	18.00	12.17	----	
LW019S	10/23/2003	11:54	27.72	16.62	11.10	----	
LW019S	02/19/2004	15:00	27.72	13.84	13.88	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
LW019S	06/09/2004	07:27	27.72	15.46	12.26	----	
LW019S	08/10/2004	11:07	27.72	16.35	11.37	----	
LW019S	11/18/2004	08:51	27.72	17.18	10.54	----	
LW019S	02/15/2005	08:20	27.72	16.10	11.62	----	
LW020S	10/23/2003	12:14	29.51	14.86	14.65	----	
LW020S	02/19/2004	14:45	29.51	12.55	16.96	----	
LW020S	06/09/2004	07:47	29.51	14.18	15.33	----	
LW020S	08/10/2004	11:05	29.51	14.90	14.61	----	
LW020S	11/18/2004	08:46	29.51	14.42	15.09	----	
LW020S	02/15/2005	08:28	29.51	14.23	15.28	----	
LW021S	10/23/2003	12:16	30.29	16.57	13.72	----	
LW021S	02/19/2004	14:54	30.29	13.82	17.29	1.03	
LW021S	06/09/2004	07:44	30.29	15.36	15.02	0.11	
LW021S	08/10/2004	11:02	30.29	16.40	14.03	0.17	
LW021S	11/18/2004	08:43	30.29	16.51	13.87	0.11	
LW021S	02/15/2005	10:52	30.29	15.63	14.68	0.02	
LW027S	10/23/2003	12:20	30.59	25.40	5.19	----	
LW027S	02/19/2004	12:44	30.59	22.07	9.07	0.69	
LW027S	06/09/2004	07:39	30.59	21.26	9.33	----	
LW027S	08/10/2004	10:58	30.59	24.56	6.13	0.12	
LW027S	11/18/2004	07:39	30.59	24.68	5.93	0.02	
LW027S	02/15/2005	10:58	30.59	23.66	6.95	0.02	
LW028S	10/23/2003	14:26	30.98	dry	----	----	
LW028S	02/19/2004	15:17	30.98	12.87	18.11	----	
LW028S	06/09/2004	09:52	30.98	15.15	15.83	----	
LW028S	08/10/2004	11:45	30.98	dry	----	----	
LW028S	11/18/2004	09:45	30.98	dry	----	----	
LW028S	02/15/2005	11:13	30.98	15.31	15.67	----	
LW029S	10/23/2003	14:39	31.34	18.88	12.46	----	
LW029S	02/19/2004	15:30	31.34	16.52	14.82	----	
LW029S	06/09/2004	09:43	31.34	17.85	13.49	----	
LW029S	08/10/2004	11:50	31.34	18.56	12.78	----	
LW029S	11/18/2004	09:58	31.34	18.97	12.37	----	
LW029S	02/15/2005	11:35	31.34	18.15	13.19	----	
LW030S	10/23/2003	14:41	30.08	17.91	12.17	----	
LW030S	02/19/2004	15:32	30.08	15.58	14.50	----	
LW030S	06/09/2004	09:46	30.08	16.91	13.17	----	
LW030S	08/10/2004	11:52	30.08	17.62	12.46	----	
LW030S	11/18/2004	09:59	30.08	17.96	12.12	----	
LW030S	02/15/2005	11:33	30.08	17.24	12.84	----	
LW031S	10/23/2003	14:30	31.26	18.87	12.39	----	
LW031S	02/19/2004	15:21	31.26	16.07	15.19	----	
LW031S	06/09/2004	09:56	31.26	17.67	13.59	----	
LW031S	08/10/2004	11:42	31.26	16.52	14.74	----	
LW031S	11/18/2004	09:50	31.26	18.93	12.33	----	
LW031S	02/15/2005	11:08	31.26	18.14	13.12	----	
LW032S	10/23/2003	14:32	30.71	17.02	13.69	----	
LW032S	02/19/2004	15:29	30.71	13.59	17.12	----	
LW032S	06/09/2004	09:58	30.71	15.66	15.05	----	
LW032S	08/10/2004	11:46	30.71	16.67	14.04	----	
LW032S	11/18/2004	09:52	30.71	17.04	13.67	----	
LW032S	02/15/2005	10:58	30.71	16.26	14.45	----	
LW033S	10/23/2003	14:35	29.89	dry	----	----	
LW033S	02/19/2004	15:23	29.89	13.89	16.00	----	
LW033S	06/09/2004	10:02	29.89	15.60	14.29	----	
LW033S	08/10/2004	11:44	29.89	16.69	13.20	----	
LW033S	11/18/2004	09:51	29.89	dry	----	----	
LW033S	02/15/2005	11:05	29.89	16.36	13.53	----	
LW034S	10/23/2003	14:24	30.93	16.99	13.94	----	
LW034S	02/19/2004	15:15	30.93	13.29	17.64	----	
LW034S	06/09/2004	09:50	30.93	15.53	15.40	----	
LW034S	08/10/2004	11:39	30.93	16.61	14.32	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
LW034S	11/18/2004	09:46	30.93	17.00	13.93	----	
LW034S	02/15/2005	11:16	30.93	16.20	14.73	----	
LW040S	11/18/2004	08:59	33.70	dry	----	----	
LW040S	02/15/2005	08:45	33.70	dry	----	----	
LW041S	11/18/2004	10:02	29.85	dry	----	----	
LW041S	02/15/2005	11:26	29.85	dry	----	----	
LW042S	11/18/2004	10:00	30.45	18.89	11.56	----	
LW042S	02/15/2005	11:30	30.45	18.25	12.20	----	
LW043S	11/18/2004	09:49	30.66	18.44	12.22	----	
LW043S	02/15/2005	11:10	30.66	17.67	12.99	----	
LW044S	11/18/2004	09:53	30.86	17.44	13.42	----	
LW044S	02/15/2005	10:53	30.86	16.60	14.26	----	
LW101S	03/31/1997	09:54	29.41	4.51	24.90	----	
LW101S	07/16/1997	09:01	29.41	6.81	22.60	----	
LW101S	10/21/1997	18:01	29.41	7.28	22.13	----	
LW101S	01/27/1998	14:15	29.41	4.10	25.31	----	
LW101S	05/18/1998	18:18	29.41	6.68	22.73	----	
LW101S	08/17/1998	11:21	29.41	8.14	21.27	----	
LW101S	11/13/1998	10:48	29.41	8.61	20.80	----	
LW101S	02/16/1999	14:11	29.41	3.21	26.20	----	
LW101S	05/18/1999	16:17	29.41	6.00	23.41	----	
LW101S	09/21/1999	12:54	29.41	8.60	20.81	----	
LW101S	12/06/1999	14:58	29.41	6.98	22.43	----	
LW101S	02/16/2000	09:44	29.41	4.96	24.45	----	
LW101S	05/23/2000	18:06	29.41	6.83	22.58	----	
LW101S	08/29/2000	14:47	29.41	8.67	20.74	----	
LW101S	11/09/2000	13:56	29.41	9.39	20.02	----	
LW101S	02/12/2001	15:02	29.41	8.02	21.39	----	
LW101S	06/04/2001	13:35	29.41	8.40	21.01	----	
LW101S	08/16/2001	12:20	29.41	9.44	19.97	----	
LW101S	11/28/2001	13:12	29.41	8.58	20.83	----	
LW101S	02/27/2002	14:52	29.41	5.70	23.71	----	
LW101S	06/27/2002	15:32	29.41	7.80	21.61	----	
LW101S	08/26/2002	17:34	29.41	8.85	20.56	----	
LW101S	11/13/2002	09:35	29.41	9.92	19.49	----	
LW101S	02/11/2003	10:59	29.41	5.27	24.14	----	
LW101S	05/08/2003	08:43	29.41	5.40	24.01	----	
LW101S	08/27/2003	15:14	29.41	8.59	20.82	----	
LW102S	03/31/1997	10:01	25.77	1.86	23.91	----	
LW102S	07/16/1997	09:09	25.77	3.91	21.86	----	
LW102S	10/21/1997	17:59	25.77	4.03	21.74	----	
LW102S	01/27/1998	14:07	25.77	1.26	24.51	----	
LW102S	05/18/1998	18:15	25.77	3.57	22.20	----	
LW102S	08/17/1998	11:18	25.77	4.88	20.89	----	
LW102S	11/13/1998	10:45	25.77	5.14	20.63	----	
LW102S	02/16/1999	14:08	25.77	0.45	25.32	----	
LW102S	05/18/1999	16:12	25.77	3.24	22.53	----	
LW102S	09/21/1999	12:52	25.77	5.33	20.44	----	
LW102S	12/06/1999	14:56	25.77	3.67	22.10	----	
LW102S	02/16/2000	09:41	25.77	1.91	23.86	----	
LW102S	05/23/2000	18:03	25.77	3.72	22.05	----	
LW102S	08/29/2000	14:45	25.77	5.40	20.37	----	
LW102S	11/09/2000	13:53	25.77	5.94	19.83	----	
LW102S	02/12/2001	15:00	25.77	4.52	21.25	----	
LW102S	06/04/2001	13:32	25.77	4.93	20.84	----	
LW102S	08/16/2001	12:17	25.77	5.96	19.81	----	
LW102S	11/28/2001	13:10	25.77	5.15	20.62	----	
LW102S	02/27/2002	14:48	25.77	2.14	23.63	----	
LW102S	06/27/2002	15:30	25.77	4.50	21.27	----	
LW102S	08/26/2002	17:39	25.77	5.48	20.29	----	
LW102S	11/13/2002	09:32	25.77	6.50	19.27	----	
LW102S	02/11/2003	10:55	25.77	1.88	23.89	----	
LW102S	05/08/2003	08:40	25.77	2.22	23.55	----	
LW102S	08/27/2003	15:17	25.77	5.24	20.53	----	
LW103S	03/31/1997	09:50	29.07	5.50	23.57	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
LW103S	07/16/1997	08:59	29.07	6.93	22.14	----	
LW103S	10/21/1997	18:03	29.07	7.08	21.99	----	
LW103S	01/27/1998	14:20	29.07	5.11	23.96	----	
LW103S	05/18/1998	18:21	29.07	6.57	22.50	----	
LW103S	08/17/1998	11:24	29.07	7.80	21.27	----	
LW103S	11/13/1998	10:51	29.07	7.91	21.16	----	
LW103S	02/16/1999	14:14	29.07	4.54	24.53	----	
LW103S	05/18/1999	16:20	29.07	6.20	22.87	----	
LW103S	09/21/1999	12:57	29.07	8.30	20.77	----	
LW103S	12/06/1999	15:00	29.07	6.60	22.47	----	
LW103S	02/16/2000	09:46	29.07	5.50	23.57	----	
LW103S	05/23/2000	18:10	29.07	6.64	22.43	----	
LW103S	08/29/2000	14:50	29.07	8.41	20.66	----	
LW103S	11/09/2000	13:58	29.07	8.78	20.29	----	
LW103S	02/12/2001	15:04	29.07	7.39	21.68	----	
LW103S	06/04/2001	13:37	29.07	7.83	21.24	----	
LW103S	08/16/2001	12:23	29.07	9.07	20.00	----	
LW103S	11/28/2001	13:16	29.07	8.02	21.05	----	
LW103S	02/27/2002	14:50	29.07	5.26	23.81	----	
LW103S	06/27/2002	15:34	29.07	7.42	21.65	----	
LW103S	08/26/2002	17:36	29.07	8.57	20.50	----	
LW103S	11/13/2002	09:37	29.07	9.48	19.59	----	
LW103S	02/11/2003	11:03	29.07	5.65	23.42	----	
LW103S	05/08/2003	08:46	29.07	5.86	23.21	----	
LW103S	08/27/2003	15:15	29.07	8.33	20.74	----	
LW104S	03/31/1997	10:06	26.57	3.55	23.02	----	
LW104S	07/16/1997	08:54	26.57	5.71	20.86	----	
LW104S	10/21/1997	16:22	26.57	5.71	20.86	----	
LW104S	01/27/1998	14:00	26.57	2.84	23.73	----	
LW104S	05/18/1998	18:11	26.57	5.17	21.40	----	
LW104S	08/17/1998	11:15	26.57	6.64	19.93	----	
LW104S	11/13/1998	10:41	26.57	6.72	19.85	----	
LW104S	02/16/1999	14:03	26.57	2.11	24.46	----	
LW104S	05/18/1999	16:08	26.57	4.97	21.60	----	
LW104S	09/21/1999	12:48	26.57	7.18	19.39	----	
LW104S	12/06/1999	14:54	26.57	5.00	21.57	----	
LW104S	02/16/2000	09:39	26.57	3.61	22.96	----	
LW104S	05/23/2000	17:59	26.57	5.61	20.96	----	
LW104S	08/29/2000	14:43	26.57	7.08	19.49	----	
LW104S	11/09/2000	13:51	26.57	7.49	19.08	----	
LW104S	02/12/2001	14:57	26.57	6.28	20.29	----	
LW104S	06/04/2001	13:30	26.57	6.64	19.93	----	
LW104S	08/16/2001	12:15	26.57	7.56	19.01	----	
LW104S	11/28/2001	13:06	26.57	6.30	20.27	----	
LW104S	02/27/2002	14:46	26.57	4.07	22.50	----	
LW104S	06/27/2002	15:27	26.57	6.28	20.29	----	
LW104S	08/26/2002	17:41	26.57	7.13	19.44	----	
LW104S	11/13/2002	09:30	26.57	7.85	18.72	----	
LW104S	02/11/2003	10:51	26.57	3.72	22.85	----	
LW104S	05/08/2003	08:38	26.57	4.94	21.63	----	
LW104S	08/27/2003	15:19	26.57	6.87	19.70	----	
RW1	05/18/1999	15:06	31.46	15.70	15.76	----	
RW1	09/21/1999	11:46	31.46	18.02	13.44	----	
RW1	12/06/1999	14:43	31.46	17.73	13.73	----	
RW1	02/16/2000	10:33	31.46	16.14	15.32	----	
RW1	05/23/2000	17:46	31.46	17.09	14.37	----	
RW1	08/29/2000	14:28	31.46	18.29	13.17	----	
RW1	11/09/2000	12:57	31.46	18.67	12.79	----	
RW1	02/12/2001	16:44	31.46	18.30	13.16	----	
RW1	06/04/2001	13:17	31.46	18.22	13.24	----	
RW1	08/16/2001	10:55	31.46		31.46	----	Vapor/water recovery system test running - not measurec
RW1	11/28/2001	12:02	31.46	18.55	12.91	----	
RW1	02/27/2002	14:03	31.46	16.12	15.34	----	
RW1	03/05/2002	11:38	31.46	16.33	15.13	----	
RW1	04/05/2002	08:27	31.46	16.28	15.18	----	
RW1	05/29/2002	00:00	31.46	17.00	14.46	----	
RW1	06/27/2002	15:16	31.46	17.33	14.13	----	
RW1	08/26/2002	16:40	31.46	18.00	13.46	----	
RW1	11/13/2002	08:26	31.46	18.85	12.61	----	
RW1	02/11/2003	09:34	31.46	16.50	14.96	----	
RW1	05/08/2003	07:46	31.46	16.23	15.23	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
RW1	08/27/2003	14:04	31.46	18.09	13.37	----	
RW1	10/23/2003	13:23	31.46	18.55	12.91	----	
RW1	02/19/2004	13:52	31.46	16.31	15.15	----	
RW1	06/09/2004	08:35	31.46	17.60	13.86	----	
RW1	08/10/2004	12:03	31.46	18.22	13.24	----	
RW1	11/18/2004	09:21	31.46	18.61	12.85	----	
RW1	02/15/2005	10:24	31.46	17.95	13.51	----	
RW3	12/06/1999	15:24	29.96	14.20	15.76	----	
RW3	02/16/2000	10:37	29.96	11.88	18.08	----	
RW3	05/23/2000	17:26	29.96	13.02	16.94	----	
RW3	08/29/2000	13:42	29.96	14.88	15.08	----	
RW3	11/09/2000	13:03	29.96	15.58	14.38	----	
RW3	02/12/2001	15:28	29.96	15.13	14.83	----	
RW3	06/04/2001	12:30	29.96	15.09	14.87	----	
RW3	08/16/2001	11:44	29.96	15.74	14.22	----	
RW3	11/28/2001	12:40	29.96	15.52	14.44	----	
RW3	02/27/2002	14:26	29.96	11.80	18.16	----	
RW3	03/05/2002	11:02	29.96	11.94	18.02	----	
RW3	04/05/2002	08:44	29.96	12.06	17.90	----	
RW3	05/29/2002	00:00	29.96	13.00	16.96	----	
RW3	06/27/2002	14:59	29.96	13.64	16.32	----	
RW3							Abandoned August 2003
PZ1	05/23/2000	17:47	28.04	14.21	13.83	----	
PZ1	08/29/2000	14:30	28.04	15.33	12.71	----	
PZ1	11/09/2000	12:55	28.04	15.68	12.36	----	
PZ1	02/12/2001	16:42	28.04	15.30	12.74	----	
PZ1	06/04/2001	13:20	28.04	15.29	12.75	----	
PZ1	08/16/2001	11:17	28.04	15.94	12.10	----	
PZ1	11/28/2001	12:09	28.04	15.48	12.56	----	
PZ1	02/27/2002	14:02	28.04	13.28	14.76	----	
PZ1	03/05/2002	11:34	28.04	13.40	14.64	----	
PZ1	04/05/2002	08:32	28.04	13.44	14.60	----	
PZ1	05/29/2002	00:00	28.04	14.16	13.88	----	
PZ1	06/27/2002	15:17	28.04	14.50	13.54	----	
PZ1	08/26/2002	16:33	28.04	15.17	12.87	----	
PZ1	11/13/2002	08:42	28.04	15.83	12.21	----	
PZ1	02/11/2003	09:36	28.04	13.58	14.46	----	
PZ1	05/08/2003	07:58	28.04	13.25	14.79	----	
PZ1	08/27/2003	14:20	28.04	15.32	12.72	----	
PZ1	10/23/2003	13:19	28.04	15.75	12.29	----	
PZ1	02/19/2004	13:56	28.04	13.41	14.63	----	
PZ1	06/09/2004	08:37	28.04	14.75	13.29	----	
PZ1	08/10/2004	12:00	28.04	15.42	12.62	----	
PZ1	11/18/2004	09:22	28.04	15.46	12.58	----	
PZ2	06/27/2002	15:18	31.97	18.31	13.66	----	
PZ2	08/26/2002	16:34	31.97	18.88	13.09	----	
PZ2	11/13/2002	08:25	31.97	19.40	12.57	----	
PZ2	02/11/2003	09:44	31.97	17.46	14.51	----	
PZ2	05/08/2003	07:45	31.97	17.15	14.82	----	
PZ2	08/27/2003	14:03	31.97	19.02	12.95	----	
PZ2	10/23/2003	13:21	31.97	19.27	12.75	0.06	
PZ2	02/19/2004	13:50	31.97	17.36	14.61	----	
PZ2	06/09/2004	08:33	31.97	18.51	13.46	----	
PZ2	08/10/2004	12:02	31.97	19.12	12.85	----	
PZ2	11/18/2004	09:20	31.97	19.24	12.73	----	
PZ3	06/27/2002	15:19	31.12	19.35	11.77	----	
PZ3	08/26/2002	16:35	31.12	19.74	11.38	----	
PZ3	11/13/2002	08:45	31.12	16.87	----	----	
PZ3	02/11/2003	09:40	31.12	19.05	12.07	----	
PZ3	05/08/2003	07:53	31.12	18.95	12.17	----	
PZ3	08/27/2003	14:26	31.12	19.82	11.30	----	
PZ3	10/23/2003	12:39	31.12	dry	----	----	
PZ3	02/19/2004	15:09	31.12	19.07	12.05	----	
PZ3	06/09/2004	08:39	31.12	19.53	11.59	----	
PZ3	08/10/2004	12:04	31.12	19.86	11.26	----	
PZ3	11/18/2004	09:19	31.12	dry	----	----	
PZ4	06/27/2002	15:20	28.47	dry	----	----	
PZ4	08/26/2002	16:36	28.47	dry	----	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
PZ4	11/13/2002	08:48	28.47	16.87	11.60	----	
PZ4	02/11/2003	09:41	28.47	dry	----	----	
PZ4	05/08/2003	07:52	28.47	17.78	10.69	----	
PZ4	08/27/2003	14:27	28.47	dry	----	----	
PZ4	10/23/2003	12:36	28.47	dry	----	----	
PZ4	02/19/2004	15:08	28.47	dry	----	----	
PZ4	06/09/2004	08:41	28.47	dry	----	----	
PZ4	08/10/2004	12:03	28.47	dry	----	----	
PZ4	11/18/2004	09:18	28.47	dry	----	----	
OX001S	06/27/2002	15:13	33.38	17.85	15.53	----	
OX001S	08/26/2002	16:45	33.38	18.75	14.63	----	
OX001S	11/13/2002	08:30	33.38	19.92	13.46	----	
OX001S	02/11/2003	09:59	33.38	16.96	16.42	----	
OX001S	05/08/2003	08:04	33.38	16.48	16.90	----	
OX001S	08/27/2003	14:38	33.38	18.76	14.62	----	
OX001S	10/23/2003	14:09	33.38	19.51	13.87	----	
OX001S	02/19/2004	14:10	33.38	16.64	16.74	----	
OX001S	06/09/2004	08:45	33.38	18.16	15.22	----	
OX001S	08/10/2004	12:07	33.38	19.08	14.30	----	
OX001S	11/18/2004	09:07	33.38	19.63	13.77	0.03	
OX001S	02/15/2005	11:11	33.38	18.77	14.61	----	Strong product odor
OX002S	06/27/2002	15:12	28.69	13.22	15.47	----	
OX002S	08/26/2002	16:44	28.69	14.26	14.43	----	
OX002S	11/13/2002	08:33	28.81	15.39	13.42	----	New reference elevation September 2002
OX002S	02/11/2003	10:06	28.81	12.39	16.42	----	
OX002S	05/08/2003	08:09	28.81	11.90	16.91	----	
OX002S	08/27/2003	14:33	28.81	14.55	14.26	----	
OX002S	10/23/2003	14:14	28.81	15.22	13.84	0.31	
OX002S	02/19/2004	14:07	28.81	12.06	16.75	----	
OX002S	06/09/2004	08:52	28.95	13.61	15.34	----	New reference elevation July 2004
OX002S	08/10/2004	12:09	28.95	14.53	14.42	----	
OX002S	11/18/2004	09:10	28.95	15.18	13.87	0.13	
OX002S	02/15/2005	11:09	28.95	14.25	14.72	0.03	
OX003S	06/27/2002	15:14	30.01	14.65	15.36	----	
OX003S	08/26/2002	16:42	30.01	15.50	14.51	----	
OX003S	11/13/2002	08:31	30.01	16.65	13.36	----	
OX003S	02/11/2003	09:58	30.01	13.78	16.23	----	
OX003S	05/08/2003	08:03	30.01	13.30	16.71	----	
OX003S	08/27/2003	14:40	30.01	15.52	14.49	----	
OX003S	10/23/2003	14:10	30.01	16.22	13.79	----	
OX003S	02/19/2004	14:09	30.01	13.47	16.54	----	
OX003S	06/09/2004	08:51	30.01	14.96	15.05	----	
OX003S	08/10/2004	12:06	30.01	15.81	14.20	----	
OX003S	11/18/2004	09:13	30.01	16.61	13.66	0.33	
OX003S	02/15/2005	11:18	30.01	15.53	14.48	----	Slight product odor
OX004S	06/27/2002	15:15	33.42	19.07	14.35	----	
OX004S	08/26/2002	16:39	33.42	19.74	13.68	----	
OX004S	11/13/2002	08:24	33.54	20.73	12.81	----	New reference elevation September 2002
OX004S	02/11/2003	09:38	33.54	18.39	15.15	----	
OX004S	05/08/2003	07:47	33.54	19.07	14.47	----	
OX004S	08/27/2003	14:07	33.54	19.95	13.59	----	
OX004S	10/23/2003	12:43	33.54	dry	----	----	
OX004S	02/19/2004	13:54	33.54	18.21	15.33	----	
OX004S	06/09/2004	08:38	33.51	19.44	14.07	----	New reference elevation July 2004
OX004S	08/10/2004	12:06	33.51	20.12	13.39	----	
OX004S	11/18/2004	09:17	33.51	dry	----	----	
OX004S	02/15/2005	10:27	33.51	19.82	13.69	----	
OX005S	10/23/2003	13:44	30.74	16.15	14.59	----	
OX005S	02/19/2004	14:25	30.74	12.46	18.28	----	
OX005S	06/09/2004	09:14	30.74	14.35	16.39	----	
OX005S	08/10/2004	12:18	30.74	15.65	15.09	----	
OX005S	11/18/2004	08:58	30.74	16.26	14.48	----	
OX005S	02/15/2005	09:28	30.74	15.22	15.52	----	
OX006S	10/23/2003	13:45	30.92	16.43	14.49	----	
OX006S	02/19/2004	14:24	30.92	12.85	18.07	----	
OX006S	06/09/2004	09:12	31.03	14.71	16.32	----	New reference elevation July 2004

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
OX006S	08/10/2004	12:17	31.03	16.09	14.94	----	
OX006S	11/18/2004	09:00	31.03	16.66	14.37	----	
OX006S	02/15/2005	09:30	31.03	15.72	15.31	----	
OX007S	10/23/2003	13:46	30.68	16.25	14.43	----	
OX007S	02/19/2004	14:23	30.68	12.67	18.01	----	
OX007S	06/09/2004	09:11	30.68	14.55	16.13	----	
OX007S	08/10/2004	12:16	30.68	15.79	14.89	----	
OX007S	11/18/2004	09:02	30.68	16.34	14.34	----	
OX007S	02/15/2005	09:32	30.68	15.45	15.23	----	
OX008S	10/23/2003	13:47	30.74	16.41	14.33	----	
OX008S	02/19/2004	14:19	30.74	12.96	17.78	----	
OX008S	06/09/2004	09:09	30.74	14.81	15.93	----	
OX008S	08/10/2004	12:15	30.74	15.96	14.78	----	
OX008S	11/18/2004	08:23	30.74	16.52	14.22	----	
OX008S	02/15/2005	09:35	30.74	15.63	15.11	----	
OX009S	08/10/2004	12:12	31.14	16.92	14.22		Reference elevation July 2004
OX009S	02/15/2005	10:15	31.14	16.61	14.53		
Deep Wells:							
B2	08/11/1993	10:02	30.31	25.44	4.87	----	Slight sheen, slight to mod solvent-like odor
B2	10/26/1993	13:32	30.31	25.25	5.06	----	
B2	11/17/1993	13:32	30.31	25.23	5.08	----	
B2	12/17/1993	12:59	30.31	23.88	6.43	----	
B2	01/17/1994	13:12	30.31	23.99	6.32	----	
B2	02/18/1994	14:20	30.31	23.73	6.58	----	
B2	03/18/1994	12:59	30.31	23.15	7.16	----	
B2	04/18/1994	14:42	30.31	24.35	5.96	----	
B2	05/18/1994	15:22	30.31	23.12	7.19	----	
B2	06/17/1994	14:54	30.31	22.90	7.41	----	
B2	07/19/1994	09:20	30.31	24.38	5.93	----	
B2	08/17/1994	07:35	30.31	25.22	5.09	----	
B2	09/16/1994	07:27	30.31	25.89	4.42	----	
B2	10/17/1994	09:03	30.31	25.43	4.88	----	
B2	11/21/1994	11:51	30.31	24.56	5.75	----	
B2	12/19/1994	11:10	30.31	21.82	8.49	----	
B2	01/18/1995	11:18	30.31	18.93	11.38	----	
B2	02/21/1995	13:23	30.31	17.12	13.19	----	
B2	03/21/1995	13:05	30.31	20.37	9.94	----	
B2	04/19/1995	12:48	30.31	21.21	9.10	----	
B2	05/19/1995	13:38	30.31	19.30	11.01	----	
B2	07/17/1995	13:55	30.31	22.72	7.59	----	
B2	08/22/1995	07:53	30.31	24.42	5.89	----	
B2	09/22/1995	08:28	30.31	25.28	5.03	----	
B2	11/20/1995	07:57	30.31	22.02	8.29	----	
B2	12/01/1995	08:29	30.31	13.63	16.68	----	
B2	12/19/1995	07:26	30.31	15.57	14.74	----	
B2	01/19/1996	08:38	30.31	16.48	13.83	----	
B2	02/20/1996	10:42	30.31	10.63	19.68	----	
B2	03/19/1996	09:23	30.31	16.61	13.70	----	
B2	04/19/1996	11:53	30.31	16.20	14.11	----	
B2	07/22/1996	14:24	30.31	22.29	8.02	----	
B2	08/20/1996	14:20	30.31	23.43	6.88	----	
B2	09/24/1996	08:11	30.31	24.30	6.01	----	
B2	10/28/1996	11:09	30.31	23.76	6.55	----	
B2	12/13/1996	10:47	30.31	16.70	13.61	----	
B2	03/25/1997	12:02	30.31	15.85	14.46	----	
B2	03/31/1997	09:27	30.31	14.91	15.40	----	
B2	07/16/1997	07:45	30.31	19.91	10.40	----	
B2	10/21/1997	16:30	30.31	23.56	6.75	----	
B2	01/27/1998	12:06	30.31	19.32	10.99	----	
B2	05/18/1998	17:54	30.31	18.80	11.51	----	
B2	08/17/1998	10:23	30.31	24.38	5.93	----	
B2	11/13/1998	10:17	30.31	25.33	4.98	----	
B2	02/16/1999	13:34	30.31	19.64	10.67	----	
B2	05/18/1999	15:50	30.31	19.04	11.27	----	
B2	09/21/1999	12:18	30.31	25.34	4.97	----	
B2	12/06/1999	14:39	30.31	20.25	10.06	----	
B2	02/16/2000	10:56	30.31	20.57	9.74	----	
B2	05/23/2000	17:33	30.31	20.99	9.32	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
B2	08/29/2000	14:20	30.31	25.38	4.93	----	
B2	11/09/2000	13:29	30.31	25.31	5.00	----	
B2	02/12/2001	15:27	30.31	24.62	5.69	----	
B2	06/04/2001	13:04	30.31	24.84	5.47	----	
B2	08/16/2001	11:58	30.31	26.75	3.56	----	
B2	11/28/2001	12:46	30.31	24.14	6.17	----	
B2	02/27/2002	14:35	30.31	22.90	7.41	----	
B2	06/27/2002	15:07	30.31	20.16	10.15	----	
B2	08/26/2002	17:01	30.31	25.32	4.99	----	
B2	11/13/2002	09:03	30.31	25.28	5.03	----	
B2	02/11/2003	10:14	30.31	23.58	6.73	----	
B2	05/08/2003	08:13	30.31	21.33	8.98	----	
B2	08/27/2003	15:32	30.31	24.25	6.06	----	
B2	10/23/2003	14:08	30.31	25.85	4.46	----	
B2	02/19/2004	14:12	30.31	22.21	8.10	----	
B2	06/09/2004	09:02	30.31	21.45	8.86	----	
B2	08/10/2004	08:50	30.31	25.73	4.58	----	
B2	08/10/2004	10:29	30.31	25.96	4.35	----	
B2	11/18/2004	08:13	30.31	25.08	5.23	----	
B2	02/15/2005	10:09	30.31	24.50	5.81	----	
G1A	03/25/1997	11:55	29.72	14.84	14.88	----	
G1A	03/31/1997	09:11	29.72	14.28	15.44	----	
G1A	07/16/1997	07:33	29.72	18.94	10.78	----	
G1A	10/21/1997	16:18	29.72	22.44	7.28	----	
G1A	01/27/1998	11:46	29.72	18.42	11.30	----	
G1A	05/18/1998	17:31	29.72	18.05	11.67	----	
G1A	08/17/1998	10:07	29.72	23.35	6.37	----	
G1A	11/13/1998	09:54	29.72	24.59	5.13	----	
G1A	02/16/1999	13:14	29.72	18.28	11.44	----	
G1A	05/18/1999	14:51	29.72	18.42	11.30	----	
G1A	09/21/1999	11:29	29.72	24.32	5.40	----	
G1A	12/06/1999	14:05	29.72	19.82	9.90	----	
G1A	02/16/2000	10:18	29.72	19.81	9.91	----	
G1A	05/23/2000	16:31	29.72	20.08	9.64	----	Replaced lock and tubing
G1A	08/29/2000	13:13	29.72	24.36	5.36	----	
G1A	11/09/2000	12:32	29.72	24.85	4.87	----	
G1A	02/12/2001	16:01	29.72	24.08	5.64	----	
G1A	06/04/2001	11:40	29.72	24.10	5.62	----	
G1A	08/16/2001	10:52	29.72	25.51	4.21	----	
G1A	11/28/2001	11:32	29.72	23.84	5.88	----	
G1A	02/27/2002	13:39	29.72	21.96	7.76	----	
G1A	06/27/2002	14:17	29.72	19.48	10.24	----	
G1A	08/26/2002	16:06	29.72	24.36	5.36	----	
G1A	11/13/2002	07:35	29.72	24.60	5.12	----	
G1A	02/11/2003	08:59	29.72	22.32	7.40	----	
G1A	05/08/2003	06:58	29.72	20.51	9.21	----	
G1A	08/27/2003	13:36	29.72	24.16	5.56	----	
G1A	10/23/2003	12:37	29.72	25.20	4.52	----	
G1A	02/19/2004	12:57	29.72	21.51	8.21	----	
G1A	06/09/2004	07:55	29.72	20.91	8.81	----	
G1A	08/10/2004	08:46	29.72	25.07	4.65	----	
G1A	08/10/2004	10:25	29.72	25.24	4.48	----	
G1A	11/18/2004	08:09	29.72	24.56	5.16	----	
G1A	02/15/2005	09:53	29.72	23.62	6.10	----	
J2	03/25/1997	12:18	29.65	15.22	14.43	----	
J2	03/31/1997	11:21	29.65	14.38	15.27	----	
J2	07/16/1997	08:24	29.65	19.28	10.37	----	
J2	10/21/1997	17:00	29.65	23.02	6.63	----	
J2	01/27/1998	13:19	29.65	18.69	10.96	----	
J2	05/18/1998	18:00	29.65	18.14	11.51	----	
J2	08/17/1998	10:21	29.65	23.70	5.95	----	
J2	11/13/1998	10:28	29.65	24.64	5.01	----	
J2	02/16/1999	13:40	29.65	19.00	10.65	----	
J2	05/18/1999	15:46	29.65	18.40	11.25	----	
J2	09/21/1999	12:30	29.65	24.73	4.92	----	
J2	12/06/1999	15:08	29.65	19.53	10.12	----	
J2	02/16/2000	11:07	29.65	19.89	9.76	----	
J2	05/23/2000	17:28	29.65	20.33	9.32	----	
J2	08/29/2000	14:15	29.65	24.67	4.98	----	
J2	11/09/2000	13:26	29.65	24.66	4.99	----	
J2	02/12/2001	15:23	29.65	23.92	5.73	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
J2	06/04/2001	13:02	29.65	24.17	5.48	----	
J2	08/16/2001	11:51	29.65	25.57	4.08	----	
J2	11/28/2001	12:36	29.65	23.45	6.20	----	
J2	02/27/2002	14:31	29.65	22.21	7.44	----	
J2	06/27/2002	15:03	29.65	19.48	10.17	----	
J2	08/26/2002	16:56	29.65	24.67	4.98	----	
J2	11/13/2002	08:59	29.65	24.60	5.05	----	
J2	02/11/2003	10:19	29.65	22.95	6.70	----	
J2	05/08/2003	08:16	29.65	20.65	9.00	----	
J2	08/27/2003	14:48	29.65	24.12	5.53	----	
J2	10/23/2003	13:54	29.65	25.18	4.47	----	
J2	02/19/2004	14:17	29.65	21.52	8.13	----	
J2	06/09/2004	09:07	29.65	20.76	8.89	----	
J2	08/10/2004	08:40	29.65	25.00	4.65	----	
J2	08/10/2004	10:27	29.65	25.24	4.41	----	
J2	11/18/2004	08:20	29.65	24.39	5.26	----	
J2	02/15/2005	09:52	29.65	23.44	6.21	----	
J3	03/25/1997	12:20	29.58	14.70	14.88	----	
J3	03/31/1997	11:25	29.58	14.03	15.55	----	
J3	07/16/1997	08:25	29.58	18.91	10.67	----	
J3	10/21/1997	17:02	29.58	22.37	7.21	----	
J3	01/27/1998	13:21	29.58	18.28	11.30	----	
J3	05/18/1998	17:58	29.58	17.84	11.74	----	
J3	08/17/1998	10:22	29.58	23.12	6.46	----	
J3	11/13/1998	10:26	29.58	24.14	5.44	----	
J3	02/16/1999	13:41	29.58	18.32	11.26	----	
J3	05/18/1999	15:48	29.58	18.01	11.57	----	
J3	09/21/1999	12:31	29.58	24.12	5.46	----	
J3	12/06/1999	15:09	29.58	19.31	10.27	----	
J3	02/16/2000	10:07	29.58	19.50	10.08	----	
J3	05/23/2000	17:29	29.58	19.86	9.72	----	
J3	08/29/2000	14:17	29.58	24.05	5.53	----	
J3	11/09/2000	13:27	29.58	24.24	5.34	----	
J3	02/12/2001	15:24	29.58	23.45	6.13	----	
J3	06/04/2001	12:44	29.58	23.62	5.96	----	
J3	08/16/2001	11:50	29.58	24.98	4.60	----	
J3	11/28/2001	12:37	29.58	22.98	6.60	----	
J3	02/27/2002	14:32	29.58	21.52	8.06	----	
J3	06/27/2002	15:04	29.58	19.14	10.44	----	
J3	08/26/2002	16:57	29.58	23.99	5.59	----	
J3	11/13/2002	08:58	29.58	24.10	5.48	----	
J3	02/11/2003	10:20	29.58	22.28	7.30	----	
J3	05/08/2003	08:17	29.58	20.16	9.42	----	
J3	08/27/2003	14:49	29.58	23.60	5.98	----	
J3	10/23/2003	13:56	29.58	24.70	4.88	----	
J3	02/19/2004	14:16	29.58	21.18	8.40	----	
J3	06/09/2004	09:06	29.58	20.40	9.18	----	
J3	08/10/2004	08:41	29.58	24.50	5.08	----	
J3	08/10/2004	10:28	29.58	24.67	4.91	----	
J3	11/18/2004	08:17	29.58	23.86	5.72	----	
O	03/25/1997	11:40	32.03	17.01	15.02	----	
O	03/31/1997	08:48	32.03	16.39	15.64	----	
O	07/16/1997	07:05	32.03	21.93	10.10	----	
O	10/21/1997	16:01	32.03	22.23	9.80	----	
O	01/27/1998	11:03	32.03	20.51	11.52	----	
O	05/18/1998	17:14	32.03	20.25	11.78	----	
O	08/17/1998	10:13	32.03	25.42	6.61	----	
O	11/13/1998	09:31	32.03	26.49	5.54	----	
O	02/16/1999	12:45	32.03	20.25	11.78	----	
O	05/18/1999	14:36	32.03	21.23	10.80	----	
O	09/21/1999	11:09	32.03	26.22	5.81	----	
O	12/06/1999	13:48	32.03	21.90	10.13	----	
O	02/16/2000	10:04	32.03	22.21	9.82	----	
O	05/23/2000	16:15	32.03	22.18	9.85	----	
O	08/29/2000	12:56	32.03	26.49	5.54	----	
O	11/09/2000	12:18	32.03	27.01	5.02	----	
O	02/12/2001	15:52	32.03	26.12	5.91	----	
O	06/04/2001	11:22	32.03	26.08	5.95	----	
O	08/16/2001	10:22	32.03	27.58	4.45	----	
O	11/28/2001	11:18	32.03	26.15	5.88	----	
O	02/27/2002	13:15	32.03	24.08	7.95	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
O	06/27/2002	14:09	32.03	21.29	10.74	----	
O	08/26/2002	15:47	32.03	25.91	6.12	----	
O	11/13/2002	07:21	32.03	26.56	5.47	----	
O	02/11/2003	08:38	32.03	22.81	9.22	----	
O	05/08/2003	06:44	32.03	22.70	9.33	----	
O	08/27/2003	13:23	32.03	26.43	5.60	----	
O	10/23/2003	12:02	32.03	27.11	4.92	----	
O	02/19/2004	12:15	32.03	23.71	8.32	----	
O	06/09/2004	07:32	32.03	22.76	9.27	----	
O	08/10/2004	08:23	32.03	26.51	5.52	----	
O	08/10/2004	10:02	32.03	26.52	5.51	----	
O	11/18/2004	07:33	32.03	26.13	5.90	----	
R	03/25/1997	11:36	30.47	15.56	14.91	----	
R	03/31/1997	08:43	30.47	14.85	15.62	----	
R	07/16/1997	07:00	30.47	20.37	10.10	----	
R	10/21/1997	15:56	30.47	22.54	7.93	----	
R	01/27/1998	10:57	30.47	18.98	11.49	----	
R	05/18/1998	17:15	30.47	18.73	11.74	----	
R	08/17/1998	10:12	30.47	23.93	6.54	----	
R	11/13/1998	09:35	30.47	25.17	5.30	----	
R	02/16/1999	13:05	30.47	18.79	11.68	----	
R	05/18/1999	14:37	30.47	19.64	10.83	----	
R	09/21/1999	11:15	30.47	24.53	5.94	----	
R	12/06/1999	13:46	30.47	20.33	10.14	----	
R	02/16/2000	10:12	30.47	20.65	9.82	----	
R	05/23/2000	16:17	30.47	20.64	9.83	----	
R	08/29/2000	12:58	30.47	24.97	5.50	----	
R	11/09/2000	12:20	30.47	25.47	5.00	----	
R	02/12/2001	15:54	30.47	24.46	6.01	----	
R	06/04/2001	11:36	30.47	24.53	5.94	----	
R	08/16/2001	10:35	30.47	26.02	4.45	----	
R	11/28/2001	11:19	30.47	24.57	5.90	----	
R	02/27/2002	13:17	30.47	22.50	7.97	----	
R	06/27/2002	14:08	30.47	19.75	10.72	----	
R	08/26/2002	15:58	30.47	24.38	6.09	----	
R	11/13/2002	07:22	30.47	25.04	5.43	----	
R	02/11/2003	08:41	30.47	21.22	9.25	----	
R	05/08/2003	06:46	30.47	21.14	9.33	----	
R	08/27/2003	13:25	30.47	24.91	5.56	----	
R	10/23/2003	11:56	30.47	25.60	4.87	----	
R	02/19/2004	12:05	30.47	22.15	8.32	----	
R	06/09/2004	07:30	30.47	21.21	9.26	----	
R	08/10/2004	08:21	30.47	24.99	5.48	----	
R	08/10/2004	10:00	30.47	24.99	5.48	----	
R	11/18/2004	07:34	30.47	24.61	5.86	----	
LW001D	03/31/1997	11:11	28.31	12.71	15.60	----	
LW001D	07/16/1997	08:12	28.31	17.65	10.66	----	
LW001D	10/21/1997	16:55	28.31	21.29	7.02	----	
LW001D	01/27/1998	13:07	28.31	17.06	11.25	----	
LW001D	05/18/1998	17:39	28.31	16.53	11.78	----	
LW001D	08/17/1998	10:30	28.31	21.82	6.49	----	
LW001D	11/13/1998	10:01	28.31	22.77	5.54	----	
LW001D	02/16/1999	13:21	28.31	17.30	11.01	----	
LW001D	05/18/1999	15:36	28.31	16.76	11.55	----	
LW001D	09/21/1999	12:12	28.31	22.91	5.40	----	
LW001D	12/06/1999	14:34	28.31	18.00	10.31	----	
LW001D	02/16/2000	10:49	28.31	18.16	10.15	----	
LW001D	05/23/2000	17:19	28.31	18.62	9.69	----	
LW001D	08/29/2000	13:59	28.31	22.81	5.50	----	
LW001D	11/09/2000	13:20	28.31	22.98	5.33	----	
LW001D	02/12/2001	15:35	28.31	22.23	6.08	----	
LW001D	06/04/2001	12:23	28.31	22.36	5.95	----	
LW001D	08/16/2001	11:38	28.31	23.73	4.58	----	
LW001D	11/28/2001	12:29	28.31	21.73	6.58	----	
LW001D	02/27/2002	14:17	28.31	20.31	8.00	----	
LW001D	06/27/2002	14:49	28.31	17.81	10.50	----	
LW001D	08/26/2002	17:12	28.31	22.85	5.46	----	
LW001D	11/13/2002	09:08	28.31	22.91	5.40	----	
LW001D	02/11/2003	10:27	28.31	21.11	7.20	----	
LW001D	05/08/2003	08:19	28.31	18.91	9.40	----	
LW001D	08/27/2003	14:50	28.31	22.40	5.91	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
LW001D	10/23/2003	13:57	28.31	23.51	4.80	----	
LW001D	02/19/2004	14:30	28.31	19.91	8.40	----	
LW001D	06/09/2004	09:21	28.31	19.13	9.18	----	
LW001D	08/10/2004	08:45	28.31	23.30	5.01	----	
LW001D	08/10/2004	10:27	28.31	23.50	4.81	----	
LW001D	11/18/2004	08:27	28.31	22.69	5.62	----	
LW001D	02/15/2005	09:21	28.31	21.98	6.33	----	
LW003D	03/31/1997	11:45	30.80	19.38	11.42	----	Time estimated
LW003D	07/16/1997	08:38	30.80	28.09	2.71	----	
LW003D	10/21/1997	17:07	30.80	23.36	7.44	----	
LW003D	01/27/1998	13:30	30.80	21.66	9.14	----	
LW003D	05/18/1998	17:35	30.80	19.21	11.59	----	
LW003D	08/17/1998	10:24	30.80	24.62	6.18	----	
LW003D	11/13/1998	09:03	30.80	25.56	5.24	----	
LW003D	02/16/1999	13:44	30.80	20.00	10.80	----	
LW003D	05/18/1999	15:58	30.80	19.42	11.38	----	Purged dry at 11:00
LW003D	09/21/1999	10:40	30.80	25.76	5.04	----	
LW003D	12/06/1999	14:45	30.80	20.69	10.11	----	
LW003D	02/16/2000	09:54	30.80	20.98	9.82	----	
LW003D	05/23/2000	14:40	30.80	21.16	9.64	----	Purged dry at 13:10
LW003D	08/29/2000	14:36	30.80	----	----	----	Well purged dry 8/28; sampled a.m. on 8/29
LW003D	11/09/2000	----	30.80	----	----	----	Well sampled 11/8/00 - water level not representative
LW003D	02/12/2001	15:11	30.80	24.85	5.95	----	
LW003D	06/04/2001	12:35	30.80	25.09	5.71	----	
LW003D	08/16/2001	11:47	30.80	26.43	4.37	----	
LW003D	11/28/2001	12:42	30.80	24.48	6.32	----	
LW003D	02/27/2002	14:20	30.80	23.13	7.67	----	
LW003D	06/27/2002	14:59	30.80	20.55	10.25	----	
LW003D	08/26/2002	17:03	30.80	25.63	5.17	----	
LW003D	11/13/2002	09:20	30.80	25.57	5.23	----	
LW003D	02/11/2003	10:40	30.80	24.03	6.77	----	
LW003D	05/08/2003	08:29	30.80	21.68	9.12	----	
LW003D	08/27/2003	15:04	30.80	25.10	5.70	----	
LW003D	10/23/2003	13:49	30.80	26.18	4.62	----	
LW003D	02/19/2004	14:21	30.80	22.65	8.15	----	
LW003D	06/09/2004	09:29	30.80	21.82	8.98	----	
LW003D	08/10/2004	08:39	30.80	25.95	4.85	----	
LW003D	08/10/2004	10:25	30.80	26.10	4.70	----	
LW003D	11/18/2004	08:24	30.80	25.42	5.38	----	
LW003D	02/15/2005	09:40	30.80	25.06	5.74	----	
LW004D	03/31/1997	09:18	30.17	14.73	15.44	----	
LW004D	07/16/1997	07:42	30.17	19.43	10.74	----	
LW004D	10/21/1997	16:27	30.17	23.02	7.15	----	
LW004D	01/27/1998	11:56	30.17	18.84	11.33	----	
LW004D	05/18/1998	17:33	30.17	18.54	11.63	----	
LW004D	08/17/1998	10:18	30.17	23.81	6.36	----	
LW004D	11/13/1998	09:57	30.17	24.99	5.18	----	
LW004D	02/16/1999	13:17	30.17	18.79	11.38	----	
LW004D	05/18/1999	15:04	30.17	18.77	11.40	----	Completed sampling at 13:40
LW004D	09/21/1999	11:41	30.17	24.78	5.39	----	
LW004D	12/06/1999	14:18	30.17	20.21	9.96	----	
LW004D	02/16/2000	10:30	30.17	20.23	9.94	----	
LW004D	05/23/2000	16:54	30.17	20.55	9.62	----	
LW004D	08/29/2000	13:38	30.17	24.78	5.39	----	
LW004D	11/09/2000	12:52	30.17	25.19	4.98	----	
LW004D	02/12/2001	16:39	30.17	24.71	5.46	----	
LW004D	06/04/2001	12:07	30.17	24.66	5.51	----	
LW004D	08/16/2001	11:15	30.17	26.27	3.90	----	
LW004D	11/28/2001	12:04	30.17	24.41	5.76	----	
LW004D	02/27/2002	14:00	30.17	22.65	7.52	----	
LW004D	03/05/2002	11:36	30.17	22.94	7.23	----	
LW004D	04/05/2002	08:19	30.17	23.75	6.42	----	
LW004D	05/29/2002	00:00	30.17	20.48	9.69	----	
LW004D	06/27/2002	14:41	30.17	20.15	10.02	----	
LW004D	08/26/2002	16:32	30.17	25.02	5.15	----	
LW004D	11/13/2002	08:23	30.17	25.26	4.91	----	
LW004D	02/11/2003	09:32	30.17	23.08	7.09	----	
LW004D	05/08/2003	07:44	30.17	21.21	8.96	----	
LW004D	08/27/2003	14:01	30.17	24.78	5.39	----	
LW004D	10/23/2003	13:16	30.17	25.85	4.32	----	
LW004D	02/19/2004	13:45	30.17	22.14	8.03	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
LW004D	06/09/2004	08:32	30.17	21.60	8.57	----	
LW004D	08/10/2004	08:24	30.17	25.68	4.49	----	
LW004D	08/10/2004	10:09	30.17	25.87	4.30	----	
LW004DR	11/24/2004	11:00	30.11	26.23	3.88	----	Replacement well installed 11/19/04
LW004DR	02/15/2005	10:20	30.11	23.94	6.17	----	
LW006D	03/25/1997	11:52	30.84	16.51	14.33	----	
LW006D	03/31/1997	09:05	30.84	15.53	15.31	----	Faint odor
LW006D	07/16/1997	07:30	30.84	20.74	10.10	----	
LW006D	10/21/1997	16:16	30.84	24.05	6.79	----	
LW006D	01/27/1998	11:38	30.84	19.94	10.90	----	
LW006D	05/18/1998	17:28	30.84	19.36	11.48	----	
LW006D	08/17/1998	10:05	30.84	24.92	5.92	----	
LW006D	11/13/1998	09:50	30.84	25.94	4.90	----	
LW006D	02/16/1999	13:11	30.84	20.40	10.44	----	
LW006D	05/18/1999	14:53	30.84	19.81	11.03	----	
LW006D	09/21/1999	11:32	30.84	25.92	4.92	----	
LW006D	12/06/1999	14:09	30.84	20.86	9.98	----	
LW006D	02/16/2000	10:20	30.84	21.27	9.57	----	
LW006D	05/23/2000	16:35	30.84	21.64	9.20	----	
LW006D	08/29/2000	13:20	30.84	25.93	4.91	----	
LW006D	11/09/2000	12:35	30.84	26.21	4.63	----	
LW006D	02/12/2001	16:03	30.84	25.37	5.47	----	
LW006D	06/04/2001	11:42	30.84	25.30	5.54	----	
LW006D	08/16/2001	10:54	30.84	26.72	4.12	----	
LW006D	11/28/2001	11:46	30.84	24.92	5.92	----	
LW006D	02/27/2002	13:35	30.84	23.62	7.22	----	
LW006D	06/27/2002	14:19	30.84	20.68	10.16	----	
LW006D	08/26/2002	16:04	30.84	25.79	5.05	----	
LW006D	11/13/2002	07:42	30.84	25.82	5.02	----	
LW006D	02/11/2003	09:01	30.84	24.08	6.76	----	
LW006D	05/08/2003	07:01	30.84	21.97	8.87	----	
LW006D	08/27/2003	13:40	30.84	25.37	5.47	----	
LW006D	10/23/2003	12:31	30.84	26.47	4.37	----	
LW006D	02/19/2004	12:37	30.84	23.00	7.84	----	
LW006D	06/09/2004	08:00	30.84	21.90	8.94	----	
LW006D	08/10/2004	08:42	30.84	26.22	4.62	----	
LW006D	08/10/2004	10:20	30.84	26.43	4.41	----	
LW006D	11/18/2004	07:51	30.84	25.61	5.23	----	
LW006D	02/15/2005	09:20	30.84	24.74	6.10	----	
LW009D	05/18/1999	14:56	30.98	20.02	10.96	----	
LW009D	09/21/1999	11:34	30.98	25.23	5.75	----	
LW009D	12/06/1999	14:11	30.98	21.04	9.94	----	
LW009D	02/16/2000	10:23	30.98	21.17	9.81	----	
LW009D	05/23/2000	16:39	30.98	21.15	9.83	----	
LW009D	08/29/2000	13:27	30.98	25.36	5.62	----	
LW009D	11/09/2000	12:43	30.98	25.96	5.02	----	
LW009D	02/12/2001	16:11	30.98	25.13	5.85	----	
LW009D	06/04/2001	11:49	30.98	25.15	5.83	----	
LW009D	08/16/2001	11:02	30.98	26.57	4.41	----	
LW009D	11/28/2001	11:53	30.98	25.40	5.58	----	
LW009D	02/27/2002	13:47	30.98	22.97	8.01	----	
LW009D	06/27/2002	14:25	30.98	20.38	10.60	----	
LW009D	08/26/2002	16:11	30.98	24.90	6.08	----	
LW009D	11/13/2002	07:48	30.98	25.73	5.25	----	
LW009D	02/11/2003	09:07	30.98	22.03	8.95	----	
LW009D	05/08/2003	07:12	30.98	21.65	9.33	----	
LW009D	08/27/2003	13:47	30.98	25.50	5.48	----	
LW009D	10/23/2003	12:50	30.98	26.22	4.76	----	
LW009D	02/19/2004	13:02	30.98	22.55	8.43	----	
LW009D	06/09/2004	08:11	30.98	21.91	9.07	----	
LW009D	08/10/2004	08:14	30.98	25.49	5.49	----	
LW009D	08/10/2004	09:59	30.98	25.54	5.44	----	
LW009D	11/18/2004	07:44	30.98	25.36	5.62	----	
LW009D	02/15/2005	09:24	30.98	24.46	6.52	----	
LW010D	05/18/1999	15:00	31.12	19.82	11.30	----	
LW010D	09/21/1999	11:37	31.12	25.81	5.31	----	
LW010D	12/06/1999	14:15	31.12	21.18	9.94	----	
LW010D	02/16/2000	10:27	31.12	21.20	9.92	----	
LW010D	05/23/2000	16:42	31.12	21.51	9.61	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
LW010D	08/29/2000	13:29	31.12	25.86	5.26	----	
LW010D	11/09/2000	12:46	31.12	26.26	4.86	----	
LW010D	02/12/2001	16:15	31.12	25.63	5.49	----	
LW010D	06/04/2001	11:52	31.12	25.62	5.50	----	
LW010D	08/16/2001	11:04	31.12	27.16	3.96	----	
LW010D	11/28/2001	11:55	31.12	25.46	5.66	----	
LW010D	02/27/2002	13:49	31.12	23.58	7.54	----	
LW010D	06/27/2002	14:29	31.12	21.03	10.09	----	
LW010D	08/26/2002	16:17	31.12	25.91	5.21	----	
LW010D	11/13/2002	08:01	31.12	26.17	4.95	----	
LW010D	02/11/2003	09:21	31.12	23.83	7.29	----	
LW010D	05/08/2003	07:33	31.12	22.10	9.02	----	
LW010D	08/27/2003	13:53	31.12	25.74	5.38	----	
LW010D	10/23/2003	13:10	31.12	26.79	4.33	----	
LW010D	02/19/2004	13:25	31.12	22.98	8.14	----	
LW010D	06/09/2004	08:23	31.12	22.46	8.66	----	
LW010D	08/10/2004	08:16	31.12	26.52	4.60	----	
LW010D	08/10/2004	10:02	31.12	26.70	4.42	----	
LW010D	11/18/2004	07:51	31.12	26.08	5.04	----	
LW010D	02/15/2005	10:07	31.12	25.07	6.05	----	
LW011D	05/18/1999	15:09	29.04	18.59	10.45	----	
LW011D	09/21/1999	11:50	29.04	20.76	8.28	----	
LW011D	12/06/1999	15:06	29.04	21.81	7.23	----	
LW011D	02/16/2000	11:02	29.04	20.35	8.69	----	
LW011D	05/23/2000	17:37	29.04	19.50	9.54	----	
LW011D	08/29/2000	14:54	29.04	----	----	----	Well purged dry 8/28; sampled a.m. on 8/29
LW011D	11/09/2000		29.04	----	----	----	Well sampled 11/8/00 - water level not representative
LW011D	02/12/2001	15:16	29.04	23.14	5.90	----	
LW011D	06/04/2001	13:11	29.04	23.35	5.69	----	
LW011D	08/16/2001	11:25	29.04	26.94	2.10	----	
LW011D	11/28/2001	12:53	29.04	24.54	4.50	----	
LW011D	02/27/2002	14:57	29.04	21.80	7.24	----	
LW011D	06/27/2002	15:11	29.04	18.84	10.20	----	
LW011D	08/26/2002	16:47	29.04	22.71	6.33	----	
LW011D	11/13/2002	08:55	29.04	23.87	5.17	----	
LW011D	02/11/2003	10:04	29.04	21.79	7.25	----	
LW011D	05/08/2003	08:08	29.04	19.28	9.76	----	
LW011D	08/27/2003	14:34	29.04	23.35	5.69	----	
LW011D	10/23/2003	14:11	29.04	23.98	5.06	----	
LW011D	02/19/2004	14:05	29.04	21.08	7.96	----	
LW011D	06/09/2004	08:55	29.04	20.04	9.00	----	
LW011D	08/10/2004	08:35	29.04	24.17	4.87	----	
LW011D	08/10/2004	10:20	29.04	24.46	4.58	----	
LW011D	11/18/2004	08:11	29.04	23.67	5.37	----	
LW011D	02/15/2005	10:19	29.04	22.02	7.02	----	
LW012D1	05/18/1999	15:13	30.02	18.45	11.57	----	
LW012D1	09/21/1999	11:54	30.02	24.44	5.58	----	
LW012D1	12/06/1999	14:21	30.02	19.72	10.30	----	
LW012D1	02/16/2000	10:35	30.02	19.89	10.13	----	
LW012D1	05/23/2000	17:00	30.02	20.23	9.79	----	
LW012D1	08/29/2000	13:45	30.02	24.38	5.64	----	
LW012D1	11/09/2000	13:00	30.02	24.66	5.36	----	
LW012D1	02/12/2001	15:57	30.02	23.92	6.10	----	
LW012D1	06/04/2001	12:32	30.02	23.99	6.03	----	
LW012D1	08/16/2001	11:42	30.02	25.39	4.63	----	
LW012D1	11/28/2001	12:38	30.02	23.33	6.69	----	
LW012D1	02/27/2002	14:28	30.02	21.88	8.14	----	
LW012D1	06/27/2002	14:57	30.02	19.58	10.44	----	
LW012D1							Abandoned August 2003
LW012D2	05/18/1999	15:14	29.24	18.23	11.01	----	
LW012D2	09/21/1999	11:53	29.24	24.69	4.55	----	
LW012D2	12/06/1999	14:22	29.24	19.40	9.84	----	
LW012D2	02/16/2000	10:36	29.24	19.90	9.34	----	
LW012D2	05/23/2000	16:59	29.24	20.38	8.86	----	
LW012D2	08/29/2000	13:44	29.24	24.68	4.56	----	
LW012D2	11/09/2000	13:01	29.24	24.56	4.68	----	
LW012D2	02/12/2001	15:56	29.24	23.88	5.36	----	
LW012D2	06/04/2001	12:31	29.24	24.10	5.14	----	
LW012D2	08/16/2001	11:43	29.24	25.43	3.81	----	
LW012D2	11/28/2001	12:39	29.24	23.17	6.07	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
LW012D2	02/27/2002	14:29	29.24	22.38	6.86	----	
LW012D2	06/27/2002	14:58	29.24	19.44	9.80	----	
LW012D2							Abandoned August 2003
LW014D	05/23/2000	16:50	30.54	21.26	9.28	----	
LW014D	08/29/2000	13:35	30.54	25.68	4.86	----	
LW014D	11/09/2000	12:49	30.54	25.90	4.64	----	
LW014D	02/12/2001	16:20	30.54	25.33	5.21	----	
LW014D	06/04/2001	12:00	30.54	25.37	5.17	----	
LW014D	08/16/2001	11:08	30.54	27.00	3.54	----	
LW014D	11/28/2001	11:56	30.54	25.03	5.51	----	
LW014D	02/27/2002	13:55	30.54	23.57	6.97	----	
LW014D	06/27/2002	14:33	30.54	20.70	9.84	----	
LW014D	08/26/2002	16:26	30.54	25.90	4.64	----	
LW014D	11/13/2002	08:07	30.54	25.76	4.78	----	
LW014D	02/11/2003	09:27	30.54	24.33	6.21	----	
LW014D	05/08/2003	07:38	30.54	21.92	8.62	----	
LW014D	08/27/2003	13:56	30.54	25.32	5.22	----	
LW014D	10/23/2003	13:13	30.54	26.56	3.98	----	
LW014D	02/19/2004	13:30	30.54	22.86	7.68	----	
LW014D	06/09/2004	08:27	30.54	22.11	8.43	----	
LW014D	08/10/2004	08:20	30.54	26.29	4.25	----	
LW014D	08/10/2004	10:05	30.54	26.58	3.96	----	
LW014D	11/18/2004	07:57	30.54	25.74	4.80	----	
LW014D	02/15/2005	10:03	30.54	24.61	5.93	----	
LW015D	05/23/2000	16:49	30.85	21.26	9.59	----	
LW015D	08/29/2000	13:34	30.85	25.54	5.31	----	
LW015D	11/09/2000	12:48	30.85	25.98	4.87	----	
LW015D	02/12/2001	16:18	30.85	25.43	5.42	----	
LW015D	06/04/2001	11:59	30.85	25.41	5.44	----	
LW015D	08/16/2001	11:07	30.85	27.05	3.80	----	
LW015D	11/28/2001	11:55	30.85	25.29	5.56	----	
LW015D	02/27/2002	13:52	30.85	23.42	7.43	----	
LW015D	06/27/2002	14:32	30.85	20.91	9.94	----	
LW015D	08/26/2002	16:25	30.85	25.77	5.08	----	
LW015D	11/13/2002	08:05	30.85	26.04	4.81	----	
LW015D	02/11/2003	09:23	30.85	23.65	7.20	----	
LW015D	05/08/2003	07:37	30.85	21.95	8.90	----	
LW015D	08/27/2003	13:55	30.85	25.58	5.27	----	
LW015D	10/23/2003	13:12	30.85	26.61	4.24	----	
LW015D	02/19/2004	13:30	30.85	22.83	8.02	----	
LW015D	06/09/2004	08:25	30.85	22.36	8.49	----	
LW015D	08/10/2004	08:19	30.85	26.43	4.42	----	
LW015D	08/10/2004	10:04	30.85	26.61	4.24	----	
LW015D	11/18/2004	07:55	30.85	25.98	4.87	----	
LW016D	05/23/2000	16:48	28.40	18.79	9.61	----	
LW016D	08/29/2000	13:32	28.40	23.07	5.33	----	
LW016D	11/09/2000	12:47	28.40	23.59	4.81	----	
LW016D	02/12/2001	16:17	28.40	22.94	5.46	----	
LW016D	06/04/2001	11:57	28.40	23.00	5.40	----	
LW016D	08/16/2001	11:05	28.40	24.43	3.97	----	
LW016D	11/28/2001	11:57	28.40	22.87	5.53	----	
LW016D	02/27/2002	13:54	28.40	20.94	7.46	----	
LW016D	06/27/2002	14:31	28.40	18.46	9.94	----	
LW016D	08/26/2002	16:23	28.40	23.24	5.16	----	
LW016D	11/13/2002	08:08	28.40	23.45	4.95	----	
LW016D	02/11/2003	09:25	28.40	21.14	7.26	----	
LW016D	05/08/2003	07:36	28.40	19.65	8.75	----	
LW016D	08/27/2003	13:54	28.40	23.08	5.32	----	
LW016D	10/23/2003	13:11	28.40	24.10	4.30	----	
LW016D	02/19/2004	13:31	28.40	20.30	8.10	----	
LW016D	06/09/2004	08:26	28.40	19.91	8.49	----	
LW016D	08/10/2004	08:17	28.40	23.88	4.52	----	
LW016D	08/10/2004	10:03	28.40	24.08	4.32	----	
LW016D	11/18/2004	07:54	28.40	23.41	4.99	----	
LW017D	08/29/2000	13:21	27.82	22.96	4.86	----	
LW017D	11/09/2000	12:36	27.82	23.17	4.65	----	
LW017D	02/12/2001	16:04	27.82	22.44	5.38	----	
LW017D	06/04/2001	11:44	27.82	22.42	5.40	----	
LW017D	08/16/2001	10:55	27.82	23.80	4.02	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
LW017D	11/28/2001	11:50	27.82	22.00	5.82	----	
LW017D	02/27/2002	13:37	27.82	19.82	8.00	----	
LW017D	03/05/2002	11:30	27.82	20.46	7.36	----	
LW017D	04/05/2002	08:15	27.82	21.34	6.48	----	
LW017D	05/29/2002	00:00	27.82	17.90	9.92	----	
LW017D	06/27/2002	14:20	27.82	17.64	10.18	----	
LW017D	08/26/2002	16:07	27.82	22.67	5.15	----	
LW017D	11/13/2002	07:45	27.82	22.80	5.02	----	
LW017D	02/11/2003	09:03	27.82	20.79	7.03	----	
LW017D	05/08/2003	07:05	27.82	18.82	9.00	----	
LW017D	08/27/2003	13:43	27.82	22.38	5.44	----	
LW017D	10/23/2003	12:34	27.82	23.46	4.36	----	
LW017D	02/19/2004	12:52	27.82	19.82	8.00	----	
LW017D	06/09/2004	08:04	27.82	19.00	8.82	----	
LW017D	08/10/2004	08:44	27.82	23.21	4.61	----	
LW017D	08/10/2004	10:23	27.82	23.41	4.41	----	
LW017D	11/18/2004	08:04	27.82	22.69	5.13	----	
LW017D	02/15/2005	09:33	27.82	21.65	6.17	----	
LW018D	08/29/2000	13:25	27.82	22.79	5.03	----	
LW018D	11/09/2000	12:40	27.82	22.91	4.91	----	
LW018D	02/12/2001	16:10	27.82	22.56	5.26	----	
LW018D	06/04/2001	11:47	27.82	22.28	5.54	----	
LW018D	08/16/2001	11:00	27.82	23.81	4.01	----	
LW018D	11/28/2001	11:51	27.82	22.00	5.82	----	
LW018D	02/27/2002	13:43	27.82	20.44	7.38	----	
LW018D	06/27/2002	14:23	27.82	17.72	10.10	----	
LW018D	08/26/2002	16:13	27.82	21.90	5.92	----	
LW018D	11/13/2002	07:51	27.82	22.71	5.11	----	
LW018D	02/11/2003	09:05	27.82	20.95	6.87	----	
LW018D	05/08/2003	07:10	27.82	18.75	9.07	----	
LW018D	08/27/2003	13:45	27.82	22.41	5.41	----	
LW018D	10/23/2003	12:45	27.82	23.46	4.36	----	
LW018D	02/19/2004	13:10	27.82	19.74	8.08	----	
LW018D	06/09/2004	08:07	27.82	19.45	8.37	----	
LW018D	08/10/2004	08:11	27.82	23.26	4.56	----	
LW018D	08/10/2004	09:54	27.82	23.46	4.36	----	
LW018D	11/18/2004	08:02	27.82	22.87	4.95	----	
LW018D	02/15/2005	09:39	27.82	21.80	6.02	----	
LW020D	10/23/2003	12:15	29.51	24.86	4.65	----	
LW020D	02/19/2004	14:46	29.51	21.00	8.51	----	
LW020D	06/09/2004	07:48	29.51	20.45	9.06	----	
LW020D	08/10/2004	08:32	29.51	24.70	4.81	----	
LW020D	08/10/2004	10:08	29.51	24.90	4.61	----	
LW020D	11/18/2004	07:48	29.51	24.17	5.34	----	
LW020D	02/15/2005	08:31	29.51	23.45	6.06	----	
LW022D	10/23/2003	11:58	32.56	27.72	4.84	----	
LW022D	02/19/2004	12:14	32.56	24.44	8.12	----	
LW022D	06/09/2004	07:22	32.56	23.35	9.21	----	
LW022D	08/10/2004	08:16	32.56	27.20	5.36	----	
LW022D	08/10/2004	09:55	32.56	27.21	5.35	----	
LW022D	11/18/2004	07:24	32.56	26.69	5.87	----	
LW022D	02/15/2005	08:55	32.56	26.08	6.48	----	
LW023D	10/23/2003	12:00	31.41	26.56	4.85	----	
LW023D	02/19/2004	12:13	31.41	23.31	8.10	----	
LW023D	06/09/2004	07:21	31.41	22.24	9.17	----	
LW023D	08/10/2004	08:13	31.41	26.08	5.33	----	
LW023D	08/10/2004	09:53	31.41	26.09	5.32	----	
LW023D	11/18/2004	07:22	31.41	25.58	5.83	----	
LW023D	02/15/2005	09:10	31.41	24.94	6.47	----	
LW024D	10/23/2003	12:23	33.47	28.61	4.86	----	
LW024D	02/19/2004	12:40	33.47	25.28	8.19	----	
LW024D	06/09/2004	07:57	33.47	24.30	9.17	----	
LW024D	08/10/2004	08:36	33.47	28.02	5.45	----	
LW024D	08/10/2004	10:15	33.47	28.04	5.43	----	
LW024D	11/18/2004	07:54	33.47	27.65	5.82	----	
LW024D	02/15/2005	09:13	33.47	26.99	6.48	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
LW025D	10/23/2003	12:28	35.38	30.50	4.88	----	
LW025D	02/19/2004	12:38	35.38	27.25	8.13	----	
LW025D	06/09/2004	07:59	35.38	26.26	9.12	----	
LW025D	08/10/2004	08:40	35.38	29.94	5.44	----	
LW025D	08/10/2004	10:17	35.38	29.96	5.42	----	
LW025D	11/18/2004	07:48	35.38	29.59	5.79	----	
LW025D	02/15/2005	09:16	35.38	28.91	6.47	----	
LW026D	10/23/2003	12:09	31.49	27.17	4.32	----	
LW026D	02/19/2004	12:22	31.49	23.64	7.85	----	
LW026D	06/09/2004	07:37	31.49	22.67	8.82	----	
LW026D	08/10/2004	08:26	31.49	27.03	4.46	----	
LW026D	08/10/2004	10:05	31.49	27.31	4.18	----	
LW026D	11/18/2004	07:36	31.49	26.49	5.00	----	
LW026D	02/15/2005	10:35	31.49	25.08	6.41	----	
LW027D	10/23/2003	12:21	29.71	25.47	4.24	----	
LW027D	02/19/2004	12:43	29.71	21.96	7.75	----	
LW027D	06/09/2004	07:38	29.71	20.97	8.74	----	
LW027D	08/10/2004	08:28	29.71	25.34	4.37	----	
LW027D	08/10/2004	10:12	29.71	25.65	4.06	----	
LW027D	11/18/2004	07:38	29.71	24.78	4.93	----	
LW027D	02/15/2005	10:31	29.71	23.39	6.32	----	
LW029D	10/23/2003	14:40	31.12	26.45	4.67	----	
LW029D	02/19/2004	15:31	31.12	22.55	8.57	----	
LW029D	06/09/2004	09:44	31.12	22.16	8.96	----	
LW029D	08/10/2004	08:28	31.12	26.28	4.84	----	
LW029D	08/10/2004	10:12	31.12	26.52	4.60	----	
LW029D	11/18/2004	08:13	31.12	25.80	5.32	----	
LW029D	02/15/2005	11:33	31.12	24.65	6.47	----	
LW030D	10/23/2003	14:52	30.06	25.58	4.48	----	
LW030D	02/19/2004	15:33	30.06	21.55	8.51	----	
LW030D	06/09/2004	09:47	30.06	21.21	8.85	----	
LW030D	08/10/2004	08:30	30.06	25.58	4.48	----	
LW030D	08/10/2004	10:14	30.06	25.87	4.19	----	
LW030D	11/18/2004	08:15	30.06	25.01	5.05	----	
LW030D	02/15/2005	11:35	30.06	23.68	6.38	----	
LW032D	10/23/2003	14:33	30.86	25.23	5.63	----	
LW032D	02/19/2004	15:28	30.86	21.95	8.91	----	
LW032D	06/09/2004	09:59	30.86	21.41	9.45	----	
LW032D	08/10/2004	08:33	30.86	25.24	5.62	----	
LW032D	08/10/2004	10:16	30.86	25.42	5.44	----	
LW032D	11/18/2004	08:18	30.86	24.63	6.23	----	
LW032D	02/15/2005	10:57	30.86	23.78	7.08	----	
LW035D	10/23/2003	11:48	33.19	28.33	4.86	----	
LW035D	02/19/2004	12:34	33.19	24.86	8.33	----	
LW035D	06/09/2004	07:24	33.19	23.88	9.31	----	
LW035D	08/10/2004	08:19	33.19	27.62	5.57	----	
LW035D	08/10/2004	09:57	33.19	27.65	5.54	----	
LW035D	11/18/2004	07:27	33.19	27.31	5.88	----	
LW035D	02/15/2005	09:02	33.19	26.63	6.56	----	
LW036D	11/18/2004	07:25	11.30	5.59	5.71	----	
LW036D	02/15/2005	08:28	11.30	5.26	6.04	----	
LW037D	11/18/2004	07:30	10.84	5.35	5.49	----	
LW037D	02/15/2005	08:36	10.84	4.84	6.00	----	
LW038D	11/18/2004	07:34	10.21	5.22	4.99	----	
LW038D	02/15/2005	08:43	10.21	4.29	5.92	----	
LW039D	11/18/2004	07:39	9.35	4.03	5.32	----	
LW039D	02/15/2005	08:51	9.35	3.53	5.82	----	
LW040D	02/15/2005	08:39	33.77	27.54	6.23	----	
LW045D	11/18/2004	07:29	33.36	27.53	5.83	----	
LW045D	02/15/2005	09:05	33.36	26.69	6.67	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
OX008D	10/23/2003	13:48	30.84	26.12	4.72	----	
OX008D	02/19/2004	14:20	30.84	22.52	8.32	----	
OX008D	06/09/2004	09:10	30.84	21.77	9.07	----	
OX008D	08/10/2004	08:37	30.84	25.90	4.94	----	
OX008D	08/10/2004	10:23	30.84	26.09	4.75	----	
OX008D	11/18/2004	08:25	30.84	25.25	5.59	----	
OX008D	02/15/2005	09:37	30.84	24.54	6.30	----	
RW2	05/18/1999	15:02	30.68	19.50	11.18	----	
RW2	09/21/1999	11:40	30.68	25.75	4.93	----	
RW2	12/06/1999	14:17	30.68	20.77	9.91	----	
RW2	02/16/2000	10:29	30.68	20.99	9.69	----	
RW2	05/23/2000	16:52	30.68	21.37	9.31	----	
RW2	08/29/2000	13:36	30.68	25.36	5.32	----	
RW2	11/09/2000	12:50	30.68	25.83	4.85	----	Groundwater interim action pumping began 10/5/00 in the lower zone at this well. Pump not running at time of measurement.
RW2	02/12/2001	16:37	30.68	26.40	4.28	----	
RW2	06/04/2001	12:05	30.68	26.26	4.42	----	
RW2	08/16/2001	11:11	30.68	28.98	1.70	----	
RW2	11/28/2001	12:02	30.68	26.86	3.82	----	
RW2	02/27/2002	13:57	30.68	26.02	4.66	----	
RW2	06/27/2002	14:35	30.68	23.68	7.00	----	
RW2	08/26/2002	16:29	30.68	28.26	2.42	----	
RW2	11/13/2002	08:20	30.68	28.50	2.18	----	
RW2	02/11/2003	09:29	30.68	26.96	3.72	----	
RW2	05/07/2003	17:30	30.68	24.80	5.88	----	Date of measurement is day of sampling
RW2	08/27/2003	13:57	30.68	27.91	2.77	----	
RW2	10/23/2003	13:30	30.68	28.73	1.95	----	
RW2	02/19/2004	13:43	30.68	25.53	5.15	----	
RW2	06/10/2004	08:13	30.68	25.19	5.49	----	
RW2	08/10/2004	08:23	30.68	29.55	1.13	----	
RW2	08/10/2004	10:07	30.68	29.74	0.94	----	
RW2	11/18/2004	08:05	30.68	29.50	1.18	----	
RW2	02/15/2005	10:36	30.68	37.19	-6.51	----	Strong TPH odor
RIVER_GAUGE	08/11/1993	12:57	28.13	24.90	3.23	----	
RIVER_GAUGE	10/26/1993	13:17	28.13	25.27	2.86	----	
RIVER_GAUGE	11/17/1993	13:21	28.13	24.18	3.95	----	
RIVER_GAUGE	12/17/1993	12:46	28.13	22.48	5.65	----	
RIVER_GAUGE	01/17/1994	12:58	28.13	22.90	5.23	----	
RIVER_GAUGE	02/18/1994	14:10	28.13	22.30	5.83	----	
RIVER_GAUGE	03/18/1994	12:48	28.13	21.70	6.43	----	
RIVER_GAUGE	04/18/1994	14:34	28.13	23.50	4.63	----	
RIVER_GAUGE	05/18/1994	15:14	28.13	21.80	6.33	----	
RIVER_GAUGE	06/17/1994	14:45	28.13	21.32	6.81	----	
RIVER_GAUGE	07/19/1994	09:10	28.13	23.25	4.88	----	
RIVER_GAUGE	08/17/1994	07:26	28.13	24.00	4.13	----	
RIVER_GAUGE	09/16/1994	07:30	28.13	24.66	3.47	----	
RIVER_GAUGE	10/17/1994	08:58	28.13	24.10	4.03	----	
RIVER_GAUGE	11/21/1994	11:43	28.13	23.20	4.93	----	
RIVER_GAUGE	12/19/1994	10:58	28.13	19.95	8.18	----	
RIVER_GAUGE	01/18/1995	11:04	28.13	16.70	11.43	----	
RIVER_GAUGE	02/21/1995	13:14	28.13	14.65	13.48	----	
RIVER_GAUGE	03/21/1995	12:58	28.13	18.90	9.23	----	
RIVER_GAUGE	04/19/1995	12:37	28.13	19.80	8.33	----	
RIVER_GAUGE	05/19/1995	13:22	28.13	17.40	10.73	----	
RIVER_GAUGE	07/17/1995	13:48	28.13	22.00	6.13	----	
RIVER_GAUGE	08/22/1995	07:45	28.13	23.24	4.89	----	
RIVER_GAUGE	09/22/1995	08:19	28.13	24.26	3.87	----	
RIVER_GAUGE	11/20/1995	07:50	28.13	20.20	7.93	----	
RIVER_GAUGE	12/01/1995	08:23	28.13	8.45	19.68	----	
RIVER_GAUGE	12/19/1995	07:11	28.13	14.10	14.03	----	
RIVER_GAUGE	01/19/1996	08:29	28.13	14.06	14.07	----	
RIVER_GAUGE	02/20/1996	10:36	28.13	8.00	20.13	----	
RIVER_GAUGE	03/19/1996	09:15	28.13	15.95	12.18	----	
RIVER_GAUGE	04/19/1996	11:45	28.13	13.95	14.18	----	
RIVER_GAUGE	07/22/1996	14:18	28.13	22.00	6.13	----	
RIVER_GAUGE	07/22/1996	15:05	28.13	22.20	5.93	----	
RIVER_GAUGE	08/20/1996	14:09	28.13	22.80	5.33	----	
RIVER_GAUGE	08/20/1996	15:10	28.13	23.00	5.13	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
RIVER_GAUGE	09/24/1996	07:55	28.13	23.41	4.72	----	
RIVER_GAUGE	09/24/1996	10:15	28.13	24.25	3.88	----	
RIVER_GAUGE	10/28/1996	10:53	28.13	22.95	5.18	----	
RIVER_GAUGE	10/28/1996	12:12	28.13	23.21	4.92	----	
RIVER_GAUGE	12/13/1996	12:09	28.13	14.50	13.63	----	
RIVER_GAUGE	03/25/1997	11:33	28.13	14.60	13.53	----	
RIVER_GAUGE	03/31/1997		28.13	----	----	----	Locked
RIVER_GAUGE	07/16/1997	06:55	28.13	18.73	9.40	----	
RIVER_GAUGE	07/16/1997	07:55	28.13	18.84	9.29	----	
RIVER_GAUGE	07/16/1997	09:14	28.13	18.92	9.21	----	
RIVER_GAUGE	10/21/1997	15:52	28.13	23.38	4.75	----	
RIVER_GAUGE	10/21/1997	16:11	28.13	23.44	4.69	----	
RIVER_GAUGE	10/21/1997	17:55	28.13	23.59	4.54	----	
RIVER_GAUGE	01/27/1998	10:46	28.13	18.20	9.93	----	
RIVER_GAUGE	01/27/1998	12:25	28.13	18.31	9.82	----	
RIVER_GAUGE	01/27/1998	13:56	28.13	17.89	10.24	----	
RIVER_GAUGE	05/18/1998	17:12	28.13	16.97	11.16	----	
RIVER_GAUGE	05/18/1998	17:45	28.13	17.15	10.98	----	
RIVER_GAUGE	08/17/1998	09:58	28.13	23.98	4.15	----	
RIVER_GAUGE	08/17/1998	10:34	28.13	24.15	3.98	----	
RIVER_GAUGE	11/13/1998	09:30	28.13	24.64	3.49	----	
RIVER_GAUGE	11/13/1998	10:05	28.13	24.45	3.68	----	
RIVER_GAUGE	02/16/1999	12:40	28.13	19.36	8.77	----	
RIVER_GAUGE	02/16/1999	13:27	28.13	19.43	8.70	----	
RIVER_GAUGE	05/18/1999	14:33	28.13	17.24	10.89	----	
RIVER_GAUGE	05/18/1999	15:19	28.13	17.30	10.83	----	
RIVER_GAUGE	09/21/1999	11:10	28.13	24.94	3.19	----	
RIVER_GAUGE	09/21/1999	11:59	28.13	25.03	3.10	----	
RIVER_GAUGE	12/06/1999	13:43	28.13	18.24	9.89	----	
RIVER_GAUGE	12/06/1999	14:25	28.13	18.06	10.07	----	
RIVER_GAUGE	02/16/2000	10:03	28.13	19.18	8.95	----	
RIVER_GAUGE	02/16/2000	10:41	28.13	19.07	9.06	----	
RIVER_GAUGE	05/23/2000	16:12	28.13	19.80	8.33	----	
RIVER_GAUGE	05/23/2000	17:04	28.13	19.94	8.19	----	
RIVER_GAUGE	08/29/2000	12:54	28.13	24.63	3.50	----	
RIVER_GAUGE	08/29/2000	13:49	28.13	24.91	3.22	----	
RIVER_GAUGE	11/09/2000	12:19	28.13	24.26	3.87	----	
RIVER_GAUGE	11/09/2000	13:10	28.13	23.67	4.46	----	
RIVER_GAUGE	02/12/2001	15:45	28.13	23.75	4.38	----	
RIVER_GAUGE	02/12/2001	16:43	28.13	24.00	4.13	----	
RIVER_GAUGE	06/04/2001	11:20	28.13	23.62	4.51	----	
RIVER_GAUGE	06/04/2001	12:15	28.13	23.79	4.34	----	
RIVER_GAUGE	08/16/2001	10:20	28.13	24.83	3.30	----	
RIVER_GAUGE	08/16/2001	11:29	28.13	25.23	2.90	----	
RIVER_GAUGE	11/28/2001	11:16	28.13	22.50	5.63	----	
RIVER_GAUGE	11/28/2001	12:18	28.13	23.13	5.00	----	
RIVER_GAUGE	02/27/2002	13:11	28.13	22.24	5.89	----	
RIVER_GAUGE	02/27/2002	14:12	28.13	22.27	5.86	----	
RIVER_GAUGE	03/05/2002	11:25	28.13	21.42	6.71	----	
RIVER_GAUGE	04/05/2002	08:00	28.13	23.10	5.03	----	
RIVER_GAUGE	05/29/2002	14:07	28.13	17.31	10.82	----	
RIVER_GAUGE	06/27/2002	14:07	28.13	18.31	9.82	----	
RIVER_GAUGE	06/27/2002	14:43	28.13	18.36	9.77	----	
RIVER_GAUGE	08/26/2002	15:45	28.13	24.83	3.30	----	
RIVER_GAUGE	08/26/2002	16:13	28.13	24.85	3.28	----	
RIVER_GAUGE	11/13/2002	07:19	28.13	24.10	4.03	----	
RIVER_GAUGE	11/13/2002	07:54	28.13	24.21	3.92	----	
RIVER_GAUGE	02/11/2003	08:34	28.13	23.70	4.43	----	
RIVER_GAUGE	02/11/2003	09:14	28.13	23.43	4.70	----	
RIVER_GAUGE	05/08/2003	06:40	28.13	20.02	8.11	----	
RIVER_GAUGE	05/08/2003	07:17	28.13	20.00	8.13	----	
RIVER_GAUGE	08/27/2003	13:18	28.13	23.36	4.77	----	
RIVER_GAUGE	08/27/2003	14:15	28.13	23.66	4.47	----	
RIVER_GAUGE	10/23/2003	11:46	28.13	25.00	3.13	----	
RIVER_GAUGE	10/23/2003	13:35	28.13	24.94	3.19	----	
RIVER_GAUGE	02/19/2004	12:10	28.13	21.14	6.99	----	
RIVER_GAUGE	02/19/2004	13:20	28.13	20.89	7.24	----	
RIVER_GAUGE	06/09/2004	07:18	28.13	19.79	8.34	----	
RIVER_GAUGE	06/09/2004	08:16	28.13	19.78	8.35	----	
RIVER_GAUGE	08/10/2004	08:10	28.13	24.85	3.28	----	
RIVER_GAUGE	08/10/2004	08:52	28.13	25.11	3.02	----	
RIVER_GAUGE	08/10/2004	09:51	28.13	25.43	2.70	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
RIVER_GAUGE	08/10/2004	10:35	28.13	25.54	2.59	----	
RIVER_GAUGE	11/18/2004	07:20	28.13	24.25	3.88	----	
RIVER_GAUGE	11/18/2004	08:30	28.13	24.65	3.48	----	
RIVER_GAUGE	02/15/2005	08:18	28.13	22.91	5.22	----	

Notes:
NM Not measured.
NA Not available.
-- No measurable product or odor observed.
* Well Point
(a) Reference Elevation (Ref. Elev) is the north side of the top of the 1.25-, 2- or 4-inch well casing, reference elevation surveys wer conducted by Zarosinski-Tatone Engineers, Inc., Portland, Oregon. For the river gauge, the reference elevation was measured at a marked location on the south side of the dock on the Willamette River.
(b) Depth to water (DTW) measured from surveyed reference elevation [see note (1)]
(c) Where LNAPL thickness measured, groundwater elevation adjusted to account for the presence of LNAPL in the well using the method in "*Estimation of Free Hydrocarbon Volume from Fluid Levels in Monitoring Wells* " [Lenhard and Parker 1990; Groundwater 28(1):57-67].

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	B1 0502102-04 2/23/2005	D 0502102-05 2/23/2005	HRW1 0502087-09 2/18/2005	J1 0502102-02 2/23/2005	LW1S 0502099-01 2/22/2005	LW4S 0502087-01 2/17/2005	LW7S 0502102-07 2/23/2005	LW8S 0502087-12 2/18/2005	LW11S 0502087-02 2/17/2005	LW13S 0502102-08 2/23/2005
CHLORINATED PHENOLS (µg/L)										
Method SW8270SIM										
Pentachlorophenol	0.483 U	0.481 U	**10.2**	0.48 U	NA	0.501 U	0.499 U	0.484 UJ	NA	0.479 U
SEMIVOLATILES (µg/L)										
Method SW8270										
1,2,4-Trichlorobenzene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
1,2-Dichlorobenzene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
1,3-Dichlorobenzene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
1,4-Dichlorobenzene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
2,3,4,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	**26.9**	NA
2,3,5,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	**88.2**	NA
2,4,5-Trichlorophenol	5.01 U	5.05 U	NA	4.79 U	4.93 U	5.03 U	4.75 U	4.88 U	5.03 U	NA
2,4,6-Trichlorophenol	5.01 U	5.05 U	NA	4.79 U	4.93 U	5.03 U	4.75 U	4.88 U	5.03 U	NA
2,4-Dichlorophenol	3.01 U	3.03 U	NA	2.87 U	2.96 U	3.02 U	2.85 U	2.93 U	3.02 U	NA
2,4-Dimethylphenol	3.01 U	3.03 U	NA	2.87 U	2.96 U	3.02 U	2.85 U	2.93 U	**3.36**	NA
2,4-Dinitrophenol	10 U	10.1 U	NA	9.58 U	9.86 U	10.1 U	9.51 U	9.77 U	10.1 U	NA
2,4-Dinitrotoluene	5.01 U	5.05 U	NA	4.79 U	4.93 U	5.03 U	4.75 U	4.88 U	5.03 U	NA
2,6-Dinitrotoluene	5.01 U	5.05 U	NA	4.79 U	4.93 U	5.03 U	4.75 U	4.88 U	5.03 U	NA
2-Chloronaphthalene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
2-Chlorophenol	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
2-Methylnaphthalene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	**10.4**	**3.22**	NA
2-Methylphenol	2 U	2.02 U	NA	1.92 U	1.97 U	2.01 U	1.9 U	1.95 U	2.01 U	NA
2-Nitroaniline	5.01 U	5.05 U	NA	4.79 U	4.93 U	5.03 U	4.75 U	4.88 U	5.03 U	NA
2-Nitrophenol	5.01 U	5.05 U	NA	4.79 U	4.93 U	5.03 U	4.75 U	4.88 U	5.03 U	NA
3-&4-Methylphenol	10 U	10.1 U	NA	9.58 U	9.86 U	10.1 U	9.51 U	9.77 U	10.1 U	NA
3,3'-Dichlorobenzidine	5.01 U	5.05 U	NA	4.79 U	4.93 U	5.03 U	4.75 U	4.88 U	5.03 U	NA
3-Nitroaniline	6.01 U	6.06 U	NA	5.75 U	5.92 U	6.03 U	5.7 U	5.86 U	6.03 U	NA
4,6-Dinitro-2-methylphenol	10 U	10.1 U	NA	9.58 U	9.86 U	10.1 U	9.51 U	9.77 U	10.1 U	NA
4-Bromophenyl phenyl ether	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
4-Chloro-3-methylphenol	2 U	2.02 U	NA	1.92 U	1.97 U	2.01 U	1.9 U	1.95 U	2.01 U	NA
4-Chloroaniline	3.01 U	3.03 U	NA	2.87 U	2.96 U	3.02 U	2.85 U	2.93 U	3.02 U	NA
4-Chlorophenyl phenyl ether	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
4-Nitroaniline	5.01 U	5.05 U	NA	4.79 U	4.93 U	5.03 U	4.75 U	4.88 U	5.03 U	NA
4-Nitrophenol	5.01 U	5.05 U	NA	4.79 U	4.93 U	5.03 U	4.75 U	4.88 U	5.03 U	NA
Acenaphthene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Acenaphthylene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Anthracene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Benz(a)anthracene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Benzo(a)pyrene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA

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TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	B1 0502102-04 2/23/2005	D 0502102-05 2/23/2005	HRW1 0502087-09 2/18/2005	J1 0502102-02 2/23/2005	LW1S 0502099-01 2/22/2005	LW4S 0502087-01 2/17/2005	LW7S 0502102-07 2/23/2005	LW8S 0502087-12 2/18/2005	LW11S 0502087-02 2/17/2005	LW13S 0502102-08 2/23/2005
Benzo(b)fluoranthene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Benzo(g,h,i)perylene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Benzo(k)fluoranthene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Benzoic Acid	20 U	20.2 U	NA	19.2 U	19.7 U	20.1 U	19 U	19.5 U	20.1 U	NA
Benzyl Alcohol	5.01 U	5.05 U	NA	4.79 U	4.93 U	5.03 U	4.75 U	4.88 U	5.03 U	NA
Bis(2-chloroethoxy)methane	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Bis(2-chloroethyl)ether	2 U	2.02 U	NA	1.92 U	1.97 U	2.01 U	1.9 U	1.95 U	2.01 U	NA
Bis(2-chloroisopropyl)ether	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Bis(2-ethylhexyl)phthalate	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Butyl benzyl phthalate	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Carbazole	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Chrysene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Dibenz(a,h)anthracene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Dibenzofuran	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Diethyl phthalate	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Dimethyl phthalate	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Di-n-butyl phthalate	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Di-n-octyl phthalate	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Fluoranthene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Fluorene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Hexachlorobenzene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Hexachlorobutadiene	2 U	2.02 U	NA	1.92 U	1.97 U	2.01 U	1.9 U	1.95 U	2.01 U	NA
Hexachlorocyclopentadiene	5.01 U	5.05 U	NA	4.79 U	4.93 U	5.03 U	4.75 U	4.88 U	5.03 U	NA
Hexachloroethane	2 U	2.02 U	NA	1.92 U	1.97 U	2.01 U	1.9 U	1.95 U	2.01 U	NA
Indeno(1,2,3-cd)pyrene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Isophorone	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Naphthalene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	**20.7**	**5.65**	NA
Nitrobenzene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
N-Nitrosodimethylamine	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
N-Nitrosodi-n-propylamine	2 U	2.02 U	NA	1.92 U	1.97 U	2.01 U	1.9 U	1.95 U	2.01 U	NA
N-Nitrosodiphenylamine	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Pentachlorophenol	5.01 U	5.05 U	NA	4.79 U	4.93 U	5.03 U	4.75 U	4.88 U	**178**	NA
Phenanthrene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Phenol	2 U	2.02 U	NA	1.92 U	1.97 U	2.01 U	1.9 U	1.95 U	2.01 U	NA
Pyrene	1 U	1.01 U	NA	0.958 U	0.986 U	1.01 U	0.951 U	0.977 U	1.01 U	NA
Pyridine	5.01 U	5.05 U	NA	4.79 U	4.93 U	5.03 U	4.75 U	4.88 U	5.03 U	NA

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	B1 0502102-04 2/23/2005	D 0502102-05 2/23/2005	HRW1 0502087-09 2/18/2005	J1 0502102-02 2/23/2005	LW1S 0502099-01 2/22/2005	LW4S 0502087-01 2/17/2005	LW7S 0502102-07 2/23/2005	LW8S 0502087-12 2/18/2005	LW11S 0502087-02 2/17/2005	LW13S 0502102-08 2/23/2005
PAHS (µg/L)										
Method SW8270SIM										
Acenaphthene	NA	NA	NA	NA	0.0479 U	NA	0.0501 U	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	0.0479 U	NA	0.0501 U	NA	NA	NA
Anthracene	NA	NA	NA	NA	0.0479 U	NA	0.0501 U	NA	NA	NA
Benz(a)anthracene	NA	NA	NA	NA	0.0479 U	NA	0.0501 U	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	0.0479 U	NA	0.0501 U	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	0.0479 U	NA	0.0501 U	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	0.0479 U	NA	0.0501 U	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	0.0479 U	NA	0.0501 U	NA	NA	NA
Chrysene	NA	NA	NA	NA	0.0479 U	NA	0.0501 U	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	0.0479 U	NA	0.0501 U	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	0.0479 U	NA	0.0501 U	NA	NA	NA
Fluorene	NA	NA	NA	NA	0.0479 U	NA	0.0501 U	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	0.0479 U	NA	0.0501 U	NA	NA	NA
Naphthalene	NA	NA	NA	NA	0.0479 U	NA	**0.591**	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	0.0479 U	NA	0.0501 U	NA	NA	NA
Pyrene	NA	NA	NA	NA	0.0479 U	NA	0.0501 U	NA	NA	NA
VOLATILES (µg/L)										
Method SW8260										
1,1,1,2-Tetrachloroethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
1,1,1-Trichloroethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
1,1,2,2-Tetrachloroethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
1,1,2-Trichloroethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
1,1-Dichloroethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
1,1-Dichloroethene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
1,1-Dichloropropene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
1,2,3-Trichlorobenzene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
1,2,3-Trichloropropane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
1,2,4-Trichlorobenzene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
1,2,4-Trimethylbenzene	**2.58**	1 U	NA	1 U	1 U	1 U	1 U	1 U	**175**	NA
1,2-Dibromo-3-chloropropane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
1,2-Dibromoethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
1,2-Dichlorobenzene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
1,2-Dichloroethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
1,2-Dichloropropane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
1,3,5-Trimethylbenzene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	**34.5**	NA
1,3-Dichlorobenzene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
1,3-Dichloropropane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	B1 0502102-04 2/23/2005	D 0502102-05 2/23/2005	HRW1 0502087-09 2/18/2005	J1 0502102-02 2/23/2005	LW1S 0502099-01 2/22/2005	LW4S 0502087-01 2/17/2005	LW7S 0502102-07 2/23/2005	LW8S 0502087-12 2/18/2005	LW11S 0502087-02 2/17/2005	LW13S 0502102-08 2/23/2005
1,4-Dichlorobenzene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
2,2-Dichloropropane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
2-Butanone	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA
2-Chlorotoluene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
2-Hexanone	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA
4-Chlorotoluene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
4-Isopropyltoluene	1 U	1 U	NA	1 U	1 U	1 U	**1.84**	1 U	**8.43**	NA
4-Methyl-2-pentanone	20 U	20 U	NA	20 U	20 U	20 U	20 U	20 U	20 U	NA
Acetone	50 U	50 U	NA	50 U	50 U	50 U	50 U	50 U	50 U	NA
Acrylonitrile	5 U	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA
Benzene	0.3 U	0.3 U	NA	0.3 U	0.3 U	0.3 U	0.3 U	**2.86**	**9.91**	NA
Bromobenzene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Bromochloromethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Bromodichloromethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Bromoform	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Bromomethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Carbon disulfide	2 U	2 U	NA	2 U	2 U	2 U	2 U	2 U	2 U	NA
Carbon tetrachloride	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Chlorobenzene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Chloroethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Chloroform	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Chloromethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
cis-1,2-Dichloroethene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
cis-1,3-Dichloropropene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Dibromochloromethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Dibromomethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Dichlorodifluoromethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Ethylbenzene	**3.59**	1 U	NA	1 U	1 U	1 U	**5.14**	**68.2**	**47.1**	NA
Hexachlorobutadiene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Isopropylbenzene	**2.36**	1 U	NA	1 U	1 U	1 U	**11.4**	**225**	**15**	NA
m,p-Xylene	2 U	2 U	NA	2 U	2 U	2 U	**4.85**	2 U	**73.9**	NA
Methyl tert-butyl ether	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Methylene chloride	20 U	20 U	NA	20 U	20 U	20 U	20 U	20 U	20 U	NA
Naphthalene	**2.62**	1 U	NA	1 U	1 U	1 U	**4.9**	**54.2**	**12.9**	NA
n-Butylbenzene	1 U	1 U	NA	1 U	1 U	1 U	**7.48**	**16.2**	**8.86**	NA
n-Propylbenzene	**4.97**	1 U	NA	1 U	1 U	1 U	**23.7**	**259**	**25.9**	NA
o-Xylene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	**84.1**	NA
sec-Butylbenzene	1 U	1 U	NA	1 U	1 U	1 U	**2.32**	**36.5**	**10.8**	NA
Styrene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
tert-Butylbenzene	1 U	1 U	NA	1 U	1 U	1 U	1 U	**12.2**	**3.03**	NA

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	B1 0502102-04 2/23/2005	D 0502102-05 2/23/2005	HRW1 0502087-09 2/18/2005	J1 0502102-02 2/23/2005	LW1S 0502099-01 2/22/2005	LW4S 0502087-01 2/17/2005	LW7S 0502102-07 2/23/2005	LW8S 0502087-12 2/18/2005	LW11S 0502087-02 2/17/2005	LW13S 0502102-08 2/23/2005
Tetrachloroethene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Toluene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	**1.3**	NA
trans-1,2-Dichloroethene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
trans-1,3-Dichloropropene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Trichloroethene	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Trichlorofluoromethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
Vinyl chloride	1 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA
TOTAL PETROLEUM HYDROCARBONS (µg/L)										
Method NWTPH-Dx/NWTPHg										
Diesel Range Hydrocarbons	**9290**	NA	NA	NA	246 U	254 U	248 U	**7970**	**2720**	243 U
Lube Oil	1090 U	NA	NA	NA	608 U	509 U	495 U	482 U	483 U	487 U
Gasoline Range Hydrocarbons	NA	NA	NA	NA	100 U	NA	**1260**	**6160**	**3660**	100 U
PRIORITY POLLUTANT METALS (µg/L)										
Method 6010/6020										
Arsenic (total)	**4.44**	**18.8**	NA	**18**	**13.2**	1 U	**14.8**	**26.3**	**3.67**	NA
Chromium (total)	**8.8**	**9.7**	NA	**6.8**	**10.4**	**8**	**9.1**	5 U	**6.5**	NA
Copper (total)	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA
Lead (total)	**1.17**	0.146 U	NA	**0.543**	**1.19**	**0.546**	**0.786**	0.157 U	0.202 U	NA
Nickel (total)	5 U	5 U	NA	**50.9**	5 U	**21.9**	5 U	5 U	**37.7**	NA
Selenium (total)	NA	NA	NA	NA	NA	NA	NA	NA	20 U	NA
Zinc (total)	10 U	10 U	NA	10 U	**12.4**	10 U	10 U	10 U	**13.5**	NA
DISSOLVED METALS (µg/L)										
Method 6010/6020										
Arsenic (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	B1 0502102-04 2/23/2005	D 0502102-05 2/23/2005	HRW1 0502087-09 2/18/2005	J1 0502102-02 2/23/2005	LW1S 0502099-01 2/22/2005	LW4S 0502087-01 2/17/2005	LW7S 0502102-07 2/23/2005	LW8S 0502087-12 2/18/2005	LW11S 0502087-02 2/17/2005	LW13S 0502102-08 2/23/2005
CONVENTIONALS (µg/L)										
Calcium (total)	**29200**	**53800**	NA	**86600**	**30000**	**28900**	**30400**	**30200**	**45200**	NA
Magnesium (total)	**11700**	**18400**	NA	**34900**	**11600**	**8900**	**12500**	**8670**	**16100**	NA
Potassium (total)	**3330**	**2930**	NA	**4340**	**2830**	**4490**	**3150**	**3870**	**4220**	NA
Sodium (total)	**10400**	**9650**	NA	**11200**	**7980**	**9610**	**12400**	**9720**	**10100**	NA
Alkalinity, Bicarbonate (As CaCO3)	**154000**	**227000**	NA	**149000**	**120000**	**78800**	**165000**	**156000**	**165000**	NA
Alkalinity, Carbonate (As CaCO3)	10000 U	10000 U	NA	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	NA
Alkalinity, Total (As CaCO3)	**154000**	**227000**	NA	**149000**	**120000**	**78800**	**165000**	**156000**	**165000**	NA
Chloride	**4000**	**3830**	NA	**2720**	**4050**	**3890**	**3240**	**1970**	**3690**	NA
Ferrous Iron	NA	NA	NA	NA	NA	NA	NA	NA	**35300**	NA
Nitrogen, Nitrate (As N)	30 U	30 U	NA	30 U	**328**	**6990**	48.7 U	30 U	30 U	NA
Nitrogen, Nitrite	25 U	25 U	NA	25 U	25 U	25 U	25 U	25 U	25 U	NA
Sulfate	**1120**	**2510**	NA	**198000**	**7340**	**29300**	**680**	500 U	**34400**	NA
Total Dissolved Solids	**170000**	**244000**	NA	**497000**	**202000**	**192000**	**150000**	**243000**	**295000**	NA
FIELD PARAMETERS										
pH (avg)	6.7	6.79	6.67	0	6.82	6.55	6.79	6.57	6.58	6.89
Temperature (° C) (avg)	15.2	15.2	13.7	6.71	15.4	14.2	15.6	14	14.3	13.9
Conductivity (mS/cm) (avg)	195	210	224	15.2	157	147	176	188	207	93
Dissolved oxygen (mg/L) (avg)	0.38	0	0	233	0.72	5.78	0	1.26	0	4.87
Turbidity (NTU)	0	0	28	0	0	0	0	0	0	0
Redox (mV)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM

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TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	B1 0502102-04 2/23/2005	D 0502102-05 2/23/2005	HRW1 0502087-09 2/18/2005	J1 0502102-02 2/23/2005	LW1S 0502099-01 2/22/2005	LW4S 0502087-01 2/17/2005	LW7S 0502102-07 2/23/2005	LW8S 0502087-12 2/18/2005	LW11S 0502087-02 2/17/2005	LW13S 0502102-08 2/23/2005
DIOXINS/FURANS (ng/L)										
Method 8290										
1,2,3,4,6,7,8-HpCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PeCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HpCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PeCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TEQ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW19S 0502099-03 2/22/2005	LW20S 0502110-06 2/24/2005	LW29S 0502059-02 2/15/2005	LW30S 0502059-03 2/15/2005	LW31S 0502056-01 2/14/2005	LW32S 0502056-04 2/14/2005	LW33S 0502099-06 2/22/2005	LW34S 0502099-07 2/22/2005	LW42S 0502099-10 2/22/2005	LW42S-Dup Z 0502099-13 2/22/2005
CHLORINATED PHENOLS (µg/L)										
Method SW8270SIM										
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (µg/L)										
Method SW8270										
1,2,4-Trichlorobenzene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
1,2-Dichlorobenzene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
1,3-Dichlorobenzene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
1,4-Dichlorobenzene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
2,3,4,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,5,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	4.98 U	4.94 U	4.9 U	5.11 U	4.83 U	4.93 U	4.84 U	4.81 U	4.93 U	4.87 U
2,4,6-Trichlorophenol	4.98 U	4.94 U	4.9 U	5.11 U	4.83 U	4.93 U	4.84 U	4.81 U	4.93 U	4.87 U
2,4-Dichlorophenol	2.99 U	2.96 U	2.94 U	3.06 U	2.9 U	2.96 U	2.9 U	2.88 U	2.96 U	2.92 U
2,4-Dimethylphenol	2.99 U	2.96 U	2.94 U	3.06 U	2.9 U	2.96 U	2.9 U	2.88 U	2.96 U	2.92 U
2,4-Dinitrophenol	9.95 U	9.87 U	9.8 U	10.2 U	9.65 U	9.86 U	9.68 U	9.62 U	9.85 U	9.74 U
2,4-Dinitrotoluene	4.98 U	4.94 U	4.9 U	5.11 U	4.83 U	4.93 U	4.84 U	4.81 U	4.93 U	4.87 U
2,6-Dinitrotoluene	4.98 U	4.94 U	4.9 U	5.11 U	4.83 U	4.93 U	4.84 U	4.81 U	4.93 U	4.87 U
2-Chloronaphthalene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
2-Chlorophenol	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
2-Methylnaphthalene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
2-Methylphenol	1.99 U	1.97 U	1.96 U	2.04 U	1.93 U	1.97 U	1.94 U	1.92 U	1.97 U	1.95 U
2-Nitroaniline	4.98 U	4.94 U	4.9 U	5.11 U	4.83 U	4.93 U	4.84 U	4.81 U	4.93 U	4.87 U
2-Nitrophenol	4.98 U	4.94 U	4.9 U	5.11 U	4.83 U	4.93 U	4.84 U	4.81 U	4.93 U	4.87 U
3-&4-Methylphenol	9.95 U	9.87 U	9.8 U	10.2 U	9.65 U	9.86 U	9.68 U	9.62 U	9.85 U	9.74 U
3,3'-Dichlorobenzidine	4.98 U	4.94 U	4.9 U	5.11 U	4.83 U	4.93 U	4.84 U	4.81 U	4.93 U	4.87 U
3-Nitroaniline	5.97 U	5.92 U	5.88 U	6.13 U	5.79 U	5.92 U	5.81 U	5.77 U	5.91 U	5.84 U
4,6-Dinitro-2-methylphenol	9.95 U	9.87 U	9.8 U	10.2 U	9.65 U	9.86 U	9.68 U	9.62 U	9.85 U	9.74 U
4-Bromophenyl phenyl ether	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
4-Chloro-3-methylphenol	1.99 U	1.97 U	1.96 U	2.04 U	1.93 U	1.97 U	1.94 U	1.92 U	1.97 U	1.95 U
4-Chloroaniline	2.99 U	2.96 U	2.94 U	3.06 U	2.9 U	2.96 U	2.9 U	2.88 U	2.96 U	2.92 U
4-Chlorophenyl phenyl ether	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
4-Nitroaniline	4.98 U	4.94 U	4.9 U	5.11 U	4.83 U	4.93 U	4.84 U	4.81 U	4.93 U	4.87 U
4-Nitrophenol	4.98 U	4.94 U	4.9 U	5.11 U	4.83 U	4.93 U	4.84 U	4.81 U	4.93 U	4.87 U
Acenaphthene	0.995 U	**1.15**	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	**1.7**	**1.4**
Acenaphthylene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Anthracene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Benz(a)anthracene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Benzo(a)pyrene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW19S 0502099-03 2/22/2005	LW20S 0502110-06 2/24/2005	LW29S 0502059-02 2/15/2005	LW30S 0502059-03 2/15/2005	LW31S 0502056-01 2/14/2005	LW32S 0502056-04 2/14/2005	LW33S 0502099-06 2/22/2005	LW34S 0502099-07 2/22/2005	LW42S 0502099-10 2/22/2005	LW42S-Dup Z 0502099-13 2/22/2005
Benzo(b)fluoranthene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Benzo(g,h,i)perylene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Benzo(k)fluoranthene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Benzoic Acid	19.9 U	19.7 U	19.6 U	20.4 U	19.3 U	19.7 U	19.4 U	19.2 U	19.7 U	19.5 U
Benzyl Alcohol	4.98 U	4.94 U	4.9 U	5.11 U	4.83 U	4.93 U	4.84 U	4.81 U	4.93 U	4.87 U
Bis(2-chloroethoxy)methane	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Bis(2-chloroethyl)ether	1.99 U	1.97 U	1.96 U	2.04 U	1.93 U	1.97 U	1.94 U	1.92 U	1.97 U	1.95 U
Bis(2-chloroisopropyl)ether	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Bis(2-ethylhexyl)phthalate	**2**	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Butyl benzyl phthalate	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Carbazole	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Chrysene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Dibenz(a,h)anthracene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Dibenzofuran	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	**1.86**	**1.8**
Diethyl phthalate	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Dimethyl phthalate	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Di-n-butyl phthalate	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Di-n-octyl phthalate	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Fluoranthene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Fluorene	**11.3**	**3.18**	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	**3.63**	**3.47**
Hexachlorobenzene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Hexachlorobutadiene	1.99 U	1.97 U	1.96 U	2.04 U	1.93 U	1.97 U	1.94 U	1.92 U	1.97 U	1.95 U
Hexachlorocyclopentadiene	4.98 U	4.94 U	4.9 U	5.11 U	4.83 U	4.93 U	4.84 U	4.81 U	4.93 U	4.87 U
Hexachloroethane	1.99 U	1.97 U	1.96 U	2.04 U	1.93 U	1.97 U	1.94 U	1.92 U	1.97 U	1.95 U
Indeno(1,2,3-cd)pyrene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Isophorone	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Naphthalene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Nitrobenzene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
N-Nitrosodimethylamine	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
N-Nitrosodi-n-propylamine	1.99 U	1.97 U	1.96 U	2.04 U	1.93 U	1.97 U	1.94 U	1.92 U	1.97 U	1.95 U
N-Nitrosodiphenylamine	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Pentachlorophenol	4.98 U	4.94 U	4.9 U	5.11 U	4.83 U	4.93 U	4.84 U	4.81 U	4.93 U	4.87 U
Phenanthrene	**12.9**	**2.23**	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	**3.89**	**3.56**
Phenol	1.99 U	1.97 U	1.96 U	2.04 U	1.93 U	1.97 U	1.94 U	1.92 U	1.97 U	1.95 U
Pyrene	0.995 U	0.987 U	0.98 U	1.02 U	0.965 U	0.986 U	0.968 U	0.962 U	0.985 U	0.974 U
Pyridine	4.98 U	4.94 U	4.9 U	5.11 U	4.83 U	4.93 U	4.84 U	4.81 U	4.93 U	4.87 U

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW19S 0502099-03 2/22/2005	LW20S 0502110-06 2/24/2005	LW29S 0502059-02 2/15/2005	LW30S 0502059-03 2/15/2005	LW31S 0502056-01 2/14/2005	LW32S 0502056-04 2/14/2005	LW33S 0502099-06 2/22/2005	LW34S 0502099-07 2/22/2005	LW42S 0502099-10 2/22/2005	LW42S-Dup Z 0502099-13 2/22/2005
PAHS (µg/L)										
Method SW8270SIM										
Acenaphthene	**2.28**	**0.94**	0.0507 U	**0.425**	0.0479 U	**0.726**	0.0486 U	0.0489 U	**2.04**	**2.11**
Acenaphthylene	**0.76**	**0.29**	0.0507 U	**0.0965**	0.0479 U	**0.189**	0.0486 U	0.0489 U	**0.554**	**0.605**
Anthracene	**0.267**	**0.07**	0.0507 U	**0.0579**	0.0479 U	0.0497 U	0.0486 U	0.0489 U	**0.243**	**0.224**
Benz(a)anthracene	**0.0691**	0.05 U	0.0507 U	0.0483 U	0.0479 U	0.0497 U	0.0486 U	0.0489 U	0.0486 U	0.0488 U
Benzo(a)pyrene	0.0494 U	0.05 U	0.0507 U	0.0483 U	0.0479 U	0.0497 U	0.0486 U	0.0489 U	0.0486 U	0.0488 U
Benzo(b)fluoranthene	0.0494 U	0.05 U	0.0507 U	0.0483 U	0.0479 U	0.0497 U	0.0486 U	0.0489 U	0.0486 U	0.0488 U
Benzo(g,h,i)perylene	0.0494 U	0.05 U	0.0507 U	0.0483 U	0.0479 U	0.0497 U	0.0486 U	0.0489 U	0.0486 U	0.0488 U
Benzo(k)fluoranthene	0.0494 U	0.05 U	0.0507 U	0.0483 U	0.0479 U	0.0497 U	0.0486 U	0.0489 U	0.0486 U	0.0488 U
Chrysene	**0.0691**	0.05 U	0.0507 U	0.0483 U	0.0479 U	0.0497 U	0.0486 U	0.0489 U	0.0486 U	0.0488 U
Dibenz(a,h)anthracene	0.0494 U	0.05 U	0.0507 U	0.0483 U	0.0479 U	0.0497 U	0.0486 U	0.0489 U	0.0486 U	0.0488 U
Fluoranthene	**0.148**	0.05 U	0.0507 U	0.0483 U	0.0479 U	**0.0497**	0.0486 U	0.0489 U	**0.0583**	0.0488 U
Fluorene	**7.83**	**2.94**	0.0507 U	**0.772**	0.0479 U	**0.905**	0.0486 U	0.0489 U	**4.72**	**4.83**
Indeno(1,2,3-cd)pyrene	0.0494 U	0.05 U	0.0507 U	0.0483 U	0.0479 U	0.0497 U	0.0486 U	0.0489 U	0.0486 U	0.0488 U
Naphthalene	**1.13**	**0.45**	0.0507 U	**0.261**	0.0479 U	**1.09**	0.0486 U	0.0489 U	0.68 U	0.771 U
Phenanthrene	**6.25**	**1.86**	0.0507 U	**0.647**	0.0479 U	**0.219**	0.0486 U	0.0489 U	**4.46**	**4.35**
Pyrene	**0.326**	0.05 U	0.0507 U	0.0483 U	0.0479 U	0.0497 U	0.0486 U	0.0489 U	**0.0875**	**0.0683**
VOLATILES (µg/L)										
Method SW8260										
1,1,1,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW19S 0502099-03 2/22/2005	LW20S 0502110-06 2/24/2005	LW29S 0502059-02 2/15/2005	LW30S 0502059-03 2/15/2005	LW31S 0502056-01 2/14/2005	LW32S 0502056-04 2/14/2005	LW33S 0502099-06 2/22/2005	LW34S 0502099-07 2/22/2005	LW42S 0502099-10 2/22/2005	LW42S-Dup Z 0502099-13 2/22/2005
1,4-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2,2-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorotoluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorotoluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Isopropyltoluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Methyl-2-pentanone	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Acetone	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Acrylonitrile	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Bromobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon disulfide	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Carbon tetrachloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromomethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Isopropylbenzene	**2.55**	**4.55**	1 U	**2.96**	1 U	**40.2**	1 U	1 U	**14.3**	**13.2**
m,p-Xylene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Methyl tert-butyl ether	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylene chloride	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Naphthalene	**7.88**	**13.1**	1 U	1 U	1 U	**3.36**	1 U	1 U	**1.81**	**2.16**
n-Butylbenzene	**6.28**	**7.22**	1 U	**4.75**	1 U	**18.2**	1 U	1 U	**11.6**	**11.8**
n-Propylbenzene	**5.54**	**9.38**	1 U	**17.2**	1 U	**55.9**	1 U	1 U	**39.2**	**41.6**
o-Xylene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
sec-Butylbenzene	**2.67**	**4.57**	1 U	**3.13**	1 U	**20.6**	1 U	1 U	**4.77**	**4.32**
Styrene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
tert-Butylbenzene	1 U	1 U	1 U	**2.25**	1 U	**3.84**	1 U	1 U	1 U	1 U

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW19S 0502099-03 2/22/2005	LW20S 0502110-06 2/24/2005	LW29S 0502059-02 2/15/2005	LW30S 0502059-03 2/15/2005	LW31S 0502056-01 2/14/2005	LW32S 0502056-04 2/14/2005	LW33S 0502099-06 2/22/2005	LW34S 0502099-07 2/22/2005	LW42S 0502099-10 2/22/2005	LW42S-Dup Z 0502099-13 2/22/2005
Tetrachloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl chloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL PETROLEUM HYDROCARBONS (µg/L)										
Method NWTPH-Dx/NWTPHg										
Diesel Range Hydrocarbons	**11300**	**6270**	242 U	**1340**	**261**	**3130**	243 U	248 U	**3740** J	**2980** J
Lube Oil	481 U	488 U	484 U	496 U	500 U	500 U	669 U	495 U	1130 U	484 U
Gasoline Range Hydrocarbons	**973**	**699**	**108**	**927**	100 U	**4670**	100 U	100 U	**1350**	**1610**
PRIORITY POLLUTANT METALS (µg/L)										
Method 6010/6020										
Arsenic (total)	**43.4**	**31.3**	**2.34**	**15.5**	**1.09**	**30.2**	1 U	1 U	**19.2**	**19.1**
Chromium (total)	**6.3**	5 U	**8.8**	**5.9**	**5.6**	5 U	**7.9**	**8**	**7.7**	5 U
Copper (total)	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Lead (total)	**0.56**	0.277 U	0.1 U	**1.41**	0.1 U	0.1 U	**0.251**	0.1 U	**5.19**	**5.14**
Nickel (total)	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Selenium (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc (total)	10 U	**14.6**	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
DISSOLVED METALS (µg/L)										
Method 6010/6020										
Arsenic (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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	LW19S 0502099-03 2/22/2005	LW20S 0502110-06 2/24/2005	LW29S 0502059-02 2/15/2005	LW30S 0502059-03 2/15/2005	LW31S 0502056-01 2/14/2005	LW32S 0502056-04 2/14/2005	LW33S 0502099-06 2/22/2005	LW34S 0502099-07 2/22/2005	LW42S 0502099-10 2/22/2005	LW42S-Dup Z 0502099-13 2/22/2005
CONVENTIONALS (µg/L)										
Calcium (total)	**30200**	**46200**	**13900**	**28300**	**15800**	**36000**	**15900**	**30500**	**30000**	**29800**
Magnesium (total)	**8610**	**10600**	**2470**	**3180**	**4170**	**7200**	**4700**	**14000**	**6810**	**6790**
Potassium (total)	**9390**	**5770**	**3220**	**3140**	**3160**	**4760**	**2360**	**1780**	**4170**	**4140**
Sodium (total)	**15000**	**5760**	**5880**	**8540**	**6120**	**13900**	**5450**	**9460**	**7480**	**7480**
Alkalinity, Bicarbonate (As CaCO3)	**352000**	**275000**	**69900**	**126000**	**76000**	**188000**	**61900**	**146000**	**160000**	**163000**
Alkalinity, Carbonate (As CaCO3)	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U
Alkalinity, Total (As CaCO3)	**352000**	**275000**	**69900**	**126000**	**76000**	**188000**	**61900**	**146000**	**160000**	**163000**
Chloride	**980**	**2230**	**5440**	**1600**	**1630**	**2200**	**1420**	**2720**	**1480**	**1500**
Ferrous Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrogen, Nitrate (As N)	30 U	30 UJ	**592**	30 U	**740** J	30 UJ	**1470**	**668**	30 U	30 U
Nitrogen, Nitrite	25 U	25 U	25 U	25 U	25 UJ	25 UJ	25 U	25 U	25 U	25 U
Sulfate	500 U	**880**	**5280**	500 U	**4860**	**610**	**8070**	**5930**	500 U	500 U
Total Dissolved Solids	**218000**	**411000**	**134000**	**177000**	**124000**	**252000**	**135000**	**195000**	**230000**	**223000**
FIELD PARAMETERS										
pH (avg)	6.34	6.72	6.81	6.94	6.48	6.78	6.85	6.58	6.66	6.66
Temperature (° C) (avg)	13.4	13	12.9	12.9	11.6	13.1	13.1	13.5	13.4	13.4
Conductivity (mS/cm) (avg)	223	196	102	180	94	248	77	167	172	172
Dissolved oxygen (mg/L) (avg)	0.06	0.47	1.38	5.08	1.71	0.1	1.94	1.12	0.69	0.69
Turbidity (NTU)	19	0	0	0	0	0	2	0	7	7
Redox (mV)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW19S 0502099-03 2/22/2005	LW20S 0502110-06 2/24/2005	LW29S 0502059-02 2/15/2005	LW30S 0502059-03 2/15/2005	LW31S 0502056-01 2/14/2005	LW32S 0502056-04 2/14/2005	LW33S 0502099-06 2/22/2005	LW34S 0502099-07 2/22/2005	LW42S 0502099-10 2/22/2005	LW42S-Dup Z 0502099-13 2/22/2005
DIOXINS/FURANS (ng/L)										
Method 8290										
1,2,3,4,6,7,8-HpCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PeCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HpCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PeCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TEQ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW43S 0502056-02 2/14/2005	LW44S 0502099-11 2/23/2005	N 0502110-01 2/24/2005	OX1S 0502070-01 2/16/2005	OX3S 0502070-02 2/16/2005	OX5S 0502070-03 2/16/2005	OX6S 0502070-04 2/16/2005	OX7S 0502070-05 2/16/2005	OX8S 0502070-06 2/16/2005	OX9S 0502070-07 2/16/2005
CHLORINATED PHENOLS (µg/L)										
Method SW8270SIM										
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (µg/L)										
Method SW8270										
1,2,4-Trichlorobenzene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
1,2-Dichlorobenzene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
1,3-Dichlorobenzene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
1,4-Dichlorobenzene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
2,3,4,6-Tetrachlorophenol	NA	NA	NA	5.09 U	4.84 U	4.94 U	**7.77**	4.88 U	**13.4**	4.94 U
2,3,5,6-Tetrachlorophenol	NA	NA	NA	5.09 U	**39.8**	4.94 U	**12.9**	**8.13**	**117**	4.94 U
2,4,5-Trichlorophenol	5.05 U	4.89 U	4.74 U	5.09 U	4.84 U	4.94 U	4.75 U	4.88 U	4.91 U	4.94 U
2,4,6-Trichlorophenol	5.05 U	4.89 U	4.74 U	5.09 U	4.84 U	4.94 U	4.75 U	4.88 U	4.91 U	4.94 U
2,4-Dichlorophenol	3.03 U	2.93 U	2.84 U	3.05 U	2.9 U	2.96 U	2.85 U	2.93 U	2.94 U	2.96 U
2,4-Dimethylphenol	3.03 U	2.93 U	2.84 U	**5.7**	**6.2**	2.96 U	2.85 U	2.93 U	2.94 U	2.96 U
2,4-Dinitrophenol	10.1 U	9.78 U	9.48 U	10.2 U	9.68 U	9.87 U	9.51 U	9.76 U	9.81 U	9.88 U
2,4-Dinitrotoluene	5.05 U	4.89 U	4.74 U	5.09 U	4.84 U	4.94 U	4.75 U	4.88 U	4.91 U	4.94 U
2,6-Dinitrotoluene	5.05 U	4.89 U	4.74 U	5.09 U	4.84 U	4.94 U	4.75 U	4.88 U	4.91 U	4.94 U
2-Chloronaphthalene	1.01 U	0.978 U	0.948 U	1.02 U	**10.6**	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
2-Chlorophenol	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
2-Methylnaphthalene	1.01 U	0.978 U	**16.4**	**2.88**	**7.17**	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
2-Methylphenol	2.02 U	1.96 U	1.9 U	2.04 U	1.94 U	1.97 U	1.9 U	1.95 U	1.96 U	1.98 U
2-Nitroaniline	5.05 U	4.89 U	4.74 U	5.09 U	4.84 U	4.94 U	4.75 U	4.88 U	4.91 U	4.94 U
2-Nitrophenol	5.05 U	4.89 U	4.74 U	5.09 U	4.84 U	4.94 U	4.75 U	4.88 U	4.91 U	4.94 U
3-&4-Methylphenol	10.1 U	9.78 U	9.48 U	10.2 U	9.68 U	9.87 U	9.51 U	9.76 U	9.81 U	9.88 U
3,3'-Dichlorobenzidine	5.05 U	4.89 U	4.74 U	5.09 U	4.84 U	4.94 U	4.75 U	4.88 U	4.91 U	4.94 U
3-Nitroaniline	6.06 U	5.87 U	5.69 U	6.11 U	5.81 U	5.92 U	5.7 U	5.85 U	5.89 U	5.93 U
4,6-Dinitro-2-methylphenol	10.1 U	9.78 U	9.48 U	10.2 U	9.68 U	9.87 U	9.51 U	9.76 U	9.81 U	9.88 U
4-Bromophenyl phenyl ether	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
4-Chloro-3-methylphenol	2.02 U	1.96 U	1.9 U	2.04 U	1.94 U	1.97 U	1.9 U	1.95 U	1.96 U	1.98 U
4-Chloroaniline	3.03 U	2.93 U	2.84 U	3.05 U	2.9 U	2.96 U	2.85 U	2.93 U	2.94 U	2.96 U
4-Chlorophenyl phenyl ether	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
4-Nitroaniline	5.05 U	4.89 U	4.74 U	5.09 U	4.84 U	4.94 U	4.75 U	4.88 U	4.91 U	4.94 U
4-Nitrophenol	5.05 U	4.89 U	4.74 U	5.09 U	4.84 U	4.94 U	4.75 U	4.88 U	4.91 U	4.94 U
Acenaphthene	1.01 U	0.978 U	**0.967**	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Acenaphthylene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Anthracene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Benz(a)anthracene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Benzo(a)pyrene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW43S 0502056-02 2/14/2005	LW44S 0502099-11 2/23/2005	N 0502110-01 2/24/2005	OX1S 0502070-01 2/16/2005	OX3S 0502070-02 2/16/2005	OX5S 0502070-03 2/16/2005	OX6S 0502070-04 2/16/2005	OX7S 0502070-05 2/16/2005	OX8S 0502070-06 2/16/2005	OX9S 0502070-07 2/16/2005
Benzo(b)fluoranthene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Benzo(g,h,i)perylene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Benzo(k)fluoranthene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Benzoic Acid	20.2 U	19.6 U	19 U	20.4 U	19.4 U	19.7 U	19 U	19.5 U	19.6 U	19.8 U
Benzyl Alcohol	5.05 U	4.89 U	4.74 U	5.09 U	4.84 U	4.94 U	4.75 U	4.88 U	4.91 U	4.94 U
Bis(2-chloroethoxy)methane	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Bis(2-chloroethyl)ether	2.02 U	1.96 U	1.9 U	2.04 U	1.94 U	1.97 U	1.9 U	1.95 U	1.96 U	1.98 U
Bis(2-chloroisopropyl)ether	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Bis(2-ethylhexyl)phthalate	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Butyl benzyl phthalate	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Carbazole	1.01 U	0.978 U	**1.04**	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Chrysene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Dibenz(a,h)anthracene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Dibenzofuran	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Diethyl phthalate	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Dimethyl phthalate	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Di-n-butyl phthalate	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Di-n-octyl phthalate	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Fluoranthene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Fluorene	1.22 U	0.978 U	1.75 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Hexachlorobenzene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Hexachlorobutadiene	2.02 U	1.96 U	1.9 U	2.04 U	1.94 U	1.97 U	1.9 U	1.95 U	1.96 U	1.98 U
Hexachlorocyclopentadiene	5.05 U	4.89 U	4.74 U	5.09 U	4.84 U	4.94 U	4.75 U	4.88 U	4.91 U	4.94 U
Hexachloroethane	2.02 U	1.96 U	1.9 U	2.04 U	1.94 U	1.97 U	1.9 U	1.95 U	1.96 U	1.98 U
Indeno(1,2,3-cd)pyrene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Isophorone	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Naphthalene	1.01 U	0.978 U	**5.5**	**6.89**	**23.8**	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Nitrobenzene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
N-Nitrosodimethylamine	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
N-Nitrosodi-n-propylamine	2.02 U	1.96 U	1.9 U	2.04 U	1.94 U	1.97 U	1.9 U	1.95 U	1.96 U	1.98 U
N-Nitrosodiphenylamine	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Pentachlorophenol	5.05 U	4.89 U	4.74 U	5.09 U	**28.7**	4.94 U	**127**	**30.8**	**95.9**	4.94 U
Phenanthrene	**1.3**	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Phenol	2.02 U	1.96 U	1.9 U	**2.09**	1.94 U	1.97 U	1.9 U	1.95 U	1.96 U	1.98 U
Pyrene	1.01 U	0.978 U	0.948 U	1.02 U	0.968 U	0.987 U	0.951 U	0.976 U	0.981 U	0.988 U
Pyridine	5.05 U	4.89 U	4.74 U	5.09 U	4.84 U	4.94 U	4.75 U	4.88 U	4.91 U	4.94 U

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TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW43S 0502056-02 2/14/2005	LW44S 0502099-11 2/23/2005	N 0502110-01 2/24/2005	OX1S 0502070-01 2/16/2005	OX3S 0502070-02 2/16/2005	OX5S 0502070-03 2/16/2005	OX6S 0502070-04 2/16/2005	OX7S 0502070-05 2/16/2005	OX8S 0502070-06 2/16/2005	OX9S 0502070-07 2/16/2005
PAHS (µg/L)										
Method SW8270SIM										
Acenaphthene	**0.703**	**0.283**	**0.702**	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	**0.163**	0.0488 U	**0.133**	NA	NA	NA	NA	NA	NA	NA
Anthracene	**0.0917**	0.0488 U	0.0474 U	NA	NA	NA	NA	NA	NA	NA
Benz(a)anthracene	0.051 U	0.0488 U	0.0474 U	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.051 U	0.0488 U	0.0474 U	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.051 U	0.0488 U	0.0474 U	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	0.051 U	0.0488 U	0.0474 U	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.051 U	0.0488 U	0.0474 U	NA	NA	NA	NA	NA	NA	NA
Chrysene	0.051 U	0.0488 U	0.0474 U	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	0.051 U	0.0488 U	0.0474 U	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	0.051 U	0.0488 U	**0.0569**	NA	NA	NA	NA	NA	NA	NA
Fluorene	**1.35**	**0.361**	**1.65**	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.051 U	0.0488 U	0.0474 U	NA	NA	NA	NA	NA	NA	NA
Naphthalene	**0.387**	**1.31**	**3.78**	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	**1.25**	0.0488 U	**0.493**	NA	NA	NA	NA	NA	NA	NA
Pyrene	0.051 U	0.0488 U	**0.104**	NA	NA	NA	NA	NA	NA	NA
VOLATILES (µg/L)										
Method SW8260										
1,1,1,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	1 U	1 U	**35.6**	**310**	**354**	1 U	**11.6**	**2.68**	**55.2**	1 U
1,2-Dibromo-3-chloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	1 U	1 U	**12.6**	**97.8**	**139**	1 U	1 U	1 U	**2.28**	1 U
1,3-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW43S 0502056-02 2/14/2005	LW44S 0502099-11 2/23/2005	N 0502110-01 2/24/2005	OX1S 0502070-01 2/16/2005	OX3S 0502070-02 2/16/2005	OX5S 0502070-03 2/16/2005	OX6S 0502070-04 2/16/2005	OX7S 0502070-05 2/16/2005	OX8S 0502070-06 2/16/2005	OX9S 0502070-07 2/16/2005
1,4-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2,2-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorotoluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorotoluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Isopropyltoluene	1 U	1 U	**1.43**	**13**	**14.8**	1 U	1 U	1 U	**3.44**	1 U
4-Methyl-2-pentanone	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Acetone	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Acrylonitrile	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	0.3 U	0.3 U	**214**	**102**	**111**	**0.46**	0.3 U	0.3 U	0.3 U	0.3 U
Bromobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon disulfide	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Carbon tetrachloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	**1.36**	1 U	1 U
Chloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromomethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	1 U	1 U	**24.6**	**129**	**161**	1 U	1 U	1 U	**4.38**	1 U
Hexachlorobutadiene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Isopropylbenzene	**5.59**	**65.9**	**43.1**	**47.1**	**69.9**	1 U	**2.51**	1 U	**10.7**	1 U
m,p-Xylene	2 U	2 U	**48.5**	**260**	**278**	2 U	2 U	2 U	2 U	2 U
Methyl tert-butyl ether	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylene chloride	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Naphthalene	**4.04**	**6.14**	**12.1**	**21.3**	**39.4**	**3.06**	**2.71**	1 U	**2.52**	1 U
n-Butylbenzene	**6.36**	**5.35**	**7.83**	**11.2**	**13**	1 U	**3.89**	1 U	**6.17**	1 U
n-Propylbenzene	**22.1**	**51**	**54.8**	**67.3**	**99.7**	1 U	**2.81**	1 U	**23.3**	1 U
o-Xylene	1 U	1 U	**13.9**	**83.6**	**152**	1 U	**4.09**	**1.3**	**6.23**	1 U
sec-Butylbenzene	**3.84**	**8.93**	**3.97**	**15.1**	**17**	1 U	**4.7**	**2.77**	**14.2**	1 U
Styrene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
tert-Butylbenzene	**2.72**	1 U	1 U	**4**	1 U	1 U	1 U	1 U	**3.34**	1 U

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW43S 0502056-02 2/14/2005	LW44S 0502099-11 2/23/2005	N 0502110-01 2/24/2005	OX1S 0502070-01 2/16/2005	OX3S 0502070-02 2/16/2005	OX5S 0502070-03 2/16/2005	OX6S 0502070-04 2/16/2005	OX7S 0502070-05 2/16/2005	OX8S 0502070-06 2/16/2005	OX9S 0502070-07 2/16/2005
Tetrachloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1 U	1 U	**14.3**	**2**	**3.44**	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl chloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL PETROLEUM HYDROCARBONS (µg/L)										
Method NWTPH-Dx/NWTPHg										
Diesel Range Hydrocarbons	**2340**	**9380**	**1760**	NA	NA	NA	NA	NA	NA	NA
Lube Oil	500 U	488 U	500 U	NA	NA	NA	NA	NA	NA	NA
Gasoline Range Hydrocarbons	**1330**	**2970**	**2440**	NA	NA	NA	NA	NA	NA	NA
PRIORITY POLLUTANT METALS (µg/L)										
Method 6010/6020										
Arsenic (total)	**14.8**	**25.6**	**35.3**	**17.9**	**12.6**	**14.5**	**53.1**	**20**	**18.2**	**2.53**
Chromium (total)	5 U	**9.3**	5 U	**7.7**	**5.1**	**8.8**	**6.8**	**8.5**	5 U	5 U
Copper (total)	10 U	10 U	10 U	10 U	10 U	10 U	**44.4**	**12.1**	10 U	10 U
Lead (total)	**0.281**	**0.158**	**4.54**	**0.45**	**0.22**	**0.561**	**2.87**	**1.84**	**0.603**	0.1 U
Nickel (total)	5 U	5 U	5 U	**10.4**	**91.5**	5 U	**113**	**68.9**	**170**	**70.6**
Selenium (total)	NA	NA	NA	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Zinc (total)	**26.2**	10 U	10 U	10 U	**18.1**	10 U	**96.4**	**30.4**	**49.5**	10 U
DISSOLVED METALS (µg/L)										
Method 6010/6020										
Arsenic (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW43S 0502056-02 2/14/2005	LW44S 0502099-11 2/23/2005	N 0502110-01 2/24/2005	OX1S 0502070-01 2/16/2005	OX3S 0502070-02 2/16/2005	OX5S 0502070-03 2/16/2005	OX6S 0502070-04 2/16/2005	OX7S 0502070-05 2/16/2005	OX8S 0502070-06 2/16/2005	OX9S 0502070-07 2/16/2005
CONVENTIONALS (µg/L)										
Calcium (total)	**44900**	**51100**	**45700**	**37900**	**30800**	**27900**	**45600**	**48800**	**130000**	**46300**
Magnesium (total)	**10600**	**9040**	**10600**	**6860**	**2830**	**8960**	**8070**	**10600**	**31200**	**15600**
Potassium (total)	**5330**	**5750**	**4270**	**4480**	**5000**	**2490**	**5890**	**5220**	**7780**	**4290**
Sodium (total)	**13400**	**13700**	**6200**	**10800**	**12800**	**7320**	**18900**	**12200**	**37000**	**13400** J
Alkalinity, Bicarbonate (As CaCO3)	**223000**	**242000**	**228000**	**173000**	**141000**	**114000**	**112000**	**101000**	**176000**	**142000**
Alkalinity, Carbonate (As CaCO3)	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U
Alkalinity, Total (As CaCO3)	**223000**	**242000**	**228000**	**173000**	**141000**	**114000**	**112000**	**101000**	**176000**	**142000**
Chloride	**2090**	**2540**	**2120**	**4250**	**4670**	**2190**	**2950**	**2110**	**3510**	**4550**
Ferrous Iron	NA	NA	NA	**49400**	**59000**	**8050**	**17900**	**25700**	**79500**	**4750**
Nitrogen, Nitrate (As N)	30 UJ	30 U	30 UJ	30 U	30 U	**414**	**47.8**	**48.1**	**174**	**4930**
Nitrogen, Nitrite	25 UJ	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	**65.2**
Sulfate	500 U	500 U	500 U	**8240**	**20100**	**13700**	**108000**	**118000**	**361000**	**49400**
Total Dissolved Solids	**276000**	**314000**	**362000**	**237000**	**226000**	**171000**	**313000**	**290000**	**876000**	**276000**
FIELD PARAMETERS										
pH (avg)	6.8	6.64	6.72	6.6	6.45	6.8	6.43	6.44	6.49	6.56
Temperature (° C) (avg)	12.9	13.6	12	13.4	13.9	13.7	NM	14.9	14.4	13.6
Conductivity (mS/cm) (avg)	283	208	200	263	237	148	NM	238	329	227
Dissolved oxygen (mg/L) (avg)	0.45	0.73	0	1.22	0	0.67	NM	1.06	0.08	0.79
Turbidity (NTU)	0	0	0	0	0	0	NM	33	0	0
Redox (mV)	NM	NM	NM	12	-4	NM	11	-6	NM	NM

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GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW43S 0502056-02 2/14/2005	LW44S 0502099-11 2/23/2005	N 0502110-01 2/24/2005	OX1S 0502070-01 2/16/2005	OX3S 0502070-02 2/16/2005	OX5S 0502070-03 2/16/2005	OX6S 0502070-04 2/16/2005	OX7S 0502070-05 2/16/2005	OX8S 0502070-06 2/16/2005	OX9S 0502070-07 2/16/2005
DIOXINS/FURANS (ng/L)										
Method 8290										
1,2,3,4,6,7,8-HpCDD	NA	NA	NA	**0.232233**	NA	NA	**1.551352**	NA	NA	NA
1,2,3,4,6,7,8-HpCDF	NA	NA	NA	**0.031277**	NA	NA	**0.228015**	NA	NA	NA
1,2,3,4,7,8,9-HpCDF	NA	NA	NA	0.001392 UJ	NA	NA	**0.008529** J	NA	NA	NA
1,2,3,4,7,8-HxCDD	NA	NA	NA	0.000267 U	NA	NA	0.000383 U	NA	NA	NA
1,2,3,4,7,8-HxCDF	NA	NA	NA	0.001266 UJ	NA	NA	**0.006875** J	NA	NA	NA
1,2,3,6,7,8-HxCDD	NA	NA	NA	**0.00805** J	NA	NA	**0.053899**	NA	NA	NA
1,2,3,6,7,8-HxCDF	NA	NA	NA	0.000917 U	NA	NA	0.004071 U	NA	NA	NA
1,2,3,7,8,9-HxCDD	NA	NA	NA	0.000844 UJ	NA	NA	0.003976 UJ	NA	NA	NA
1,2,3,7,8,9-HxCDF	NA	NA	NA	0.001128 U	NA	NA	0.005011 U	NA	NA	NA
1,2,3,7,8-PeCDD	NA	NA	NA	0.000554 U	NA	NA	0.000308 U	NA	NA	NA
1,2,3,7,8-PeCDF	NA	NA	NA	0.000393 U	NA	NA	0.001959 UJ	NA	NA	NA
2,3,4,6,7,8-HxCDF	NA	NA	NA	0.00098 U	NA	NA	0.004352 U	NA	NA	NA
2,3,4,7,8-PeCDF	NA	NA	NA	0.000378 U	NA	NA	0.001528 UJ	NA	NA	NA
2,3,7,8-TCDD	NA	NA	NA	0.000325 U	NA	NA	0.000247 U	NA	NA	NA
2,3,7,8-TCDF	NA	NA	NA	0.000676 U	NA	NA	0.000503 U	NA	NA	NA
OCDD	NA	NA	NA	**1.321433**	NA	NA	**11.764345**	NA	NA	NA
OCDF	NA	NA	NA	**0.133707**	NA	NA	**1.501197**	NA	NA	NA
Total HpCDD	NA	NA	NA	**0.35569**	NA	NA	**2.399614**	NA	NA	NA
Total HpCDF	NA	NA	NA	**0.159035**	NA	NA	**1.165599**	NA	NA	NA
Total HxCDD	NA	NA	NA	**0.016634**	NA	NA	**0.125227**	NA	NA	NA
Total HxCDF	NA	NA	NA	**0.050538**	NA	NA	**0.311203**	NA	NA	NA
Total PeCDD	NA	NA	NA	0.000554 U	NA	NA	0.000308 U	NA	NA	NA
Total PeCDF	NA	NA	NA	**0.005961**	NA	NA	**0.042411**	NA	NA	NA
Total TCDD	NA	NA	NA	0.000325 U	NA	NA	0.000247 U	NA	NA	NA
Total TCDF	NA	NA	NA	0.000676 U	NA	NA	0.000503 U	NA	NA	NA
Total TEQ	NA	NA	NA	**0.00489**	NA	NA	**0.03724**	NA	NA	NA

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	P 0502110-02 2/24/2005	Q 0502110-03 2/24/2005	RW1 0502087-04 2/17/2005	RW1-Dup W 0502087-05 2/17/2005	SDM-1 0502087-10 2/18/2005
CHLORINATED PHENOLS (µg/L)					
Method SW8270SIM					
Pentachlorophenol	NA	NA	NA	NA	**7.2**
SEMIVOLATILES (µg/L)					
Method SW8270					
1,2,4-Trichlorobenzene	0.983 U	1.01 U	0.976 U	0.974 U	NA
1,2-Dichlorobenzene	0.983 U	1.01 U	0.976 U	0.974 U	NA
1,3-Dichlorobenzene	0.983 U	1.01 U	0.976 U	0.974 U	NA
1,4-Dichlorobenzene	0.983 U	1.01 U	0.976 U	0.974 U	NA
2,3,4,6-Tetrachlorophenol	NA	NA	**60**	NA	NA
2,3,5,6-Tetrachlorophenol	NA	NA	**566**	NA	NA
2,4,5-Trichlorophenol	4.92 U	5.03 U	4.88 U	4.87 U	NA
2,4,6-Trichlorophenol	4.92 U	5.03 U	4.88 U	4.87 U	NA
2,4-Dichlorophenol	2.95 U	3.02 U	**15.4**	**18.2**	NA
2,4-Dimethylphenol	2.95 U	3.02 U	2.93 U	2.92 U	NA
2,4-Dinitrophenol	9.83 U	10.1 U	9.76 U	9.74 U	NA
2,4-Dinitrotoluene	4.92 U	5.03 U	4.88 U	4.87 U	NA
2,6-Dinitrotoluene	4.92 U	5.03 U	4.88 U	4.87 U	NA
2-Chloronaphthalene	0.983 U	1.01 U	**10.5** J	0.974 UJ	NA
2-Chlorophenol	0.983 U	1.01 U	0.976 U	0.974 U	NA
2-Methylnaphthalene	0.983 U	1.01 U	0.976 U	0.974 U	NA
2-Methylphenol	**6.05**	2.01 U	1.95 U	1.95 U	NA
2-Nitroaniline	4.92 U	5.03 U	4.88 U	4.87 U	NA
2-Nitrophenol	4.92 U	5.03 U	4.88 U	4.87 U	NA
3-&4-Methylphenol	**81.8**	**14.4**	9.76 U	9.74 U	NA
3,3'-Dichlorobenzidine	4.92 U	5.03 U	4.88 U	4.87 U	NA
3-Nitroaniline	5.9 U	6.03 U	5.85 U	5.84 U	NA
4,6-Dinitro-2-methylphenol	9.83 U	10.1 U	9.76 U	9.74 U	NA
4-Bromophenyl phenyl ether	0.983 U	1.01 U	0.976 U	0.974 U	NA
4-Chloro-3-methylphenol	1.97 U	2.01 U	1.95 U	1.95 U	NA
4-Chloroaniline	2.95 U	3.02 U	2.93 U	2.92 U	NA
4-Chlorophenyl phenyl ether	0.983 U	1.01 U	0.976 U	0.974 U	NA
4-Nitroaniline	4.92 U	5.03 U	4.88 U	4.87 U	NA
4-Nitrophenol	4.92 U	5.03 U	4.88 U	4.87 U	NA
Acenaphthene	0.983 U	**5.91**	0.976 U	0.974 U	NA
Acenaphthylene	0.983 U	1.01 U	0.976 U	0.974 U	NA
Anthracene	0.983 U	1.01 U	0.976 U	0.974 U	NA
Benz(a)anthracene	0.983 U	1.01 U	0.976 U	0.974 U	NA
Benzo(a)pyrene	0.983 U	1.01 U	0.976 U	0.974 U	NA

TABLE A-3
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FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	P 0502110-02 2/24/2005	Q 0502110-03 2/24/2005	RW1 0502087-04 2/17/2005	RW1-Dup W 0502087-05 2/17/2005	SDM-1 0502087-10 2/18/2005
Benzo(b)fluoranthene	0.983 U	1.01 U	0.976 U	0.974 U	NA
Benzo(g,h,i)perylene	0.983 U	1.01 U	0.976 U	0.974 U	NA
Benzo(k)fluoranthene	0.983 U	1.01 U	0.976 U	0.974 U	NA
Benzoic Acid	19.7 U	20.1 U	19.5 U	19.5 U	NA
Benzyl Alcohol	4.92 U	5.03 U	4.88 U	4.87 U	NA
Bis(2-chloroethoxy)methane	0.983 U	1.01 U	0.976 U	0.974 U	NA
Bis(2-chloroethyl)ether	1.97 U	2.01 U	1.95 U	1.95 U	NA
Bis(2-chloroisopropyl)ether	0.983 U	1.01 U	0.976 U	0.974 U	NA
Bis(2-ethylhexyl)phthalate	0.983 U	1.01 U	0.976 U	0.974 U	NA
Butyl benzyl phthalate	0.983 U	1.01 U	0.976 U	0.974 U	NA
Carbazole	0.983 U	1.01 U	0.976 U	0.974 U	NA
Chrysene	0.983 U	1.01 U	0.976 U	0.974 U	NA
Dibenz(a,h)anthracene	0.983 U	1.01 U	0.976 U	0.974 U	NA
Dibenzofuran	0.983 U	**4.1**	0.976 U	0.974 U	NA
Diethyl phthalate	0.983 U	1.01 U	0.976 U	0.974 U	NA
Dimethyl phthalate	0.983 U	1.01 U	0.976 U	0.974 U	NA
Di-n-butyl phthalate	**1.73**	1.01 U	0.976 U	0.974 U	NA
Di-n-octyl phthalate	0.983 U	1.01 U	0.976 U	0.974 U	NA
Fluoranthene	**1.66**	1.01 U	0.976 U	0.974 U	NA
Fluorene	**2.19**	**5.26**	0.976 U	0.974 U	NA
Hexachlorobenzene	0.983 U	1.01 U	0.976 U	0.974 U	NA
Hexachlorobutadiene	1.97 U	2.01 U	1.95 U	1.95 U	NA
Hexachlorocyclopentadiene	4.92 U	5.03 U	4.88 U	4.87 U	NA
Hexachloroethane	1.97 U	2.01 U	1.95 U	1.95 U	NA
Indeno(1,2,3-cd)pyrene	0.983 U	1.01 U	0.976 U	0.974 U	NA
Isophorone	0.983 U	1.01 U	0.976 U	0.974 U	NA
Naphthalene	0.983 U	1.01 U	0.976 U	0.974 U	NA
Nitrobenzene	0.983 U	1.01 U	0.976 U	0.974 U	NA
N-Nitrosodimethylamine	0.983 U	1.01 U	0.976 U	0.974 U	NA
N-Nitrosodi-n-propylamine	1.97 U	2.01 U	1.95 U	1.95 U	NA
N-Nitrosodiphenylamine	0.983 U	1.01 U	0.976 U	0.974 U	NA
Pentachlorophenol	4.92 U	5.03 U	**205** J	**137** J	NA
Phenanthrene	0.983 U	**2.58**	0.976 U	0.974 U	NA
Phenol	**18.9**	**4.03**	1.95 U	1.95 U	NA
Pyrene	**1.39**	1.01 U	0.976 U	0.974 U	NA
Pyridine	4.92 U	5.03 U	4.88 U	4.87 U	NA

TABLE A-3
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FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	P 0502110-02 2/24/2005	Q 0502110-03 2/24/2005	RW1 0502087-04 2/17/2005	RW1-Dup W 0502087-05 2/17/2005	SDM-1 0502087-10 2/18/2005
PAHS (µg/L)					
Method SW8270SIM					
Acenaphthene	**1.74**	**4.71**	NA	NA	NA
Acenaphthylene	**0.0688**	**0.167**	NA	NA	NA
Anthracene	**0.118**	**0.266**	NA	NA	NA
Benz(a)anthracene	**0.187**	0.0492 U	NA	NA	NA
Benzo(a)pyrene	**0.0491**	0.0492 U	NA	NA	NA
Benzo(b)fluoranthene	**0.0884**	0.0492 U	NA	NA	NA
Benzo(g,h,i)perylene	0.0491 U	0.0492 U	NA	NA	NA
Benzo(k)fluoranthene	0.0491 U	0.0492 U	NA	NA	NA
Chrysene	**0.147**	0.0492 U	NA	NA	NA
Dibenz(a,h)anthracene	0.0491 U	0.0492 U	NA	NA	NA
Fluoranthene	**1.06**	**0.453**	NA	NA	NA
Fluorene	**1.45**	**5.13**	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.0491 U	0.0492 U	NA	NA	NA
Naphthalene	**1.15**	**0.837**	NA	NA	NA
Phenanthrene	**0.216**	**2.04**	NA	NA	NA
Pyrene	**0.766**	**0.276**	NA	NA	NA
VOLATILES (µg/L)					
Method SW8260					
1,1,1,2-Tetrachloroethane	1 U	1 U	1 U	1 U	NA
1,1,1-Trichloroethane	1 U	1 U	1 U	1 U	NA
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U	1 U	NA
1,1,2-Trichloroethane	1 U	1 U	1 U	1 U	NA
1,1-Dichloroethane	1 U	1 U	1 U	1 U	NA
1,1-Dichloroethene	1 U	1 U	1 U	1 U	NA
1,1-Dichloropropene	1 U	1 U	1 U	1 U	NA
1,2,3-Trichlorobenzene	1 U	1 U	1 U	1 U	NA
1,2,3-Trichloropropane	1 U	1 U	1 U	1 U	NA
1,2,4-Trichlorobenzene	1 U	1 U	1 U	1 U	NA
1,2,4-Trimethylbenzene	**39**	**6.55**	**133**	**160**	NA
1,2-Dibromo-3-chloropropane	1 U	1 U	1 U	1 U	NA
1,2-Dibromoethane	1 U	1 U	1 U	1 U	NA
1,2-Dichlorobenzene	1 U	1 U	1 U	1 U	NA
1,2-Dichloroethane	1 U	1 U	1 U	1 U	NA
1,2-Dichloropropane	1 U	1 U	1 U	1 U	NA
1,3,5-Trimethylbenzene	**62.3**	**7.33**	**2.54**	**2.31**	NA
1,3-Dichlorobenzene	1 U	1 U	1 U	1 U	NA
1,3-Dichloropropane	1 U	1 U	1 U	1 U	NA

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	P 0502110-02 2/24/2005	Q 0502110-03 2/24/2005	RW1 0502087-04 2/17/2005	RW1-Dup W 0502087-05 2/17/2005	SDM-1 0502087-10 2/18/2005
1,4-Dichlorobenzene	1 U	1 U	1 U	1 U	NA
2,2-Dichloropropane	1 U	1 U	1 U	1 U	NA
2-Butanone	10 U	10 U	10 U	10 U	NA
2-Chlorotoluene	1 U	1 U	1 U	1 U	NA
2-Hexanone	10 U	10 U	10 U	10 U	NA
4-Chlorotoluene	1 U	1 U	1 U	1 U	NA
4-Isopropyltoluene	**3.13**	1 U	1 U	1 U	NA
4-Methyl-2-pentanone	20 U	20 U	20 U	20 U	NA
Acetone	50 U	50 U	50 U	50 U	NA
Acrylonitrile	5 U	5 U	5 U	5 U	NA
Benzene	**1480**	**259**	**8.62**	**10**	NA
Bromobenzene	1 U	1 U	1 U	1 U	NA
Bromochloromethane	1 U	1 U	1 U	1 U	NA
Bromodichloromethane	1 U	1 U	1 U	1 U	NA
Bromoform	1 U	1 U	1 U	1 U	NA
Bromomethane	1 U	1 U	1 U	1 U	NA
Carbon disulfide	2 U	2 U	2 U	2 U	NA
Carbon tetrachloride	1 U	1 U	1 U	1 U	NA
Chlorobenzene	1 U	1 U	1 U	1 U	NA
Chloroethane	1 U	1 U	1 U	1 U	NA
Chloroform	1 U	1 U	1 U	1 U	NA
Chloromethane	1 U	1 U	1 U	1 U	NA
cis-1,2-Dichloroethene	1 U	1 U	1 U	1 U	NA
cis-1,3-Dichloropropene	1 U	1 U	1 U	1 U	NA
Dibromochloromethane	1 U	1 U	1 U	1 U	NA
Dibromomethane	1 U	1 U	1 U	1 U	NA
Dichlorodifluoromethane	1 U	1 U	1 U	1 U	NA
Ethylbenzene	**4.29**	**5.28**	**23.2**	**28.2**	NA
Hexachlorobutadiene	1 U	1 U	1 U	1 U	NA
Isopropylbenzene	**7.45**	**47.3**	**27.2** J	**35.8** J	NA
m,p-Xylene	**12.1**	**18.4**	2 U	2 U	NA
Methyl tert-butyl ether	1 U	1 U	1 U	1 U	NA
Methylene chloride	20 U	20 U	20 U	20 U	NA
Naphthalene	**6.91**	**2.61**	**6.78**	**8.21**	NA
n-Butylbenzene	**5.32**	**10.9**	**5.52**	**6.32**	NA
n-Propylbenzene	**10.9**	**86.6**	**27.1** J	**36.3** J	NA
o-Xylene	**22**	**7.62**	**54.3**	**63.8**	NA
sec-Butylbenzene	**1.52**	**5.91**	**7.89** J	**10.2** J	NA
Styrene	1 U	1 U	1 U	1 U	NA
tert-Butylbenzene	1 U	1 U	**3.4**	**3.94**	NA

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	P 0502110-02 2/24/2005	Q 0502110-03 2/24/2005	RW1 0502087-04 2/17/2005	RW1-Dup W 0502087-05 2/17/2005	SDM-1 0502087-10 2/18/2005
Tetrachloroethene	1 U	1 U	1 U	1 U	NA
Toluene	**4.78**	**11.4**	1 U	1 U	NA
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U	NA
trans-1,3-Dichloropropene	1 U	1 U	1 U	1 U	NA
Trichloroethene	1 U	1 U	1 U	1 U	NA
Trichlorofluoromethane	1 U	1 U	1 U	1 U	NA
Vinyl chloride	1 U	1 U	1 U	1 U	NA
TOTAL PETROLEUM HYDROCARBONS (µg/L)					
Method NWTPH-Dx/NWTPHg					
Diesel Range Hydrocarbons	**16200**	**3220**	**2620**	**2820**	NA
Lube Oil	499 U	489 U	494 U	498 U	NA
Gasoline Range Hydrocarbons	**3500**	**2280**	**2020** J	**2610** J	NA
PRIORITY POLLUTANT METALS (µg/L)					
Method 6010/6020					
Arsenic (total)	**37.8**	**38**	**3.43**	**3.45**	NA
Chromium (total)	5 U	**5.9**	5 U	**7.5**	NA
Copper (total)	10 U	10 U	10 U	10 U	NA
Lead (total)	**72.8**	**10.4**	0.331 U	0.316 U	NA
Nickel (total)	5 U	5 U	**17.5**	**17.3**	NA
Selenium (total)	NA	NA	20 U	20 U	NA
Zinc (total)	**13.3**	10 U	10 U	10 U	NA
DISSOLVED METALS (µg/L)					
Method 6010/6020					
Arsenic (dissolved)	NA	NA	NA	NA	NA
Chromium (dissolved)	NA	NA	NA	NA	NA
Copper (dissolved)	NA	NA	NA	NA	NA
Lead (dissolved)	NA	NA	NA	NA	NA
Nickel (dissolved)	NA	NA	NA	NA	NA
Zinc (dissolved)	NA	NA	NA	NA	NA

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	P 0502110-02 2/24/2005	Q 0502110-03 2/24/2005	RW1 0502087-04 2/17/2005	RW1-Dup W 0502087-05 2/17/2005	SDM-1 0502087-10 2/18/2005
CONVENTIONALS (µg/L)					
Calcium (total)	**64400**	**61400**	**44000**	**44600**	NA
Magnesium (total)	**16300**	**16800**	**16600**	**16900**	NA
Potassium (total)	**7360**	**5790**	**4930**	**5070**	NA
Sodium (total)	**7440**	**16700**	**10100**	**10400**	NA
Alkalinity, Bicarbonate (As CaCO3)	**360000**	**298000**	**157000**	**156000**	NA
Alkalinity, Carbonate (As CaCO3)	10000 U	10000 U	10000 U	10000 U	NA
Alkalinity, Total (As CaCO3)	**360000**	**298000**	**157000**	**156000**	NA
Chloride	**800**	**2730**	**6920**	**6490**	NA
Ferrous Iron	NA	NA	**28900**	**29400**	NA
Nitrogen, Nitrate (As N)	30 UJ	30 UJ	**186**	**173**	NA
Nitrogen, Nitrite	25 U	25 U	25 U	**26.9**	NA
Sulfate	500 U	500 U	**41400**	**41800**	NA
Total Dissolved Solids	**170000**	**455000**	**268000**	**265000**	NA
FIELD PARAMETERS					
pH (avg)	6.61	6.79	6.42	6.42	6.82
Temperature (° C) (avg)	13	13	14.6	14.6	12.2
Conductivity (mS/cm) (avg)	233	206	198	198	218
Dissolved oxygen (mg/L) (avg)	0	0.43	0	0	0.004
Turbidity (NTU)	78	10	0	0	30
Redox (mV)	NM	NM	NM	NM	NM

TABLE A-3
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, UPPER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	P 0502110-02 2/24/2005	Q 0502110-03 2/24/2005	RW1 0502087-04 2/17/2005	RW1-Dup W 0502087-05 2/17/2005	SDM-1 0502087-10 2/18/2005
DIOXINS/FURANS (ng/L)					
Method 8290					
1,2,3,4,6,7,8-HpCDD	NA	NA	**0.115509**	NA	NA
1,2,3,4,6,7,8-HpCDF	NA	NA	**0.015291** J	NA	NA
1,2,3,4,7,8,9-HpCDF	NA	NA	0.000732 U	NA	NA
1,2,3,4,7,8-HxCDD	NA	NA	0.000436 U	NA	NA
1,2,3,4,7,8-HxCDF	NA	NA	0.00151 UJ	NA	NA
1,2,3,6,7,8-HxCDD	NA	NA	0.001897 UJ	NA	NA
1,2,3,6,7,8-HxCDF	NA	NA	0.000474 U	NA	NA
1,2,3,7,8,9-HxCDD	NA	NA	0.000415 U	NA	NA
1,2,3,7,8,9-HxCDF	NA	NA	0.000583 U	NA	NA
1,2,3,7,8-PeCDD	NA	NA	0.000549 U	NA	NA
1,2,3,7,8-PeCDF	NA	NA	0.00024 U	NA	NA
2,3,4,6,7,8-HxCDF	NA	NA	0.000506 U	NA	NA
2,3,4,7,8-PeCDF	NA	NA	0.000231 U	NA	NA
2,3,7,8-TCDD	NA	NA	0.000208 U	NA	NA
2,3,7,8-TCDF	NA	NA	0.000455 U	NA	NA
OCDD	NA	NA	**1.148422**	NA	NA
OCDF	NA	NA	**0.103526**	NA	NA
Total HpCDD	NA	NA	**0.189293**	NA	NA
Total HpCDF	NA	NA	**0.073902**	NA	NA
Total HxCDD	NA	NA	**0.019999**	NA	NA
Total HxCDF	NA	NA	**0.01711**	NA	NA
Total PeCDD	NA	NA	0.000549 U	NA	NA
Total PeCDF	NA	NA	**0.000754**	NA	NA
Total TCDD	NA	NA	0.000208 U	NA	NA
Total TCDF	NA	NA	**0.001836**	NA	NA
Total TEQ	NA	NA	**0.00256**	NA	NA

NA = Not analyzed.
NM = Not measured.
U = Indicates compound was analyzed for, but was not detected at the reported sample detection limit.
UJ = The analyte was not detected in the sample; the reported sample detection limit is an estimate.
J = indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
Bold indicates detected constituent.

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	B2 0502102-03 2/23/2005	G1A 0502087-13 2/18/2005	J2 0502102-01 2/23/2005	LW1D 0502099-02 2/22/2005	LW3D 0502102-06 2/23/2005	LW4DR 0502102-11 2/23/2005	LW6D 0502087-06 2/18/2005	LW9D 0502087-07 2/18/2005	LW10D 0502102-10 2/23/2005	LW11D 0502087-03 2/17/2005
CHLORINATED PHENOLS (µg/L)										
Method SW8270SIM										
Pentachlorophenol	0.506 U	0.509 U	0.503 U	NA	0.484 U	0.503 U	**0.607**	0.507 U	0.504 U	0.49 U
SEMIVOLATILES (µg/L)										
Method SW8270										
1,2,4-Trichlorobenzene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
1,2-Dichlorobenzene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
1,3-Dichlorobenzene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
1,4-Dichlorobenzene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
2,3,4,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.95 U
2,3,5,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.95 U
2,4,5-Trichlorophenol	5.16 U	5.21 U	5.19 U	5.09 U	4.81 U	5.13 U	5.12 U	5.06 U	5 U	4.95 U
2,4,6-Trichlorophenol	5.16 U	5.21 U	5.19 U	5.09 U	4.81 U	5.13 U	5.12 U	5.06 U	5 U	4.95 U
2,4-Dichlorophenol	3.1 U	3.13 U	3.11 U	3.05 U	2.88 U	3.08 U	3.07 U	3.03 U	3 U	2.97 U
2,4-Dimethylphenol	3.1 U	3.13 U	3.11 U	3.05 U	2.88 U	3.08 U	3.07 U	3.03 U	3 U	2.97 U
2,4-Dinitrophenol	10.3 U	10.4 U	10.4 U	10.2 U	9.62 U	10.3 U	10.2 U	10.1 U	9.99 U	9.89 U
2,4-Dinitrotoluene	5.16 U	5.21 U	5.19 U	5.09 U	4.81 U	5.13 U	5.12 U	5.06 U	5 U	4.95 U
2,6-Dinitrotoluene	5.16 U	5.21 U	5.19 U	5.09 U	4.81 U	5.13 U	5.12 U	5.06 U	5 U	4.95 U
2-Chloronaphthalene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
2-Chlorophenol	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
2-Methylnaphthalene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
2-Methylphenol	2.06 U	2.09 U	2.07 U	2.04 U	1.92 U	2.05 U	2.05 U	2.02 U	2 U	1.98 U
2-Nitroaniline	5.16 U	5.21 U	5.19 U	5.09 U	4.81 U	5.13 U	5.12 U	5.06 U	5 U	4.95 U
2-Nitrophenol	5.16 U	5.21 U	5.19 U	5.09 U	4.81 U	5.13 U	5.12 U	5.06 U	5 U	4.95 U
3-&4-Methylphenol	10.3 U	10.4 U	10.4 U	10.2 U	9.62 U	10.3 U	10.2 U	10.1 U	9.99 U	9.89 U
3,3'-Dichlorobenzidine	5.16 U	5.21 U	5.19 U	5.09 U	4.81 U	5.13 U	5.12 U	5.06 U	5 U	4.95 U
3-Nitroaniline	6.19 U	6.26 U	6.22 U	6.11 U	5.77 U	6.16 U	6.15 U	6.07 U	5.99 U	5.93 U
4,6-Dinitro-2-methylphenol	10.3 U	10.4 U	10.4 U	10.2 U	9.62 U	10.3 U	10.2 U	10.1 U	9.99 U	9.89 U
4-Bromophenyl phenyl ether	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
4-Chloro-3-methylphenol	2.06 U	2.09 U	2.07 U	2.04 U	1.92 U	2.05 U	2.05 U	2.02 U	2 U	1.98 U
4-Chloroaniline	3.1 U	3.13 U	3.11 U	3.05 U	2.88 U	3.08 U	3.07 U	3.03 U	3 U	2.97 U
4-Chlorophenyl phenyl ether	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
4-Nitroaniline	5.16 U	5.21 U	5.19 U	5.09 U	4.81 U	5.13 U	5.12 U	5.06 U	5 U	4.95 U
4-Nitrophenol	5.16 U	5.21 U	5.19 U	5.09 U	4.81 U	5.13 U	5.12 U	5.06 U	5 U	4.95 U
Acenaphthene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Acenaphthylene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Anthracene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Benz(a)anthracene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Benzo(a)pyrene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	B2 0502102-03 2/23/2005	G1A 0502087-13 2/18/2005	J2 0502102-01 2/23/2005	LW1D 0502099-02 2/22/2005	LW3D 0502102-06 2/23/2005	LW4DR 0502102-11 2/23/2005	LW6D 0502087-06 2/18/2005	LW9D 0502087-07 2/18/2005	LW10D 0502102-10 2/23/2005	LW11D 0502087-03 2/17/2005
Benzo(b)fluoranthene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Benzo(g,h,i)perylene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Benzo(k)fluoranthene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Benzoic Acid	20.6 U	20.9 U	20.7 U	20.4 U	19.2 U	20.5 U	20.5 U	20.2 U	20 U	19.8 U
Benzyl Alcohol	5.16 U	5.21 U	5.19 U	5.09 U	4.81 U	5.13 U	5.12 U	5.06 U	5 U	4.95 U
Bis(2-chloroethoxy)methane	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Bis(2-chloroethyl)ether	2.06 U	2.09 U	2.07 U	2.04 U	1.92 U	2.05 U	2.05 U	2.02 U	2 U	1.98 U
Bis(2-chloroisopropyl)ether	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Bis(2-ethylhexyl)phthalate	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Butyl benzyl phthalate	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Carbazole	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Chrysene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Dibenz(a,h)anthracene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Dibenzofuran	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Diethyl phthalate	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Dimethyl phthalate	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Di-n-butyl phthalate	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Di-n-octyl phthalate	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Fluoranthene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Fluorene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Hexachlorobenzene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Hexachlorobutadiene	2.06 U	2.09 U	2.07 U	2.04 U	1.92 U	2.05 U	2.05 U	2.02 U	2 U	1.98 U
Hexachlorocyclopentadiene	5.16 U	5.21 U	5.19 U	5.09 U	4.81 U	5.13 U	5.12 U	5.06 U	5 U	4.95 U
Hexachloroethane	2.06 U	2.09 U	2.07 U	2.04 U	1.92 U	2.05 U	2.05 U	2.02 U	2 U	1.98 U
Indeno(1,2,3-cd)pyrene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Isophorone	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Naphthalene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Nitrobenzene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
N-Nitrosodimethylamine	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
N-Nitrosodi-n-propylamine	2.06 U	2.09 U	2.07 U	2.04 U	1.92 U	2.05 U	2.05 U	2.02 U	2 U	1.98 U
N-Nitrosodiphenylamine	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Pentachlorophenol	5.16 U	5.21 U	5.19 U	5.09 U	4.81 U	5.13 U	5.12 U	5.06 U	5 U	4.95 U
Phenanthrene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Phenol	2.06 U	2.09 U	2.07 U	2.04 U	1.92 U	2.05 U	2.05 U	2.02 U	2 U	1.98 U
Pyrene	1.03 U	1.04 U	1.04 U	1.02 U	0.962 U	1.03 U	1.02 U	1.01 U	0.999 U	0.989 U
Pyridine	5.16 U	5.21 U	5.19 U	5.09 U	4.81 U	5.13 U	5.12 U	5.06 U	5 U	4.95 U

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	B2 0502102-03 2/23/2005	G1A 0502087-13 2/18/2005	J2 0502102-01 2/23/2005	LW1D 0502099-02 2/22/2005	LW3D 0502102-06 2/23/2005	LW4DR 0502102-11 2/23/2005	LW6D 0502087-06 2/18/2005	LW9D 0502087-07 2/18/2005	LW10D 0502102-10 2/23/2005	LW11D 0502087-03 2/17/2005
PAHS (µg/L)										
Method SW8270SIM										
Acenaphthene	NA	NA	NA	0.0514 U	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	0.0514 U	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	0.0514 U	NA	NA	NA	NA	NA	NA
Benz(a)anthracene	NA	NA	NA	0.0514 U	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	0.0514 U	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	0.0514 U	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	0.0514 U	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	0.0514 U	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	0.0514 U	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	0.0514 U	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	0.0514 U	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	0.0514 U	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	0.0514 U	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	0.0514 U	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	0.0514 U	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	0.0514 U	NA	NA	NA	NA	NA	NA
VOLATILES (µg/L)										
Method SW8260										
1,1,1,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	**1.53**	1 U	1 U	**1**
1,2-Dibromo-3-chloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	B2 0502102-03 2/23/2005	G1A 0502087-13 2/18/2005	J2 0502102-01 2/23/2005	LW1D 0502099-02 2/22/2005	LW3D 0502102-06 2/23/2005	LW4DR 0502102-11 2/23/2005	LW6D 0502087-06 2/18/2005	LW9D 0502087-07 2/18/2005	LW10D 0502102-10 2/23/2005	LW11D 0502087-03 2/17/2005
1,4-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2,2-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorotoluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorotoluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Isopropyltoluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Methyl-2-pentanone	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Acetone	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Acrylonitrile	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Bromobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon disulfide	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Carbon tetrachloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromomethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	1 U	**1.06**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Isopropylbenzene	1 U	**218**	1 U	1 U	1 U	1 U	**2.06**	**1.64**	1 U	1 U
m,p-Xylene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Methyl tert-butyl ether	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylene chloride	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Naphthalene	1 U	**5.45**	1 U	1 U	**3.5**	1 U	**3.91**	1 U	1 U	**3.1**
n-Butylbenzene	1 U	**18.8**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
n-Propylbenzene	1 U	**247**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
o-Xylene	1 U	**1.09**	1 U	1 U	1 U	1 U	**1.6**	1 U	1 U	**1.26**
sec-Butylbenzene	1 U	**34.4**	1 U	1 U	1 U	1 U	**4.04**	1 U	1 U	1 U
Styrene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
tert-Butylbenzene	1 U	**7.49**	1 U	1 U	1 U	1 U	**6.03**	**2.71**	1 U	1 U

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	B2 0502102-03 2/23/2005	G1A 0502087-13 2/18/2005	J2 0502102-01 2/23/2005	LW1D 0502099-02 2/22/2005	LW3D 0502102-06 2/23/2005	LW4DR 0502102-11 2/23/2005	LW6D 0502087-06 2/18/2005	LW9D 0502087-07 2/18/2005	LW10D 0502102-10 2/23/2005	LW11D 0502087-03 2/17/2005
Tetrachloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl chloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL PETROLEUM HYDROCARBONS (µg/L)										
Method NWTPH-Dx/NWTPHg										
Diesel Range Hydrocarbons	NA	**3600**	NA	259 U	247 U	252 U	**1570**	255 U	246 U	**482**
Lube Oil	NA	501 U	NA	583 U	494 U	504 U	517 U	511 U	492 U	484 U
Gasoline Range Hydrocarbons	NA	NA	NA	100 U	NA	NA	NA	**436**	100 U	**328**
PRIORITY POLLUTANT METALS (µg/L)										
Method 6010/6020										
Arsenic (total)	1 U	**30.3**	**12.6**	**6.37**	**15.7**	**5.81**	**11.3**	**32.1**	**17.5**	**5**
Chromium (total)	**7.6**	**5.3**	**6.9**	**9.6**	**13.7**	**10.1**	**7.7**	**8.6**	**15.6**	**8.4**
Copper (total)	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Lead (total)	0.1 U	**0.572**	0.136 U	**3.63**	**4.67**	**0.876**	0.168 U	**1.44**	**2.34**	**1.29**
Nickel (total)	**17.2**	**101**	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Selenium (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc (total)	10 U	10 U	10 U	**19.5**	**26.2**	**35.3**	10 U	**14.6**	**24.6**	10 U
DISSOLVED METALS (µg/L)										
Method 6010/6020										
Arsenic (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-4
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FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	B2 0502102-03 2/23/2005	G1A 0502087-13 2/18/2005	J2 0502102-01 2/23/2005	LW1D 0502099-02 2/22/2005	LW3D 0502102-06 2/23/2005	LW4DR 0502102-11 2/23/2005	LW6D 0502087-06 2/18/2005	LW9D 0502087-07 2/18/2005	LW10D 0502102-10 2/23/2005	LW11D 0502087-03 2/17/2005
CONVENTIONALS (µg/L)										
Calcium (total)	**43700**	**63100**	**55900**	**43600**	**57300**	**42100**	**42400**	**37200**	**16400**	**60400**
Magnesium (total)	**14700**	**22300**	**29100**	**29800**	**29300**	**23600**	**17200**	**12900**	**9760**	**28300**
Potassium (total)	**5230**	**2070**	**2920**	**1660**	**4250**	**2840**	**2570**	**2070**	**945**	**2420**
Sodium (total)	**9930**	**13100**	**16200**	**14600**	**14900**	**20000**	**11300**	**6060**	**8230**	**17500**
Alkalinity, Bicarbonate (As CaCO3)	**216000**	**268000**	**309000**	**255000**	**303000**	**239000**	**210000**	**147000**	**87500**	**301000**
Alkalinity, Carbonate (As CaCO3)	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U
Alkalinity, Total (As CaCO3)	**216000**	**268000**	**309000**	**255000**	**303000**	**239000**	**210000**	**147000**	**87500**	**301000**
Chloride	**3850**	**4790**	**4510**	**2440**	**3390**	**4100**	**2530**	**1580**	**1590**	**5650**
Ferrous Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrogen, Nitrate (As N)	**792**	30 U	30 U	30 U	30 U	30 U	30 U	**95.9**	30 U	30 U
Nitrogen, Nitrite	25 U	25 U	25 U	25 U	25 U	25 U	25 U	**25.7**	25 U	25 U
Sulfate	**980**	500 U	500 U	500 U	500 U	500 U	500 U	**9150**	**4150**	**18500**
Total Dissolved Solids	**262000**	**328000**	**308000**	**328000**	**287000**	**379000**	**249000**	**207000**	**96000**	**382000**
FIELD PARAMETERS										
pH (avg)	7.06	6.67	0	6.92	6.79	6.73	6.66	7.68	7.02	6.84
Temperature (° C) (avg)	14.4	13.5	6.71	14.4	14	14.8	14.5	15	15.5	13.1
Conductivity (mS/cm) (avg)	190	188	14.2	223	214	197	219	195	103	214
Dissolved oxygen (mg/L) (avg)	2.31	0	204	1.99	3.38	1.38	0.52	1.82	2.2	0.88
Turbidity (NTU)	0	31	0.52	0	91	71	0	21	81	45
Redox (mV)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM

TABLE A-4
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TIME OIL NORTHWEST TERMINAL

	B2 0502102-03 2/23/2005	G1A 0502087-13 2/18/2005	J2 0502102-01 2/23/2005	LW1D 0502099-02 2/22/2005	LW3D 0502102-06 2/23/2005	LW4DR 0502102-11 2/23/2005	LW6D 0502087-06 2/18/2005	LW9D 0502087-07 2/18/2005	LW10D 0502102-10 2/23/2005	LW11D 0502087-03 2/17/2005
DIOXINS/FURANS (ng/L)										
Method 8290										
1,2,3,4,6,7,8-HpCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PeCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HpCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PeCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TEQ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW14D 0502102-09 2/23/2005	LW17D 0502087-11 2/18/2005	LW18D 0502087-08 2/18/2005	LW20D 0502110-07 2/24/2005	LW22D 0502099-04 2/22/2005	LW23D 0502099-05 2/22/2005	LW24D 0502088-06 2/18/2005	LW25D 0502088-07 2/18/2005	LW26D 0502110-04 2/24/2005	LW27D 0502110-05 2/24/2005
CHLORINATED PHENOLS (µg/L)										
Method SW8270SIM										
Pentachlorophenol	0.513 U	0.499 U	0.507 U	NA	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (µg/L)										
Method SW8270										
1,2,4-Trichlorobenzene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
1,2-Dichlorobenzene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
1,3-Dichlorobenzene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
1,4-Dichlorobenzene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
2,3,4,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,5,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	5.05 U	5.18 U	4.95 U	5.04 U	4.84 U	4.94 U	5.25 U
2,4,6-Trichlorophenol	NA	NA	NA	5.05 U	5.18 U	4.95 U	5.04 U	4.84 U	4.94 U	5.25 U
2,4-Dichlorophenol	NA	NA	NA	3.03 U	3.11 U	2.97 U	3.02 U	2.91 U	2.96 U	3.15 U
2,4-Dimethylphenol	NA	NA	NA	3.03 U	3.11 U	2.97 U	3.02 U	2.91 U	2.96 U	3.15 U
2,4-Dinitrophenol	NA	NA	NA	10.1 U	10.4 U	9.89 U	10.1 U	9.69 U	9.87 U	10.5 U
2,4-Dinitrotoluene	NA	NA	NA	5.05 U	5.18 U	4.95 U	5.04 U	4.84 U	4.94 U	5.25 U
2,6-Dinitrotoluene	NA	NA	NA	5.05 U	5.18 U	4.95 U	5.04 U	4.84 U	4.94 U	5.25 U
2-Chloronaphthalene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
2-Chlorophenol	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
2-Methylnaphthalene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
2-Methylphenol	NA	NA	NA	2.02 U	2.07 U	1.98 U	2.02 U	1.94 U	1.97 U	2.1 U
2-Nitroaniline	NA	NA	NA	5.05 U	5.18 U	4.95 U	5.04 U	4.84 U	4.94 U	5.25 U
2-Nitrophenol	NA	NA	NA	5.05 U	5.18 U	4.95 U	5.04 U	4.84 U	4.94 U	5.25 U
3-&4-Methylphenol	NA	NA	NA	10.1 U	10.4 U	9.89 U	10.1 U	9.69 U	9.87 U	10.5 U
3,3'-Dichlorobenzidine	NA	NA	NA	5.05 U	5.18 U	4.95 U	5.04 U	4.84 U	4.94 U	5.25 U
3-Nitroaniline	NA	NA	NA	6.05 U	6.22 U	5.93 U	6.05 U	5.81 U	5.92 U	6.3 U
4,6-Dinitro-2-methylphenol	NA	NA	NA	10.1 U	10.4 U	9.89 U	10.1 U	9.69 U	9.87 U	10.5 U
4-Bromophenyl phenyl ether	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
4-Chloro-3-methylphenol	NA	NA	NA	2.02 U	2.07 U	1.98 U	2.02 U	1.94 U	1.97 U	2.1 U
4-Chloroaniline	NA	NA	NA	3.03 U	3.11 U	2.97 U	3.02 U	2.91 U	2.96 U	3.15 U
4-Chlorophenyl phenyl ether	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
4-Nitroaniline	NA	NA	NA	5.05 U	5.18 U	4.95 U	5.04 U	4.84 U	4.94 U	5.25 U
4-Nitrophenol	NA	NA	NA	5.05 U	5.18 U	4.95 U	5.04 U	4.84 U	4.94 U	5.25 U
Acenaphthene	NA	NA	NA	1.01 U	1.04 U	0.989 U	**1.21**	**1.03**	0.987 U	1.05 U
Acenaphthylene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Anthracene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Benz(a)anthracene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Benzo(a)pyrene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW14D 0502102-09 2/23/2005	LW17D 0502087-11 2/18/2005	LW18D 0502087-08 2/18/2005	LW20D 0502110-07 2/24/2005	LW22D 0502099-04 2/22/2005	LW23D 0502099-05 2/22/2005	LW24D 0502088-06 2/18/2005	LW25D 0502088-07 2/18/2005	LW26D 0502110-04 2/24/2005	LW27D 0502110-05 2/24/2005
Benzo(b)fluoranthene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Benzo(g,h,i)perylene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Benzo(k)fluoranthene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Benzoic Acid	NA	NA	NA	20.2 U	20.7 U	19.8 U	20.2 U	19.4 U	19.7 U	21 U
Benzyl Alcohol	NA	NA	NA	5.05 U	5.18 U	4.95 U	5.04 U	4.84 U	4.94 U	5.25 U
Bis(2-chloroethoxy)methane	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Bis(2-chloroethyl)ether	NA	NA	NA	2.02 U	2.07 U	1.98 U	2.02 U	1.94 U	1.97 U	2.1 U
Bis(2-chloroisopropyl)ether	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Bis(2-ethylhexyl)phthalate	NA	NA	NA	**21.7**	1.04 U	**1.26**	1.01 U	**4.57**	**32.8**	**17.8**
Butyl benzyl phthalate	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Carbazole	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Chrysene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Dibenz(a,h)anthracene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Dibenzofuran	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Diethyl phthalate	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Dimethyl phthalate	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Di-n-butyl phthalate	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Di-n-octyl phthalate	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Fluoranthene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Fluorene	NA	NA	NA	1.01 U	1.04 U	0.989 U	**2.79**	**2.15**	0.987 U	1.05 U
Hexachlorobenzene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Hexachlorobutadiene	NA	NA	NA	2.02 U	2.07 U	1.98 U	2.02 U	1.94 U	1.97 U	2.1 U
Hexachlorocyclopentadiene	NA	NA	NA	5.05 U	5.18 U	4.95 U	5.04 U	4.84 U	4.94 U	5.25 U
Hexachloroethane	NA	NA	NA	2.02 U	2.07 U	1.98 U	2.02 U	1.94 U	1.97 U	2.1 U
Indeno(1,2,3-cd)pyrene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Isophorone	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Naphthalene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Nitrobenzene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
N-Nitrosodimethylamine	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
N-Nitrosodi-n-propylamine	NA	NA	NA	2.02 U	2.07 U	1.98 U	2.02 U	1.94 U	1.97 U	2.1 U
N-Nitrosodiphenylamine	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Pentachlorophenol	NA	NA	NA	5.05 U	5.18 U	4.95 U	5.04 U	4.84 U	4.94 U	5.25 U
Phenanthrene	NA	NA	NA	1.01 U	1.04 U	0.989 U	**1.79**	**1.02**	0.987 U	1.05 U
Phenol	NA	NA	NA	2.02 U	2.07 U	1.98 U	2.02 U	1.94 U	1.97 U	2.1 U
Pyrene	NA	NA	NA	1.01 U	1.04 U	0.989 U	1.01 U	0.969 U	0.987 U	1.05 U
Pyridine	NA	NA	NA	5.05 U	5.18 U	4.95 U	5.04 U	4.84 U	4.94 U	5.25 U

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW14D 0502102-09 2/23/2005	LW17D 0502087-11 2/18/2005	LW18D 0502087-08 2/18/2005	LW20D 0502110-07 2/24/2005	LW22D 0502099-04 2/22/2005	LW23D 0502099-05 2/22/2005	LW24D 0502088-06 2/18/2005	LW25D 0502088-07 2/18/2005	LW26D 0502110-04 2/24/2005	LW27D 0502110-05 2/24/2005
PAHS (µg/L)										
Method SW8270SIM										
Acenaphthene	NA	NA	NA	**0.00509**	0.0501 U	**0.508**	**1.3**	**1.1**	**0.0907**	0.0535 U
Acenaphthylene	NA	NA	NA	0.00509 U	0.0501 U	**0.0896**	**0.324**	**0.305**	0.0504 U	0.0535 U
Anthracene	NA	NA	NA	0.00509 U	0.0501 U	**0.0498**	**0.364**	**0.448**	0.0504 U	0.0535 U
Benz(a)anthracene	NA	NA	NA	0.00509 U	0.0501 U	0.0498 U	**0.142**	**0.244**	0.0504 U	0.0535 U
Benzo(a)pyrene	NA	NA	NA	0.00509 U	0.0501 U	0.0498 U	**0.081**	**0.244**	0.0504 U	0.0535 U
Benzo(b)fluoranthene	NA	NA	NA	0.00509 U	0.0501 U	0.0498 U	**0.081**	**0.204**	0.0504 U	0.0535 U
Benzo(g,h,i)perylene	NA	NA	NA	0.00509 U	0.0501 U	0.0498 U	**0.0506**	**0.132**	0.0504 U	0.0535 U
Benzo(k)fluoranthene	NA	NA	NA	0.00509 U	0.0501 U	0.0498 U	0.0506 U	**0.0713**	0.0504 U	0.0535 U
Chrysene	NA	NA	NA	0.00509 U	0.0501 U	0.0498 U	**0.101**	**0.214**	0.0504 U	0.0535 U
Dibenz(a,h)anthracene	NA	NA	NA	0.00509 U	0.0501 U	0.0498 U	0.0506 U	0.0509 U	0.0504 U	0.0535 U
Fluoranthene	NA	NA	NA	0.00509 U	0.0501 U	**0.0498**	**0.344**	**0.835**	0.0504 U	0.0535 U
Fluorene	NA	NA	NA	0.00509 U	0.0501 U	**0.239**	**3.69**	**2.9**	0.0504 U	0.0535 U
Indeno(1,2,3-cd)pyrene	NA	NA	NA	0.00509 U	0.0501 U	0.0498 U	0.0506 U	**0.0916**	0.0504 U	0.0535 U
Naphthalene	NA	NA	NA	**0.00509**	0.0501 U	0.339 U	**0.587**	**0.55**	**0.121**	**0.0749**
Phenanthrene	NA	NA	NA	0.00509 U	0.0501 U	**0.0598**	**2.13**	**1.32**	0.0504 U	0.0535 U
Pyrene	NA	NA	NA	0.00509 U	0.0501 U	**0.0797**	**0.476**	**1.1**	0.0504 U	0.0535 U
VOLATILES (µg/L)										
Method SW8260										
1,1,1,2-Tetrachloroethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichloropropane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW14D 0502102-09 2/23/2005	LW17D 0502087-11 2/18/2005	LW18D 0502087-08 2/18/2005	LW20D 0502110-07 2/24/2005	LW22D 0502099-04 2/22/2005	LW23D 0502099-05 2/22/2005	LW24D 0502088-06 2/18/2005	LW25D 0502088-07 2/18/2005	LW26D 0502110-04 2/24/2005	LW27D 0502110-05 2/24/2005
1,4-Dichlorobenzene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2,2-Dichloropropane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorotoluene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Hexanone	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorotoluene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Isopropyltoluene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Methyl-2-pentanone	NA	NA	NA	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Acetone	NA	NA	NA	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Acrylonitrile	NA	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	NA	NA	NA	0.3 U	0.3 U	**8.76**	0.3 U	0.3 U	**5.6**	0.3 U
Bromobenzene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromochloromethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon disulfide	NA	NA	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Carbon tetrachloride	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromomethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Isopropylbenzene	NA	NA	NA	1 U	1 U	**8.96**	**6.19**	1 U	**7.35**	1 U
m,p-Xylene	NA	NA	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Methyl tert-butyl ether	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	**5.38**	**7.68**
Methylene chloride	NA	NA	NA	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Naphthalene	NA	NA	NA	**2.4**	1 U	1.64 U	1 U	1 U	1 U	1 U
n-Butylbenzene	NA	NA	NA	1 U	1 U	**4.49**	**5.94**	1 U	1 U	1 U
n-Propylbenzene	NA	NA	NA	1 U	1 U	**5.75**	**8.13**	1 U	**4.47**	1 U
o-Xylene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
sec-Butylbenzene	NA	NA	NA	1 U	1 U	**1.57**	**3.33**	1 U	1 U	1 U
Styrene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
tert-Butylbenzene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW14D 0502102-09 2/23/2005	LW17D 0502087-11 2/18/2005	LW18D 0502087-08 2/18/2005	LW20D 0502110-07 2/24/2005	LW22D 0502099-04 2/22/2005	LW23D 0502099-05 2/22/2005	LW24D 0502088-06 2/18/2005	LW25D 0502088-07 2/18/2005	LW26D 0502110-04 2/24/2005	LW27D 0502110-05 2/24/2005
Tetrachloroethene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	**1.02**	1 U
trans-1,2-Dichloroethene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl chloride	NA	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL PETROLEUM HYDROCARBONS (µg/L) Method NWTPH-Dx/NWTPHg										
Diesel Range Hydrocarbons	NA	**2080**	**2800**	**459**	**1230**	**2750**	**4920**	**2200**	**1560**	**1020**
Lube Oil	NA	499 U	503 U	768 U	1260 U	492 U	498 U	519 U	491 U	509 U
Gasoline Range Hydrocarbons	NA	**3370**	**2900**	162 U	100 U	**598**	**958**	**526**	**469**	110 U
PRIORITY POLLUTANT METALS (µg/L) Method 6010/6020										
Arsenic (total)	NA	NA	NA	**33**	**23.4**	**63.8**	**84.1**	**95.1**	**15.2**	**15.6**
Chromium (total)	NA	NA	NA	**9.4**	**8.4**	**12.2**	**15.2**	**19.9**	**11.9**	**112**
Copper (total)	NA	NA	NA	10 U	10 U	10 U	**16.2**	**19.6**	10 U	**118**
Lead (total)	NA	NA	NA	**0.426**	**0.85**	**4.94**	**20.9**	**22.2**	**2.6**	**40.7**
Nickel (total)	NA	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	**82.1**
Selenium (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc (total)	NA	NA	NA	10 U	10 U	**21.3**	**50.2**	**59.4**	**17.4**	**299**
DISSOLVED METALS (µg/L) Method 6010/6020										
Arsenic (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW14D 0502102-09 2/23/2005	LW17D 0502087-11 2/18/2005	LW18D 0502087-08 2/18/2005	LW20D 0502110-07 2/24/2005	LW22D 0502099-04 2/22/2005	LW23D 0502099-05 2/22/2005	LW24D 0502088-06 2/18/2005	LW25D 0502088-07 2/18/2005	LW26D 0502110-04 2/24/2005	LW27D 0502110-05 2/24/2005
CONVENTIONALS (µg/L)										
Calcium (total)	NA	NA	NA	**53300**	**47100**	**38200**	**59700**	**41200**	**59000**	**86000**
Magnesium (total)	NA	NA	NA	**15500**	**14300**	**10300**	**18000**	**13000**	**24500**	**52600**
Potassium (total)	NA	NA	NA	**1400**	**6640**	**5710**	**4830**	**3460**	**1330**	**5230**
Sodium (total)	NA	NA	NA	**11600**	**22800**	**135000**	**15200**	**12500**	**23000**	**20800**
Alkalinity, Bicarbonate (As CaCO3)	NA	NA	NA	**238000**	**244000**	**338000**	**235000**	**150000**	**305000**	**224000**
Alkalinity, Carbonate (As CaCO3)	NA	NA	NA	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U
Alkalinity, Total (As CaCO3)	NA	NA	NA	**238000**	**244000**	**338000**	**235000**	**150000**	**305000**	**224000**
Chloride	NA	NA	NA	**3120**	**1240**	**2140**	**3220**	**1920**	**2360**	**2870**
Ferrous Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrogen, Nitrate (As N)	NA	NA	NA	30 UJ	**218**	**101**	30 U	30 U	30 UJ	30 UJ
Nitrogen, Nitrite	NA	NA	NA	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Sulfate	NA	NA	NA	500 U	**2840**	**510**	500 U	500 U	500 U	**600**
Total Dissolved Solids	NA	NA	NA	**360000**	**295000**	**421000**	**289000**	**211000**	**451000**	**349000**
FIELD PARAMETERS										
pH (avg)	6.65	6.61	6.61	7.01	6.43	6.61	6.79	6.59	7.1	6.82
Temperature (° C) (avg)	13.9	15.1	13.9	15	15.4	14.6	13.9	14.9	13.1	16
Conductivity (mS/cm) (avg)	177	205	211	196	235	267	201	207	219	207
Dissolved oxygen (mg/L) (avg)	0	0.96	1.05	0	1.79	1.63	2.24	0.07	0	0
Turbidity (NTU)	77	10	43	53	0	125	391	945	109	0
Redox (mV)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW14D 0502102-09 2/23/2005	LW17D 0502087-11 2/18/2005	LW18D 0502087-08 2/18/2005	LW20D 0502110-07 2/24/2005	LW22D 0502099-04 2/22/2005	LW23D 0502099-05 2/22/2005	LW24D 0502088-06 2/18/2005	LW25D 0502088-07 2/18/2005	LW26D 0502110-04 2/24/2005	LW27D 0502110-05 2/24/2005
DIOXINS/FURANS (ng/L)										
Method 8290										
1,2,3,4,6,7,8-HpCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PeCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HpCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PeCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TEQ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW29D 0502059-01 2/15/2005	LW30D 0502059-04 2/15/2005	LW32D 0502056-03 2/14/2005	LW35D 0502099-08 2/22/2005	LW36D 0502088-01 2/17/2005	LW37D 0502088-02 2/17/2005	LW38D 0502088-03 2/17/2005	LW39D 0502088-04 2/17/2005	LW39D-Dup Y 0502088-05 2/17/2005	LW40D 0502099-09 2/22/2005
CHLORINATED PHENOLS (µg/L)										
Method SW8270SIM										
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (µg/L)										
Method SW8270										
1,2,4-Trichlorobenzene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
1,2-Dichlorobenzene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
1,3-Dichlorobenzene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
1,4-Dichlorobenzene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
2,3,4,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	4.95 U	NA
2,3,5,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	4.95 U	NA
2,4,5-Trichlorophenol	4.79 U	5.11 U	4.76 U	5 U	4.76 U	5.04 U	4.99 U	4.89 U	4.95 U	5 U
2,4,6-Trichlorophenol	4.79 U	5.11 U	4.76 U	5 U	4.76 U	5.04 U	4.99 U	4.89 U	4.95 U	5 U
2,4-Dichlorophenol	2.88 U	3.07 U	2.86 U	3 U	2.85 U	3.02 U	2.99 U	2.93 U	2.97 U	3 U
2,4-Dimethylphenol	2.88 U	3.07 U	2.86 U	3 U	2.85 U	3.02 U	2.99 U	2.93 U	2.97 U	3 U
2,4-Dinitrophenol	9.59 U	10.2 U	9.52 U	10 U	9.51 U	10.1 U	9.97 U	9.78 U	9.9 U	9.99 U
2,4-Dinitrotoluene	4.79 U	5.11 U	4.76 U	5 U	4.76 U	5.04 U	4.99 U	4.89 U	4.95 U	5 U
2,6-Dinitrotoluene	4.79 U	5.11 U	4.76 U	5 U	4.76 U	5.04 U	4.99 U	4.89 U	4.95 U	5 U
2-Chloronaphthalene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
2-Chlorophenol	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
2-Methylnaphthalene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
2-Methylphenol	1.92 U	2.04 U	1.9 U	2 U	1.9 U	2.02 U	1.99 U	1.96 U	1.98 U	2 U
2-Nitroaniline	4.79 U	5.11 U	4.76 U	5 U	4.76 U	5.04 U	4.99 U	4.89 U	4.95 U	5 U
2-Nitrophenol	4.79 U	5.11 U	4.76 U	5 U	4.76 U	5.04 U	4.99 U	4.89 U	4.95 U	5 U
3-&4-Methylphenol	9.59 U	10.2 U	9.52 U	10 U	9.51 U	10.1 U	9.97 U	9.78 U	9.9 U	9.99 U
3,3'-Dichlorobenzidine	4.79 U	5.11 U	4.76 U	5 U	4.76 U	5.04 U	4.99 U	4.89 U	4.95 U	5 U
3-Nitroaniline	5.75 U	6.13 U	5.71 U	6 U	5.71 U	6.05 U	5.98 U	5.87 U	5.94 U	5.99 U
4,6-Dinitro-2-methylphenol	9.59 U	10.2 U	9.52 U	10 U	9.51 U	10.1 U	9.97 U	9.78 U	9.9 U	9.99 U
4-Bromophenyl phenyl ether	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
4-Chloro-3-methylphenol	1.92 U	2.04 U	1.9 U	2 U	1.9 U	2.02 U	1.99 U	1.96 U	1.98 U	2 U
4-Chloroaniline	2.88 U	3.07 U	2.86 U	3 U	2.85 U	3.02 U	2.99 U	2.93 U	2.97 U	3 U
4-Chlorophenyl phenyl ether	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
4-Nitroaniline	4.79 U	5.11 U	4.76 U	5 U	4.76 U	5.04 U	4.99 U	4.89 U	4.95 U	5 U
4-Nitrophenol	4.79 U	5.11 U	4.76 U	5 U	4.76 U	5.04 U	4.99 U	4.89 U	4.95 U	5 U
Acenaphthene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Acenaphthylene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Anthracene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Benz(a)anthracene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Benzo(a)pyrene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW29D 0502059-01 2/15/2005	LW30D 0502059-04 2/15/2005	LW32D 0502056-03 2/14/2005	LW35D 0502099-08 2/22/2005	LW36D 0502088-01 2/17/2005	LW37D 0502088-02 2/17/2005	LW38D 0502088-03 2/17/2005	LW39D 0502088-04 2/17/2005	LW39D-Dup Y 0502088-05 2/17/2005	LW40D 0502099-09 2/22/2005
Benzo(b)fluoranthene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Benzo(g,h,i)perylene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Benzo(k)fluoranthene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Benzoic Acid	19.2 U	20.4 U	19 U	20 U	19 U	20.2 U	19.9 U	19.6 U	19.8 U	20 U
Benzyl Alcohol	4.79 U	5.11 U	4.76 U	5 U	4.76 U	5.04 U	4.99 U	4.89 U	4.95 U	5 U
Bis(2-chloroethoxy)methane	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Bis(2-chloroethyl)ether	1.92 U	2.04 U	1.9 U	2 U	1.9 U	2.02 U	1.99 U	1.96 U	1.98 U	2 U
Bis(2-chloroisopropyl)ether	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Bis(2-ethylhexyl)phthalate	0.959 U	1.02 U	0.952 U	**2.33**	0.951 U	1.01 U	0.997 U	0.978 U	**1.25**	**1.38**
Butyl benzyl phthalate	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Carbazole	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Chrysene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Dibenz(a,h)anthracene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Dibenzofuran	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Diethyl phthalate	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Dimethyl phthalate	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Di-n-butyl phthalate	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Di-n-octyl phthalate	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Fluoranthene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Fluorene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Hexachlorobenzene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Hexachlorobutadiene	1.92 U	2.04 U	1.9 U	2 U	1.9 U	2.02 U	1.99 U	1.96 U	1.98 U	2 U
Hexachlorocyclopentadiene	4.79 U	5.11 U	4.76 U	5 U	4.76 U	5.04 U	4.99 U	4.89 U	4.95 U	5 U
Hexachloroethane	1.92 U	2.04 U	1.9 U	2 U	1.9 U	2.02 U	1.99 U	1.96 U	1.98 U	2 U
Indeno(1,2,3-cd)pyrene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Isophorone	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Naphthalene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Nitrobenzene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
N-Nitrosodimethylamine	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
N-Nitrosodi-n-propylamine	1.92 U	2.04 U	1.9 U	2 U	1.9 U	2.02 U	1.99 U	1.96 U	1.98 U	2 U
N-Nitrosodiphenylamine	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Pentachlorophenol	4.79 U	5.11 U	4.76 U	5 U	4.76 U	5.04 U	4.99 U	4.89 U	4.95 U	5 U
Phenanthrene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Phenol	1.92 U	2.04 U	1.9 U	2 U	1.9 U	2.02 U	1.99 U	1.96 U	1.98 U	2 U
Pyrene	0.959 U	1.02 U	0.952 U	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U	0.999 U
Pyridine	4.79 U	5.11 U	4.76 U	5 U	4.76 U	5.04 U	4.99 U	4.89 U	4.95 U	5 U

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW29D 0502059-01 2/15/2005	LW30D 0502059-04 2/15/2005	LW32D 0502056-03 2/14/2005	LW35D 0502099-08 2/22/2005	LW36D 0502088-01 2/17/2005	LW37D 0502088-02 2/17/2005	LW38D 0502088-03 2/17/2005	LW39D 0502088-04 2/17/2005	LW39D-Dup Y 0502088-05 2/17/2005	LW40D 0502099-09 2/22/2005
PAHS (µg/L)										
Method SW8270SIM										
Acenaphthene	0.0479 U	0.0508 U	0.0478 U	0.0482 U	0.0478 U	0.0499 U	**0.0515**	**0.061**	**0.0612**	0.0511 U
Acenaphthylene	0.0479 U	0.0508 U	0.0478 U	0.0482 U	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U	0.0511 U
Anthracene	0.0479 U	0.0508 U	0.0478 U	**0.0674**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U	0.0511 U
Benz(a)anthracene	0.0479 U	0.0508 U	0.0478 U	**0.135**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U	0.0511 U
Benzo(a)pyrene	0.0479 U	0.0508 U	0.0478 U	**0.106**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U	0.0511 U
Benzo(b)fluoranthene	0.0479 U	0.0508 U	0.0478 U	**0.0867**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U	0.0511 U
Benzo(g,h,i)perylene	0.0479 U	0.0508 U	0.0478 U	**0.0578**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U	0.0511 U
Benzo(k)fluoranthene	0.0479 U	0.0508 U	0.0478 U	0.0482 U	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U	0.0511 U
Chrysene	0.0479 U	0.0508 U	0.0478 U	**0.0963**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U	0.0511 U
Dibenz(a,h)anthracene	0.0479 U	0.0508 U	0.0478 U	0.0482 U	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U	0.0511 U
Fluoranthene	0.0479 U	0.0508 U	0.0478 U	**0.154**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U	0.0511 U
Fluorene	0.0479 U	0.0508 U	0.0478 U	0.0482 U	0.0478 U	0.0499 U	**0.0515**	0.0509 U	0.051 U	0.0511 U
Indeno(1,2,3-cd)pyrene	0.0479 U	0.0508 U	0.0478 U	0.0482 U	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U	0.0511 U
Naphthalene	0.0479 U	0.0508 U	0.0478 U	0.0482 U	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U	0.0511 U
Phenanthrene	0.0479 U	0.0508 U	0.0478 U	**0.116**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U	0.0511 U
Pyrene	0.0479 U	0.0508 U	0.0478 U	**0.212**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U	0.0511 U
VOLATILES (µg/L)										
Method SW8260										
1,1,1,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW29D 0502059-01 2/15/2005	LW30D 0502059-04 2/15/2005	LW32D 0502056-03 2/14/2005	LW35D 0502099-08 2/22/2005	LW36D 0502088-01 2/17/2005	LW37D 0502088-02 2/17/2005	LW38D 0502088-03 2/17/2005	LW39D 0502088-04 2/17/2005	LW39D-Dup Y 0502088-05 2/17/2005	LW40D 0502099-09 2/22/2005
1,4-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2,2-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorotoluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorotoluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Isopropyltoluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Methyl-2-pentanone	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Acetone	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Acrylonitrile	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Bromobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon disulfide	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Carbon tetrachloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromomethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Isopropylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
m,p-Xylene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Methyl tert-butyl ether	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylene chloride	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Naphthalene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
n-Butylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
n-Propylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
o-Xylene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
sec-Butylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
tert-Butylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW29D 0502059-01 2/15/2005	LW30D 0502059-04 2/15/2005	LW32D 0502056-03 2/14/2005	LW35D 0502099-08 2/22/2005	LW36D 0502088-01 2/17/2005	LW37D 0502088-02 2/17/2005	LW38D 0502088-03 2/17/2005	LW39D 0502088-04 2/17/2005	LW39D-Dup Y 0502088-05 2/17/2005	LW40D 0502099-09 2/22/2005
Tetrachloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl chloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL PETROLEUM HYDROCARBONS (µg/L)										
Method NWTPH-Dx/NWTPHg										
Diesel Range Hydrocarbons	239 U	**370**	**579**	**1420**	243 U	248 U	**375**	247 U	**758**	250 U
Lube Oil	478 U	545 U	500 U	1350 U	486 U	495 U	475 U	494 U	509 U	667 U
Gasoline Range Hydrocarbons	**106**	**211**	**221**	100 U	100 U	100 U	100 U	100 U	100 U	100 U
PRIORITY POLLUTANT METALS (µg/L)										
Method 6010/6020										
Arsenic (total)	**8.23**	**11.4**	**9.56**	**6.3**	1 U	1 U	**3.91**	**2.92**	**2.74**	**8.32**
Chromium (total)	**8.8**	**8.4**	**9.3**	**14.6**	**6.4**	**7.8**	**8**	**6.3**	**6.4**	**52.7**
Copper (total)	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**48.5**
Lead (total)	**1.32**	**0.81**	**1.3**	**7.63**	0.1 U	**0.728**	**0.117**	**0.132**	**0.1**	**11.9**
Nickel (total)	5 U	5 U	5 U	**5.8**	5 U	5 U	5 U	5 U	5 U	**35.5**
Selenium (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc (total)	10 U	**10.7**	10 U	**22.3**	10 U	10 U	10 U	10 U	10 U	**126**
DISSOLVED METALS (µg/L)										
Method 6010/6020										
Arsenic (dissolved)	NA	NA	NA	NA	1 U	1 U	**3.7**	**2.7**	**3**	NA
Chromium (dissolved)	NA	NA	NA	NA	**6**	**5**	**7.6**	**8.8**	**8.1**	NA
Copper (dissolved)	NA	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	NA
Lead (dissolved)	NA	NA	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA
Nickel (dissolved)	NA	NA	NA	NA	5 U	5 U	5 U	5 U	5 U	NA
Zinc (dissolved)	NA	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	NA

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW29D 0502059-01 2/15/2005	LW30D 0502059-04 2/15/2005	LW32D 0502056-03 2/14/2005	LW35D 0502099-08 2/22/2005	LW36D 0502088-01 2/17/2005	LW37D 0502088-02 2/17/2005	LW38D 0502088-03 2/17/2005	LW39D 0502088-04 2/17/2005	LW39D-Dup Y 0502088-05 2/17/2005	LW40D 0502099-09 2/22/2005
CONVENTIONALS (µg/L)										
Calcium (total)	**62500**	**46700**	**53800**	**83600**	**11500**	**3960**	**16100**	**10100**	**9880**	**24200**
Magnesium (total)	**35600**	**18500**	**31800**	**22900**	**3650**	**1490**	**4710**	**3780**	**3660**	**14100**
Potassium (total)	**1700**	**3220**	**1120**	**8830**	**1530**	**1360**	**1600**	**1260**	**1240**	**4030**
Sodium (total)	**21100**	**23300**	**16400**	**23000**	**7280**	**12500**	**8930**	**5970**	**5780**	**13900**
Alkalinity, Bicarbonate (As CaCO3)	**344000**	**264000**	**309000**	**312000**	**56600**	**37300**	**75800**	**46000**	**49200**	**91200**
Alkalinity, Carbonate (As CaCO3)	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U
Alkalinity, Total (As CaCO3)	**344000**	**264000**	**309000**	**312000**	**56600**	**37300**	**75800**	**46000**	**49200**	**91200**
Chloride	**4200**	**6280**	**2830**	**1560**	**1480**	**3410**	**2760**	**3740**	**3740**	**2150**
Ferrous Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrogen, Nitrate (As N)	30 U	30 U	30 UJ	**13100**	**321**	**69.5**	30 U	**148**	**162**	30 U
Nitrogen, Nitrite	25 U	25 U	25 UJ	**38**	25 U	25 U	25 U	25 U	25 U	25 U
Sulfate	**1170**	**620**	500 U	**2390**	**3740**	**4440**	**6080**	**4370**	**4460**	**3470**
Total Dissolved Solids	**405000**	**327000**	**338000**	**423000**	**78000**	**79000**	**115000**	**71000**	**75000**	**178000**
FIELD PARAMETERS										
pH (avg)	7.13	6.84	7.14	6.62	6.81	7.12	6.52	6.59	6.59	6.91
Temperature (° C) (avg)	12.6	12.5	12.5	13.8	11.6	10.8	10.7	10.7	10.7	12.6
Conductivity (mS/cm) (avg)	261	285	278	250	61	39	81	68	68	99
Dissolved oxygen (mg/L) (avg)	1.03	0.39	1.01	1.91	2.25	3.39	0	0.03	0.03	1.08
Turbidity (NTU)	13	20	28	352	0	0	0	0	0	951
Redox (mV)	NM	NM	NM	6.62	NM	NM	NM	NM	NM	NM

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW29D 0502059-01 2/15/2005	LW30D 0502059-04 2/15/2005	LW32D 0502056-03 2/14/2005	LW35D 0502099-08 2/22/2005	LW36D 0502088-01 2/17/2005	LW37D 0502088-02 2/17/2005	LW38D 0502088-03 2/17/2005	LW39D 0502088-04 2/17/2005	LW39D-Dup Y 0502088-05 2/17/2005	LW40D 0502099-09 2/22/2005
DIOXINS/FURANS (ng/L)										
Method 8290										
1,2,3,4,6,7,8-HpCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PeCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HpCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HpCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HxCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total HxCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PeCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PeCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TEQ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW45D 0502099-12 2/22/2005	OX8D 0502070-08 2/16/2005	RW2 0502102-12 2/23/2005
CHLORINATED PHENOLS (µg/L)			
Method SW8270SIM			
Pentachlorophenol	NA	NA	**1.13**
SEMIVOLATILES (µg/L)			
Method SW8270			
1,2,4-Trichlorobenzene	0.962 U	0.999 U	0.998 U
1,2-Dichlorobenzene	0.962 U	0.999 U	0.998 U
1,3-Dichlorobenzene	0.962 U	0.999 U	0.998 U
1,4-Dichlorobenzene	0.962 U	0.999 U	0.998 U
2,3,4,6-Tetrachlorophenol	NA	5 U	NA
2,3,5,6-Tetrachlorophenol	NA	5 U	NA
2,4,5-Trichlorophenol	4.81 U	5 U	4.99 U
2,4,6-Trichlorophenol	4.81 U	5 U	4.99 U
2,4-Dichlorophenol	2.89 U	3 U	2.99 U
2,4-Dimethylphenol	2.89 U	3 U	2.99 U
2,4-Dinitrophenol	9.62 U	9.99 U	9.98 U
2,4-Dinitrotoluene	4.81 U	5 U	4.99 U
2,6-Dinitrotoluene	4.81 U	5 U	4.99 U
2-Chloronaphthalene	0.962 U	0.999 U	0.998 U
2-Chlorophenol	0.962 U	0.999 U	0.998 U
2-Methylnaphthalene	0.962 U	0.999 U	**1.47**
2-Methylphenol	1.92 U	2 U	2 U
2-Nitroaniline	4.81 U	5 U	4.99 U
2-Nitrophenol	4.81 U	5 U	4.99 U
3-&4-Methylphenol	9.62 U	9.99 U	9.98 U
3,3'-Dichlorobenzidine	4.81 U	5 U	4.99 U
3-Nitroaniline	5.77 U	5.99 U	5.99 U
4,6-Dinitro-2-methylphenol	9.62 U	9.99 U	9.98 U
4-Bromophenyl phenyl ether	0.962 U	0.999 U	0.998 U
4-Chloro-3-methylphenol	1.92 U	2 U	2 U
4-Chloroaniline	2.89 U	3 U	2.99 U
4-Chlorophenyl phenyl ether	0.962 U	0.999 U	0.998 U
4-Nitroaniline	4.81 U	5 U	4.99 U
4-Nitrophenol	4.81 U	5 U	4.99 U
Acenaphthene	0.962 U	0.999 U	0.998 U
Acenaphthylene	0.962 U	0.999 U	0.998 U
Anthracene	0.962 U	0.999 U	0.998 U
Benz(a)anthracene	0.962 U	0.999 U	0.998 U
Benzo(a)pyrene	0.962 U	0.999 U	0.998 U

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW45D 0502099-12 2/22/2005	OX8D 0502070-08 2/16/2005	RW2 0502102-12 2/23/2005
Benzo(b)fluoranthene	0.962 U	0.999 U	0.998 U
Benzo(g,h,i)perylene	0.962 U	0.999 U	0.998 U
Benzo(k)fluoranthene	0.962 U	0.999 U	0.998 U
Benzoic Acid	19.2 U	20 U	20 U
Benzyl Alcohol	4.81 U	5 U	4.99 U
Bis(2-chloroethoxy)methane	0.962 U	0.999 U	0.998 U
Bis(2-chloroethyl)ether	1.92 U	2 U	2 U
Bis(2-chloroisopropyl)ether	0.962 U	0.999 U	0.998 U
Bis(2-ethylhexyl)phthalate	**7.91**	**20.9**	0.998 U
Butyl benzyl phthalate	0.962 U	0.999 U	0.998 U
Carbazole	0.962 U	0.999 U	0.998 U
Chrysene	0.962 U	0.999 U	0.998 U
Dibenz(a,h)anthracene	0.962 U	0.999 U	0.998 U
Dibenzofuran	0.962 U	0.999 U	0.998 U
Diethyl phthalate	0.962 U	0.999 U	0.998 U
Dimethyl phthalate	0.962 U	0.999 U	0.998 U
Di-n-butyl phthalate	0.962 U	0.999 U	0.998 U
Di-n-octyl phthalate	0.962 U	0.999 U	0.998 U
Fluoranthene	0.962 U	0.999 U	0.998 U
Fluorene	0.962 U	0.999 U	0.998 U
Hexachlorobenzene	0.962 U	0.999 U	0.998 U
Hexachlorobutadiene	1.92 U	2 U	2 U
Hexachlorocyclopentadiene	4.81 U	5 U	4.99 U
Hexachloroethane	1.92 U	2 U	2 U
Indeno(1,2,3-cd)pyrene	0.962 U	0.999 U	0.998 U
Isophorone	0.962 U	0.999 U	0.998 U
Naphthalene	0.962 U	0.999 U	0.998 U
Nitrobenzene	0.962 U	0.999 U	0.998 U
N-Nitrosodimethylamine	0.962 U	0.999 U	0.998 U
N-Nitrosodi-n-propylamine	1.92 U	2 U	2 U
N-Nitrosodiphenylamine	0.962 U	0.999 U	0.998 U
Pentachlorophenol	4.81 U	5 U	4.99 U
Phenanthrene	0.962 U	0.999 U	0.998 U
Phenol	1.92 U	2 U	2 U
Pyrene	0.962 U	0.999 U	0.998 U
Pyridine	4.81 U	5 U	4.99 U

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW45D 0502099-12 2/22/2005	OX8D 0502070-08 2/16/2005	RW2 0502102-12 2/23/2005
PAHS (µg/L)			
Method SW8270SIM			
Acenaphthene	**0.263**	NA	NA
Acenaphthylene	**0.0709**	NA	NA
Anthracene	**3.75**	NA	NA
Benz(a)anthracene	**0.111**	NA	NA
Benzo(a)pyrene	**0.0912**	NA	NA
Benzo(b)fluoranthene	**0.0811**	NA	NA
Benzo(g,h,i)perylene	**0.0608**	NA	NA
Benzo(k)fluoranthene	0.0507 U	NA	NA
Chrysene	**0.122**	NA	NA
Dibenz(a,h)anthracene	0.0507 U	NA	NA
Fluoranthene	**0.182**	NA	NA
Fluorene	**0.233**	NA	NA
Indeno(1,2,3-cd)pyrene	0.0507 U	NA	NA
Naphthalene	0.405 U	NA	NA
Phenanthrene	**0.182**	NA	NA
Pyrene	**0.253**	NA	NA
VOLATILES (µg/L)			
Method SW8260			
1,1,1,2-Tetrachloroethane	1 U	1 U	1 U
1,1,1-Trichloroethane	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U
1,1-Dichloroethane	1 U	1 U	1 U
1,1-Dichloroethene	1 U	1 U	1 U
1,1-Dichloropropene	1 U	1 U	1 U
1,2,3-Trichlorobenzene	1 U	1 U	1 U
1,2,3-Trichloropropane	1 U	1 U	1 U
1,2,4-Trichlorobenzene	1 U	1 U	1 U
1,2,4-Trimethylbenzene	1 U	**2.59**	**8.71**
1,2-Dibromo-3-chloropropane	1 U	1 U	1 U
1,2-Dibromoethane	1 U	1 U	1 U
1,2-Dichlorobenzene	1 U	1 U	1 U
1,2-Dichloroethane	1 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U
1,3,5-Trimethylbenzene	1 U	1 U	**2.21**
1,3-Dichlorobenzene	1 U	1 U	1 U
1,3-Dichloropropane	1 U	1 U	1 U

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW45D 0502099-12 2/22/2005	OX8D 0502070-08 2/16/2005	RW2 0502102-12 2/23/2005
1,4-Dichlorobenzene	1 U	1 U	1 U
2,2-Dichloropropane	1 U	1 U	1 U
2-Butanone	10 U	10 U	10 U
2-Chlorotoluene	1 U	1 U	1 U
2-Hexanone	10 U	10 U	10 U
4-Chlorotoluene	1 U	1 U	1 U
4-Isopropyltoluene	1 U	1 U	1 U
4-Methyl-2-pentanone	20 U	20 U	20 U
Acetone	50 U	50 U	50 U
Acrylonitrile	5 U	5 U	5 U
Benzene	0.3 U	0.3 U	0.3 U
Bromobenzene	1 U	1 U	1 U
Bromochloromethane	1 U	1 U	1 U
Bromodichloromethane	1 U	1 U	1 U
Bromoform	1 U	1 U	1 U
Bromomethane	1 U	1 U	1 U
Carbon disulfide	2 U	2 U	2 U
Carbon tetrachloride	1 U	1 U	1 U
Chlorobenzene	1 U	1 U	1 U
Chloroethane	1 U	1 U	1 U
Chloroform	1 U	1 U	1 U
Chloromethane	1 U	1 U	1 U
cis-1,2-Dichloroethene	1 U	1 U	1 U
cis-1,3-Dichloropropene	1 U	1 U	1 U
Dibromochloromethane	1 U	1 U	1 U
Dibromomethane	1 U	1 U	1 U
Dichlorodifluoromethane	1 U	1 U	1 U
Ethylbenzene	1 U	1 U	**3.04**
Hexachlorobutadiene	1 U	1 U	1 U
Isopropylbenzene	**2.38**	1 U	**33.6**
m,p-Xylene	2 U	2 U	2 U
Methyl tert-butyl ether	1 U	1 U	1 U
Methylene chloride	20 U	20 U	20 U
Naphthalene	1 U	1 U	**1.97**
n-Butylbenzene	1 U	1 U	**7.07**
n-Propylbenzene	1 U	1 U	**40.9**
o-Xylene	1 U	1 U	1 U
sec-Butylbenzene	1 U	**2.64**	**6.18**
Styrene	1 U	1 U	1 U
tert-Butylbenzene	1 U	1 U	1 U

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW45D 0502099-12 2/22/2005	OX8D 0502070-08 2/16/2005	RW2 0502102-12 2/23/2005
Tetrachloroethene	1 U	1 U	1 U
Toluene	1 U	1 U	1 U
trans-1,2-Dichloroethene	1 U	1 U	1 U
trans-1,3-Dichloropropene	1 U	1 U	1 U
Trichloroethene	1 U	1 U	1 U
Trichlorofluoromethane	1 U	1 U	1 U
Vinyl chloride	1 U	1 U	1 U
TOTAL PETROLEUM HYDROCARBONS (µg/L)			
Method NWTPH-Dx/NWTPHg			
Diesel Range Hydrocarbons	**3350**	NA	**928**
Lube Oil	1480 U	NA	500 U
Gasoline Range Hydrocarbons	**334**	NA	**1010**
PRIORITY POLLUTANT METALS (µg/L)			
Method 6010/6020			
Arsenic (total)	**90.2**	**21.6**	**21.8**
Chromium (total)	**17.1**	**44.8**	**8.6**
Copper (total)	**14.2**	**42.8**	10 U
Lead (total)	**77.6**	**23.6**	0.1 U
Nickel (total)	**12.5**	**15.9**	**14**
Selenium (total)	NA	20 U	NA
Zinc (total)	**60**	**86.5**	10 U
DISSOLVED METALS (µg/L)			
Method 6010/6020			
Arsenic (dissolved)	NA	NA	NA
Chromium (dissolved)	NA	NA	NA
Copper (dissolved)	NA	NA	NA
Lead (dissolved)	NA	NA	NA
Nickel (dissolved)	NA	NA	NA
Zinc (dissolved)	NA	NA	NA

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW45D 0502099-12 2/22/2005	OX8D 0502070-08 2/16/2005	RW2 0502102-12 2/23/2005
CONVENTIONALS (µg/L)			
Calcium (total)	**94600**	**61800**	**41900**
Magnesium (total)	**26700**	**28300**	**18400**
Potassium (total)	**12000**	**2680**	**2730**
Sodium (total)	**22900**	**13400**	**13200**
Alkalinity, Bicarbonate (As CaCO3)	**388000**	**264000**	**198000**
Alkalinity, Carbonate (As CaCO3)	10000 U	10000 U	10000 U
Alkalinity, Total (As CaCO3)	**388000**	**264000**	**198000**
Chloride	**1870**	**5930**	**3620**
Ferrous Iron	NA	**31500**	NA
Nitrogen, Nitrate (As N)	**1550**	30 U	30 U
Nitrogen, Nitrite	**156**	25 U	25 U
Sulfate	500 U	500 U	**3760**
Total Dissolved Solids	**456000**	**298000**	**345000**
FIELD PARAMETERS			
pH (avg)	6.5	7.22	6.78
Temperature (° C) (avg)	13.5	13.4	14.5
Conductivity (mS/cm) (avg)	268	235	184
Dissolved oxygen (mg/L) (avg)	1.67	1.91	1.47
Turbidity (NTU)	999	435	0
Redox (mV)	NM	NM	NM

TABLE A-4
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS, LOWER ZONE
FIRST QUARTERLY SAMPLING EVENT, FEBRUARY 2005
TIME OIL NORTHWEST TERMINAL

	LW45D 0502099-12 2/22/2005	OX8D 0502070-08 2/16/2005	RW2 0502102-12 2/23/2005
DIOXINS/FURANS (ng/L)			
Method 8290			
1,2,3,4,6,7,8-HpCDD	NA	NA	NA
1,2,3,4,6,7,8-HpCDF	NA	NA	NA
1,2,3,4,7,8,9-HpCDF	NA	NA	NA
1,2,3,4,7,8-HxCDD	NA	NA	NA
1,2,3,4,7,8-HxCDF	NA	NA	NA
1,2,3,6,7,8-HxCDD	NA	NA	NA
1,2,3,6,7,8-HxCDF	NA	NA	NA
1,2,3,7,8,9-HxCDD	NA	NA	NA
1,2,3,7,8,9-HxCDF	NA	NA	NA
1,2,3,7,8-PeCDD	NA	NA	NA
1,2,3,7,8-PeCDF	NA	NA	NA
2,3,4,6,7,8-HxCDF	NA	NA	NA
2,3,4,7,8-PeCDF	NA	NA	NA
2,3,7,8-TCDD	NA	NA	NA
2,3,7,8-TCDF	NA	NA	NA
OCDD	NA	NA	NA
OCDF	NA	NA	NA
Total HpCDD	NA	NA	NA
Total HpCDF	NA	NA	NA
Total HxCDD	NA	NA	NA
Total HxCDF	NA	NA	NA
Total PeCDD	NA	NA	NA
Total PeCDF	NA	NA	NA
Total TCDD	NA	NA	NA
Total TCDF	NA	NA	NA
Total TEQ	NA	NA	NA

NA = Not analyzed.
NM = Not measured.
U = Indicates compound was analyzed for, but was not detected at the reported sample detection limit
UJ = The analyte was not detected in the sample; the reported sample detection limit is an estimate.
J = indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
Bold indicates detected constituent.

TABLE A-5
FIRST QUARTER 2005 GROUNDWATER DATA - DETECTED ANALYTES
NEARSHORE WELLS
TIME OIL NORTHWEST TERMINAL

	Minimum Preliminary Screening Level		River Bank Wells							Shoreline (Beach) Wells				
			LW006D 0502087-06 2/18/2005	LW009D 0502087-07 2/18/2005	LW022D 0502099-04 2/22/2005	LW023D 0502099-05 2/22/2005	LW024D 0502088-06 2/18/2005	LW025D 0502088-07 2/18/2005	LW035D 0502099-08 2/22/2005	LW036D 0502088-01 2/17/2005	LW037D 0502088-02 2/17/2005	LW038D 0502088-03 2/17/2005	LW039D 0502088-04 2/17/2005	LW039D-Dup 0502088-05 2/17/2005
SEMIVOLATILES (µg/L)														
EPA Method 8270														
Acenaphthene	520	(a)	1.02 U	1.01 U	1.04 U	0.989 U	**1.21**	**1.03**	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U
Bis(2-ethylhexyl)phthalate	2.2	(b)	1.02 U	1.01 U	1.04 U	**1.26**	1.01 U	**4.57**	**2.33**	0.951 U	1.01 U	0.997 U	0.978 U	**1.25**
Fluorene	3.9	(c)	1.02 U	1.01 U	1.04 U	0.989 U	**2.79**	**2.15**	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U
Phenanthrene	6.3	(c)	1.02 U	1.01 U	1.04 U	0.989 U	**1.79**	**1.02**	1 U	0.951 U	1.01 U	0.997 U	0.978 U	0.99 U
EPA Method SW8270 SIM														
Pentachlorophenol	3.0	(b)	**0.607**	0.507 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PAHs (µg/L)														
EPA Method 8270 SIM														
Acenaphthene	520	(a)	NA	NA	0.0501 U	**0.508**	**1.3**	**1.1**	0.0482 U	0.0478 U	0.0499 U	**0.0515**	**0.061**	**0.0612**
Acenaphthylene	620	(c)	NA	NA	0.0501 U	**0.0896**	**0.324**	**0.305**	0.0482 U	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U
Anthracene	13	(c)	NA	NA	0.0501 U	**0.0498**	**0.364**	**0.448**	**0.0674**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U
Benzo(a)anthracene	0.018	(b)	NA	NA	0.0501 U	0.0498 U	**0.142**	**0.244**	**0.135**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U
Benzo(a)pyrene	0.014	(c)	NA	NA	0.0501 U	0.0498 U	**0.081**	**0.244**	**0.106**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U
Benzo(b)fluoranthene	0.018	(b)	NA	NA	0.0501 U	0.0498 U	**0.081**	**0.204**	**0.0867**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U
Benzo(g,h,i)perylene	--		NA	NA	0.0501 U	0.0498 U	**0.0506**	**0.132**	**0.0578**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U
Benzo(k)fluoranthene	0.018	(b)	NA	NA	0.0501 U	0.0498 U	0.0506 U	**0.0713**	0.0482 U	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U
Chrysene	0.018	(b)	NA	NA	0.0501 U	0.0498 U	**0.101**	**0.214**	**0.0963**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U
Fluoranthene	6.16	(c)	NA	NA	0.0501 U	**0.0498**	**0.344**	**0.835**	**0.154**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U
Fluorene	3.9	(c)	NA	NA	0.0501 U	**0.239**	**3.69**	**2.9**	0.0482 U	0.0478 U	0.0499 U	**0.0515**	0.0509 U	0.051 U
Indeno(1,2,3-cd)pyrene	0.018	(b)	NA	NA	0.0501 U	0.0498 U	0.0506 U	**0.0916**	0.0482 U	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U
Naphthalene	620	(a)	NA	NA	0.0501 U	0.339 U	**0.587**	**0.55**	0.0482 U	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U
Phenanthrene	620	(c)	NA	NA	0.0501 U	**0.0598**	**2.13**	**1.32**	**0.116**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U
Pyrene	4000	(b)	NA	NA	0.0501 U	**0.0797**	**0.476**	**1.1**	**0.212**	0.0478 U	0.0499 U	0.0515 U	0.0509 U	0.051 U
VOLATILES (µg/L)														
EPA Method 8260														
1,2,4-Trimethylbenzene	130	(a)	**1.53**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Benzene	51	(b)	0.3 U	0.3 U	0.3 U	**8.76**	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Isopropylbenzene	130	(c)	**2.06**	**1.64**	1 U	**8.96**	**6.19**	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	31,000	(d)	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
n-Butylbenzene	130	(c)	1 U	1 U	1 U	**4.49**	**5.94**	1 U	1 U	1 U	1 U	1 U	1 U	1 U
n-Propylbenzene	130	(c)	1 U	1 U	1 U	**5.75**	**8.13**	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Naphthalene	620	(a)	**9.31**	1 U	1 U	**1.64**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
o-Xylene	1.8	(c)	**1.6**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
sec-Butylbenzene	130	(c)	**4.04**	1 U	1 U	**1.57**	**3.33**	1 U	1 U	1 U	1 U	1 U	1 U	1 U
tert-Butylbenzene	130	(c)	**6.03**	**2.71**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

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TABLE A-5
FIRST QUARTER 2005 GROUNDWATER DATA - DETECTED ANALYTES
NEARSHORE WELLS
TIME OIL NORTHWEST TERMINAL

			River Bank Wells							Shoreline (Beach) Wells				
	Minimum Preliminary Screening Level		LW006D 0502087-06 2/18/2005	LW009D 0502087-07 2/18/2005	LW022D 0502099-04 2/22/2005	LW023D 0502099-05 2/22/2005	LW024D 0502088-06 2/18/2005	LW025D 0502088-07 2/18/2005	LW035D 0502099-08 2/22/2005	LW036D 0502088-01 2/17/2005	LW037D 0502088-02 2/17/2005	LW038D 0502088-03 2/17/2005	LW039D 0502088-04 2/17/2005	LW039D-Dup 0502088-05 2/17/2005
HYDROCARBONS (mg/L)														
NWTPH-Dx														
Diesel Range Hydrocarbons	--		**1.57**	0.255 U	**1.23**	**2.75**	**4.92**	**2.2**	**1.42**	0.243 U	0.248 U	**0.375**	0.247 U	**0.758**
Lube Oil	--		0.517 U	0.511 U	1.26 U	0.492 U	0.498 U	0.519 U	1.35 U	0.486 U	0.495 U	0.475 U	0.494 U	0.509 U
NWTPH-G														
Gasoline Range Hydrocarbons	12	(d)	NA	**0.436**	0.1 U	**0.598**	**0.958**	**0.526**	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
PRIORITY POLLUTANT TOTAL METALS (mg/L)														
Arsenic (total)	1.5	(e)	**0.0113**	**0.0321**	**0.0234**	**0.0638**	**0.0841**	**0.0951**	**0.0063**	0.001 U	0.001 U	**0.00391**	**0.00292**	**0.00274**
Chromium (total)	0.011	(c)	**0.0077**	**0.0086**	**0.0084**	**0.0122**	**0.0152**	**0.0199**	**0.0146**	**0.0064**	**0.0078**	**0.008**	**0.0063**	**0.0064**
Copper (total)	0.009	(f)	0.01 U	0.01 U	0.01 U	0.01 U	**0.0162**	**0.0196**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Lead (total)	0.02	(e)	0.000168 U	**0.00144**	**0.00085**	**0.00494**	**0.0209**	**0.0222**	**0.00763**	0.0001 U	**0.000728**	**0.000117**	**0.000132**	**0.0001**
Nickel (total)	0.052	(g)	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	**0.0058**	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Zinc (total)	0.10	(c)	0.01 U	**0.0146**	0.01 U	**0.0213**	**0.0502**	**0.0594**	**0.0223**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Notes:
Bolded values are detected concentrations.
Outlined values are detected concentrations that exceed the minimum screening level.
Preliminary Screening Levels:

(a) Oregon Screening Level Values (SLVs), surface water - aquatic and Oregon Ambient Water Quality Criteria (AWQC), Tables 20 and 33A, fresh water, acute.
(b) Oregon AWQC, Tables 20 and 33A, fish consumption only and National Recommended Water Quality Criteria, organism only.
(c) Oregon Screening Level Values (SLVs) - surface water, aquatic
(d) Oregon Department of Environmental Quality Risk-Based Concentration, Groundwater in Excavation, Construction and Excavation Worker ("Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites," ODEQ, Deptember 22, 2003
(e) Site-specific background concentrations (Phase I and II Contaminants of Potential Concern Screening Report, Time Oil Northwest Terminal, Landau Associates, September 10, 199
(f) Oregon Screening Level Values (SLVs), surface water - aquatic and National Recommended Water Quality Criteria, fresh water chronic.
(g) Oregon AWQC, fresh water acute and fresh chronic.

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TABLE A-6
TOTAL AND DISSOLVED METALS IN SHORELINE WELLS
FIRST QUARTER 2005
TIME OIL NORTHWEST TERMINAL

	Minimum Preliminary Screening Level		LW036D 0502088-01 2/17/2005	LW037D 0502088-02 2/17/2005	LW038D 0502088-03 2/17/2005	LW039D 0502088-04 2/17/2005
TOTAL METALS (µg/L)						
Methods 6010/6020						
Arsenic	1500	(a)	1 U	1 U	3.91	2.92
Chromium	11	(b)	6.4	7.8	8.0	6.3
Copper	9	(c)	10 U	10 U	10 U	10 U
Lead	20	(a)	0.10 U	0.728	0.117	0.132
Nickel	52	(d)	5 U	5 U	5 U	5 U
Zinc	100	(b)	10 U	10 U	10 U	10 U
DISSOLVED METALS (µg/L)						
Methods 6010/6020						
Arsenic	1500	(a)	1 U	1 U	3.70	2.70
Chromium	11	(b)	6.0	5.0	7.6	8.8
Copper	9	(c)	10 U	10 U	10 U	10 U
Lead	20	(a)	0.10 U	0.10 U	0.10 U	0.10 U
Nickel	52	(d)	5 U	5 U	5 U	5 U
Zinc	100	(b)	10 U	10 U	10 U	10 U

U = Indicates the compound was undetected at the reported concentration.
Preliminary Screening Levels

(a) Site-specific background concentrations (Phase I and II Contaminants of Potential ConcernScreening Report, Time Oil Northwest Terminal, Landau Associates, September 10, 1999).
(b) Oregon Screening Level Values (SLVs) - surface water, aquatic
(c) Oregon Screening Level Values (SLVs), surface water - aquatic and National Recommended Water Quality Criteria, fresh water chronic
(d) Oregon AWQC, fresh water acute and fresh chronic

Groundwater Interim Action Recovery Summary

TABLE B-1
GROUNDWATER INTERIM ACTION OPERATIONAL HISTORY
UPPER AND LOWER WATER-BEARING ZONES
TIME OIL NORTHWEST TERMINAL

	RW-2 Discharge				HRW-1 Discharge				SDM-1 Discharge				Treatment System Discharge			
Monitoring Period	Volume of Water Pumped (gal)	Sample Date	PCP Concentration (µg/L)	Estimated PCP Mass Removal (lb)	Volume of Water Pumped (gal)	Sample Date	PCP Concentration (µg/L)	Estimated PCP Mass Removal (lb)	Volume of Water Pumped (gal)	Sample Date	PCP Concentration (µg/L)	Estimated PCP Mass Removal (lb)	Volume of Water Treated (gal)	Sample Date	Discharge PCP Concentration (µg/L)	Comments
Fourth Quarter 2000																
October 2000	439,003			0.35									0			Mass removal calculated using November 2000 PCP concentration.
November 2000	305,601	11/9/2000	95	0.24									467,478	11/7/2000	ND (a)	
December 2000	348,720	12/20/2000	39	0.11									497,656	12/6/2000	5.89	
														12/20/2000	9.73	
Quarterly Totals	*1,093,324*			*0.70*									*965,134*			
First Quarter 2001																
January 2001	416,140	1/18/2001	38.8	0.13									239,207	1/18/2001	14.3	
February 2001	335,008	2/13/2001	30	0.08									184,192			
March 2001	332,963	3/7/2001	ND (b)	0.03									517,332	3/7/2001	ND (b)	
Quarterly Totals	*1,084,111*			*0.25*									*940,731*			
Second Quarter 2001																
April 2001	377,931			0.04									275,519			Mass removal calculated using May 2001 PCP concentration.
May 2001	344,252	5/22/2001	12.3	0.04									195,522	5/22/2001	5.29	
June 2001	361,846	6/4/2001	0.68	0.00									563,853			
Quarterly Totals	*1,084,029*			*0.08*									*1,034,894*			
Third Quarter 2001																
July 2001	351,509			0.01									559,015			Mass removal calculated using August 2001 PCP concentration.
August 2001	486,123	8/13/2001	5	0.02									66,876			
Quarterly Totals	*837,632*			*0.03*									*625,891*			
Fourth Quarter 2001																
October 2001	393,168	10/11/2001	ND (a)	0.01									484,158	10/11/2001	ND (a)	
November 2001	319,798			0.01									118,786	11/1 & 11/15/01	ND (a)	Mass removal calculated using December 2001 PCP concentration.
December 2001	361,058	12/6/2001	ND (c)	0.01									717,769	12/6/2001	ND (c)	
Quarterly Totals	*1,074,024*			*0.02*									*836,555*			
First Quarter 2002																
January 2002	331,224			0.02	1,812			0.01					340,688			Recovered groundwater from HRW-1 from January 22-29. Re-initiated groundwater recovery from HRW-1 on February 28.
February 2002	282,480	2/27/2002	8.6	0.02	58			0.00					437,943			HRW-1 mass removal estimates for January and February are based on the March 12 sampling event.
March 2002	280,814			0.02	40,294	3/12/2002	786	0.26					234,816			RW-2 mass removal estimates for January and March are based on February 27 sampling event.
Quarterly Totals	*894,518*			*0.06*	*42,164*			*0.28*					*1,013,447*			
Second Quarter 2002																
April 2002	292,099			0.19	74,996	4/5/2002	94	0.06					391,263	4/5/02	34.4	RW-2 mass removal estimates for April and May are based on June 27 sampling event.
														4/22/02	9.33	
May 2002	310,584			0.20	23,427	5/29/2002	452	0.09					247,440			
June 2002	272,393	6/27/2002	76	0.17	25,484	6/25/2002	410	0.09					307,810			
Quarterly Totals	*875,076*			*0.56*	*123,907*			*0.23*					*946,513*			
Third Quarter 2002																
July 2002	272,771			0.08	51,111			0.18					188,300	7/24/2002	2.09	
August 2002	270,746	8/27/2002	36	0.08	7								301,613	8/20/2002	9.15	HRW-1 shut down on July 24 due to dry pumping conditions and potential biofouling of the well. HRW-1 mass removal rate estimate based on June 2002 data.
September 2002	143,662			0.04	0				110,000	9/23/2002	47.0		369,469	9/23/2002	11.8	RW-2 temporarily shut down on September 25. Water being intercepted from SDM-1 and pumped to treatment system beginning on September 16.
Quarterly Totals	*687,179*				*51,118*				*110,000*		*47.0*		*859,382*			RW-2 mass removal rates based on August 27 sampling event. Total Volume pumped from SDM-1 estimated based on throughout of WWTP and volume recovered from RW-2; Flowmeter to be installed for SDM-1 in October 2002.

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TABLE B-1
GROUNDWATER INTERIM ACTION OPERATIONAL HISTORY
UPPER AND LOWER WATER-BEARING ZONES
TIME OIL NORTHWEST TERMINAL

	RW-2 Discharge				HRW-1 Discharge				SDM-1 Discharge				Treatment System Discharge			
Monitoring Period	Volume of Water Pumped (gal)	Sample Date	PCP Concentration (µg/L)	Estimated PCP Mass Removal (lb)	Volume of Water Pumped (gal)	Sample Date	PCP Concentration (µg/L)	Estimated PCP Mass Removal (lb)	Volume of Water Pumped (gal)	Sample Date	PCP Concentration (µg/L)	Estimated PCP Mass Removal (lb)	Volume of Water Treated (gal)	Sample Date	Discharge PCP Concentration (µg/L)	Comments
Fourth Quarter 2002																
October 2002	177,937			0.06	0				Not metered				112,129	10/3/2002	8.84	
				0.09												
November 2002	275,033	11/13/2002	37		0				95,157				399,747			The storage tank gauge was moved to groundwater sump SDM-1 on November 1.
December 2002	418,846			0.13	0				124,894				507,766			
Quarterly Totals	*871,816*			*0.27*	*0*				*220,051*				*1,019,642*			RW-2 mass removal rates based on November 13 sampling event.
First Quarter 2003																
January 2003	417,646			0.12	0				166,663			0.40	574,451	1/15/2003	11.6	
February 2003	398,299	2/11/2003	33	0.11	0				192,395	2/13/2003	290	0.47	483,579			
March 2003	458,160			0.13	0				210,400			0.51	624,807			SDM-1 mass removal rates based on February 13 sampling event.
Quarterly Totals	*1,274,105*			*0.35*	*0*				*569,458*			*1.38*	*1,371,258*			RW-2 mass removal rates based on February 11 sampling event.
Second Quarter 2003																
April 2003	445,275			0.04	0				55,037			0.00	481,816	4/9/2003	22.2	
May 2003	455,994	5/7/2003	12	0.05	0	Not Analyzed			0	5/7/2003	0.93	0.00	469,079			
June 2003	385,658			0.04	4,175				89,243			0.00	446,127			RW-2 mass removal rates based on April 8, 2003 sampling event.
Quarterly Totals	*1,286,927*			*0.13*	*4,175*				*144,280*			*0.00*	*1,397,022*			
Third Quarter 2003																
July 2003	330,738	7/28/2003	<5.0	0.01	30,104	7/28/2003	370	0.09	128,562	7/28/2003	409	0.44	441,023	7/11/2003	87.4	Multiple treatment system discharge samples collected and analyzed due to upset
														7/30/2003	8.6	concentration (87.4 ug/L) reported for July 11, 2003 sampling event. Additional discharge samples in response to request from City of Portland
August 2003	366,307	8/27/2003	10	0.03	7,388			0.02	119,831	8/27/2003	120	0.12	397,748	8/4/2003	<5.0	
														8/6/2003	<5.0	HRW-1 mass removal rates based on July 28 sampling event.
														8/11/2003	<4.76	
														8/13/2003	<4.83	SDM-1 mass removal rates based on July 28 sampling event.
														8/18/2003	<4.75	
														8/20/2003	<5.16	RW-2 mass removal rates based on August 27 sampling event.
														8/25/2003	23.8	
														8/27/2003	36.5	
September 2003	262,403			0.02	0			0.00	87,439			0.09	479,703	9/3/2003	19.3	
														9/5/2003	19.6	
														9/9/2003	7.09	
														9/23/2003	16.9	
														9/29/2003	5.96	
Quarterly Totals	*959,448*			*0.07*	*37,492*			*0.12*	*335,832*			*0.65*	*1,318,474*			
Fourth Quarter 2003																
October 2003	298,092	10/23/2003	8.1	0.02					74,025	10/20/2003	43	0.03	350,921	10/6/2003	<4.75	Multiple treatment system discharge samples collected and analyzed due to upset
														10/13/2003	<4.76	concentration (87.4 ug/L) reported for July 11, 2003 sampling event. Additional
														10/20/2003	<4.84	discharge samples in response to request from City of Portland
														10/30/2003	<5.19	
November 2003	216,630			0.01					45,472			0.02	216,711	11/3/2003	<4.73	
														11/10/2003	<4.78	SDM-1 mass removal rates based on October 20 sampling event.
														11/17/2003	<4.84	
														11/21/2003	<4.79	RW-2 mass removal rates based on October 23 sampling event.
December 2003	367,462			0.02					95,504			0.03	488,055	12/1/2003	<4.79	
														12/15/2003	<4.92	
														12/29/2003	30.4	
Quarterly Totals	*882,184*			*0.06*					*335,832*			*0.08*	*3,692,635*			

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TABLE B-1
GROUNDWATER INTERIM ACTION OPERATIONAL HISTORY
UPPER AND LOWER WATER-BEARING ZONES
TIME OIL NORTHWEST TERMINAL

	RW-2 Discharge				HRW-1 Discharge				SDM-1 Discharge				Treatment System Discharge			
Monitoring Period	Volume of Water Pumped (gal)	Sample Date	PCP Concentration (µg/L)	Estimated PCP Mass Removal (lb)	Volume of Water Pumped (gal)	Sample Date	PCP Concentration (µg/L)	Estimated PCP Mass Removal (lb)	Volume of Water Pumped (gal)	Sample Date	PCP Concentration (µg/L)	Estimated PCP Mass Removal (lb)	Volume of Water Treated (gal)	Sample Date	Discharge PCP Concentration (µg/L)	Comments
First Quarter 2004																
January 2004	348,926	2/23/2004	8.69	0.03					141,282	2/23/2004	791	0.93	367,831	1/15/2004 1/23/2004 1/26/2004	32.1 45.7 31.9	
February 2004	267,665			0.02					197,525			1.31	321,085	2/19/2004	57.2	
March 2004	246,667			0.02					17,825			0.12	197,621	3/2/2004 3/4/2004 3/16/2004 3/19/2004 3/24/2004 3/26/2004	112 48.5 113 85.9 6.23 7.07	Multiple treatment system discharge samples collected due to upset
Quarterly Totals	*863,258*			*0.06*					*356,632*			*2.36*	*886,537*			
Second Quarter 2004																
April 2004	190,512	6/9/2004	47.3	0.08	0	6/9/2004	278	0.00					315,554	4/22/2004	194	
May 2004	87,481			0.03	3,624			0.01	146	6/9/2004	595	0.001	242,530	5/19/2004 5/27/2004	39.3 5.81	SDM-1 flow meter replaced May 28, 2004
June 2004	168,615			0.07	6,681			0.02	44,155			0.22	263,730	6/3/2004 6/9/2004 6/15/2004	ND 7.55 8.78	
Quarterly Totals	*446,608*			*0.18*	*10,305*			*0.02*	*44,301*			*0.22*	*821,814*			
Third Quarter 2004																
July 2004	210,710	8/5/2004	13.5	0.02	0	8/5/2004	16.6	0.00	58,561	8/5/2004	158	0.08	343,028	7/7/2004	37.5	
August 2004	299,000			0.03	1,700			0.0002	56,900			0.08	667,180	8/10/2004	ND	
September 2004	329,619			0.04	719			0.0001	36,500			0.05	348,620	9/17/2004 9/30/2004	ND ND	
Quarterly Totals	*839,329*			*0.09*	*2,419*			*0.00*	*151,961*			*0.20*	*1,358,828*			
Fourth Quarter 2004																
October 2004	226,975	11/9/2004	2.12	0.004	62	11/11/2004	ND (d)	0	30,347	11/11/2004	1.61	0.0004	137,056			
November 2004	290,700			0.005	0			0.0000	42,400			0.001	395,562	11/10/2004 11/19/2004	ND ND	
December 2004	391,500			0.007	1,200			0	65,000			0.001	470,334	12/17/2004	6.92	
Quarterly Totals	*909,175*			*0.016*	*1,262*			*0.00*	*137,747*			*0.002*	*1,002,952*			
First Quarter 2005																
January 2005	478,600			0.005	4,000			0.0003	110,400			0.007	548,870	1/10/2005	ND	
February 2005	275,000	2/23/2005	1.13	0.003	4,700	2/18/2005	10.2	0.0004	68,800	2/18/2005	7.2	0.004	301,515	2/17/2005	ND	
March 2005	485,200			0.005	9,300			0.0008	148,400			0.009	449,041	3/17/2005	ND	
Quarterly Totals	*1,238,800*			*0.012*	*18,000*			*0.002*	*327,600*			*0.020*	*1,299,426*			
Grand Totals	***17,201,543***			***2.950***	***290,842***			***0.6534***	***2,733,694***			***4.9037***	***21,391,135***			

ND = Not Detected.

(a) PCP not detected above the detection limit of 5 µg/L; concentration-dependent calculations based on half the detection limit.
(b) PCP not detected above the detection limit of 25 µg/L; concentration-dependent calculations based on half the detection limit.
(c) PCP not detected above the detection limit of 5.25 µg/L; concentration-dependent calculations based on half the detection limit.
(d) PCP not detected above the detection limit of 0.473 µg/L.

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APPENDIX C

Measurement and Evaluation Procedures

APPENDIX C
MEASUREMENT AND EVALUATION PROCEDURES

This appendix discusses the procedures for conducting groundwater level and product (where observed) measurements during the quarterly groundwater events and the method used to evaluate the groundwater elevations.

MEASUREMENT PROCEDURES

Groundwater level measurements and the check for the presence of product were conducted using an electronic oil-water interface probe. Measurements were taken from the top of the PVC well casing at a marked survey point or at the north side of the casing, and recorded to the nearest 0.01 ft. Measurements in the Willamette River were taken from a surveyed PK nail with washer located on the south side of the dock. Surveyed reference elevations for each water level measurement location, obtained by a licensed land surveyor (ZTec Engineers, Inc., Portland, Oregon), are shown in Table A-2 of this report.

Water level measurements for the quarterly event were obtained over about a 2.5-hour period beginning at about 2.5 hours after a predicted mean river stage, based on predictions for the St. Johns station on the Willamette River. The timing for water level measurements was scheduled to estimate a mean water level elevation or elevation minimally influenced by river stage, and to reduce the time-dependent variation between wells screened in the same water-bearing zone. The timing of the water level measurements was based on average time lag calculations presented in the additional groundwater investigation technical memorandum (Landau Associates 1998), aquifer test report (Landau Associates 1999), and previous quarterly measurements.

GROUNDWATER LEVEL EVALUATION METHODS

For evaluation purposes, the groundwater level measurements were converted from depth-to-water readings to groundwater elevations using the survey information for each location. At locations where product was observed, the groundwater elevations were adjusted to account for the presence of product using the method defined by Lenhard and Parker (1990). Groundwater elevations for the upper and lower zones were contoured using GIS/Key or manually in conjunction with the evaluations conducted to evaluate the capture zone of the groundwater interim action for the upper and lower zones.

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GROUNDWATER SAMPLING PROCEDURES

Groundwater samples were collected from the shallow wells using a peristaltic pump attached to dedicated polyethylene tubing immediately following purging. The deep wells were sampled with disposable bailers, with the following exceptions: the sample from RW-2 was collected from the in-line sampling port on the groundwater interim action system, and the sample from the groundwater intercept system at SDM-1 was collected from the discharge line at the output into Tank 16804. Wells were purged using a peristaltic pump or a centrifugal purge pump. Purging continued until at least 3 casing volumes of water had been removed and specific conductance and temperature had stabilized or until the well purged dry. Four replicate measurements of field parameters (pH, conductivity, dissolved oxygen, turbidity, and temperature) were collected at each well during sampling. To prevent degassing of volatile organic compounds during sampling, the pumping rate was maintained below about 100 milliliters per minute. All sampling was conducted in accordance with the Phase I/II RI/FS work plan (Landau Associates 1996) and appropriate provisions of the revised quality assurance project plan and project health and safety plan (Landau Associates 2001). A more detailed description of groundwater sampling procedures is provided in the Phase II RI report (Landau Associates 2000).

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APPENDIX D

Summary of Modification to Quarterly Groundwater Analysis Program

APPENDIX D
SUMMARY OF MODIFICATIONS TO QUARTERLY GROUNDWATER ANALYSIS PROGRAM

A summary of modifications to the Phase II RI quarterly groundwater monitoring program for the Time Oil Northwest Terminal in Portland, Oregon is presented below by the date of first implementation. A reference list for the modifications is included.

- ***Second Quarter 1998*** (Landau Associates 1998; DEQ 1998):
  - Annual sampling of east property wells LW-101S, LW-102S, LW-103S, and LW-104S
  - Elimination of 2-chloroethylvinylether from the volatile analyte list
  - Reduction of the suite of metals analyses to include only arsenic, chromium, copper, lead, nickel, and zinc
  - Quarterly analysis of only metals in well K and only chlorinated phenols and metals in well H
  - Elimination of PCB analysis
  - Annual analysis for major ions; quarterly analysis for chloride and dissolved oxygen.

- ***First Quarter 1999*** (Landau Associates 1999; Urbanowicz, K., 12 February 1999, personal communication):
  - Analysis of polycyclic aromatic hydrocarbons (PAHs) using analytical techniques that provide lower detection limits at upper zone wells LW-2S, LW-7S and LW-101S and at lower zone wells G1A, O, and LW-4D for the first quarter 1999 event only
  - Elimination of sampling at well J3.

- ***Second Quarter 2000*** (Landau Associates 2000a; DEQ 2000):
  - Elimination of dioxin/furan analyses.

- ***Third Quarter 2000*** (Landau Associates 2000b; Roick 2000):
  - Reduction of sampling frequency of wells H, L, and LW-5S from quarterly to annually.

- ***Second Quarter 2001*** (Landau Associates 2001a, 2001b; Roick 2001):
  - Reduction of the list of chlorinated phenols being analyzed by EPA Method 8040 to pentachlorophenol (PCP) only using EPA Method 8270 SIM
  - Reduction of the frequency of total petroleum hydrocarbon (TPH) analysis from quarterly to annually at upper zone wells J1 and LW-1S; lower zone wells B2, J2, LW-1D; and deep sand unit well LW-12D2. In addition, TPH analysis was eliminated for the following wells: upper zone wells D, L, LW-5S, LW-101S through -104S, and lower zone well LW-3D.

- ***First Quarter 2004*** (Landau Associates 2004; Roick 2005):
  - Elimination of eight wells from the Phase II sampling program for future events. These wells included five upper zone wells (H, K, L, LW-1S, and LW-5S), and three lower zone wells (O, R, LW-1D).

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- Reduction of the monitoring frequency for selected Phase II wells from quarterly to semiannually. These wells include: B1, B2, D, J1, J2, LW-3D, LW-4S, LW-4D, LW-11S, LW-11D, LW-13S, LW-14D, LW-17D, LW-18D, OX-1S through OX-8S, OX-8D, and RW-1. Semiannual sampling of these wells will be conducted in conjunction with the first and third quarter sampling of the Phase III wells.

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APPENDIX E

Data Validation Report

TECHNICAL MEMORANDUM

LANDAU ASSOCIATES
ENVIRONMENTAL | GEOTECHNICAL | NATURAL RESOURCES

TO: Rebekah Brooks, Landau Associates

CC: Tom Roick, DEQ
Mark Chandler, Time Oil Co.
Patty Dost, Schwabe, Williamson & Wyatt
Mike Tischuk, Beazer East, Inc.

FROM: April Wallace and Anne Halvorsen, Landau Associates

DATE: April 6, 2005

RE: 1ST QUARTER 2005 GROUNDWATER MONITORING LABORATORY DATA QUALITY EVALUATION TIME OIL NORTHWEST TERMINAL

INTRODUCTION

This technical memorandum provides the results of a data quality evaluation for 68 groundwater samples and 8 trip blanks collected at the Time Oil Northwest Terminal February 14 through February 24, 2005, for the Phase II/III remedial investigation (RI) first quarter 2005 groundwater monitoring event. A data quality evaluation was performed for analysis of volatile organic compounds [VOCs; U.S. Environmental Protection Agency (EPA) Method 8260B]; semivolatile organic compounds (SVOCs; EPA Method 8270C); total petroleum-range hydrocarbons (NWTPH-Dx and NWTPH-Gx); polycyclic aromatic hydrocarbons [PAH; EPA Method 8270 with selected ion monitoring (SIM)]; pentachlorophenol (PCP; EPA Method 8270 SIM); selected total and dissolved priority pollutant (PP) metals (EPA Method 6010/6020 Series); ferrous iron (EPA Method SM3500); dioxins and furans (EPA Method 8290); chloride and sulfate (EPA Method 9056); alkalinity (EPA Method E310.1); nitrite and nitrate as nitrogen (EPA Method E353.2); and total dissolved solids (TDS; EPA Method 160.1).

Analyses of groundwater samples were performed by Specialty Analytical (Specialty) located in Tualatin, Oregon; Columbia Analytical Services (CAS) located in Houston, Texas; and Analytical Resources, Inc. (ARI) located in Tukwila, Washington. This data quality evaluation covers Specialty data packages 0502056, 0502059, 0502070, 0502087, 0502088, 0502099, 0502102, 0502110, CAS data packages E0500119 and E0500121, and ARI packages HS90 and HT16.

The data quality evaluation was performed in accordance with the revised quality assurance project plan (QAPP) contained in Appendix C of the *Phase III Remedial Investigation* work plan (Landau Associates 2001), and with applicable portions of the EPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* and *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA 1994a,b).

The evaluation considered the following elements:

- Chain-of-custody records
- Holding times
- Method blank results
- Surrogate spike recoveries
- Matrix spike and matrix spike duplicate (MS/MSD) results
- Laboratory control sample (LCS) results
- Duplicate (laboratory and field) results
- Reporting limits
- Overall data quality and completeness.

Data validation qualifiers are added to sample results based on the evaluation of data quality. The absence of a data qualifier indicates that the datum is acceptable without qualification. Applicable data validation qualifiers are summarized in Table 1. The data quality evaluation is summarized below.

CHAIN-OF-CUSTODY RECORDS

Signed chain-of-custody records accompanied each data package. The laboratory received all samples in good condition and all requested analyses were performed.

HOLDING TIMES

For all analyses and all samples, the time between sample collection, extraction, and analyses was determined to be within EPA- and project-specified holding times, except as indicated in Table 1 and discussed below:

- Nitrate and nitrite analyses for all project samples in data package 0502056 were performed one day outside of the EPA-specified 48-hour holding time. Associated nitrate and nitrite values are qualified as estimates (J/UJ), as indicated in Table 1.

METHOD BLANK RESULTS

Method blanks were analyzed with each batch of samples for each analysis. No contamination was detected in any of the method blanks, except as indicated in Table 1 and discussed below:

- Magnesium, sodium, and/or lead were detected in the method blanks associated with the PP metals analyses of all data packages. Only lead was detected in associated project samples in data packages 0502087, 0502102, and 0502110 at concentrations less than five times the method blank concentration; therefore, these lead values are qualified as nondetect (U), as indicated in Table 1. Magnesium and sodium were either not detected or were detected at

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concentrations greater than five times the method blank concentration in associated project samples. No further qualification of the data is necessary.

- Methylene chloride and/or naphthalene were detected in the method blanks associated with the VOC analysis of all data packages. Naphthalene was detected in data package 0502099 at concentrations less than five times the method blank concentration; therefore, these naphthalene values are qualified as nondetect (U), as indicated in Table 1. Methylene chloride was not detected in any associated project samples; no further qualification of the data is necessary.

- 2-Nitroaniline, benzoic acid, di-n-butylphthalate, fluorene, n-nitrosodiphenylamine, nitrobenzene, phenol, and/or pyrene were detected in the method blanks associated with the SVOC analyses of all data packages. Fluorene was detected in data packages 0502056 and 0502110 at concentrations less than five times the method blank concentration; therefore, these fluorene values are qualified as nondetect (U), as indicated in Table 1. All other SVOC compounds were either not detected or were detected at concentrations greater than five or ten times the method blank concentration in associated project samples. No further qualification of the data is necessary.

- Nitrate, sulfate, and TDS were detected in the method blanks associated with the conventional inorganic chemistry analyses of several data packages. Nitrate was detected in data package 0502102 at concentrations less than five times the method blank concentration; therefore this nitrate value is qualified as nondetect (U), as indicated in Table 1. All other conventional inorganic compounds were either not detected or were detected at concentrations greater than five times the method blank concentration in associated project samples. No further qualification of the data is necessary.

- Lube oil was detected in the method blanks associated with the NWTPH-Dx analyses of several data packages. Lube oil was detected in data package 0502059, 0502099, 0502102, and 0502110 at concentrations less than five times the method blank concentration; therefore these lube oil values are qualified as nondetect (U), as indicated in Table 1. Lube oil was not detected in other associated project samples. No further qualification of the data is necessary.

- Gasoline was detected in the method blank associated with the NWTPH-Gx analysis of data package 0502110. Gasoline was detected in associated samples in data package 0502110 at concentrations less than five times the method blank concentration; therefore these gasoline values are qualified as nondetect (U), as indicated in Table 1.

- Benzo(a)anthracene, naphthalene, and pyrene were detected in the method blanks associated with the PAH analysis of several data packages. Benzo(a)anthracene was detected in data package 0502110 at a concentration less than five times the method blank concentration; therefore this benzo(a)anthracene value is qualified as nondetect (U), as indicated in Table 1. Naphthalene was detected in data package 0502099 at concentrations less than five times the method blank concentration; therefore these naphthalene values are qualified as nondetect (U), as indicated in Table 1. Pyrene was detected in data package 0502056 at a concentration less than five times the method blank concentration; therefore this pyrene value is qualified as nondetect (U), as indicated in Table 1. All other PAH compounds were either not detected or were detected in concentrations greater than five times the method blank concentration in associated project samples. No further qualification of the data is necessary.

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- OCDD; OCDF; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,7,8-HxCDF; total hepta-dioxins; and total hepta-furans were detected in the method blanks associated with the dioxins/furans analysis of data packages E0500119 and E0500121. OCDD; OCDF; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,6,7,8-HpCDF; total hepta-dioxins; and total hepta-furans were detected at concentrations greater than five times the method blank concentration in all associated project samples; therefore, no qualification of the data is necessary for these compounds. 1,2,3,4,7,8-HxCDF was detected in two associated project samples at concentrations less than five times the method blank concentration; therefore, these 1,2,3,4,7,8-HxCDF values are qualified as nondetect (U), as indicated in Table 1.

FIELD BLANK RESULTS

In accordance with the QAPP, field equipment rinsate blanks were not collected (all sampling equipment was dedicated and/or disposable, which eliminated the potential for cross contamination). Eight field trip blanks were collected and submitted for laboratory analysis of VOCs in data packages 0502056, 0502059, 0502070, 0502087, 0502088, 0502099, 0502102, and 0502110. No contamination was detected in any of the trip blanks. No qualification of the data is necessary.

SURROGATE SPIKE RECOVERIES

Surrogate spikes were performed with each organic analysis (or internal standards for dioxin/furan analysis). Recovery values for the surrogate spikes were within the current laboratory control limits, except as indicated below.

- Recoveries of the surrogate 2-Fluorobiphenyl (2-FBP) associated with the SVOC analyses of data packages 0502070, 0502088, and 0502099 were slightly below the laboratory control limits. However, no qualifiers were assigned because, in accordance with the EPA guidelines (1994a), two or more surrogates of the same fraction must be outside the control limits to qualify SVOC results based on surrogate recoveries.

- Recovery of the surrogate 2,4,6-Tribromophenol (2,4,6-TBP) associated with the PCP analysis of data package 0502087 was below the laboratory control limits for one sample. The nondetected reporting limit for this sample was qualified as an estimate (UJ), as indicated in Table 1.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) RESULTS

MS and/or MSD samples were performed for most analyses. Recoveries and RPDs for all project sample matrix spikes were within the project-specified control limits, except as indicated below and summarized on Table 1:

- MS and MSD recoveries for alkalinity for the conventional inorganic chemistry analysis of data packages 0502099 were slightly below laboratory control limits. Because individual

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recoveries and LCS recoveries of these compounds were within laboratory control limits, no qualification of the data is necessary.

- MS and MSD recoveries for alkalinity for the conventional inorganic chemistry analysis of data packages 0502110 were below laboratory control limits. Recoveries are not applicable when the parent sample concentration is greater than four times the spike concentration. Therefore, no qualification of the data is necessary.

- MS and MSD recoveries for nitrate for the conventional inorganic chemistry analysis of data package 0502110 were below laboratory control limits. The laboratory indicated that the results are outside of control limits due to matrix interference. Associated samples where nitrate was not detected are qualified as estimates (UJ), as indicated in Table 1.

- MS and MSD recoveries for sodium for the PP metals analysis of data package 0502070 exceeded laboratory control limits. The associated project sample value is qualified as an estimate (J), as indicated in Table 1.

- MS recoveries for copper, nickel, and zinc for the PP metals analysis of data package 0502110 were slightly below laboratory control limits. Because individual recoveries and LCS recoveries of these compounds were within laboratory control limits, no qualification of the data is necessary.

- The MSD recovery for 4-nitrophenol for the SVOC analysis of data package 0502110 was slightly above laboratory control limits. Because individual recoveries and LCS recoveries of these compounds were within laboratory control limits, no qualification of the data is necessary.

- The MS recovery for diesel for the NWTPH-Dx analysis of data package 0502110 was below laboratory control limits. Because individual recoveries and LCS recoveries of these compounds were within laboratory control limits, no qualification of the data is necessary.

LABORATORY CONTROL SAMPLE (LCS) RESULTS

At least one LCS (or blank spike sample) and/or laboratory control sample duplicate (LCSD) was analyzed with each batch of samples for each analysis. Recoveries and RPDs for the laboratory control samples and associated duplicates were within laboratory-specified control limits for all project samples, except as indicated in Table 1 and discussed below:

- The RPDs between the LCS and LCSD for n-nitrosodi-n-propylamine associated with the SVOC analyses of data packages 0502056 and 0502059 slightly exceeded the laboratory control limit of 20 percent. Because the individual LCS and LCS recoveries were each within control limits, and all other RPDs associated with the SVOC analyses were below 20 percent, no qualification of the data is necessary.

- The RPDs between the LCS and LCSD for 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, 2-chlorophenol, 4-nitrophenol, and phenol associated with the SVOC analyses of data packages 0502087 and 0502088 slightly exceeded the laboratory control limit of 20 percent. Because

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individual LCS and LCSD recoveries were acceptable, and these compounds were not detected in any associated project samples, no qualification of the data is necessary.

- The LCSD recovery of benzo(g,h,i)perylene associated with the PAH analyses of data packages 0502056, 0502099, and 0502102 slightly exceeded the laboratory control limit. Because the LCS recovery and RPD between the LCS and LCSD were acceptable, and this compound was not detected in any associated project samples, no qualification of the data is necessary.

- The LCS recoveries of diesel and lube oil associated with the NWTPH-Dx analysis of data package 0502102 slightly exceeded the laboratory control limits. Neither diesel nor lube oil was detected in any associated project samples; therefore, no qualification of the data is necessary.

LABORATORY DUPLICATE RESULTS

Laboratory duplicate samples were generally performed with the TDS, NWTPH-Gx, and metals analyses. RPDs between the laboratory duplicate results were all within the laboratory control limits. No qualification of the data is necessary.

FIELD DUPLICATE RESULTS

Three pairs of blind field duplicate samples (RW1/W, LW039D/Y, LW042S/Z) were collected during this sampling event and submitted for analysis. A project-specified control limit of 20 percent was used to evaluate the RPDs between the duplicate sample results, except when the sample results were within five times the reporting limit. In these cases, a project-specified control limit of plus or minus the reporting limit was used. RPDs for all duplicate sample pairs submitted for analysis were within the control limits, except as indicated on Table 1 and discussed below:

- The RPDs between the isopropylbenzene, n-propylbenzene, and sec-butylbenzene results for the VOC analysis of field duplicate pair RW1/W in data package 0502087 exceeded the project-specified limit. Results of for these compounds for samples RW1 and W are qualified as estimates (J), as indicated in Table 1.

- The RPDs between the 2-chloronaphthalene and PCP results for the SVOC analysis of field duplicate pair RW1/W in data package 0502087 exceeded the project-specified control limit. Results for these compounds for samples RW1 and W are qualified as estimates (J/UJ), as indicated in Table 1.

- The RPD between the gasoline results for the NWTPH-Gx analysis of field duplicate pair RW1/W in data package 0502087 exceeded the project-specified control limit. Results for this compound for samples RW1 and W are qualified as estimates (J), as indicated in Table 1.

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- The RPD between diesel results for the NWTPH-Dx analysis of field duplicate pair LW042S/Z in data package 0502099 exceeded the project-specified limit. Results for this compound for samples LW042S and Z are qualified as estimates (J), as indicated in Table 1.

REPORTING LIMITS

Method and/or project-specified reporting limits were met.

OTHER

Other factors which required evaluation of the data include the following:

- Several samples analyzed for lube oil (NWTPH-Dx) in data packages 0502056, 0502059, 0502087, 0502088, 0502099, and 0502110 were identified by the laboratory as not detected based on hydrocarbon pattern recognition. As indicated by the laboratory in the case narrative, in the opinion of the laboratory, the product was carry-over from another hydrocarbon type. No qualification of the data is necessary.

- The 1,2,3,7,8,9-HxCDD; 1,2,3,7,8-PeCDF; 2,3,4,7,8-PeCDF; 1,2,3,4,7,8-HxCDF; and 1,2,3,4,7,8,9-HpCDF for the dioxins/furans analysis results in data package E0500119 were qualified by the laboratory as estimated maximum possible concentrations (EMPC); therefore, the results for these compounds for these samples were qualified as nondetect (UJ) at the EMPC, as indicated in Table 1.

- The 1,2,3,6,7,8-HxCDD result for the dioxins/furans analysis of data package E0500121 was qualified by the laboratory as an EMPC; therefore, the result for this compound for this sample was qualified as nondetect (UJ) at the EMPC, as indicated in Table 1.

- 2,3,7,8-TCDF was not detected in the dioxin/furan analysis of either data package. No confirmation analysis is required on a second column (DB-225). No qualification of the data is necessary.

OVERALL DATA QUALITY AND COMPLETENESS

Data precision was evaluated through laboratory duplicates, field duplicates, matrix spike duplicates, and laboratory control samples duplicates. Data accuracy was evaluated through surrogate spikes, matrix spikes, and laboratory control samples. Based on this data quality evaluation, all of the data were determined to be acceptable and no data were rejected.

The completeness for this set of data is 100 percent, which exceeds the project-specified goal of 90 percent.

BZTO104(e)021252

REFERENCES

EPA. 1994a. *Contract Laboratory Program National Functional Guidelines for Organic Data Review*. U.S. Environmental Protection Agency.

EPA. 1994b. *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*. U.S. Environmental Protection Agency.

Landau Associates. 2001. *Work Plan, Phase III Remedial Investigation, Time Oil Northwest Terminal, Portland, Oregon.* June 18.

ATTACHMENT

Table 1 Summary of Data Validation Qualifiers

BZTO104(e)021253

TABLE 1
SUMMARY OF DATA VALIDATION QUALIFIERS
TIME OIL NORTHWEST TERMINAL
1ST QUARTER 2005 GROUNDWATER ANALYTICAL RESULTS

Package Number	Analysis	Analyte	Sample Number	Concentration	Qualifier	Reason
0502056	Conventionals	Nitrate	LW031S	0.0250	UJ	Holding time exceeded by 1 day
0502056	Conventionals	Nitrite	LW031S	0.740	J	Holding time exceeded by 1 day
0502056	Conventionals	Nitrate	LW032S	0.0250	UJ	Holding time exceeded by 1 day
0502056	Conventionals	Nitrite	LW032S	0.0300	UJ	Holding time exceeded by 1 day
0502056	Conventionals	Nitrate	LW032D	0.0250	UJ	Holding time exceeded by 1 day
0502056	Conventionals	Nitrite	LW032D	0.0300	UJ	Holding time exceeded by 1 day
0502056	Conventionals	Nitrate	LW043S	0.0250	UJ	Holding time exceeded by 1 day
0502056	Conventionals	Nitrite	LW043S	0.03	UJ	Holding time exceeded by 1 day
0502110	Conventionals	Nitrate	N	0.03	UJ	Low MS/MSD recoveries
0502110	Conventionals	Nitrate	P	0.03	UJ	Low MS/MSD recoveries
0502110	Conventionals	Nitrate	Q	0.03	UJ	Low MS/MSD recoveries
0502110	Conventionals	Nitrate	LW026D	0.03	UJ	Low MS/MSD recoveries
0502110	Conventionals	Nitrate	LW027D	0.03	UJ	Low MS/MSD recoveries
0502110	Conventionals	Nitrate	LW020S	0.03	UJ	Low MS/MSD recoveries
0502110	Conventionals	Nitrate	LW020D	0.0300	UJ	Low MS/MSD recoveries
0502102	Conventionals	Nitrate	LW007S	0.0487	U	Method blank contamination
0502087	NWTPH-Gx	Gasoline	RW1	2020	J	High RPD between field duplicate results
0502087	NWTPH-Gx	Gasoline	W	2610	J	High RPD between field duplicate results
0502110	NWTPH-Gx	Gasoline	LW027D	110	U	Method blank contamination
0502110	NWTPH-Gx	Gasoline	LW020D	162	U	Method blank contamination
0502059	NWTPH-Dx	Lube Oil	LW030D	0.545	U	Method blank contamination
0502099	NWTPH-Dx	Lube Oil	LW001S	0.608	U	Method blank contamination
0502099	NWTPH-Dx	Lube Oil	LW001D	0.583	U	Method blank contamination
0502099	NWTPH-Dx	Lube Oil	LW022D	1.26	U	Method blank contamination
0502099	NWTPH-Dx	Lube Oil	LW033S	0.669	U	Method blank contamination
0502099	NWTPH-Dx	Lube Oil	LW035D	1.35	U	Method blank contamination
0502099	NWTPH-Dx	Lube Oil	LW040D	0.667	U	Method blank contamination
0502099	NWTPH-Dx	Lube Oil	LW042S	1.13	U	Method blank contamination
0502099	NWTPH-Dx	Lube Oil	LW045D	1.48	U	Method blank contamination
0502110	NWTPH-Dx	Lube Oil	LW020D	0.768	U	Method blank contamination
0502102	NWTPH-Dx	Lube Oil	B1	1.09	U	Method blank contamination
0502099	NWTPH-Dx	Diesel	LW042S	3.74	J	High RPD between field duplicate results
0502099	NWTPH-Dx	Diesel	Z	2.98	J	High RPD between field duplicate results
E0500119	Dioxins/Furans	1,2,3,4,7,8-HxCDF	OX001S	1.266	U	Method blank contamination
E0500119	Dioxins/Furans	1,2,3,7,8,9-HxCDD	OX001S	0.844	UJ	Estimated Maximum Possible Concentration
E0500119	Dioxins/Furans	1,2,3,7,8,9-HxCDD	OX006S	3.976	UJ	Estimated Maximum Possible Concentration
E0500119	Dioxins/Furans	1,2,3,4,7,8-HxCDF	OX001S	1.266	UJ	Estimated Maximum Possible Concentration
E0500119	Dioxins/Furans	1,2,3,4,7,8,9-HpCDF	OX001S	1.392	UJ	Estimated Maximum Possible Concentration
E0500119	Dioxins/Furans	1,2,3,7,8-PeCDF	OX006S	1.959	UJ	Estimated Maximum Possible Concentration
E0500119	Dioxins/Furans	2,3,4,7,8-PeCDF	OX006S	1.528	UJ	Estimated Maximum Possible Concentration
E0500121	Dioxins/Furans	1,2,3,4,7,8-HxCDF	RW1	1.510	U	Method blank contamination
E0500121	Dioxins/Furans	1,2,3,6,7,8-HxCDD	RW1	1.897	UJ	Estimated Maximum Possible Concentration
0502087	Metals	Lead	LW011S	0.202	U	Method blank contamination
0502087	Metals	Lead	RW1	0.331	U	Method blank contamination
0502087	Metals	Lead	W	0.316	U	Method blank contamination
0502087	Metals	Lead	LW006D	0.168	U	Method blank contamination
0502087	Metals	Lead	LW008S	0.157	U	Method blank contamination
0502110	Metals	Lead	LW020S	0.277	U	Method blank contamination
0502102	Metals	Lead	J2	0.136	U	Method blank contamination
0502102	Metals	Lead	D	0.146	U	Method blank contamination
0502070	Metals	Sodium	OX009S	13.4	J	High MS/MSD recoveries
0502056	PAHs	Pyrene	LW032S	0.0497	U	Method blank contamination
0502099	PAHs	Naphthalene	LW023D	0.339	U	Method blank contamination
0502099	PAHs	Naphthalene	LW042S	0.680	U	Method blank contamination
0502099	PAHs	Naphthalene	LW045S	0.405	U	Method blank contamination
0502099	PAHs	Naphthalene	Z	0.771	U	Method blank contamination
0502110	PAHs	Benzo(a)anthracene	Q	0.0492	U	Method blank contamination

TABLE 1
SUMMARY OF DATA VALIDATION QUALIFIERS
TIME OIL NORTHWEST TERMINAL
1ST QUARTER 2005 GROUNDWATER ANALYTICAL RESULTS

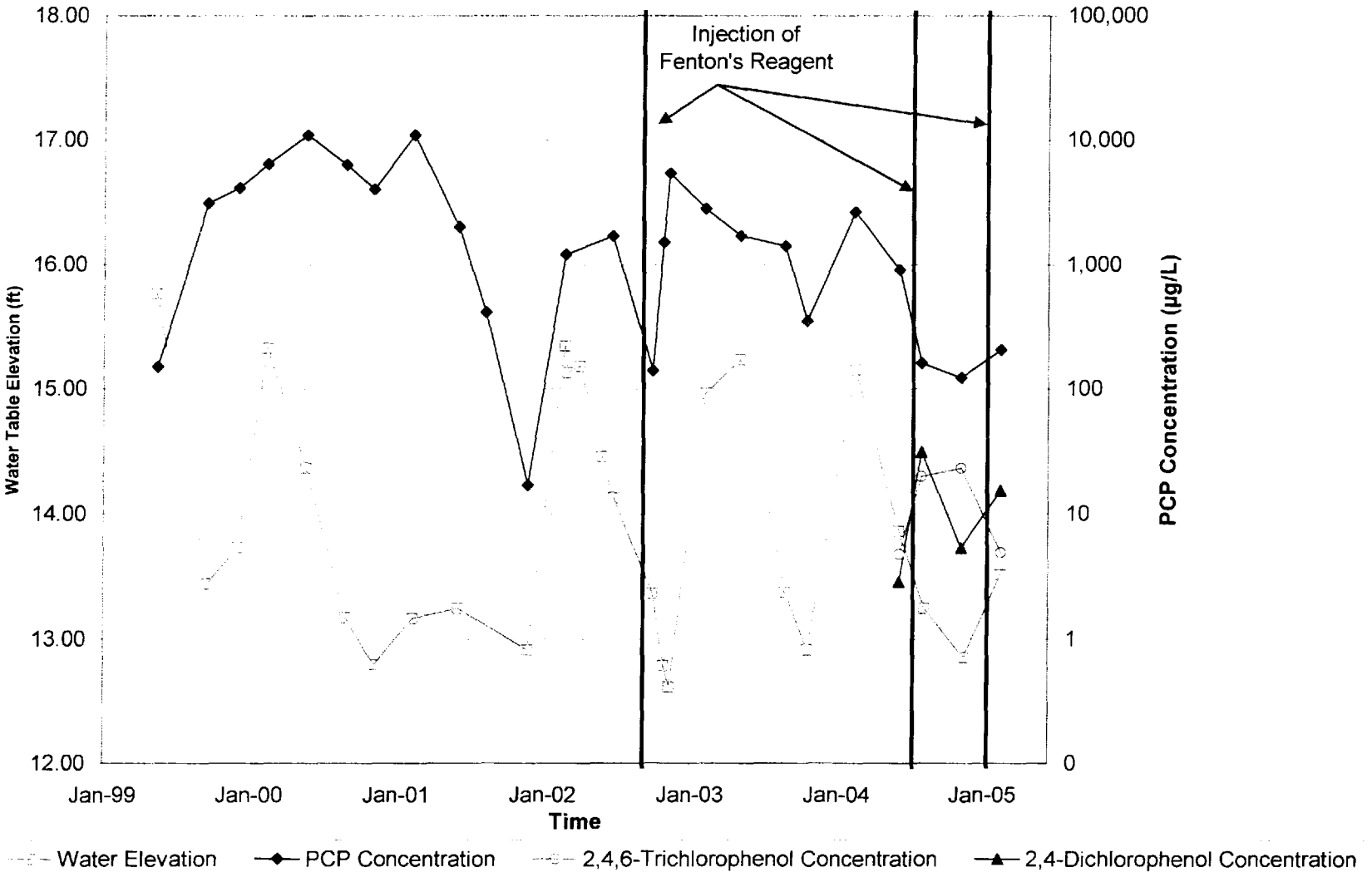
Package Number	Analysis	Analyte	Sample Number	Concentration	Qualifier	Reason
0502056	SVOCs	Fluorene	LW043S	1.22	U	Method blank contamination
0502087	SVOCs	2-Chloronaphthalene	RW1	10.5	J	High RPD between field duplicate results
0502087	SVOCs	2-Chloronaphthalene	RW1	0.974	UJ	High RPD between field duplicate results
0502087	SVOCs	PCP	W	205	J	High RPD between field duplicate results
0502087	SVOCs	PCP	W	137	J	High RPD between field duplicate results
0502110	SVOCs	Fluorene	N	1.75	U	Method blank contamination
0502087	VOCs	Isopropylbenzene	RW1	27.2	J	High RPD between field duplicate results
0502087	VOCs	Isopropylbenzene	W	35.8	J	High RPD between field duplicate results
0502087	VOCs	n-Propylbenzene	RW1	27.1	J	High RPD between field duplicate results
0502087	VOCs	n-Propylbenzene	W	36.1	J	High RPD between field duplicate results
0502087	VOCs	sec-Butylbenzene	RW1	7.89	J	High RPD between field duplicate results
0502087	VOCs	sec-Butylbenzene	W	10.2	J	High RPD between field duplicate results
0502099	VOCs	Naphthalene	LW023D	1.64	U	Method blank contamination
0502087	PCP	Pentachlorophenol	LW008S	0.484	UJ	Low surrogate recovery

APPENDIX F

Laboratory Data

APPENDIX G

Groundwater Elevation and Chlorinated Phenol Concentration vs. Time Graphs



Notes: 1) 2,4,6-Trichlorophenol concentrations shown at 5 µg/L and below are nondetected concentrations.
2) 2,4-Dichlorophenol concentrations shown at 3 µg/L and below are nondetected concentrations.

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Time Oil NW Terminal
Portland, Oregon

PCP Concentrations, Breakdown Products and Groundwater Elevations, RW-1
May 1999 – February 2005

Figure
G-1

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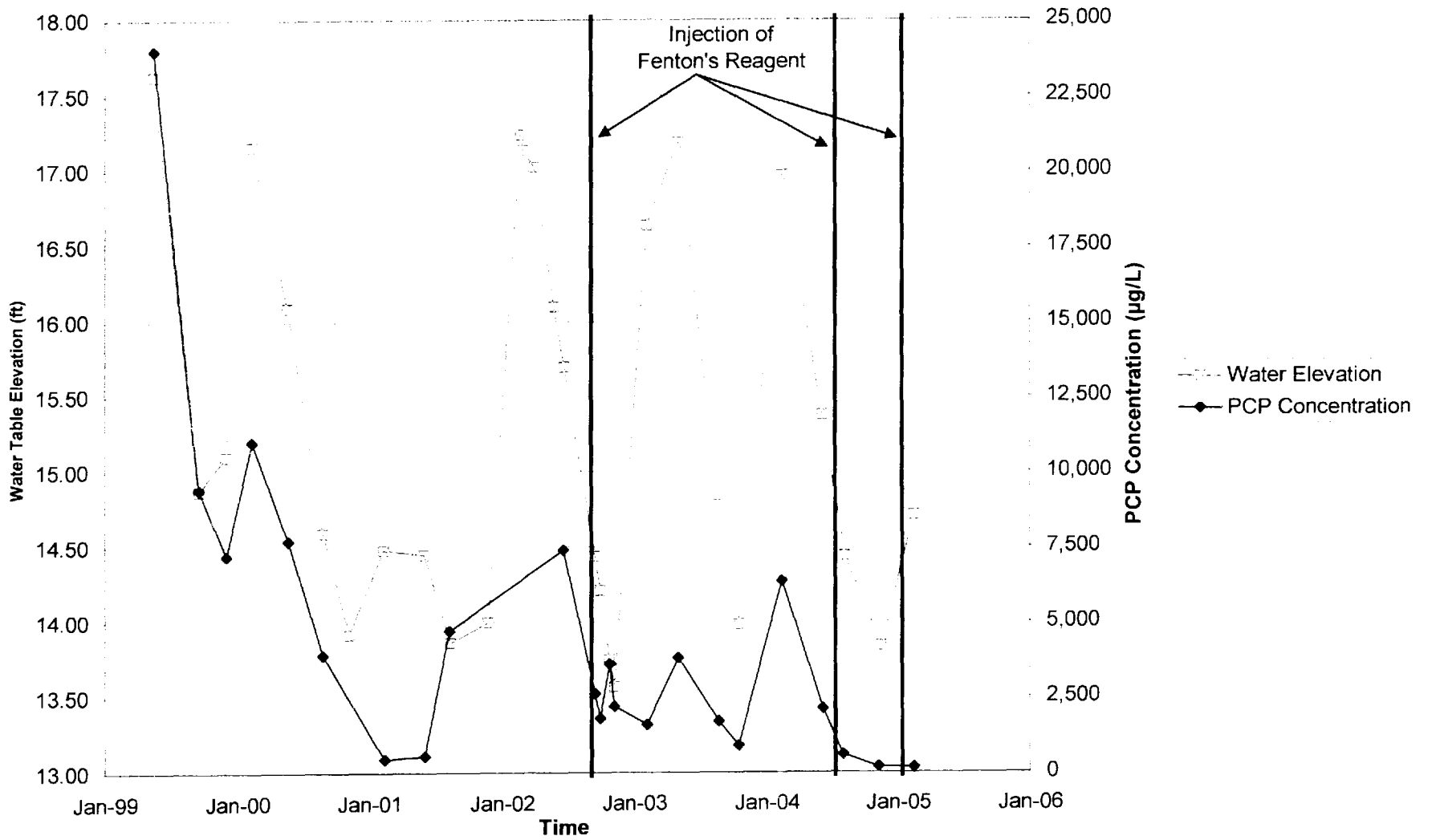
Source: S:\SHAREDOC\231\001\131\1Q05 ISCO Plots LW-11S

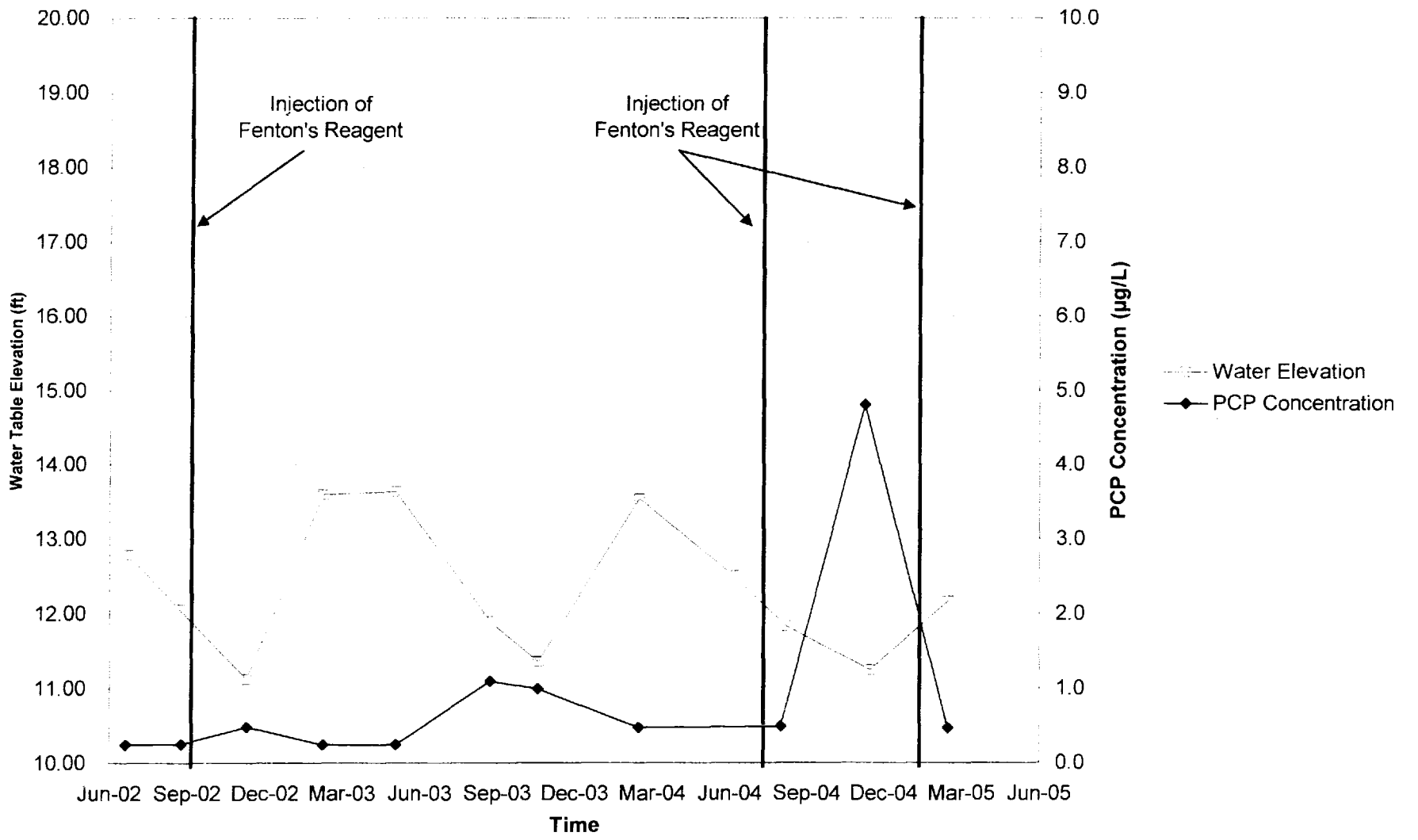


Note: Groundwater elevation without corresponding PCP concentration (e.g., December 2001, June 2002) is indicative of the presence of LNAPL and no sample was collected for analysis.

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**PCP Concentrations and Groundwater Elevations, LW-11S May 1999 – February 2005**	Figure G-2

BZTO104(e)021259

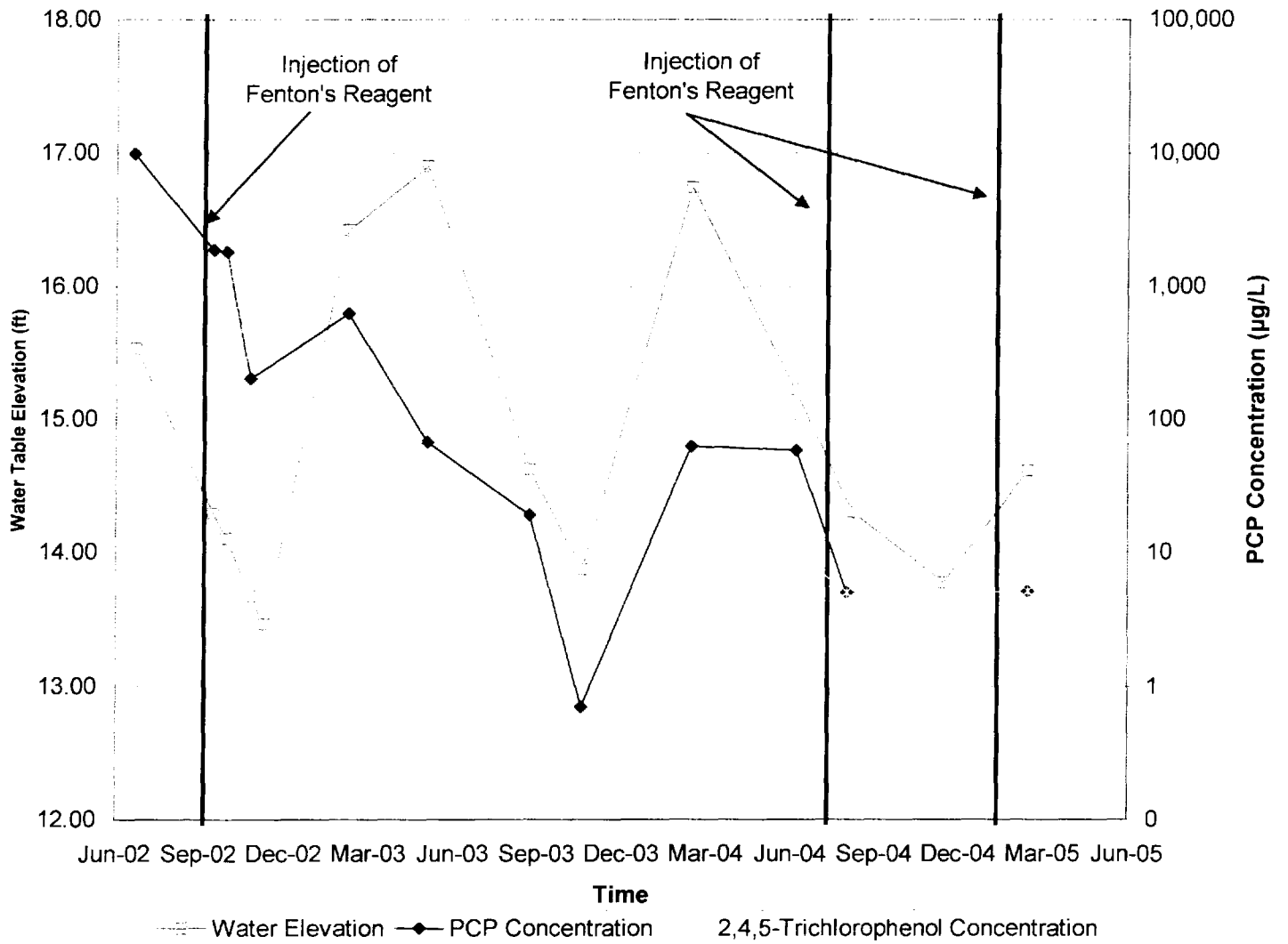


Note: PCP concentrations shown at 0.5 µg/L and below are nondetected concentrations.

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**PCP Concentrations and Groundwater Elevations, LW-13S June 2002 – February 2005**	Figure G-3

BZTO104(e)021260

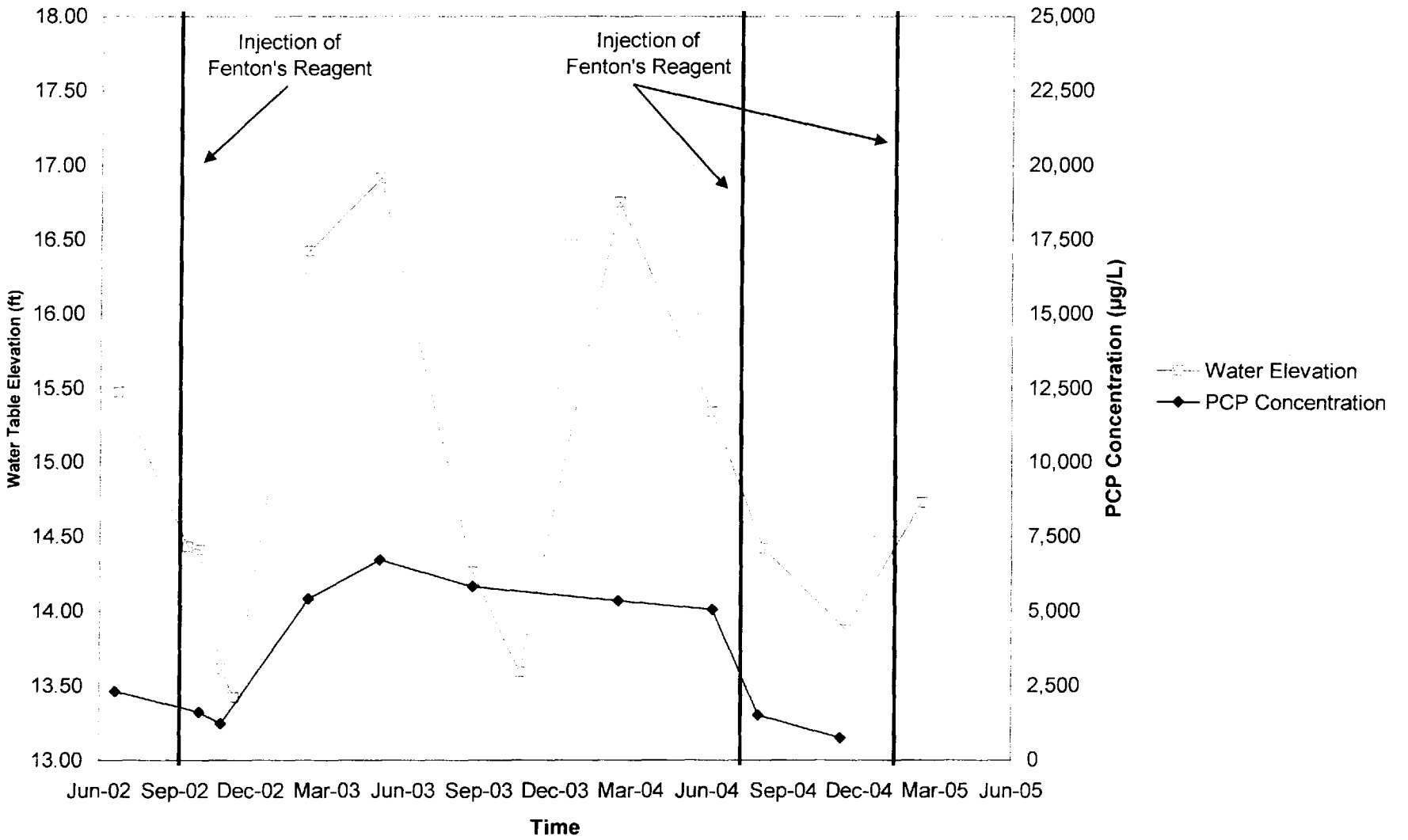


Notes: 1) PCP concentrations shown at 0.5 µg/L and below are nondetected concentrations.
2) 2,4,5-Trichlorophenol concentrations shown at 5 µg/L and below are nondetected concentrations.

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**PCP Concentrations, Breakdown Products and Groundwater Elevations, OX-1S June 2002 – February 2005**	Figure G-4

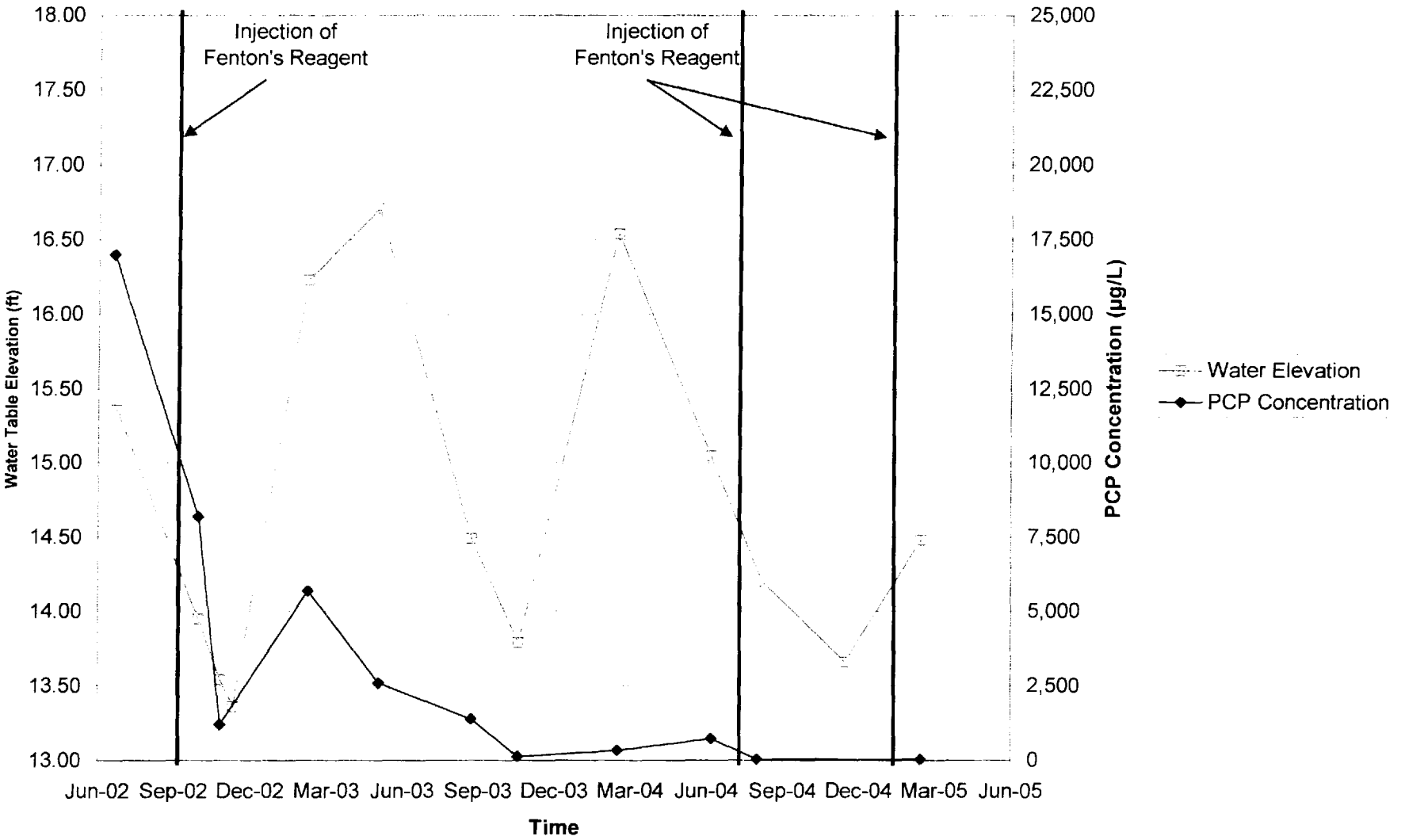
BZTO104(e)021261



LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**PCP Concentrations and Groundwater Elevations, OX-2S June 2002 – February 2005**	Figure G-5

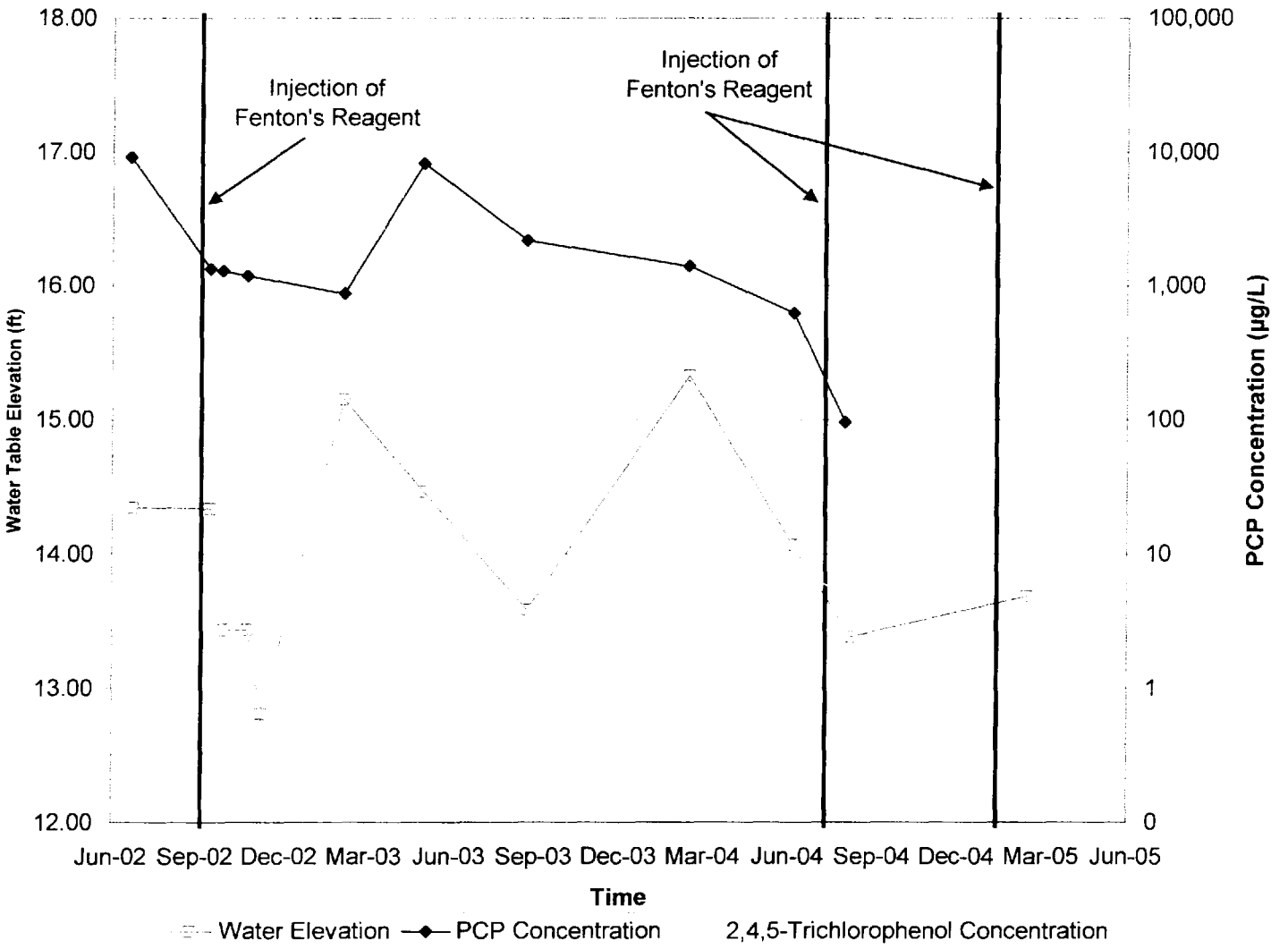
BZTO104(e)021262



LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**PCP Concentrations and Groundwater Elevations, OX-3S June 2002 – February 2005**	Figure G-6

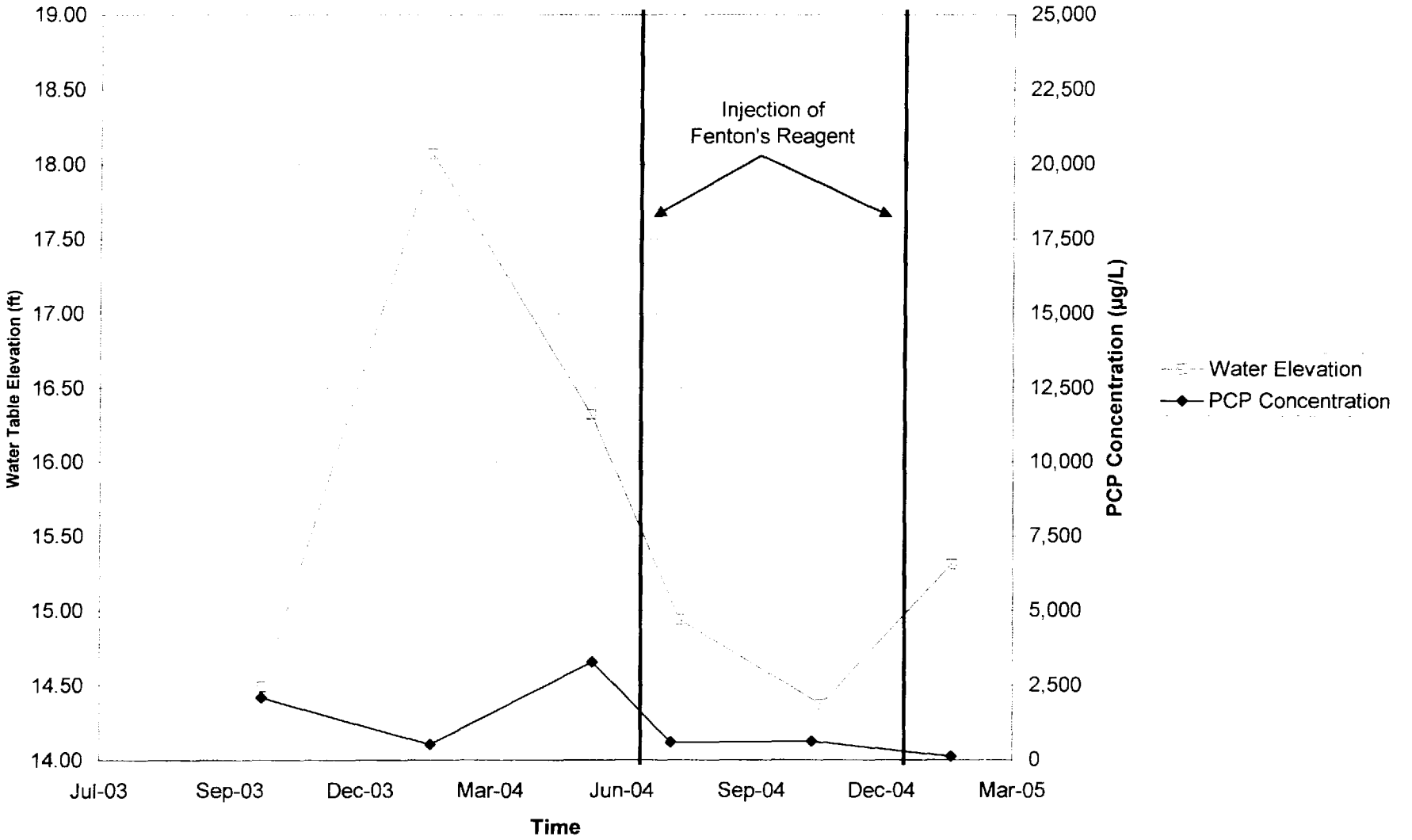
BZTO104(e)021263



Note: 2,4,5-Trichlorophenol concentrations shown at 5 µg/L and below are nondetected concentrations.

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**PCP Concentrations, Breakdown Products and Groundwater Elevations, OX-4S June 2002 – February 2005**	Figure G-7



Note: Well installed in Fall 2003.

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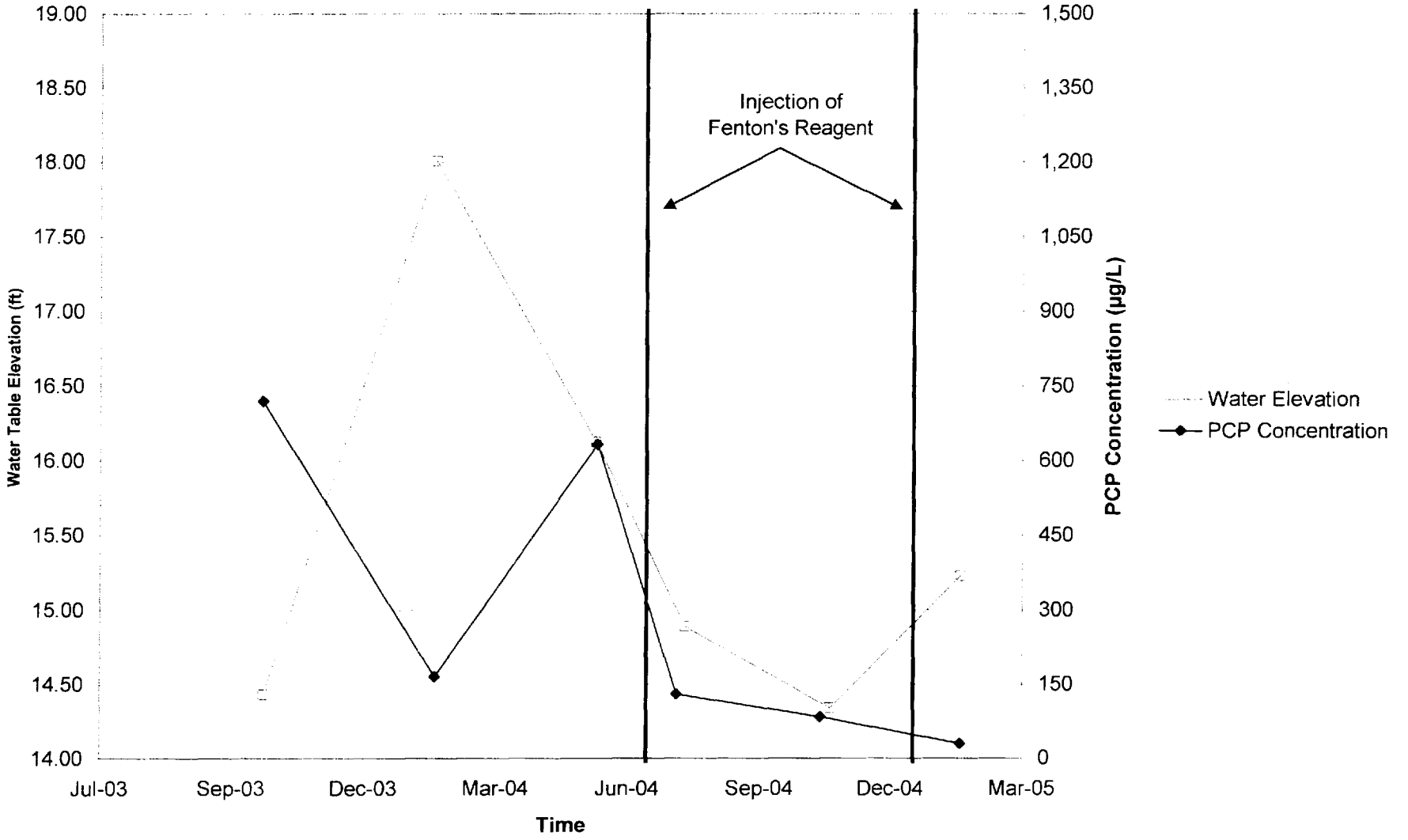
Time Oil NW Terminal Portland, Oregon	**PCP Concentrations and Groundwater Elevations, OX- 6S October 2003 – February 2005**	Figure G-8

BZTO104(e)021265

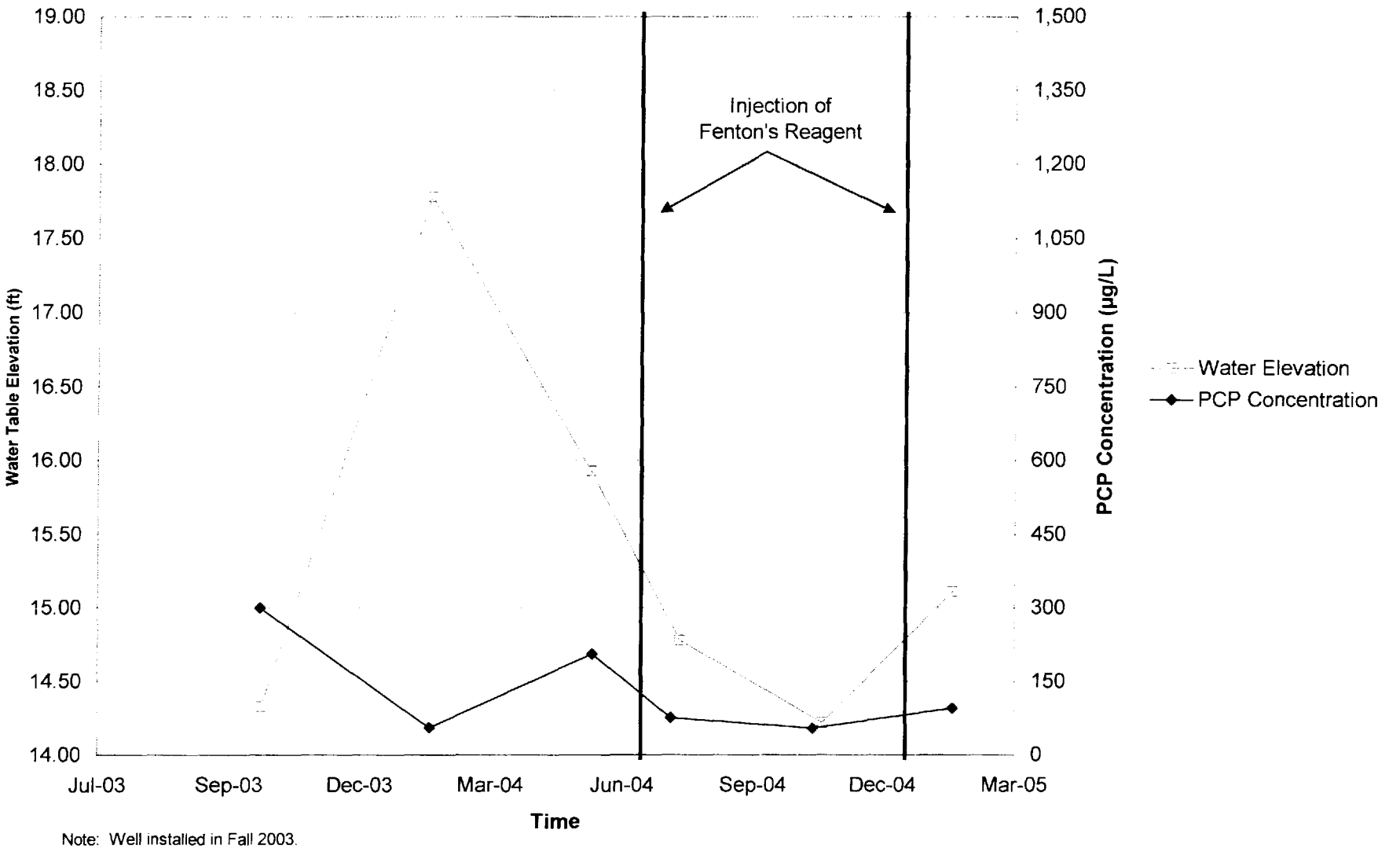


Note: Well installed in Fall 2003.

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**PCP Concentrations and Groundwater Elevations, OX- 7S October 2003 – February 2005**	Figure G-9

BZTO104(e)021266



Note: Well installed in Fall 2003.

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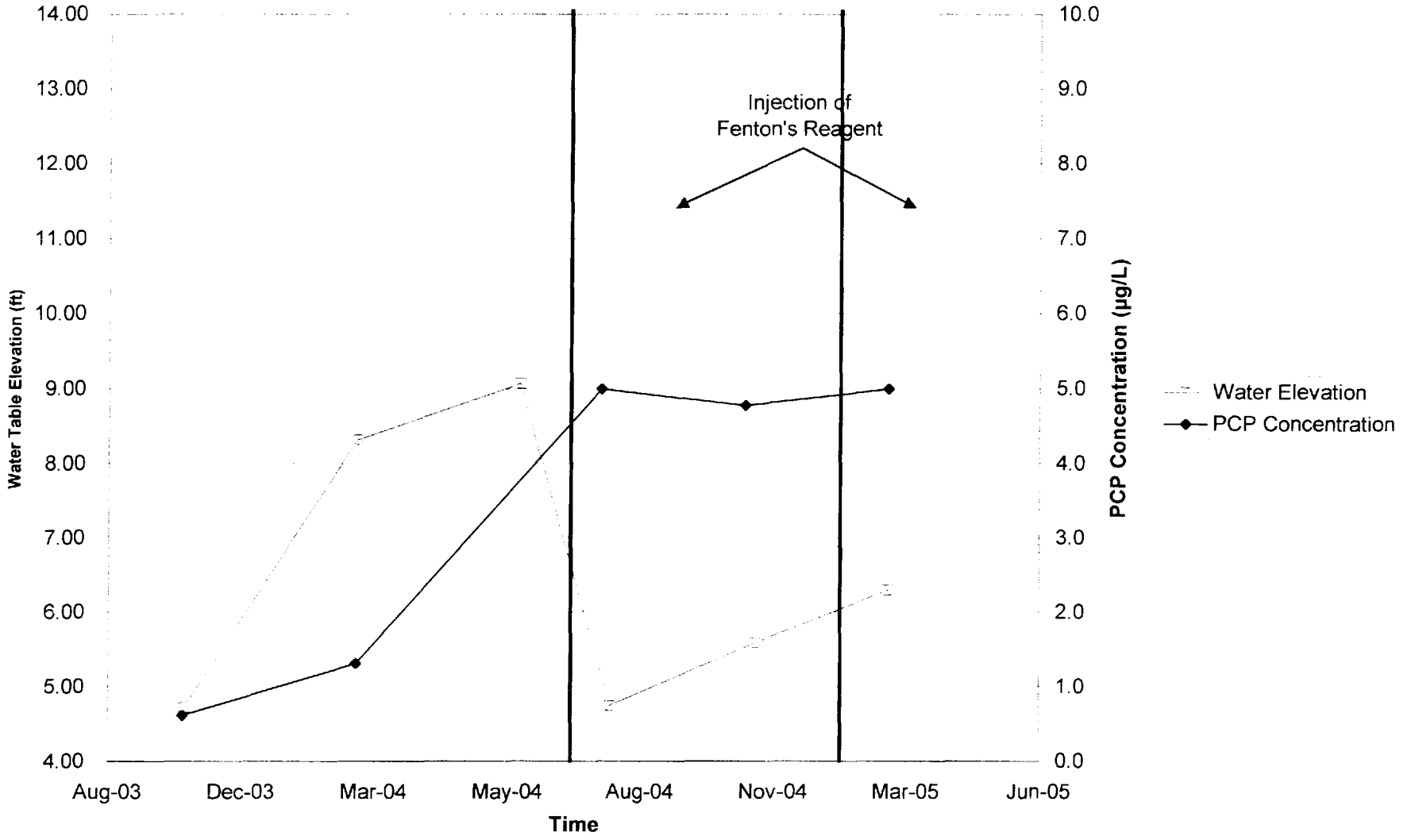
Time Oil NW Terminal Portland, Oregon	**PCP Concentrations and Groundwater Elevations, OX- 8S October 2003 – February 2005**	Figure G-10

BZTO104(e)021267



Notes: 1) Well installed in Fall 2003.
2) PCP concentrations shown at 0.5 µg/L and below are nondetected concentrations.

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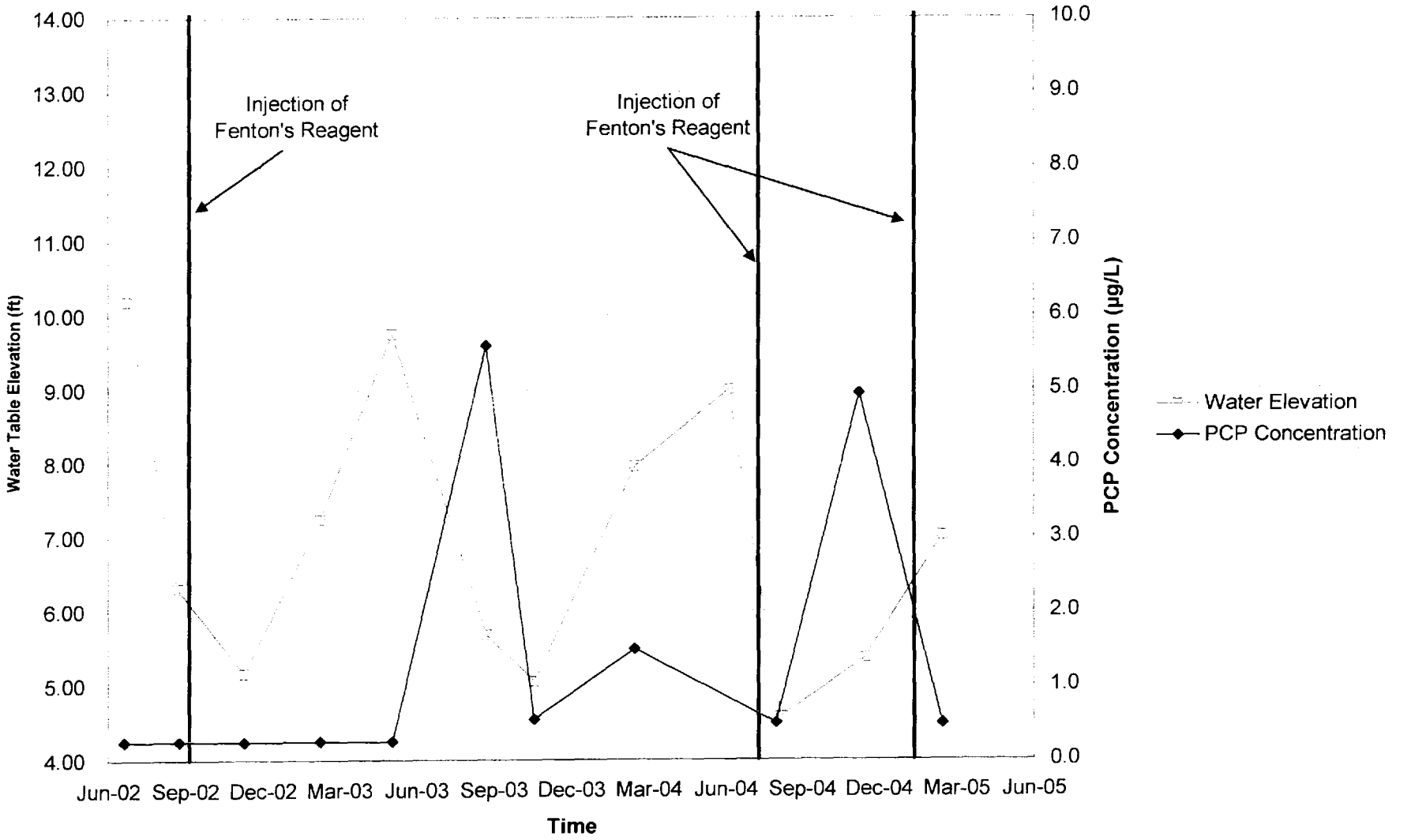
Time Oil NW Terminal Portland, Oregon	**PCP Concentrations and Groundwater Elevations, OX- 8D October 2003 – February 2005**	Figure G-11

BZTO104(e)021268

Source S:\SHAREDOC\231\001\131\1Q05 ISCO Plots OX-11D



Note: PCP concentrations shown at 0.5 µg/L and below are nondetected concentrations.

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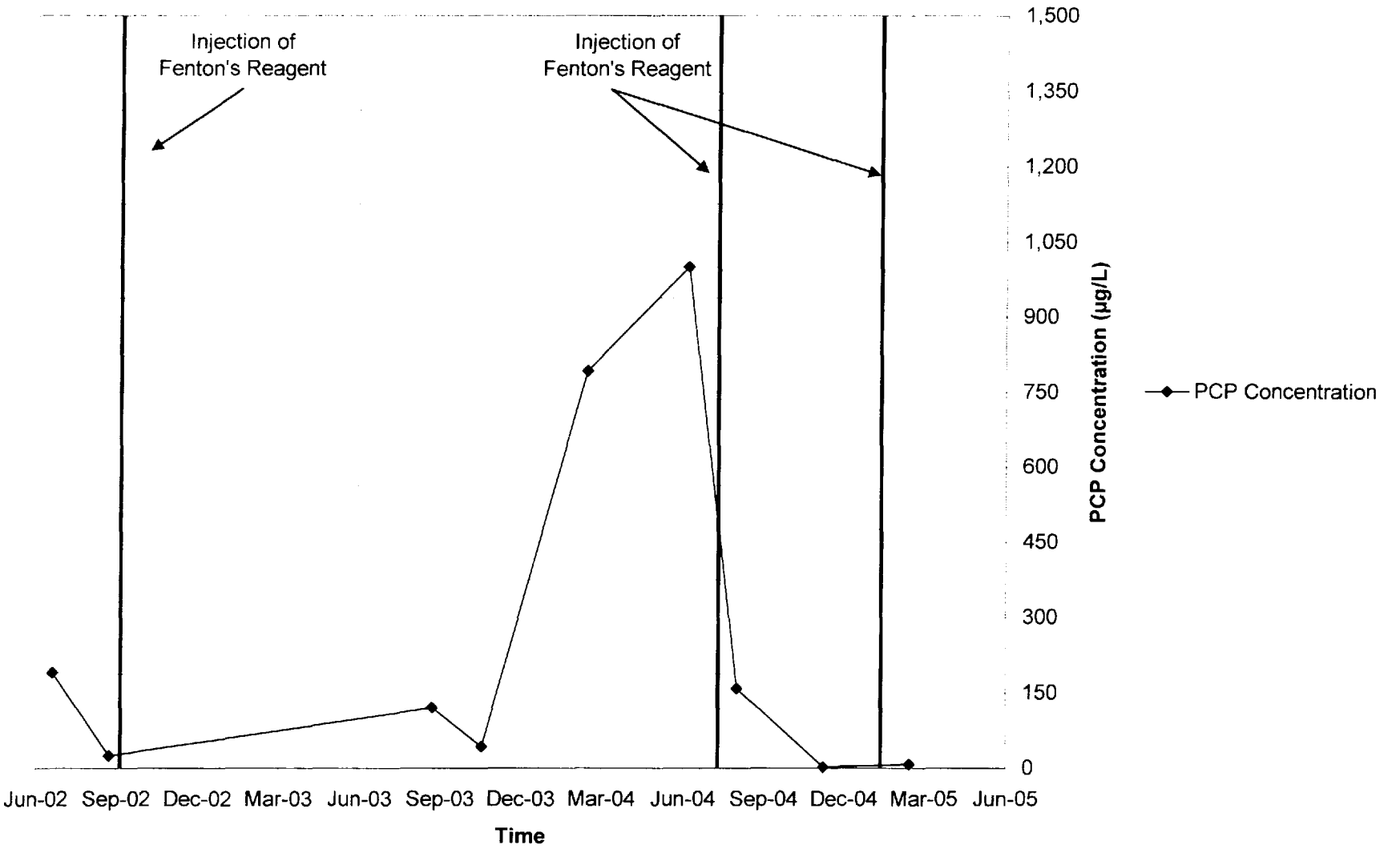
Time Oil NW Terminal Portland, Oregon	**PCP Concentrations and Groundwater Elevations, OX- 11D June 2002 – February 2005**	Figure G-12

BZTO104(e)021269



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Time Oil NW Terminal Portland, Oregon	**PCP Concentrations and Groundwater Elevations, SDM-1 June 2002 – February 2005**	Figure G-13

BZTO104(e)021270

APPENDIX H

PCP Mass Removal Calculations

APPENDIX H
MASS REMOVAL ESTIMATE OF PCP IN GROUNDWATER

Pre-Injection PCP Mass in Upper Zone Groundwater (November 2004)

Assumed Saturated Thickness =	5	ft	Assumed Saturated Thickness =	5	ft	Assumed Saturated Thickness =	5	ft
Assumed Porosity =	0.2		Assumed Porosity =	0.2		Assumed Porosity =	0.2	
Estimated Area of >1,000 ug/L Impact =	1,800	ft^2	Estimated Area of >100 ug/L Impact =	7,700	ft^2	Estimated Area of >10 ug/L Impact =	15,300	ft^2
Estimated Volume of >1,000 ug/L Impact =	51,000	liters	Estimated Volume of >100 ug/L Impact =	218,000	liters	Estimated Volume of >10 ug/L Impact =	433,000	liters
Calculated Mass of PCP in >1,000 ug/L Impact Area =	0.263	lb.	Calculated Mass of PCP in >100 ug/L Impact Area =	0.24	lb.	Calculated Mass of PCP in >10 ug/L Impact Area =	0.048	lb.

Total Estimated Pre-Injection Mass = 0.55 lb. (Notes 1, 2)

Post-Injection PCP Mass in Upper Zone Groundwater (February 2005)

Assumed Saturated Thickness =	5	ft	Assumed Saturated Thickness =	5	ft	Assumed Saturated Thickness =	5	ft
Assumed Porosity =	0.2		Assumed Porosity =	0.2		Assumed Porosity =	0.2	
Estimated Area of >1,000 ug/L Impact =	0	ft^2	Estimated Area of >100 ug/L Impact =	6,500	ft^2	Estimated Area of >10 ug/L Impact =	16,600	ft^2
Estimated Volume of >1,000 ug/L Impact =	0	liters	Estimated Volume of >100 ug/L Impact =	184,000	liters	Estimated Volume of >10 ug/L Impact =	470,000	liters
Calculated Mass of PCP in >1,000 ug/L Impact Area =	0.000	lb.	Calculated Mass of PCP in >100 ug/L Impact Area =	0.212	lb.	Calculated Mass of PCP in >10 ug/L Impact Area =	0.054	lb.

Total Estimated Post-Injection Mass = 0.27 lb. (Notes 1, 2)

Notes:
1. Total estimated mass is rounded to nearest hundredth of a pound
2. Average PCP concentrations in or between concentration contours were estimated assuming a roughly linear interpolation of concentrations.

BZTO104(e)021272

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2
4			S177C		T176O		U235I		V224S		W371J		Y336B		Z225N		Z960F		AH49A		AU36B		BC27M		BH96P		BR55J
5			4/1/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/21/99		12/8/99		2/16/00		5/23/00
6																											
7	1	**CHLORINATED PHENOLS (µg/L)**																									
8	2	**EPA Method SW8040**																									
9	3	Pentachlorophenol	0.25	U	**0.17**	J1	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
16	10																										
17	11	**SEMIVOLATILES (µg/L)**																									
18	12	**EPA Method SW8270**																									
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.0**		1.0	U	**0.6**	J1	1.0	U	1.0
33	27																										
34	28	**VOLATILES (µg/L)**																									
35	29	**EPA Method SW8260**																									
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**5.6**		5.0	U	5.0	U	5.0	U	5.0	U	5.0
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56	49																										
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																									
58	51	**Method OR-DEQ**																									
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.48**		0.25	U	0.25	U	**0.36**		**0.28**
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62	55																										
63	56	**PRIORITY POLLUTANT**																									
64	57	**METALS (mg/L)**																									
65	58	Arsenic (7060)	**0.008**		**0.008**		0.05	U	0.05	U	**0.014**		**0.022**		**0.010**		**0.026**		**0.010**		**0.012**		**0.012**		**0.017**		**0.012**

BZTO104(e)021273

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2	
4			CB68B		CL03J		CT67G		DE68K		DM30N		DW37C		ED23B		EM75K		ES04H		EY88D		FF88P		FL41G		FU50D	
5			8/29/00		11/10/00		2/15/01		6/5/01		8/14/01		11/28/01		2/26/02		6/25/02		08/28/02		11/11/02		2/13/03		5/7/03		8/29/03	
7	**CHLORINATED PHENOLS (µg/L)**																											
8	**EPA Method SW8040**																											
9	Pentachlorophenol	UJ	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.27	U	0.25	U	0.26	U	0.25	U	0.5	U
10	2,4,6-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																												
17	**SEMIVOLATILES (µg/L)**																											
18	**EPA Method SW8270**																											
19	Phenol	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.1	U	2.2	U	2	U	2	U	2	U
20	4-Methylphenol	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U
21	Isophorone	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U
22	2,4-Dimethylphenol	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.2	U	3.3	U	3.1	U	3	U	3	U
23	Benzoic Acid	U	10	U	10	U	10	U	10	U	10	U	50	U	50	U	50	U	53	U	56	U	51	U	50	U	50	U
24	Naphthalene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U
25	2-Methylnaphthalene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U
26	2,4,6-Trichlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5.6	U	5.1	U	5	U	5	U
27	2,4,5-Trichlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5.6	U	5.1	U	5	U	5	U
28	Acenaphthene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U
29	Dibenzofuran	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U
30	Fluorene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U
31	Pentachlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5.6	U	5.1	U	5	U	5	U
32	bis(2-Ethylhexyl)phthalate	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	4.0	U	4.0	U	4.0	U	4.3	U	4.4	U	1	U	1	U	**6.1**	
33																												
34	**VOLATILES (µg/L)**																											
35	**EPA Method SW8260**																											
36	Acetone	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**7.2**		5.0	U	5.0	U	5	U	5	U	5	U	**12**		5	U
37	Carbon Disulfide	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U
39	Benzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
40	Bromoform	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
42	Ethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
43	Styrene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
45	o-Xylene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
49	n-Propylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
50	tert-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
52	4-Isopropyltoluene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
54	Naphthalene	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																												
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																											
58	**Method OR-DEQ**																											
59	**TPH-Diesel**		0.25	U	0.25	U	0.25	U	NA		NA		NA		0.25	U	NA		NA		NA		0.25	U	NA		NA	
60	**TPH-D Motor Oil**		NA		0.50	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																												
63	**PRIORITY POLLUTANT**																											
64	**METALS (mg/L)**																											
65	Arsenic (7060)		**0.015**		**0.006**		**0.006**		**0.005**		**0.010**		**0.009**		**0.011**		**0.010**		**0.013**		0.05	U	**0.027**		**0.048**		**0.01**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD	BE	BF	BG	BH	BI	BJ
3		B2		B2		B2		B2	
4		FY64E		0402099-02		0408019-03		0502102-03	
5		10/20/03		2/19/04		8/03/04		2/23/05	
7	**CHLORINATED PHENOLS (µg/L)**								
8	**EPA Method SW8040**								
9	Pentachlorophenol	0.5	U	0.475	U	0.5	U	0.506	U
10	2,4,6-Trichlorophenol	NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA	
16									
17	**SEMIVOLATILES (µg/L)**								
18	**EPA Method SW8270**								
19	Phenol	2	U	1.95	U	2.01	U	2.06	U
20	4-Methylphenol	1	U	9.73	U	10	U	10.3	U
21	Isophorone	1	U	0.973	U	1	U	1.03	U
22	2,4-Dimethylphenol	3	U	2.92	U	3.01	U	3.1	U
23	Benzoic Acid	10	U	19.5	U	20.1	U	20.6	U
24	Naphthalene	1	U	0.973	U	1	U	1.03	U
25	2-Methylnaphthalene	1	U	0.973	U	1	U	1.03	U
26	2,4,6-Trichlorophenol	5	U	4.86	U	5.02	U	5.16	U
27	2,4,5-Trichlorophenol	5	U	4.86	U	5.02	U	5.16	U
28	Acenaphthene	1	U	0.973	U	1	U	1.03	U
29	Dibenzofuran	1	U	0.973	U	1	U	1.03	U
30	Fluorene	1	U	0.973	U	1	U	1.03	U
31	Pentachlorophenol	5	U	4.86	U	5.02	U	5.16	U
32	bis(2-Ethylhexyl)phthalate	1	U	0.973	U	1	U	1.03	U
33									
34	**VOLATILES (µg/L)**								
35	**EPA Method SW8260**								
36	Acetone	5	U	50	U	50	U	50	U
37	Carbon Disulfide	1	U	2	U	2	U	2	U
38	2-Butanone	5	U	10	U	10	U	10	U
39	Benzene	1	U	0.4	U	0.3	U	0.3	U
40	Bromoform	1	U	1	U	1	U	1	U
41	Toluene	1	U	1	U	1	U	1	U
42	Ethylbenzene	1	U	1	U	1	U	1	U
43	Styrene	1	U	1	U	1	U	1	U
44	m,p-Xylene	1	U	2	U	2	U	2	U
45	o-Xylene	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U
48	Isopropylbenzene	1	U	1	U	1	U	1	U
49	n-Propylbenzene	1	U	1	U	1	U	1	U
50	tert-Butylbenzene	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	1	U	1	U	1	U	1	U
52	4-Isopropyltoluene	1	U	1	U	1	U	1	U
53	n-Butylbenzene	1	U	1	U	1	U	1	U
54	Naphthalene	5	U	1	U	1	U	1	U
55	Methyl tert-butyl ether	NA		1	U	1	U	1	U
56									
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**								
58	**Method OR-DEQ**								
59	**TPH-Diesel**	NA		NA		NA		NA	
60	**TPH-D Motor Oil**	NA		NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA	
62									
63	**PRIORITY POLLUTANT**								
64	**METALS (mg/L)**								
65	Arsenic (7060)	**0.002**		**0.005**		**0.00363**		0.001	U

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2
4			S177C		T176O		U235I		V224S		W371J		Y336B		Z225N		Z960F		AH49A		AU36B		BC27M		BH96P		BR55J
5			4/1/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/21/99		12/8/99		2/16/00		5/23/00
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005
67	60	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002
68	61	Lead (7421)	0.001	U	0.001	U	0.02	U	0.02	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01
70	63	Zinc (6010)	0.004	U	0.004	U	**0.013**		0.004	U	0.004	U	**0.005**		0.004	U	**0.007**	J	**0.006**		**0.005**		0.006	U	**0.007**		**0.011**
71	64																										
72	65	**MAJOR IONS AND CONVENTIONALS**																									
73	66	Calcium (mg/L) (6010)	**66.1**		**65.6**		**40.1**		**41.8**		NA		NA		NA		**38.8**		NA		NA		NA		NA		NA
74	67	Magnesium (mg/L) (6010)	**45.2**		**47**		**14.4**		**13.5**		NA		NA		NA		**11.9**		NA		NA		NA		NA		NA
75	68	Potassium (mg/L) (6010)	**2.0**		**1.9**		**4.7**		**4.5**		NA		NA		NA		**4.5**		NA		NA		NA		NA		NA
76	69	Sodium (mg/L) (6010)	**18.8**		**19.6**		**11.5**		**9.59**		NA		NA		NA		**9.03**		NA		NA		NA		NA		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**370**		**380**	J2	**38**		**190**		NA		NA		NA		**170**		NA		NA		NA		NA		NA
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		NA		NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**370**		**380**	J2	**38**		**190**		NA		NA		NA		**170**		NA		NA		NA		NA		NA
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**420**	J2	**210**		**190**		**180**		**200**		**230**		**180**		**170**		**210**		**160**		**180**		**190**
81	74	Chloride (mg/L) (EPA 325.2)	**7.6**		**9.1**		**2.6**		**1.9**		**3.4**		**1.6**		**2.7**		**1.0**		**3.9**		**2.7**		**3.9**		**3.6**		**2.8**
82	75	N-Nitrate (mg-N/L) (Calculated)	0.010	U	0.010	U	**0.027**		**0.018**	J2	NA		NA		NA		**0.012**		NA		NA		NA		NA		NA
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	0.02	J	**0.028**	J2	**0.32**		0.010	UJ	NA		NA		NA		**0.019**		NA		NA		NA		NA		NA
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.019**		0.010	U	**0.35**		**0.018**	J2	NA		NA		NA		**0.031**		NA		NA		NA		NA		NA
85	78	Sulfate (mg/L) (EPA 375.2)	2.5	U	2.5	U	2.5	U	2.5	U	NA		NA		NA		**3.8**		NA		NA		NA		NA		NA
86	79																										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2																												
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2	
4			CB68B		CL03J		CT67G		DE68K		DM30N		DW37C		ED23B		EM75K		ES04H		EY88D		FF88P		FL41G		FU50D	
5			8/29/00		11/10/00		2/15/01		6/5/01		8/14/01		11/28/01		2/26/02		6/25/02		08/28/02		11/11/02		2/13/03		5/7/03		8/29/03	
66	Chromium (6010)	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U
68	Lead (7421)	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.02	U	0.001	U	0.001	U	0.001	U
69	Nickel (6010)	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)		**0.011**		0.006	U	0.006	U	**0.009**		0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	**0.01**		**0.016**	J	0.006	U
71																												
72	**MAJOR IONS AND CONVENTIONALS**																											
73	Calcium (mg/L) (6010)		NA		NA		**43.6**		**48.0**		**42.0**		**56.4**	J	**43.3**		NA		NA		NA		**46.7**		NA		NA	
74	Magnesium (mg/L) (6010)		NA		NA		**19.4**		**23.8**		**18.3**		**32.6**	J	**14.5**		NA		NA		NA		**20.5**		NA		NA	
75	Potassium (mg/L) (6010)		NA		NA		**3.4**		**3.4**		**3.9**		**2.4**		**5.2**		NA		NA		NA		**3.9**		NA		NA	
76	Sodium (mg/L) (6010)		NA		NA		**11.0**		**12.1**		**11.4**		**15.0**		**9.84**		NA		NA		NA		**11.3**		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		NA		**200**		NA		NA		NA		**240**		NA		NA		NA		**270**		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		1.0	U	NA		NA		NA		**1.0**	U	NA		NA		NA		1	U	NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		**200**		NA		NA		NA		**240**		NA		NA		NA		**270**		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**220**		**240**		**260**		**260**		**270**		**280**		**240**		**190**		**210**		**360**		**250**		**220**		**240**	
81	Chloride (mg/L) (EPA 325.2)		**2.5**		**3.2**		**3.9**	J	**3.2**		**6.1**		**3.9**		**3.3**		**5.1**		**5.2**		**4.3**		**5.9**		**3.5**		**2.9**	
82	N-Nitrate (mg-N/L) (Calculated)		NA		NA		**0.81**		NA		NA		NA		**0.73**		NA		NA		NA		**0.2**		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		NA		0.010	J	NA		NA		NA		**0.021**		NA		NA		NA		**0.023**		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		NA		**0.81**		NA		NA		NA		**0.75**	J	NA		NA		NA		**0.22**		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		NA		**4.1**		NA		NA		NA		**2.6**		NA		NA		NA		**3**		NA		NA	
86																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD	BE	BF	BG	BH	BI	BJ
1									
2									
3		B2		B2		B2		B2	
4		FY64E		0402099-02		0408019-03		0502102-03	
5		10/20/03		2/19/04		8/03/04		2/23/05	
66	Chromium (6010)	0.005	U	**0.0087**		**0.0161**		**0.0076**	
67	Copper (6010)	0.002	U	0.01	U	0.01	U	0.01	U
68	Lead (7421)	0.001	U	0.0001	U	0.0001	U	0.0001	U
69	Nickel (6010)	0.01	U	0.005	U	0.005	U	**0.0172**	
70	Zinc (6010)	0.006	U	0.01	U	0.01	U	0.01	U
71									
72	**MAJOR IONS AND CONVENTIONALS**								
73	Calcium (mg/L) (6010)	NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**250**		**218**		**286**		**262**	
81	Chloride (mg/L) (EPA 325.2)	**3.1**		**2.64**		**3.51**		**3.85**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA	
86									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2
4			S177C		T176O		U235I		V224S		W371J		Y336B		Z225N		Z960F		AH49A		AU36B		BC27M		BH96P		BR55J
5			4/1/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/21/99		12/8/99		2/16/00		5/23/00
87	80	**FIELD PARAMETERS**																									
88	81	pH (avg)	6.75		6.73		7.28		6.96		6.61		6.43		6.48		7.16		6.27		6.61		6.88		6.70		6.51
89	82	Temperature (° C) (avg)	13.4		16.3		13.9		14.4		13.0		15.5		12.9		13.3		14.1		15.0		12.6		13.4		16.1
90	83	Conductivity (um/hos)	769		675		297		385		494		643		234		357		253		285		305		653		665
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		1.44		1.50		3.24		3.13		1.53		2.93		1.98		1.09		0.67
92	85																										
93	86	**DIOXINS AND FURANS (ng/L)**																									
94	87	**Method 8290**																									
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120	113																										
121																											
122																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2																												
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2	
4			CB68B		CL03J		CT67G		DE68K		DM30N		DW37C		ED23B		EM75K		ES04H		EY88D		FF88P		FL41G		FU50D	
5			8/29/00		11/10/00		2/15/01		6/5/01		8/14/01		11/28/01		2/26/02		6/25/02		08/28/02		11/11/02		2/13/03		5/7/03		8/29/03	
87	**FIELD PARAMETERS**																											
88	pH (avg)		7.00		5.53		6.97		6.80		6.96		6.71		6.90		7.01		7.21		6.8		7.06		7.25		6.96	
89	Temperature (° C) (avg)		15.6		13.3		13.5		14.0		16.3		12.8		13.1		15.3		15.9		14.1		14.4		15.2		14.9	
90	Conductivity (um/hos)		346		319		315		611		608		384		362		272		272		595		598		319		340	
91	Dissolved oxygen (mg/L) (avg)		1.16		2.17		1.81		1.59		1.98		4.27		7.72		4.80		1.09		2.52		0		4.22		1.75	
92																												
93	**DIOXINS AND FURANS (ng/L)**																											
94	**Method 8290**																											
95	2,3,7,8-TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD	BE	BF	BG	BH	BI	BJ
1									
2									
3		B2		B2		B2		B2	
4		FY64E		0402099-02		0408019-03		0502102-03	
5		10/20/03		2/19/04		8/03/04		2/23/05	
87	**FIELD PARAMETERS**								
88	pH (avg)	6.71		6.52		7.76		7.06	
89	Temperature (° C) (avg)	14.9		14.8		15.3		14.4	
90	Conductivity (um/hos)	560		301		414		190	
91	Dissolved oxygen (mg/L) (avg)	0.56		3.24		NM		2.31	
92									
93	**DIOXINS AND FURANS (ng/L)**								
94	**Method 8290**								
95	2,3,7,8-TCDF	NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA	
120									
121									
122									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2
4			S177C		T176O		U235I		V224S		W371J		Y336B		Z225N		Z960F		AH49A		AU36B		BC27M		BH96P		BR55J
5			4/1/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/21/99		12/8/99		2/16/00		5/23/00
123	114	**PAHs (µg/L)**																									
124	115	**EPA Method SW8270 SIM**																									
125	116	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126	117	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127	118	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128	119	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129	120	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130	121	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131	122	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2																												
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2	
4			CB68B		CL03J		CT67G		DE68K		DM30N		DW37C		ED23B		EM75K		ES04H		EY88D		FF88P		FL41G		FU50D	
5			8/29/00		11/10/00		2/15/01		6/5/01		8/14/01		11/28/01		2/26/02		6/25/02		08/28/02		11/11/02		2/13/03		5/7/03		8/29/03	
123	**PAHs (µg/L)**																											
124	**EPA Method SW8270 SIM**																											
125	Naphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD	BE	BF	BG	BH	BI	BJ
1									
2									
3		B2		B2		B2		B2	
4		FY64E		0402099-02		0408019-03		0502102-03	
5		10/20/03		2/19/04		8/03/04		2/23/05	
123	**PAHs (µg/L)**								
124	**EPA Method SW8270 SIM**								
125	Naphthalene	NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		1	U	NA	
128	Acenaphthene	NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA	
130	Anthracene	NA		NA		1	U	NA	
131	Dibenzofuran	NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
2									Dup of G1A				Dup of G1A													
3			G1A		G1A		G1A		G1B		G1A		S		G1A		G1A		G1A		G1A		G1A		G1A	
4			S177E		T176H		U258C		U258A		V224T		V224L		W391G		Y313D		Z225C		Z960O		AH27J		AU45F	
5			4/2/97		7/15/97		10/23/97		10/23/97		1/29/98		1/29/98		5/20/98		8/17/98		11/13/98		2/17/99		5/17/99		9/22/99	
7	1	**CHLORINATED PHENOLS (µg/L)**																								
8	2	**EPA Method SW8040**																								
9	3	Pentachlorophenol	**66**		**170**		**25**		**21**		**99**		**96**		**0.16**	J1	**0.37**		0.25	U	**0.28**		0.25	U	0.25	U
10	4	2,4,6-Trichlorophenol	**0.25**		**5.1**		**0.58**		**0.59**		**1.8**	J2	**1.3**	J2	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
11	5	2,3,6-Trichlorophenol	**0.40**		0.91	U	0.25	U	0.25	U	**0.26**		**0.20**	J1	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
12	6	2,4,5-Trichlorophenol	0.49	U	1.7	U	0.35	U	1.0	U	**1.1**		**0.86**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**3.4**		**21**		**2.5**		**2.3**		**5.4**		**5.1**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
15	9	2,3,4,5-Tetrachlorophenol	**0.49**		**3.6**		**0.50**		**0.49**		**0.50**		**0.41**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
16	10																									
17	11	**SEMIVOLATILES (µg/L)**																								
18	12	**EPA Method SW8270**																								
19	13	Phenol	2.0	U	**7.5**		3.4	U	2.5	U	2.0	U	2.0	U	**2.3**		**6.0**		2.0	U	2.0	U	**3.2**		**10**	
20	14	4-Methylphenol	1.0	U	**2.2**		1.7	U	1.2	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**15**		1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.7	U	1.2	U	**1.2**		**1.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	5.2	U	3.8	U	3.0	U	**3.3**		**11**	J2	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	17	U	12	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	**16**	
24	18	Naphthalene	**9.7**		**14**		**11**		**11**		30	J2	**23**	J2	**8.4**	J2	**9.0**		**1.6**		**2.4**		**15**		**6.4**	
25	19	2-Methylnaphthalene	**29**		**37**		**33**		**35**		**44**	J2	**30**	J2	**19**	J2	**25**		**7.2**		**14**		**23**		**16**	
26	20	2,4,6-Trichlorophenol	5.0	U	**9.6**		8.6	U	6.2	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	**5.6**		8.6	U	6.2	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.7	U	1.2	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.7	U	1.2	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.7	U	1.2	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	**65**		**180**		**34**		**37**		**4.3**	J1	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.7	U	**2.1**		1.0	U	**1.8**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
33	27																									
34	28	**VOLATILES (µg/L)**																								
35	29	**EPA Method SW8260**																								
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**6.8**		5.0	U	5.0	U	5.0	U	**14**		**16**	M
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	150	J	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**36**		**22**	
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**2.7**	
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	**1.2**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.3**		1.0	U
42	36	Ethylbenzene	31		**49**		**74**	J2	**59**	J2	**28**		**32**		**34**		**42**		**3.1**		1.0	U	**81**		**7.4**	
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	**51**		**74**		**160**	J2	**120**	J2	**74**		**89**		**74**		**93**		**5.7**		**2.0**		**120**		**24**	
45	39	o-Xylene	**3.4**		**5.2**		**10**		**8.3**		**4.1**		**4.1**		1.0	U	**2.5**		1.0	U	1.0	U	**5.6**		1.0	U
46	40	1,3,5-Trimethylbenzene	**36**		**58**		**120**	J2	**85**	J2	**59**		**60**		**38**		**52**		**3.2**		**4.2**		**35**		**20**	
47	41	1,2,4-Trimethylbenzene	**130**		**150**		**350**	J2	**250**	J2	140		**160**		**120**		**99**		**8.8**		**9.9**		**110**		**57**	
48	42	Isopropylbenzene	**180**		**200**		**310**	J2	**240**	J2	**130**		**140**		**200**	E	**180**		**170**		**170**		**190**		**96**	
49	43	n-Propylbenzene	**200**		**220**		**340**	J2	**270**	J2	**140**		**160**		**210**	E	**180**		**170**		**160**		**220**		**93**	
50	44	tert-Butylbenzene	**3.6**		**5.1**	J2	**6.9**		**5.7**		**3.6**		**4.0**		**5.3**	M	**6.9**		**4.6**		**4.1**		**3.9**		**3.7**	
51	45	sec-Butylbenzene	**18**		**25**		**33**		**27**		**14**		**17**		**24**		**30**	J2	**23**		**18**		**20**		**19**	
52	46	4-Isopropyltoluene	**2.8**		**3.6**		**9.2**	J2	**6.2**	J2	**4.8**		**5.6**		**4.0**		**6.5**		1.0	U	1.0	U	**2.9**		**1.3**	
53	47	n-Butylbenzene	**14**	M	**19**		**26**		**22**		**12**		**14**		**19**		**23**		**15**		**11**		**15**		14	U
54	48	Naphthalene	**20**		**32**		**73**	J2	**50**	J2	**22**		**78**		**36**		**41**		**5.2**		**5.3**		**28**		**18**	
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	51	**Method OR-DEQ**																								
59	52	**TPH-Diesel**	**4.0**		**3.9**		**3.5**		**3.6**		**3.3**		**3.5**		**3.0**		**2.6**		**2.7**		**2.5**		**2.6**		**2.6**	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																									
63	56	**PRIORITY POLLUTANT**																								
64	57	**METALS (mg/L)**																								
65	58	Arsenic (7060)	**0.031**		**0.034**		0.05	U	0.05	U	0.05	U	0.05	U	**0.039**		**0.039**		**0.10**		**0.041**		**0.032**		**0.040**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
3		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4		BC27E		BH96J		BR64I		CB85G		CL03E		CT55A		DE87L		DM30A		DW37F		ED23I		EM85J		ER93D		EZ03D	
5		12/7/99		2/17/00		5/24/00		8/30/00		11/8/00		2/13/01		6/6/01		8/13/01		11/28/01		2/26/02		6/26/02		08/26/02		11/12/02	
7	**CHLORINATED PHENOLS (µg/L)**																										
8	**EPA Method SW8040**																										
9	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.26	U	0.25	U
10	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA	
16																											
17	**SEMIVOLATILES (µg/L)**																										
18	**EPA Method SW8270**																										
19	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.1	U	2.2	U
20	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1.1	U
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1.1	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.1	U	3.3	U
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	50	U	50	U	50	U	52	U	54	U
24	Naphthalene	**3.0**		**6.7**		**3.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1.1	U
25	2-Methylnaphthalene	**12**		**24**		**14**		**7.7**		**4.1**		**1.6**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1.1	U
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.2	U	5.4	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.2	U	5.4	U
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1.1	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1.1	U
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1.1	U
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.2	U	5.4	U
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	**1.7**		1.0	U	1.0	U	1.0	U	1.0	U	4.0	U	4.0	U	4.0	U	4.2	U	4.3	U
33																											
34	**VOLATILES (µg/L)**																										
35	**EPA Method SW8260**																										
36	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U		R	5.0	U	**5.6**		5.0	U	5.0	U	**7.8**		5	U	5	U
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
38	2-Butanone	5.0	U	5.0	U	**9.0**		21	U	**21**		5.0	U	**6.2**		**13**		**6.4**		**7.5**		5.0	U	**11**	M	5	U
39	Benzene	1.0	U	**4.4**		**1.7**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
41	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
42	Ethylbenzene	**2.3**		1.0	U	**1.9**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.3**		1	U	1	U
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
44	m,p-Xylene	**1.5**		1.0	U	1.0	U	1.0	U	**1.0**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
45	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
46	1,3,5-Trimethylbenzene	**11**		**1.6**		**7.9**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
47	1,2,4-Trimethylbenzene	**14**		**17**		**11**		**3.8**		2.4	M	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U
48	Isopropylbenzene	**66**		**140**		**95**		**100**		**140**		**120**		**150**		**130**		**200**		**140**		**170**		**140**		**150**	
49	n-Propylbenzene	**64**		**130**		**90**		**92**		**130**		**110**		**140**		**120**		**190**		**120**		**150**		**110**		**130**	
50	tert-Butylbenzene	**1.7**		**4.8**		**2.6**		**4.0**		**3.7**		**3.2**		**4.5**		**3.2**		**4.9**		**3.6**		**4.7**		**3.8**		**3.7**	
51	sec-Butylbenzene	**6.9**		**24**		**9.6**		**20**		**19**		**16**		**20**		**17**		**23**		**16**		**23**		**18**		**18**	
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**7.9**		1.0	U	1.0	U	1	U	1	U
53	n-Butylbenzene	1.0	U	**17**		**6.2**	M	**14**	M	**12**		**10**		14	U	**11**		**14**	M	**12**		**13**	M	**11**	M	**11**	M
54	Naphthalene	5.0	U	**13**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																											
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	**Method OR-DEQ**																										
59	**TPH-Diesel**	**2.3**		**2.3**		**3.2**		**2.1**		**2.2**		**3.4**		**2.3**		**3.3**		**4.5**		**4.3**		**5.0**		**4.8**		**4.4**	
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																											
63	**PRIORITY POLLUTANT**																										
64	**METALS (mg/L)**																										
65	Arsenic (7060)	**0.039**		**0.036**		**0.036**		**0.036**		**0.033**		**0.035**		**0.036**		**0.040**		**0.034**		**0.035**		**0.037**		**0.039**		0.05	U

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT
3		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4		FF76E		FL66D		FU50F		FY82N		0402105-04		0406039-03		0408044-06		0411051-06		0502087-13		P5F0553-05	
5		2/12/03		5/9/03		8/29/03		10/24/03		2/20/04		6/7/04		8/06/04		11/9/04		2/18/05		6/14/05	
7	**CHLORINATED PHENOLS (µg/L)**																				
8	**EPA Method SW8040**																				
9	Pentachlorophenol	**0.39**		0.25	U	0.51	U	0.5	U	0.478	U	0.507	U	NA		0.478	U	0.509	U	0.500	U
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																					
17	**SEMIVOLATILES (µg/L)**																				
18	**EPA Method SW8270**																				
19	Phenol	2.1	U	2	U	2	U	2	U	2.06	U	2.13	U	2	U	2.01	U	2.09	U	5.00	U
20	4-Methylphenol	1	U	1	U	1	U	1	U	10.3	U	10.6	U	10	U	10.1	U	10.4	U	5.00	U
21	Isophorone	1	U	1	U	1	U	1	U	1.03	U	1.06	U	1	U	1.01	U	1.04	U	5.00	U
22	2,4-Dimethylphenol	3.1	U	3	U	3	U	3	U	3.08	U	3.19	U	3	U	3.02	U	3.13	U	10.00	U
23	Benzoic Acid	52	U	50	U	51	U	10	U	20.6	U	21.3	U	20	U	20.1	U	20.9	U	50.0	U
24	Naphthalene	1	U	1	U	1	U	1	U	1.03	U	1.06	U	1	U	1.01	U	1.04	U	5.00	U
25	2-Methylnaphthalene	1	U	1	U	1	U	1	U	1.03	U	1.06	U	1	U	1.01	U	1.04	U	5.00	U
26	2,4,6-Trichlorophenol	5.2	U	5	U	5.1	U	5	U	5.14	U	5.32	U	5	U	5.04	U	5.21	U	5.00	U
27	2,4,5-Trichlorophenol	5.2	U	5	U	5.1	U	5	U	5.14	U	5.32	U	5	U	5.04	U	5.21	U	5.00	U
28	Acenaphthene	1	U	1	U	1	U	1	U	1.03	U	1.06	U	1	U	1.01	U	1.04	U	5.00	U
29	Dibenzofuran	1	U	1	U	1	U	1	U	1.03	U	1.06	U	1	U	1.01	U	1.04	U	5.00	U
30	Fluorene	1	U	1	U	1	U	1	U	1.03	U	1.06	U	1	U	1.01	U	1.04	U	5.00	U
31	Pentachlorophenol	5.2	U	5	U	5.1	U	5	U	5.14	U	5.32	U	**5.22**		5.04	U	5.21	U	10	U
32	bis(2-Ethylhexyl)phthalate	1	U	1	U	**2.8**		1	U	1.03	U	1.06	U	1	U	1.01	U	1.04	U	10.00	U
33																					
34	**VOLATILES (µg/L)**																				
35	**EPA Method SW8260**																				
36	Acetone	5	U	**5.6**	M	**9.3**	M	**7.3**	M	50	U	50	U	50	U	50	U	50	U	25.0	U
37	Carbon Disulfide	1	U	1	U	1	U	1	U	2	U	2	U	2	U	2	U	2	U	10.00	U
38	2-Butanone	5	U	5	U	**10**	M	**6.7**	M	10	U	10	U	10	U	**12**		10	U	10.00	U
39	Benzene	1	U	1	U	1	U	1	U	0.4	U	0.3	U	0.3	U	0.3	U	0.3	U	1.00	U
40	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
41	Toluene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
42	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**1.06**		1.00	U
43	Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
44	m,p-Xylene	1	U	1	U	1	U	1	U	2	U	2	U	2	U	2	U	2	U	2.00	U
45	o-Xylene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**1.4**		**1.09**		1.00	U
46	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
47	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
48	Isopropylbenzene	**180**		**65**		**180**		**150**		**67.2**		**105**		**118**		**86.6**		**218**		**146**	
49	n-Propylbenzene	**150**		**49**		**160**		**130**		**57.1**		**112**		**99.6**		**114**		**247**		**115**	
50	tert-Butylbenzene	**4.7**		**2.6**		**5.1**		**3.5**		1	U	**5.1**		**2.94**		**3.89**		**7.49**		**3.84**	
51	sec-Butylbenzene	**22**		**7.2**		**23**		**17**		**7.93**		**27.5**		**16.8**		**24.5**		**34.4**		**15.4**	
52	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
53	n-Butylbenzene	**14**	M	**4.3**	M	**14**		**10**		**4.23**		**15**		**8.97**		**14**		**18.8**		**9.15**	
54	Naphthalene	5	U	5	U	5	U	5	U	1	U	1	U	**2.49**		1	U	**5.45**		2.00	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		1	U	1	U	1	U	1	U	1	U	1.00	U
56																					
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																				
58	**Method OR-DEQ**																				
59	**TPH-Diesel**	**4.4**		**3.3**		**3.7**		**2.2**		**2.39**	J	**3.98**		**3.25**		**3.13**		**3.6**		**0.388**	
60	**TPH-D Motor Oil**	NA		NA		NA		0.5	U	0.491	UJ	0.536	U	0.507	U	0.502	U	0.501	U	0.5	U
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																					
63	**PRIORITY POLLUTANT**																				
64	**METALS (mg/L)**																				
65	Arsenic (7060)	**0.024**		**0.028**		**0.036**		**0.035**		**0.032**		**0.033**		**0.0293**		**0.0295**		**0.0303**		**0.0424**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2									Dup of G1A				Dup of G1A													
3			G1A		G1A		G1A		G1B		G1A		S		G1A		G1A		G1A		G1A		G1A		G1A	
4			S177E		T176H		U258C		U258A		V224T		V224L		W391G		Y313D		Z225C		Z960O		AH27J		AU45F	
5			4/2/97		7/15/97		10/23/97		10/23/97		1/29/98		1/29/98		5/20/98		8/17/98		11/13/98		2/17/99		5/17/99		9/22/99	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.008**	
67	60	Copper (6010)	0.002	U	0.002	U	**0.002**		**0.003**		**0.004**		**0.004**		0.002	U	**0.004**		**0.004**		0.002	U	0.002	U	**0.009**	
68	61	Lead (7421)	0.001	U	0.001	U	0.02	U	0.02	U	0.02	U	0.02	U	**0.001**		**0.005**		**0.002**		0.001	U	**0.003**		**0.007**	
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.02	U
70	63	Zinc (6010)	0.004	U	0.004	U	**0.024**		**0.024**		**0.008**		**0.010**		**0.005**	J2	**0.013**		**0.012**		**0.011**	J	0.009	U	**0.020**	
71	64																									
72	65	**MAJOR IONS AND CONVENTIONALS**																								
73	66	Calcium (mg/L) (6010)	**59.1**		**51**		**53.5**		**53.0**		**46.7**		**46.4**		NA		NA		NA		**55.5**		NA		NA	
74	67	Magnesium (mg/L) (6010)	**21.6**		**19.1**		**17.9**		**17.6**		**15.8**		**15.7**		NA		NA		NA		**19.5**		NA		NA	
75	68	Potassium (mg/L) (6010)	**0.8**		**0.7**		**6.8**		**7.6**		**1.5**		**1.5**		NA		NA		NA		**1.0**		NA		NA	
76	69	Sodium (mg/L) (6010)	**11.5**		**10.5**		**15.2**		**15.4**		**10.4**		**10.2**		NA		NA		NA		**11.0**		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**260**		**230**		**210**		**210**		**250**		**210**		NA		NA		NA		**240**		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**260**		**230**		**210**		**210**		**250**		**210**		NA		NA		NA		**240**		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**300**	J2	**270**		**260**		**230**		**270**		**300**		**290**		**260**		**340**		**670**		**580**	
81	74	Chloride (mg/L) (EPA 325.2)	**13**		**14**		**14**		**13**		**13**		**12**		**12**		**11**		**12**		**12**		**9.1**		**11**	
82	75	N-Nitrate (mg-N/L) (Calculated)	0.010	U	0.010	U	0.010	U	0.010	U	**0.022**	J2	**0.024**	J2	NA		NA		NA		**0.010**		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	**0.036**	J	**0.042**	J2	**0.013**		**0.019**		**0.011**	J2	0.010	UJ	NA		NA		NA		**0.015**		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.024**		0.010	U	**0.020**		**0.020**		**0.033**	J2	**0.024**	J2	NA		NA		NA		**0.025**		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	3.7		NA		NA		NA		**4.7**		NA		NA	
86	79																									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																											
3		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4		BC27E		BH96J		BR64I		CB85G		CL03E		CT55A		DE87L		DM30A		DW37F		ED23I		EM85J		ER93D		EZ03D	
5		12/7/99		2/17/00		5/24/00		8/30/00		11/8/00		2/13/01		6/6/01		8/13/01		11/28/01		2/26/02		6/26/02		08/26/02		11/12/02	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	**0.005**		0.005	U	0.005	U	0.005	U	**0.013**		**0.005**		**0.005**		0.005	U	0.005	U	**0.008**	
67	Copper (6010)	**0.003**		0.002	U	0.002	U	**0.015**		**0.004**		0.002	U	**0.003**		**0.017**		**0.005**	J	**0.005**		**0.002**		**0.004**		**0.01**	
68	Lead (7421)	**0.001**		0.001	U	**0.001**		**0.004**		**0.003**		**0.002**		**0.001**		**0.008**		**0.004**		**0.002**		0.001	U	**0.003**		0.02	U
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	**0.01**		0.01	U	0.01	U	0.01	U	**0.01**		0.01	U	0.01	U	0.01	U	0.01	U	**0.01**	
70	Zinc (6010)	0.008	U	0.006	U	0.006	U	**0.014**		**0.009**		**0.008**		**0.009**		**0.033**		**0.015**	J	**0.008**		**0.008**		**0.034**		**0.02**	
71																											
72	**MAJOR IONS AND CONVENTIONALS**																										
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		**65.6**		**60.3**		**67.9**		**56.9**	J	**62.8**		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		**21.6**		**20.2**		**24.9**		**18.7**	J	**21.1**		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		**1.8**		**3.4**		**2.4**		**3.6**		**3.2**		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		**11.2**		**12.1**		**13.5**		**13.4**		**13.0**		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		**310**		NA		NA		NA		**290**		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		**310**		NA		NA		NA		**290**		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**420**		**450**		**390**		**460**		**380**		**350**	J	**340**	J	**330**	J	**330**		**380**		**320**		**330**		**430**	
81	Chloride (mg/L) (EPA 325.2)	**9.3**		**18**		**8.4**		**6.7**		**8.2**		**8.8**		**8.2**		**10**		**3.3**		**26**		**5.1**		**5**		**4.8**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		**0.010**		NA		NA		NA		0.010	U	NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.074**		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		**0.010**		NA		NA		NA		**0.057**	J	NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		**4.7**		NA		NA		NA		**2.5**		NA		NA		NA	
86																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT
1																					
2																					
3		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4		FF76E		FL66D		FU50F		FY82N		0402105-04		0406039-03		0408044-06		0411051-06		0502087-13		P5F0553-05	
5		2/12/03		5/9/03		8/29/03		10/24/03		2/20/04		6/7/04		8/06/04		11/9/04		2/18/05		6/14/05	
66	Chromium (6010)	0.005	U	0.005	U	**0.006**		**0.01**		**0.0077**		**0.0155**		**0.0156**		**0.0203**		**0.0053**		**0.00212**	
67	Copper (6010)	**0.01**		0.002	U	**0.004**		**0.007**		**0.0346**		0.01	U	0.01	U	0.01	U	0.01	U	**0.00334**	
68	Lead (7421)	0.001	U	0.001	U	0.001	U	**0.003**		**0.0004**		**0.0004**		**0.000658**		**0.00395**		**0.000572**		**0.00139**	
69	Nickel (6010)	0.01	U	0.01	U	**0.05**		**0.08**		**0.0997**		**0.0955**		**0.13**		**0.13**		**0.101**		**0.109**	
70	Zinc (6010)	**0.013**		**0.011**		**0.009**		**0.021**		0.01	U	**0.0102**		0.01	U	**0.0243**		0.01	U	**0.0101**	
71																					
72	**MAJOR IONS AND CONVENTIONALS**																				
73	Calcium (mg/L) (6010)	**61.7**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	**22**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	**7**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	**17**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	**300**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**300**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**350**		**350**		**400**		**310**		**280**		**364**		**302**		**339**		**328**		**350**	
81	Chloride (mg/L) (EPA 325.2)	**3.6**		**6**		**7.3**		**8.4**		**7.79**		**6.83**		**6.46**		**6.51**		**4.79**		**5.37**	
82	N-Nitrate (mg-N/L) (Calculated)	**0.045**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	**0.023**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.068**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	2.5	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
86																					

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2									Dup of G1A				Dup of G1A													
3			G1A		G1A		G1A		G1B		G1A		S		G1A		G1A		G1A		G1A		G1A		G1A	
4			S177E		T176H		U258C		U258A		V224T		V224L		W391G		Y313D		Z225C		Z960O		AH27J		AU45F	
5			4/2/97		7/15/97		10/23/97		10/23/97		1/29/98		1/29/98		5/20/98		8/17/98		11/13/98		2/17/99		5/17/99		9/22/99	
87	80	**FIELD PARAMETERS**																								
88	81	pH (avg)	6.77		6.67		6.82		6.82		6.73		6.70		6.43		6.50		6.30		6.87		5.75		6.67	
89	82	Temperature (° C) (avg)	14.1		16.0		14.5		14.5		14.2		14.0		13.8		15.2		12.6		13.0		15.5		17.9	
90	83	Conductivity (um/hos)	625		585		496		496		473		480		444		680		127		559		825		850	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		NA		NA		2.18		0.93		1.58		1.54		1.83		0.68	
92	85																									
93	86	**DIOXINS AND FURANS (ng/L)**																								
94	87	**Method 8290**																								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																										
121																										
122																										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																											
3		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4		BC27E		BH96J		BR64I		CB85G		CL03E		CT55A		DE87L		DM30A		DW37F		ED23I		EM85J		ER93D		EZ03D	
5		12/7/99		2/17/00		5/24/00		8/30/00		11/8/00		2/13/01		6/6/01		8/13/01		11/28/01		2/26/02		6/26/02		08/26/02		11/12/02	
87	**FIELD PARAMETERS**																										
88	pH (avg)	6.45		6.68		6.47		5.92		5.84		6.42		6.83		6.79		6.58		6.64		6.48		6.69		6.76	
89	Temperature (° C) (avg)	13.0		13.9		17.2		15.0		13.7		15.2		14.4		15.5		13.4		14.3		17.5		17.7		13.7	
90	Conductivity (um/hos)	742		828		796		799		679		645		651		614		586		578		592		513		665	
91	Dissolved oxygen (mg/L) (avg)	2.00		0.86		0.31		0.67		0.64		1.76		1.84		1.41		4.16		7.50		2.72		0.69		1.06	
92																											
93	**DIOXINS AND FURANS (ng/L)**																										
94	**Method 8290**																										
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																											
121																											
122																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT
1																					
2																					
3		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4		FF76E		FL66D		FU50F		FY82N		0402105-04		0406039-03		0408044-06		0411051-06		0502087-13		P5F0553-05	
5		2/12/03		5/9/03		8/29/03		10/24/03		2/20/04		6/7/04		8/06/04		11/9/04		2/18/05		6/14/05	
87	**FIELD PARAMETERS**																				
88	pH (avg)	7.18		6.92		6.69		6.64		6.7		5.4		6.22		6.74		6.67		6.59	
89	Temperature (° C) (avg)	14.4		14.9		15		14.7		15.4		14.9		14.4		14.1		13.5		17.7	
90	Conductivity (um/hos)	682		566		588		603		560		473		811		545		188		308	
91	Dissolved oxygen (mg/L) (avg)	1.68		2.83		1.35		2.92		0.96		1.54		3.36		1.2		0		0.78	
92																					
93	**DIOXINS AND FURANS (ng/L)**																				
94	**Method 8290**																				
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																					
121																					
122																					

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2									Dup of G1A				Dup of G1A													
3			G1A		G1A		G1A		G1B		G1A		S		G1A		G1A		G1A		G1A		G1A		G1A	
4			S177E		T176H		U258C		U258A		V224T		V224L		W391G		Y313D		Z225C		Z960O		AH27J		AU45F	
5			4/2/97		7/15/97		10/23/97		10/23/97		1/29/98		1/29/98		5/20/98		8/17/98		11/13/98		2/17/99		5/17/99		9/22/99	
123		**PAHs (µg/L)**																								
124		**EPA Method SW8270 SIM**																								
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		**2.5**		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		**16**		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.23**	M	NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.16**	M	NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																											
3		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4		BC27E		BH96J		BR64I		CB85G		CL03E		CT55A		DE87L		DM30A		DW37F		ED23I		EM85J		ER93D		EZ03D	
5		12/7/99		2/17/00		5/24/00		8/30/00		11/8/00		2/13/01		6/6/01		8/13/01		11/28/01		2/26/02		6/26/02		08/26/02		11/12/02	
123	**PAHs (µg/L)**																										
124	**EPA Method SW8270 SIM**																										
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT
1																					
2																					
3		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4		FF76E		FL66D		FU50F		FY82N		0402105-04		0406039-03		0408044-06		0411051-06		0502087-13		P5F0553-05	
5		2/12/03		5/9/03		8/29/03		10/24/03		2/20/04		6/7/04		8/06/04		11/9/04		2/18/05		6/14/05	
123	**PAHs (µg/L)**																				
124	**EPA Method SW8270 SIM**																				
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		1	U	NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		1	U	NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2	
4			S177J		T176Q		U235K		V224P		W371L		Y314J		Z225P		Z960D		AH49D		AU22I		BC27L		BH96S		BR64E	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/20/99		12/8/99		2/16/00		5/24/00	
6																												
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	**0.15**	J	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.36**		0.25	U	0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	**2.8**		2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.1	U	**1.7**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
37	31	Carbon Disulfide	1.0	U	1.0	U	**44**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.36**		0.25	U	0.25	U	**0.28**		**0.31**		**0.28**		**0.30**		**0.38**	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	**0.011**		**0.012**		0.05	U	0.05	U	**0.010**		**0.008**		**0.008**		**0.009**		**0.006**		**0.010**		**0.010**		**0.012**		**0.006**	

BZTO104(e)021297

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC
3		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2
4		CB49H		CL03I		CT55E		DE68J		DM52A		DW48D		ED23D		EM85E		ES04E		EZ03L		FF76I		FL58J		FU31B		FY64I
5		8/29/00		11/10/00		2/14/01		6/5/01		8/14/01		11/29/01		2/26/02		6/26/02		08/28/02		11/12/02		2/12/03		5/8/03		8/27/03		10/21/03
7	**CHLORINATED PHENOLS (µg/L)**																											
8	**EPA Method SW8040**																											
9	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.33**		0.25	U	0.25	U	0.28	U	0.25	U	0.26	U	0.25	U	0.5	U	0.5
10	2,4,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
11	2,3,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
12	2,4,5-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
13	2,3,4-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
15	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
16																												
17	**SEMIVOLATILES (µg/L)**																											
18	**EPA Method SW8270**																											
19	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.2	U	2.2	U	2	U	2	U	2	U	2
20	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.3	U	3.3	U	3.1	U	3	U	3	U	3
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U	56	U	56	U	51	U	50	U	50	U	10
24	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1
25	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5.6	U	5.1	U	5	U	5	U	5
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5.6	U	5.1	U	5	U	5	U	5
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5.6	U	5.1	U	5	U	5	U	5
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	**1.0**		1.0	U	1.0	U	1.0	U	4.0	U	4.0	U	4.4	U	4.4	U	1	U	1	U	1	U	1
33																												
34	**VOLATILES (µg/L)**																											
35	**EPA Method SW8260**																											
36	Acetone	5.0	U	5.0	U		R	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
38	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5
39	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
41	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
42	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
44	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
45	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
46	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
47	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
48	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
49	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
50	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
51	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
53	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1
54	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56																												
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																											
58	**Method OR-DEQ**																											
59	**TPH-Diesel**	**0.26**		**0.40**		**0.35**		NA		NA		NA		**0.41**		NA		NA		NA		**0.39**		NA		NA		NA
60	**TPH-D Motor Oil**	NA		0.50	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62																												
63	**PRIORITY POLLUTANT**																											
64	**METALS (mg/L)**																											
65	Arsenic (7060)	**0.004**		**0.008**		**0.008**		**0.010**		**0.010**		**0.008**		**0.012**		**0.005**		**0.008**		0.05	U	**0.008**		**0.005**		**0.005**		**0.004**

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BD	BE	BF	BG	BH	BI	BJ
1								
2								
3			J2		J2		J2	
4			0402105-02		0408019-05		0502102-01	
5			2/20/04		8/03/04		2/23/05	
6								
7	**CHLORINATED PHENOLS (µg/L)**							
8	**EPA Method SW8040**							
9	Pentachlorophenol	U	0.483	U	0.5	U	0.503	U
10	2,4,6-Trichlorophenol		NA		NA		NA	
11	2,3,6-Trichlorophenol		NA		NA		NA	
12	2,4,5-Trichlorophenol		NA		NA		NA	
13	2,3,4-Trichlorophenol		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol		NA		NA		NA	
16								
17	**SEMIVOLATILES (µg/L)**							
18	**EPA Method SW8270**							
19	Phenol	U	1.99	U	2.01	U	2.07	U
20	4-Methylphenol	U	9.93	U	10.1	U	10.4	U
21	Isophorone	U	0.993	U	1.01	U	1.04	U
22	2,4-Dimethylphenol	U	2.98	U	3.02	U	3.11	U
23	Benzoic Acid	U	19.9	U	20.1	U	20.7	U
24	Naphthalene	U	0.993	U	1.01	U	1.04	U
25	2-Methylnaphthalene	U	0.993	U	1.01	U	1.04	U
26	2,4,6-Trichlorophenol	U	4.97	U	5.04	U	5.19	U
27	2,4,5-Trichlorophenol	U	4.97	U	5.04	U	5.19	U
28	Acenaphthene	U	0.993	U	1.01	U	1.04	U
29	Dibenzofuran	U	0.993	U	1.01	U	1.04	U
30	Fluorene	U	0.993	U	1.01	U	1.04	U
31	Pentachlorophenol	U	4.97	U	5.04	U	5.19	U
32	bis(2-Ethylhexyl)phthalate	U	0.993	U	1.01	U	1.04	U
33								
34	**VOLATILES (µg/L)**							
35	**EPA Method SW8260**							
36	Acetone	U	50	U	50	U	50	U
37	Carbon Disulfide	U	2	U	2	U	2	U
38	2-Butanone	U	10	U	10	U	10	U
39	Benzene	U	0.4	U	0.3	U	0.3	U
40	Bromoform	U	1	U	1	U	1	U
41	Toluene	U	1	U	1	U	1	U
42	Ethylbenzene	U	1	U	1	U	1	U
43	Styrene	U	1	U	1	U	1	U
44	m,p-Xylene	U	2	U	2	U	2	U
45	o-Xylene	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	U	1	U	1	U	1	U
48	Isopropylbenzene	U	1	U	1	U	1	U
49	n-Propylbenzene	U	1	U	1	U	1	U
50	tert-Butylbenzene	U	1	U	1	U	1	U
51	sec-Butylbenzene	U	1	U	1	U	1	U
52	4-Isopropyltoluene	U	1	U	1	U	1	U
53	n-Butylbenzene	U	1	U	1	U	1	U
54	Naphthalene	U	1	U	1	U	1	U
55	Methyl tert-butyl ether		1	U	1	U	1	U
56								
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**							
58	**Method OR-DEQ**							
59	**TPH-Diesel**		NA		NA		NA	
60	**TPH-D Motor Oil**		NA		NA		NA	
61	**TPH-Gasoline**		NA		NA		NA	
62								
63	**PRIORITY POLLUTANT**							
64	**METALS (mg/L)**							
65	Arsenic (7060)		**0.008**		**0.0108**		**0.0126**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2	
4			S177J		T176Q		U235K		V224P		W371L		Y314J		Z225P		Z960D		AH49D		AU22I		BC27L		BH96S		BR64E	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/20/99		12/8/99		2/16/00		5/24/00	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U
68	61	Lead (7421)	0.001	U	0.001	U	0.02	U	0.02	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	0.004	U	0.004	U	**0.012**		0.004	U	**0.005**	J2	**0.008**		0.004	U	**0.017**	J	**0.004**		**0.005**		0.006	U	0.006	U	**0.008**	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	**63.6**		**63**		**61.6**		**57.8**		NA		NA		NA		**59.4**		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**43.1**		**43.9**		**39.7**		**37.1**		NA		NA		NA		**38.5**		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**2.4**		**2.1**		**2.5**		**2.2**		NA		NA		NA		**4.0**		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**17.7**		**17.7**		**18.1**		**17.1**		NA		NA		NA		**18.3**		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**350**		**360**	J2	**170**		**380**		NA		NA		NA		**350**		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**350**		**360**	J2	**170**		**380**		NA		NA		NA		**350**		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**410**	J2	**360**		**410**		**360**		**390**		**360**		**380**		**350**		**380**		**360**		**330**		**320**	
81	74	Chloride (mg/L) (EPA 325.2)	**7.3**		**7.0**		**9.0**		**8.0**		**8.2**		**7.7**		**8.1**		**8.0**		**6.9**		**6.3**		**7.2**		**7.7**		**5.6**	
82	75	N-Nitrate (mg-N/L) (Calculated)	0.010	U	0.010	U	**0.028**		**0.027**	J2	NA		NA		NA		0.010	U	NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	**0.022**	J	**0.019**	J2	**0.015**		**0.013**	J2	NA		NA		NA		**0.022**		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.015**		0.010	U	**0.043**		**0.040**	J2	NA		NA		NA		**0.016**		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	2.5	U	2.5	U	2.5	U	2.5	U	NA		NA		NA		**5.7**		NA		NA		NA		NA		NA	
86	79																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC
1																												
2																												
3		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2
4		CB49H		CL03I		CT55E		DE68J		DM52A		DW48D		ED23D		EM85E		ES04E		EZ03L		FF76I		FL58J		FU31B		FY64I
5		8/29/00		11/10/00		2/14/01		6/5/01		8/14/01		11/29/01		2/26/02		6/26/02		08/28/02		11/12/02		2/12/03		5/8/03		8/27/03		10/21/03
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005
67	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.002**		0.002	U	**0.003**		0.002	U	0.002	U	0.002	U	0.002	U	**0.004**
68	Lead (7421)	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	0.02	U	**0.001**		0.001	U	0.001	U	0.001
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01
70	Zinc (6010)	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	0.006	U	**0.011**		**0.009**		**0.007**		**0.008**		**0.006**		**0.006**
71																												
72	**MAJOR IONS AND CONVENTIONALS**																											
73	Calcium (mg/L) (6010)	NA		NA		**53.0**		**57.1**		**49.5**		**53.9**		**55.8**		NA		NA		NA		**54.1**		NA		NA		NA
74	Magnesium (mg/L) (6010)	NA		NA		**31.3**		**33.2**		**30.0**		**28.8**		**31.7**		NA		NA		NA		**29.2**		NA		NA		NA
75	Potassium (mg/L) (6010)	NA		NA		**1.8**		**2.1**		**2.1**		**2.6**		**2.8**		NA		NA		NA		**2.8**		NA		NA		NA
76	Sodium (mg/L) (6010)	NA		NA		**14.5**		**15.2**		**14.8**		**14.9**		**15.9**		NA		NA		NA		**15**		NA		NA		NA
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		**330**		NA		NA		NA		**370**		NA		NA		NA		**310**		NA		NA		NA
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		1	U	NA		NA		NA
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		**330**		NA		NA		NA		**370**		NA		NA		NA		**310**		NA		NA		NA
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**380**		**340**		**370**		**370**		**350**		**350**		**340**		**290**		**330**		**360**		**330**		**320**		**360**		**340**
81	Chloride (mg/L) (EPA 325.2)	**4.4**		**5.1**		**5.0**		**4.2**		**5.9**		**4.3**		**5.3**		**4.8**		**4.1**		**4.6**		**4.5**		**4.6**		**3.9**		**4.1**
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		0.010	U	NA		NA		NA		0.010	U	NA		NA		NA		**0.046**		NA		NA		NA
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		0.010	U	NA		NA		NA		**0.013**		NA		NA		NA		**0.012**		NA		NA		NA
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		0.010	U	NA		NA		NA		**0.019**	J	NA		NA		NA		**0.058**		NA		NA		NA
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		**5.6**		NA		NA		NA		**3.5**		NA		NA		NA		**5.9**		NA		NA		NA
86																												

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BD	BE	BF	BG	BH	BI	BJ
1								
2								
3			J2		J2		J2	
4			0402105-02		0408019-05		0502102-01	
5			2/20/04		8/03/04		2/23/05	
66	Chromium (6010)	U	0.005	U	0.005	U	**0.0069**	
67	Copper (6010)		0.01	U	0.01	U	0.01	U
68	Lead (7421)	U	**0.0002**		**0.000186**		0.000136	U
69	Nickel (6010)	U	0.005	U	0.005	U	0.005	U
70	Zinc (6010)		0.01	U	**0.021**		0.01	U
71								
72	**MAJOR IONS AND CONVENTIONALS**							
73	Calcium (mg/L) (6010)		NA		NA		NA	
74	Magnesium (mg/L) (6010)		NA		NA		NA	
75	Potassium (mg/L) (6010)		NA		NA		NA	
76	Sodium (mg/L) (6010)		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**329**		**382**		**308**	
81	Chloride (mg/L) (EPA 325.2)		**4.42**		**4.62**		**4.51**	
82	N-Nitrate (mg-N/L) (Calculated)		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		NA		NA	
86								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2	
4			S177J		T176Q		U235K		V224P		W371L		Y314J		Z225P		Z960D		AH49D		AU22I		BC27L		BH96S		BR64E	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/20/99		12/8/99		2/16/00		5/24/00	
87	80	**FIELD PARAMETERS**																										
88	81	pH (avg)	6.76		6.74		6.91		6.76		6.49		6.37		6.35		6.89		5.95		6.30		6.56		6.69		6.49	
89	82	Temperature (° C) (avg)	13.9		16.8		13.8		14.3		13.0		16.5		12.7		14.1		14.7		14.9		12.1		13.6		16.1	
90	83	Conductivity (um/hos)	721		650		551		646		663		756		399		683		565		587		631		657		637	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		0.73		0.77		2.50		2.54		1.96		2.18		2.42		1.12		0.90	
92	85																											
93	86	**DIOXINS AND FURANS (ng/L)**																										
94	87	**Method 8290**																										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC
1																												
2																												
3		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2
4		CB49H		CL03I		CT55E		DE68J		DM52A		DW48D		ED23D		EM85E		ES04E		EZ03L		FF76I		FL58J		FU31B		FY64I
5		8/29/00		11/10/00		2/14/01		6/5/01		8/14/01		11/29/01		2/26/02		6/26/02		08/28/02		11/12/02		2/12/03		5/8/03		8/27/03		10/21/03
87	**FIELD PARAMETERS**																											
88	pH (avg)	6.71		5.46		6.27		6.72		6.91		6.61		6.62		6.58		6.93		6.61		7.06		6.87		6.73		6.93
89	Temperature (° C) (avg)	14.7		12.8		13.9		13.7		15.7		13.4		13.8		15.3		15.5		14.1		14		14.5		15.1		16.1
90	Conductivity (um/hos)	584		578		574		619		594		584		592		467		416		456		654		464		523		457
91	Dissolved oxygen (mg/L) (avg)	1.10		1.02		0.62		1.12		1.30		3.69		6.76		3.17		1.32		1.19		0		2.73		1.76		3.09
92																												
93	**DIOXINS AND FURANS (ng/L)**																											
94	**Method 8290**																											
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BD	BE	BF	BG	BH	BI	BJ
1								
2								
3			J2		J2		J2	
4			0402105-02		0408019-05		0502102-01	
5			2/20/04		8/03/04		2/23/05	
87	**FIELD PARAMETERS**							
88	pH (avg)		6.67		6.16		NM	
89	Temperature (° C) (avg)		13.9		15.8		6.71	
90	Conductivity (um/hos)		490		692		14.2	
91	Dissolved oxygen (mg/L) (avg)		1.64		3.72		204	
92								
93	**DIOXINS AND FURANS (ng/L)**							
94	**Method 8290**							
95	2,3,7,8-TCDF		NA		NA		NA	
96	Total TCDF		NA		NA		NA	
97	2,3,7,8-TCDD		NA		NA		NA	
98	Total TCDD		NA		NA		NA	
99	1,2,3,7,8-PeCDF		NA		NA		NA	
100	2,3,4,7,8-PeCDF		NA		NA		NA	
101	Total PeCDF		NA		NA		NA	
102	1,2,3,7,8-PeCDD		NA		NA		NA	
103	Total PeCDD		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF		NA		NA		NA	
108	Total HxCDF		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD		NA		NA		NA	
112	Total HxCDD		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF		NA		NA		NA	
115	Total HpCDF		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD		NA		NA		NA	
117	Total HpCDD		NA		NA		NA	
118	OCDF		NA		NA		NA	
119	OCDD		NA		NA		NA	
120								
121								
122								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2	
4			S177J		T176Q		U235K		V224P		W371L		Y314J		Z225P		Z960D		AH49D		AU22I		BC27L		BH96S		BR64E	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98		2/17/99		5/18/99		9/20/99		12/8/99		2/16/00		5/24/00	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC
1																												
2																												
3		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2
4		CB49H		CL03I		CT55E		DE68J		DM52A		DW48D		ED23D		EM85E		ES04E		EZ03L		FF76I		FL58J		FU31B		FY64I
5		8/29/00		11/10/00		2/14/01		6/5/01		8/14/01		11/29/01		2/26/02		6/26/02		08/28/02		11/12/02		2/12/03		5/8/03		8/27/03		10/21/03
123	**PAHs (µg/L)**																											
124	**EPA Method SW8270 SIM**																											
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BD	BE	BF	BG	BH	BI	BJ
1								
2								
3			J2		J2		J2	
4			0402105-02		0408019-05		0502102-01	
5			2/20/04		8/03/04		2/23/05	
123	**PAHs (µg/L)**							
124	**EPA Method SW8270 SIM**							
125	Naphthalene		NA		NA		NA	
126	2-Methylnaphthalene		NA		NA		NA	
127	Acenaphthylene		NA		1.01	U	NA	
128	Acenaphthene		NA		NA		NA	
129	Fluorene		NA		NA		NA	
130	Anthracene		NA		1.01	U	NA	
131	Dibenzofuran		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D
4			S167L		T176F		U235U		V208G		W371H		Y336H		Z225D		Z960H		AH27H		AU45K		BC21AC		BH75H		BR55F
5			4/1/97		7/15/97		10/23/97		1/28/98		5/18/98		8/19/98		11/13/98		2/17/99		5/17/99		9/23/99		12/6/99		2/15/00		5/23/00
6																											
7	1	**CHLORINATED PHENOLS (µg/L)**																									
8	2	**EPA Method SW8040**																									
9	3	Pentachlorophenol	**0.60**		0.25	U	0.25	U	0.25	U	0.25	U	**0.16**	J1	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
16	10																										
17	11	**SEMIVOLATILES (µg/L)**																									
18	12	**EPA Method SW8270**																									
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
21	15	Isophorone	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10
24	18	Naphthalene	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
25	19	2-Methylnaphthalene	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
28	22	Acenaphthene	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
29	23	Dibenzofuran	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
30	24	Fluorene	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
32	26	bis(2-Ethylhexyl)phthalate	1.0	UJ	1.0	UJ	3.5	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.0**		**6.5**		1.0	U	1.0	U	1.0
33	27																										
34	28	**VOLATILES (µg/L)**																									
35	29	**EPA Method SW8260**																									
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
37	31	Carbon Disulfide	1.0	U	1.0	U	**1.4**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56	49																										
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																									
58	51	**Method OR-DEQ**																									
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.36**		0.25	U	0.25	U	0.25	U	**0.67**		0.25	U	0.25	U	0.25
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62	55																										
63	56	**PRIORITY POLLUTANT**																									
64	57	**METALS (mg/L)**																									
65	58	Arsenic (7060)	**0.004**		**0.006**		0.05	U	0.05	U	**0.006**		**0.006**		**0.007**		**0.007**		**0.005**		**0.006**		**0.006**		**0.008**		**0.006**

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
3			LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D	
4			CB49B		CK77E		CT37C		DE68E		DM52D		DW48L		ED16I		EM75H		ER92D		EY88F		FF88L		FL41E		FU31D	
5			8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/29/01		2/25/02		6/25/02		08/26/02		11/11/02		2/13/03		5/7/03		8/27/03	
7	**CHLORINATED PHENOLS (µg/L)**																											
8	**EPA Method SW8040**																											
9	Pentachlorophenol	UJ	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.26**		**0.26**		0.25	U	0.27	U	0.25	U	0.25	U	0.25	U	0.6	U
10	2,4,6-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																												
17	**SEMIVOLATILES (µg/L)**																											
18	**EPA Method SW8270**																											
19	Phenol	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.1	U	2	U	2	U	2	U	2.4	U
20	4-Methylphenol	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.2	U
21	Isophorone	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.2	U
22	2,4-Dimethylphenol	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.2	U	3	U	3	U	3	U	3.6	U
23	Benzoic Acid	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U	53	U	50	U	50	U	50	U	60	U
24	Naphthalene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.2	U
25	2-Methylnaphthalene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.2	U
26	2,4,6-Trichlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5	U	5	U	5	U	6	U
27	2,4,5-Trichlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5	U	5	U	5	U	6	U
28	Acenaphthene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.2	U
29	Dibenzofuran	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.2	U
30	Fluorene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.2	U
31	Pentachlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5	U	5	U	5	U	6	U
32	bis(2-Ethylhexyl)phthalate	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	4.0	U	4.0	U	4.3	U	4	U	1	U	1	U	1.2	U
33																												
34	**VOLATILES (µg/L)**																											
35	**EPA Method SW8260**																											
36	Acetone	U	5.0	U	5.0	U	7.6	U	5.0	U	5.0	U	**20**		**6.9**		**6.4**		**16**		5	U	5	U	**6.3**		5	U
37	Carbon Disulfide	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U
39	Benzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
40	Bromoform	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
42	Ethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
43	Styrene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
45	o-Xylene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
49	n-Propylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
50	tert-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
52	4-Isopropyltoluene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
54	Naphthalene	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																												
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																											
58	**Method OR-DEQ**																											
59	**TPH-Diesel**	U	0.25	U	0.25	U	**0.27**		NA		NA		NA		0.25	U	NA		NA		NA		0.25	U	NA		NA	
60	**TPH-D Motor Oil**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																												
63	**PRIORITY POLLUTANT**																											
64	**METALS (mg/L)**																											
65	Arsenic (7060)		**0.006**		**0.005**		**0.006**		**0.005**		**0.006**		**0.006**		**0.006**		**0.005**		**0.006**		0.05	U	**0.006**		**0.006**		**0.006**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD	BE	BF
1					
2					
3		LW1D		LW1D	
4		FY64K		0502099-02	
5		10/21/03		2/22/05	
6					
7	**CHLORINATED PHENOLS (µg/L)**				
8	**EPA Method SW8040**				
9	Pentachlorophenol	0.5	U	NA	
10	2,4,6-Trichlorophenol	NA		NA	
11	2,3,6-Trichlorophenol	NA		NA	
12	2,4,5-Trichlorophenol	NA		NA	
13	2,3,4-Trichlorophenol	NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA	
16					
17	**SEMIVOLATILES (µg/L)**				
18	**EPA Method SW8270**				
19	Phenol	2	U	2.04	U
20	4-Methylphenol	1	U	10.2	U
21	Isophorone	1	U	1.02	U
22	2,4-Dimethylphenol	3	U	3.05	U
23	Benzoic Acid	10	U	20.4	U
24	Naphthalene	1	U	1.02	U
25	2-Methylnaphthalene	1	U	1.02	U
26	2,4,6-Trichlorophenol	5	U	5.09	U
27	2,4,5-Trichlorophenol	5	U	5.09	U
28	Acenaphthene	1	U	1.02	U
29	Dibenzofuran	1	U	1.02	U
30	Fluorene	1	U	1.02	U
31	Pentachlorophenol	5	U	5.09	U
32	bis(2-Ethylhexyl)phthalate	1	U	1.02	U
33					
34	**VOLATILES (µg/L)**				
35	**EPA Method SW8260**				
36	Acetone	**5.1**		50	U
37	Carbon Disulfide	1	U	2	U
38	2-Butanone	5	U	10	U
39	Benzene	1	U	0.3	U
40	Bromoform	1	U	1	U
41	Toluene	1	U	1	U
42	Ethylbenzene	1	U	1	U
43	Styrene	1	U	1	U
44	m,p-Xylene	1	U	2	U
45	o-Xylene	1	U	1	U
46	1,3,5-Trimethylbenzene	1	U	1	U
47	1,2,4-Trimethylbenzene	1	U	1	U
48	Isopropylbenzene	1	U	1	U
49	n-Propylbenzene	1	U	1	U
50	tert-Butylbenzene	1	U	1	U
51	sec-Butylbenzene	1	U	1	U
52	4-Isopropyltoluene	1	U	1	U
53	n-Butylbenzene	1	U	1	U
54	Naphthalene	5	U	1	U
55	Methyl tert-butyl ether	NA		1	U
56					
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**				
58	**Method OR-DEQ**				
59	**TPH-Diesel**	NA		0.259	U
60	**TPH-D Motor Oil**	NA		0.583	U
61	**TPH-Gasoline**	NA		0.1	U
62					
63	**PRIORITY POLLUTANT**				
64	**METALS (mg/L)**				
65	Arsenic (7060)	**0.006**		**0.00637**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D
4			S167L		T176F		U235U		V208G		W371H		Y336H		Z225D		Z960H		AH27H		AU45K		BC21AC		BH75H		BR55F
5			4/1/97		7/15/97		10/23/97		1/28/98		5/18/98		8/19/98		11/13/98		2/17/99		5/17/99		9/23/99		12/6/99		2/15/00		5/23/00
66	59	Chromium (6010)	0.005	U	**0.007**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.007**		**0.006**		0.005	U	0.005
67	60	Copper (6010)	0.002	U	**0.009**		**0.004**		**0.003**		0.002	U	0.004		0.002	U	0.002	U	0.002	U	**0.007**		**0.003**		**0.003**		0.002
68	61	Lead (7421)	0.001	U	**0.002**		0.02	U	0.02	U	0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	**0.003**		**0.001**		**0.002**		**0.001**
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01
70	63	Zinc (6010)	0.004	U	**0.019**	J2	**0.021**		**0.010**		**0.008**	J2	**0.014**		**0.006**		**0.009**	J	0.007	U	**0.021**		**0.012**		**0.017**		**0.007**
71	64																										
72	65	**MAJOR IONS AND CONVENTIONALS**																									
73	66	Calcium (mg/L) (6010)	**69.1**		**71.1**		**72.9**		**65.8**		NA		NA		NA		**63.4**		NA		NA		NA		NA		NA
74	67	Magnesium (mg/L) (6010)	**40.5**		**42.6**		**43.1**		**37.0**		NA		NA		NA		**38.6**		NA		NA		NA		NA		NA
75	68	Potassium (mg/L) (6010)	**1.9**		**2.0**		**2.0**		**1.1**		NA		NA		NA		**1.5**		NA		NA		NA		NA		NA
76	69	Sodium (mg/L) (6010)	**15.3**		**16.4**		**16.3**		**15.9**		NA		NA		NA		**15.1**		NA		NA		NA		NA		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**360**		**350**		**360**		**370**		NA		NA		NA		**360**		NA		NA		NA		NA		NA
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		NA		NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**360**		**350**		**360**		**370**		NA		NA		NA		**360**		NA		NA		NA		NA		NA
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**400**	J2	**400**		**370**	J2	**310**		**350**		**310**		**340**		**340**		**360**		**360**		**360**		**350**
81	74	Chloride (mg/L) (EPA 325.2)	**3.2**	J	**3.0**		**3.5**		**3.3**		**3.9**		**2.0**		**2.8**		**3.6**		**1.6**		**3.2**		**3.7**		**3.5**		**10**
82	75	N-Nitrate (mg-N/L) (Calculated)	**0.012**	J	0.010	U	**0.017**		**0.021**		NA		NA		NA		0.010	U	NA		NA		NA		NA		NA
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	0.010	U	0.010	U	0.010	U	0.010	U	NA		NA		NA		**0.020**		NA		NA		NA		NA		NA
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.012**	J	0.010	U	**0.017**		**0.021**		NA		NA		NA		**0.020**		NA		NA		NA		NA		NA
85	78	Sulfate (mg/L) (EPA 375.2)	**3.4**	J	2.5	U	2.5	U	2.5	U	NA		NA		NA		**7.2**		NA		NA		NA		NA		NA
86	79																										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
3			LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D	
4			CB49B		CK77E		CT37C		DE68E		DM52D		DW48L		ED16I		EM75H		ER92D		EY88F		FF88L		FL41E		FU31D	
5			8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/29/01		2/25/02		6/25/02		08/26/02		11/11/02		2/13/03		5/7/03		8/27/03	
66	Chromium (6010)	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	U	0.002	U	**0.002**	J2	0.002	U	0.002	U	0.002	U	0.003	U	**0.005**		0.002	U	**0.005**		**0.003**		**0.004**		0.002	U	**0.002**	
68	Lead (7421)		0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	**0.002**		0.001	U	**0.005**		**0.002**		0.02	U	0.001	U	0.001	U	0.001	U
69	Nickel (6010)	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)		**0.011**		**0.007**		**0.007**		0.006	U	0.006	U	**0.01**		**0.011**		**0.006**		**0.011**		**0.009**		**0.014**		**0.01**	J	**0.012**	
71																												
72	**MAJOR IONS AND CONVENTIONALS**																											
73	Calcium (mg/L) (6010)		NA		NA		**51.5**		**53.8**		**50.2**		**45.3**		**51.6**		NA		NA		NA		**48.2**		NA		NA	
74	Magnesium (mg/L) (6010)		NA		NA		**32.5**		**33.0**		**32.0**		**29.2**		**34.0**		NA		NA		NA		**30.9**		NA		NA	
75	Potassium (mg/L) (6010)		NA		NA		**1.1**		**1.3**		**1.4**		**1.3**		**1.8**		NA		NA		NA		**1.4**		NA		NA	
76	Sodium (mg/L) (6010)		NA		NA		**13.0**		**12.9**		**13.3**		**12.4**		**14.4**		NA		NA		NA		**13.6**		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		NA		**300**		NA		NA		NA		**280**		NA		NA		NA		**270**		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		1	U	NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		**300**		NA		NA		NA		**280**		NA		NA		NA		**270**		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**380**		**360**		**380**		**360**		**360**		**320**		**320**		**300**		**340**		**320**		**280**		**300**		**320**	
81	Chloride (mg/L) (EPA 325.2)		**3.2**		**3.2**		**3.0**		**3.2**		**3.1**		**2.6**		**3.0**		**1.6**		**2.6**		**2.7**		**4.9**		**3.1**		**2.2**	
82	N-Nitrate (mg-N/L) (Calculated)		NA		NA		0.010	U	NA		NA		NA		0.010	U	NA		NA		NA		**0.031**		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		NA		0.010	U	NA		NA		NA		**0.010**		NA		NA		NA		0.01	U	NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		NA		0.010	UJ	NA		NA		NA		**0.017**		NA		NA		NA		**0.031**		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		NA		**11**		NA		NA		NA		**6.1**		NA		NA		NA		**4.6**		NA		NA	
86																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD	BE	BF
1					
2					
3		LW1D		LW1D	
4		FY64K		0502099-02	
5		10/21/03		2/22/05	
66	Chromium (6010)	**0.005**		**0.0096**	
67	Copper (6010)	**0.005**		0.01	U
68	Lead (7421)	**0.036**		**0.00363**	
69	Nickel (6010)	0.01	U	0.005	U
70	Zinc (6010)	**0.019**		**0.0195**	
71					
72	**MAJOR IONS AND CONVENTIONALS**				
73	Calcium (mg/L) (6010)	NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA	
75	Potassium (mg/L) (6010)	NA		NA	
76	Sodium (mg/L) (6010)	NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**330**		**328**	
81	Chloride (mg/L) (EPA 325.2)	**2.9**		**2.44**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA	
86					

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D
4			S167L		T176F		U235U		V208G		W371H		Y336H		Z225D		Z960H		AH27H		AU45K		BC21AC		BH75H		BR55F
5			4/1/97		7/15/97		10/23/97		1/28/98		5/18/98		8/19/98		11/13/98		2/17/99		5/17/99		9/23/99		12/6/99		2/15/00		5/23/00
6																											
87	80	**FIELD PARAMETERS**																									
88	81	pH (avg)	6.91		6.99		7.14		6.94		6.64		6.61		6.45		6.97		6.05		6.90		6.36		6.88		6.65
89	82	Temperature (° C) (avg)	14.1		16.5		14.4		14.1		12.7		16.0		13.8		14.6		16.4		15.9		14.1		14.7		14.7
90	83	Conductivity (um/hos)	678		654		576		594		522		633		137		586		459		488		536		521		482
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		NA		0.95		2.22		2.43		2.41		0.76		3.26		1.89		0.97
92	85																										
93	86	**DIOXINS AND FURANS (ng/L)**																									
94	87	**Method 8290**																									
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120																											
121																											
122																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2																												
3			LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D	
4			CB49B		CK77E		CT37C		DE68E		DM52D		DW48L		ED16I		EM75H		ER92D		EY88F		FF88L		FL41E		FU31D	
5			8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/29/01		2/25/02		6/25/02		08/26/02		11/11/02		2/13/03		5/7/03		8/27/03	
87	**FIELD PARAMETERS**																											
88	pH (avg)		6.55		5.47		6.64		6.96		7.11		6.86		6.36		6.86		6.96		7.03		7.12		7.31		7.05	
89	Temperature (° C) (avg)		15.2		14.0		15.0		15.6		16.3		14.3		14.1		16.0		16.0		14.9		15.5		14.6		16.7	
90	Conductivity (um/hos)		553		481		476		484		503		467		445		451		389		495		508		411		388	
91	Dissolved oxygen (mg/L) (avg)		1.78		2.23		1.51		1.99		1.34		4.23		4.78		5.36		1.91		2.59		0		4.2		1.54	
92																												
93	**DIOXINS AND FURANS (ng/L)**																											
94	**Method 8290**																											
95	2,3,7,8-TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD	BE	BF
1					
2					
3		LW1D		LW1D	
4		FY64K		0502099-02	
5		10/21/03		2/22/05	
87	**FIELD PARAMETERS**				
88	pH (avg)	7.07		6.92	
89	Temperature (° C) (avg)	17.1		14.4	
90	Conductivity (um/hos)	381		223	
91	Dissolved oxygen (mg/L) (avg)	2.51		1.99	
92					
93	**DIOXINS AND FURANS (ng/L)**				
94	**Method 8290**				
95	2,3,7,8-TCDF	NA		NA	
96	Total TCDF	NA		NA	
97	2,3,7,8-TCDD	NA		NA	
98	Total TCDD	NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA	
101	Total PeCDF	NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA	
103	Total PeCDD	NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA	
108	Total HxCDF	NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA	
112	Total HxCDD	NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA	
115	Total HpCDF	NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA	
117	Total HpCDD	NA		NA	
118	OCDF	NA		NA	
119	OCDD	NA		NA	
120					
121					
122					

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D
4			S167L		T176F		U235U		V208G		W371H		Y336H		Z225D		Z960H		AH27H		AU45K		BC21AC		BH75H		BR55F
5			4/1/97		7/15/97		10/23/97		1/28/98		5/18/98		8/19/98		11/13/98		2/17/99		5/17/99		9/23/99		12/6/99		2/15/00		5/23/00
123		**PAHs (µg/L)**																									
124		**EPA Method SW8270 SIM**																									
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2																												
3			LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D		LW1D	
4			CB49B		CK77E		CT37C		DE68E		DM52D		DW48L		ED16I		EM75H		ER92D		EY88F		FF88L		FL41E		FU31D	
5			8/28/00		11/7/00		2/12/01		6/4/01		8/15/01		11/29/01		2/25/02		6/25/02		08/26/02		11/11/02		2/13/03		5/7/03		8/27/03	
123	**PAHs (µg/L)**																											
124	**EPA Method SW8270 SIM**																											
125	Naphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD	BE	BF
1					
2					
3		LW1D		LW1D	
4		FY64K		0502099-02	
5		10/21/03		2/22/05	
123	**PAHs (µg/L)**				
124	**EPA Method SW8270 SIM**				
125	Naphthalene	NA		0.0514	U
126	2-Methylnaphthalene	NA		NA	
127	Acenaphthylene	NA		0.0514	U
128	Acenaphthene	NA		0.0514	U
129	Fluorene	NA		0.0514	U
130	Anthracene	NA		0.0514	U
131	Dibenzofuran	NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D
4			S177F		T176V		U235S		V224M		W391H		Y336C		Z225H		Z960M		AH76I		AU36C		BC27B		BH96K		BR55I
5			4/2/97		7/16/97		10/23/97		1/29/98		5/20/98		8/18/98		11/13/98		2/18/99		5/19/99		9/21/99		12/7/99		2/18/00		5/23/00
6																											
7	1	**CHLORINATED PHENOLS (µg/L)**																									
8	2	**EPA Method SW8040**																									
9	3	Pentachlorophenol	**0.23**	J	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
16	10																										
17	11	**SEMIVOLATILES (µg/L)**																									
18	12	**EPA Method SW8270**																									
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.2**		1.0	U	1.0
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	**5.3**	J2	5.4	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
33	27																										
34	28	**VOLATILES (µg/L)**																									
35	29	**EPA Method SW8260**																									
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
37	31	Carbon Disulfide	1.0	U	1.0	U	**4.0**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
40	34	Bromoform	1.0	U	**1.6**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.0**		1.0	U	1.0	U	1.0
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56	49																										
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																									
58	51	**Method OR-DEQ**																									
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.38**		**0.32**
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62	55																										
63	56	**PRIORITY POLLUTANT**																									
64	57	**METALS (mg/L)**																									
65	58	Arsenic (7060)	**0.010**		**0.009**		0.05	U	0.05	U	**0.018**		**0.014**		**0.015**		**0.017**		**0.017**		**0.017**		**0.017**		**0.021**		**0.019**

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
3			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D	
4			CB49E		CK77G		CT55C		DE68H		DM52C		DW48A		ED34F		EM85A		ES04B		EZ03A		FF88B		FL66J		FU50A	
5			8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/28/02		6/26/02		08/28/02		11/12/02		2/13/03		5/9/03		8/29/03	
7	**CHLORINATED PHENOLS (µg/L)**																											
8	**EPA Method SW8040**																											
9	Pentachlorophenol	UJ	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**3.0**		**0.76**		0.25	U	0.29	U	0.25	U	**0.28**		0.25	U	0.55	U
10	2,4,6-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																												
17	**SEMIVOLATILES (µg/L)**																											
18	**EPA Method SW8270**																											
19	Phenol	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.3	U	2.2	U	2	U	2	U	2.2	U
20	4-Methylphenol	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U
21	Isophorone	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U
22	2,4-Dimethylphenol	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.5	U	3.3	U	3	U	3	U	3.3	U
23	Benzoic Acid	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U	58	U	54	U	50	U	50	U	55	U
24	Naphthalene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U
25	2-Methylnaphthalene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U
26	2,4,6-Trichlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.8	U	5.4	U	5	U	5	U	5.5	U
27	2,4,5-Trichlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.8	U	5.4	U	5	U	5	U	5.5	U
28	Acenaphthene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U
29	Dibenzofuran	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U
30	Fluorene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U
31	Pentachlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**26**		5.0	U	5.8	U	5.4	U	5	U	5	U	5.5	U
32	bis(2-Ethylhexyl)phthalate	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.0**		4.0	U	4.0	U	4.7	U	4.3	U	1	U	1	U	1.1	U
33																												
34	**VOLATILES (µg/L)**																											
35	**EPA Method SW8260**																											
36	Acetone	U	5.0	U	**15**			R	**23**		**38**		**80**		**10**		**50**		**13**		5	U	**12**		**24**		**17**	
37	Carbon Disulfide	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U
39	Benzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
40	Bromoform	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
42	Ethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
43	Styrene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
45	o-Xylene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
49	n-Propylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
50	tert-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
52	4-Isopropyltoluene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U
54	Naphthalene	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																												
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																											
58	**Method OR-DEQ**																											
59	**TPH-Diesel**		0.25	U	0.25	U	**0.28**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	**TPH-D Motor Oil**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																												
63	**PRIORITY POLLUTANT**																											
64	**METALS (mg/L)**																											
65	Arsenic (7060)		**0.017**		**0.016**		**0.015**		**0.016**		**0.018**		**0.020**		**0.016**		**0.019**		**0.016**		0.05	U	**0.014**		**0.016**		**0.018**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD	BE	BF	BG	BH	BI	BJ
3		LW3D		LW3D		LW3D		LW3D	
4		FY82I		0402113-10		0408044-01		0502102-06	
5		10/24/03		2/23/04		8/06/04		2/23/05	
7	**CHLORINATED PHENOLS (µg/L)**								
8	**EPA Method SW8040**								
9	Pentachlorophenol	**0.62**		0.489	U	0.5	U	0.484	U
10	2,4,6-Trichlorophenol	NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA	
16									
17	**SEMIVOLATILES (µg/L)**								
18	**EPA Method SW8270**								
19	Phenol	2.2	U	1.97	U	2	U	1.92	U
20	4-Methylphenol	1.1	U	9.85	U	10	U	9.62	U
21	Isophorone	1.1	U	0.985	U	1	U	0.962	U
22	2,4-Dimethylphenol	3.3	U	2.96	U	3	U	2.88	U
23	Benzoic Acid	11	U	19.7	U	20	U	19.2	U
24	Naphthalene	1.1	U	0.985	U	1	U	0.962	U
25	2-Methylnaphthalene	1.1	U	0.985	U	1	U	0.962	U
26	2,4,6-Trichlorophenol	5.5	U	4.93	U	5	U	4.81	U
27	2,4,5-Trichlorophenol	5.5	U	4.93	U	5	U	4.81	U
28	Acenaphthene	1.1	U	0.985	U	1	U	0.962	U
29	Dibenzofuran	1.1	U	0.985	U	1	U	0.962	U
30	Fluorene	1.1	U	0.985	U	1	U	0.962	U
31	Pentachlorophenol	5.5	U	4.93	U	5	U	4.81	U
32	bis(2-Ethylhexyl)phthalate	1.1	U	0.985	U	1	U	0.962	U
33									
34	**VOLATILES (µg/L)**								
35	**EPA Method SW8260**								
36	Acetone	**64**		50	U	50	U	50	U
37	Carbon Disulfide	1	U	2	U	2	U	2	U
38	2-Butanone	5	U	10	U	10	U	10	U
39	Benzene	1	U	0.4	U	0.3	U	0.3	U
40	Bromoform	1	U	1	U	1	U	1	U
41	Toluene	1	U	1	U	1	U	1	U
42	Ethylbenzene	1	U	1	U	1	U	1	U
43	Styrene	1	U	1	U	1	U	1	U
44	m,p-Xylene	1	U	2	U	2	U	2	U
45	o-Xylene	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U
48	Isopropylbenzene	1	U	1	U	1	U	1	U
49	n-Propylbenzene	1	U	1	U	1	U	1	U
50	tert-Butylbenzene	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	1	U	1	U	1	U	1	U
52	4-Isopropyltoluene	1	U	1	U	1	U	1	U
53	n-Butylbenzene	1	U	1	U	1	U	1	U
54	Naphthalene	5	U	1	U	1	U	**3.5**	
55	Methyl tert-butyl ether	NA		1	U	1	U	1	U
56									
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**								
58	**Method OR-DEQ**								
59	**TPH-Diesel**	NA		NA		NA		0.247	U
60	**TPH-D Motor Oil**	NA		NA		NA		0.494	U
61	**TPH-Gasoline**	NA		NA		NA		NA	
62									
63	**PRIORITY POLLUTANT**								
64	**METALS (mg/L)**								
65	Arsenic (7060)	**0.018**		**0.014**		**0.014**		**0.0157**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D
4			S177F		T176V		U235S		V224M		W391H		Y336C		Z225H		Z960M		AH76I		AU36C		BC27B		BH96K		BR55I
5			4/2/97		7/16/97		10/23/97		1/29/98		5/20/98		8/18/98		11/13/98		2/18/99		5/19/99		9/21/99		12/7/99		2/18/00		5/23/00
66	59	Chromium (6010)	0.005	U	**0.164**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005
67	60	Copper (6010)	**0.003**		**0.164**		0.002	U	**0.004**		0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002
68	61	Lead (7421)	0.001	U	**0.062**		0.02	U	0.02	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001
69	62	Nickel (6010)	0.01	U	**0.12**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01
70	63	Zinc (6010)	**0.021**		**0.464**		**0.016**		**0.015**		**0.009**	J2	**0.011**		**0.007**		**0.012**	J	**0.009**		**0.012**		0.010	U	**0.011**		0.006
71	64																										
72	65	**MAJOR IONS AND CONVENTIONALS**																									
73	66	Calcium (mg/L) (6010)	**54.4**		**82.6**		**58.7**		**61.3**		NA		NA		NA		**62.7**		NA		NA		NA		NA		NA
74	67	Magnesium (mg/L) (6010)	**26.1**		**55.4**		**27.7**		**28.4**		NA		NA		NA		**29.0**		NA		NA		NA		NA		NA
75	68	Potassium (mg/L) (6010)	**3.4**		**11.5**		**3.9**		**3.7**		NA		NA		NA		**3.5**		NA		NA		NA		NA		NA
76	69	Sodium (mg/L) (6010)	**51.0**		**92.1**		**35.7**		**27.8**		NA		NA		NA		**17.8**		NA		NA		NA		NA		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**370**		**340**	J2	**340**		**360**		NA		NA		NA		**350**		NA		NA		NA		NA		NA
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		NA		NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**370**		**340**	J2	**340**		**360**		NA		NA		NA		**350**		NA		NA		NA		NA		NA
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**360**	J2	**350**		**360**		**380**		**340**		**330**		**380**		**340**		**340**		**360**		**360**		**360**
81	74	Chloride (mg/L) (EPA 325.2)	**4.8**		**4.3**		**4.9**		**3.9**		**4.7**		**3.1**		**3.5**		**5.3**		**3.5**		**3.4**		**4.5**		**4.3**		**4.4**
82	75	N-Nitrate (mg-N/L) (Calculated)	**0.012**		0.010	U	**0.026**		**0.023**	J2	NA		NA		NA		0.010	U	NA		NA		NA		NA		NA
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	**0.012**	J	**0.012**	J2	**0.014**		0.010	UJ	NA		NA		NA		**0.021**		NA		NA		NA		NA		NA
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.024**		0.010	U	**0.040**		**0.023**	J2	NA		NA		NA		**0.020**		NA		NA		NA		NA		NA
85	78	Sulfate (mg/L) (EPA 375.2)	**12**	J	**4.3**		2.5	U	**2.6**		NA		NA		NA		**5.4**		NA		NA		NA		NA		NA
86	79																										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2																												
3			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D	
4			CB49E		CK77G		CT55C		DE68H		DM52C		DW48A		ED34F		EM85A		ES04B		EZ03A		FF88B		FL66J		FU50A	
5			8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/28/02		6/26/02		08/28/02		11/12/02		2/13/03		5/9/03		8/29/03	
66	Chromium (6010)	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.010**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	U	0.002	U	**0.004**	J2	0.002	U	0.002	U	0.002	U	0.002	U	**0.004**		**0.002**		**0.003**		**0.002**		0.002	U	**0.003**		**0.003**	
68	Lead (7421)	U	0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	**0.002**		0.001	U	0.001	U	0.001	U	0.02	U	**0.002**		**0.001**		0.001	U
69	Nickel (6010)	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)	U	**0.015**		**0.017**		**0.007**		0.006	U	**0.012**		**0.013**		**0.008**		**0.008**		**0.014**		0.006	U	0.006	U	**1.1**		**0.008**	
71																												
72	**MAJOR IONS AND CONVENTIONALS**																											
73	Calcium (mg/L) (6010)		NA		NA		**61.4**		**62.1**		**55.1**		**57.3**		**60.9**		NA		NA		NA		**57.8**		NA		NA	
74	Magnesium (mg/L) (6010)		NA		NA		**27.5**		**28.4**		**25.4**		**26.3**		**27.6**		NA		NA		NA		**27.7**		NA		NA	
75	Potassium (mg/L) (6010)		NA		NA		**3.2**		**3.5**		**3.4**		**3.2**		**3.9**		NA		NA		NA		**3.6**		NA		NA	
76	Sodium (mg/L) (6010)		NA		NA		**13.4**		**13.4**		**12.6**		**13.2**		**14.5**		NA		NA		NA		**13.7**		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		NA		**330**		NA		NA		NA		**350**		NA		NA		NA		**310**		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		1	U	NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		**330**		NA		NA		NA		**350**		NA		NA		NA		**310**		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**410**		**350**		**360**		**370**		**310**		**330**		**390**		**310**		**380**		**380**		**350**		**330**		**330**	
81	Chloride (mg/L) (EPA 325.2)		**3.5**		**6.9**		**3.3**		**6.2**		**4.5**		**3.4**		**3.7**		**3.4**		**3.4**		**3.5**		**4.7**		**3.3**		**2.6**	
82	N-Nitrate (mg-N/L) (Calculated)		NA		NA		**0.012**		NA		NA		NA		NA		NA		NA		NA		**0.031**		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		NA		0.010	U	NA		NA		NA		NA		NA		NA		NA		**0.032**		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		NA		**0.012**		NA		NA		NA		NA		NA		NA		NA		**0.063**		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		NA		**6.5**		NA		NA		NA		**5.5**		NA		NA		NA		**4.1**		NA		NA	
86																												

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD	BE	BF	BG	BH	BI	BJ
1									
2									
3		LW3D		LW3D		LW3D		LW3D	
4		FY82I		0402113-10		0408044-01		0502102-06	
5		10/24/03		2/23/04		8/06/04		2/23/05	
66	Chromium (6010)	**0.006**		**0.006**		0.005	U	**0.0137**	
67	Copper (6010)	**0.004**		0.01	U	0.01	U	0.01	U
68	Lead (7421)	**0.001**		**0.0006**		**0.000392**		**0.00467**	
69	Nickel (6010)	0.01	U	0.005	U	0.005	U	0.005	U
70	Zinc (6010)	**0.013**		0.01	U	0.01	U	**0.0262**	
71									
72	**MAJOR IONS AND CONVENTIONALS**								
73	Calcium (mg/L) (6010)	NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**290**		**350**		**359**		**287**	
81	Chloride (mg/L) (EPA 325.2)	**3.6**		**3.97**		0.5	U	**3.39**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA	
86									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D
4			S177F		T176V		U235S		V224M		W391H		Y336C		Z225H		Z960M		AH76I		AU36C		BC27B		BH96K		BR55I
5			4/2/97		7/16/97		10/23/97		1/29/98		5/20/98		8/18/98		11/13/98		2/18/99		5/19/99		9/21/99		12/7/99		2/18/00		5/23/00
87	80	**FIELD PARAMETERS**																									
88	81	pH (avg)	6.76		6.74		6.59		6.87		6.48		6.40		6.21		6.58		6.08		6.44		6.31		6.30		6.55
89	82	Temperature (° C) (avg)	12.7		16.2		13.4		16.5		13.3		14.2		13.3		12.4		13.9		15.5		12.2		12.3		16.0
90	83	Conductivity (um/hos)	706		646		627		668		504		673		159		695		635		588		657		667		627
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		2.21		1.60		2.22		2.47		1.99		2.10		2.44		2.05		1.49
92	85																										
93	86	**DIOXINS AND FURANS (ng/L)**																									
94	87	**Method 8290**																									
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120																											
121																											
122																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2																												
3			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D	
4			CB49E		CK77G		CT55C		DE68H		DM52C		DW48A		ED34F		EM85A		ES04B		EZ03A		FF88B		FL66J		FU50A	
5			8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/28/02		6/26/02		08/28/02		11/12/02		2/13/03		5/9/03		8/29/03	
87	**FIELD PARAMETERS**																											
88	pH (avg)		5.92		5.58		6.29		6.56		6.54		6.47		6.50		6.30		6.45		6.39		6.8		6.87		6.52	
89	Temperature (° C) (avg)		14.0		12.7		12.4		13.6		14.4		12.7		12.5		14.4		15.2		13.3		13.1		14.5		15.1	
90	Conductivity (um/hos)		629		624		638		655		628		628		617		629		595		664		826		534		525	
91	Dissolved oxygen (mg/L) (avg)		1.04		1.28		0.60		0.92		11.14		3.61		7.98		4.43		1.20		1.94		0		4.28		1.13	
92																												
93	**DIOXINS AND FURANS (ng/L)**																											
94	**Method 8290**																											
95	2,3,7,8-TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD	BE	BF	BG	BH	BI	BJ
1									
2									
3		LW3D		LW3D		LW3D		LW3D	
4		FY82I		0402113-10		0408044-01		0502102-06	
5		10/24/03		2/23/04		8/06/04		2/23/05	
87	**FIELD PARAMETERS**								
88	pH (avg)	6.33		6.45		5.93		6.79	
89	Temperature (° C) (avg)	13.0		14.2		14.7		14	
90	Conductivity (um/hos)	543		541		836		214	
91	Dissolved oxygen (mg/L) (avg)	2.00		0.04		3.8		3.38	
92									
93	**DIOXINS AND FURANS (ng/L)**								
94	**Method 8290**								
95	2,3,7,8-TCDF	NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA	
120									
121									
122									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D
4			S177F		T176V		U235S		V224M		W391H		Y336C		Z225H		Z960M		AH76I		AU36C		BC27B		BH96K		BR55I
5			4/2/97		7/16/97		10/23/97		1/29/98		5/20/98		8/18/98		11/13/98		2/18/99		5/19/99		9/21/99		12/7/99		2/18/00		5/23/00
123		**PAHs (µg/L)**																									
124		**EPA Method SW8270 SIM**																									
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2																												
3			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D	
4			CB49E		CK77G		CT55C		DE68H		DM52C		DW48A		ED34F		EM85A		ES04B		EZ03A		FF88B		FL66J		FU50A	
5			8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/28/02		6/26/02		08/28/02		11/12/02		2/13/03		5/9/03		8/29/03	
123	**PAHs (µg/L)**																											
124	**EPA Method SW8270 SIM**																											
125	Naphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BC	BD	BE	BF	BG	BH	BI	BJ
1									
2									
3		LW3D		LW3D		LW3D		LW3D	
4		FY82I		0402113-10		0408044-01		0502102-06	
5		10/24/03		2/23/04		8/06/04		2/23/05	
123	**PAHs (µg/L)**								
124	**EPA Method SW8270 SIM**								
125	Naphthalene	NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		1	U	NA	
128	Acenaphthene	NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA	
130	Anthracene	NA		NA		1	U	NA	
131	Dibenzofuran	NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
2							Dup of LW4D										Dup of LW4D				Dup of LW4D			
3			LW4D		LW4D		LW40D		LW4D		LW4D		LW4D (a)		LW4D		LW40D		LW4D		LW40D		LW4D	
4			S167I		T176M		T176L		U235N		V232F		B802035-02		W391E		W391I		Y314E		Y314B		Z225J	
5			4/1/97		7/16/97		7/16/97		10/22/97		1/30/98		1/30/98		5/20/98		5/20/98		8/17/98		8/17/98		11/14/98	
7	1	**CHLORINATED PHENOLS (µg/L)**																						
8	2	**EPA Method SW8040**																						
9	3	Pentachlorophenol	**450**		**8200**		**7200**		**8700**		**14000**		**16500**		**4300**		**4400**		**3300**		**3300**		**2400**	
10	4	2,4,6-Trichlorophenol	**0.44**		**4.0**		**3.7**		**4.8**		**8.8**		NA		**5.3**		**5.4**		**6.3**		**6.5**		**20**	J2
11	5	2,3,6-Trichlorophenol	0.29	U	1.8	U	1.8	U	0.73	U	0.25	U	NA		0.25	U	0.25	U	0.82	U	0.90	U	0.46	U
12	6	2,4,5-Trichlorophenol	11	U	39	U	30	U	76	U	**39**		NA		**90**		**90**		51	U	51	U	60	U
13	7	2,3,4-Trichlorophenol	0.28	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**20**		**880**		**770**		**600**		**940**		**746**		**240**		**250**		**270**		**280**		**210**	J2
15	9	2,3,4,5-Tetrachlorophenol	**6.1**		**29**		**26**		**19**		**20**		NA		50	U	50	U	**16**		**14**		**8.4**	
16	10																							
17	11	**SEMIVOLATILES (µg/L)**																						
18	12	**EPA Method SW8270**																						
19	13	Phenol	**150**		**180**		**200**		**58**		**30**		100	U	**16**		**17**		**10**		**8.1**		**7.7**	
20	14	4-Methylphenol	**11**		**33**		**32**		1.0	U	**8.7**		100	U	**16**		**15**		1.0	U	1.0	U	**10**	
21	15	Isophorone	1.0	U	1.0	U	1.0	U	**1.8**		**2.3**		NA		1.0	U	1.0	U	**1.1**		1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	200	U	**17**	J2	**18**	J2	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	**22**		**28**	J2	**47**	J2	10	U	10	U	NA		10	U	10	U	10	U	10	U	10	U
24	18	Naphthalene	**35**		**44**		**46**		**36**		**30**		NA		**16**	J2	**21**	J2	**18**	J2	**23**	J2	**28**	
25	19	2-Methylnaphthalene	**52**		**67**		**74**		**45**		**44**		NA		**24**	J2	**32**	J2	**42**		**49**		**57**	
26	20	2,4,6-Trichlorophenol	5.0	U	**8.0**		**9.4**		**7.5**		**9.3**		100	U	**7.3**	J2	**9.4**	J2	5.0	U	5.0	U	**18**	J2
27	21	2,4,5-Trichlorophenol	**14**		**43**		**49**		**69**		**78**		100	U	**57**		**60**		**7.4**		**6.7**		**69**	
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	**390**		**10000**		**12000**		**18000**		**16000**		**13500**		**5300**		**5200**		**3100**		**2900**		**4600**	
32	26	bis(2-Ethylhexyl)phthalate	10	UJ	1.0	U	1.0	U	**2.0**		1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
33	27																							
34	28	**VOLATILES (µg/L)**																						
35	29	**EPA Method SW8260**																						
36	30	Acetone	**16**		**42**		**43**		**25**		**29**		NA		**17**		**17**		**11**		**9.2**		**12**	
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	**12**		**12**		5.0	U	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	**10**		**6.4**		**6.3**		**17**		**11**		NA		**5.4**		**5.4**		**10**		**9.6**		**5.7**	
42	36	Ethylbenzene	**140**		**190**		**190**		**180**		**130**		NA		**12**		**13**		**100**		**95**		**93**	
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	**390**		**580**		**600**		**730**		**500**		NA		**450**		**450**		**320**		**320**		**340**	
45	39	o-Xylene	**77**		**140**		**140**		**150**		**100**		NA		**110**		**110**		**120**		**95**		**94**	
46	40	1,3,5-Trimethylbenzene	**170**		**190**		**180**		**330**		**140**		NA		**160**		**150**		**180**		**170**		**120**	
47	41	1,2,4-Trimethylbenzene	**580**		**630**		720		**1100**	J2	**560**		NA		**480**		**550**		**590**		**570**		**460**	J2
48	42	Isopropylbenzene	**110**		**120**		**120**		**140**	J2	**81**		NA		**7.5**		**7.4**		**100**		**85**		**54**	
49	43	n-Propylbenzene	**140**		**160**		**150**		**190**		**110**		NA		**7.6**		**7.3**		**120**		**110**		**78**	
50	44	tert-Butylbenzene	1.0	U	1.0	U	**4.1**	J2	**3.8**		**2.6**		NA		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	**15**		**20**		**18**		**18**	J2	**12**		NA		1.0	U	1.0	U	**22**	J2	1.0	UJ	1.0	U
52	46	4-Isopropyltoluene	**10**		**15**		**14**		**14**	J2	**10**		NA		**5.4**		**5.4**		**15**		**12**		**8.5**	
53	47	n-Butylbenzene	**14**		**20**		**18**		**17**	J2	**13**		NA		4.4	U	4.2	U	**21**	J2	**16**	J2	**12**	J2
54	48	Naphthalene	**54**		**87**		**84**		**92**	J2	**78**		NA		**41**		**41**		**50**		**48**		**28**	
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																							
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																						
58	51	**Method OR-DEQ**																						
59	52	**TPH-Diesel**	**7.2**		**12**		**12**		**15**		**11**		NA		**7.2**		**6.8**		**6.5**	J2	**8.2**	J2	**4.6**	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																							
63	56	**PRIORITY POLLUTANT**																						
64	57	**METALS (mg/L)**																						
65	58	Arsenic (7060)	**0.024**		**0.025**		**0.025**		0.05	U	0.05	U	NA		**0.028**		**0.028**		**0.028**		**0.029**		**0.028**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU
2		Dup of LW4D				Dup of LW4D						Dup of LW4D				Dup of LW4D								
3		LW40D		LW4D		LW40D		LW4D		LW4D		LW40D		LW4D		LW40D		LW4D		LW4D		LW4D		LW4D
4		Z225L		Z960P		Z960K		AH49H		AU45G		AU45I		BC21J		BC27P		BH96E		BR55D		CB68D		CL03G
5		11/14/98		2/17/99		2/17/99		5/18/99		9/22/99		9/22/99		12/9/99		12/9/99		2/17/00		5/22/00		8/30/00		11/9/00
7	**CHLORINATED PHENOLS (µg/L)**																							
8	**EPA Method SW8040**																							
9	Pentachlorophenol	**2300**		**2300**		**2400**		**2.5**		**0.85**	J2	**0.58**	J2	**1.5**	J2	**3.4**	J2	**0.60**		**0.41**	J2	**0.30**		0.25
10	2,4,6-Trichlorophenol	**16**	J2	**9.6**	J	**13**	J	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
11	2,3,6-Trichlorophenol	0.47	U	1.2	U	1.1	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
12	2,4,5-Trichlorophenol	26	U	80	U	48	U	0.39	U	0.25	U	0.25	U	0.34	U	0.69	U	0.25	U	0.25	U	0.41	U	0.25
13	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**160**	J2	**130**		**140**		**0.26**		0.25	U	0.25	U	**1.4**	J2	**3.0**	J2	0.25	U	0.25	U	0.25	U	0.25
15	2,3,4,5-Tetrachlorophenol	**8.4**		**67**	J	**42**	J	**0.49**		0.25	U	0.25	U	0.25	U	**0.19**	J1	0.25	U	0.25	U	0.25	U	0.25
16																								
17	**SEMIVOLATILES (µg/L)**																							
18	**EPA Method SW8270**																							
19	Phenol	**7.6**		**23**		**25**		2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	**110**		2.0
20	4-Methylphenol	**9.4**		**7.5**		**7.7**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	**11**		10
24	Naphthalene	**28**		**23**		**25**		1.0	U	**27**	J2	**14**	J2	**19**		**19**		**24**		**10**		**11**		**5.4**
25	2-Methylnaphthalene	**58**		**64**		**65**		1.0	U	**41**	J2	**22**	J2	**30**		**30**		**30**		**18**		**18**		**11**
26	2,4,6-Trichlorophenol	**20**	J2	**12**		**11**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
27	2,4,5-Trichlorophenol	**66**		**59**		**55**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
31	Pentachlorophenol	**3800**		**4000**		**3700**		**6.5**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**8.9**		5.0
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**0.7**	J1	**0.7**	J1	1.0	U	1.0	U	1.0	U	2.8
33																								
34	**VOLATILES (µg/L)**																							
35	**EPA Method SW8260**																							
36	Acetone	**13**		**16**		**15**		**16**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	25	U	17
37	Carbon Disulfide	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U	1.0
38	2-Butanone	5.0	U	15	U	**7.4**		**8.2**		**28**		**32**		5.0	U	5.0	U	5.0	U	5.0	U	25	U	**14**
39	Benzene	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.2**		5.0	U	1.0
40	Bromoform	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U	1.0
41	Toluene	**5.0**		**6.0**		**6.5**		**11**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.4**		5.0	U	1.0
42	Ethylbenzene	**80**		**52**		**62**		**220**		**39**		**38**		**21**		**21**		**18**		**22**		**39**		**1.3**
43	Styrene	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U	1.0
44	m,p-Xylene	**300**		**320**		**320**		**720**		**110**		**110**		**88**		**90**		**76**		**100**		**120**		**3.6**
45	o-Xylene	**78**		**84**		**95**		**130**		**5.4**		**4.5**		**20**		**20**		**8.1**		**11**		**13**		1.0
46	1,3,5-Trimethylbenzene	**99**		**170**		**140**		**160**		**70**		**70**		**94**		**96**		**90**		**70**		**50**		**12**
47	1,2,4-Trimethylbenzene	**590**	J2	**550**		**520**		**700**		**320**		**310**		**260**		**280**		**290**		**300**		**270**		**240**
48	Isopropylbenzene	**46**		**42**		**43**		**92**		**65**		**68**		**40**		**39**		**79**		**54**		**62**		**56**
49	n-Propylbenzene	**65**		**51**		**54**		**130**		**69**		**71**		**45**		**45**		**87**		**61**		**76**		**60**
50	tert-Butylbenzene	1.0	U	**3.0**		**2.9**		**4.3**		1.0	U	1.0	U	**2.0**		**2.0**		**4.2**		**2.6**		5.0	U	**2.9**
51	sec-Butylbenzene	1.0	U	**8.3**		**9.2**		**16**		**14**		**14**		**7.3**		**7.3**		**15**		**9.8**		**11**		**9.1**
52	4-Isopropyltoluene	**6.8**		**8.3**		**8.1**		**11**		**7.6**		**6.9**		**7.3**		**7.5**		**6.6**		**4.3**		**7.6**		1.0
53	n-Butylbenzene	**8.9**	J2	**9.7**		**10**		**16**		12	U	12	U	8.0	U	8.3	U	**14**		9.2	U	9.7	U	**7.0**
54	Naphthalene	**28**		**41**		**44**		**57**		**34**		**33**		**28**		**30**		**50**		**34**		**26**		**12**
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56																								
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																							
58	**Method OR-DEQ**																							
59	**TPH-Diesel**	**4.6**		**6.9**		**7.3**		**5.0**		**4.2**	J2	**3.2**	J2	**3.1**		**2.9**		**3.8**		**2.8**		**3.3**		**5.4**
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.50
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62																								
63	**PRIORITY POLLUTANT**																							
64	**METALS (mg/L)**																							
65	Arsenic (7060)	**0.030**		**0.030**		**0.029**		**0.029**		**0.030**		**0.033**		**0.024**		**0.025**		**0.030**		**0.025**		**0.029**		**0.028**

BZTO104(e)021334

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU
3			LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D
4			CT67D		DE87K		DM30D		DW29G		ED30H		EN00H		ER93L		EZ17F		FF65G		FL58E		FU45N		FY82L		0402113-08
5			2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/13/02		2/11/03		5/8/03		8/28/03		10/24/03		2/23/04
7	**CHLORINATED PHENOLS (µg/L)**																										
8	**EPA Method SW8040**																										
9	Pentachlorophenol	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.3	U	0.25	U	0.26	U	0.26	U	**1**	J	0.5	U	NA
10	2,4,6-Trichlorophenol	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
11	2,3,6-Trichlorophenol	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
12	2,4,5-Trichlorophenol	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
13	2,3,4-Trichlorophenol	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
15	2,3,4,5-Tetrachlorophenol	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
16																											
17	**SEMIVOLATILES (µg/L)**																										
18	**EPA Method SW8270**																										
19	Phenol	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.4	U	2.3	U	2.1	U	2	U	2	U	2	U	1.93
20	4-Methylphenol	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1	U	1	U	9.64
21	Isophorone	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1	U	1	U	0.964
22	2,4-Dimethylphenol	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.6	U	3.4	U	3.1	U	3.1	U	3.1	U	3	U	2.89
23	Benzoic Acid	U	10	U	10	U	10	U	30	U	50	U	50	U	60	U	57	U	52	U	51	U	51	U	10	U	19.3
24	Naphthalene		**2.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1	U	1	U	**4.12**
25	2-Methylnaphthalene		**11**		**3.6**		**3.3**		**1.4**		**1.8**		**1.6**		1.2	U	1.1	U	1	U	1	U	1	U	1	U	**11.7**
26	2,4,6-Trichlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6	U	5.7	U	5.2	U	5.1	U	5.1	U	5	U	4.82
27	2,4,5-Trichlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6	U	5.7	U	5.2	U	5.1	U	5.1	U	5	U	4.82
28	Acenaphthene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1	U	1	U	0.964
29	Dibenzofuran	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1	U	1	U	0.964
30	Fluorene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1	U	1	U	0.964
31	Pentachlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6	U	5.7	U	5.2	U	5.1	U	5.1	U	5	U	**8.95**
32	bis(2-Ethylhexyl)phthalate	U	1.0	U	1.0	U	1.0	U	1.0	U	4.0	U	4.0	U	4.8	U	4.5	U	1	U	1	U	1	U	1	U	0.964
33																											
34	**VOLATILES (µg/L)**																										
35	**EPA Method SW8260**																										
36	Acetone	U	5.0	U	**22**		**42**		**77**		**14**		20	U	**8.2**		9	U	**96**		**11**	M	**12**	J	**6.6**	M	50
37	Carbon Disulfide	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U	2
38	2-Butanone		**26**		**14**		5.0	U	5.0	U	**14**		5.0	U	**13**	M	5	U	5	U	5	U	**13**	M	**9.1**	M	10
39	Benzene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U	0.4
40	Bromoform	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U	1
41	Toluene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U	1
42	Ethylbenzene		**1.3**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U	1
43	Styrene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U	1
44	m,p-Xylene		**3.0**		**1.4**		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U	2
45	o-Xylene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U	1
46	1,3,5-Trimethylbenzene		**14**		**13**		**3.4**		**1.4**		**2.4**		**1.1**		1	U	1	U	1	U	1	U	1	U	1	U	1
47	1,2,4-Trimethylbenzene		**120**		**84**		**49**		**7.2**		**48**		**9.5**		**15**		1	U	**3**		**5.5**		1	U	**1.4**		1
48	Isopropylbenzene		**58**		**31**		**14**		**3.9**		**14**		**5.0**		**5.7**		**4.2**		**3.7**		**7**		**2.6**		**1.9**		**2.46**
49	n-Propylbenzene		**60**		**39**		**16**		**5.2**		**14**		**5.1**		**4.9**		**4.2**		**2.9**		**5.3**		**1.6**		**1.6**		**1**
50	tert-Butylbenzene		**2.8**		**1.7**		**1.3**	M	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U	1
51	sec-Butylbenzene		**9.8**		**7.4**		**4.1**		**1.6**		**2.8**		**1.7**		**1.8**		**1.3**		1	U	**1.6**		1	U	1	U	1
52	4-Isopropyltoluene	U	1.0	U	**2.3**		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U	1
53	n-Butylbenzene		**7.8**		**6.2**		**3.4**	M	1.7	U	**2.3**		1.6	U	**1.6**		**1.1**	M	1	U	**1.2**		1	U	1	U	1
54	Naphthalene		**8.9**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5	U	1
55	Methyl tert-butyl ether		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		1
56																											
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	**Method OR-DEQ**																										
59	**TPH-Diesel**		**4.4**		**3.5**		**3.4**		**1.8**		**4.0**		**2.8**		**3.2**		**2.4**		**3**		**2.6**		**1.8**		**1.6**		**1**
60	**TPH-D Motor Oil**	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.5	U	0.504
61	**TPH-Gasoline**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62																											
63	**PRIORITY POLLUTANT**																										
64	**METALS (mg/L)**																										
65	Arsenic (7060)		**0.03**		**0.028**		**0.032**		**0.022**		**0.040**		**0.027**		**0.028**		0.05	U	**0.03**		**0.04**		**0.04**		**0.028**		**0.031**

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BV
1		
2		
3		
4		
5		
6		
7	**CHLORINATED PHENOLS (µg/L)**	
8	**EPA Method SW8040**	
9	Pentachlorophenol	
10	2,4,6-Trichlorophenol	
11	2,3,6-Trichlorophenol	
12	2,4,5-Trichlorophenol	
13	2,3,4-Trichlorophenol	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	
15	2,3,4,5-Tetrachlorophenol	
16		
17	**SEMIVOLATILES (µg/L)**	
18	**EPA Method SW8270**	
19	Phenol	U
20	4-Methylphenol	U
21	Isophorone	U
22	2,4-Dimethylphenol	U
23	Benzoic Acid	U
24	Naphthalene	
25	2-Methylnaphthalene	
26	2,4,6-Trichlorophenol	U
27	2,4,5-Trichlorophenol	U
28	Acenaphthene	U
29	Dibenzofuran	U
30	Fluorene	U
31	Pentachlorophenol	
32	bis(2-Ethylhexyl)phthalate	U
33		
34	**VOLATILES (µg/L)**	
35	**EPA Method SW8260**	
36	Acetone	U
37	Carbon Disulfide	U
38	2-Butanone	U
39	Benzene	U
40	Bromoform	U
41	Toluene	U
42	Ethylbenzene	U
43	Styrene	U
44	m,p-Xylene	U
45	o-Xylene	U
46	1,3,5-Trimethylbenzene	U
47	1,2,4-Trimethylbenzene	U
48	Isopropylbenzene	
49	n-Propylbenzene	
50	tert-Butylbenzene	U
51	sec-Butylbenzene	U
52	4-Isopropyltoluene	U
53	n-Butylbenzene	U
54	Naphthalene	U
55	Methyl tert-butyl ether	U
56		
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**	
58	**Method OR-DEQ**	
59	**TPH-Diesel**	
60	**TPH-D Motor Oil**	U
61	**TPH-Gasoline**	
62		
63	**PRIORITY POLLUTANT**	
64	**METALS (mg/L)**	
65	Arsenic (7060)	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1																								
2							Dup of LW4D										Dup of LW4D				Dup of LW4D			
3			LW4D		LW4D		LW40D		LW4D		LW4D		LW4D (a)		LW4D		LW40D		LW4D		LW40D		LW4D	
4			S167I		T176M		T176L		U235N		V232F		B802035-02		W391E		W391I		Y314E		Y314B		Z225J	
5			4/1/97		7/16/97		7/16/97		10/22/97		1/30/98		1/30/98		5/20/98		5/20/98		8/17/98		8/17/98		11/14/98	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	NA		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	**0.003**		**0.004**		**0.003**		**0.002**		**0.005**		NA		**0.002**		**0.002**		**0.003**		**0.003**		0.002	U
68	61	Lead (7421)	0.001	U	0.001	U	0.001	U	0.02	U	0.02	U	NA		0.001	U	0.001	U	**0.001**		**0.001**		0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	NA		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	0.004	U	**0.008**	J2	**0.005**	J2	**0.023**		**0.014**		NA		0.004	U	**0.010**	J2	**0.006**		**0.010**		**0.007**	
71	64																							
72	65	**MAJOR IONS AND CONVENTIONALS**																						
73	66	Calcium (mg/L) (6010)	**49.9**		**49.7**		**51**		**45.6**		**42.2**		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**21.9**		**21.7**		**22.3**		**19.4**		**17.7**		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**1.2**		**1.0**		**1.0**		**1.2**		**1.0**		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**10.9**		**10.4**		**10.6**		**10.1**		**9.60**		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**240**		**200**		**200**		**200**		**140**		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**240**		**200**		**200**		**200**		**140**		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**240**	J2	**340**	J2	**260**		**250**	J2	NA		**240**		**230**		**240**		**270**		**270**	
81	74	Chloride (mg/L) (EPA 325.2)	**19**	J	**15**		**15**		**16**		**15**		NA		**13**		**12**		**13**		**12**		**11**	
82	75	N-Nitrate (mg-N/L) (Calculated)	0.010	U	0.010	U	0.010	U	**0.025**		0.010	UJ	NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	**0.026**	J	**0.032**	J2	**0.025**	J2	**0.010**		**0.019**	J2	NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.019**	J	**0.01**		**0.01**		**0.035**		**0.010**	J2	NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	**3.2**	J	2.5	U	**2.5**	U	2.5	U	2.5	U	NA		NA		NA		NA		NA		NA	
86	79																							

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU
2		Dup of LW4D				Dup of LW4D						Dup of LW4D				Dup of LW4D								
3		LW40D		LW4D		LW40D		LW4D		LW4D		LW40D		LW4D		LW40D		LW4D		LW4D		LW4D		LW4D
4		Z225L		Z960P		Z960K		AH49H		AU45G		AU45I		BC21J		BC27P		BH96E		BR55D		CB68D		CL03G
5		11/14/98		2/17/99		2/17/99		5/18/99		9/22/99		9/22/99		12/9/99		12/9/99		2/17/00		5/22/00		8/30/00		11/9/00
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.007**		**0.008**		0.005	U	0.005	U	0.005	U	0.005
67	Copper (6010)	0.002	U	**0.005**		**0.005**		0.002	U	**0.004**		**0.003**		**0.011**		**0.012**		**0.007**		0.002	U	**0.002**		**0.004**
68	Lead (7421)	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	**0.002**		**0.002**		**0.001**		0.001	U	0.001
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.01**		0.01	U	0.01	U	0.01
70	Zinc (6010)	**0.006**		**0.009**	J	**0.008**	J	**0.005**		**0.007**	J2	**0.016**	J2	0.020	U	0.021	U	**0.019**		**0.008**		**0.020**		**0.013**
71																								
72	**MAJOR IONS AND CONVENTIONALS**																							
73	Calcium (mg/L) (6010)	NA		**50.4**		**51.7**		NA		NA		NA		NA		NA		NA		NA		NA		NA
74	Magnesium (mg/L) (6010)	NA		**21.6**		**22.0**		NA		NA		NA		NA		NA		NA		NA		NA		NA
75	Potassium (mg/L) (6010)	NA		**0.7**	J	**0.9**	J	NA		NA		NA		NA		NA		NA		NA		NA		NA
76	Sodium (mg/L) (6010)	NA		**10.6**		**10.9**		NA		NA		NA		NA		NA		NA		NA		NA		NA
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		**210**		**210**		NA		NA		NA		NA		NA		NA		NA		NA		NA
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		**210**		**210**		NA		NA		NA		NA		NA		NA		NA		NA		NA
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**280**		**360**		**320**		**310**		**300**		**270**		**260**		**290**		**270**		**270**		**360**		**370**
81	Chloride (mg/L) (EPA 325.2)	**13**		**17**		**18**		**12**		**12**		**12**		**13**		**14**		**12**		**12**		**9.8**		**16**
82	N-Nitrate (mg-N/L) (Calculated)	NA		**0.010**		0.010	U	NA		NA		NA		NA		NA		NA		NA		NA		NA
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		**0.015**	J	**0.023**	J	NA		NA		NA		NA		NA		NA		NA		NA		NA
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		**0.025**	J	**0.018**	J	NA		NA		NA		NA		NA		NA		NA		NA		NA
85	Sulfate (mg/L) (EPA 375.2)	NA		**6.1**	J	**8.8**	J	NA		NA		NA		NA		NA		NA		NA		NA		NA
86																								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU
3			LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D
4			CT67D		DE87K		DM30D		DW29G		ED30H		EN00H		ER93L		EZ17F		FF65G		FL58E		FU45N		FY82L		0402113-08
5			2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/13/02		2/11/03		5/8/03		8/28/03		10/24/03		2/23/04
66	Chromium (6010)	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.009**		**0.01**
67	Copper (6010)		**0.005**		**0.003**		**0.004**		**0.003**		**0.004**		**0.003**		**0.004**		**0.004**		**0.002**		**0.002**		**0.005**		**0.006**		0.01
68	Lead (7421)	U	0.001	U	0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	**0.002**		0.02	U	0.001	U	**0.002**		0.001	U	0.001	U	**0.0010**
69	Nickel (6010)	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.02**		0.01	U	0.005
70	Zinc (6010)		**0.016**		**0.011**		0.012		**0.011**		**0.010**	J	**0.009**		**0.009**		**0.011**		**0.021**		**0.009**		**0.006**		**0.017**		0.01
71																											
72	**MAJOR IONS AND CONVENTIONALS**																										
73	Calcium (mg/L) (6010)		**71.3**		**74.5**		**81.3**		**57.1**		**67.1**		**65.9**		NA		NA		**56.5**		NA		NA		NA		NA
74	Magnesium (mg/L) (6010)		**30.1**		**31.0**		**35.2**		**25.2**		**31.9**		**29.4**		NA		NA		**25.9**		NA		NA		NA		NA
75	Potassium (mg/L) (6010)		**1.6**		**1.4**		**1.5**		**1.8**		**1.0**		**1.3**		NA		NA		**1.4**		NA		NA		NA		NA
76	Sodium (mg/L) (6010)		**14.5**		**14.5**		**16.5**		**16.4**		**15.9**		**18.2**		NA		NA		**16.1**		NA		NA		NA		NA
77	Alkalinity (mg/L CaCO3) (SM 2320)		**360**		NA		NA		NA		**430**		NA		NA		NA		**330**		NA		NA		NA		NA
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		1	U	NA		NA		NA		NA
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		**360**		NA		NA		NA		**430**		NA		NA		NA		**330**		NA		NA		NA		NA
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**430**		**460**	J	**430**	J	**350**		**400**		**360**		**430**		**390**		**360**		**400**		**390**		**340**		**417**
81	Chloride (mg/L) (EPA 325.2)		**24**	J	**18**		**18**		**12**		**14**	J	**15**		**13**		**15**		**15**		**11**		**7.8**		**11**		**9.75**
82	N-Nitrate (mg-N/L) (Calculated)		0.010	U	NA		NA		NA		**0.012**		NA		NA		NA		0.01	U	NA		NA		NA		NA
83	N-Nitrite (mg-N/L) (EPA 354.1)		**0.037**	J	NA		NA		NA		**0.012**		NA		NA		NA		**0.052**		NA		NA		NA		NA
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		**0.045**		NA		NA		NA		**0.024**		NA		NA		NA		**0.045**		NA		NA		NA		NA
85	Sulfate (mg/L) (EPA 375.2)		**8.6**		NA		NA		NA		**9.5**		NA		NA		NA		**8.5**		NA		NA		NA		NA
86																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BV
1		
2		
3		
4		
5		
66	Chromium (6010)	
67	Copper (6010)	U
68	Lead (7421)	
69	Nickel (6010)	U
70	Zinc (6010)	U
71		
72	**MAJOR IONS AND CONVENTIONALS**	
73	Calcium (mg/L) (6010)	
74	Magnesium (mg/L) (6010)	
75	Potassium (mg/L) (6010)	
76	Sodium (mg/L) (6010)	
77	Alkalinity (mg/L CaCO3) (SM 2320)	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	
81	Chloride (mg/L) (EPA 325.2)	
82	N-Nitrate (mg-N/L) (Calculated)	
83	N-Nitrite (mg-N/L) (EPA 354.1)	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	
85	Sulfate (mg/L) (EPA 375.2)	
86		

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1																								
2							Dup of LW4D										Dup of LW4D				Dup of LW4D			
3			LW4D		LW4D		LW40D		LW4D		LW4D		LW4D (a)		LW4D		LW40D		LW4D		LW40D		LW4D	
4			S167I		T176M		T176L		U235N		V232F		B802035-02		W391E		W391I		Y314E		Y314B		Z225J	
5			4/1/97		7/16/97		7/16/97		10/22/97		1/30/98		1/30/98		5/20/98		5/20/98		8/17/98		8/17/98		11/14/98	
87	80	**FIELD PARAMETERS**																						
88	81	pH (avg)	6.65		6.67		6.67		6.94		6.84		6.84		6.51		6.51		6.49		6.48		6.39	
89	82	Temperature (° C) (avg)	12.9		15.1		14.9		13.6		13.5		13.5		13.3		13.3		18.1		18.3		13.5	
90	83	Conductivity (um/hos)	559		491		490		375		381		381		368		367		557		560		120	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		NA		NA		1.74		1.74		1.00		1.00		1.44	
92	85																							
93	86	**DIOXINS AND FURANS (ng/L)**																						
94	87	**Method 8290**																						
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		0.0027	U	NA		NA		NA		0.0049	U	NA		0.0023	U
96	89	Total TCDF	NA		NA		NA		NA		0.0027	U	NA		NA		NA		0.0049	U	NA		0.0023	U
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		0.0029	U	NA		NA		NA		0.0063	U	NA		0.0045	U
98	91	Total TCDD	NA		NA		NA		NA		0.0029	U	NA		NA		NA		0.0063	U	NA		0.0045	U
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		0.0018	U	NA		NA		NA		0.0035	U	NA		**0.0012**	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		0.0019	U	NA		NA		NA		0.0050	U	NA		0.0034	U
101	94	Total PeCDF	NA		NA		NA		NA		0.0019	U	NA		NA		NA		0.0043	U	NA		**0.0012**	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		0.0052	U	NA		NA		NA		0.0071	U	NA		0.0072	U
103	96	Total PeCDD	NA		NA		NA		NA		0.0052	U	NA		NA		NA		**0.019**		NA		0.0072	U
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		0.0024	U	NA		NA		NA		0.0880	U	NA		0.0059	U
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		0.0026	U	NA		NA		NA		0.0390	U	NA		0.0020	U
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		0.0049	U	NA		NA		NA		0.0088	U	NA		0.0049	U
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		0.0052	U	NA		NA		NA		**0.066**		NA		0.0036	U
108	101	Total HxCDF	NA		NA		NA		NA		0.0110	U	NA		NA		NA		**0.210**		NA		0.0041	U
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		0.0032	U	NA		NA		NA		0.0140	U	NA		0.0056	U
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		0.0044	U	NA		NA		NA		0.0097	U	NA		0.0043	U
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		0.0031	U	NA		NA		NA		0.0048	U	NA		0.0040	U
112	105	Total HxCDD	NA		NA		NA		NA		0.0036	U	NA		NA		NA		**0.043**		NA		0.0046	U
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		0.0140	U	NA		NA		NA		0.0140	U	NA		0.0038	U
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		0.0030	U	NA		NA		NA		0.0062	U	NA		0.0022	U
115	108	Total HpCDF	NA		NA		NA		NA		0.0220	U	NA		NA		NA		**0.022**		NA		0.0030	U
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		**0.0240**		NA		NA		NA		**0.031**		NA		**0.0095**	
117	110	Total HpCDD	NA		NA		NA		NA		**0.0400**		NA		NA		NA		**0.045**		NA		**0.0160**	
118	111	OCDF	NA		NA		NA		NA		**0.0140**		NA		NA		NA		**0.032**		NA		**0.0088**	
119	112	OCDD	NA		NA		NA		NA		**0.1500**		NA		NA		NA		**0.300**		NA		**0.0720**	
120																								
121																								
122																								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU
2		Dup of LW4D				Dup of LW4D						Dup of LW4D				Dup of LW4D								
3		LW40D		LW4D		LW40D		LW4D		LW4D		LW40D		LW4D		LW40D		LW4D		LW4D		LW4D		LW4D
4		Z225L		Z960P		Z960K		AH49H		AU45G		AU45I		BC21J		BC27P		BH96E		BR55D		CB68D		CL03G
5		11/14/98		2/17/99		2/17/99		5/18/99		9/22/99		9/22/99		12/9/99		12/9/99		2/17/00		5/22/00		8/30/00		11/9/00
87	**FIELD PARAMETERS**																							
88	pH (avg)	6.37		6.86		6.85		5.88		5.99		6.60		6.68		6.65		6.72		6.66		6.02		5.96
89	Temperature (° C) (avg)	13.3		13.3		13.2		14.7		18.8		16.3		12.8		12.9		16.4		16.5		14.4		13.3
90	Conductivity (um/hos)	120		500		500		462		491		359		436		424		548		437		526		656
91	Dissolved oxygen (mg/L) (avg)	1.80		2.39		2.57		2.40		1.35		1.42		1.76		1.86		0.12		1.00		1.39		0.31
92																								
93	**DIOXINS AND FURANS (ng/L)**																							
94	**Method 8290**																							
95	2,3,7,8-TCDF	NA		0.0017	U	NA		0.0011	U	0.0018	U	NA		0.00068	U	NA		0.0034	U	NA		NA		NA
96	Total TCDF	NA		0.0017	U	NA		0.0011	U	0.0018	U	NA		0.00068	U	NA		0.0034	U	NA		NA		NA
97	2,3,7,8-TCDD	NA		0.0043	U	NA		0.0016	U	0.0031	U	NA		0.00130	U	NA		0.0058	U	NA		NA		NA
98	Total TCDD	NA		0.0043	U	NA		0.0016	U	0.0031	U	NA		0.00130	U	NA		0.0058	U	NA		NA		NA
99	1,2,3,7,8-PeCDF	NA		0.0028	U	NA		0.0021	U	0.0031	U	NA		0.00120	U	NA		0.0025	U	NA		NA		NA
100	2,3,4,7,8-PeCDF	NA		0.0036	U	NA		0.0027	U	0.0032	U	NA		0.00088	U	NA		0.0033	U	NA		NA		NA
101	Total PeCDF	NA		0.0032	U	NA		0.0024	U	0.0032	U	NA		0.00110	U	NA		0.0029	U	NA		NA		NA
102	1,2,3,7,8-PeCDD	NA		0.0046	U	NA		0.0023	U	0.0048	U	NA		0.00094	U	NA		0.0051	U	NA		NA		NA
103	Total PeCDD	NA		0.0046	U	NA		0.0023	U	0.0048	U	NA		0.00094	U	NA		0.0051	U	NA		NA		NA
104	1,2,3,4,7,8-HxCDF	NA		**0.0013**		NA		0.0035	U	0.0024	U	NA		0.00150	U	NA		0.0031	U	NA		NA		NA
105	1,2,3,6,7,8-HxCDF	NA		0.0024	U	NA		**0.0014**		0.0019	U	NA		0.00150	U	NA		0.0029	U	NA		NA		NA
106	2,3,4,6,7,8-HxCDF	NA		0.0036	U	NA		**0.0032**		**0.0024**		NA		0.0025	U	NA		0.0034	U	NA		NA		NA
107	1,2,3,7,8,9-HxCDF	NA		0.0044	U	NA		0.0039	U	0.0021	U	NA		0.00170	U	NA		0.0036	U	NA		NA		NA
108	Total HxCDF	NA		**0.0013**		NA		**0.0046**		**0.0024**		NA		0.0025	U	NA		0.0033	U	NA		NA		NA
109	1,2,3,4,7,8-HxCDD	NA		0.0054	U	NA		0.0051	U	0.0039	U	NA		0.00150	U	NA		0.0050	U	NA		NA		NA
110	1,2,3,6,7,8-HxCDD	NA		0.0037	U	NA		0.0052	U	0.0035	U	NA		0.00170	U	NA		0.0037	U	NA		NA		NA
111	1,2,3,7,8,9-HxCDD	NA		0.0036	U	NA		0.0039	U	0.0025	U	NA		0.00150	U	NA		0.0034	U	NA		NA		NA
112	Total HxCDD	NA		0.0042	U	NA		0.0047	U	0.0033	U	NA		0.00160	U	NA		0.0040	U	NA		NA		NA
113	1,2,3,4,6,7,8-HpCDF	NA		0.0026	U	NA		0.0039	U	0.0022	U	NA		0.0015	U	NA		0.0024	U	NA		NA		NA
114	1,2,3,4,7,8,9-HpCDF	NA		0.0045	U	NA		**0.0036**	U	0.0060	U	NA		0.00200	U	NA		0.0065	U	NA		NA		NA
115	Total HpCDF	NA		0.0036	U	NA		**0.0051**		0.0041	U	NA		**0.0036**	J1	NA		0.0044	U	NA		NA		NA
116	1,2,3,4,6,7,8-HpCDD	NA		**0.0055**		NA		**0.0110**		**0.0044**		NA		**0.0090**	J1	NA		0.0059	U	NA		NA		NA
117	Total HpCDD	NA		**0.0055**		NA		**0.0160**		**0.0044**		NA		**0.0160**	J1	NA		0.0040	U	NA		NA		NA
118	OCDF	NA		**0.0100**		NA		**0.0100**		0.0042	U	NA		**0.0058**	J1	NA		0.0048	U	NA		NA		NA
119	OCDD	NA		0.0420	U	NA		**0.0770**		**0.0440**		NA		0.0660	U	NA		**0.044**	J1	NA		NA		NA
120																								
121																								
122																								

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU
1																											
2																											
3			LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D
4			CT67D		DE87K		DM30D		DW29G		ED30H		EN00H		ER93L		EZ17F		FF65G		FL58E		FU45N		FY82L		0402113-08
5			2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/13/02		2/11/03		5/8/03		8/28/03		10/24/03		2/23/04
87	**FIELD PARAMETERS**																										
88	pH (avg)		6.49		6.91		6.94		6.61		6.48		6.65		7.04		6.31		7		6.97		7		6.79		6.49
89	Temperature (° C) (avg)		13.8		14.7		15.4		13.3		14.2		14.4		15.8		14		14.1		14.1		17.3		14.6		14.4
90	Conductivity (um/hos)		673		778		757		592		705		624		613		564		704		599		526		523		482
91	Dissolved oxygen (mg/L) (avg)		0.19		0.48		0.98		4.41		7.10		4.00		1.24		0.37		0.76		1.68		1.66		2.57		1.36
92																											
93	**DIOXINS AND FURANS (ng/L)**																										
94	**Method 8290**																										
95	2,3,7,8-TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	Total TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	2,3,7,8-TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	Total TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	1,2,3,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	2,3,4,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	Total PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	1,2,3,7,8-PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	Total PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	1,2,3,4,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	1,2,3,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	2,3,4,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	1,2,3,7,8,9-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	Total HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	1,2,3,4,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	1,2,3,6,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	1,2,3,7,8,9-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	Total HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	1,2,3,4,6,7,8-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	1,2,3,4,7,8,9-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	Total HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	1,2,3,4,6,7,8-HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	Total HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	OCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	OCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120																											
121																											
122																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BV
1		
2		
3		
4		
5		
87	**FIELD PARAMETERS**	
88	pH (avg)	
89	Temperature (° C) (avg)	
90	Conductivity (um/hos)	
91	Dissolved oxygen (mg/L) (avg)	
92		
93	**DIOXINS AND FURANS (ng/L)**	
94	**Method 8290**	
95	2,3,7,8-TCDF	
96	Total TCDF	
97	2,3,7,8-TCDD	
98	Total TCDD	
99	1,2,3,7,8-PeCDF	
100	2,3,4,7,8-PeCDF	
101	Total PeCDF	
102	1,2,3,7,8-PeCDD	
103	Total PeCDD	
104	1,2,3,4,7,8-HxCDF	
105	1,2,3,6,7,8-HxCDF	
106	2,3,4,6,7,8-HxCDF	
107	1,2,3,7,8,9-HxCDF	
108	Total HxCDF	
109	1,2,3,4,7,8-HxCDD	
110	1,2,3,6,7,8-HxCDD	
111	1,2,3,7,8,9-HxCDD	
112	Total HxCDD	
113	1,2,3,4,6,7,8-HpCDF	
114	1,2,3,4,7,8,9-HpCDF	
115	Total HpCDF	
116	1,2,3,4,6,7,8-HpCDD	
117	Total HpCDD	
118	OCDF	
119	OCDD	
120		
121		
122		

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1																								
2							Dup of LW4D										Dup of LW4D				Dup of LW4D			
3			LW4D		LW4D		LW40D		LW4D		LW4D		LW4D (a)		LW4D		LW40D		LW4D		LW40D		LW4D	
4			S167I		T176M		T176L		U235N		V232F		B802035-02		W391E		W391I		Y314E		Y314B		Z225J	
5			4/1/97		7/16/97		7/16/97		10/22/97		1/30/98		1/30/98		5/20/98		5/20/98		8/17/98		8/17/98		11/14/98	
123		**PAHs (µg/L)**																						
124		**EPA Method SW8270 SIM**																						
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU
1																								
2		Dup of LW4D				Dup of LW4D						Dup of LW4D				Dup of LW4D								
3		LW40D		LW4D		LW40D		LW4D		LW4D		LW40D		LW4D		LW40D		LW4D		LW4D		LW4D		LW4D
4		Z225L		Z960P		Z960K		AH49H		AU45G		AU45I		BC21J		BC27P		BH96E		BR55D		CB68D		CL03G
5		11/14/98		2/17/99		2/17/99		5/18/99		9/22/99		9/22/99		12/9/99		12/9/99		2/17/00		5/22/00		8/30/00		11/9/00
123	**PAHs (µg/L)**																							
124	**EPA Method SW8270 SIM**																							
125	Naphthalene	NA		**22**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126	2-Methylnaphthalene	NA		**60**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127	Acenaphthylene	NA		0.10	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128	Acenaphthene	NA		**0.44**	M	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129	Fluorene	NA		0.10	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130	Anthracene	NA		0.10	U	NA		NA		NA		NA				NA		NA		NA		NA		NA
131	Dibenzofuran	NA		**0.34**	M	NA		NA		NA		NA				NA		NA		NA		NA		NA

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU
1																											
2																											
3			LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D
4			CT67D		DE87K		DM30D		DW29G		ED30H		EN00H		ER93L		EZ17F		FF65G		FL58E		FU45N		FY82L		0402113-08
5			2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/13/02		2/11/03		5/8/03		8/28/03		10/24/03		2/23/04
123	**PAHs (µg/L)**																										
124	**EPA Method SW8270 SIM**																										
125	Naphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126	2-Methylnaphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127	Acenaphthylene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128	Acenaphthene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129	Fluorene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130	Anthracene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131	Dibenzofuran		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BV
1		
2		
3		
4		
5		
123	**PAHs (µg/L)**	
124	**EPA Method SW8270 SIM**	
125	Naphthalene	
126	2-Methylnaphthalene	
127	Acenaphthylene	
128	Acenaphthene	
129	Fluorene	
130	Anthracene	
131	Dibenzofuran	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW4DR		LW4DR		LW4DR	
4			0411151-01		0502102-11		P5F0223-08	
5			11/29/04		2/23/05		6/6/05	
7	1	**CHLORINATED PHENOLS (µg/L)**						
8	2	**EPA Method SW8040**						
9	3	Pentachlorophenol	**1.08**		0.503	U	0.556	U
10	4	2,4,6-Trichlorophenol	NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA	
16	10							
17	11	**SEMIVOLATILES (µg/L)**						
18	12	**EPA Method SW8270**						
19	13	Phenol	1.99	U	2.05	U	5.00	U
20	14	4-Methylphenol	9.94	U	10.3	U	5.00	U
21	15	Isophorone	0.994	U	1.03	U	5.00	U
22	16	2,4-Dimethylphenol	2.98	U	3.08	U	10.00	U
23	17	Benzoic Acid	19.9	U	20.5	U	50.0	U
24	18	Naphthalene	0.994	U	1.03	U	5.00	U
25	19	2-Methylnaphthalene	0.994	U	1.03	U	5.00	U
26	20	2,4,6-Trichlorophenol	4.97	U	5.13	U	5.00	U
27	21	2,4,5-Trichlorophenol	4.97	U	5.13	U	5.00	U
28	22	Acenaphthene	0.994	U	1.03	U	5.00	U
29	23	Dibenzofuran	0.994	U	1.03	U	5.00	U
30	24	Fluorene	0.994	U	1.03	U	5.00	U
31	25	Pentachlorophenol	4.97	U	5.13	U	10	U
32	26	bis(2-Ethylhexyl)phthalate	**2.83**		1.03	U	10.00	U
33	27							
34	28	**VOLATILES (µg/L)**						
35	29	**EPA Method SW8260**						
36	30	Acetone	50	U	50	U	25.0	U
37	31	Carbon Disulfide	2	U	2	U	10.00	U
38	32	2-Butanone	10	U	10	U	10.00	U
39	33	Benzene	**0.32**		0.3	U	1.00	U
40	34	Bromoform	1	U	1	U	1.00	U
41	35	Toluene	1	U	1	U	1.00	U
42	36	Ethylbenzene	1	U	1	U	1.00	U
43	37	Styrene	1	U	1	U	1.00	U
44	38	m,p-Xylene	2	U	2	U	2.00	U
45	39	o-Xylene	1	U	1	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1.00	U
47	41	1,2,4-Trimethylbenzene	**1.9**		1	U	1.00	U
48	42	Isopropylbenzene	**1.51**		1	U	2.00	U
49	43	n-Propylbenzene	1	U	1	U	1.00	U
50	44	tert-Butylbenzene	1	U	1	U	1.00	U
51	45	sec-Butylbenzene	1	U	1	U	1.00	U
52	46	4-Isopropyltoluene	1	U	1	U	2.00	U
53	47	n-Butylbenzene	1	U	1	U	5.00	U
54	48	Naphthalene	**4.29**		1	U	2.00	U
55		Methyl tert-butyl ether	1	U	1	U	1.00	U
56	49							
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**						
58	51	**Method OR-DEQ**						
59	52	**TPH-Diesel**	**0.353**		0.252	U	0.278	U
60	53	**TPH-D Motor Oil**	**0.529**		0.504	U	0.556	U
61	54	**TPH-Gasoline**	NA		NA		0.08	U
62	55							
63	56	**PRIORITY POLLUTANT**						
64	57	**METALS (mg/L)**						
65	58	Arsenic (7060)	**0.0101**		**0.00581**		**0.0113**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW4DR		LW4DR		LW4DR	
4			0411151-01		0502102-11		P5F0223-08	
5			11/29/04		2/23/05		6/6/05	
66	59	Chromium (6010)	**0.0076**		**0.0101**		**0.00129**	
67	60	Copper (6010)	0.01	U	0.01	U	**0.00274**	
68	61	Lead (7421)	**0.00202**		**0.000876**		0.001	U
69	62	Nickel (6010)	**0.008**		0.005	U	**0.0162**	
70	63	Zinc (6010)	**0.19**		**0.0353**		**0.0137**	
71	64							
72	65	**MAJOR IONS AND CONVENTIONALS**						
73	66	Calcium (mg/L) (6010)	NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**262**		**379**		**385**	
81	74	Chloride (mg/L) (EPA 325.2)	**4.93**		**4.1**		**5.32**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA	
86	79							

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW4DR		LW4DR		LW4DR	
4			0411151-01		0502102-11		P5F0223-08	
5			11/29/04		2/23/05		6/6/05	
87	80	**FIELD PARAMETERS**						
88	81	pH (avg)	5.95		6.73		7.34	
89	82	Temperature (° C) (avg)	12.3		14.8		19.0	
90	83	Conductivity (um/hos)	436		197		469	
91	84	Dissolved oxygen (mg/L) (avg)	999		1.38		4.28	
92	85							
93	86	**DIOXINS AND FURANS (ng/L)**						
94	87	**Method 8290**						
95	88	2,3,7,8-TCDF	NA		NA		NA	
96	89	Total TCDF	NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA	
98	91	Total TCDD	NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA	
118	111	OCDF	NA		NA		NA	
119	112	OCDD	NA		NA		NA	
120								
121								
122								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW4DR		LW4DR		LW4DR	
4			0411151-01		0502102-11		P5F0223-08	
5			11/29/04		2/23/05		6/6/05	
123		**PAHs (µg/L)**						
124		**EPA Method SW8270 SIM**						
125		Naphthalene	NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA	
127		Acenaphthylene	NA		NA		NA	
128		Acenaphthene	NA		NA		NA	
129		Fluorene	NA		NA		NA	
130		Anthracene	NA		NA		NA	
131		Dibenzofuran	NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

			LW6D S167G 3/31/97		LW6D T176I 7/15/97		LW6D U235R 10/22/97		LW6D V208I 1/28/98		LW6D W391D 5/20/98		LW6D Y314C 8/17/98		LW6D Z225B 11/13/98		LW6D Z960G 2/17/99		LW6D AH27I 5/17/99		LW6D AU45D 9/22/99		LW6D BC27F 12/7/99		LW6D BH96I 2/17/00	
1	1	**CHLORINATED PHENOLS (µg/L)**																								
2	2	**EPA Method SW8040**																								
3	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.42**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
4	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
5	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
6	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
7	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
8	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
9	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
10	10																									
11	11	**SEMIVOLATILES (µg/L)**																								
12	12	**EPA Method SW8270**																								
13	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
14	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
15	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
16	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
17	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
18	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
19	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
20	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
21	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
22	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
23	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
24	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
25	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
26	26	bis(2-Ethylhexyl)phthalate	1.0	UJ	**1.1**	J2	**1.3**		**1.2**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**4.6**	
27	27																									
28	28	**VOLATILES (µg/L)**																								
29	29	**EPA Method SW8260**																								
30	30	Acetone	5.0	U	5.0	U	**5.1**		5.0	U	**7.1**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
31	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
32	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
33	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
34	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
35	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
36	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	**2.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
37	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
39	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
40	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
42	42	Isopropylbenzene	**41**		**61**		**78**	J2	**76**		**56**		**96**		**93**		**32**		**31**		**52**		**43**		**68**	
43	43	n-Propylbenzene	**14**		**28**		**40**		**36**		**20**		**44**		**32**		**8.9**		**9.3**		**14**		**7.7**		**10**	
44	44	tert-Butylbenzene	**2.4**		**2.7**	J2	**2.8**		**2.3**		**2.8**		**3.8**		**3.2**		**2.0**		**2.4**		**3.5**		**3.0**		**4.1**	
45	45	sec-Butylbenzene	**5.7**		**8.3**		**8.5**	J2	**7.1**		**7.8**		**14**	J2	**9.7**		**3.6**		**5.4**		**10**		**8.2**		**12**	
46	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
47	47	n-Butylbenzene	**1.6**		**2.8**		**2.8**	J2	**2.9**		2.7	U	**5.0**		**3.2**		**1.2**		**2.1**		3.0	U	2.3	U	**3.6**	
48	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
49	49	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
50	50																									
51	51	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
52	52	**Method OR-DEQ**																								
53	53	**TPH-Diesel**	**1.0**		**1.0**		**1.2**		**0.80**		**0.86**		**1.3**		**1.0**		**0.62**		**0.92**		**1.4**		**1.0**		**1.0**	
54	54	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
55	55	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	56																									
57	57	**PRIORITY POLLUTANT**																								
58	58	**METALS (mg/L)**																								
59	59	Arsenic (7060)	**0.013**		**0.015**		0.05	U	0.05	U	**0.017**		**0.011**		**0.016**		**0.014**		**0.018**		**0.016**		**0.016**		**0.016**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
3		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4		BR64J		CB85E		CL03C		CT55B		DE87G		DM30B		DW29H		ED23H		EM85I		ER93C		EZ03E		FF76F		FL66E	
5		5/24/00		8/30/00		11/8/00		2/13/01		6/5/01		8/13/01		11/27/01		2/26/02		6/26/02		08/26/02		11/12/02		2/12/03		5/9/03	
7	**CHLORINATED PHENOLS (µg/L)**																										
8	**EPA Method SW8040**																										
9	Pentachlorophenol	0.25	U	0.25	U	0.25	U	**0.46**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.3	U	0.25	U	0.25	U	**0.47**	
10	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																											
17	**SEMIVOLATILES (µg/L)**																										
18	**EPA Method SW8270**																										
19	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.4	U	2.2	U	2	U	2	U
20	4-Methylphenol	**1.0**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.6	U	3.3	U	3	U	3	U
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U	60	U	54	U	50	U	50	U
24	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U
25	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6	U	5.4	U	5	U	5	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6	U	5.4	U	5	U	5	U
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6	U	5.4	U	5	U	5	U
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	4.0	U	4.0	U	4.8	U	4.3	U	**13**		1	U
33																											
34	**VOLATILES (µg/L)**																										
35	**EPA Method SW8260**																										
36	Acetone	5.0	U	5.0	U	5.0	U		R	5.0	U	5.0	U	5.0	U	5.0	U	**6.8**		5	U	**16**		5	U	**9.6**	
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
38	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U
39	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
41	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
42	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
45	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	**24**		**16**		**24**		**14**		**10**		**8.8**		**2.6**		**7.0**		**2.6**		**7.5**		**3.4**		**4**		**2.7**	
49	n-Propylbenzene	**4.4**		1.0	U	**2.8**		**1.4**		**1.1**		**1.4**		1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
50	tert-Butylbenzene	**2.3**		**3.5**		**2.8**		**2.8**		**3.4**		**2.8**		**3.1**		**3.1**		**1.8**		**3.4**		**3.2**		**3.1**		**2**	
51	sec-Butylbenzene	**4.4**		**6.0**		**6.4**		**5.3**		**4.7**		**4.3**		**2.4**		**3.4**		**1.7**		**3.3**		**2.2**		**2.5**		**1.8**	
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	**1.7**	M	1.2	U	1.0	U	**1.3**	M	1.3	U	1.4	U	1.0	U	**1.2**	M	1.0	U	1	U	1	U	1	U	1	U
54	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																											
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	**Method OR-DEQ**																										
59	**TPH-Diesel**	**1.1**		**1.2**		**1.2**		**1.8**		**1.4**		**1.7**		**1.8**		**1.9**		**1.6**		**2.6**		**2.2**		**2.3**		**2.2**	
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																											
63	**PRIORITY POLLUTANT**																										
64	**METALS (mg/L)**																										
65	Arsenic (7060)	**0.012**		**0.018**		**0.015**		**0.015**		**0.017**		**0.020**		**0.021**		**0.016**		**0.016**		**0.02**		0.05	U	**0.011**		**0.017**	

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP
3		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4		FU45R		FY82O		0402105-05		0406039-01		0408044-07		0411051-07		0502087-06		P5F0553-03	
5		8/28/03		10/24/03		2/20/04		6/7/04		8/06/04		11/9/04		2/18/05		6/14/05	
7	**CHLORINATED PHENOLS (µg/L)**																
8	**EPA Method SW8040**																
9	Pentachlorophenol	**0.6**	J	**1.1**		0.483	U	0.498	U	0.5	U	0.495	U	**0.607**		0.500	U
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA	
16																	
17	**SEMIVOLATILES (µg/L)**																
18	**EPA Method SW8270**																
19	Phenol	2.1	U	2	U	1.92	U	2	U	2	U	2.08	U	2.05	U	5.00	U
20	4-Methylphenol	1	U	1	U	9.61	U	9.98	U	10	U	10.4	U	10.2	U	5.00	U
21	Isophorone	1	U	1	U	0.961	U	0.998	U	1	U	1.04	U	1.02	U	5.00	U
22	2,4-Dimethylphenol	3.1	U	3.1	U	2.88	U	2.99	U	3	U	3.12	U	3.07	U	10.00	U
23	Benzoic Acid	52	U	10	U	19.2	U	20	U	20	U	20.8	U	20.5	U	50.0	U
24	Naphthalene	1	U	1	U	0.961	U	0.998	U	1	U	1.04	U	1.02	U	5.00	U
25	2-Methylnaphthalene	1	U	1	U	0.961	U	0.998	U	1	U	1.04	U	1.02	U	5.00	U
26	2,4,6-Trichlorophenol	5.2	U	5.1	U	4.8	U	4.99	U	5	U	5.21	U	5.12	U	5.00	U
27	2,4,5-Trichlorophenol	5.2	U	5.1	U	4.8	U	4.99	U	5	U	5.21	U	5.12	U	5.00	U
28	Acenaphthene	1	U	1	U	0.961	U	0.998	U	1	U	1.04	U	1.02	U	5.00	U
29	Dibenzofuran	1	U	1	U	0.961	U	0.998	U	1	U	1.04	U	1.02	U	5.00	U
30	Fluorene	1	U	1	U	0.961	U	0.998	U	1	U	1.04	U	1.02	U	5.00	U
31	Pentachlorophenol	5.2	U	5.1	U	4.8	U	4.99	U	5	U	5.21	U	5.12	U	10	U
32	bis(2-Ethylhexyl)phthalate	1	U	1	U	0.961	U	0.998	U	1	U	1.04	U	1.02	U	10.00	U
33																	
34	**VOLATILES (µg/L)**																
35	**EPA Method SW8260**																
36	Acetone	**6.2**	J	5	U	50	U	50	U	50	U	50	U	50	U	25.0	U
37	Carbon Disulfide	1	U	1	U	2	U	2	U	2	U	2	U	2	U	10.00	U
38	2-Butanone	5	U	5	U	10	U	10	U	10	U	10	U	10	U	10.00	U
39	Benzene	1	U	1	U	0.4	U	0.3	U	0.3	U	0.3	U	0.3	U	1.00	U
40	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
41	Toluene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
42	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
43	Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
44	m,p-Xylene	1	U	1	U	2	U	2	U	2	U	2	U	2	U	2.00	U
45	o-Xylene	1	U	1	U	1	U	1	U	1	U	**1.38**		**1.6**		1.00	U
46	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
47	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	**1.53**		1.00	U
48	Isopropylbenzene	**3.5**		**4.2**		**3.43**		**2.05**		**2.11**		**2.39**		**2.06**		2.00	U
49	n-Propylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
50	tert-Butylbenzene	**2.3**		**2.9**		1	U	**1.76**		**2.09**		**3.23**		**6.03**		**2.00**	
51	sec-Butylbenzene	**2.1**		**2.1**		**1.27**		1	U	**1.29**		**1.09**		**4.04**		**1.16**	
52	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
53	n-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	5.00	U
54	Naphthalene	5	U	5	U	1	U	1	U	1	U	1	U	**3.91**		2.00	U
55	Methyl tert-butyl ether	NA		NA		1	U	1	U	1	U	1	U	1	U	1.00	U
56																	
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																
58	**Method OR-DEQ**																
59	**TPH-Diesel**	**1.9**		**1.1**		**1.36**	J	**1.9**		**2.05**		**1.9**		**1.57**		**0.326**	
60	**TPH-D Motor Oil**	NA		0.5	U	0.491	UJ	0.51	U	0.474	U	0.509	U	0.517	U	0.5	U
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA	
62																	
63	**PRIORITY POLLUTANT**																
64	**METALS (mg/L)**																
65	Arsenic (7060)	**0.014**		**0.016**		**0.015**		**0.013**		**0.0153**		**0.014**		**0.0113**		**0.0109**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4			S167G		T176I		U235R		V208I		W391D		Y314C		Z225B		Z960G		AH27I		AU45D		BC27F		BH96I	
5			3/31/97		7/15/97		10/22/97		1/28/98		5/20/98		8/17/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/17/00	
66	59	Chromium (6010)	0.005	U	0.005	U	**0.011**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	**0.004**		**0.003**		**0.014**		**0.002**		**0.003**		0.002	U	0.002	U	0.002	U	0.002	U	**0.002**		0.002	U	0.002	U
68	61	Lead (7421)	**0.001**		**0.002**		0.02	U	0.02	U	**0.001**		0.001	U	**0.002**		0.001	U	0.001	U	0.001	U	**0.001**		0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U	**0.01**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	**0.006**		**0.009**	J2	**0.045**		**0.011**		**0.017**	J2	**0.006**		**0.009**		**0.008**	J	0.007	U	**0.009**		**0.011**	U	**0.010**	
71	64																									
72	65	**MAJOR IONS AND CONVENTIONALS**																								
73	66	Calcium (mg/L) (6010)	**47.2**		**44.2**		**49.1**		**41.8**		NA		NA		NA		**42.9**		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**19.9**		**19**		**20.3**		**16.3**		NA		NA		NA		**17.6**		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**3.0**		**2.7**		**3.5**		**2.4**		NA		NA		NA		**2.3**		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**15.6**		**13.9**		**14.1**		**12.1**		NA		NA		NA		**11.6**		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**250**		**190**		**210**		**200**		NA		NA		NA		**210**		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**250**		**190**		**210**		**200**		NA		NA		NA		**210**		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**260**	J2	**260**		**230**		**220**		**240**		**240**		**260**		**240**		**240**		**250**		**240**	
81	74	Chloride (mg/L) (EPA 325.2)	**8.4**	J	**4.1**		**3.9**		**2.7**		**3.3**		**2.0**		**2.6**		**4.2**		1.0	U	**3.1**		**4.3**		**2.8**	
82	75	N-Nitrate (mg-N/L) (Calculated)	**0.016**	J	0.010	U	**0.013**		0.010	U	NA		NA		NA		0.010	U	NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	**0.025**	J	**0.014**		**0.010**		**0.014**		NA		NA		NA		**0.018**		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.041**	J	0.010	U	**0.023**		**0.016**		NA		NA		NA		**0.017**		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	**4.7**	J	2.5	U	2.5	U	2.5	U	NA		NA		NA		**5.5**		NA		NA		NA		NA	
86	79																									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																											
3		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4		BR64J		CB85E		CL03C		CT55B		DE87G		DM30B		DW29H		ED23H		EM85I		ER93C		EZ03E		FF76F		FL66E	
5		5/24/00		8/30/00		11/8/00		2/13/01		6/5/01		8/13/01		11/27/01		2/26/02		6/26/02		08/26/02		11/12/02		2/12/03		5/9/03	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	0.002	U	**0.002**		**0.006**		0.002	U	**0.003**		**0.003**		0.002	U	0.002	U	0.002	U	**0.002**		0.002	U	**0.005**		0.002	U
68	Lead (7421)	**0.001**		**0.002**		**0.002**		**0.001**		**0.002**		**0.002**		0.001	U	0.001	U	0.001	U	0.001	U	0.02	U	0.001	U	**0.001**	
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)	0.006	U	**0.007**		**0.008**		**0.007**		**0.008**		**0.009**		0.006	U	**0.008**		0.006	U	**0.007**		0.006	U	**0.01**		**0.007**	
71																											
72	**MAJOR IONS AND CONVENTIONALS**																										
73	Calcium (mg/L) (6010)	NA		NA		NA		**40.8**		**44.2**		**40.8**		**40.9**		**42.5**		NA		NA		NA		**39.5**		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		**16.1**		**18.4**		**16.8**		**16.5**		**17.6**		NA		NA		NA		**16.7**		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		**2.1**		**3.2**		**2.6**		**2.0**		**2.7**		NA		NA		NA		**1.9**		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		**10.3**		**11.5**		**10.4**		**10.3**		**11.1**		NA		NA		NA		**9.6**		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		**200**		NA		NA		NA		**220**		NA		NA		NA		**300**		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA		NA		NA		1	U	NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		**200**		NA		NA		NA		**220**		NA		NA		NA		**300**		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**230**		**240**		**220**		**290**	J	**240**	J	**220**	J	**250**		**260**		**240**		**270**		**310**		**280**		**260**	
81	Chloride (mg/L) (EPA 325.2)	**2.1**		**1.4**		**2.2**		**1.8**		**2.2**		**3.8**		**2.1**		**2.8**		**2.5**		**2.2**		**2.8**		**4.2**		**1.8**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		0.010	U	NA		NA		NA		**0.010**		NA		NA		NA		**0.048**		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		0.010	U	NA		NA		NA		**0.023**		NA		NA		NA		**0.015**		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		0.010	U	NA		NA		NA		**0.033**	J	NA		NA		NA		**0.063**		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		**3.3**		NA		NA		NA		2.5	U	NA		NA		NA		2.5	U	NA	
86																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP
1																	
2																	
3		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4		FU45R		FY82O		0402105-05		0406039-01		0408044-07		0411051-07		0502087-06		P5F0553-03	
5		8/28/03		10/24/03		2/20/04		6/7/04		8/06/04		11/9/04		2/18/05		6/14/05	
66	Chromium (6010)	0.005	U	**0.008**		**0.0101**		**0.0208**		**0.0187**		**0.0182**		**0.0077**		0.001	U
67	Copper (6010)	**0.004**		**0.005**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.002	U
68	Lead (7421)	0.001	U	**0.003**		**0.0009**		**0.0002**		**0.000252**		**0.00042**		0.000168	U	0.001	U
69	Nickel (6010)	0.01	U	0.01	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.00418**	
70	Zinc (6010)	**0.007**		**0.013**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.00523**	
71																	
72	**MAJOR IONS AND CONVENTIONALS**																
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**290**		**250**		**269**		**325**		**259**		**283**		**249**		**268**	
81	Chloride (mg/L) (EPA 325.2)	**1.6**		**2.9**		**3.04**		**2.91**		**2.57**		**2.86**		**2.53**		**2.41**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA	
86																	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4			S167G		T176I		U235R		V208I		W391D		Y314C		Z225B		Z960G		AH27I		AU45D		BC27F		BH96I	
5			3/31/97		7/15/97		10/22/97		1/28/98		5/20/98		8/17/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/17/00	
87	80	**FIELD PARAMETERS**																								
88	81	pH (avg)	6.53		6.63		6.84		6.65		6.35		6.34		6.17		6.78		5.66		6.64		6.38		6.57	
89	82	Temperature (° C) (avg)	12.2		15.7		13.2		13.5		13.0		17.9		13.1		13.7		14.6		15.5		12.8		13.5	
90	83	Conductivity (um/hos)	504		501		377		431		369		559		134		448		360		398		409		420	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		1.85		NA		1.58		2.77		1.60		1.96		1.86		0.82	
92	85																									
93	86	**DIOXINS AND FURANS (ng/L)**																								
94	87	**Method 8290**																								
95	88	2,3,7,8-TCDF	NA		0.0027	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		0.0011-0.0028	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		0.0013	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		0.0011-0.0029	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		0.0035	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		0.0029	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		0.0013-0.0045	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		0.0052	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		0.0019-0.0061	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		0.0030	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		0.0032	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		0.0041	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		0.0047	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		0.0041	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		0.0051	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		0.0076	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		0.0041	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		0.0024-0.0089	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		0.0047	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		0.0054	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		0.0017-0.0069	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		**0.0250**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		**0.0360**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		**0.0350**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		**0.2400**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																										
121																										
122																										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																											
3		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4		BR64J		CB85E		CL03C		CT55B		DE87G		DM30B		DW29H		ED23H		EM85I		ER93C		EZ03E		FF76F		FL66E	
5		5/24/00		8/30/00		11/8/00		2/13/01		6/5/01		8/13/01		11/27/01		2/26/02		6/26/02		08/26/02		11/12/02		2/12/03		5/9/03	
87	**FIELD PARAMETERS**																										
88	pH (avg)	6.42		5.85		5.73		6.32		6.58		6.72		6.58		6.54		6.41		6.58		6.73		6.96		6.81	
89	Temperature (° C) (avg)	17.1		15.1		13.8		16.6		14.1		15.7		13.4		15.7		16.6		17.3		13.7		14.5		14.5	
90	Conductivity (um/hos)	421		398		360		408		428		413		410		381		331		373		499		494		354	
91	Dissolved oxygen (mg/L) (avg)	0.48		1.36		1.20		2.16		2.06		1.50		3.91		7.27		3.07		1.39		1.14		1.68		2.47	
92																											
93	**DIOXINS AND FURANS (ng/L)**																										
94	**Method 8290**																										
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																											
121																											
122																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP
1																	
2																	
3		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4		FU45R		FY82O		0402105-05		0406039-01		0408044-07		0411051-07		0502087-06		P5F0553-03	
5		8/28/03		10/24/03		2/20/04		6/7/04		8/06/04		11/9/04		2/18/05		6/14/05	
87	**FIELD PARAMETERS**																
88	pH (avg)	6.87		6.57		6.55		5.37		6.26		6.57		6.66		6.54	
89	Temperature (° C) (avg)	16.3		14.7		15.5		15.3		15.2		14.2		14.5		20.1	
90	Conductivity (um/hos)	364		375		378		311		597		403		219		279	
91	Dissolved oxygen (mg/L) (avg)	2.1		2.86		2.34		1.62		4.43		1.92		0.52		4.69	
92																	
93	**DIOXINS AND FURANS (ng/L)**																
94	**Method 8290**																
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA	
120																	
121																	
122																	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3			LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4			S167G		T176I		U235R		V208I		W391D		Y314C		Z225B		Z960G		AH27I		AU45D		BC27F		BH96I	
5			3/31/97		7/15/97		10/22/97		1/28/98		5/20/98		8/17/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/17/00	
123		**PAHs (µg/L)**																								
124		**EPA Method SW8270 SIM**																								
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																											
2																											
3		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4		BR64J		CB85E		CL03C		CT55B		DE87G		DM30B		DW29H		ED23H		EM85I		ER93C		EZ03E		FF76F		FL66E	
5		5/24/00		8/30/00		11/8/00		2/13/01		6/5/01		8/13/01		11/27/01		2/26/02		6/26/02		08/26/02		11/12/02		2/12/03		5/9/03	
123	**PAHs (µg/L)**																										
124	**EPA Method SW8270 SIM**																										
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP
1																	
2																	
3		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4		FU45R		FY82O		0402105-05		0406039-01		0408044-07		0411051-07		0502087-06		P5F0553-03	
5		8/28/03		10/24/03		2/20/04		6/7/04		8/06/04		11/9/04		2/18/05		6/14/05	
123	**PAHs (µg/L)**																
124	**EPA Method SW8270 SIM**																
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		1	U	NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		1	U	NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4			AH76Q		AU45E		BC27G		BH96Q		BR64M		CB85F		CL03D		CT67B		DE87H		DM30F		DW29B		ED34J		EM85H	
5			5/19/99		9/22/99		12/7/99		2/16/00		5/25/00		8/30/00		11/8/00		2/14/01		6/5/01		8/14/01		11/27/01		2/28/02		6/26/02	
6																												
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	**17**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.2	U	**2.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.1**		1.0	U	1.0	U	**3.1**		4.0	U	4.0	U
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**6.1**		5.0	U	**6.7**		**37**		**14**	
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
48	42	Isopropylbenzene	**10**		**5.5**		**8.5**		**1.1**		**3.0**		**3.0**		1.0	U	**2.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
49	43	n-Propylbenzene	**8.4**		**8.7**		**3.8**		1.0	U	**1.2**		**2.7**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	1.0	U	**2.3**		**1.4**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
53	47	n-Butylbenzene	1.0	U	**1.6**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.25**		0.25	U	**0.35**		0.25	U	**0.26**	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.50	U	NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.25	U	NA		NA	
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	**0.025**		**0.030**		**0.022**		**0.028**		**0.028**		**0.032**		**0.030**		**0.037**		**0.033**		**0.044**		**0.042**		**0.030**		**0.033**	

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
3		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4		ER93M		EZ03F		FF76K		FL66H		FU45P		FY82M		0402105-08		0406039-02		0408044-05		0411051-02		0502087-07		P5F0553-04	
5		08/27/02		11/12/02		2/12/03		5/9/03		8/28/03		10/24/03		2/20/04		6/7/04		8/06/04		11/9/04		2/18/05		6/14/05	
7	**CHLORINATED PHENOLS (µg/L)**																								
8	**EPA Method SW8040**																								
9	Pentachlorophenol	0.28	U	0.25	U	0.26	U	0.25	U	**0.55**	J	0.51	U	0.495	U	0.494	U	0.5	U	0.504	U	0.507	U	0.500	U
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																									
17	**SEMIVOLATILES (µg/L)**																								
18	**EPA Method SW8270**																								
19	Phenol	2.2	U	2.3	U	2.1	U	2	U	2.1	U	2	U	1.92	U	2.27	U	2	U	2	U	2.02	U	5.00	U
20	4-Methylphenol	1.1	U	1.1	U	1	U	1	U	1	U	1	U	9.58	U	11.4	U	10	U	10	U	10.1	U	5.00	U
21	Isophorone	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.958	U	1.14	U	1	U	1	U	1.01	U	5.00	U
22	2,4-Dimethylphenol	3.3	U	3.4	U	3.1	U	3	U	3.1	U	3.1	U	2.87	U	3.41	U	3	U	3.01	U	3.03	U	10.00	U
23	Benzoic Acid	56	U	57	U	52	U	50	U	52	U	10	U	19.2	U	22.7	U	20	U	20	U	20.2	U	50.0	U
24	Naphthalene	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.958	U	1.14	U	1	U	1	U	1.01	U	5.00	U
25	2-Methylnaphthalene	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.958	U	1.14	U	1	U	1	U	1.01	U	5.00	U
26	2,4,6-Trichlorophenol	5.6	U	5.7	U	5.2	U	5	U	5.2	U	5.1	U	4.79	U	5.68	U	5	U	5.01	U	5.06	U	5.00	U
27	2,4,5-Trichlorophenol	5.6	U	5.7	U	5.2	U	5	U	5.2	U	5.1	U	4.79	U	5.68	U	5	U	5.01	U	5.06	U	5.00	U
28	Acenaphthene	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.958	U	1.14	U	1	U	1	U	1.01	U	5.00	U
29	Dibenzofuran	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.958	U	1.14	U	1	U	1	U	1.01	U	5.00	U
30	Fluorene	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.958	U	1.14	U	1	U	1	U	1.01	U	5.00	U
31	Pentachlorophenol	5.6	U	5.7	U	5.2	U	5	U	5.2	U	5.1	U	4.79	U	5.68	U	5	U	5.01	U	5.06	U	10	U
32	bis(2-Ethylhexyl)phthalate	4.4	U	4.6	U	1	U	1	U	1	U	1	U	0.958	U	1.14	U	1	U	1	U	1.01	U	10.00	U
33																									
34	**VOLATILES (µg/L)**																								
35	**EPA Method SW8260**																								
36	Acetone	5	U	5	U	5	U	5	U	5	U	5	U	50	U	50	U	50	U	50	U	50	U	25.0	U
37	Carbon Disulfide	1	U	1	U	1	U	1	U	1	U	1	U	2	U	2	U	2	U	2	U	2	U	10.00	U
38	2-Butanone	5	U	5	U	5	U	5	U	5	U	5	U	10	U	10	U	10	U	10	U	10	U	10.00	U
39	Benzene	1	U	1	U	1	U	1	U	1	U	1	U	0.4	U	0.3	U	0.3	U	0.3	U	0.3	U	1.00	U
40	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
41	Toluene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
42	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
43	Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
44	m,p-Xylene	1	U	1	U	1	U	1	U	1	U	1	U	2	U	2	U	2	U	2	U	2	U	2.00	U
45	o-Xylene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
46	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
47	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
48	Isopropylbenzene	1	U	1	U	**3.3**		1	U	**14**		**12**		**4.36**		1	U	**17.6**		**1.74**		**1.64**		2.00	U
49	n-Propylbenzene	1	U	1	U	1		1	U	**7.8**		**5.4**		**1.16**		1	U	**8.72**		1	U	1	U	1.00	U
50	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**1.03**		**2.71**		1.00	U
51	sec-Butylbenzene	1	U	1	U	1	U	1	U	**1.6**		**1.3**		1	U	1	U	**1.03**		1	U	1	U	1.00	U
52	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
53	n-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	5.00	U
54	Naphthalene	5	U	5	U	5	U	5	U	5	U	5	U	1	U	1	U	1	U	1	U	1	U	2.00	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		1	U	1	U	1	U	1	U	1	U	1.00	U
56																									
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	**Method OR-DEQ**																								
59	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	**0.34**		0.25	U	0.246	UJ	0.246	U	0.254	U	**0.289**		0.255	U	0.25	U
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		0.5	U	0.492	UJ	0.492	U	0.508	U	0.514	U	0.511	U	0.5	U
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.436**		**0.109**	
62																									
63	**PRIORITY POLLUTANT**																								
64	**METALS (mg/L)**																								
65	Arsenic (7060)	**0.033**		0.05	U	**0.021**		**0.03**		**0.03**		**0.038**		**0.030**		**0.027**		**0.0307**		**0.0458**		**0.0321**		**0.0366**	

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4			AH76Q		AU45E		BC27G		BH96Q		BR64M		CB85F		CL03D		CT67B		DE87H		DM30F		DW29B		ED34J		EM85H	
5			5/19/99		9/22/99		12/7/99		2/16/00		5/25/00		8/30/00		11/8/00		2/14/01		6/5/01		8/14/01		11/27/01		2/28/02		6/26/02	
66	59	Chromium (6010)	**0.025**		**0.020**		**0.009**		**0.014**		0.005	U	**0.013**		**0.010**		**0.012**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	**0.027**		**0.019**		**0.011**		**0.016**		**0.004**		**0.013**		**0.015**		**0.014**		**0.009**		**0.002**		**0.005**		**0.004**		**0.002**	
68	61	Lead (7421)	**0.006**		**0.006**		**0.004**		**0.003**		**0.002**		**0.005**		**0.003**		**0.006**		0.001	U	0.001	U	**0.003**		0.001	U	0.001	U
69	62	Nickel (6010)	**0.02**		0.02	U	0.01	U	**0.02**		0.01	U	**0.01**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	**0.070**		**0.052**		**0.032**	U	**0.042**		**0.013**		**0.033**		**0.028**		**0.039**		**0.012**		0.006	U	**0.019**		**0.009**		**0.011**	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**28.8**		**37.0**		**39.8**		**39.3**		**40.0**		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**11.0**	J	**13.2**		**13.8**		**13.7**		**13.8**		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**2.0**		**1.9**		**1.8**		**1.6**		**2.0**		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**5.18**		**5.47**		**5.76**		**6.14**		**7.23**		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**150**		NA		NA		NA		**180**		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**150**		NA		NA		NA		**180**		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**130**		**120**		**130**		**110**		**140**		**150**		**170**		**190**		**210**	J	**200**		**220**		**260**		**220**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.4**		**2.6**		**2.7**		**3.1**		**2.6**		**2.4**		**2.1**		**2.9**	J	**2.1**		**3.3**		**1.8**		**2.4**		**3.0**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		0.010	U	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		**0.011**	J	NA		NA		NA		**0.018**		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		**0.018**		NA		NA		NA		**0.025**		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		**4.6**		NA		NA		NA		**5.3**		NA	
86	79																											

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
3		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4		ER93M		EZ03F		FF76K		FL66H		FU45P		FY82M		0402105-08		0406039-02		0408044-05		0411051-02		0502087-07		P5F0553-04	
5		08/27/02		11/12/02		2/12/03		5/9/03		8/28/03		10/24/03		2/20/04		6/7/04		8/06/04		11/9/04		2/18/05		6/14/05	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.012**		**0.0101**		**0.0173**		**0.0175**		**0.0182**		**0.0086**		0.001	U
67	Copper (6010)	0.002	U	0.002	U	**0.002**		0.002	U	**0.004**		**0.011**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.002	U
68	Lead (7421)	**0.002**		0.02	U	0.001	U	0.001	U	0.001	U	**0.002**		**0.0007**		**0.0006**		**0.000788**		**0.00068**		**0.00144**		0.001	U
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.00233**	
70	Zinc (6010)	**0.012**		**0.008**		**0.008**		0.006	U	**0.008**		**0.027**		0.01	U	0.01	U	0.01	U	0.0124	U	**0.0146**		**0.00808**	
71																									
72	**MAJOR IONS AND CONVENTIONALS**																								
73	Calcium (mg/L) (6010)	NA		NA		**34.3**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		**11.8**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		**1.6**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		**5.3**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		**130**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		1	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		**130**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**190**		**210**		**250**		**180**		**180**		**160**		**181**		**237**		**163**		**229**		**207**		**220**	
81	Chloride (mg/L) (EPA 325.2)	**2.5**		**2.2**		**1.9**		**2**		1	U	**1.2**		**1.47**		**1.39**		**1.33**		**1.27**		**1.58**		**1.20**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		**0.11**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		**0.019**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		**0.13**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		**16**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86																									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4			AH76Q		AU45E		BC27G		BH96Q		BR64M		CB85F		CL03D		CT67B		DE87H		DM30F		DW29B		ED34J		EM85H	
5			5/19/99		9/22/99		12/7/99		2/16/00		5/25/00		8/30/00		11/8/00		2/14/01		6/5/01		8/14/01		11/27/01		2/28/02		6/26/02	
87	80	**FIELD PARAMETERS**																										
88	81	pH (avg)	6.35		6.71		6.62		6.90		6.69		6.05		5.91		6.35		6.81		6.97		6.72		6.52		6.41	
89	82	Temperature (° C) (avg)	14.5		14.9		13.1		13.7		14.8		14.7		13.4		14.3		14.3		14.6		13.0		14.1		16.9	
90	83	Conductivity (um/hos)	171		160		166		198		198		227		242		259		330		324		345		361		310	
91	84	Dissolved oxygen (mg/L) (avg)	3.18		1.73		1.57		1.39		0.48		1.67		1.06		0.75		1.67		1.80		1.32		7.46		3.30	
92	85																											
93	86	**DIOXINS AND FURANS (ng/L)**																										
94	87	**Method 8290**																										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
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GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																									
2																									
3		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4		ER93M		EZ03F		FF76K		FL66H		FU45P		FY82M		0402105-08		0406039-02		0408044-05		0411051-02		0502087-07		P5F0553-04	
5		08/27/02		11/12/02		2/12/03		5/9/03		8/28/03		10/24/03		2/20/04		6/7/04		8/06/04		11/9/04		2/18/05		6/14/05	
87	**FIELD PARAMETERS**																								
88	pH (avg)	6.89		6.91		7.02		6.83		6.95		6.69		6.64		5.41		6.22		6.76		7.68		6.72	
89	Temperature (° C) (avg)	15.6		14.3		14.7		15		16.4		14.9		16.3		15.6		15		14.6		15		15.8	
90	Conductivity (um/hos)	249		314		281		171		205		255		274		125		362		303		195		186	
91	Dissolved oxygen (mg/L) (avg)	0.99		1		2.04		4.56		1.03		2.91		1.42		5.05		3.75		1.9		1.82		1.95	
92																									
93	**DIOXINS AND FURANS (ng/L)**																								
94	**Method 8290**																								
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																									
121																									
122																									

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PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4			AH76Q		AU45E		BC27G		BH96Q		BR64M		CB85F		CL03D		CT67B		DE87H		DM30F		DW29B		ED34J		EM85H	
5			5/19/99		9/22/99		12/7/99		2/16/00		5/25/00		8/30/00		11/8/00		2/14/01		6/5/01		8/14/01		11/27/01		2/28/02		6/26/02	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																									
2																									
3		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4		ER93M		EZ03F		FF76K		FL66H		FU45P		FY82M		0402105-08		0406039-02		0408044-05		0411051-02		0502087-07		P5F0553-04	
5		08/27/02		11/12/02		2/12/03		5/9/03		8/28/03		10/24/03		2/20/04		6/7/04		8/06/04		11/9/04		2/18/05		6/14/05	
123	**PAHs (µg/L)**																								
124	**EPA Method SW8270 SIM**																								
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		1	U	NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		1	U	NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB		
1																														
2																														
3			LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D			
4			AH76P		AU45H		BC27D		BH96H		BR64L		CB85H		CL03O		CT67A		DE87I		DM30E		DW29D		ED30C		EN00C			
5			5/19/99		9/22/99		12/7/99		2/17/00		5/25/00		8/31/00		11/9/00		2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02			
6																														
7	1	**CHLORINATED PHENOLS (µg/L)**																												
8	2	**EPA Method SW8040**																												
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U		
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA			
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA			
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA			
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA			
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA			
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA			
16	10																													
17	11	**SEMIVOLATILES (µg/L)**																												
18	12	**EPA Method SW8270**																												
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U		
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U		
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U				
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U		
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U		
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U		
32	26	bis(2-Ethylhexyl)phthalate	3.2	U	**1.3**		1.0	U	**1.1**		**1.7**		1.0	U	**2.7**		**1.2**		1.0	U	**2.0**		1.0	U	4.0	U	4.0	U				
33	27																													
34	28	**VOLATILES (µg/L)**																												
35	29	**EPA Method SW8260**																												
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**11**		5.0	U	5.0	U				
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U				
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U				
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
56	49																													
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																												
58	51	**Method OR-DEQ**																												
59	52	**TPH-Diesel**	0.25	U	**0.32**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U		
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		0.50	U	NA		NA		NA		NA		NA		NA			
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
62	55																													
63	56	**PRIORITY POLLUTANT**																												
64	57	**METALS (mg/L)**																												
65	58	Arsenic (7060)	**0.038**		**0.038**		**0.022**		**0.032**		**0.025**		**0.037**		**0.022**		**0.025**		**0.023**		**0.027**		**0.017**		**0.019**		**0.031**					

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
3		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4		ER93E		EZ17I		FF76C		FL41N		FU45K		FY82B		0402113-02		0406073-02		0408044-03		0411051-03		0502102-10		P5F0223-05	
5		08/27/02		11/13/02		2/12/03		5/7/03		8/28/03		10/23/03		2/23/04		6/10/04		8/06/04		11/9/04		2/23/05		6/6/05	
7	**CHLORINATED PHENOLS (µg/L)**																								
8	**EPA Method SW8040**																								
9	Pentachlorophenol	0.27	U	**0.47**		0.25	U	**0.36**		**4**	J	**0.94**		0.491	U	0.509	U	0.5	U	0.489	U	0.504	U	0.485	U
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																									
17	**SEMIVOLATILES (µg/L)**																								
18	**EPA Method SW8270**																								
19	Phenol	2.2	U	2.1	U	2	U	2	U	2	U	2	U	2	U	2.14	U	2	U	1.97	U	2	U	5.56	U
20	4-Methylphenol	1.1	U	1.1	U	1	U	1	U	1	U	1	U	9.99	U	10.7	U	10	U	9.85	U	9.99	U	5.56	U
21	Isophorone	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.999	U	1.07	U	1	U	0.985	U	0.999	U	5.56	U
22	2,4-Dimethylphenol	3.3	U	3.2	U	3	U	3	U	3.1	U	3	U	3	U	3.21	U	3	U	2.96	U	3	U	11.1	U
23	Benzoic Acid	54	U	53	U	50	U	50	U	51	U	10	U	20	U	21.4	U	20	U	19.7	U	20	U	55.6	U
24	Naphthalene	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.999	U	1.07	U	1	U	0.985	U	0.999	U	5.56	U
25	2-Methylnaphthalene	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.999	U	1.07	U	1	U	0.985	U	0.999	U	5.56	U
26	2,4,6-Trichlorophenol	5.4	U	5.3	U	5	U	5	U	5.1	U	5	U	5	U	5.35	U	5	U	4.93	U	5	U	5.56	U
27	2,4,5-Trichlorophenol	5.4	U	5.3	U	5	U	5	U	5.1	U	5	U	5	U	5.35	U	5	U	4.93	U	5	U	5.56	U
28	Acenaphthene	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.999	U	1.07	U	1	U	0.985	U	0.999	U	5.56	U
29	Dibenzofuran	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.999	U	1.07	U	1	U	0.985	U	0.999	U	5.56	U
30	Fluorene	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.999	U	1.07	U	1	U	0.985	U	0.999	U	5.56	U
31	Pentachlorophenol	5.4	U	5.3	U	5	U	5	U	5.1	U	5	U	5	U	5.35	U	5	U	4.93	U	5	U	11.1	U
32	bis(2-Ethylhexyl)phthalate	4.3	U	4.3	U	1	U	1	U	1	U	1	U	0.999	U	1.07	U	1	U	0.985	U	0.999	U	11.1	U
33																									
34	**VOLATILES (µg/L)**																								
35	**EPA Method SW8260**																								
36	Acetone	5	U	5	U	5	U	5	U	5	U	5	U	50	U	50	U	50	U	50	U	50	U	25.0	U
37	Carbon Disulfide	1	U	1	U	1	U	1	U	1	U	1	U	2	U	2	U	2	U	2	U	2	U	10.00	U
38	2-Butanone	5	U	5	U	5	U	5	U	5	U	5	U	10	U	10	U	10	U	10	U	10	U	10.00	U
39	Benzene	1	U	1	U	1	U	1	U	1	U	1	U	0.4	U	0.3	U	0.3	U	0.3	U	0.3	U	1.00	U
40	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
41	Toluene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
42	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
43	Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
44	m,p-Xylene	1	U	1	U	1	U	1	U	1	U	1	U	2	U	2	U	2	U	2	U	2	U	2.00	U
45	o-Xylene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
46	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
47	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
48	Isopropylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
49	n-Propylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
50	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
51	sec-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
52	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
53	n-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	5.00	U
54	Naphthalene	5	U	5	U	5	U	5	U	5	U	5	U	1	U	1	U	1	U	1	U	1	U	2.00	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		1	U	1	U	1	U	1	U	1	U	1.00	U
56																									
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	**Method OR-DEQ**																								
59	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.247	U	0.238	U	0.245	U	0.24	U	0.246	U	0.25	U
60	**TPH-D Motor Oil**	NA		0.5	U	NA		NA		NA		0.5	U	0.494	U	0.476	U	0.49	U	0.481	U	0.492	U	0.5	U
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1	U	0.08	U
62																									
63	**PRIORITY POLLUTANT**																								
64	**METALS (mg/L)**																								
65	Arsenic (7060)	**0.026**		0.05	U	**0.011**		**0.008**		**0.026**		**0.024**		**0.023**		**0.019**		**0.0198**		**0.0168**		**0.0175**		**0.0226**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4			AH76P		AU45H		BC27D		BH96H		BR64L		CB85H		CL03O		CT67A		DE87I		DM30E		DW29D		ED30C		EN00C	
5			5/19/99		9/22/99		12/7/99		2/17/00		5/25/00		8/31/00		11/9/00		2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02	
66	59	Chromium (6010)	0.005	U	**0.021**		**0.006**		0.005	U	0.005	U	**0.034**		**0.013**		**0.011**		**0.008**		**0.019**		**0.010**		0.005	U	0.005	U
67	60	Copper (6010)	**0.003**		**0.028**		**0.011**		0.002	U	**0.005**		**0.045**		**0.021**		**0.015**		**0.009**		**0.024**		**0.012**		**0.009**		**0.004**	
68	61	Lead (7421)	**0.001**		**0.008**		**0.003**		0.001	U	**0.002**		**0.012**		**0.006**		**0.006**		**0.003**		**0.008**		**0.004**		**0.002**		0.001	U
69	62	Nickel (6010)	0.01	U	0.02	U	0.01	U	0.01	U	0.01	U	**0.03**		0.01	U	0.01	U	0.01	U	**0.01**		0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	**0.018**		**0.046**		0.022	U	**0.010**		**0.010**		**0.076**		**0.030**		**0.031**		**0.018**		**0.039**		**0.022**		**0.015**	J	**0.010**	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**19.2**		**20.4**		**22.5**		**21.0**		**19.0**		**19.1**	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**9.95**		**10.3**		**12.1**		**10.3**		**9.55**		**9.37**	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**1.1**		**1.2**		**1.5**		**0.9**		**1.0**		**0.7**	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**8.31**		**9.80**		**9.09**		**9.65**		**9.06**		**8.77**	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**110**		NA		NA		NA		**100**		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**110**		NA		NA		NA		**100**		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**180**		**180**		**170**		**150**		**150**		**170**		**160**		**150**		**150**	J	**160**	J	**150**		**100**		**140**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.7**		**1.9**		**2.1**		**3.5**		**2.3**		**14**		**2.0**		**2.6**	J	**1.9**		**4.1**		**1.7**		**1.3**	J	**2.1**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.012**		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.013**		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.025**		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		**6.2**		NA		NA		NA		**7.5**		NA	
86	79																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																									
2																									
3		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4		ER93E		EZ17I		FF76C		FL41N		FU45K		FY82B		0402113-02		0406073-02		0408044-03		0411051-03		0502102-10		P5F0223-05	
5		08/27/02		11/13/02		2/12/03		5/7/03		8/28/03		10/23/03		2/23/04		6/10/04		8/06/04		11/9/04		2/23/05		6/6/05	
66	Chromium (6010)	**0.007**		**0.009**		0.005	U	0.005	U	0.005	U	**0.012**		**0.0114**		**0.0156**		**0.0185**		**0.0233**		**0.0156**		**0.00497**	
67	Copper (6010)	**0.009**		**0.012**		**0.004**	J	**0.003**		**0.004**		**0.011**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.00874**	
68	Lead (7421)	**0.004**		0.02	U	0.001	U	**0.001**		0.001	U	**0.003**		**0.0010**		0.0001	U	**0.00123**		**0.0021**		**0.00234**		**0.00207**	
69	Nickel (6010)	0.01	U	**0.01**		0.01	U	0.01	U	0.01	U	0.01	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.00499**	
70	Zinc (6010)	**0.018**		**0.026**		**0.01**		**0.019**		0.006	U	**0.024**		0.01	U	0.01	U	0.01	U	**0.0159**		**0.0246**		**0.0136**	
71																									
72	**MAJOR IONS AND CONVENTIONALS**																								
73	Calcium (mg/L) (6010)	NA		NA		**14.1**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		**5.88**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		**1.2**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		**8.5**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		**96**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		1	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		**96**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**150**		**170**		**130**		**88**		**120**	J	**120**		**162**		**161**		**113**		**156**		**96**		**151**	
81	Chloride (mg/L) (EPA 325.2)	**2.2**		**2.5**		**1.9**		**1.6**		**1.4**		**1.5**		**1.56**		**1.53**		**1.42**		**1.34**		**1.59**		**1.62**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		**0.025**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		0.01	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		**0.025**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		**7.4**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86																									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4			AH76P		AU45H		BC27D		BH96H		BR64L		CB85H		CL03O		CT67A		DE87I		DM30E		DW29D		ED30C		EN00C	
5			5/19/99		9/22/99		12/7/99		2/17/00		5/25/00		8/31/00		11/9/00		2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02	
87	80	**FIELD PARAMETERS**																										
88	81	pH (avg)	6.44		6.49		6.79		6.86		6.90		6.71		6.10		6.72		6.88		7.03		6.80		6.50		6.56	
89	82	Temperature (° C) (avg)	14.7		17.1		12.6		15.8		13.9		13.8		13.0		13.7		13.7		16.2		14.1		13.5		14.1	
90	83	Conductivity (um/hos)	195		233		220		246		255		208		203		204		228		216		216		164		189	
91	84	Dissolved oxygen (mg/L) (avg)	2.03		1.29		2.53		0.52		0.72		1.47		1.09		0.52		2.70		0.63		3.97		7.74		5.59	
92	85																											
93	86	**DIOXINS AND FURANS (ng/L)**																										
94	87	**Method 8290**																										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																									
2																									
3		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4		ER93E		EZ17I		FF76C		FL41N		FU45K		FY82B		0402113-02		0406073-02		0408044-03		0411051-03		0502102-10		P5F0223-05	
5		08/27/02		11/13/02		2/12/03		5/7/03		8/28/03		10/23/03		2/23/04		6/10/04		8/06/04		11/9/04		2/23/05		6/6/05	
87	**FIELD PARAMETERS**																								
88	pH (avg)	6.67		6.35		7.14		7.18		7.07		6.48		6.47		6.71		6.2		6.8		7.02		7.41	
89	Temperature (° C) (avg)	14.3		13.7		13.6		13.4		15.8		17.9		15.7		14.5		14		13.8		15.5		14.4	
90	Conductivity (um/hos)	180		188		178		93		122		164		151		140		236		157		103		124	
91	Dissolved oxygen (mg/L) (avg)	0.95		1.22		1.47		5.73		2.33		5.66		4.49		1.71		4.91		1.66		2.2		4.79	
92																									
93	**DIOXINS AND FURANS (ng/L)**																								
94	**Method 8290**																								
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																									
121																									
122																									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4			AH76P		AU45H		BC27D		BH96H		BR64L		CB85H		CL03O		CT67A		DE87I		DM30E		DW29D		ED30C		EN00C	
5			5/19/99		9/22/99		12/7/99		2/17/00		5/25/00		8/31/00		11/9/00		2/15/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
1																									
2																									
3		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4		ER93E		EZ17I		FF76C		FL41N		FU45K		FY82B		0402113-02		0406073-02		0408044-03		0411051-03		0502102-10		P5F0223-05	
5		08/27/02		11/13/02		2/12/03		5/7/03		8/28/03		10/23/03		2/23/04		6/10/04		8/06/04		11/9/04		2/23/05		6/6/05	
123	**PAHs (µg/L)**																								
124	**EPA Method SW8270 SIM**																								
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		1	U	NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		1	U	NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4			AH76H		AU45C		BC27I		BH96L		BR64G		CB49F		CK77H		CT55D		DE68B		DM52G		DW48B		ED34E		EM85C	
5			5/20/99		9/22/99		12/8/99		2/18/00		5/24/00		8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/28/02		6/26/02	
6																												
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	**46**		**8.1**		**1.1**		**0.36**		0.25	U	0.25	U	0.25	U	**1.6**		0.25	U	0.25	U	**0.62**		**0.76**		0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	0.57	U	1.3	U	0.39	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**2.2**		**1.5**		**0.36**		**0.12**	J1	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	**2.2**		**1.1**		**0.27**		0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.6**		1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U
24	18	Naphthalene	**1.3**		1.0	U	**0.9**	J1	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	**0.6**	J1	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	**55**		**5.0**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	3.5	U	1.0	U	**2.6**		**2.7**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.9**		4.0	U	4.0	U
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	**8.9**		**16**		5.0	U	5.0	U	5.0	U	**8.4**		**12**			R	**35**		**10**		**130**		5.0	U	**54**	
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	22	U	5.9	U	5.0	U	**5.4**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
42	36	Ethylbenzene	**16**		**7.2**		**3.2**		**1.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	**22**		**7.4**		**2.1**		**1.3**		**1.6**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
45	39	o-Xylene	**21**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
46	40	1,3,5-Trimethylbenzene	**34**		**26**		**10**		**7.5**		**8.0**		**4.4**		**3.1**		**4.2**		**3.4**		**2.2**		**1.1**		1.0	U	1.0	U
47	41	1,2,4-Trimethylbenzene	**97**		**40**		**12**		**9.0**		**12**		**6.7**		**5.6**		**7.0**		**5.7**		**3.6**		**1.7**		1.0	U	**1.4**	
48	42	Isopropylbenzene	**12**		**11**		**6.9**		**4.0**		**2.4**		**1.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
49	43	n-Propylbenzene	**18**		**20**		**13**		**7.5**		**4.8**		**2.8**		**1.6**		**1.3**		**1.2**		**1.2**		1.0	U	1.0	U	1.0	U
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	**4.6**		**5.3**		**4.8**		**3.7**		**2.7**		**2.2**		**1.7**		**1.2**		**1.2**		**1.4**		**1.2**		1.0	U	1.0	U
52	46	4-Isopropyltoluene	**6.7**		**5.0**		**2.0**		**1.6**		**1.9**		**1.7**		1.0	U	**1.0**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
53	47	n-Butylbenzene	**5.8**		4.1	U	2.3	U	**2.3**		**2.2**	M	**2.4**	M	**1.5**		**1.4**	M	**1.5**		**1.5**		1.0	U	1.0	U	1.0	U
54	48	Naphthalene	**5.3**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	**0.68**		**1.4**		**0.76**		**0.60**		**0.74**		**0.88**		**0.70**		**1.1**		**1.0**		**0.88**		**0.98**		**0.87**		**1.1**	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	**0.006**		**0.008**		**0.006**		**0.007**		**0.007**		**0.007**		**0.007**		**0.006**		**0.007**		**0.009**		**0.009**		**0.007**		**0.007**	

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
3		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4		ES04C		EZ03B		FF88D		FL66I		FU50B		FY82J		0402113-11		0408044-02		0411066-08		0502087-03		P5F0223-03	
5		08/28/02		11/12/02		2/13/03		5/9/03		8/29/03		10/24/03		2/23/04		8/06/04		11/11/04		2/17/05		6/6/05	
7	**CHLORINATED PHENOLS (µg/L)**																						
8	**EPA Method SW8040**																						
9	Pentachlorophenol	0.26	U	0.25	U	0.26	U	0.26	U	**5.6**		0.55	U	**1.5**		0.5	U	NA		0.49	U	0.485	U
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																							
17	**SEMIVOLATILES (µg/L)**																						
18	**EPA Method SW8270**																						
19	Phenol	2	U	2.2	U	2	U	2	U	2.1	U	2.2	U	1.95	U	2	U	1.98	U	1.98	U	5.00	U
20	4-Methylphenol	1	U	1.1	U	1	U	1	U	1	U	1.1	U	9.76	U	10	U	9.89	U	9.89	U	5.00	U
21	Isophorone	1	U	1.1	U	1	U	1	UJ	1	U	1.1	U	0.976	U	1	U	0.989	U	0.989	U	5.00	U
22	2,4-Dimethylphenol	3.1	U	3.3	U	3.1	U	3.1	U	3.1	U	3.3	U	2.93	U	3	U	2.97	U	2.97	U	10.00	U
23	Benzoic Acid	51	U	54	U	51	U	51	U	52	U	11	U	19.5	U	20	U	19.8	U	19.8	U	50.0	U
24	Naphthalene	1	U	1.1	U	1	U	1	UJ	1	U	1.1	U	0.976	U	1	U	0.989	U	0.989	U	5.00	U
25	2-Methylnaphthalene	1	U	1.1	U	1	U	1	UJ	1	U	1.1	U	0.976	U	1	U	0.989	U	0.989	U	5.00	U
26	2,4,6-Trichlorophenol	5.1	U	5.4	U	5.1	U	5.1	U	5.2	U	5.5	U	4.88	U	5	U	4.95	U	4.95	U	5.00	U
27	2,4,5-Trichlorophenol	5.1	U	5.4	U	5.1	U	5.1	U	5.2	U	5.5	U	4.88	U	5	U	4.95	U	4.95	U	5.00	U
28	Acenaphthene	1	U	1.1	U	1	U	1	UJ	1	U	1.1	U	0.976	U	1	U	0.989	U	0.989	U	5.00	U
29	Dibenzofuran	1	U	1.1	U	1	U	1	UJ	1	U	1.1	U	0.976	U	1	U	0.989	U	0.989	U	5.00	U
30	Fluorene	1	U	1.1	U	1	U	1	UJ	1	U	1.1	U	0.976	U	1	U	0.989	U	0.989	U	5.00	U
31	Pentachlorophenol	5.1	U	5.4	U	5.1	U	5.1	U	5.2	U	5.5	U	4.88	U	5	U	4.95	U	4.95	U	10	U
32	bis(2-Ethylhexyl)phthalate	4.1	U	4.3	U	**1.9**		1	UJ	**1.9**		**1.5**		**1.86**		**1.71**		**1.17**		0.989	U	10.00	U
33																							
34	**VOLATILES (µg/L)**																						
35	**EPA Method SW8260**																						
36	Acetone	**27**		**31**		**26**		**140**		**11**		**71**		50	U	50	U	50	U	50	U	25.0	U
37	Carbon Disulfide	1	U	1	U	1	U	1	U	1	U	1	U	2	U	2	U	2	U	2	U	10.00	U
38	2-Butanone	5	U	5	U	5	U	5	U	5	U	5	U	10	U	10	U	10	U	10	U	10.00	U
39	Benzene	1	U	1	U	1	U	1	U	1	U	1	U	0.4	U	0.3	U	0.3	U	0.3	U	1.00	U
40	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
41	Toluene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
42	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
43	Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
44	m,p-Xylene	1	U	1	U	1	U	1	U	1	U	1	U	2	U	2	U	2	U	2	U	2.00	U
45	o-Xylene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**1.26**		1.00	U
46	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
47	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**1**		1.00	U
48	Isopropylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
49	n-Propylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
50	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
51	sec-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
52	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
53	n-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	5.00	U
54	Naphthalene	5	U	5	U	5	U	5	U	5	U	5	U	1	U	1	U	1	U	**3.1**		2.00	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		1	U	1	U	1	U	1	U	1.00	U
56																							
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																						
58	**Method OR-DEQ**																						
59	**TPH-Diesel**	**0.97**		**0.8**		**0.74**		**0.91**		**1.1**		**0.66**		**0.562**		**0.79**		NA		**0.482**		0.25	U
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		0.5	U	0.504	U	0.51	U	NA		0.484	U	0.5	U
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.328**		0.08	U
62																							
63	**PRIORITY POLLUTANT**																						
64	**METALS (mg/L)**																						
65	Arsenic (7060)	**0.005**		0.05	U	**0.008**		**0.007**		**0.005**		**0.005**		**0.007**		**0.00558**		**0.00441**		**0.005**		**0.0104**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4			AH76H		AU45C		BC27I		BH96L		BR64G		CB49F		CK77H		CT55D		DE68B		DM52G		DW48B		ED34E		EM85C	
5			5/20/99		9/22/99		12/8/99		2/18/00		5/24/00		8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/28/02		6/26/02	
66	59	Chromium (6010)	**0.008**		**0.053**		**0.015**		**0.011**		**0.013**		**0.018**		**0.016**		0.005	U	0.005	U	**0.024**		0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	**0.005**		**0.051**		**0.016**		**0.013**		**0.014**		**0.017**		**0.018**	J2	**0.005**		**0.002**		**0.024**		0.004	U	**0.007**		**0.003**	
68	61	Lead (7421)	**0.002**		**0.018**		**0.007**		**0.004**		**0.008**		**0.006**		**0.008**		**0.002**		**0.002**		**0.008**		**0.004**		**0.002**		0.001	U
69	62	Nickel (6010)	0.01	U	0.04	U	0.01	U	**0.01**		0.01	U	**0.02**		**0.01**		0.01	U	0.01	U	**0.02**		0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	**0.030**		**0.142**		**0.047**		**0.042**		**0.040**		**0.052**		**0.058**		**0.023**		**0.018**		**0.064**		**0.022**		**0.022**		**0.013**	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**54.9**		**61.5**		**55.9**		**58.6**		**60.0**		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**26.4**		**31.0**		**27.6**		**28.6**		**31.3**		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**1.7**		**1.9**		**2.9**		**2.1**		**2.2**		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**15.6**		**16.6**		**17.5**		**16.2**		**17.6**		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**350**		NA		NA		NA		**370**		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**350**		NA		NA		NA		**370**		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**420**		**310**		**310**		**290**		**350**		**380**		**380**		**360**		**370**		**300**		**340**		**340**		**410**	
81	74	Chloride (mg/L) (EPA 325.2)	**9.2**		**10**		**11**		**11**		**10**		**10**		**14**		**7.7**		**8.8**		**8.3**		**7.5**		**9.8**		**12**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.024**		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.025**		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.049**		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		**6.3**		NA		NA		NA		**7.6**		NA	
86	79																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
1																							
2																							
3		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4		ES04C		EZ03B		FF88D		FL66I		FU50B		FY82J		0402113-11		0408044-02		0411066-08		0502087-03		P5F0223-03	
5		08/28/02		11/12/02		2/13/03		5/9/03		8/29/03		10/24/03		2/23/04		8/06/04		11/11/04		2/17/05		6/6/05	
66	Chromium (6010)	**0.02**		**0.032**		0.005	U	0.005	U	**0.007**		**0.016**		**0.0104**		**0.0176**		**0.0216**		**0.0084**		**0.065**	
67	Copper (6010)	**0.02**		**0.034**		**0.007**		**0.004**		**0.008**		**0.015**		0.01	U	0.01	U	0.01	U	0.01	U	**0.0999**	
68	Lead (7421)	**0.007**		0.02	U	**0.002**		**0.002**		**0.002**		**0.004**		**0.0019**		**0.00274**		**0.00301**		**0.00129**		**0.0369**	
69	Nickel (6010)	**0.01**		**0.05**		**0.05**		**0.01**		**0.01**		**0.02**		0.005	U	0.005	U	0.005	U	0.005	U	**0.0839**	
70	Zinc (6010)	**0.053**		**0.096**		**0.024**		**0.019**		**0.025**		**0.041**		0.01	U	**0.0216**		**0.0246**		0.01	U	**0.254**	
71																							
72	**MAJOR IONS AND CONVENTIONALS**																						
73	Calcium (mg/L) (6010)	NA		NA		**70.4**		NA		NA		NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		**31.7**		NA		NA		NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		**2.6**		NA		NA		NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		**17.5**		NA		NA		NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		**310**		NA		NA		NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		1	U	NA		NA		NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		**310**		NA		NA		NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**390**		**470**		**380**		**320**		**260**		**290**		**361**		**303**		**333**		**382**		**447**	
81	Chloride (mg/L) (EPA 325.2)	**9.8**		**7.4**		**7.8**		**6.7**		**4.6**		**5.8**		**6.68**		**4.59**		**4.54**		**5.65**		**5.57**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		**0.02**		NA		NA		NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		0.01	U	NA		NA		NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		**0.02**		NA		NA		NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		**96**		NA		NA		NA		NA		NA		NA		NA		NA	
86																							

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4			AH76H		AU45C		BC27I		BH96L		BR64G		CB49F		CK77H		CT55D		DE68B		DM52G		DW48B		ED34E		EM85C	
5			5/20/99		9/22/99		12/8/99		2/18/00		5/24/00		8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/28/02		6/26/02	
87	80	**FIELD PARAMETERS**																										
88	81	pH (avg)	6.51		6.75		6.54		6.44		6.63		6.35		5.75		6.38		6.75		7.80		6.68		6.52		6.56	
89	82	Temperature (° C) (avg)	15.5		15.3		12.1		12.0		17.0		15.0		12.8		12.3		13.3		14.7		12.6		12.8		14.9	
90	83	Conductivity (um/hos)	630		487		617		551		643		523		544		454		493		488		473		576		694	
91	84	Dissolved oxygen (mg/L) (avg)	1.96		1.53		1.33		1.86		1.53		1.49		1.23		1.14		1.45		1.43		3.48		8.44		3.33	
92	85																											
93	86	**DIOXINS AND FURANS (ng/L)**																										
94	87	**Method 8290**																										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
1																							
2																							
3		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4		ES04C		EZ03B		FF88D		FL66I		FU50B		FY82J		0402113-11		0408044-02		0411066-08		0502087-03		P5F0223-03	
5		08/28/02		11/12/02		2/13/03		5/9/03		8/29/03		10/24/03		2/23/04		8/06/04		11/11/04		2/17/05		6/6/05	
87	**FIELD PARAMETERS**																						
88	pH (avg)	6.44		6.2		6.96		6.81		6.7		6.48		6.53		6.3		6.69		6.84		7.34	
89	Temperature (° C) (avg)	15.7		14		13.6		14.3		14.4		13.3		14.1		14.3		13.6		13.1		17.1	
90	Conductivity (um/hos)	466		642		704		419		334		376		485		678		463		214		462	
91	Dissolved oxygen (mg/L) (avg)	1.30		0.48		0		2.57		2.31		2.80		1.13		3.15		1.34		0.88		2.79	
92																							
93	**DIOXINS AND FURANS (ng/L)**																						
94	**Method 8290**																						
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																							
121																							
122																							

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4			AH76H		AU45C		BC27I		BH96L		BR64G		CB49F		CK77H		CT55D		DE68B		DM52G		DW48B		ED34E		EM85C	
5			5/20/99		9/22/99		12/8/99		2/18/00		5/24/00		8/29/00		11/8/00		2/14/01		6/5/01		8/15/01		11/29/01		2/28/02		6/26/02	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
1																							
2																							
3		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4		ES04C		EZ03B		FF88D		FL66I		FU50B		FY82J		0402113-11		0408044-02		0411066-08		0502087-03		P5F0223-03	
5		08/28/02		11/12/02		2/13/03		5/9/03		8/29/03		10/24/03		2/23/04		8/06/04		11/11/04		2/17/05		6/6/05	
123	**PAHs (µg/L)**																						
124	**EPA Method SW8270 SIM**																						
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		1	U	NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		1	U	NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
2					Dup of LW14D																							
3			LW14D		W		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D	
4			BR64R		BR64Q		CT67N		DE87E		DM30Q		DW29J		ED30E		EN00E		ER93F		EZ17C		FF65E		FL58D		FU45L	
5			5/25/00		5/25/00		2/14/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/13/02		2/11/03		5/8/03		8/28/03	
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.27	U	0.25	U	0.25	U	0.25	U	**2.3**	J
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
20	14	4-Methylphenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
21	15	Isophorone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
22	16	2,4-Dimethylphenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
23	17	Benzoic Acid	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
24	18	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
25	19	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
26	20	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
27	21	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
28	22	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
29	23	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
30	24	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
31	25	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
37	31	Carbon Disulfide	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
38	32	2-Butanone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
39	33	Benzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
40	34	Bromoform	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
41	35	Toluene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
42	36	Ethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
43	37	Styrene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
44	38	m,p-Xylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
45	39	o-Xylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
46	40	1,3,5-Trimethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
47	41	1,2,4-Trimethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
48	42	Isopropylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
49	43	n-Propylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
50	44	tert-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
51	45	sec-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
52	46	4-Isopropyltoluene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
53	47	n-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
54	48	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ
3		LW14D		LW14D		LW14D		LW14D	
4		FY82C		0402113-03		0408036-05		0502102-09	
5		10/23/03		2/23/04		8/05/04		2/23/05	
7	**CHLORINATED PHENOLS (µg/L)**								
8	**EPA Method SW8040**								
9	Pentachlorophenol	0.5	U	0.557	U	0.5	U	0.513	U
10	2,4,6-Trichlorophenol	NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA	
16									
17	**SEMIVOLATILES (µg/L)**								
18	**EPA Method SW8270**								
19	Phenol	NA		NA		NA		NA	
20	4-Methylphenol	NA		NA		NA		NA	
21	Isophorone	NA		NA		NA		NA	
22	2,4-Dimethylphenol	NA		NA		NA		NA	
23	Benzoic Acid	NA		NA		NA		NA	
24	Naphthalene	NA		NA		NA		NA	
25	2-Methylnaphthalene	NA		NA		NA		NA	
26	2,4,6-Trichlorophenol	NA		NA		NA		NA	
27	2,4,5-Trichlorophenol	NA		NA		NA		NA	
28	Acenaphthene	NA		NA		NA		NA	
29	Dibenzofuran	NA		NA		NA		NA	
30	Fluorene	NA		NA		NA		NA	
31	Pentachlorophenol	NA		NA		NA		NA	
32	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA	
33									
34	**VOLATILES (µg/L)**								
35	**EPA Method SW8260**								
36	Acetone	NA		NA		NA		NA	
37	Carbon Disulfide	NA		NA		NA		NA	
38	2-Butanone	NA		NA		NA		NA	
39	Benzene	NA		NA		NA		NA	
40	Bromoform	NA		NA		NA		NA	
41	Toluene	NA		NA		NA		NA	
42	Ethylbenzene	NA		NA		NA		NA	
43	Styrene	NA		NA		NA		NA	
44	m,p-Xylene	NA		NA		NA		NA	
45	o-Xylene	NA		NA		NA		NA	
46	1,3,5-Trimethylbenzene	NA		NA		NA		NA	
47	1,2,4-Trimethylbenzene	NA		NA		NA		NA	
48	Isopropylbenzene	NA		NA		NA		NA	
49	n-Propylbenzene	NA		NA		NA		NA	
50	tert-Butylbenzene	NA		NA		NA		NA	
51	sec-Butylbenzene	NA		NA		NA		NA	
52	4-Isopropyltoluene	NA		NA		NA		NA	
53	n-Butylbenzene	NA		NA		NA		NA	
54	Naphthalene	NA		NA		NA		NA	
55	Methyl tert-butyl ether	NA		NA		NA		NA	
56									
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**								
58	**Method OR-DEQ**								
59	**TPH-Diesel**	NA		NA		NA		NA	
60	**TPH-D Motor Oil**	NA		NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA	
62									
63	**PRIORITY POLLUTANT**								
64	**METALS (mg/L)**								
65	Arsenic (7060)	NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2					Dup of LW14D																							
3			LW14D		W		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D	
4			BR64R		BR64Q		CT67N		DE87E		DM30Q		DW29J		ED30E		EN00E		ER93F		EZ17C		FF65E		FL58D		FU45L	
5			5/25/00		5/25/00		2/14/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/13/02		2/11/03		5/8/03		8/28/03	
66	59	Chromium (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
67	60	Copper (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
68	61	Lead (7421)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
69	62	Nickel (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
70	63	Zinc (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86	79																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ
1									
2									
3		LW14D		LW14D		LW14D		LW14D	
4		FY82C		0402113-03		0408036-05		0502102-09	
5		10/23/03		2/23/04		8/05/04		2/23/05	
66	Chromium (6010)	NA		NA		NA		NA	
67	Copper (6010)	NA		NA		NA		NA	
68	Lead (7421)	NA		NA		NA		NA	
69	Nickel (6010)	NA		NA		NA		NA	
70	Zinc (6010)	NA		NA		NA		NA	
71									
72	**MAJOR IONS AND CONVENTIONALS**								
73	Calcium (mg/L) (6010)	NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		NA		NA	
81	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA	
86									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
2					Dup of LW14D																							
3			LW14D		W		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D	
4			BR64R		BR64Q		CT67N		DE87E		DM30Q		DW29J		ED30E		EN00E		ER93F		EZ17C		FF65E		FL58D		FU45L	
5			5/25/00		5/25/00		2/14/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/13/02		2/11/03		5/8/03		8/28/03	
87	80	**FIELD PARAMETERS**																										
88	81	pH (avg)	6.64		6.64		6.15		6.65		6.81		6.61		6.35		6.64		6.73		6.22		7.05		6.69		6.98	
89	82	Temperature (° C) (avg)	14.1		14.2		12.9		13.5		14.1		12.4		13.6		13.9		14.8		13.4		14.3		13.3		16.1	
90	83	Conductivity (um/hos)	312		312		345		371		296		362		356		487		434		477		426		258		224	
91	84	Dissolved oxygen (mg/L) (avg)	4.54		4.52		0.12		1.17		0.83		4.12		7.36		5.08		2.09		0.77		2.48		3.06		1.54	
92	85																											
93	86	**DIOXINS AND FURANS (ng/L)**																										
94	87	**Method 8290**																										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ
1									
2									
3		LW14D		LW14D		LW14D		LW14D	
4		FY82C		0402113-03		0408036-05		0502102-09	
5		10/23/03		2/23/04		8/05/04		2/23/05	
87	**FIELD PARAMETERS**								
88	pH (avg)	6.56		6.38		6.1		6.65	
89	Temperature (° C) (avg)	14.2		13.7		16		13.9	
90	Conductivity (um/hos)	238		239		356		177	
91	Dissolved oxygen (mg/L) (avg)	2.29		1.11		3.07		0	
92									
93	**DIOXINS AND FURANS (ng/L)**								
94	**Method 8290**								
95	2,3,7,8-TCDF	NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA	
120									
121									
122									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2					Dup of LW14D																							
3			LW14D		W		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D		LW14D	
4			BR64R		BR64Q		CT67N		DE87E		DM30Q		DW29J		ED30E		EN00E		ER93F		EZ17C		FF65E		FL58D		FU45L	
5			5/25/00		5/25/00		2/14/01		6/6/01		8/13/01		11/27/01		2/27/02		6/27/02		08/27/02		11/13/02		2/11/03		5/8/03		8/28/03	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ
1									
2									
3		LW14D		LW14D		LW14D		LW14D	
4		FY82C		0402113-03		0408036-05		0502102-09	
5		10/23/03		2/23/04		8/05/04		2/23/05	
123	**PAHs (µg/L)**								
124	**EPA Method SW8270 SIM**								
125	Naphthalene	NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			LW16D		LW16D	
4			BR64U		0408036-04	
5			5/25/00		8/05/04	
6						
7	1	**CHLORINATED PHENOLS (µg/L)**				
8	2	**EPA Method SW8040**				
9	3	Pentachlorophenol	0.25	U	0.5	U
10	4	2,4,6-Trichlorophenol	0.25	U	NA	
11	5	2,3,6-Trichlorophenol	0.25	U	NA	
12	6	2,4,5-Trichlorophenol	0.25	U	NA	
13	7	2,3,4-Trichlorophenol	0.25	U	NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	NA	
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	NA	
16	10					
17	11	**SEMIVOLATILES (µg/L)**				
18	12	**EPA Method SW8270**				
19	13	Phenol	NA		NA	
20	14	4-Methylphenol	NA		NA	
21	15	Isophorone	NA		NA	
22	16	2,4-Dimethylphenol	NA		NA	
23	17	Benzoic Acid	NA		NA	
24	18	Naphthalene	NA		NA	
25	19	2-Methylnaphthalene	NA		NA	
26	20	2,4,6-Trichlorophenol	NA		NA	
27	21	2,4,5-Trichlorophenol	NA		NA	
28	22	Acenaphthene	NA		NA	
29	23	Dibenzofuran	NA		NA	
30	24	Fluorene	NA		NA	
31	25	Pentachlorophenol	NA		NA	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA	
33	27					
34	28	**VOLATILES (µg/L)**				
35	29	**EPA Method SW8260**				
36	30	Acetone	NA		NA	
37	31	Carbon Disulfide	NA		NA	
38	32	2-Butanone	NA		NA	
39	33	Benzene	NA		NA	
40	34	Bromoform	NA		NA	
41	35	Toluene	NA		NA	
42	36	Ethylbenzene	NA		NA	
43	37	Styrene	NA		NA	
44	38	m,p-Xylene	NA		NA	
45	39	o-Xylene	NA		NA	
46	40	1,3,5-Trimethylbenzene	NA		NA	
47	41	1,2,4-Trimethylbenzene	NA		NA	
48	42	Isopropylbenzene	NA		NA	
49	43	n-Propylbenzene	NA		NA	
50	44	tert-Butylbenzene	NA		NA	
51	45	sec-Butylbenzene	NA		NA	
52	46	4-Isopropyltoluene	NA		NA	
53	47	n-Butylbenzene	NA		NA	
54	48	Naphthalene	NA		NA	
55		Methyl tert-butyl ether	NA	NA	NA	
56	49					
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**				
58	51	**Method OR-DEQ**				
59	52	**TPH-Diesel**	NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA	
61	54	**TPH-Gasoline**	NA		NA	
62	55					
63	56	**PRIORITY POLLUTANT**				
64	57	**METALS (mg/L)**				
65	58	Arsenic (7060)	NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			LW16D		LW16D	
4			BR64U		0408036-04	
5			5/25/00		8/05/04	
66	59	Chromium (6010)	NA		NA	
67	60	Copper (6010)	NA		NA	
68	61	Lead (7421)	NA		NA	
69	62	Nickel (6010)	NA		NA	
70	63	Zinc (6010)	NA		NA	
71	64					
72	65	**MAJOR IONS AND CONVENTIONALS**				
73	66	Calcium (mg/L) (6010)	NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA	
86	79					

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			LW16D		LW16D	
4			BR64U		0408036-04	
5			5/25/00		8/05/04	
87	80	**FIELD PARAMETERS**				
88	81	pH (avg)	6.74		6.29	
89	82	Temperature (° C) (avg)	14.3		15	
90	83	Conductivity (um/hos)	314		200	
91	84	Dissolved oxygen (mg/L) (avg)	0.71		5.43	
92	85					
93	86	**DIOXINS AND FURANS (ng/L)**				
94	87	**Method 8290**				
95	88	2,3,7,8-TCDF	NA		NA	
96	89	Total TCDF	NA		NA	
97	90	2,3,7,8-TCDD	NA		NA	
98	91	Total TCDD	NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA	
101	94	Total PeCDF	NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA	
103	96	Total PeCDD	NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA	
108	101	Total HxCDF	NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA	
112	105	Total HxCDD	NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA	
115	108	Total HpCDF	NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA	
117	110	Total HpCDD	NA		NA	
118	111	OCDF	NA		NA	
119	112	OCDD	NA		NA	
120						
121						
122						

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			LW16D		LW16D	
4			BR64U		0408036-04	
5			5/25/00		8/05/04	
123		**PAHs (µg/L)**				
124		**EPA Method SW8270 SIM**				
125		Naphthalene	NA		NA	
126		2-Methylnaphthalene	NA		NA	
127		Acenaphthylene	NA		NA	
128		Acenaphthene	NA		NA	
129		Fluorene	NA		NA	
130		Anthracene	NA		NA	
131		Dibenzofuran	NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D	
4			CB85A		CL03R		CT67L		DE87C		DM30P		DW48H		ED34B		EN00J		ER93N		EZ03H		FF88H		FL66F		FU45S	
5			8/31/00		11/8/00		2/14/01		6/5/01		8/13/01		11/29/01		2/28/02		6/27/02		08/27/02		11/12/02		2/13/03		5/9/03		8/28/03	
6																												
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	0.25	U	0.25	U	**0.56**		0.25	U	0.25	U	0.25	U	**6.8**		0.25	U	0.28	U	0.25	U	**0.33**		0.25	U	0.5	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
20	14	4-Methylphenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
21	15	Isophorone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
22	16	2,4-Dimethylphenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
23	17	Benzoic Acid	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
24	18	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
25	19	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
26	20	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
27	21	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
28	22	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
29	23	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
30	24	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
31	25	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
37	31	Carbon Disulfide	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
38	32	2-Butanone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
39	33	Benzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
40	34	Bromoform	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
41	35	Toluene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
42	36	Ethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
43	37	Styrene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
44	38	m,p-Xylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
45	39	o-Xylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
46	40	1,3,5-Trimethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
47	41	1,2,4-Trimethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
48	42	Isopropylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
49	43	n-Propylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
50	44	tert-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
51	45	sec-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
52	46	4-Isopropyltoluene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
53	47	n-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
54	48	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
3		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D	
4		FY82G		0402105-06		0408044-08		0411051-08		0502087-11		P5F0444-02	
5		10/23/03		2/20/04		8/06/04		11/9/04		2/18/05		6/10/05	
7	**CHLORINATED PHENOLS (µg/L)**												
8	**EPA Method SW8040**												
9	Pentachlorophenol	0.51	U	0.497	U	0.5	U	0.495	U	0.499	U	0.500	U
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA	
16													
17	**SEMIVOLATILES (µg/L)**												
18	**EPA Method SW8270**												
19	Phenol	NA		NA		NA		NA		NA		5.00	U
20	4-Methylphenol	NA		NA		NA		NA		NA		5.00	U
21	Isophorone	NA		NA		NA		NA		NA		5.00	U
22	2,4-Dimethylphenol	NA		NA		NA		NA		NA		10.00	U
23	Benzoic Acid	NA		NA		NA		NA		NA		50.0	U
24	Naphthalene	NA		NA		NA		NA		NA		5.00	U
25	2-Methylnaphthalene	NA		NA		NA		NA		NA		5.00	U
26	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		5.00	U
27	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		5.00	U
28	Acenaphthene	NA		NA		NA		NA		NA		5.00	U
29	Dibenzofuran	NA		NA		NA		NA		NA		5.00	U
30	Fluorene	NA		NA		NA		NA		NA		5.00	U
31	Pentachlorophenol	NA		NA		NA		NA		NA		10	U
32	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA		10.00	U
33													
34	**VOLATILES (µg/L)**												
35	**EPA Method SW8260**												
36	Acetone	NA		NA		NA		NA		NA		25.0	U
37	Carbon Disulfide	NA		NA		NA		NA		NA		10.00	U
38	2-Butanone	NA		NA		NA		NA		NA		10.00	U
39	Benzene	NA		NA		NA		NA		NA		1.00	U
40	Bromoform	NA		NA		NA		NA		NA		1.00	U
41	Toluene	NA		NA		NA		NA		NA		1.00	U
42	Ethylbenzene	NA		NA		NA		NA		NA		**8.10**	
43	Styrene	NA		NA		NA		NA		NA		1.00	U
44	m,p-Xylene	NA		NA		NA		NA		NA		2.00	U
45	o-Xylene	NA		NA		NA		NA		NA		1.00	U
46	1,3,5-Trimethylbenzene	NA		NA		NA		NA		NA		1.00	U
47	1,2,4-Trimethylbenzene	NA		NA		NA		NA		NA		1.00	U
48	Isopropylbenzene	NA		NA		NA		NA		NA		**145**	
49	n-Propylbenzene	NA		NA		NA		NA		NA		**121**	
50	tert-Butylbenzene	NA		NA		NA		NA		NA		**4.81**	
51	sec-Butylbenzene	NA		NA		NA		NA		NA		**18.8**	
52	4-Isopropyltoluene	NA		NA		NA		NA		NA		2.00	U
53	n-Butylbenzene	NA		NA		NA		NA		NA		**6.31**	
54	Naphthalene	NA		NA		NA		NA		NA		2.00	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		1.00	U
56													
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**												
58	**Method OR-DEQ**												
59	**TPH-Diesel**	NA		NA		NA		**2.74**		**2.08**		**0.759**	
60	**TPH-D Motor Oil**	NA		NA		NA		0.489	U	0.499	U	0.5	U
61	**TPH-Gasoline**	NA		NA		NA		**3.83**		**3.37**		**1.83**	J
62													
63	**PRIORITY POLLUTANT**												
64	**METALS (mg/L)**												
65	Arsenic (7060)	NA		NA		NA		NA		NA		**0.034**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D	
4			CB85A		CL03R		CT67L		DE87C		DM30P		DW48H		ED34B		EN00J		ER93N		EZ03H		FF88H		FL66F		FU45S	
5			8/31/00		11/8/00		2/14/01		6/5/01		8/13/01		11/29/01		2/28/02		6/27/02		08/27/02		11/12/02		2/13/03		5/9/03		8/28/03	
66	59	Chromium (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
67	60	Copper (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
68	61	Lead (7421)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
69	62	Nickel (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
70	63	Zinc (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86	79																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1													
2													
3		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D	
4		FY82G		0402105-06		0408044-08		0411051-08		0502087-11		P5F0444-02	
5		10/23/03		2/20/04		8/06/04		11/9/04		2/18/05		6/10/05	
66	Chromium (6010)	NA		NA		NA		NA		NA		0.001	U
67	Copper (6010)	NA		NA		NA		NA		NA		**0.00317**	
68	Lead (7421)	NA		NA		NA		NA		NA		**0.00132**	
69	Nickel (6010)	NA		NA		NA		NA		NA		**0.0342**	
70	Zinc (6010)	NA		NA		NA		NA		NA		**0.0218**	
71													
72	**MAJOR IONS AND CONVENTIONALS**												
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		NA		NA		NA		NA	
81	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA	
86													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D	
4			CB85A		CL03R		CT67L		DE87C		DM30P		DW48H		ED34B		EN00J		ER93N		EZ03H		FF88H		FL66F		FU45S	
5			8/31/00		11/8/00		2/14/01		6/5/01		8/13/01		11/29/01		2/28/02		6/27/02		08/27/02		11/12/02		2/13/03		5/9/03		8/28/03	
87	80	**FIELD PARAMETERS**																										
88	81	pH (avg)	6.14		5.95		6.15		6.53		6.67		6.44		6.49		6.68		6.41		6.64		6.9		6.75		6.74	
89	82	Temperature (° C) (avg)	13.8		13.5		14.4		14.0		15.3		14		13.7		14.2		16.1		13.7		15.2		13.8		17.4	
90	83	Conductivity (um/hos)	305		79		440		488		544		529		62		196		399		457		401		349		431	
91	84	Dissolved oxygen (mg/L) (avg)	2.10		1.21		0.47		2.27		1.69		3.81		7.82		4.92		1.31		0.94		0		2.33		1.01	
92	85																											
93	86	**DIOXINS AND FURANS (ng/L)**																										
94	87	**Method 8290**																										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1													
2													
3		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D	
4		FY82G		0402105-06		0408044-08		0411051-08		0502087-11		P5F0444-02	
5		10/23/03		2/20/04		8/06/04		11/9/04		2/18/05		6/10/05	
87	**FIELD PARAMETERS**												
88	pH (avg)	6.47		6.44		6.17		6.59		6.61		6.81	
89	Temperature (° C) (avg)	15.8		15.7		14.6		14.4		15.1		15.7	
90	Conductivity (um/hos)	434		367		607		399		205		315	
91	Dissolved oxygen (mg/L) (avg)	3.72		23.19		3.04		1.72		0.96		2.76	
92													
93	**DIOXINS AND FURANS (ng/L)**												
94	**Method 8290**												
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA	
120													
121													
122													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D	
4			CB85A		CL03R		CT67L		DE87C		DM30P		DW48H		ED34B		EN00J		ER93N		EZ03H		FF88H		FL66F		FU45S	
5			8/31/00		11/8/00		2/14/01		6/5/01		8/13/01		11/29/01		2/28/02		6/27/02		08/27/02		11/12/02		2/13/03		5/9/03		8/28/03	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1													
2													
3		LW17D		LW17D		LW17D		LW17D		LW17D		LW17D	
4		FY82G		0402105-06		0408044-08		0411051-08		0502087-11		P5F0444-02	
5		10/23/03		2/20/04		8/06/04		11/9/04		2/18/05		6/10/05	
123	**PAHs (µg/L)**												
124	**EPA Method SW8270 SIM**												
125	Naphthalene	NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
3			LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D	
4			CB85B		CL03S		CT67M		DE87D		DM30O		DW48G		ED34C		EN00I		ER93O		EZ03G		FF76D		FL66G		FU45Q	
5			8/31/00		11/9/00		2/14/01		6/5/01		8/13/01		11/29/01		2/28/02		6/27/02		08/27/02		11/12/02		2/12/03		5/9/03		8/28/03	
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.26**		**0.44**		0.25	U	0.3	U	0.25	U	0.25	U	0.25	U	**0.58**	J
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
20	14	4-Methylphenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
21	15	Isophorone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
22	16	2,4-Dimethylphenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
23	17	Benzoic Acid	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
24	18	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
25	19	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
26	20	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
27	21	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
28	22	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
29	23	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
30	24	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
31	25	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
37	31	Carbon Disulfide	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
38	32	2-Butanone	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
39	33	Benzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
40	34	Bromoform	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
41	35	Toluene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
42	36	Ethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
43	37	Styrene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
44	38	m,p-Xylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
45	39	o-Xylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
46	40	1,3,5-Trimethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
47	41	1,2,4-Trimethylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
48	42	Isopropylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
49	43	n-Propylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
50	44	tert-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
51	45	sec-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
52	46	4-Isopropyltoluene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
53	47	n-Butylbenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
54	48	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
3		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D	
4		FY82F		0402105-07		0408044-04		0411051-05		0502087-08		P5F0444-01	
5		10/23/03		2/20/04		8/06/04		11/9/04		2/18/05		6/10/05	
7	**CHLORINATED PHENOLS (µg/L)**												
8	**EPA Method SW8040**												
9	Pentachlorophenol	**0.58**		0.488	U	0.5	U	0.5	U	0.507	U	0.495	U
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA	
16													
17	**SEMIVOLATILES (µg/L)**												
18	**EPA Method SW8270**												
19	Phenol	NA		NA		NA		NA		NA		5.00	U
20	4-Methylphenol	NA		NA		NA		NA		NA		5.00	U
21	Isophorone	NA		NA		NA		NA		NA		5.00	U
22	2,4-Dimethylphenol	NA		NA		NA		NA		NA		10.00	U
23	Benzoic Acid	NA		NA		NA		NA		NA		50.0	U
24	Naphthalene	NA		NA		NA		NA		NA		5.00	U
25	2-Methylnaphthalene	NA		NA		NA		NA		NA		5.00	U
26	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		5.00	U
27	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		5.00	U
28	Acenaphthene	NA		NA		NA		NA		NA		5.00	U
29	Dibenzofuran	NA		NA		NA		NA		NA		5.00	U
30	Fluorene	NA		NA		NA		NA		NA		5.00	U
31	Pentachlorophenol	NA		NA		NA		NA		NA		10	U
32	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA		10.00	U
33													
34	**VOLATILES (µg/L)**												
35	**EPA Method SW8260**												
36	Acetone	NA		NA		NA		NA		NA		25.0	U
37	Carbon Disulfide	NA		NA		NA		NA		NA		10.00	U
38	2-Butanone	NA		NA		NA		NA		NA		10.00	U
39	Benzene	NA		NA		NA		NA		NA		1.00	U
40	Bromoform	NA		NA		NA		NA		NA		1.00	U
41	Toluene	NA		NA		NA		NA		NA		1.00	U
42	Ethylbenzene	NA		NA		NA		NA		NA		1.00	U
43	Styrene	NA		NA		NA		NA		NA		1.00	U
44	m,p-Xylene	NA		NA		NA		NA		NA		2.00	U
45	o-Xylene	NA		NA		NA		NA		NA		1.00	U
46	1,3,5-Trimethylbenzene	NA		NA		NA		NA		NA		1.00	U
47	1,2,4-Trimethylbenzene	NA		NA		NA		NA		NA		1.00	U
48	Isopropylbenzene	NA		NA		NA		NA		NA		**76.3**	
49	n-Propylbenzene	NA		NA		NA		NA		NA		**60.7**	
50	tert-Butylbenzene	NA		NA		NA		NA		NA		**3.67**	
51	sec-Butylbenzene	NA		NA		NA		NA		NA		**11.0**	
52	4-Isopropyltoluene	NA		NA		NA		NA		NA		2.00	U
53	n-Butylbenzene	NA		NA		NA		NA		NA		**6.23**	
54	Naphthalene	NA		NA		NA		NA		NA		2.00	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		1.00	U
56													
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**												
58	**Method OR-DEQ**												
59	**TPH-Diesel**	NA		NA		NA		**2.32**		**2.8**		**0.498**	
60	**TPH-D Motor Oil**	NA		NA		NA		0.491	U	0.503	U	0.5	U
61	**TPH-Gasoline**	NA		NA		NA		**1.79**		**2.9**		**0.985**	J
62													
63	**PRIORITY POLLUTANT**												
64	**METALS (mg/L)**												
65	Arsenic (7060)	NA		NA		NA		NA		NA		**0.00345**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D	
4			CB85B		CL03S		CT67M		DE87D		DM30O		DW48G		ED34C		EN00I		ER93O		EZ03G		FF76D		FL66G		FU45Q	
5			8/31/00		11/9/00		2/14/01		6/5/01		8/13/01		11/29/01		2/28/02		6/27/02		08/27/02		11/12/02		2/12/03		5/9/03		8/28/03	
66	59	Chromium (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
67	60	Copper (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
68	61	Lead (7421)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
69	62	Nickel (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
70	63	Zinc (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86	79																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1													
2													
3		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D	
4		FY82F		0402105-07		0408044-04		0411051-05		0502087-08		P5F0444-01	
5		10/23/03		2/20/04		8/06/04		11/9/04		2/18/05		6/10/05	
66	Chromium (6010)	NA		NA		NA		NA		NA		0.001	U
67	Copper (6010)	NA		NA		NA		NA		NA		**0.00728**	
68	Lead (7421)	NA		NA		NA		NA		NA		**0.00124**	
69	Nickel (6010)	NA		NA		NA		NA		NA		**0.0031**	
70	Zinc (6010)	NA		NA		NA		NA		NA		**0.322**	
71													
72	**MAJOR IONS AND CONVENTIONALS**												
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		NA		NA		NA		NA	
81	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA	
86													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D	
4			CB85B		CL03S		CT67M		DE87D		DM30O		DW48G		ED34C		EN00I		ER93O		EZ03G		FF76D		FL66G		FU45Q	
5			8/31/00		11/9/00		2/14/01		6/5/01		8/13/01		11/29/01		2/28/02		6/27/02		08/27/02		11/12/02		2/12/03		5/9/03		8/28/03	
87	80	**FIELD PARAMETERS**																										
88	81	pH (avg)	6.48		6.12		6.08		6.38		6.60		6.44		6.26		6.45		6.64		6.57		6.83		6.62		6.79	
89	82	Temperature (° C) (avg)	14.1		12.8		13.9		14.7		15.2		13.8		14.5		15.5		16.0		14.6		14.4		15.1		18.8	
90	83	Conductivity (um/hos)	338		265		523		486		623		435		422		393		455		511		544		315		379	
91	84	Dissolved oxygen (mg/L) (avg)	2.14		1.25		0.37		0.69		1.82		3.27		7.60		4.42		0.82		0.69		0.88		1.78		0.98	
92	85																											
93	86	**DIOXINS AND FURANS (ng/L)**																										
94	87	**Method 8290**																										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1													
2													
3		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D	
4		FY82F		0402105-07		0408044-04		0411051-05		0502087-08		P5F0444-01	
5		10/23/03		2/20/04		8/06/04		11/9/04		2/18/05		6/10/05	
87	**FIELD PARAMETERS**												
88	pH (avg)	6.53		6.42		6.05		6.56		6.61		7.13	
89	Temperature (° C) (avg)	17.9		15.7		15.2		15		13.9		12.6	
90	Conductivity (um/hos)	425		206		487		369		211		145	
91	Dissolved oxygen (mg/L) (avg)	4.38		2.29		4.09		1.6		1.05		3.23	
92													
93	**DIOXINS AND FURANS (ng/L)**												
94	**Method 8290**												
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA	
120													
121													
122													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D	
4			CB85B		CL03S		CT67M		DE87D		DM30O		DW48G		ED34C		EN00I		ER93O		EZ03G		FF76D		FL66G		FU45Q	
5			8/31/00		11/9/00		2/14/01		6/5/01		8/13/01		11/29/01		2/28/02		6/27/02		08/27/02		11/12/02		2/12/03		5/9/03		8/28/03	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
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DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1													
2													
3		LW18D		LW18D		LW18D		LW18D		LW18D		LW18D	
4		FY82F		0402105-07		0408044-04		0411051-05		0502087-08		P5F0444-01	
5		10/23/03		2/20/04		8/06/04		11/9/04		2/18/05		6/10/05	
123	**PAHs (µg/L)**												
124	**EPA Method SW8270 SIM**												
125	Naphthalene	NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW20D		LW20D		LW20D		LW20D		LW20D		LW20D		LW20D	
4			FZ04N		0402115-03		0406050-10		0408056-10		0411059-03		0502110-07		P5F0666-04	
5			10/28/03		2/24/04		6/8/04		8/09/04		11/10/04		2/24/05		6/15/05	
6																
7	1	**CHLORINATED PHENOLS (µg/L)**														
8	2	**EPA Method SW8040**														
9	3	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
16	10															
17	11	**SEMIVOLATILES (µg/L)**														
18	12	**EPA Method SW8270**														
19	13	Phenol	2	U	2.05	U	2.08	U	2.13	U	1.9	U	2.02	U	5.00	U
20	14	4-Methylphenol	1	U	10.2	U	10.4	U	10.6	U	9.5	U	10.1	U	5.00	U
21	15	Isophorone	1	U	1.02	U	1.04	U	1.06	U	0.95	U	1.01	U	5.00	U
22	16	2,4-Dimethylphenol	3	U	3.07	U	3.12	U	3.19	U	2.85	U	3.03	U	10.00	U
23	17	Benzoic Acid	10	U	20.5	U	20.8	U	21.3	U	19	U	20.2	U	50.0	U
24	18	Naphthalene	1	U	1.02	U	1.04	U	1.06	U	0.95	U	1.01	U	5.00	U
25	19	2-Methylnaphthalene	1	U	1.02	U	1.04	U	1.06	U	0.95	U	1.01	U	5.00	U
26	20	2,4,6-Trichlorophenol	5	U	5.12	U	5.19	U	5.31	U	4.75	U	5.05	U	5.00	U
27	21	2,4,5-Trichlorophenol	5	U	5.12	U	5.19	U	5.31	U	4.75	U	5.05	U	5.00	U
28	22	Acenaphthene	1	U	1.02	U	1.04	U	1.06	U	0.95	U	1.01	U	5.00	U
29	23	Dibenzofuran	1	U	1.02	U	1.04	U	1.06	U	0.95	U	1.01	U	5.00	U
30	24	Fluorene	1	U	1.02	U	1.04	U	1.06	U	0.95	U	1.01	U	5.00	U
31	25	Pentachlorophenol	5	U	5.12	U	5.19	U	5.31	U	4.75	U	5.05	U	10	U
32	26	bis(2-Ethylhexyl)phthalate	**3.9**		1.02	U	1.04	U	**1.86**		0.95	U	**21.7**		10.00	U
33	27															
34	28	**VOLATILES (µg/L)**														
35	29	**EPA Method SW8260**														
36	30	Acetone	**6**	M	50	U	50	U	50	U	50	U	50	U	25.0	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U	2	U	2	U	10.00	U
38	32	2-Butanone	5	U	10	U	10	U	10	U	10	U	10	U	10.00	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U	0.3	U	0.3	U	1.00	U
40	34	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
41	35	Toluene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
43	37	Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
44	38	m,p-Xylene	1	U	2	U	2	U	2	U	2	U	2	U	2.00	U
45	39	o-Xylene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
48	42	Isopropylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
49	43	n-Propylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
51	45	sec-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
53	47	n-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	5.00	U
54	48	Naphthalene	5	U	1	U	1	U	1	U	1	U	**2.4**		2.00	U
55		Methyl tert-butyl ether	**1.5**		1	U	1	U	1	U	1	U	1	U	1.00	U
56	49															
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**														
58	51	**Method OR-DEQ**														
59	52	**TPH-Diesel**	**0.4**		**0.369**		**0.573**		**0.737**		**0.552**		**0.459**		0.25	U
60	53	**TPH-D Motor Oil**	0.5	U	0.492	U	0.504	U	0.506	U	**0.665**		0.768	U	0.5	U
61	54	**TPH-Gasoline**	0.25	U	0.1	U	0.1	U	**0.229**		0.1	U	0.162	U	0.08	U
62	55															
63	56	**PRIORITY POLLUTANT**														
64	57	**METALS (mg/L)**														
65	58	Arsenic (7060)	**0.021**		**0.029**		**0.027**		**0.0286**		**0.0297**		**0.033**		**0.0326**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW20D		LW20D		LW20D		LW20D		LW20D		LW20D		LW20D	
4			FZ04N		0402115-03		0406050-10		0408056-10		0411059-03		0502110-07		P5F0666-04	
5			10/28/03		2/24/04		6/8/04		8/09/04		11/10/04		2/24/05		6/15/05	
66	59	Chromium (6010)	0.005	U	**0.0206**		**0.0199**		**0.0271**		**0.022**		**0.0094**		**0.00392**	
67	60	Copper (6010)	**0.004**		0.01	U	0.01	U	**0.0957**		**0.0113**		0.01	U	**0.00589**	
68	61	Lead (7421)	0.001	U	**0.0020**		**0.0014**		**0.00305**		**0.00188**		**0.000426**		**0.00125**	
69	62	Nickel (6010)	0.01	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.00501**	
70	63	Zinc (6010)	**0.015**		**0.0113**		**0.0167**		**0.0674**		**0.0238**		0.01	U	**0.0108**	
71	64															
72	65	**MAJOR IONS AND CONVENTIONALS**														
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**220**		**244**		**222**		**260**		**248**	J	**360**		**269**	
81	74	Chloride (mg/L) (EPA 325.2)	**5.6**		**2.77**		**2.8**		**3.34**		**3.68**		**3.12**		**2.73**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA	
86	79															

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW20D		LW20D		LW20D		LW20D		LW20D		LW20D		LW20D	
4			FZ04N		0402115-03		0406050-10		0408056-10		0411059-03		0502110-07		P5F0666-04	
5			10/28/03		2/24/04		6/8/04		8/09/04		11/10/04		2/24/05		6/15/05	
87	80	**FIELD PARAMETERS**														
88	81	pH (avg)	6.62		6.74		6.82		6.23		7.02		7.01		6.77	
89	82	Temperature (° C) (avg)	15.8		14.1		14.8		15.7		14.2		15		15.8	
90	83	Conductivity (um/hos)	347		283		264		590		325		196		256	
91	84	Dissolved oxygen (mg/L) (avg)	2.04		2.67		1.19		2.23		1.81		0		0.09	
92	85															
93	86	**DIOXINS AND FURANS (ng/L)**														
94	87	**Method 8290**														
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA	
120																
121																
122																

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW20D		LW20D		LW20D		LW20D		LW20D		LW20D		LW20D	
4			FZ04N		0402115-03		0406050-10		0408056-10		0411059-03		0502110-07		P5F0666-04	
5			10/28/03		2/24/04		6/8/04		8/09/04		11/10/04		2/24/05		6/15/05	
123		**PAHs (µg/L)**														
124		**EPA Method SW8270 SIM**														
125		Naphthalene	0.1	U	0.0557	U	**0.06**		**0.1**		0.0476	U	**0.00509**		0.495	U
126		2-Methylnaphthalene	0.1	U	NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	0.1	U	0.0557	U	0.05	U	0.0502	U	0.0476	U	0.00509	U	0.495	U
128		Acenaphthene	0.1	U	0.0557	U	0.05	U	**0.11**		0.0476	U	**0.00509**		0.495	U
129		Fluorene	0.1	U	**0.078**		**0.17**		**0.0602**		0.0476	U	0.00509	U	0.495	U
130		Anthracene	0.1	U	0.0557	U	0.05	U	0.0502	U	0.0476	U	0.00509	U	0.495	U
131		Dibenzofuran	0.1	U	NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW22D		LW22D		LW22D		LW22D		LW22D		LW22D		LW22D	
4			FZ04A		0402115-10		0406040-03		0408056-03		0411059-04		0502099-04		P5F0554-02	
5			10/27/03		2/24/04		6/7/04		8/09/04		11/10/04		2/22/05		6/13/05	
6																
7	1	**CHLORINATED PHENOLS (µg/L)**														
8	2	**EPA Method SW8040**														
9	3	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
16	10															
17	11	**SEMIVOLATILES (µg/L)**														
18	12	**EPA Method SW8270**														
19	13	Phenol	**4.1**		2.05	U	1.9	U	2.02	U	1.96	U	2.07	U	5.00	U
20	14	4-Methylphenol	1.4	U	10.3	U	9.51	U	10.1	U	9.79	U	10.4	U	5.00	U
21	15	Isophorone	1.4	U	1.03	U	0.951	U	1.01	U	0.979	U	1.04	U	5.00	U
22	16	2,4-Dimethylphenol	4.2	U	3.08	U	2.85	U	3.03	U	2.94	U	3.11	U	10.00	U
23	17	Benzoic Acid	14	U	20.5	U	19	U	20.2	U	19.6	U	20.7	U	50.0	U
24	18	Naphthalene	1.4	U	1.03	U	0.951	U	1.01	U	0.979	U	1.04	U	5.00	U
25	19	2-Methylnaphthalene	1.4	U	1.03	U	0.951	U	1.01	U	0.979	U	1.04	U	5.00	U
26	20	2,4,6-Trichlorophenol	7	U	5.13	U	4.76	U	5.05	U	4.9	U	5.18	U	5.00	U
27	21	2,4,5-Trichlorophenol	7	U	5.13	U	4.76	U	5.05	U	4.9	U	5.18	U	5.00	U
28	22	Acenaphthene	1.4	U	1.03	U	0.951	U	1.01	U	0.979	U	1.04	U	5.00	U
29	23	Dibenzofuran	1.4	U	1.03	U	0.951	U	1.01	U	0.979	U	1.04	U	5.00	U
30	24	Fluorene	1.4	U	1.03	U	0.951	U	1.01	U	0.979	U	1.04	U	5.00	U
31	25	Pentachlorophenol	7	U	5.13	U	4.76	U	5.05	U	4.9	U	5.18	U	10.00	U
32	26	bis(2-Ethylhexyl)phthalate	1.4	U	1.03	U	0.951	U	1.01	U	0.979	U	1.04	U	10.00	U
33	27															
34	28	**VOLATILES (µg/L)**														
35	29	**EPA Method SW8260**														
36	30	Acetone	**5.2**	M	50	U	50	U	50	U	50	U	50	U	25.0	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U	2	U	2	U	10.00	U
38	32	2-Butanone	5	U	10	U	10	U	10	U	10	U	10	U	10.00	U
39	33	Benzene	**2.9**		0.4	U	0.3	U	0.3	U	0.3	U	0.3	U	1.00	U
40	34	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
41	35	Toluene	**1.6**		1	U	1	U	1	U	1	U	1	U	1.00	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
43	37	Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
44	38	m,p-Xylene	**1.6**		2	U	2	U	2	U	2	U	2	U	2.00	U
45	39	o-Xylene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
48	42	Isopropylbenzene	**14**		1	U	**13.8**		1	U	**1.38**		1	U	2.00	U
49	43	n-Propylbenzene	**12**		1	U	**5.59**		1	U	1	U	1	U	1.00	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
51	45	sec-Butylbenzene	**1.5**		1	U	**1.26**		1	U	1	U	1	U	1.00	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
53	47	n-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	5.00	U
54	48	Naphthalene	5	U	1	U	1	U	1	U	1	U	1	U	2.00	U
55		Methyl tert-butyl ether	**1.9**	M	1	U	1	U	1	U	**2.26**		1	U	1.00	U
56	49															
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**														
58	51	**Method OR-DEQ**														
59	52	**TPH-Diesel**	**2**		**0.429**		**3.43**		**1.75**		**1.61**		**1.23**		0.25	U
60	53	**TPH-D Motor Oil**	0.5	U	0.497	U	0.499	U	0.498	U	**1.29**		1.26	U	0.5	U
61	54	**TPH-Gasoline**	**0.54**		0.1	U	**0.239**		0.1	U	0.1	U	0.1	U	0.08	U
62	55															
63	56	**PRIORITY POLLUTANT**														
64	57	**METALS (mg/L)**														
65	58	Arsenic (7060)	**0.023**		**0.039**		**0.026**		**0.00774**		**0.0417**		**0.0234**		**0.0757**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW22D		LW22D		LW22D		LW22D		LW22D		LW22D		LW22D	
4			FZ04A		0402115-10		0406040-03		0408056-03		0411059-04		0502099-04		P5F0554-02	
5			10/27/03		2/24/04		6/7/04		8/09/04		11/10/04		2/22/05		6/13/05	
66	59	Chromium (6010)	**0.15**		**0.0195**		**0.0235**		**0.0194**		0.005	U	**0.0084**		**0.0339**	
67	60	Copper (6010)	**0.199**		**0.0114**		0.01	U	0.01	U	0.01	U	0.01	U	**0.0491**	
68	61	Lead (7421)	**0.056**		**0.0097**		**0.0037**		**0.00121**		**0.0028**		**0.00085**		**0.0213**	
69	62	Nickel (6010)	**0.14**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.0497**	
70	63	Zinc (6010)	**0.4**		**0.0361**		**0.0175**		**0.0123**		**0.0176**		0.01	U	**0.116**	
71	64															
72	65	**MAJOR IONS AND CONVENTIONALS**														
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**280**		**263**		**308**		**243**		**247**	J	**295**		**289**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.7**		**1.94**		**1.55**		**1.79**		**1.72**		**1.24**		**1.51**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA	
86	79															

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW22D		LW22D		LW22D		LW22D		LW22D		LW22D		LW22D	
4			FZ04A		0402115-10		0406040-03		0408056-03		0411059-04		0502099-04		P5F0554-02	
5			10/27/03		2/24/04		6/7/04		8/09/04		11/10/04		2/22/05		6/13/05	
87	80	**FIELD PARAMETERS**														
88	81	pH (avg)	6.65		6.53		5.19		5.61		6.56		6.43		5.89	
89	82	Temperature (° C) (avg)	17.2		14.5		14.6		15.4		14.5		15.4		14.6	
90	83	Conductivity (um/hos)	498		295		377		639		341		235		285	
91	84	Dissolved oxygen (mg/L) (avg)	4.51		2.82		3.19		2.34		2.57		1.79		5.90	
92	85															
93	86	**DIOXINS AND FURANS (ng/L)**														
94	87	**Method 8290**														
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA	
120																
121																
122																

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW22D		LW22D		LW22D		LW22D		LW22D		LW22D		LW22D	
4			FZ04A		0402115-10		0406040-03		0408056-03		0411059-04		0502099-04		P5F0554-02	
5			10/27/03		2/24/04		6/7/04		8/09/04		11/10/04		2/22/05		6/13/05	
123		**PAHs (µg/L)**														
124		**EPA Method SW8270 SIM**														
125		Naphthalene	0.14	U	0.0523	U	**0.106**		0.052	U	0.052	U	0.0501	U	0.100	U
126		2-Methylnaphthalene	0.14	U	NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	0.14	U	0.0523	U	0.0482	U	0.052	U	0.052	U	0.0501	U	0.100	U
128		Acenaphthene	1		0.0523	U	0.0482	U	0.052	U	0.052	U	0.0501	U	0.100	U
129		Fluorene	0.35		0.0523	U	0.0482	U	**0.166**		0.052	U	0.0501	U	0.100	U
130		Anthracene	0.14	U	0.0523	U	0.0482	U	0.052	U	0.052	U	0.0501	U	0.100	U
131		Dibenzofuran	0.14	U	NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW23D		LW23D		LW23D		LW23D		LW23D		LW23D		LW23D	
4			FZ04B		0402115-11		0406040-04		0408056-04		0411065-01		0502099-05		P5F0441-13	
5			10/27/03		2/24/04		6/7/04		8/09/04		11/11/04		2/22/05		6/10/05	
6																
7	1	**CHLORINATED PHENOLS (µg/L)**														
8	2	**EPA Method SW8040**														
9	3	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
16	10															
17	11	**SEMIVOLATILES (µg/L)**														
18	12	**EPA Method SW8270**														
19	13	Phenol	2	U	2.26	U	1.94	U	2.09	U	2.05	U	1.98	U	5.00	U
20	14	4-Methylphenol	1	U	11.3	U	9.68	U	10.5	U	10.2	U	9.89	U	5.00	U
21	15	Isophorone	1	U	1.13	U	0.968	U	1.05	U	1.02	U	0.989	U	5.00	U
22	16	2,4-Dimethylphenol	3	U	3.39	U	2.9	U	3.14	U	3.07	U	2.97	U	10.00	U
23	17	Benzoic Acid	10	U	22.6	U	19.4	U	20.9	U	20.5	U	19.8	U	50.0	U
24	18	Naphthalene	1	U	1.13	U	0.968	U	1.05	U	1.02	U	0.989	U	5.00	U
25	19	2-Methylnaphthalene	1	U	1.13	U	0.968	U	1.05	U	1.02	U	0.989	U	5.00	U
26	20	2,4,6-Trichlorophenol	5	U	5.66	U	4.84	U	5.24	U	5.12	U	4.95	U	5.00	U
27	21	2,4,5-Trichlorophenol	5	U	5.66	U	4.84	U	5.24	U	5.12	U	4.95	U	5.00	U
28	22	Acenaphthene	1	U	1.13	U	0.968	U	1.05	U	1.02	U	0.989	U	5.00	U
29	23	Dibenzofuran	1	U	1.13	U	0.968	U	1.05	U	1.02	U	0.989	U	5.00	U
30	24	Fluorene	1	U	1.13	U	0.968	U	1.05	U	1.02	U	0.989	U	5.00	U
31	25	Pentachlorophenol	5	U	5.66	U	4.84	U	5.24	U	5.12	U	4.95	U	10	U
32	26	bis(2-Ethylhexyl)phthalate	**6.8**		1.13	U	0.968	U	1.05	U	**3.52**		**1.26**		10.00	U
33	27															
34	28	**VOLATILES (µg/L)**														
35	29	**EPA Method SW8260**														
36	30	Acetone	**19**		50	U	50	U	50	U	50	U	50	U	25.0	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U	2	U	2	U	10.00	U
38	32	2-Butanone	5	U	10	U	10	U	10	U	10	U	10	U	10.00	U
39	33	Benzene	**40**		**22.9**		**132**		**26.1**		**12.1**		**8.76**		**64.6**	
40	34	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
41	35	Toluene	**1.2**		1	U	1	U	1	U	1	U	1	U	1.00	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
43	37	Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
44	38	m,p-Xylene	**1.2**		2	U	2	U	2	U	2	U	2	U	2.00	U
45	39	o-Xylene	1	U	1	U	1	U	1	U	**1.22**		1	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
48	42	Isopropylbenzene	**16**		**8.51**		**13.7**		**11.5**		**14.5**		**8.96**		**4.15**	
49	43	n-Propylbenzene	**8.6**		**6.71**		**6.9**		**5.51**		**4.79**		**5.75**		**1.53**	
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
51	45	sec-Butylbenzene	**3.3**		**1.12**		**2.86**		**1.6**		**2.08**		**1.57**		1.00	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
53	47	n-Butylbenzene	**1.6**		1	U	**1.4**		1	U	**1.45**		**4.49**		5.00	U
54	48	Naphthalene	5	U	1	U	1	U	1	U	1	U	1.64	U	2.00	U
55		Methyl tert-butyl ether	**33**		**17.4**		**51.2**		**3.17**		**7.93**		1	U	**10.9**	
56	49															
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**														
58	51	**Method OR-DEQ**														
59	52	**TPH-Diesel**	**2.9**		**1.53**		**4.44**		**3.21**		**2.94**		**2.75**		0.25	U
60	53	**TPH-D Motor Oil**	0.5	U	**0.648**		0.527	U	0.5	U	**1.2**		0.492	U	0.5	U
61	54	**TPH-Gasoline**	**0.88**		**0.67**		**0.732**		**0.562**		**1.23**		**0.598**		**0.241**	
62	55															
63	56	**PRIORITY POLLUTANT**														
64	57	**METALS (mg/L)**														
65	58	Arsenic (7060)	**0.021**		**0.042**		**0.044**		**0.0435**		**0.0574**		**0.0638**		**0.0472**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW23D		LW23D		LW23D		LW23D		LW23D		LW23D		LW23D	
4			FZ04B		0402115-11		0406040-04		0408056-04		0411065-01		0502099-05		P5F0441-13	
5			10/27/03		2/24/04		6/7/04		8/09/04		11/11/04		2/22/05		6/10/05	
66	59	Chromium (6010)	**0.135**		**0.0226**		**0.0248**		**0.0224**		**0.037**		**0.0122**		**0.0114**	
67	60	Copper (6010)	**0.201**		**0.0197**		0.01	U	**0.0372**		**0.0387**		0.01	U	**0.0182**	
68	61	Lead (7421)	**0.068**		**0.0085**		**0.0047**		**0.00792**		**0.0169**		**0.00494**		**0.00629**	
69	62	Nickel (6010)	**0.11**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.0122**	
70	63	Zinc (6010)	**0.348**		**0.0333**		**0.024**		**0.0431**		**0.0754**		**0.0213**		**0.0315**	
71	64															
72	65	**MAJOR IONS AND CONVENTIONALS**														
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**330**		**349**		**456**		**466**		**371**		**421**		**459**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.4**		**2.54**		**2.54**		**2.8**		**2.59**		**2.14**		**2.43**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA	
86	79															

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW23D		LW23D		LW23D		LW23D		LW23D		LW23D		LW23D	
4			FZ04B		0402115-11		0406040-04		0408056-04		0411065-01		0502099-05		P5F0441-13	
5			10/27/03		2/24/04		6/7/04		8/09/04		11/11/04		2/22/05		6/10/05	
87	80	**FIELD PARAMETERS**														
88	81	pH (avg)	6.78		6.85		5.51		6.13		6.86		6.61		7.01	
89	82	Temperature (° C) (avg)	15.8		13.9		14.5		13.8		14.5		14.6		13.9	
90	83	Conductivity (um/hos)	547		474		547		998		579		267		507	
91	84	Dissolved oxygen (mg/L) (avg)	0.35		1.11		3.01		2.46		0.68		1.63		4.64	
92	85															
93	86	**DIOXINS AND FURANS (ng/L)**														
94	87	**Method 8290**														
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA	
120																
121																
122																

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW23D		LW23D		LW23D		LW23D		LW23D		LW23D		LW23D	
4			FZ04B		0402115-11		0406040-04		0408056-04		0411065-01		0502099-05		P5F0441-13	
5			10/27/03		2/24/04		6/7/04		8/09/04		11/11/04		2/22/05		6/10/05	
123		**PAHs (µg/L)**														
124		**EPA Method SW8270 SIM**														
125		Naphthalene	0.1	U	**0.09**		**0.517**		**0.409**		**0.526**		0.339	U	0.400	U
126		2-Methylnaphthalene	0.1	U	NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	0.1	U	0.05	U	**0.0683**		**0.123**		**0.115**		**0.0896**		0.100	U
128		Acenaphthene	0.61		**0.16**		**0.429**		**0.86**		**0.698**		**0.508**		**0.356**	
129		Fluorene	0.31		**0.06**		**0.0585**		**0.246**		**0.277**		**0.239**		**0.160**	
130		Anthracene	0.11		0.05	U	0.0488	U	0.0512	U	0.0478	U	**0.0498**		0.100	U
131		Dibenzofuran	0.1	U	NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1																		
2																	Dup of LW24D	
3			LW24D		LW24D		LW24D		LW24D		LW24D		LW24D		LW24D		X	
4			FZ04U		0402115-07		0406040-07		0408056-06		0411065-02		0502088-06		P5F0554-07		P5F0554-06	
5			10/28/03		2/24/04		6/7/04		8/09/04		11/11/04		2/18/05		6/14/05		6/14/05	
7	1	**CHLORINATED PHENOLS (µg/L)**																
8	2	**EPA Method SW8040**																
9	3	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA	
16	10																	
17	11	**SEMIVOLATILES (µg/L)**																
18	12	**EPA Method SW8270**																
19	13	Phenol	2	U	2.14	U	1.9	U	2.08	U	1.91	U	2.02	U	5.00	U	5.00	U
20	14	4-Methylphenol	1	U	10.7	U	9.51	U	10.4	U	9.55	U	10.1	U	5.00	U	5.00	U
21	15	Isophorone	1	U	1.07	U	0.951	U	1.04	U	0.955	U	1.01	U	5.00	U	5.00	U
22	16	2,4-Dimethylphenol	3	U	3.22	U	2.85	U	3.12	U	2.87	U	3.02	U	10.00	U	10.00	U
23	17	Benzoic Acid	10	U	21.4	U	19	U	20.8	U	19.1	U	20.2	U	50.0	U	50.0	U
24	18	Naphthalene	1	U	1.07	U	0.951	U	1.04	U	0.955	U	1.01	U	5.00	U	5.00	U
25	19	2-Methylnaphthalene	1	U	1.07	U	0.951	U	1.04	U	0.955	U	1.01	U	5.00	U	5.00	U
26	20	2,4,6-Trichlorophenol	5	U	5.36	U	4.75	U	5.21	U	4.78	U	5.04	U	5.00	U	5.00	U
27	21	2,4,5-Trichlorophenol	5	U	5.36	U	4.75	U	5.21	U	4.78	U	5.04	U	5.00	U	5.00	U
28	22	Acenaphthene	1	U	**1.37**		**1.27**		**1.65**		**1.43**		**1.21**		5.00	U	5.00	U
29	23	Dibenzofuran	1	U	1.07	U	0.951	U	1.04	U	0.955	U	1.01	U	5.00	U	5.00	U
30	24	Fluorene	1	U	**3.55**		**3.06**		**4.04**		**3.47**		**2.79**		5.00	U	5.00	U
31	25	Pentachlorophenol	5	U	5.36	U	4.75	U	5.21	U	4.78	U	5.04	U	10	U	10	U
32	26	bis(2-Ethylhexyl)phthalate	**5.6**		1.07	U	**1.07**		**1.91**		**2.93**		1.01	U	10.00	U	10.00	U
33	27																	
34	28	**VOLATILES (µg/L)**																
35	29	**EPA Method SW8260**																
36	30	Acetone	5	U	50	U	50	U	50	U	50	U	50	U	25.0	U	25.0	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U	2	U	2	U	10.00	U	10.00	U
38	32	2-Butanone	5	U	10	U	10	U	10	U	10	U	10	U	10.00	U	10.00	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U	0.3	U	0.3	U	1.00	U	1.00	U
40	34	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U	1.00	U
41	35	Toluene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U	1.00	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U	1.00	U
43	37	Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U	1.00	U
44	38	m,p-Xylene	1	U	2	U	2	U	2	U	2	U	2	U	2.00	U	2.00	U
45	39	o-Xylene	1	U	1	U	1	U	1	U	**1.31**		1	U	1.00	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U	1.00	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U	1.00	U
48	42	Isopropylbenzene	**2.2**		**7.97**		**8.96**		**10.4**		**10.6**		**6.19**		**3.62**		**3.62**	
49	43	n-Propylbenzene	1	U	**12.8**		**11.5**		**13**		**10.3**		**8.13**		**3.65**		**3.60**	
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U	1.00	U
51	45	sec-Butylbenzene	**1.3**		**4.81**		**4.84**		**4.22**		**4.08**		**3.33**		**2.19**		**2.09**	
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U	2.00	U
53	47	n-Butylbenzene	1	U	**2.85**		**3.51**		**2.63**		**3.3**		**5.94**		5.00	U	5.00	U
54	48	Naphthalene	5	U	1	U	1	U	1	U	1	U	1	U	2.00	U	2.00	U
55		Methyl tert-butyl ether	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U	1.00	U
56	49																	
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																
58	51	**Method OR-DEQ**																
59	52	**TPH-Diesel**	**2.5**		**5.43**		**6.84**		**6.57**		**3.87**		**4.92**		NA		**0.655**	
60	53	**TPH-D Motor Oil**	0.5	U	**1.15**		0.541	U	0.575	U	**1.24**		0.498	U	NA		0.5	U
61	54	**TPH-Gasoline**	**0.92**		**1.5**		**1.23**		**0.948**		**1.64**		**0.958**		NA		**0.189**	
62	55																	
63	56	**PRIORITY POLLUTANT**																
64	57	**METALS (mg/L)**																
65	58	Arsenic (7060)	**0.009**		**0.066**		**0.058**		**0.043**		**0.0525**		**0.0841**		NA		**0.0465**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1																		
2																	Dup of LW24D	
3			LW24D		LW24D		LW24D		LW24D		LW24D		LW24D		LW24D		X	
4			FZ04U		0402115-07		0406040-07		0408056-06		0411065-02		0502088-06		P5F0554-07		P5F0554-06	
5			10/28/03		2/24/04		6/7/04		8/09/04		11/11/04		2/18/05		6/14/05		6/14/05	
66	59	Chromium (6010)	**0.125**		**0.0423**		**0.0421**		**0.0279**		**0.0422**		**0.0152**		NA		**0.0105**	
67	60	Copper (6010)	**0.163**		**0.0474**		**0.0256**		**0.0125**		**0.0424**		**0.0162**		NA		**0.0149**	
68	61	Lead (7421)	**0.058**		**0.0182**		**0.0126**		**0.00423**		**0.0256**		**0.0209**		NA		**0.00578**	
69	62	Nickel (6010)	**0.11**		**0.0096**		**0.0069**		**0.0088**		**0.0237**		0.005	U	NA		**0.013**	
70	63	Zinc (6010)	**0.327**		**0.102**		**0.0779**		**0.0905**		**0.124**		**0.0502**		NA		**0.0328**	
71	64																	
72	65	**MAJOR IONS AND CONVENTIONALS**																
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**340**		**277**		**350**		**268**		**347**		**289**		NA		**352**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.2**		**2.3**		**1.89**		**3.24**		**2.8**		**3.22**		NA		**3.06**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA	
86	79																	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1																		
2																	Dup of LW24D	
3			LW24D		LW24D		LW24D		LW24D		LW24D		LW24D		LW24D		X	
4			FZ04U		0402115-07		0406040-07		0408056-06		0411065-02		0502088-06		P5F0554-07		P5F0554-06	
5			10/28/03		2/24/04		6/7/04		8/09/04		11/11/04		2/18/05		6/14/05		6/14/05	
87	80	**FIELD PARAMETERS**																
88	81	pH (avg)	6.87		6.69		5.43		6.02		6.86		6.79		6.71		6.72	
89	82	Temperature (° C) (avg)	16.9		14.8		15.5		15.9		15		13.9		15.5		15.5	
90	83	Conductivity (um/hos)	494		440		426		793		457		201		397		397	
91	84	Dissolved oxygen (mg/L) (avg)	0.57		1.08		1.6		2.57		0.86		2.24		2.24		2.24	
92	85																	
93	86	**DIOXINS AND FURANS (ng/L)**																
94	87	**Method 8290**																
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA	
120																		
121																		
122																		

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1																		
2																	Dup of LW24D	
3			LW24D		LW24D		LW24D		LW24D		LW24D		LW24D		LW24D		X	
4			FZ04U		0402115-07		0406040-07		0408056-06		0411065-02		0502088-06		P5F0554-07		P5F0554-06	
5			10/28/03		2/24/04		6/7/04		8/09/04		11/11/04		2/18/05		6/14/05		6/14/05	
123		**PAHs (µg/L)**																
124		**EPA Method SW8270 SIM**																
125		Naphthalene	0.1	U	**0.749**		**0.87**		**0.409**		**0.829**		**0.587**		NA		2.00	U
126		2-Methylnaphthalene	0.1	U	NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	0.1	U	**0.375**		**0.303**		**0.517**		**0.357**		**0.324**		NA		1.00	U
128		Acenaphthene	0.91		**1.56**		**1.21**		**1.39**		**1.45**		**1.3**		NA		**1.27**	
129		Fluorene	0.7		**3.96**		**2.81**		**2.65**		**3.73**		**3.69**		NA		**3.01**	
130		Anthracene	0.43		**0.135**		**0.162**		**0.146**		**0.154**		**0.364**		NA		0.150	U
131		Dibenzofuran	0.1	U	NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW25D		LW25D		LW25D		LW25D		LW25D		LW25D		LW25D	
4			FZ04V		0402115-08		0406040-08		0408056-07		0411065-03		0502088-07		P5F0441-12	
5			10/28/03		2/24/04		6/7/04		8/09/04		11/11/04		2/18/05		6/10/05	
6																
7	1	**CHLORINATED PHENOLS (µg/L)**														
8	2	**EPA Method SW8040**														
9	3	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
16	10															
17	11	**SEMIVOLATILES (µg/L)**														
18	12	**EPA Method SW8270**														
19	13	Phenol	2.3	U	2.13	U	2.04	U	1.99	U	1.97	U	1.94	U	5.00	U
20	14	4-Methylphenol	1.2	U	10.7	U	10.2	U	9.96	U	9.84	U	9.69	U	5.00	U
21	15	Isophorone	1.2	U	1.07	U	1.02	U	0.996	U	0.984	U	0.969	U	5.00	U
22	16	2,4-Dimethylphenol	3.5	U	3.2	U	3.06	U	2.99	U	2.95	U	2.91	U	10.00	U
23	17	Benzoic Acid	12	U	21.3	U	20.4	U	19.9	U	19.7	U	19.4	U	50.0	U
24	18	Naphthalene	1.2	U	1.07	U	1.02	U	0.996	U	0.984	U	0.969	U	5.00	U
25	19	2-Methylnaphthalene	1.2	U	1.07	U	1.02	U	0.996	U	0.984	U	0.969	U	5.00	U
26	20	2,4,6-Trichlorophenol	5.8	U	5.34	U	5.11	U	4.98	U	4.92	U	4.84	U	5.00	U
27	21	2,4,5-Trichlorophenol	5.8	U	5.34	U	5.11	U	4.98	U	4.92	U	4.84	U	5.00	U
28	22	Acenaphthene	1.2	U	1.07	U	1.02	U	**1.93**		**1.4**		**1.03**		5.00	U
29	23	Dibenzofuran	1.2	U	1.07	U	1.02	U	0.996	U	0.984	U	0.969	U	5.00	U
30	24	Fluorene	1.2	U	1.29	U	1.02	U	**4.12**		**2.98**		**2.15**		5.00	U
31	25	Pentachlorophenol	5.8	U	5.34	U	5.11	U	4.98	U	4.92	U	4.84	U	10	U
32	26	bis(2-Ethylhexyl)phthalate	1.2	U	1.07	U	**3.53**		**2.95**		**5.88**		**4.57**		10.00	U
33	27															
34	28	**VOLATILES (µg/L)**														
35	29	**EPA Method SW8260**														
36	30	Acetone	5	U	50	U	50	U	50	U	50	U	50	U	25.0	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U	2	U	2	U	10.00	U
38	32	2-Butanone	5	U	10	U	10	U	10	U	10	U	10	U	10.00	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U	0.3	U	0.3	U	1.00	U
40	34	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
41	35	Toluene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
43	37	Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
44	38	m,p-Xylene	**1.6**		2	U	2	U	2	U	2	U	2	U	2.00	U
45	39	o-Xylene	1	U	1	U	1	U	1	U	**1.36**		1	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
48	42	Isopropylbenzene	**5.6**		**5.01**		**1.29**		**17.8**		**4.09**		1	U	2.00	U
49	43	n-Propylbenzene	**2**		1	U	1	U	**5.78**		1	U	1	U	1.00	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
51	45	sec-Butylbenzene	**1.2**		**2.43**		**1.4**		**4.59**		**1.77**		1	U	1.00	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
53	47	n-Butylbenzene	1	U	1	U	1	U	**1.87**		1	U	1	U	5.00	U
54	48	Naphthalene	5	U	1	U	1	U	1	U	1	U	1	U	2.00	U
55		Methyl tert-butyl ether	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
56	49															
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**														
58	51	**Method OR-DEQ**														
59	52	**TPH-Diesel**	**1.3**		**6.67**		**2.31**		**3.17**		**2.54**		**2.2**		**0.52**	
60	53	**TPH-D Motor Oil**	0.5	U	**1.32**		0.494	U	0.502	U	**1.04**		0.519	U	0.5	U
61	54	**TPH-Gasoline**	**0.43**		**0.88**		**0.409**	J	**0.98**		**1.38**		**0.526**		**0.182**	
62	55															
63	56	**PRIORITY POLLUTANT**														
64	57	**METALS (mg/L)**														
65	58	Arsenic (7060)	**0.032**		**0.026**		**0.028**		**0.0425**		**0.064**		**0.0951**		**0.0235**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW25D		LW25D		LW25D		LW25D		LW25D		LW25D		LW25D	
4			FZ04V		0402115-08		0406040-08		0408056-07		0411065-03		0502088-07		P5F0441-12	
5			10/28/03		2/24/04		6/7/04		8/09/04		11/11/04		2/18/05		6/10/05	
66	59	Chromium (6010)	**0.31**		**0.0517**		**0.0345**		**0.0161**		**0.0862**		**0.0199**		**0.00126**	
67	60	Copper (6010)	**0.373**		**0.0441**		**0.0179**		0.01	U	**0.0865**		**0.0196**		0.002	U
68	61	Lead (7421)	**0.15**		**0.0233**		**0.0108**		**0.00816**		**0.0658**		**0.0222**		**0.00186**	
69	62	Nickel (6010)	**0.28**		**0.0158**		**0.0084**		**0.0065**		**0.0603**		0.005	U	**0.00572**	
70	63	Zinc (6010)	**0.83**		**0.113**		**0.0647**		**0.0831**		**0.269**		**0.0594**		**0.00586**	
71	64															
72	65	**MAJOR IONS AND CONVENTIONALS**														
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**210**		**250**		**232**		**152**		**253**		**211**		**247**	
81	74	Chloride (mg/L) (EPA 325.2)	**12**		**1.96**		**1.51**		**2.13**		**2.26**		**1.92**		**1.63**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA	
86	79															

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW25D		LW25D		LW25D		LW25D		LW25D		LW25D		LW25D	
4			FZ04V		0402115-08		0406040-08		0408056-07		0411065-03		0502088-07		P5F0441-12	
5			10/28/03		2/24/04		6/7/04		8/09/04		11/11/04		2/18/05		6/10/05	
87	80	**FIELD PARAMETERS**														
88	81	pH (avg)	6.55		6.58		5.05		5.93		6.8		6.59		6.17	
89	82	Temperature (° C) (avg)	18.1		14.8		16		16.3		15.2		14.9		14.3	
90	83	Conductivity (um/hos)	290		381		232		456		384		207		411	
91	84	Dissolved oxygen (mg/L) (avg)	2.68		1.36		3.2		2.36		0.56		0.07		2.24	
92	85															
93	86	**DIOXINS AND FURANS (ng/L)**														
94	87	**Method 8290**														
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA	
120																
121																
122																

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW25D		LW25D		LW25D		LW25D		LW25D		LW25D		LW25D	
4			FZ04V		0402115-08		0406040-08		0408056-07		0411065-03		0502088-07		P5F0441-12	
5			10/28/03		2/24/04		6/7/04		8/09/04		11/11/04		2/18/05		6/10/05	
123		**PAHs (µg/L)**														
124		**EPA Method SW8270 SIM**														
125		Naphthalene	0.12	U	**0.352**		**0.397**		**0.478**		**0.694**		**0.55**		1.60	U
126		2-Methylnaphthalene	0.12	U	NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	0.12	U	**0.0771**		0.0509	U	**0.211**		**0.262**		**0.305**		0.400	U
128		Acenaphthene	0.45		**0.639**		**0.112**		**1.16**		**1.13**		**1.1**		**1.07**	
129		Fluorene	0.57		**0.738**		**0.285**		**1.98**		**2.57**		**2.9**		**2.14**	
130		Anthracene	0.12	U	**0.0771**		**0.214**		**0.289**		**0.231**		**0.448**		**0.257**	
131		Dibenzofuran	0.12	U	NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW26D		LW26D		LW26D		LW26D		LW26D		LW26D		LW26D	
4			FZ04T		0402115-05		0406040-06		0408066-01		0411059-05		0502110-04		P5F0666-08	
5			10/28/03		2/24/04		6/7/04		8/10/04		11/10/04		2/24/05		6/15/05	
6																
7	1	**CHLORINATED PHENOLS (µg/L)**														
8	2	**EPA Method SW8040**														
9	3	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
16	10															
17	11	**SEMIVOLATILES (µg/L)**														
18	12	**EPA Method SW8270**														
19	13	Phenol	2.2	U	2.22	U	1.94	U	2	U	1.95	U	1.97	U	5.00	U
20	14	4-Methylphenol	1.1	U	11.1	U	9.72	U	10	U	9.75	U	9.87	U	5.00	U
21	15	Isophorone	1.1	U	1.11	U	0.972	U	1	U	0.975	U	0.987	U	5.00	U
22	16	2,4-Dimethylphenol	3.3	U	3.33	U	2.92	U	3.01	U	2.92	U	2.96	U	10.00	U
23	17	Benzoic Acid	11	U	22.2	U	19.4	U	20	U	19.5	U	19.7	U	50.0	U
24	18	Naphthalene	1.1	U	1.11	U	0.972	U	1	U	0.975	U	0.987	U	5.00	U
25	19	2-Methylnaphthalene	1.1	U	1.11	U	0.972	U	1	U	0.975	U	0.987	U	5.00	U
26	20	2,4,6-Trichlorophenol	5.5	U	5.56	U	4.86	U	5.01	U	4.87	U	4.94	U	5.00	U
27	21	2,4,5-Trichlorophenol	5.5	U	5.56	U	4.86	U	5.01	U	4.87	U	4.94	U	5.00	U
28	22	Acenaphthene	1.1	U	1.11	U	0.972	U	1	U	0.975	U	0.987	U	5.00	U
29	23	Dibenzofuran	1.1	U	1.11	U	0.972	U	1	U	0.975	U	0.987	U	5.00	U
30	24	Fluorene	1.1	U	1.11	U	0.972	U	1	U	0.975	U	0.987	U	5.00	U
31	25	Pentachlorophenol	5.5	U	5.56	U	4.86	U	5.01	U	4.87	U	4.94	U	10	U
32	26	bis(2-Ethylhexyl)phthalate	1.1	U	1.11	U	0.972	U	**3.77**		0.975	U	**32.8**		10.00	U
33	27															
34	28	**VOLATILES (µg/L)**														
35	29	**EPA Method SW8260**														
36	30	Acetone	**11**		50	U	50	U	50	U	50	U	50	U	25.0	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U	2	U	2	U	10.00	U
38	32	2-Butanone	5	U	10	U	10	U	10	U	10	U	10	U	10.00	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U	**0.4**		**5.6**		1.00	U
40	34	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
41	35	Toluene	1	U	1	U	1	U	1	U	1	U	**1.02**		1.00	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
43	37	Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
44	38	m,p-Xylene	1	U	2	U	2	U	2	U	2	U	2	U	2.00	U
45	39	o-Xylene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
48	42	Isopropylbenzene	1	U	1	U	1	U	1	U	**1**		**7.35**		2.00	U
49	43	n-Propylbenzene	1	U	1	U	1	U	1	U	1	U	**4.47**		1.00	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
51	45	sec-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
53	47	n-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	5.00	U
54	48	Naphthalene	5	U	1	U	1	U	1	U	1	U	1	U	2.00	U
55		Methyl tert-butyl ether	**1.2**		1	U	1	U	**2.38**		**3.32**		**5.38**		**4.68**	
56	49															
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**														
58	51	**Method OR-DEQ**														
59	52	**TPH-Diesel**	**1.1**		**1.74**		**4.07**		**1.37**		**2.18**		**1.56**		0.25	U
60	53	**TPH-D Motor Oil**	0.5	U	**0.541**		0.491	U	0.497	U	**1.4**		0.491	U	0.5	U
61	54	**TPH-Gasoline**	**0.35**		**0.27**		**0.129**		**0.202**	J	**0.211**		**0.469**		**0.181**	
62	55															
63	56	**PRIORITY POLLUTANT**														
64	57	**METALS (mg/L)**														
65	58	Arsenic (7060)	**0.007**		**0.010**		**0.006**		**0.0112**		**0.0108**		**0.0152**		**0.00373**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW26D		LW26D		LW26D		LW26D		LW26D		LW26D		LW26D	
4			FZ04T		0402115-05		0406040-06		0408066-01		0411059-05		0502110-04		P5F0666-08	
5			10/28/03		2/24/04		6/7/04		8/10/04		11/10/04		2/24/05		6/15/05	
66	59	Chromium (6010)	**0.012**		**0.0159**		**0.0185**		**0.0171**		**0.0212**		**0.0119**		**0.00377**	
67	60	Copper (6010)	**0.016**		0.01	U	0.01	U	**0.0812**		**0.0132**		0.01	U	**0.00714**	
68	61	Lead (7421)	**0.006**		**0.0027**		**0.0021**		**0.0028**		**0.00353**		**0.0026**		**0.00219**	
69	62	Nickel (6010)	**0.01**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.00365**	
70	63	Zinc (6010)	**0.036**		**0.0116**		**0.0161**		**0.0173**		**0.0276**		**0.0174**		**0.0177**	
71	64															
72	65	**MAJOR IONS AND CONVENTIONALS**														
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**300**		**349**		**356**		**294**		**331**	J	**451**		**333**	
81	74	Chloride (mg/L) (EPA 325.2)	**18**		**2.84**		**2.6**		**2.97**		**2.93**		**2.36**		**2.86**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA	
86	79															

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW26D		LW26D		LW26D		LW26D		LW26D		LW26D		LW26D	
4			FZ04T		0402115-05		0406040-06		0408066-01		0411059-05		0502110-04		P5F0666-08	
5			10/28/03		2/24/04		6/7/04		8/10/04		11/10/04		2/24/05		6/15/05	
87	80	**FIELD PARAMETERS**														
88	81	pH (avg)	6.8		6.93		5.53		5.86		7.06		7.1		6.73	
89	82	Temperature (° C) (avg)	19.0		13		17.8		16.4		14		13.1		15.5	
90	83	Conductivity (um/hos)	509		388		397		704		442		219		265	
91	84	Dissolved oxygen (mg/L) (avg)	2.65		1.38		3.7		1.36		1.6		0		NA	
92	85															
93	86	**DIOXINS AND FURANS (ng/L)**														
94	87	**Method 8290**														
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA	
120																
121																
122																

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW26D		LW26D		LW26D		LW26D		LW26D		LW26D		LW26D	
4			FZ04T		0402115-05		0406040-06		0408066-01		0411059-05		0502110-04		P5F0666-08	
5			10/28/03		2/24/04		6/7/04		8/10/04		11/10/04		2/24/05		6/15/05	
123		**PAHs (µg/L)**														
124		**EPA Method SW8270 SIM**														
125		Naphthalene	0.11	U	**0.0843**		0.0482	U	0.0498	U	**0.0916**		**0.121**		0.500	U
126		2-Methylnaphthalene	0.11	U	NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	0.11	U	**0.116**		0.0482	U	0.0498	U	**0.0509**		0.0504	U	0.500	U
128		Acenaphthene	0.11	U	**0.0632**		0.0482	U	0.0498	U	**0.0509**		**0.0907**		0.500	U
129		Fluorene	0.11	U	**0.432**		0.0482	U	**0.129**		**0.204**		0.0504	U	0.500	U
130		Anthracene	0.11	U	0.0527	U	0.0482	U	0.0498	U	0.0509	U	0.0504	U	0.100	U
131		Dibenzofuran	0.11	U	NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW27D		LW27D		LW27D		LW27D		LW27D		LW27D		LW27D	
4			FZ04S		0402115-06		0406040-05		0408056-11		0411059-06		0502110-05		P5F0666-09	
5			10/28/03		2/24/04		6/7/04		8/09/04		11/10/04		2/24/05		6/15/05	
6																
7	1	**CHLORINATED PHENOLS (µg/L)**														
8	2	**EPA Method SW8040**														
9	3	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
16	10															
17	11	**SEMIVOLATILES (µg/L)**														
18	12	**EPA Method SW8270**														
19	13	Phenol	2.2	U	1.99	U	1.98	U	2.16	U	1.93	U	2.1	U	5.00	U
20	14	4-Methylphenol	1.1	U	9.93	U	9.89	U	10.8	U	9.67	U	10.5	U	5.00	U
21	15	Isophorone	1.1	U	0.993	U	0.989	U	1.08	U	0.967	U	1.05	U	5.00	U
22	16	2,4-Dimethylphenol	3.2	U	2.98	U	2.97	U	3.24	U	2.9	U	3.15	U	10.00	U
23	17	Benzoic Acid	11	U	19.9	U	19.8	U	21.6	U	19.3	U	21	U	50.0	U
24	18	Naphthalene	1.1	U	0.993	U	0.989	U	1.08	U	0.967	U	1.05	U	5.00	U
25	19	2-Methylnaphthalene	1.1	U	0.993	U	0.989	U	1.08	U	0.967	U	1.05	U	5.00	U
26	20	2,4,6-Trichlorophenol	5.4	U	4.97	U	4.95	U	5.39	U	4.84	U	5.25	U	5.00	U
27	21	2,4,5-Trichlorophenol	5.4	U	4.97	U	4.95	U	5.39	U	4.84	U	5.25	U	5.00	U
28	22	Acenaphthene	1.1	U	0.993	U	0.989	U	1.08	U	0.967	U	1.05	U	5.00	U
29	23	Dibenzofuran	1.1	U	0.993	U	0.989	U	1.08	U	0.967	U	1.05	U	5.00	U
30	24	Fluorene	1.1	U	0.993	U	0.989	U	1.08	U	0.967	U	1.05	U	5.00	U
31	25	Pentachlorophenol	5.4	U	4.97	U	4.95	U	5.39	U	4.84	U	5.25	U	10	U
32	26	bis(2-Ethylhexyl)phthalate	1.1	U	0.993	U	0.989	U	1.08	U	0.967	U	**17.8**		10.00	U
33	27															
34	28	**VOLATILES (µg/L)**														
35	29	**EPA Method SW8260**														
36	30	Acetone	**7.9**		50	U	50	U	50	U	50	U	50	U	25.0	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U	2	U	2	U	10.00	U
38	32	2-Butanone	5	U	10	U	10	U	10	U	10	U	10	U	10.00	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U	0.3	U	0.3	U	1.00	U
40	34	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
41	35	Toluene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
43	37	Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
44	38	m,p-Xylene	1	U	2	U	2	U	2	U	2	U	2	U	2.00	U
45	39	o-Xylene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
48	42	Isopropylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
49	43	n-Propylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
51	45	sec-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
53	47	n-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	5.00	U
54	48	Naphthalene	5	U	1	U	1	U	1	U	1	U	1	U	2.00	U
55		Methyl tert-butyl ether	1	U	1	U	1	U	1	U	**3.02**		**7.68**		**4.83**	
56	49															
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**														
58	51	**Method OR-DEQ**														
59	52	**TPH-Diesel**	**0.54**		**0.598**		**2.43**		**1.25**		**0.969**		**1.02**		0.788	U
60	53	**TPH-D Motor Oil**	0.5	U	0.497	U	0.557	U	0.539	U	**0.647**		0.509	U	0.5	U
61	54	**TPH-Gasoline**	0.25	U	0.1	U	**0.24**		**0.336**		**0.188**		0.11	U	0.08	U
62	55															
63	56	**PRIORITY POLLUTANT**														
64	57	**METALS (mg/L)**														
65	58	Arsenic (7060)	**0.006**		**0.006**		**0.007**		**0.00745**		**0.00534**		**0.0156**		**0.00483**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW27D		LW27D		LW27D		LW27D		LW27D		LW27D		LW27D	
4			FZ04S		0402115-06		0406040-05		0408056-11		0411059-06		0502110-05		P5F0666-09	
5			10/28/03		2/24/04		6/7/04		8/09/04		11/10/04		2/24/05		6/15/05	
66	59	Chromium (6010)	**0.009**		**0.0181**		**0.0203**		**0.0211**		**0.0177**		**0.112**		**0.00177**	
67	60	Copper (6010)	**0.02**		0.01	U	0.01	U	**0.0157**		0.01	U	**0.118**		**0.00341**	
68	61	Lead (7421)	**0.014**		**0.0021**		**0.0006**		**0.0019**		**0.00136**		**0.0407**		0.001	U
69	62	Nickel (6010)	**0.01**		0.005	U	0.005	U	0.005	U	0.005	U	**0.0821**		**0.00411**	
70	63	Zinc (6010)	**0.047**		**0.0145**		0.01	U	**0.0528**		**0.0173**		**0.299**		**0.00924**	
71	64															
72	65	**MAJOR IONS AND CONVENTIONALS**														
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**240**		**306**		**318**		**264**		**284**	J	**349**		**309**	
81	74	Chloride (mg/L) (EPA 325.2)	**24**		**7.2**		**3.72**		**3.43**		**2.85**		**2.87**		**2.97**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA	
86	79															

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW27D		LW27D		LW27D		LW27D		LW27D		LW27D		LW27D	
4			FZ04S		0402115-06		0406040-05		0408056-11		0411059-06		0502110-05		P5F0666-09	
5			10/28/03		2/24/04		6/7/04		8/09/04		11/10/04		2/24/05		6/15/05	
87	80	**FIELD PARAMETERS**														
88	81	pH (avg)	6.84		6.73		5.53		6.16		7.06		6.82		6.60	
89	82	Temperature (° C) (avg)	15.0		13.8		14.5		15.3		14.2		16		16.3	
90	83	Conductivity (um/hos)	329		345		363		609		372		207		323	
91	84	Dissolved oxygen (mg/L) (avg)	1.07		1.34		1.56		1.5		1.57		0		3.03	
92	85															
93	86	**DIOXINS AND FURANS (ng/L)**														
94	87	**Method 8290**														
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA	
120																
121																
122																

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW27D		LW27D		LW27D		LW27D		LW27D		LW27D		LW27D	
4			FZ04S		0402115-06		0406040-05		0408056-11		0411059-06		0502110-05		P5F0666-09	
5			10/28/03		2/24/04		6/7/04		8/09/04		11/10/04		2/24/05		6/15/05	
123		**PAHs (µg/L)**														
124		**EPA Method SW8270 SIM**														
125		Naphthalene	0.11	U	**0.0584**		**0.126**		**0.104**		**0.128**		**0.0749**		0.200	U
126		2-Methylnaphthalene	0.11	U	NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	0.11	U	0.0584	U	0.0484	U	0.0522	U	0.0492	U	0.0535	U	0.500	U
128		Acenaphthene	0.11	U	**0.0701**		**0.0871**		**0.104**		**0.0689**		0.0535	U	0.500	U
129		Fluorene	0.11	U	0.0584	U	0.0484	U	**0.146**		0.0492	U	0.0535	U	0.500	U
130		Anthracene	0.11	U	0.0584	U	0.0484	U	0.0522	U	0.0492	U	0.0535	U	0.100	U
131		Dibenzofuran	0.11	U	NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW29D		LW29D		LW29D		LW29D		LW29D		LW29D		LW29D	
4			FZ04D		0402080-07		0406050-07		0408006-07		0411047-03		0502059-01		P5F0343-05	
5			10/27/03		2/17/04		6/8/04		8/02/04		11/8/04		2/15/05		6/8/05	
6																
7	1	**CHLORINATED PHENOLS (µg/L)**														
8	2	**EPA Method SW8040**														
9	3	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
16	10															
17	11	**SEMIVOLATILES (µg/L)**														
18	12	**EPA Method SW8270**														
19	13	Phenol	2.1	U	1.92	UJ	1.97	U	2.03	U	2.02	U	1.92	U	5.00	U
20	14	4-Methylphenol	1	U	9.61	UJ	9.87	U	10.1	U	10.1	U	9.59	U	5.00	U
21	15	Isophorone	1	U	0.961	UJ	0.987	U	1.01	U	1.01	U	0.959	U	5.00	U
22	16	2,4-Dimethylphenol	3.1	U	2.88	UJ	2.96	U	3.04	U	3.03	U	2.88	U	10.00	U
23	17	Benzoic Acid	10	U	19.2	UJ	19.7	U	20.3	U	20.2	U	19.2	U	50.0	U
24	18	Naphthalene	1	U	0.961	UJ	0.987	U	1.01	U	1.01	U	0.959	U	5.00	U
25	19	2-Methylnaphthalene	1	U	0.961	UJ	0.987	U	1.01	U	1.01	U	0.959	U	5.00	U
26	20	2,4,6-Trichlorophenol	5.2	U	4.8	UJ	4.94	U	5.07	U	5.05	U	4.79	U	5.00	U
27	21	2,4,5-Trichlorophenol	5.2	U	4.8	UJ	4.94	U	5.07	U	5.05	U	4.79	U	5.00	U
28	22	Acenaphthene	1	U	0.961	UJ	0.987	U	1.01	U	1.01	U	0.959	U	5.00	U
29	23	Dibenzofuran	1	U	0.961	UJ	0.987	U	1.01	U	1.01	U	0.959	U	5.00	U
30	24	Fluorene	1	U	0.961	UJ	0.987	U	1.01	U	1.01	U	0.959	U	5.00	U
31	25	Pentachlorophenol	5.2	U	4.8	UJ	4.94	U	5.07	U	5.05	U	4.79	U	10	U
32	26	bis(2-Ethylhexyl)phthalate	1	U	2.13	UJ	0.987	U	**1.37**		**1.33**		0.959	U	10.00	U
33	27															
34	28	**VOLATILES (µg/L)**														
35	29	**EPA Method SW8260**														
36	30	Acetone	5	U	50	U	50	U	50	U	50	U	50	U	25.0	U
37	31	Carbon Disulfide	**1.1**		2	U	2	U	2	U	2	U	2	U	10.00	U
38	32	2-Butanone	5	U	10	U	10	U	10	U	10	U	10	U	10.00	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U	0.3	U	0.3	U	1.00	U
40	34	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
41	35	Toluene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
43	37	Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
44	38	m,p-Xylene	1	U	2	U	2	U	2	U	2	U	2	U	2.00	U
45	39	o-Xylene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
48	42	Isopropylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
49	43	n-Propylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
51	45	sec-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
53	47	n-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	5.00	U
54	48	Naphthalene	5	U	1	U	1	U	1	U	1	U	1	U	2.00	U
55		Methyl tert-butyl ether	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
56	49															
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**														
58	51	**Method OR-DEQ**														
59	52	**TPH-Diesel**	0.25	U	0.242	U	0.249	U	**0.306**		0.252	U	0.239	U	0.25	U
60	53	**TPH-D Motor Oil**	0.5	U	0.483	U	0.497	U	0.476	U	0.503	U	0.478	U	0.5	U
61	54	**TPH-Gasoline**	0.25	U	0.1	U	0.1	U	0.1	U	0.1	U	**0.106**		0.08	U
62	55															
63	56	**PRIORITY POLLUTANT**														
64	57	**METALS (mg/L)**														
65	58	Arsenic (7060)	**0.004**		**0.006**		**0.006**		**0.00694**		**0.00658**		**0.00823**		**0.0111**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW29D		LW29D		LW29D		LW29D		LW29D		LW29D		LW29D	
4			FZ04D		0402080-07		0406050-07		0408006-07		0411047-03		0502059-01		P5F0343-05	
5			10/27/03		2/17/04		6/8/04		8/02/04		11/8/04		2/15/05		6/8/05	
66	59	Chromium (6010)	**0.019**		**0.0137**		**0.0164**		**0.015**		**0.024**		**0.0088**		**0.00177**	
67	60	Copper (6010)	**0.019**		0.01	U	0.01	U	0.01	U	**0.0115**		0.01	U	0.002	U
68	61	Lead (7421)	**0.006**		**0.0017**		**0.0013**		**0.000613**		**0.00274**		**0.00132**		0.001	U
69	62	Nickel (6010)	**0.02**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.00459**	
70	63	Zinc (6010)	**0.04**		**0.0336**		**0.0105**		0.01	U	**0.0216**		0.01	U	**0.00809**	
71	64															
72	65	**MAJOR IONS AND CONVENTIONALS**														
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**370**		**391**		**432**		**362**		**462**		**405**		**443**	
81	74	Chloride (mg/L) (EPA 325.2)	**30**		**4.25**		**4.33**		**3.43**		**4.18**		**4.2**		**4.18**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA	
86	79															

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW29D		LW29D		LW29D		LW29D		LW29D		LW29D		LW29D	
4			FZ04D		0402080-07		0406050-07		0408006-07		0411047-03		0502059-01		P5F0343-05	
5			10/27/03		2/17/04		6/8/04		8/02/04		11/8/04		2/15/05		6/8/05	
87	80	**FIELD PARAMETERS**														
88	81	pH (avg)	6.69		7.14		7.02		6.05		6.89		7.13		6.98	
89	82	Temperature (° C) (avg)	16.0		13		14.5		14.7		14.3		12.6		16.8	
90	83	Conductivity (um/hos)	569		529		474		726		511		261		471	
91	84	Dissolved oxygen (mg/L) (avg)	3.36		2.18		1.41		NM		0.94		1.03		3.79	
92	85															
93	86	**DIOXINS AND FURANS (ng/L)**														
94	87	**Method 8290**														
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA	
120																
121																
122																

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW29D		LW29D		LW29D		LW29D		LW29D		LW29D		LW29D	
4			FZ04D		0402080-07		0406050-07		0408006-07		0411047-03		0502059-01		P5F0343-05	
5			10/27/03		2/17/04		6/8/04		8/02/04		11/8/04		2/15/05		6/8/05	
123		**PAHs (µg/L)**														
124		**EPA Method SW8270 SIM**														
125		Naphthalene	0.1	U	0.0489	UJ	0.05	U	0.05	U	0.0495	U	0.0479	U	0.100	U
126		2-Methylnaphthalene	0.1	U	NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	0.1	U	0.0489	UJ	0.05	U	0.05	U	0.0495	U	0.0479	U	0.100	U
128		Acenaphthene	0.1	U	0.0489	UJ	0.05	U	0.05	U	0.0495	U	0.0479	U	0.100	U
129		Fluorene	0.1	U	0.0489	UJ	0.05	U	0.05	U	0.0495	U	0.0479	U	0.100	U
130		Anthracene	0.1	U	0.0489	UJ	0.05	U	1.01	U	0.0495	U	0.0479	U	0.100	U
131		Dibenzofuran	0.1	U	NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW30D		LW30D		LW30D		LW30D		LW30D		LW30D		LW30D	
4			FZ04F		0402085-02		0406050-09		0408020-05		0411047-05		0502059-04		P5F0441-08	
5			10/27/03		2/18/04		6/8/04		8/03/04		11/8/04		2/15/05		6/9/05	
6																
7	1	**CHLORINATED PHENOLS (µg/L)**														
8	2	**EPA Method SW8040**														
9	3	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
16	10															
17	11	**SEMIVOLATILES (µg/L)**														
18	12	**EPA Method SW8270**														
19	13	Phenol	2.2	U	2.06	U	1.95	U	1.98	U	1.99	U	2.04	U	5.00	U
20	14	4-Methylphenol	1.1	U	10.3	U	9.76	U	9.92	U	9.97	U	10.2	U	5.00	U
21	15	Isophorone	1.1	U	1.03	U	0.976	U	0.992	U	0.997	U	1.02	U	5.00	U
22	16	2,4-Dimethylphenol	3.3	U	3.09	U	2.93	U	2.98	U	2.99	U	3.07	U	10.00	U
23	17	Benzoic Acid	11	U	20.6	U	19.5	U	19.8	U	19.9	U	20.4	U	50.0	U
24	18	Naphthalene	1.1	U	1.03	U	0.976	U	0.992	U	0.997	U	1.02	U	5.00	U
25	19	2-Methylnaphthalene	1.1	U	1.03	U	0.976	U	0.992	U	0.997	U	1.02	U	5.00	U
26	20	2,4,6-Trichlorophenol	5.6	U	5.15	U	4.88	U	4.96	U	4.99	U	5.11	U	5.00	U
27	21	2,4,5-Trichlorophenol	5.6	U	5.15	U	4.88	U	4.96	U	4.99	U	5.11	U	5.00	U
28	22	Acenaphthene	1.1	U	1.03	U	0.976	U	0.992	U	0.997	U	1.02	U	5.00	U
29	23	Dibenzofuran	1.1	U	1.03	U	0.976	U	0.992	U	0.997	U	1.02	U	5.00	U
30	24	Fluorene	1.1	U	1.03	U	0.976	U	0.992	U	0.997	U	1.02	U	5.00	U
31	25	Pentachlorophenol	5.6	U	5.15	U	4.88	U	4.96	U	4.99	U	5.11	U	10	U
32	26	bis(2-Ethylhexyl)phthalate	1.1	U	1.03	U	0.976	U	**1.73**		**2.04**		1.02	U	10.00	U
33	27															
34	28	**VOLATILES (µg/L)**														
35	29	**EPA Method SW8260**														
36	30	Acetone	**5.1**		50	UJ	50	U	50	U	50	U	50	U	25.0	U
37	31	Carbon Disulfide	1	U	**2.11**	J	2	U	2	U	2	U	2	U	10.00	U
38	32	2-Butanone	5	U	10	UJ	10	U	10	U	10	U	10	U	10.00	U
39	33	Benzene	1	U	0.4	UJ	0.3	U	0.3	U	0.3	U	0.3	U	1.00	U
40	34	Bromoform	1	U	1	UJ	1	U	1	U	1	U	1	U	1.00	U
41	35	Toluene	1	U	1	UJ	1	U	1	U	1	U	1	U	1.00	U
42	36	Ethylbenzene	1	U	1	UJ	1	U	1	U	1	U	1	U	1.00	U
43	37	Styrene	1	U	1	UJ	1	U	1	U	1	U	1	U	1.00	U
44	38	m,p-Xylene	1	U	2	UJ	2	U	2	U	2	U	2	U	2.00	U
45	39	o-Xylene	1	U	1	UJ	1	U	1	U	1	U	1	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	UJ	1	U	1	U	1	U	1	U	1.00	U
47	41	1,2,4-Trimethylbenzene	1	U	1	UJ	1	U	1	U	1	U	1	U	1.00	U
48	42	Isopropylbenzene	1	U	1	UJ	1	U	1	U	1	U	1	U	2.00	U
49	43	n-Propylbenzene	1	U	1	UJ	1	U	1	U	1	U	1	U	1.00	U
50	44	tert-Butylbenzene	1	U	1	UJ	1	U	1	U	1	U	1	U	1.00	U
51	45	sec-Butylbenzene	1	U	1	UJ	1	U	1	U	1	U	1	U	1.00	U
52	46	4-Isopropyltoluene	1	U	1	UJ	1	U	1	U	1	U	1	U	2.00	U
53	47	n-Butylbenzene	1	U	1	UJ	1	U	1	U	1	U	1	U	5.00	U
54	48	Naphthalene	5	U	1	UJ	1	U	1	U	1	U	1	U	2.00	U
55		Methyl tert-butyl ether	1	U	1	UJ	1	U	1	U	1	U	1	U	1.00	U
56	49															
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**														
58	51	**Method OR-DEQ**														
59	52	**TPH-Diesel**	0.25	U	**0.352**		**0.488**		**0.539**		**0.319**		**0.37**		0.25	U
60	53	**TPH-D Motor Oil**	0.5	U	0.493	U	0.517	U	0.478	U	0.525	U	0.545	U	0.5	U
61	54	**TPH-Gasoline**	0.25	U	0.1	U	0.1	U	0.1	U	0.1	U	**0.211**		0.08	UJ
62	55															
63	56	**PRIORITY POLLUTANT**														
64	57	**METALS (mg/L)**														
65	58	Arsenic (7060)	**0.01**		**0.009**		**0.015**		**0.0128**		**0.0128**		**0.0114**		**0.0144**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW30D		LW30D		LW30D		LW30D		LW30D		LW30D		LW30D	
4			FZ04F		0402085-02		0406050-09		0408020-05		0411047-05		0502059-04		P5F0441-08	
5			10/27/03		2/18/04		6/8/04		8/03/04		11/8/04		2/15/05		6/9/05	
66	59	Chromium (6010)	**0.026**		**0.0196**		**0.119**		0.005	U	**0.0442**		**0.0084**		**0.0134**	
67	60	Copper (6010)	**0.04**		**0.016**		**0.156**		0.01	U	**0.0385**		0.01	U	**0.0258**	
68	61	Lead (7421)	**0.008**		**0.0033**		**0.0292**		**0.00221**		**0.00785**		**0.00081**		**0.00501**	
69	62	Nickel (6010)	**0.03**		0.005	U	**0.0682**		0.005	U	0.005	U	0.005	U	**0.0154**	
70	63	Zinc (6010)	**0.07**		**0.0383**		**0.264**		**0.0504**		**0.0736**		**0.0107**		**0.0421**	
71	64															
72	65	**MAJOR IONS AND CONVENTIONALS**														
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**270**		**304**		**248**		**356**		**344**		**327**		**335**	
81	74	Chloride (mg/L) (EPA 325.2)	**7.3**		**8.36**		**7.41**		**7.88**		**6.54**		**6.28**		**6.44**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA	
86	79															

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW30D		LW30D		LW30D		LW30D		LW30D		LW30D		LW30D	
4			FZ04F		0402085-02		0406050-09		0408020-05		0411047-05		0502059-04		P5F0441-08	
5			10/27/03		2/18/04		6/8/04		8/03/04		11/8/04		2/15/05		6/9/05	
87	80	**FIELD PARAMETERS**														
88	81	pH (avg)	6.65		6.86		6.69		6.12		6.71		6.84		7.06	
89	82	Temperature (° C) (avg)	13.8		13.8		14.7		14.8		14.6		12.5		17.2	
90	83	Conductivity (um/hos)	426		450		478		677		476		285		416	
91	84	Dissolved oxygen (mg/L) (avg)	1.96		2		1.34		3.06		0.9		0.39		4.21	
92	85															
93	86	**DIOXINS AND FURANS (ng/L)**														
94	87	**Method 8290**														
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA	
120																
121																
122																

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW30D		LW30D		LW30D		LW30D		LW30D		LW30D		LW30D	
4			FZ04F		0402085-02		0406050-09		0408020-05		0411047-05		0502059-04		P5F0441-08	
5			10/27/03		2/18/04		6/8/04		8/03/04		11/8/04		2/15/05		6/9/05	
123		**PAHs (µg/L)**														
124		**EPA Method SW8270 SIM**														
125		Naphthalene	0.11	U	0.0506	U	0.05	U	0.05	U	0.05	U	0.0508	U	0.100	U
126		2-Methylnaphthalene	0.11	U	NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	0.11	U	0.0506	U	0.05	U	0.05	U	0.05	U	0.0508	U	0.100	U
128		Acenaphthene	0.11	U	0.0506	U	0.05	U	0.05	U	0.05	U	0.0508	U	0.100	U
129		Fluorene	0.11	U	0.0506	U	0.05	U	0.05	U	0.05	U	0.0508	U	0.100	U
130		Anthracene	0.11	U	0.0506	U	0.05	U	0.05	U	0.05	U	0.0508	U	0.100	U
131		Dibenzofuran	0.11	U	NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW32D		LW32D		LW32D		LW32D		LW32D		LW32D		LW32D	
4			FZ04I		0402080-06		0406050-05		0408006-05		0411052-04		0502056-03		P5F0343-02	
5			10/27/03		2/17/04		6/8/04		8/02/04		11/9/04		2/14/05		6/8/05	
6																
7	1	**CHLORINATED PHENOLS (µg/L)**														
8	2	**EPA Method SW8040**														
9	3	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
16	10															
17	11	**SEMIVOLATILES (µg/L)**														
18	12	**EPA Method SW8270**														
19	13	Phenol	2.1	U	1.93	U	2.02	U	2.02	U	1.96	U	1.9	U	5.00	U
20	14	4-Methylphenol	1.1	U	9.65	U	10.1	U	10.1	U	9.78	U	9.52	U	5.00	U
21	15	Isophorone	1.1	U	0.965	U	1.01	U	1.01	U	0.978	U	0.952	U	5.00	U
22	16	2,4-Dimethylphenol	3.2	U	2.9	U	3.04	U	3.03	U	2.93	U	2.86	U	10.00	U
23	17	Benzoic Acid	11	U	19.3	U	20.2	U	20.2	U	19.6	U	19	U	50.0	U
24	18	Naphthalene	1.1	U	0.965	U	1.01	U	1.01	U	0.978	U	0.952	U	5.00	U
25	19	2-Methylnaphthalene	1.1	U	0.965	U	1.01	U	1.01	U	0.978	U	0.952	U	5.00	U
26	20	2,4,6-Trichlorophenol	5.3	U	4.83	U	5.06	U	5.05	U	4.89	U	4.76	U	5.00	U
27	21	2,4,5-Trichlorophenol	5.3	U	4.83	U	5.06	U	5.05	U	4.89	U	4.76	U	5.00	U
28	22	Acenaphthene	1.1	U	0.965	U	1.01	U	1.01	U	0.978	U	0.952	U	5.00	U
29	23	Dibenzofuran	1.1	U	0.965	U	1.01	U	1.01	U	0.978	U	0.952	U	5.00	U
30	24	Fluorene	1.1	U	0.965	U	1.01	U	1.01	U	0.978	U	0.952	U	5.00	U
31	25	Pentachlorophenol	5.3	U	4.83	U	5.06	U	5.05	U	4.89	U	4.76	U	10	U
32	26	bis(2-Ethylhexyl)phthalate	**2.2**		2.51	U	**2.21**		**2.01**		**1.05**		0.952	U	10.00	U
33	27															
34	28	**VOLATILES (µg/L)**														
35	29	**EPA Method SW8260**														
36	30	Acetone	5	U	50	U	50	U	50	U	50	U	50	U	25.0	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U	2	U	2	U	10.00	U
38	32	2-Butanone	5	U	10	U	10	U	10	U	10	U	10	U	10.00	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U	0.3	U	0.3	U	1.00	U
40	34	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
41	35	Toluene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
43	37	Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
44	38	m,p-Xylene	1	U	2	U	2	U	2	U	2	U	2	U	2.00	U
45	39	o-Xylene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
48	42	Isopropylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
49	43	n-Propylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
51	45	sec-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
53	47	n-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	5.00	U
54	48	Naphthalene	5	U	1	U	1	U	1	U	1	U	1	U	2.00	U
55		Methyl tert-butyl ether	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
56	49															
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**														
58	51	**Method OR-DEQ**														
59	52	**TPH-Diesel**	**0.35**		**0.504**		**0.72**		**0.863**		**0.6**		**0.579**		0.25	U
60	53	**TPH-D Motor Oil**	0.5	U	0.491	U	0.559	U	0.496	U	**0.501**		0.5	U	0.5	U
61	54	**TPH-Gasoline**	0.25	U	0.1	U	0.1	U	0.1	U	**0.105**		**0.221**		0.08	U
62	55															
63	56	**PRIORITY POLLUTANT**														
64	57	**METALS (mg/L)**														
65	58	Arsenic (7060)	**0.004**		**0.009**		**0.010**		**0.01**		**0.0104**		**0.00956**		**0.00959**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW32D		LW32D		LW32D		LW32D		LW32D		LW32D		LW32D	
4			FZ04I		0402080-06		0406050-05		0408006-05		0411052-04		0502056-03		P5F0343-02	
5			10/27/03		2/17/04		6/8/04		8/02/04		11/9/04		2/14/05		6/8/05	
66	59	Chromium (6010)	**0.063**		**0.0202**		**0.0261**		**0.0183**		**0.0446**		**0.0093**		**0.00175**	
67	60	Copper (6010)	**0.082**		**0.0109**		0.01	U	0.01	U	**0.0305**		0.01	U	**0.00249**	
68	61	Lead (7421)	**0.018**		**0.0028**		**0.0020**		**0.00195**		**0.00582**		**0.0013**		**0.00162**	
69	62	Nickel (6010)	**0.05**		0.005	U	0.005	U	0.005	U	**0.013**		0.005	U	**0.00283**	
70	63	Zinc (6010)	**0.146**		**0.0251**		**0.0189**		**0.0238**		**0.0734**		0.01	U	**0.00992**	
71	64															
72	65	**MAJOR IONS AND CONVENTIONALS**														
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**270**		**332**		**343**		**272**		**345**		**338**		**361**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.7**		**2.77**		**2.92**		**2.72**		**3.18**		**2.83**		**3.53**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA	
86	79															

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW32D		LW32D		LW32D		LW32D		LW32D		LW32D		LW32D	
4			FZ04I		0402080-06		0406050-05		0408006-05		0411052-04		0502056-03		P5F0343-02	
5			10/27/03		2/17/04		6/8/04		8/02/04		11/9/04		2/14/05		6/8/05	
87	80	**FIELD PARAMETERS**														
88	81	pH (avg)	6.80		6.82		6.85		6.05		6.91		7.14		6.96	
89	82	Temperature (° C) (avg)	15.8		13.1		14.6		14.8		13.5		12.5		15.3	
90	83	Conductivity (um/hos)	436		474		421		646		467		278		397	
91	84	Dissolved oxygen (mg/L) (avg)	5.75		2.29		1.35		NM		1.76		1.01		4.26	
92	85															
93	86	**DIOXINS AND FURANS (ng/L)**														
94	87	**Method 8290**														
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA	
120																
121																
122																

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW32D		LW32D		LW32D		LW32D		LW32D		LW32D		LW32D	
4			FZ04I		0402080-06		0406050-05		0408006-05		0411052-04		0502056-03		P5F0343-02	
5			10/27/03		2/17/04		6/8/04		8/02/04		11/9/04		2/14/05		6/8/05	
123		**PAHs (µg/L)**														
124		**EPA Method SW8270 SIM**														
125		Naphthalene	0.11	U	0.0473	UJ	0.05	U	**0.07**		0.0498	U	0.0478	U	0.100	U
126		2-Methylnaphthalene	0.11	U	NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	0.11	U	0.0473	UJ	0.05	U	0.05	U	0.0498	U	0.0478	U	0.100	U
128		Acenaphthene	0.11	U	0.0473	UJ	0.05	U	0.05	U	0.0498	U	0.0478	U	0.100	U
129		Fluorene	0.11	U	0.0473	UJ	0.05	U	0.05	U	0.0498	U	0.0478	U	0.100	U
130		Anthracene	0.11	U	0.0473	UJ	0.05	U	0.05	U	0.0498	U	0.0478	U	0.100	U
131		Dibenzofuran	0.11	U	NA		NA		NA		NA		NA		NA	

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PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW35D		LW35D		LW35D		LW35D		LW35D		LW35D		LW35D	
4			FZ04K		0402115-09		0406040-02		0408056-02		0411059-07		0502099-08		P5F0554-03	
5			10/27/03		2/24/04		6/7/04		8/09/04		11/10/04		2/22/05		6/13/05	
6																
7	1	**CHLORINATED PHENOLS (µg/L)**														
8	2	**EPA Method SW8040**														
9	3	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
16	10															
17	11	**SEMIVOLATILES (µg/L)**														
18	12	**EPA Method SW8270**														
19	13	Phenol	2.9	U	1.99	U	2.01	U	1.95	U	2.05	U	2	U	5.56	U
20	14	4-Methylphenol	1.4	U	9.95	U	10	U	9.75	U	10.2	U	10	U	5.56	U
21	15	Isophorone	1.4	U	0.995	U	1	U	0.975	U	1.02	U	1	U	5.56	U
22	16	2,4-Dimethylphenol	4.3	U	2.99	U	3.01	U	2.92	U	3.07	U	3	U	11.1	U
23	17	Benzoic Acid	14	U	19.9	U	20.1	U	19.5	U	20.5	U	20	U	55.6	U
24	18	Naphthalene	1.4	U	0.995	U	1	U	0.975	U	1.02	U	1	U	5.56	U
25	19	2-Methylnaphthalene	1.4	U	0.995	U	1	U	0.975	U	1.02	U	1	U	5.56	U
26	20	2,4,6-Trichlorophenol	7.1	U	4.98	U	5.02	U	4.87	U	5.12	U	5	U	5.56	U
27	21	2,4,5-Trichlorophenol	7.1	U	4.98	U	5.02	U	4.87	U	5.12	U	5	U	5.56	U
28	22	Acenaphthene	1.4	U	0.995	U	1	U	0.975	U	1.02	U	1	U	5.56	U
29	23	Dibenzofuran	1.4	U	0.995	U	1	U	0.975	U	1.02	U	1	U	5.56	U
30	24	Fluorene	1.4	U	0.995	U	1	U	0.975	U	1.02	U	1	U	5.56	U
31	25	Pentachlorophenol	7.1	U	4.98	U	5.02	U	4.87	U	5.12	U	5	U	11.1	U
32	26	bis(2-Ethylhexyl)phthalate	**2.7**		0.995	U	1	U	0.975	U	**2.73**		**2.33**		11.1	U
33	27															
34	28	**VOLATILES (µg/L)**														
35	29	**EPA Method SW8260**														
36	30	Acetone	**7.9**	M	50	U	50	U	50	U	50	U	50	U	25.0	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U	2	U	2	U	10.00	U
38	32	2-Butanone	5	U	10	U	10	U	10	U	10	U	10	U	10.00	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U	0.3	U	0.3	U	1.00	U
40	34	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
41	35	Toluene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
43	37	Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
44	38	m,p-Xylene	1	U	2	U	2	U	2	U	2	U	2	U	2.00	U
45	39	o-Xylene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
48	42	Isopropylbenzene	**2.2**		**2.05**		1	U	1	U	1	U	1	U	2.00	U
49	43	n-Propylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
51	45	sec-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U	1	U	2.00	U
53	47	n-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	5.00	U
54	48	Naphthalene	5	U	1	U	1	U	1	U	1	U	1	U	2.00	U
55		Methyl tert-butyl ether	**1.5**		1	U	1	U	1	U	1	U	1	U	1.00	U
56	49															
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**														
58	51	**Method OR-DEQ**														
59	52	**TPH-Diesel**	**3.1**		**0.491**		**4.13**		**2.71**		**1.96**		**1.42**		0.25	U
60	53	**TPH-D Motor Oil**	0.5	U	0.486	U	0.492	U	0.48	U	**1.45**		1.35	U	0.5	U
61	54	**TPH-Gasoline**	0.25	U	0.1	U	**0.102**		0.1	U	0.1	U	0.1	U	0.08	U
62	55															
63	56	**PRIORITY POLLUTANT**														
64	57	**METALS (mg/L)**														
65	58	Arsenic (7060)	**0.018**		**0.002**		**0.004**		0.001	U	**0.0166**		**0.0063**		**0.00147**	

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DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW35D		LW35D		LW35D		LW35D		LW35D		LW35D		LW35D	
4			FZ04K		0402115-09		0406040-02		0408056-02		0411059-07		0502099-08		P5F0554-03	
5			10/27/03		2/24/04		6/7/04		8/09/04		11/10/04		2/22/05		6/13/05	
66	59	Chromium (6010)	**0.35**		**0.0165**		**0.0326**		**0.0172**		**0.051**		**0.0146**		**0.00365**	
67	60	Copper (6010)	**0.37**		0.01	U	**0.0107**		**0.0241**		**0.0354**		0.01	U	**0.00449**	
68	61	Lead (7421)	**0.12**		**0.0042**		**0.0082**		**0.00314**		**0.0307**		**0.00763**		**0.0031**	
69	62	Nickel (6010)	**0.32**		0.005	U	**0.0114**		**0.0186**		**0.0647**		**0.0058**		**0.0113**	
70	63	Zinc (6010)	**0.93**		**0.0128**		**0.0444**		**0.0427**		**0.168**		**0.0223**		**0.0146**	
71	64															
72	65	**MAJOR IONS AND CONVENTIONALS**														
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**240**		**263**		**364**		**322**		**868**	J	**423**		**324**	
81	74	Chloride (mg/L) (EPA 325.2)	**3.2**		**1.53**		**1.97**		**1.63**		**1.64**		**1.56**		**1.68**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA	
86	79															

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APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW35D		LW35D		LW35D		LW35D		LW35D		LW35D		LW35D	
4			FZ04K		0402115-09		0406040-02		0408056-02		0411059-07		0502099-08		P5F0554-03	
5			10/27/03		2/24/04		6/7/04		8/09/04		11/10/04		2/22/05		6/13/05	
87	80	**FIELD PARAMETERS**														
88	81	pH (avg)	6.51		6.44		5.19		5.59		6.79		6.62		6.13	
89	82	Temperature (° C) (avg)	14.9		13.3		13.8		14.1		13.4		13.8		14.0	
90	83	Conductivity (um/hos)	526		272		428		722		473		250		410	
91	84	Dissolved oxygen (mg/L) (avg)	0.58		4.29		2.15		3.09		2.67		1.91		8.83	
92	85															
93	86	**DIOXINS AND FURANS (ng/L)**														
94	87	**Method 8290**														
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA	
120																
121																
122																

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			LW35D		LW35D		LW35D		LW35D		LW35D		LW35D		LW35D	
4			FZ04K		0402115-09		0406040-02		0408056-02		0411059-07		0502099-08		P5F0554-03	
5			10/27/03		2/24/04		6/7/04		8/09/04		11/10/04		2/22/05		6/13/05	
123		**PAHs (µg/L)**														
124		**EPA Method SW8270 SIM**														
125		Naphthalene	0.14	U	0.0509	U	**0.133**		0.0487	U	0.0503	U	0.0482	U	0.100	U
126		2-Methylnaphthalene	0.14	U	NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	0.14	U	0.0509	U	0.0513	U	**0.0584**		0.0503	U	0.0482	U	0.100	U
128		Acenaphthene	0.14	U	0.0509	U	0.0513	U	0.0487	U	0.0503	U	0.0482	U	0.100	U
129		Fluorene	0.14	U	0.0509	U	0.0513	U	**0.477**		0.0503	U	0.0482	U	0.100	U
130		Anthracene	0.14	U	0.0509	U	0.0513	U	0.0487	U	**0.0603**		**0.0674**		0.100	U
131		Dibenzofuran	0.14	U	NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW36D		LW36D		LW36D	
4			0411059-08		0502088-01		P5F0441-04	
5			11/10/04		2/17/05		6/8/05	
7	1	**CHLORINATED PHENOLS (µg/L)**						
8	2	**EPA Method SW8040**						
9	3	Pentachlorophenol	NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA	
16	10							
17	11	**SEMIVOLATILES (µg/L)**						
18	12	**EPA Method SW8270**						
19	13	Phenol	1.98	U	1.9	U	5.00	U
20	14	4-Methylphenol	9.9	U	9.51	U	5.00	U
21	15	Isophorone	0.99	U	0.951	U	5.00	U
22	16	2,4-Dimethylphenol	2.97	U	2.85	U	10.00	U
23	17	Benzoic Acid	19.8	U	19	U	50.0	U
24	18	Naphthalene	0.99	U	0.951	U	5.00	U
25	19	2-Methylnaphthalene	0.99	U	0.951	U	5.00	U
26	20	2,4,6-Trichlorophenol	4.95	U	4.76	U	5.00	U
27	21	2,4,5-Trichlorophenol	4.95	U	4.76	U	5.00	U
28	22	Acenaphthene	0.99	U	0.951	U	5.00	U
29	23	Dibenzofuran	0.99	U	0.951	U	5.00	U
30	24	Fluorene	0.99	U	0.951	U	5.00	U
31	25	Pentachlorophenol	4.95	U	4.76	U	10	U
32	26	bis(2-Ethylhexyl)phthalate	0.99	U	0.951	U	10.00	U
33	27							
34	28	**VOLATILES (µg/L)**						
35	29	**EPA Method SW8260**						
36	30	Acetone	50	U	50	U	25.0	U
37	31	Carbon Disulfide	2	U	2	U	10.00	U
38	32	2-Butanone	10	U	10	U	10.00	U
39	33	Benzene	0.3	U	0.3	U	1.00	U
40	34	Bromoform	1	U	1	U	1.00	U
41	35	Toluene	1	U	1	U	1.00	U
42	36	Ethylbenzene	1	U	1	U	1.00	U
43	37	Styrene	1	U	1	U	1.00	U
44	38	m,p-Xylene	2	U	2	U	2.00	U
45	39	o-Xylene	1	U	1	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1.00	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1.00	U
48	42	Isopropylbenzene	1	U	1	U	2.00	U
49	43	n-Propylbenzene	1	U	1	U	1.00	U
50	44	tert-Butylbenzene	1	U	1	U	1.00	U
51	45	sec-Butylbenzene	1	U	1	U	1.00	U
52	46	4-Isopropyltoluene	1	U	1	U	2.00	U
53	47	n-Butylbenzene	1	U	1	U	5.00	U
54	48	Naphthalene	1	U	1	U	2.00	U
55		Methyl tert-butyl ether	1	U	1	U	1.00	U
56	49							
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**						
58	51	**Method OR-DEQ**						
59	52	**TPH-Diesel**	**0.252**		0.243	U	0.25	U
60	53	**TPH-D Motor Oil**	**0.58**		0.486	U	0.5	U
61	54	**TPH-Gasoline**	0.1	U	0.1	U	0.08	U
62	55							
63	56	**PRIORITY POLLUTANT**						
64	57	**METALS (mg/L)**						
65	58	Arsenic (7060)	0.001	U	0.001	U	**0.00106**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW36D		LW36D		LW36D	
4			0411059-08		0502088-01		P5F0441-04	
5			11/10/04		2/17/05		6/8/05	
66	59	Chromium (6010)	0.005	U	**0.0064**		0.001	U
67	60	Copper (6010)	0.01	U	0.01	U	0.002	U
68	61	Lead (7421)	0.00025	U	0.0001	U	0.001	U
69	62	Nickel (6010)	0.005	U	0.005	U	0.002	U
70	63	Zinc (6010)	0.01	U	0.01	U	0.005	U
71	64							
72	65	**MAJOR IONS AND CONVENTIONALS**						
73	66	Calcium (mg/L) (6010)	NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**180**	J	**78**		**84**	
81	74	Chloride (mg/L) (EPA 325.2)	**3.32**		**1.48**		**1.75**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA	
86	79							

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW36D		LW36D		LW36D	
4			0411059-08		0502088-01		P5F0441-04	
5			11/10/04		2/17/05		6/8/05	
87	80	**FIELD PARAMETERS**						
88	81	pH (avg)	6.84		6.81		6.75	
89	82	Temperature (° C) (avg)	16.2		11.6		15.8	
90	83	Conductivity (um/hos)	212		61		65	
91	84	Dissolved oxygen (mg/L) (avg)	1.84		2.25		3.65	
92	85							
93	86	**DIOXINS AND FURANS (ng/L)**						
94	87	**Method 8290**						
95	88	2,3,7,8-TCDF	NA		NA		NA	
96	89	Total TCDF	NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA	
98	91	Total TCDD	NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA	
118	111	OCDF	NA		NA		NA	
119	112	OCDD	NA		NA		NA	
120								
121								
122								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW36D		LW36D		LW36D	
4			0411059-08		0502088-01		P5F0441-04	
5			11/10/04		2/17/05		6/8/05	
123		**PAHs (µg/L)**						
124		**EPA Method SW8270 SIM**						
125		Naphthalene	0.0505	U	0.0478	U	0.100	U
126		2-Methylnaphthalene	NA		NA		NA	
127		Acenaphthylene	0.0505	U	0.0478	U	0.100	U
128		Acenaphthene	0.0505	U	0.0478	U	0.100	U
129		Fluorene	0.0505	U	0.0478	U	0.100	U
130		Anthracene	0.0505	U	0.0478	U	0.100	U
131		Dibenzofuran	NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW37D		LW37D		LW37D	
4			0411059-09		0502088-02		P5F0441-05	
5			11/10/04		2/17/05		6/8/05	
7	1	**CHLORINATED PHENOLS (µg/L)**						
8	2	**EPA Method SW8040**						
9	3	Pentachlorophenol	NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA	
16	10							
17	11	**SEMIVOLATILES (µg/L)**						
18	12	**EPA Method SW8270**						
19	13	Phenol	2.03	U	2.02	U	5.00	U
20	14	4-Methylphenol	10.1	U	10.1	U	5.00	U
21	15	Isophorone	1.01	U	1.01	U	5.00	U
22	16	2,4-Dimethylphenol	3.04	U	3.02	U	10.00	U
23	17	Benzoic Acid	20.3	U	20.2	U	50.0	U
24	18	Naphthalene	1.01	U	1.01	U	5.00	U
25	19	2-Methylnaphthalene	1.01	U	1.01	U	5.00	U
26	20	2,4,6-Trichlorophenol	5.07	U	5.04	U	5.00	U
27	21	2,4,5-Trichlorophenol	5.07	U	5.04	U	5.00	U
28	22	Acenaphthene	1.01	U	1.01	U	5.00	U
29	23	Dibenzofuran	1.01	U	1.01	U	5.00	U
30	24	Fluorene	1.01	U	1.01	U	5.00	U
31	25	Pentachlorophenol	5.07	U	5.04	U	10	U
32	26	bis(2-Ethylhexyl)phthalate	1.01	U	1.01	U	10.00	U
33	27							
34	28	**VOLATILES (µg/L)**						
35	29	**EPA Method SW8260**						
36	30	Acetone	50	U	50	U	25.0	U
37	31	Carbon Disulfide	2	U	2	U	10.00	U
38	32	2-Butanone	10	U	10	U	10.00	U
39	33	Benzene	0.3	U	0.3	U	1.00	U
40	34	Bromoform	1	U	1	U	1.00	U
41	35	Toluene	1	U	1	U	1.00	U
42	36	Ethylbenzene	1	U	1	U	1.00	U
43	37	Styrene	1	U	1	U	1.00	U
44	38	m,p-Xylene	2	U	2	U	2.00	U
45	39	o-Xylene	1	U	1	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1.00	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1.00	U
48	42	Isopropylbenzene	1	U	1	U	2.00	U
49	43	n-Propylbenzene	1	U	1	U	1.00	U
50	44	tert-Butylbenzene	1	U	1	U	1.00	U
51	45	sec-Butylbenzene	1	U	1	U	1.00	U
52	46	4-Isopropyltoluene	1	U	1	U	2.00	U
53	47	n-Butylbenzene	1	U	1	U	5.00	U
54	48	Naphthalene	1	U	1	U	2.00	U
55		Methyl tert-butyl ether	1	U	1	U	1.00	U
56	49							
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**						
58	51	**Method OR-DEQ**						
59	52	**TPH-Diesel**	0.25	U	0.248	U	0.25	U
60	53	**TPH-D Motor Oil**	0.5	U	0.495	U	0.5	U
61	54	**TPH-Gasoline**	0.1	U	0.1	U	0.08	U
62	55							
63	56	**PRIORITY POLLUTANT**						
64	57	**METALS (mg/L)**						
65	58	Arsenic (7060)	**0.00578**		0.001	U	0.001	U

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW37D		LW37D		LW37D	
4			0411059-09		0502088-02		P5F0441-05	
5			11/10/04		2/17/05		6/8/05	
66	59	Chromium (6010)	**0.0261**		**0.0078**		0.001	U
67	60	Copper (6010)	**0.0196**		0.01	U	0.002	U
68	61	Lead (7421)	**0.0098**		**0.000728**		0.001	U
69	62	Nickel (6010)	**0.0117**		0.005	U	0.002	U
70	63	Zinc (6010)	**0.0505**		0.01	U	0.005	U
71	64							
72	65	**MAJOR IONS AND CONVENTIONALS**						
73	66	Calcium (mg/L) (6010)	NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**90**	J	**79**		**86**	
81	74	Chloride (mg/L) (EPA 325.2)	**6.91**		**3.41**		**2.81**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA	
86	79							

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW37D		LW37D		LW37D	
4			0411059-09		0502088-02		P5F0441-05	
5			11/10/04		2/17/05		6/8/05	
87	80	**FIELD PARAMETERS**						
88	81	pH (avg)	7.1		7.12		6.30	
89	82	Temperature (° C) (avg)	14.5		10.8		14.4	
90	83	Conductivity (um/hos)	79		39		93	
91	84	Dissolved oxygen (mg/L) (avg)	2.19		3.39		9.97	
92	85							
93	86	**DIOXINS AND FURANS (ng/L)**						
94	87	**Method 8290**						
95	88	2,3,7,8-TCDF	NA		NA		NA	
96	89	Total TCDF	NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA	
98	91	Total TCDD	NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA	
118	111	OCDF	NA		NA		NA	
119	112	OCDD	NA		NA		NA	
120								
121								
122								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW37D		LW37D		LW37D	
4			0411059-09		0502088-02		P5F0441-05	
5			11/10/04		2/17/05		6/8/05	
123		**PAHs (µg/L)**						
124		**EPA Method SW8270 SIM**						
125		Naphthalene	0.054	U	0.0499	U	0.100	U
126		2-Methylnaphthalene	NA		NA		NA	
127		Acenaphthylene	0.054	U	0.0499	U	0.100	U
128		Acenaphthene	0.054	U	0.0499	U	0.100	U
129		Fluorene	0.054	U	0.0499	U	0.100	U
130		Anthracene	0.054	U	0.0499	U	0.100	U
131		Dibenzofuran	NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW38D		LW38D		LW38D	
4			0411059-10		0502088-03		P5F0441-03	
5			11/10/04		2/17/05		6/8/05	
6								
7	1	**CHLORINATED PHENOLS (µg/L)**						
8	2	**EPA Method SW8040**						
9	3	Pentachlorophenol	NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA	
16	10							
17	11	**SEMIVOLATILES (µg/L)**						
18	12	**EPA Method SW8270**						
19	13	Phenol	1.97	U	1.99	U	5.00	U
20	14	4-Methylphenol	9.84	U	9.97	U	5.00	U
21	15	Isophorone	0.984	U	0.997	U	5.00	U
22	16	2,4-Dimethylphenol	2.95	U	2.99	U	10.00	U
23	17	Benzoic Acid	19.7	U	19.9	U	50.0	U
24	18	Naphthalene	0.984	U	0.997	U	5.00	U
25	19	2-Methylnaphthalene	0.984	U	0.997	U	5.00	U
26	20	2,4,6-Trichlorophenol	4.92	U	4.99	U	5.00	U
27	21	2,4,5-Trichlorophenol	4.92	U	4.99	U	5.00	U
28	22	Acenaphthene	0.984	U	0.997	U	5.00	U
29	23	Dibenzofuran	0.984	U	0.997	U	5.00	U
30	24	Fluorene	0.984	U	0.997	U	5.00	U
31	25	Pentachlorophenol	4.92	U	4.99	U	10	U
32	26	bis(2-Ethylhexyl)phthalate	0.984	U	0.997	U	10.00	U
33	27							
34	28	**VOLATILES (µg/L)**						
35	29	**EPA Method SW8260**						
36	30	Acetone	50	U	50	U	25.0	U
37	31	Carbon Disulfide	2	U	2	U	10.00	U
38	32	2-Butanone	10	U	10	U	10.00	U
39	33	Benzene	0.3	U	0.3	U	1.00	U
40	34	Bromoform	1	U	1	U	1.00	U
41	35	Toluene	1	U	1	U	1.00	U
42	36	Ethylbenzene	1	U	1	U	1.00	U
43	37	Styrene	1	U	1	U	1.00	U
44	38	m,p-Xylene	2	U	2	U	2.00	U
45	39	o-Xylene	1	U	1	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1.00	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1.00	U
48	42	Isopropylbenzene	1	U	1	U	2.00	U
49	43	n-Propylbenzene	1	U	1	U	1.00	U
50	44	tert-Butylbenzene	1	U	1	U	1.00	U
51	45	sec-Butylbenzene	1	U	1	U	1.00	U
52	46	4-Isopropyltoluene	1	U	1	U	2.00	U
53	47	n-Butylbenzene	1	U	1	U	5.00	U
54	48	Naphthalene	1	U	1	U	2.00	U
55		Methyl tert-butyl ether	1	U	1	U	1.00	U
56	49							
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**						
58	51	**Method OR-DEQ**						
59	52	**TPH-Diesel**	**0.954**		**0.375**		0.25	U
60	53	**TPH-D Motor Oil**	**0.702**		0.475	U	0.5	U
61	54	**TPH-Gasoline**	**0.12**		0.1	U	0.08	U
62	55							
63	56	**PRIORITY POLLUTANT**						
64	57	**METALS (mg/L)**						
65	58	Arsenic (7060)	**0.00867**		**0.00391**		**0.00438**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW38D		LW38D		LW38D	
4			0411059-10		0502088-03		P5F0441-03	
5			11/10/04		2/17/05		6/8/05	
66	59	Chromium (6010)	**0.0138**		**0.008**		0.001	U
67	60	Copper (6010)	0.01	U	0.01	U	0.002	U
68	61	Lead (7421)	0.0002	U	**0.000117**		0.001	U
69	62	Nickel (6010)	0.005	U	0.005	U	0.002	U
70	63	Zinc (6010)	0.01	U	0.01	U	0.005	U
71	64							
72	65	**MAJOR IONS AND CONVENTIONALS**						
73	66	Calcium (mg/L) (6010)	NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**157**	J	**115**		**101**	
81	74	Chloride (mg/L) (EPA 325.2)	**6.2**		**2.76**		**4.10**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA	
86	79							

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW38D		LW38D		LW38D	
4			0411059-10		0502088-03		P5F0441-03	
5			11/10/04		2/17/05		6/8/05	
87	80	**FIELD PARAMETERS**						
88	81	pH (avg)	6.84		6.52		6.72	
89	82	Temperature (° C) (avg)	16.2		10.7		16.0	
90	83	Conductivity (um/hos)	159		81		80	
91	84	Dissolved oxygen (mg/L) (avg)	1.59		0		3.02	
92	85							
93	86	**DIOXINS AND FURANS (ng/L)**						
94	87	**Method 8290**						
95	88	2,3,7,8-TCDF	NA		NA		NA	
96	89	Total TCDF	NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA	
98	91	Total TCDD	NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA	
118	111	OCDF	NA		NA		NA	
119	112	OCDD	NA		NA		NA	
120								
121								
122								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW38D		LW38D		LW38D	
4			0411059-10		0502088-03		P5F0441-03	
5			11/10/04		2/17/05		6/8/05	
123		**PAHs (µg/L)**						
124		**EPA Method SW8270 SIM**						
125		Naphthalene	**0.08**		0.0515	U	0.100	U
126		2-Methylnaphthalene	NA		NA		NA	
127		Acenaphthylene	0.05	U	0.0515	U	0.100	U
128		Acenaphthene	**0.12**		**0.0515**		0.100	U
129		Fluorene	**0.19**		**0.0515**		0.100	U
130		Anthracene	0.05	U	0.0515	U	0.100	U
131		Dibenzofuran	NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2							Dup of LW39D			
3			LW39D		LW39D		Y		LW39D	
4			0411059-11		0502088-04		0502088-05		P5F0441-02	
5			11/10/04		2/17/05		2/17/05		6/8/05	
7	1	**CHLORINATED PHENOLS (µg/L)**								
8	2	**EPA Method SW8040**								
9	3	Pentachlorophenol	NA		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA	
16	10									
17	11	**SEMIVOLATILES (µg/L)**								
18	12	**EPA Method SW8270**								
19	13	Phenol	2.12	U	1.96	U	1.98	U	5.00	U
20	14	4-Methylphenol	10.6	U	9.78	U	9.9	U	5.00	U
21	15	Isophorone	1.06	U	0.978	U	0.99	U	5.00	U
22	16	2,4-Dimethylphenol	3.17	U	2.93	U	2.97	U	10.00	U
23	17	Benzoic Acid	21.2	U	19.6	U	19.8	U	50.0	U
24	18	Naphthalene	1.06	U	0.978	U	0.99	U	5.00	U
25	19	2-Methylnaphthalene	1.06	U	0.978	U	0.99	U	5.00	U
26	20	2,4,6-Trichlorophenol	5.29	U	4.89	U	4.95	U	5.00	U
27	21	2,4,5-Trichlorophenol	5.29	U	4.89	U	4.95	U	5.00	U
28	22	Acenaphthene	1.06	U	0.978	U	0.99	U	5.00	U
29	23	Dibenzofuran	1.06	U	0.978	U	0.99	U	5.00	U
30	24	Fluorene	1.06	U	0.978	U	0.99	U	5.00	U
31	25	Pentachlorophenol	5.29	U	4.89	U	4.95	U	10	U
32	26	bis(2-Ethylhexyl)phthalate	1.06	U	0.978	U	**1.25**		10.00	U
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	50	U	50	U	50	U	25.0	U
37	31	Carbon Disulfide	2	U	2	U	2	U	10.00	U
38	32	2-Butanone	10	U	10	U	10	U	10.00	U
39	33	Benzene	0.3	U	0.3	U	0.3	U	1.00	U
40	34	Bromoform	1	U	1	U	1	U	1.00	U
41	35	Toluene	1	U	1	U	1	U	1.00	U
42	36	Ethylbenzene	1	U	1	U	1	U	1.00	U
43	37	Styrene	1	U	1	U	1	U	1.00	U
44	38	m,p-Xylene	2	U	2	U	2	U	2.00	U
45	39	o-Xylene	1	U	1	U	1	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1.00	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1.00	U
48	42	Isopropylbenzene	1	U	1	U	1	U	2.00	U
49	43	n-Propylbenzene	1	U	1	U	1	U	1.00	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1.00	U
51	45	sec-Butylbenzene	1	U	1	U	1	U	1.00	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	2.00	U
53	47	n-Butylbenzene	1	U	1	U	1	U	5.00	U
54	48	Naphthalene	1	U	1	U	1	U	2.00	U
55		Methyl tert-butyl ether	1	U	1	U	1	U	1.00	U
56	49									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**								
58	51	**Method OR-DEQ**								
59	52	**TPH-Diesel**	**0.455**		0.247	U	**0.758**		0.25	U
60	53	**TPH-D Motor Oil**	**0.52**		0.494	U	0.509	U	0.5	U
61	54	**TPH-Gasoline**	**0.133**		0.1	U	0.1	U	0.08	U
62	55									
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	**0.0107**		**0.00292**		**0.00274**		**0.00105**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2							Dup of LW39D			
3			LW39D		LW39D		Y		LW39D	
4			0411059-11		0502088-04		0502088-05		P5F0441-02	
5			11/10/04		2/17/05		2/17/05		6/8/05	
66	59	Chromium (6010)	**0.0124**		**0.0063**		**0.0064**		0.001	U
67	60	Copper (6010)	0.01	U	0.01	U	0.01	U	0.002	U
68	61	Lead (7421)	**0.0003**		**0.000132**		**0.0001**		0.001	U
69	62	Nickel (6010)	0.005	U	0.005	U	0.005	U	**0.00365**	
70	63	Zinc (6010)	0.01	U	0.01	U	0.01	U	0.005	U
71	64									
72	65	**MAJOR IONS AND CONVENTIONALS**								
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**127**	J	**71**		**75**		**119**	
81	74	Chloride (mg/L) (EPA 325.2)	**5.1**		**3.74**		**3.74**		**4.00**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA	
86	79									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2							Dup of LW39D			
3			LW39D		LW39D		Y		LW39D	
4			0411059-11		0502088-04		0502088-05		P5F0441-02	
5			11/10/04		2/17/05		2/17/05		6/8/05	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.75		6.59		6.59		5.83	
89	82	Temperature (° C) (avg)	15.8		10.7		10.7		14.3	
90	83	Conductivity (um/hos)	154		68		68		132	
91	84	Dissolved oxygen (mg/L) (avg)	1.91		0.03		0.03		11.35	
92	85									
93	86	**DIOXINS AND FURANS (ng/L)**								
94	87	**Method 8290**								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA	
120										
121										
122										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2							Dup of LW39D			
3			LW39D		LW39D		Y		LW39D	
4			0411059-11		0502088-04		0502088-05		P5F0441-02	
5			11/10/04		2/17/05		2/17/05		6/8/05	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	**0.114**		0.0509	U	0.051	U	0.100	U
126		2-Methylnaphthalene	NA		NA		NA		NA	
127		Acenaphthylene	0.0517	U	0.0509	U	0.051	U	0.100	U
128		Acenaphthene	**0.145**		**0.061**		**0.0612**		0.100	U
129		Fluorene	0.0517	U	0.0509	U	0.051	U	0.100	U
130		Anthracene	0.0517	U	0.0509	U	0.051	U	0.100	U
131		Dibenzofuran	NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2									Dup of LW40D	
3			LW40D		LW40D		LW40D		Y	
4			0411150-01		0502099-09		P5F0554-05		P5F0554-01	
5			11/29/04		2/22/05		6/13/05		6/13/05	
7	1	**CHLORINATED PHENOLS (µg/L)**								
8	2	**EPA Method SW8040**								
9	3	Pentachlorophenol	NA		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA	
16	10									
17	11	**SEMIVOLATILES (µg/L)**								
18	12	**EPA Method SW8270**								
19	13	Phenol	2.13	U	2	U	5.00	U	5.00	U
20	14	4-Methylphenol	10.6	U	9.99	U	5.00	U	5.00	U
21	15	Isophorone	1.06	U	0.999	U	5.00	U	5.00	U
22	16	2,4-Dimethylphenol	3.19	U	3	U	10.00	U	10.00	U
23	17	Benzoic Acid	21.3	U	20	U	50.0	U	50.0	U
24	18	Naphthalene	1.06	U	0.999	U	5.00	U	5.00	U
25	19	2-Methylnaphthalene	1.06	U	0.999	U	5.00	U	5.00	U
26	20	2,4,6-Trichlorophenol	5.32	U	5	U	5.00	U	5.00	U
27	21	2,4,5-Trichlorophenol	5.32	U	5	U	5.00	U	5.00	U
28	22	Acenaphthene	1.06	U	0.999	U	5.00	U	5.00	U
29	23	Dibenzofuran	1.06	U	0.999	U	5.00	U	5.00	U
30	24	Fluorene	1.06	U	0.999	U	5.00	U	5.00	U
31	25	Pentachlorophenol	5.32	U	5	U	10	U	10	U
32	26	bis(2-Ethylhexyl)phthalate	1.06	U	**1.38**		10.00	U	10.00	U
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	50	U	50	U	25.0	U	25.0	U
37	31	Carbon Disulfide	2	U	2	U	10.00	U	10.00	U
38	32	2-Butanone	10	U	10	U	10.00	U	10.00	U
39	33	Benzene	0.3	U	0.3	U	1.00	U	1.00	U
40	34	Bromoform	1	U	1	U	1.00	U	1.00	U
41	35	Toluene	1	U	1	U	1.00	U	1.00	U
42	36	Ethylbenzene	1	U	1	U	1.00	U	1.00	U
43	37	Styrene	1	U	1	U	1.00	U	1.00	U
44	38	m,p-Xylene	2	U	2	U	2.00	U	2.00	U
45	39	o-Xylene	1	U	1	U	1.00	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1.00	U	1.00	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1.00	U	1.00	U
48	42	Isopropylbenzene	1	U	1	U	2.00	U	2.00	U
49	43	n-Propylbenzene	1	U	1	U	1.00	U	1.00	U
50	44	tert-Butylbenzene	1	U	1	U	1.00	U	1.00	U
51	45	sec-Butylbenzene	1	U	1	U	1.00	U	1.00	U
52	46	4-Isopropyltoluene	1	U	1	U	2.00	U	2.00	U
53	47	n-Butylbenzene	1	U	1	U	5.00	U	5.00	U
54	48	Naphthalene	1	U	1	U	2.00	U	2.00	U
55		Methyl tert-butyl ether	1	U	1	U	1.00	U	1.00	U
56	49									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**								
58	51	**Method OR-DEQ**								
59	52	**TPH-Diesel**	**0.263**		0.25	U	0.25	UJ	0.294	U
60	53	**TPH-D Motor Oil**	**0.672**		0.667	U	0.5	UJ	0.588	U
61	54	**TPH-Gasoline**	0.1	U	0.1	U	0.08	U	0.08	U
62	55									
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	**0.00411**		**0.00832**		**0.00422**		**0.00446**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2									Dup of LW40D	
3			LW40D		LW40D		LW40D		Y	
4			0411150-01		0502099-09		P5F0554-05		P5F0554-01	
5			11/29/04		2/22/05		6/13/05		6/13/05	
66	59	Chromium (6010)	**0.0071**		**0.0527**		**0.0265**		**0.0272**	
67	60	Copper (6010)	0.01	U	**0.0485**		**0.034**		**0.0347**	
68	61	Lead (7421)	**0.00167**		**0.0119**		**0.00808**		**0.00861**	
69	62	Nickel (6010)	**0.0211**		**0.0355**		**0.0319**		**0.0335**	
70	63	Zinc (6010)	**0.206**		**0.126**		**0.0753**		**0.077**	
71	64									
72	65	**MAJOR IONS AND CONVENTIONALS**								
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**200**		**178**		**189**		**191**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.42**		**2.15**		**2.08**		**2.04**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA	
86	79									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2									Dup of LW40D	
3			LW40D		LW40D		LW40D		Y	
4			0411150-01		0502099-09		P5F0554-05		P5F0554-01	
5			11/29/04		2/22/05		6/13/05		6/13/05	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.1		6.91		6.16		6.19	
89	82	Temperature (° C) (avg)	11.8		12.6		14.3		13.9	
90	83	Conductivity (um/hos)	207		99		140		140	
91	84	Dissolved oxygen (mg/L) (avg)	999		1.08		6.10		5.97	
92	85									
93	86	**DIOXINS AND FURANS (ng/L)**								
94	87	**Method 8290**								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA	
120										
121										
122										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2									Dup of LW40D	
3			LW40D		LW40D		LW40D		Y	
4			0411150-01		0502099-09		P5F0554-05		P5F0554-01	
5			11/29/04		2/22/05		6/13/05		6/13/05	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	0.09	U	0.0511	U	0.100	U	0.100	U
126		2-Methylnaphthalene	NA		NA		NA		NA	
127		Acenaphthylene	0.05	U	0.0511	U	0.100	U	0.100	U
128		Acenaphthene	0.05	U	0.0511	U	0.100	U	0.100	U
129		Fluorene	0.05	U	0.0511	U	0.100	U	0.100	U
130		Anthracene	0.05	U	0.0511	U	0.100	U	0.100	U
131		Dibenzofuran	NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW45D		LW45D		LW45D	
4			0411065-04		0502099-12		P5F0666-02	
5			11/11/04		2/22/05		6/15/05	
7	1	**CHLORINATED PHENOLS (µg/L)**						
8	2	**EPA Method SW8040**						
9	3	Pentachlorophenol	NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA	
16	10							
17	11	**SEMIVOLATILES (µg/L)**						
18	12	**EPA Method SW8270**						
19	13	Phenol	2.08	U	1.92	U	5.00	U
20	14	4-Methylphenol	10.4	U	9.62	U	5.00	U
21	15	Isophorone	1.04	U	0.962	U	5.00	U
22	16	2,4-Dimethylphenol	3.12	U	2.89	U	10.00	U
23	17	Benzoic Acid	20.8	U	19.2	U	50.0	U
24	18	Naphthalene	1.04	U	0.962	U	5.00	U
25	19	2-Methylnaphthalene	1.04	U	0.962	U	5.00	U
26	20	2,4,6-Trichlorophenol	5.19	U	4.81	U	5.00	U
27	21	2,4,5-Trichlorophenol	5.19	U	4.81	U	5.00	U
28	22	Acenaphthene	1.04	U	0.962	U	5.00	U
29	23	Dibenzofuran	1.04	U	0.962	U	5.00	U
30	24	Fluorene	1.06	U	0.962	U	5.00	U
31	25	Pentachlorophenol	5.19	U	4.81	U	10	U
32	26	bis(2-Ethylhexyl)phthalate	**3.97**		**7.91**		10.00	U
33	27							
34	28	**VOLATILES (µg/L)**						
35	29	**EPA Method SW8260**						
36	30	Acetone	50	U	50	U	25.0	U
37	31	Carbon Disulfide	2	U	2	U	10.00	U
38	32	2-Butanone	10	U	10	U	10.00	U
39	33	Benzene	**0.4**		0.3	U	1.00	U
40	34	Bromoform	1	U	1	U	1.00	U
41	35	Toluene	1	U	1	U	1.00	U
42	36	Ethylbenzene	1	U	1	U	1.00	U
43	37	Styrene	1	U	1	U	1.00	U
44	38	m,p-Xylene	2	U	2	U	2.00	U
45	39	o-Xylene	**1.53**		1	U	1.00	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1.00	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1.00	U
48	42	Isopropylbenzene	**18.3**		**2.38**		2.00	U
49	43	n-Propylbenzene	**4.92**		1	U	1.00	U
50	44	tert-Butylbenzene	1	U	1	U	1.00	U
51	45	sec-Butylbenzene	**2.85**		1	U	1.00	U
52	46	4-Isopropyltoluene	1	U	1	U	2.00	U
53	47	n-Butylbenzene	**1.33**		1	U	5.00	U
54	48	Naphthalene	1	U	1	U	2.00	U
55		Methyl tert-butyl ether	**1.88**		1	U	1.00	U
56	49							
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**						
58	51	**Method OR-DEQ**						
59	52	**TPH-Diesel**	**3.91**		**3.35**		0.25	U
60	53	**TPH-D Motor Oil**	**1.9**		1.48	U	0.5	U
61	54	**TPH-Gasoline**	**0.776**		**0.334**		0.08	U
62	55							
63	56	**PRIORITY POLLUTANT**						
64	57	**METALS (mg/L)**						
65	58	Arsenic (7060)	**0.0532**		**0.0902**		**0.0479**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW45D		LW45D		LW45D	
4			0411065-04		0502099-12		P5F0666-02	
5			11/11/04		2/22/05		6/15/05	
66	59	Chromium (6010)	**0.14**		**0.0171**		**0.0398**	
67	60	Copper (6010)	**0.12**		**0.0142**		**0.0409**	
68	61	Lead (7421)	**0.106**		**0.0776**		**0.0268**	
69	62	Nickel (6010)	**0.132**		**0.0125**		**0.0484**	
70	63	Zinc (6010)	**0.416**		**0.06**		**0.11**	
71	64							
72	65	**MAJOR IONS AND CONVENTIONALS**						
73	66	Calcium (mg/L) (6010)	NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**388**		**456**		**182**	
81	74	Chloride (mg/L) (EPA 325.2)	**0.51**		**1.87**		**1.54**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA	
86	79							

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW45D		LW45D		LW45D	
4			0411065-04		0502099-12		P5F0666-02	
5			11/11/04		2/22/05		6/15/05	
87	80	**FIELD PARAMETERS**						
88	81	pH (avg)	6.59		6.5		5.46	
89	82	Temperature (° C) (avg)	14		13.5		14.2	
90	83	Conductivity (um/hos)	597		268		166	
91	84	Dissolved oxygen (mg/L) (avg)	0.58		1.67		3.18	
92	85							
93	86	**DIOXINS AND FURANS (ng/L)**						
94	87	**Method 8290**						
95	88	2,3,7,8-TCDF	NA		NA		NA	
96	89	Total TCDF	NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA	
98	91	Total TCDD	NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA	
118	111	OCDF	NA		NA		NA	
119	112	OCDD	NA		NA		NA	
120								
121								
122								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			LW45D		LW45D		LW45D	
4			0411065-04		0502099-12		P5F0666-02	
5			11/11/04		2/22/05		6/15/05	
123		**PAHs (µg/L)**						
124		**EPA Method SW8270 SIM**						
125		Naphthalene	**0.557**		0.405	U	0.100	U
126		2-Methylnaphthalene	NA		NA		NA	
127		Acenaphthylene	**0.105**		**0.0709**		0.100	U
128		Acenaphthene	**0.473**		**0.263**		0.100	U
129		Fluorene	**0.935**		**0.233**		0.100	U
130		Anthracene	**5.44**		**3.75**		0.100	U
131		Dibenzofuran	NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
3			O		O		O		O		O		O		O		O		O		O		O		O		O	
4			S177M		T176J		U235P		V208J		W391L		Y314M		Z225S		Z960Y		AH27A		AU45O		BC30B		BH96A		BR64A	
5			4/1/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/16/00		5/23/00	
7	1	**CHLORINATED PHENOLS (µg/L)**																										
8	2	**EPA Method SW8040**																										
9	3	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16	10																											
17	11	**SEMIVOLATILES (µg/L)**																										
18	12	**EPA Method SW8270**																										
19	13	Phenol	**8.9**		**20**		**2.8**		2.0	U	2.0	U	2.0	U	**4.1**		2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.6**		**1.0**		1.0	U	**1.2**		1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	**2.2**		**2.0**		1.0	U	1.0	U	**1.6**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**2.2**		1.0	U	1.0	U	**1.9**		1.0	U	1.0	U	**1.7**	
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	**1.0**	J2	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	5.0	U	**6.2**		**9.4**		**6.0**		8.5	U	**7.0**		**27**		5.0	U	5.0	U	**17**		5.0	U	17	U	**6.7**	M
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**7.1**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
39	33	Benzene	**180**		**690**		**94**		1.0	U	1.0	U	**34**		**39**		**2.3**		**37**		**28**		1.0	U	1.0	U	1.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	**1.1**		**1.6**		1.0	U	1.0	U	**6.3**		**5.3**		1.0	U	1.0	U	**2.5**		1.0	U	**1.5**		1.0	U
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	1.0	U	1.0	U	**1.5**		1.0	U	1.0	U	**5.0**		**3.8**		1.0	U	1.0	U	**1.6**		1.0	U	**1.1**		1.0	U
45	39	o-Xylene	1.0	U	**1.3**		1.0	U	1.0	U	1.0	U	**1.6**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	**1.0**	J2	1.0	U	1.0	U	**2.2**		**4.7**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
48	42	Isopropylbenzene	1.0	U	**15**		**22**	J2	**1.2**		**18**		**28**		**71**		1.0	U	**2.2**		**20**		**7.8**		**27**		**6.0**	
49	43	n-Propylbenzene	1.0	U	**9.8**		**7.2**		1.0	U	1.0	U	**14**		**51**		1.0	U	**2.0**		**15**		**2.3**		**12**		**3.0**	
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.0**	J1	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	1.0	U	**7.7**		**6.1**	J2	**1.3**		**5.2**		**10**	J2	**7.4**		**8.5**		**7.9**		**6.4**		**1.6**		**4.3**		**6.9**	
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
53	47	n-Butylbenzene	1.0	U	**1.9**		**1.2**	J2	1.0	U	1.0	U	**2.9**		**3.7**		**1.4**		**2.9**		**2.7**		1.0	U	**1.1**		**1.0**	
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																											
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
58	51	**Method OR-DEQ**																										
59	52	**TPH-Diesel**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																											
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	58	Arsenic (7060)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
3		O		O		O		O		O		O		O		O		O		O		O		O		O		O	
4		CB85C		CL03P		CT55I		DE87A		DM30S		DW48E		ED23F		EM75L		ER93A		EY88A		FF88I		FL66B		FU45T		FY82Q	
5		8/30/00		11/8/00		2/13/01		6/5/01		8/14/01		11/29/01		2/26/02		6/25/02		08/26/02		11/11/02		2/13/03		5/9/03		8/28/03		10/24/03	
7	**CHLORINATED PHENOLS (µg/L)**																												
8	**EPA Method SW8040**																												
9	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
17	**SEMIVOLATILES (µg/L)**																												
18	**EPA Method SW8270**																												
19	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.2	U	2.2	U	2	U	2	U	2.3	U	2.1	U
20	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1.1	U	1	U
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1.1	U	1	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.3	U	3.3	U	3.1	U	3	U	3.4	U	3.1	U
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U	56	U	54	U	51	U	50	U	57	U	10	U
24	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1.1	U	1	U
25	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1.1	U	1	U
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5.4	U	5.1	U	5	U	5.7	U	5.2	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5.4	U	5.1	U	5	U	5.7	U	5.2	U
28	Acenaphthene	**1.9**		**1.8**		1.0	U	1.0	U	**1.3**		1.0	U	1.0	U	1.0	U	1.1	U	**1.7**		1	U	1	U	1.1	U	**1.2**	
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1.1	U	1	U
30	Fluorene	**2.9**		**3.5**		**2.0**		**1.6**		**1.6**		1.0	U	1.0	U	1.0	U	1.1	U	**2.1**		1	U	1	U	1.1	U	**1.8**	
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5.4	U	5.1	U	5	U	5.7	U	5.2	U
32	bis(2-Ethylhexyl)phthalate	1.0	U	**2.2**		1.0	U	**1.1**		**2.0**		1.0	U	4.0	U	4.0	U	4.4	U	4.3	U	1	U	1	U	1.1	U	1	U
34	**VOLATILES (µg/L)**																												
35	**EPA Method SW8260**																												
36	Acetone	**45**		**11**			R	**8.7**		5.0	U	5.0	U	5.0	U	**11**		**5.7**		5	U	5	U	5	U	**11**	J	**11**	
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5	U
39	Benzene	**18**		**7.7**		1.0	U	1.0	U	1.0	U	**1.0**		1.0	U	1.0	U	**2.6**		**40**		1	U	1	U	1	U	**1.5**	
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	**1.8**		**3.0**		**2.3**		**1.6**		**1.1**		**2.4**		1.0	U	1.0	U	1	U	**2.5**		1	U	1	U	**1.4**		**1.4**	
42	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	**1.3**		**2.6**		**2.6**		**1.9**		**1.1**		**2.5**		1.0	U	1.0	U	1	U	**2.1**		1	U	1	U	1	U	1	U
45	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	1.0	U	**1.4**		1.0	U	**1.4**		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	**26**		**33**		**26**		**37**		**32**		**64**		**31**		**30**		**5.6**		**46**		1	U	**3.4**		**27**		**27**	
49	n-Propylbenzene	**15**		**18**		**15**		**22**		**13**		**36**		**19**		**7.3**		**4.1**		**46**		1	U	**3.3**		**35**		**29**	
50	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	**5.1**		**6.7**		**4.4**		**5.7**		**5.0**		**6.3**		**6.6**		**5.5**		**5.9**		**7.7**		**1.5**		**5.4**		**8**		**5.6**	
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	**2.0**		**2.5**		**1.6**		**2.2**		**2.0**		**2.8**		**2.9**		**1.8**		**1.2**		**5.3**		1	U	1	U	**4.1**		**3**	
54	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																												
58	**Method OR-DEQ**																												
59	**TPH-Diesel**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
63	**PRIORITY POLLUTANT**																												
64	**METALS (mg/L)**																												
65	Arsenic (7060)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			O		O		O		O		O		O		O		O		O		O		O		O		O	
4			S177M		T176J		U235P		V208J		W391L		Y314M		Z225S		Z960Y		AH27A		AU45O		BC30B		BH96A		BR64A	
5			4/1/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/16/00		5/23/00	
66	59	Chromium (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
67	60	Copper (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
68	61	Lead (7421)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
69	62	Nickel (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
70	63	Zinc (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**330**	J2	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86	79																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
1																													
2																													
3		O		O		O		O		O		O		O		O		O		O		O		O		O		O	
4		CB85C		CL03P		CT55I		DE87A		DM30S		DW48E		ED23F		EM75L		ER93A		EY88A		FF88I		FL66B		FU45T		FY82Q	
5		8/30/00		11/8/00		2/13/01		6/5/01		8/14/01		11/29/01		2/26/02		6/25/02		08/26/02		11/11/02		2/13/03		5/9/03		8/28/03		10/24/03	
66	Chromium (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
67	Copper (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
68	Lead (7421)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
69	Nickel (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
70	Zinc (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
71																													
72	**MAJOR IONS AND CONVENTIONALS**																												
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
81	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86																													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			O		O		O		O		O		O		O		O		O		O		O		O		O	
4			S177M		T176J		U235P		V208J		W391L		Y314M		Z225S		Z960Y		AH27A		AU45O		BC30B		BH96A		BR64A	
5			4/1/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/16/00		5/23/00	
87	80	**FIELD PARAMETERS**																										
88	81	pH (avg)	6.77		6.82		6.86		6.79		6.43		6.39		6.32		6.62		5.57		6.70		6.27		6.62		6.39	
89	82	Temperature (° C) (avg)	12.3		15.7		13.6		14.2		14.1		15.0		13.3		14.6		15.0		17.8		13.0		15.0		15.6	
90	83	Conductivity (um/hos)	413		412		389		471		437		531		183		366		391		441		337		427		413	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		3.36		1.68		1.41		2.44		1.85		1.93		1.58		1.58		1.82	
92	85																											
93	86	**DIOXINS AND FURANS (ng/L)**																										
94	87	**Method 8290**																										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
1																													
2																													
3		O		O		O		O		O		O		O		O		O		O		O		O		O		O	
4		CB85C		CL03P		CT55I		DE87A		DM30S		DW48E		ED23F		EM75L		ER93A		EY88A		FF88I		FL66B		FU45T		FY82Q	
5		8/30/00		11/8/00		2/13/01		6/5/01		8/14/01		11/29/01		2/26/02		6/25/02		08/26/02		11/11/02		2/13/03		5/9/03		8/28/03		10/24/03	
87	**FIELD PARAMETERS**																												
88	pH (avg)	5.85		5.70		6.27		6.43		6.80		6.62		6.27		6.43		6.18		6.79		6.67		6.39		6.85		6.62	
89	Temperature (° C) (avg)	15.9		13.4		16.5		14.5		15.9		12.5		15.3		17.3		17.3		14.0		14.7		14		17.9		14.9	
90	Conductivity (um/hos)	409		437		445		510		563		536		500		471		464		592		431		327		514		467	
91	Dissolved oxygen (mg/L) (avg)	1.16		0.39		2.15		2.40		1.89		4.34		7.41		4.16		2.18		1.93		0		2.01		0.88		3.07	
92																													
93	**DIOXINS AND FURANS (ng/L)**																												
94	**Method 8290**																												
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																													
121																													
122																													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			O		O		O		O		O		O		O		O		O		O		O		O		O	
4			S177M		T176J		U235P		V208J		W391L		Y314M		Z225S		Z960Y		AH27A		AU45O		BC30B		BH96A		BR64A	
5			4/1/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/16/00		5/23/00	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		**0.47**		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		**0.31**		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		**0.92**		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		**0.28**	M	NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
1																													
2																													
3		O		O		O		O		O		O		O		O		O		O		O		O		O		O	
4		CB85C		CL03P		CT55I		DE87A		DM30S		DW48E		ED23F		EM75L		ER93A		EY88A		FF88I		FL66B		FU45T		FY82Q	
5		8/30/00		11/8/00		2/13/01		6/5/01		8/14/01		11/29/01		2/26/02		6/25/02		08/26/02		11/11/02		2/13/03		5/9/03		8/28/03		10/24/03	
123	**PAHs (µg/L)**																												
124	**EPA Method SW8270 SIM**																												
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB		
1																														
2																														
3			R		R		R		R		R		R		R		R		R		R		R		R		R			
4			S177N		T176K		U235Q		V208K		W391M		Y314N		Z225T		Z960Z		AH27B		AU45P		BC30C		BH96Y		BR64B			
5			4/1/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/16/00		5/23/00			
7	1	**CHLORINATED PHENOLS (µg/L)**																												
8	2	**EPA Method SW8040**																												
9	3	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
16	10																													
17	11	**SEMIVOLATILES (µg/L)**																												
18	12	**EPA Method SW8270**																												
19	13	Phenol	**18**		**8.4**		2.0	U	2.0	U	2.0	U	**6.1**		**22**		**16**		**3.8**		**6.3**		2.0	U	2.0	U	2.0	U		
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U		
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U		
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.6**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U		
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U		
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U		
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	**4.0**	J2	**2.8**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.0**		1.0	U	1.0	U		
33	27																													
34	28	**VOLATILES (µg/L)**																												
35	29	**EPA Method SW8260**																												
36	30	Acetone	5.0	U	**13**		**6.9**		5.0	U	**11**		**8.9**		**17**		15	U	**7.5**		5.0	U	5.0	U	14	U	5.0	U		
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	15	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U		
39	33	Benzene	**410**		**990**		**4.7**		1.0	U	**2.5**		**160**		**120**		**740**		**57**		**120**		1.0	U	**2.1**		**9.3**			
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
41	35	Toluene	1.0	U	2.9		1.0	U	1.0	U	1.0	U	**6.0**		**3.5**		3.0	U	1.0	U	**6.0**		1.0	U	**1.2**		1.0	U		
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**14**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
44	38	m,p-Xylene	1.0	U	2.9		1.0	U	1.0	U	1.0	U	**6.4**		**2.1**		**4.9**		1.0	U	**6.9**		1.0	U	1.0	U	1.0	U		
45	39	o-Xylene	1.0	U	1.8		1.0	U	1.0	U	1.0	U	**1.2**		1.0	U	3.0	U	1.0	U	**1.1**		1.0	U	1.0	U	1.0	U		
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.5**		**1.4**		**15**		1.0	U	**1.4**		1.0	U	1.0	U	1.0	U		
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**3.5**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
48	42	Isopropylbenzene	**2.6**		**16**		**5.1**	J2	1.0	U	**12**		**43**		**37**		**46**		**11**		**43**		1.0	U	**8.4**		**4.8**			
49	43	n-Propylbenzene	**1.7**		**3.7**		**1.6**		1.0	U	**2.4**		**19**		**19**		**51**		**3.9**		19	U	1.0	U	**5.4**		**1.2**			
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3.0		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
51	45	sec-Butylbenzene	**2.7**		**5.4**		**2.0**	J2	1.0	U	**3.2**		**5.1**	J2	**5.0**		**4.8**		**3.2**		**6.0**		1.0	U	**2.5**		**3.0**			
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
53	47	n-Butylbenzene	1.0	U	3.0		1.0	U	1.0	U	1.0	U	**2.3**		**1.4**		**16**		**1.0**		2.5	U	1.0	U	1.0	U	1.0	U		
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	15	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U		
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
56	49																													
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																												
58	51	**Method OR-DEQ**																												
59	52	**TPH-Diesel**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
62	55																													
63	56	**PRIORITY POLLUTANT**																												
64	57	**METALS (mg/L)**																												
65	58	Arsenic (7060)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
3		R		R		R		R		R		R		R		R		R		R		R		R		R		R	
4		CB85D		CL03Q		CT55J		DE87B		DM30T		DW48F		ED23G		EM75M		ER93B		EY88B		FF88J		FL66C		FU45U		FY82R	
5		8/30/00		11/8/00		2/13/01		6/5/01		8/14/01		11/29/01		2/26/02		6/25/02		08/26/02		11/11/02		2/13/03		5/9/03		8/28/03		10/24/03	
7	**CHLORINATED PHENOLS (µg/L)**																												
8	**EPA Method SW8040**																												
9	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																													
17	**SEMIVOLATILES (µg/L)**																												
18	**EPA Method SW8270**																												
19	Phenol	**8.4**		**6.4**		2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.1	U	2.2	U	2	U	2	U	2	U	2	U
20	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1	U
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.2	U	3.3	U	3	U	3	U	3	U	3	U
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U	53	U	54	U	50	U	50	U	50	U	10	U
24	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1	U
25	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1	U
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5.4	U	5	U	5	U	5	U	5	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5.4	U	5	U	5	U	5	U	5	U
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1	U
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.1	U	1	U	1	U	1	U	1	U
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	5.4	U	5	U	5	U	5	U	5	U
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	**1.6**		1.0	U	**5.4**		1.0	U	4.0	U	4.0	U	4.3	U	4.3	U	1	U	1	U	1	U	1	U
33																													
34	**VOLATILES (µg/L)**																												
35	**EPA Method SW8260**																												
36	Acetone	**22**		**12**			R	5.0	U	**10**		**5.0**		5.0	U	**11**		**14**		5	U	**7.4**		5	U	**18**	J	**16**	
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
38	2-Butanone	5.0	U	**5.0**	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5	U
39	Benzene	**120**		**77**		**36**		**3.1**		**13**		1.0	U	**41**		1.0	U	**32**		**7.7**		1	U	1	U	1	U	1	U
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	**6.3**		**3.6**		**3.0**		**2.9**		**2.8**		**1.5**		1.0	U	1.0	U	**2.9**		**1.6**		1	U	1	U	**2.4**		**2.5**	
42	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	**14**		**3.8**	
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	**5.8**		**2.4**		**1.8**		**4.1**		**3.4**		**1.6**		1.0	U	1.0	U	**3.5**		**1.4**		1	U	1	U	**26**	J	**9.4**	
45	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	**1.1**		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	**33**		**24**		**11**		**26**		**30**		**17**		**2.6**		**7.3**		**36**		**34**		**8.8**		1	U	**46**		**43**	
49	n-Propylbenzene	**18**		**14**		**5.1**		**9.1**		**16**		**6.8**		1.0	U	1.0	U	**14**		**20**		**3.3**		1	U	**37**		**20**	
50	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	**5.6**		**4.4**		**3.4**		**4.7**		**3.8**		**2.9**		**2.3**		**2.2**		**5.4**		**4.7**		**2**		**1.4**		**6.8**		**4.3**	
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	2.0	U	1.3	U	1.0	U	1.4	U	1.0	U	1.0	U	1.0	U	1.0	U	2.2	U	**2**		1	U	1	U	**3.9**		**1.7**	
54	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56																													
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																												
58	**Method OR-DEQ**																												
59	**TPH-Diesel**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																													
63	**PRIORITY POLLUTANT**																												
64	**METALS (mg/L)**																												
65	Arsenic (7060)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			R		R		R		R		R		R		R		R		R		R		R		R		R	
4			S177N		T176K		U235Q		V208K		W391M		Y314N		Z225T		Z960Z		AH27B		AU45P		BC30C		BH96Y		BR64B	
5			4/1/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/16/00		5/23/00	
66	59	Chromium (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
67	60	Copper (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
68	61	Lead (7421)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
69	62	Nickel (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
70	63	Zinc (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
71	64																											
72	65	**MAJOR IONS AND CONVENTIONALS**																										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**340**	J2	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86	79																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
1																													
2																													
3		R		R		R		R		R		R		R		R		R		R		R		R		R		R	
4		CB85D		CL03Q		CT55J		DE87B		DM30T		DW48F		ED23G		EM75M		ER93B		EY88B		FF88J		FL66C		FU45U		FY82R	
5		8/30/00		11/8/00		2/13/01		6/5/01		8/14/01		11/29/01		2/26/02		6/25/02		08/26/02		11/11/02		2/13/03		5/9/03		8/28/03		10/24/03	
66	Chromium (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
67	Copper (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
68	Lead (7421)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
69	Nickel (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
70	Zinc (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
71																													
72	**MAJOR IONS AND CONVENTIONALS**																												
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
81	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
86																													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			R		R		R		R		R		R		R		R		R		R		R		R		R	
4			S177N		T176K		U235Q		V208K		W391M		Y314N		Z225T		Z960Z		AH27B		AU45P		BC30C		BH96Y		BR64B	
5			4/1/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/16/00		5/23/00	
87	80	**FIELD PARAMETERS**																										
88	81	pH (avg)	6.66		6.78		6.72		6.84		6.60		6.55		6.36		6.06		5.72		6.87		6.86		6.75		6.42	
89	82	Temperature (° C) (avg)	12.8		15.8		14.1		14.3		14.8		15.0		13.5		14.4		15.2		16.5		15.7		14.1		15.8	
90	83	Conductivity (um/hos)	503		629		1007		319		510		591		179		246		471		566		578		533		502	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		3.54		1.35		1.16		2.27		1.61		2.26		1.33		0.93		2.10	
92	85																											
93	86	**DIOXINS AND FURANS (ng/L)**																										
94	87	**Method 8290**																										
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																												
121																												
122																												

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
1																													
2																													
3		R		R		R		R		R		R		R		R		R		R		R		R		R		R	
4		CB85D		CL03Q		CT55J		DE87B		DM30T		DW48F		ED23G		EM75M		ER93B		EY88B		FF88J		FL66C		FU45U		FY82R	
5		8/30/00		11/8/00		2/13/01		6/5/01		8/14/01		11/29/01		2/26/02		6/25/02		08/26/02		11/11/02		2/13/03		5/9/03		8/28/03		10/24/03	
87	**FIELD PARAMETERS**																												
88	pH (avg)	6.10		5.91		6.43		6.88		7.00		6.68		5.95		6.64		6.75		NM		6.88		6.23		7.01		6.75	
89	Temperature (° C) (avg)	15.0		13.5		15.4		14.5		15.1		14.2		14.5		15.2		15.8		NM		14.6		13.7		17		15.5	
90	Conductivity (um/hos)	560		571		661		694		628		600		170		591		631		NM		598		244		630		644	
91	Dissolved oxygen (mg/L) (avg)	1.90		0.69		2.01		1.49		1.26		4.02		7.80		4.86		1.19		NM		0		3.12		0.44		3.62	
92																													
93	**DIOXINS AND FURANS (ng/L)**																												
94	**Method 8290**																												
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																													
121																													
122																													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1																												
2																												
3			R		R		R		R		R		R		R		R		R		R		R		R		R	
4			S177N		T176K		U235Q		V208K		W391M		Y314N		Z225T		Z960Z		AH27B		AU45P		BC30C		BH96Y		BR64B	
5			4/1/97		7/15/97		10/22/97		1/28/98		5/19/98		8/18/98		11/13/98		2/17/99		5/17/99		9/22/99		12/7/99		2/16/00		5/23/00	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
1																													
2																													
3		R		R		R		R		R		R		R		R		R		R		R		R		R		R	
4		CB85D		CL03Q		CT55J		DE87B		DM30T		DW48F		ED23G		EM75M		ER93B		EY88B		FF88J		FL66C		FU45U		FY82R	
5		8/30/00		11/8/00		2/13/01		6/5/01		8/14/01		11/29/01		2/26/02		6/25/02		08/26/02		11/11/02		2/13/03		5/9/03		8/28/03		10/24/03	
123	**PAHs (µg/L)**																												
124	**EPA Method SW8270 SIM**																												
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3			OX8D		OX8D		OX8D		OX8D		OX8D		OX8D	
4			FY72F		0402086-05		0408026-10		0411066-07		0502070-08		P5F0342-07	
5			10/22/03		2/18/04		8/04/04		11/11/04		2/16/05		6/7/05	
6														
7	1	**CHLORINATED PHENOLS (µg/L)**												
8	2	**EPA Method SW8040**												
9	3	Pentachlorophenol	**0.62**		**1.31**		NA		NA		NA		0.485	U
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA	
16	10													
17	11	**SEMIVOLATILES (µg/L)**												
18	12	**EPA Method SW8270**												
19	13	Phenol	NA		NA		2	U	1.91	U	2	U	5.00	U
20	14	4-Methylphenol	NA		NA		10	U	9.55	U	9.99	U	5.00	U
21	15	Isophorone	NA		NA		1	U	0.955	U	0.999	U	5.00	U
22	16	2,4-Dimethylphenol	NA		NA		3	U	2.87	U	3	U	10.00	U
23	17	Benzoic Acid	NA		NA		20	U	19.1	U	20	U	50.0	U
24	18	Naphthalene	NA		NA		1	U	0.955	U	0.999	U	5.00	U
25	19	2-Methylnaphthalene	NA		NA		1	U	0.955	U	0.999	U	5.00	U
26	20	2,4,6-Trichlorophenol	NA		NA		5	U	4.78	U	5	U	5.00	U
27	21	2,4,5-Trichlorophenol	NA		NA		5	U	4.78	U	5	U	5.00	U
28	22	Acenaphthene	NA		NA		1	U	0.955	U	0.999	U	5.00	U
29	23	Dibenzofuran	NA		NA		1	U	0.955	U	0.999	U	5.00	U
30	24	Fluorene	NA		NA		1	U	0.955	U	0.999	U	5.00	U
31	25	Pentachlorophenol	NA		NA		5	U	4.78	U	5	U	10	U
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		4.47	U	**2.18**		**20.9**		10.00	U
33	27													
34	28	**VOLATILES (µg/L)**												
35	29	**EPA Method SW8260**												
36	30	Acetone	NA		NA		50	U	50	U	50	U	NA	
37	31	Carbon Disulfide	NA		NA		2	U	2	U	2	U	NA	
38	32	2-Butanone	NA		NA		10	U	10	U	10	U	NA	
39	33	Benzene	NA		NA		0.3	U	0.3	U	0.3	U	NA	
40	34	Bromoform	NA		NA		1	U	1	U	1	U	NA	
41	35	Toluene	NA		NA		1	U	1	U	1	U	NA	
42	36	Ethylbenzene	NA		NA		1	U	1	U	1	U	NA	
43	37	Styrene	NA		NA		1	U	1	U	1	U	NA	
44	38	m,p-Xylene	NA		NA		2	U	2	U	2	U	NA	
45	39	o-Xylene	NA		NA		1	U	1	U	1	U	NA	
46	40	1,3,5-Trimethylbenzene	NA		NA		1	U	1	U	1	U	NA	
47	41	1,2,4-Trimethylbenzene	NA		NA		**2.49**	J	**4.05**		**2.59**		NA	
48	42	Isopropylbenzene	NA		NA		1	U	**1.1**		1	U	NA	
49	43	n-Propylbenzene	NA		NA		1	U	1	U	1	U	NA	
50	44	tert-Butylbenzene	NA		NA		1	U	1	U	1	U	NA	
51	45	sec-Butylbenzene	NA		NA		1	U	1	U	**2.64**		NA	
52	46	4-Isopropyltoluene	NA		NA		1	U	1	U	1	U	NA	
53	47	n-Butylbenzene	NA		NA		1	U	1	U	1	U	NA	
54	48	Naphthalene	NA		NA		1	U	1	U	1	U	NA	
55		Methyl tert-butyl ether	NA		NA		1	U	1	U	1	U	NA	
56	49													
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**												
58	51	**Method OR-DEQ**												
59	52	**TPH-Diesel**	NA		NA		NA		NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA	
62	55													
63	56	**PRIORITY POLLUTANT**												
64	57	**METALS (mg/L)**												
65	58	Arsenic (7060)	NA		NA		**0.0224**		**0.0246**		**0.0216**		**0.0136**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3			OX8D		OX8D		OX8D		OX8D		OX8D		OX8D	
4			FY72F		0402086-05		0408026-10		0411066-07		0502070-08		P5F0342-07	
5			10/22/03		2/18/04		8/04/04		11/11/04		2/16/05		6/7/05	
66	59	Chromium (6010)	NA		NA		**0.0204**		**0.0305**		**0.0448**		**0.00282**	
67	60	Copper (6010)	NA		NA		0.01	U	**0.0183**		**0.0428**		**0.0041**	
68	61	Lead (7421)	NA		NA		**0.00274**		**0.00723**		**0.0236**		**0.00125**	
69	62	Nickel (6010)	NA		NA		0.005	U	0.005	U	**0.0159**		**0.00464**	
70	63	Zinc (6010)	NA		NA		**0.0238**		**0.034**		**0.0865**		**0.0129**	
71	64													
72	65	**MAJOR IONS AND CONVENTIONALS**												
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		**326**		**329**		**298**		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		**7.67**		**6.71**		**5.93**		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA	
86	79													

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3			OX8D		OX8D		OX8D		OX8D		OX8D		OX8D	
4			FY72F		0402086-05		0408026-10		0411066-07		0502070-08		P5F0342-07	
5			10/22/03		2/18/04		8/04/04		11/11/04		2/16/05		6/7/05	
87	80	**FIELD PARAMETERS**												
88	81	pH (avg)	7.00		7.02		6.38		7.02		7.22		7.03	
89	82	Temperature (° C) (avg)	15.5		14.1		14.6		14.2		13.4		16.4	
90	83	Conductivity (um/hos)	406		418		605		410		235		347	
91	84	Dissolved oxygen (mg/L) (avg)	1.24		20.49		3.01		1.39		1.91		3.23	
92	85													
93	86	**DIOXINS AND FURANS (ng/L)**												
94	87	**Method 8290**												
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA	
120														
121														
122														

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3			OX8D		OX8D		OX8D		OX8D		OX8D		OX8D	
4			FY72F		0402086-05		0408026-10		0411066-07		0502070-08		P5F0342-07	
5			10/22/03		2/18/04		8/04/04		11/11/04		2/16/05		6/7/05	
123		**PAHs (µg/L)**												
124		**EPA Method SW8270 SIM**												
125		Naphthalene	NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		1	U	NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		1	U	NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

														Dup of RW2				Dup of RW2				Dup of RW2			
			RW2		RW2		RW2		RW2		RW2		X		RW2		X		RW2		X		RW2		
			AH76G		AU45N		BC30E		BH96F		BR64P		CD97A		CD97B		CL03N		CL03M		CT37L		CT37M		DE87P	
			5/20/99		9/23/99		12/7/99		2/17/00		5/25/00		9/13/00		9/13/00		11/9/00		11/9/00		2/13/01		2/13/01		6/6/01	
	1	**CHLORINATED PHENOLS (µg/L)**																								
	2	**EPA Method SW8040**																								
	3	Pentachlorophenol	**210**		**7.7**		0.25	U	**300**		**46**		**580**		**630**		**45**		**38**		**21**	J	**19**	J	0.25	U
	4	2,4,6-Trichlorophenol	**1.9**		0.25	U	0.25	U	**3.1**		0.25	U	**2.3**		**2.5**		0.25	U	0.25	U	NA		NA		NA	
	5	2,3,6-Trichlorophenol	**0.31**		0.25	U	0.25	U	**0.45**		0.25	U	0.48	U	0.51	U	0.25	U	0.25	U	NA		NA		NA	
	6	2,4,5-Trichlorophenol	5.2	U	0.70	U	0.53	U	13	U	1.2	U	10	U	11	U	1.2	U	**1.1**		NA		NA		NA	
	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA	
	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**15**		**0.71**		**0.33**		**18**		**8.0**		**42**		**45**		**3.6**		**3.5**		NA		NA		NA	
	9	2,3,4,5-Tetrachlorophenol	**1.8**		**0.91**		0.25	U	**3.4**		**1.3**		**7.0**		**7.8**		**1.3**		**1.2**		NA		NA		NA	
	10																									
	11	**SEMIVOLATILES (µg/L)**																								
	12	**EPA Method SW8270**																								
	13	Phenol	2.0	U	**13**		2.0	U	2.0	U	2.0	U	**170**	J2	**150**	J2	**85**		**97**		**8.1**		**8.0**		2.0	U
	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**6.0**	J2	**5.3**	J2	**14**		**18**		**2.9**		**2.7**		1.0	U
	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	**21**		**22**		10	U	10	U	10	U
	18	Naphthalene	**1.3**		**18**		**3.8**		**9.7**		**3.7**		**16**		**16**		**13**		**14**		**2.5**		**2.2**		1.0	U
	19	2-Methylnaphthalene	1.0	U	**33**		**1.8**		**20**		**23**		**44**		**41**		**31**		**32**		**10**		**9.1**		**2.0**	
	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	**4.5**	J1	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	**25**		5.0	U	**16**	J	**14**	J	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
	25	Pentachlorophenol	**140**		**9.6**		5.0	U	**680**		**51**		**490**	J2	**440**	J2	**77**		**95**		**26**	J	**30**	J	5.0	U
	26	bis(2-Ethylhexyl)phthalate	1.5	U	**1.7**		**1.1**		**1.0**		1.0	U	1.0	U	**2.9**	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
	27																									
	28	**VOLATILES (µg/L)**																								
	29	**EPA Method SW8260**																								
	30	Acetone	15	U	**17**	M	5.0	U	10	U	5.0	U	**24**	M	**27**	M	**20**		**17**		14	U	13	U	5.0	U
	31	Carbon Disulfide	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	2.0	U	1.0	U	1.0	U	1.0	U	1.0	U
	32	2-Butanone	15	U	**22**	M	5.0	U	**23**	M	5.0	U	**24**		**28**		**30**		**24**		5.0	U	5.0	U	5.0	U
	33	Benzene	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**2.8**		**2.7**		**1.2**		**1.2**		1.0	U
	34	Bromoform	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	2.0	U	1.0	U	1.0	U	1.0	U	1.0	U
	35	Toluene	3.0	U	**2.6**		1.0	U	1.0	U	1.0	U	**2.1**		**2.2**		2.0	U	**1.5**		1.0	U	1.0	U	1.0	U
	36	Ethylbenzene	**25**		**45**		**13**		**22**		**3.9**		**28**		**27**		**27**		**29**		**4.8**		**4.3**		1.0	U
	37	Styrene	3.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	2.0	U	1.0	U	1.0	U	1.0	U	1.0	U
	38	m,p-Xylene	**61**		**120**		**25**		**53**		**8.2**		**78**		**76**		**78**		**81**		**10**		**9.6**		1.0	U
	39	o-Xylene	**20**		**37**		**11**		**26**		**2.6**		**28**		**28**		**15**		**15**		**2.1**		**2.2**		1.0	U
	40	1,3,5-Trimethylbenzene	**100**		**91**		**42**		**120**		**49**		**100**		**100**		**58**		**66**		**12**		**11**		1.0	U
	41	1,2,4-Trimethylbenzene	**370**		**330**		**110**		**360**		**150**		**180**	M	**190**	M	**200**		**220**		**42**		**40**		**3.6**	
	42	Isopropylbenzene	**78**		**65**		**29**		**79**		**52**		**70**		**73**		**57**		**68**		**30**		**29**		**11**	
	43	n-Propylbenzene	**130**		**77**		**38**		**110**		**86**		**88**		**90**		**75**		**90**		**37**		**34**		**12**	
	44	tert-Butylbenzene	**4.0**		**3.1**		1.0	U	**3.5**		**3.3**		**3.2**		**3.4**		**2.1**		**2.8**		**1.2**		**1.3**		1.0	U
	45	sec-Butylbenzene	**18**		**17**		**5.5**		**21**		**16**		**15**		**16**		**11**		**14**		**4.9**		**4.7**		**1.6**	
	46	4-Isopropyltoluene	**19**		**13**		**4.6**		**20**		**7.7**		**11**		**12**		**5.7**		**7.6**		1.0	U	1.0	U	1.0	U
	47	n-Butylbenzene	**20**		17.0	U	5.2	U	**24**		**15**	M	**16**	M	**17**	M	**11**		14	U	**3.5**		**3.4**		1.2	U
	48	Naphthalene	**18**		**30**		**8.3**		**25**		**7.0**		**28**		**30**		**22**		**25**		5.0	U	5.0	U	5.0	U
		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
	49																									
	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
	51	**Method OR-DEQ**																								
	52	**TPH-Diesel**	**2.2**		**2.6**		**1.2**		**2.4**		**1.5**		**3.4**		**3.8**		**5.2**		**5.0**		**1.7**		**1.7**		**0.86**	
	53	**TPH-D Motor Oil**	0.50	U	0.50	U	0.50	U	NA		0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
	54	**TPH-Gasoline**	**5.7**		**10**		**1.9**		NA		**5.1**		**7.7**		**7.7**		**4.6**		**5.0**		**1.8**		**1.7**		**0.60**	
	55																									
	56	**PRIORITY POLLUTANT**																								
	57	**METALS (mg/L)**																								
	58	Arsenic (7060)	**0.034**		**0.025**		**0.022**		**0.032**		**0.036**		**0.022**		**0.022**		**0.021**		**0.021**		**0.016**		**0.016**		**0.017**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW
2		Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2		
3		X		RW2		W		RW2		W		RW2		W		RW2		W		RW2		W		RW2
4		DE87O		DM30I		DM30H		DW29E		DW29C		ED30D		ED30A		EN00D		EN00A		ER93G		ER93I		EZ17D
5		6/6/01		8/13/01		8/13/01		11/27/01		11/27/01		2/27/02		2/27/02		6/27/02		6/27/02		08/27/02		08/27/02		11/13/02
7	**CHLORINATED PHENOLS (µg/L)**																							
8	**EPA Method SW8040**																							
9	Pentachlorophenol	**0.68**		**5.0**		**5.0**		**1.7**		**1.8**		NA		NA		NA		NA		NA		NA		NA
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
16																								
17	**SEMIVOLATILES (µg/L)**																							
18	**EPA Method SW8270**																							
19	Phenol	2.0	U	2.0	U	2.0	U	2.0	UJ	2.0	U	**10**		**10**		2.0	U	**5.9**	J	**15**		**13**		2.2
20	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**3.8**	J	1.0	UJ	1.0	U	**1.1**		**1.8**		**1.5**		1.1
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1.1
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.8	U	3.3	U	3.3
23	Benzoic Acid	10	U	10	U	10	U	30	U	30	U	50	U	50	U	50	U	50	U	62	U	54	U	54
24	Naphthalene	1.0	U	**1.6**		**1.8**		**1.8**	J	**1.8**	J	**7.4**		**7.0**		**5.2**	J	**6.4**	J	**5.9**		**5.6**		**4.1**
25	2-Methylnaphthalene	**2.0**		**6.5**		**6.4**		**5.7**	J	**7.0**	J	**18**		**17**		**11**	J	**14**	J	**15**		**13**		**11**
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6.2	U	5.4	U	5.4
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	6.2	U	5.4	U	5.4
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1.1
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1.1
30	Fluorene	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1.1
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	UJ	5.0	U	**8.6**		**8.2**		**76**		**75**		**26**	J	**36**	J	**37**
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U	4.0	U	4.0	U	4.0	U	4.0	U	5	U	4.3	U	4.3
33																								
34	**VOLATILES (µg/L)**																							
35	**EPA Method SW8260**																							
36	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.1	U	**5.2**		**6.4**		5
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1
38	2-Butanone	5.0	U	**5.2**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	5
39	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**2.5**		**2.5**		**2.3**		**2.2**		**3.4**		**3.3**		**3.4**
40	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1
41	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.6**		**1.7**		1.0	U	1.0	U	1	U	1	U	1
42	Ethylbenzene	1.0	U	**3.1**		**3.4**		**1.5**		**1.4**		**27**		**28**		**15**		**15**		**13**		**13**		**7.9**
43	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1
44	m,p-Xylene	1.0	U	**6.8**		**7.8**		**3.0**		**2.6**		**59**		**62**		**32**		**33**		**38**		**34**		**17**
45	o-Xylene	1.0	U	1.0	U	**1.6**		1.0	U	1.0	U	**14**		**14**		1.0	U	1.0	U	**6.5**		**5.9**		**2.3**
46	1,3,5-Trimethylbenzene	1.0	U	**6.5**		**6.7**		**3.9**		**3.7**		**44**		**44**		**21**		**23**		**27**		**24**		**9.8**
47	1,2,4-Trimethylbenzene	**3.8**		**23**		**26**		**13**		**12**		**150**		**150**		**62**		**62**		**84**		**78**		**37**
48	Isopropylbenzene	**11**		**24**		**25**		**30**		**30**		**54**		**51**		**46**		**44**		**44**		**45**		**37**
49	n-Propylbenzene	**12**		**28**		**29**		**36**		**37**		**76**		**73**		**58**		**57**		**58**		**59**		**46**
50	tert-Butylbenzene	1.0	U	**1.1**	M	**1.0**		**1.1**		**1.1**		**2.0**		**1.9**		**1.6**		**1.4**		**1.7**		**1.8**		**1.6**
51	sec-Butylbenzene	**1.7**		**3.9**		**4.1**		**4.7**		**4.7**		**9.6**		**9.5**		**8.4**		**8.2**		**8.3**		**8.4**		**6.7**
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**4.4**		**4.3**		**2.1**		**2.0**		**2.6**		**2.6**		**1.3**
53	n-Butylbenzene	1.2	U	**3.0**	M	**3.3**		**3.7**	M	**3.9**	M	**9.0**		**9.0**		6.5	U	6.1	U	7.6	U	7	U	**4.9**
54	Naphthalene	5.0	U	5.0	U	**5.0**		5.0	U	5.0	U	**15**		**16**		**8.7**		**8.5**		**10**		**9.9**		**6.3**
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56																								
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																							
58	**Method OR-DEQ**																							
59	**TPH-Diesel**	**0.88**		**1.4**		**1.2**		**1.4**		**1.4**		**1.9**	J	**0.89**	J	**1.8**		**1.9**		**1.7**		**1.6**		**1.3**
60	**TPH-D Motor Oil**	0.50	U	0.50	U	0.50	U	0.50	U	NA		0.50	U	0.50	U	0.50	U	0.50	U	0.5	U	0.5	U	0.5
61	**TPH-Gasoline**	**0.66**		**1.3**		**1.3**		**1.2**		NA		**4.0**	J	**3.8**		**2.6**		**2.6**		**2.9**		**3**		**2.1**
62																								
63	**PRIORITY POLLUTANT**																							
64	**METALS (mg/L)**																							
65	Arsenic (7060)	**0.016**		**0.019**		**0.020**		**0.018**		**0.022**		**0.020**		**0.022**		**0.019**		**0.020**		**0.021**		**0.021**		0.05

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT
2			Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2					
3			W		RW2		W		RW2		W		RW2		W		RW2		W		RW2		RW2	
4			EZ17B		FF65I		FF65K		FL41O		FL41Q		FU31F		FU31E		FY82D		FY82A		0402113-04		0406059-02	
5			11/13/02		2/11/03		2/11/03		5/7/03		5/7/03		8/27/03		8/27/03		10/23/03		10/23/03		2/23/04		6/9/04	
7	**CHLORINATED PHENOLS (µg/L)**																							
8	**EPA Method SW8040**																							
9	Pentachlorophenol		NA		NA		NA		NA		NA		**10**		NA		NA		NA		**8.51**		NA	
10	2,4,6-Trichlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
16																								
17	**SEMIVOLATILES (µg/L)**																							
18	**EPA Method SW8270**																							
19	Phenol	U	2.2	U	2	U	2	U	2	U	2	U	2.1	U	2.1	U	2	U	2	U	1.98	U	2.05	U
20	4-Methylphenol	U	1.1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	9.89	U	10.2	U
21	Isophorone	U	1.1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.989	U	1.02	U
22	2,4-Dimethylphenol	U	3.3	U	3	U	3	U	3	U	3.1	U	3.1	U	3.1	U	3	U	3	U	2.97	U	3.07	U
23	Benzoic Acid	U	54	U	50	U	50	U	50	U	51	U	52	U	52	U	10	U	10	U	19.8	U	20.5	U
24	Naphthalene		**3.7**		**4.9**		**5.3**		**4.2**		**4**		**1.3**		**1.7**		**1.8**		**1.3**		0.989	U	**1.56**	
25	2-Methylnaphthalene		**9.6**		**13**		**14**		**13**		**12**		**4.8**	J	**6.2**	J	**7.2**	J	**5.4**	J	0.989	U	**5.41**	
26	2,4,6-Trichlorophenol	U	5.4	U	5	U	5	U	5	U	5.1	U	5.2	U	5.2	U	5	U	5	U	4.95	U	5.12	U
27	2,4,5-Trichlorophenol	U	5.4	U	5	U	5	U	5	U	5.1	U	5.2	U	5.2	U	5	U	5	U	4.95	U	5.12	U
28	Acenaphthene	U	1.1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.989	U	1.02	U
29	Dibenzofuran	U	1.1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.989	U	1.02	U
30	Fluorene	U	1.1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.989	U	1.02	U
31	Pentachlorophenol		**35**		**28**		**33**		**12**		**12**		**5.5**		**6.9**		**8.1**		**6.4**		4.95	U	**47.3**	
32	bis(2-Ethylhexyl)phthalate	U	4.3	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.989	U	1.02	U
33																								
34	**VOLATILES (µg/L)**																							
35	**EPA Method SW8260**																							
36	Acetone	U	5	U	5	U	5	U	5	U	**6.2**	M	5	U	5	U	5	U	5	U	50	U	50	U
37	Carbon Disulfide	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	2	U	2	U
38	2-Butanone	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	10	U	10	U
39	Benzene		**3.1**		**2.4**		**2.4**		**3.4**		**3.8**		**5.1**		**5.4**		**3.6**		**3.4**		**5.5**		**3.57**	
40	Bromoform	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
42	Ethylbenzene		**7.3**		**8.2**		**8.1**		**9.5**		**10**		**4.2**		**4.2**		**2.6**		**2.7**		**10.5**		**3.41**	
43	Styrene	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene		**16**		**15**		**14**		**12**		**13**		**7**		**7.4**		**4.3**		**4.5**		**4.66**		**3.34**	
45	o-Xylene		**2.2**		**2.4**		**2.2**		1	U	1	U	1	U	1	U	1	U	1	U	**1.67**		1	U
46	1,3,5-Trimethylbenzene		**9.6**		**14**		**13**		**19**		**19**		**8.6**		**8.5**		**4.4**		**5.1**		**18.1**		**6.98**	
47	1,2,4-Trimethylbenzene		**36**		**46**		**44**		**59**		**62**		**28**		**29**		**16**		**17**		**61**		**20.5**	
48	Isopropylbenzene		**36**		**50**		**51**		**41**		**45**		**30**		**29**		**28**		**29**		**36.5**		**39.3**	
49	n-Propylbenzene		**45**		**60**		**62**		**56**		**60**		**40**		**39**		**35**		**36**		**55.3**		**60.8**	
50	tert-Butylbenzene		**1.5**		**1.7**		**1.8**		**1.8**		**2**		**1.4**		**1.3**		**1.2**		**1.2**		1	U	**1.56**	
51	sec-Butylbenzene		**6.3**		**8**		**8.1**		**8.2**		**8.8**		**5.9**		**5.7**		**5.1**		**5.4**		**7.63**		**8.48**	
52	4-Isopropyltoluene		**1.2**		**1.5**		**1.4**		**1.9**		**2**		**1**		1	U	1	U	1	U	**1.85**		1	U
53	n-Butylbenzene	M	**4.8**	M	**6**	M	**6**	M	**6.5**		**6.8**		**4.4**		**4.2**		**3.6**		**3.9**		**4.54**		**4.62**	
54	Naphthalene		**5.7**		**6.2**		**6.3**		**6.9**		**7.5**		5	U	5	U	5	U	5	U	**3.26**		**5.64**	
55	Methyl tert-butyl ether		NA		NA		NA		NA		NA		NA		NA		NA		NA		1	U	1	U
56																								
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																							
58	**Method OR-DEQ**																							
59	**TPH-Diesel**		**1.3**		**1.7**		**1.8**		**1.5**		**1.5**		**1.1**		**1**		**0.73**		**0.72**		**1.04**		**1.64**	
60	**TPH-D Motor Oil**	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.493	U	0.517	U
61	**TPH-Gasoline**		**2.4**		**2.5**		**2.6**		**2.2**		**2.4**		**1.6**		**1.6**		**1.2**		**1.2**		**2.6**		**1.72**	
62																								
63	**PRIORITY POLLUTANT**																							
64	**METALS (mg/L)**																							
65	Arsenic (7060)	U	0.05	U	**0.019**		**0.018**		**0.019**		**0.019**		**0.018**		**0.019**		**0.019**		**0.018**		**0.022**		**0.019**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH
2						Dup of RW2				Dup of RW2					
3		Dup of RW2		RW2		W		RW2		W		RW2		RW2	
4		0406059-01		0408036-06		0408036-03		0411051-04		0411051-01		0502102-12		P5F0223-06	
5		6/9/04		8/05/04		8/05/04		11/9/04		11/9/04		2/23/05		6/6/05	
7	**CHLORINATED PHENOLS (µg/L)**														
8	**EPA Method SW8040**														
9	Pentachlorophenol	NA		NA		NA		**1.84**		**2.12**		**1.13**		0.495	U
10	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA		NA		NA	
16															
17	**SEMIVOLATILES (µg/L)**														
18	**EPA Method SW8270**														
19	Phenol	1.95	U	2	U	2	U	2.02	U	1.97	U	2	U	5.00	U
20	4-Methylphenol	9.75	U	10	U	10	U	10.1	U	9.84	U	9.98	U	5.00	U
21	Isophorone	0.975	U	1	U	1	U	1.01	U	0.984	U	0.998	U	5.00	U
22	2,4-Dimethylphenol	2.92	U	3	U	3	U	3.04	U	2.95	U	2.99	U	10.00	U
23	Benzoic Acid	19.5	U	20	U	20	U	20.2	U	19.7	U	20	U	50.0	U
24	Naphthalene	**1.69**		**1.58**		**1.87**		1.01	U	0.984	U	0.998	U	5.00	U
25	2-Methylnaphthalene	**6.08**		**5.49**		**6.18**		**2.22**		**2.67**		**1.47**		5.00	U
26	2,4,6-Trichlorophenol	4.87	U	5	U	5	U	5.06	U	4.92	U	4.99	U	5.00	U
27	2,4,5-Trichlorophenol	4.87	U	5	U	5	U	5.06	U	4.92	U	4.99	U	5.00	U
28	Acenaphthene	0.975	U	1	U	1	U	1.01	U	0.984	U	0.998	U	5.00	U
29	Dibenzofuran	0.975	U	1	U	1	U	1.01	U	0.984	U	0.998	U	5.00	U
30	Fluorene	0.975	U	1	U	1	U	1.01	U	0.984	U	0.998	U	5.00	U
31	Pentachlorophenol	**46.7**		**12.9**		**13.5**		5.06	U	4.92	U	4.99	U	10	U
32	bis(2-Ethylhexyl)phthalate	0.975	U	1	U	1	U	1.01	U	0.984	U	0.998	U	10.00	U
33															
34	**VOLATILES (µg/L)**														
35	**EPA Method SW8260**														
36	Acetone	50	U	50	U	50	U	50	U	50	U	50	U	25.0	U
37	Carbon Disulfide	2	U	2	U	2	U	2	U	2	U	2	U	10.00	U
38	2-Butanone	10	U	10	U	10	U	10	U	10	U	10	U	10.00	U
39	Benzene	**3.32**		**3.88**		**3.84**	J	**1**		**1.06**		0.3	U	1.00	U
40	Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
41	Toluene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
42	Ethylbenzene	**3.97**		**6.19**		**5.97**	J	**1.89**		**2.06**		**3.04**		**3.39**	
43	Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
44	m,p-Xylene	**3.08**		**9.61**		**8.88**	J	2	U	2	U	2	U	**2.06**	
45	o-Xylene	1	U	**2.75**		**2.51**	J	**1.7**		**1.82**		1	U	1.00	U
46	1,3,5-Trimethylbenzene	**7.1**		**11.5**		**10.2**	J	**1.03**		**1.31**		**2.21**		**1.20**	
47	1,2,4-Trimethylbenzene	**19.8**		**36**		**33.8**	J	**4.51**		**5.6**		**8.71**		**5.39**	
48	Isopropylbenzene	**41**		**60.9**		**64.8**	J	**57.3**		**62.4**		**33.6**		**33.2**	
49	n-Propylbenzene	**62.7**		**68.1**		**69.7**	J	**72.2**		**77.6**		**40.9**		**37.8**	
50	tert-Butylbenzene	**1.64**		**1.75**		**1.82**	J	**1.48**		**1.66**		1	U	**1.79**	
51	sec-Butylbenzene	**8.82**		**10.7**		**10.7**	J	**7.84**		**9.22**		**6.18**		**6.13**	
52	4-Isopropyltoluene	1	U	**1.25**		**1.1**	J	1	U	1	U	1	U	2.00	U
53	n-Butylbenzene	**4.5**		**5.36**		**5.13**	J	**4.91**		**6.09**		**7.07**		5.00	U
54	Naphthalene	**6.03**		**2.99**		**2.74**	J	1	U	1	U	**1.97**		2.00	U
55	Methyl tert-butyl ether	1	U	1	U	1	U	1	U	1	U	1	U	1.00	U
56															
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**														
58	**Method OR-DEQ**														
59	**TPH-Diesel**	**1.45**		**1.42**		**1.42**		**0.904**		**0.991**		**0.928**		0.25	U
60	**TPH-D Motor Oil**	0.5	U	0.499	U	0.493	U	0.477	U	0.491	U	0.5	U	0.5	U
61	**TPH-Gasoline**	**1.83**		**1.72**		**1.8**		**1.18**		**1.23**		**1.01**		**0.488**	
62															
63	**PRIORITY POLLUTANT**														
64	**METALS (mg/L)**														
65	Arsenic (7060)	**0.019**		**0.0194**		**0.02**		**0.0202**		**0.0207**		**0.0218**		**0.0249**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2															Dup of RW2				Dup of RW2				Dup of RW2			
3			RW2		RW2		RW2		RW2		RW2		RW2		X		RW2		X		RW2		X		RW2	
4			AH76G		AU45N		BC30E		BH96F		BR64P		CD97A		CD97B		CL03N		CL03M		CT37L		CT37M		DE87P	
5			5/20/99		9/23/99		12/7/99		2/17/00		5/25/00		9/13/00		9/13/00		11/9/00		11/9/00		2/13/01		2/13/01		6/6/01	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U
67	60	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.005**		**0.007**		0.002	U	**0.004**		0.002	U	0.002	U	**0.003**	
68	61	Lead (7421)	**0.001**		**0.001**		0.001	U	0.001	U	0.001	U	**0.001**		0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
70	63	Zinc (6010)	**0.016**		**0.042**		**0.025**		**0.031**		**0.016**		**0.022**	J2	**0.030**	J2	**0.116**		**0.122**		**0.022**		**0.022**		**0.058**	J
71	64																									
72	65	**MAJOR IONS AND CONVENTIONALS**																								
73	66	Calcium (mg/L) (6010)	**30.0**		NA		NA		NA		NA		NA		NA		NA		NA		**39.8**		**36.8**		**36.5**	
74	67	Magnesium (mg/L) (6010)	**9.90**		NA		NA		NA		NA		NA		NA		NA		NA		**17.1**		**15.8**		**17.2**	
75	68	Potassium (mg/L) (6010)	**2.5**		NA		NA		NA		NA		NA		NA		NA		NA		**2.4**		**2.1**		**3.1**	
76	69	Sodium (mg/L) (6010)	**7.68**		NA		NA		NA		NA		NA		NA		NA		NA		**12.6**		**11.7**		**12.6**	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**140**		NA		NA		NA		NA		NA		NA		NA		NA		**220**		**220**		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		1.0	U	1.0	U	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**140**		NA		NA		NA		NA		NA		NA		NA		NA		**220**		**220**		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**190**		**190**		**160**		**150**		**160**		**390**		**360**		**320**		**310**		**290**		**280**		**300**	J
81	74	Chloride (mg/L) (EPA 325.2)	**4.7**		**8.8**		**6.7**		**6.6**		**4.2**		**9.1**	J2	**7.4**	J2	**4.7**		**5.0**		**8.9**		**8.5**		**7.7**	
82	75	N-Nitrate (mg-N/L) (Calculated)	**0.017**		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U	0.010	U	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	0.010	U	NA		NA		NA		NA		NA		NA		NA		NA		**0.018**		**0.016**		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.017**		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U	0.010	U	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	**9.3**		NA		NA		NA		NA		NA		NA		NA		NA		**5.2**		**4.3**		NA	
86	79																									

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW
1																								
2		Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2		
3		X		RW2		W		RW2		W		RW2		W		RW2		W		RW2		W		RW2
4		DE87O		DM30I		DM30H		DW29E		DW29C		ED30D		ED30A		EN00D		EN00A		ER93G		ER93I		EZ17D
5		6/6/01		8/13/01		8/13/01		11/27/01		11/27/01		2/27/02		2/27/02		6/27/02		6/27/02		08/27/02		08/27/02		11/13/02
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005
67	Copper (6010)	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	**0.008**
68	Lead (7421)	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	**0.001**		**0.001**		0.02
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01
70	Zinc (6010)	**0.189**	J	**0.020**	J	**0.028**	J	**0.010**		**0.013**		**0.043**	J	**0.016**	J	**0.015**	J	**0.037**	J	**0.034**	J	**0.02**	J	**0.022**
71																								
72	**MAJOR IONS AND CONVENTIONALS**																							
73	Calcium (mg/L) (6010)	**40.7**		**39.0**		**41.0**		**39.4**		**41.6**		**38.9**		**37.5**		**42.3**		**43.3**		NA		NA		NA
74	Magnesium (mg/L) (6010)	**19.1**		**17.1**		**17.8**		**16.4**		**17.5**		**16.2**		**15.3**		**17.0**		**17.5**		NA		NA		NA
75	Potassium (mg/L) (6010)	**3.0**		**2.8**		**2.8**		**2.4**		**2.4**		**2.5**		**2.2**		**2.3**		**2.3**		NA		NA		NA
76	Sodium (mg/L) (6010)	**13.6**		**12.3**		**12.9**		**11.7**		**12.4**		**11.2**		**10.9**		**12.0**		**12.3**		NA		NA		NA
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		**220**		**200**		NA		NA		NA		NA		NA
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		1.0	U	1.0	U	NA		NA		NA		NA		NA
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		**220**		**200**		NA		NA		NA		NA		NA
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**290**	J	**270**	J	**290**	J	**260**		**280**		**270**		**290**		**250**		**270**		**270**		**270**		**270**
81	Chloride (mg/L) (EPA 325.2)	**7.4**		**8.9**		**8.2**		**5.5**		**5.7**		**24**	J	**4.1**	J	**6.1**		**5.8**		**4.6**		**5.1**		**4.8**
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		**0.019**		0.010	U	NA		NA		NA		NA		NA
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		**0.014**	J	**0.038**	J	NA		NA		NA		NA		NA
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		**0.033**		**0.028**		NA		NA		NA		NA		NA
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		**6.3**	J	**9.8**	J	NA		NA		NA		NA		NA
86																								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT
2			Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2					
3			W		RW2		W		RW2		W		RW2		W		RW2		W		RW2		RW2	
4			EZ17B		FF65I		FF65K		FL41O		FL41Q		FU31F		FU31E		FY82D		FY82A		0402113-04		0406059-02	
5			11/13/02		2/11/03		2/11/03		5/7/03		5/7/03		8/27/03		8/27/03		10/23/03		10/23/03		2/23/04		6/9/04	
66	Chromium (6010)	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.0076**		**0.0136**	
67	Copper (6010)	J	0.002	UJ	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.01	U	0.01	U
68	Lead (7421)	U	0.02	U	0.001	U	0.001	U	0.001	U	**0.002**		0.001	U	0.001	U	0.001	U	0.001	U	**0.0051**		0.0001	U
69	Nickel (6010)	U	0.01	U	**0.01**		0.01	U	**0.01**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.005	U	0.005	U
70	Zinc (6010)		**0.017**		**0.013**	J	**0.016**	J	**0.067**		**0.064**		**0.013**		**0.014**		**0.062**	J	**0.008**	J	**0.0724**		**0.0105**	
71																								
72	**MAJOR IONS AND CONVENTIONALS**																							
73	Calcium (mg/L) (6010)		NA		**41.8**		**41.3**		NA		NA		NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)		NA		**16.4**		**16.2**		NA		NA		NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)		NA		**2.5**		**2.6**		NA		NA		NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)		NA		**11.7**		**11.7**		NA		NA		NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		**240**		**240**		NA		NA		NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		1	U	1	U	NA		NA		NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		**240**		**240**		NA		NA		NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**270**		**260**		**260**		**270**		**270**		**290**		**280**		**230**		**250**		**237**		**254**	
81	Chloride (mg/L) (EPA 325.2)		**4.6**		**4.4**		**4.4**		**4.4**		**4.4**		**4.3**		**4.2**		**5.2**		**4.9**		**3.8**		**4.16**	
82	N-Nitrate (mg-N/L) (Calculated)		NA		0.01	U	**0.015**		NA		NA		NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		**0.041**		**0.043**		NA		NA		NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		**0.037**	J	**0.058**	J	NA		NA		NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		**3**		2.5	U	NA		NA		NA		NA		NA		NA		NA		NA	
86																								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH
2						Dup of RW2				Dup of RW2					
3		Dup of RW2		RW2		W		RW2		W		RW2		RW2	
4		0406059-01		0408036-06		0408036-03		0411051-04		0411051-01		0502102-12		P5F0223-06	
5		6/9/04		8/05/04		8/05/04		11/9/04		11/9/04		2/23/05		6/6/05	
66	Chromium (6010)	**0.0144**		**0.0152**		**0.0143**		**0.0129**		**0.0197**		**0.0086**		0.001	U
67	Copper (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.002	U
68	Lead (7421)	0.0001	U	0.0001	U	0.0001	U	0.00014	UJ	**0.00372**	J	0.0001	U	0.001	U
69	Nickel (6010)	0.005	U	0.005	U	0.005	U	**0.0113**		**0.0412**		**0.014**		**0.0268**	
70	Zinc (6010)	**0.011**		0.01	U	0.01	U	0.0116	UJ	**0.0306**	J	0.01	U	**0.114**	
71															
72	**MAJOR IONS AND CONVENTIONALS**														
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**276**		**258**		**254**		**266**		**265**		**345**		**286**	
81	Chloride (mg/L) (EPA 325.2)	**3.74**		**3.95**		**3.82**		**8.68**		**6.63**		**3.62**		**3.72**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA	
86															

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2															Dup of RW2				Dup of RW2				Dup of RW2			
3			RW2		RW2		RW2		RW2		RW2		RW2		X		RW2		X		RW2		X		RW2	
4			AH76G		AU45N		BC30E		BH96F		BR64P		CD97A		CD97B		CL03N		CL03M		CT37L		CT37M		DE87P	
5			5/20/99		9/23/99		12/7/99		2/17/00		5/25/00		9/13/00		9/13/00		11/9/00		11/9/00		2/13/01		2/13/01		6/6/01	
87	80	**FIELD PARAMETERS**																								
88	81	pH (avg)	6.63		6.65		6.58		6.67		6.56		6.19		6.19		5.55		5.54		6.33		6.33		6.66	
89	82	Temperature (° C) (avg)	14.2		14.7		13.1		14.4		15.0		15.6		15.6		12.7		12.7		12.6		12.7		13.6	
90	83	Conductivity (um/hos)	294		292		260		278		365		463		463		513		513		475		479		573	
91	84	Dissolved oxygen (mg/L) (avg)	1.61		1.37		2.46		0.68		0.74		11.94		11.94		0.53		0.55		0.90		0.95		0.83	
92	85																									
93	86	**DIOXINS AND FURANS (ng/L)**																								
94	87	**Method 8290**																								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																										
121																										
122																										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW
1																								
2		Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2		
3		X		RW2		W		RW2		W		RW2		W		RW2		W		RW2		W		RW2
4		DE87O		DM30I		DM30H		DW29E		DW29C		ED30D		ED30A		EN00D		EN00A		ER93G		ER93I		EZ17D
5		6/6/01		8/13/01		8/13/01		11/27/01		11/27/01		2/27/02		2/27/02		6/27/02		6/27/02		08/27/02		08/27/02		11/13/02
87	**FIELD PARAMETERS**																							
88	pH (avg)	6.65		6.70		6.68		6.50		6.5		6.27		6.27		6.47		6.47		6.52		6.56		6.19
89	Temperature (° C) (avg)	13.6		15.7		15.6		13.1		13.1		13.5		13.5		14.5		14.5		13.9		13.9		13.6
90	Conductivity (um/hos)	573		455		454		458		458		422		422		450		448		408		409		461
91	Dissolved oxygen (mg/L) (avg)	0.82		0.52		0.37		3.34		3.22		7.06		7.05		4.87		4.72		0.60		0.31		0.55
92																								
93	**DIOXINS AND FURANS (ng/L)**																							
94	**Method 8290**																							
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120																								
121																								
122																								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT
2			Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2					
3			W		RW2		W		RW2		W		RW2		W		RW2		W		RW2		RW2	
4			EZ17B		FF65I		FF65K		FL41O		FL41Q		FU31F		FU31E		FY82D		FY82A		0402113-04		0406059-02	
5			11/13/02		2/11/03		2/11/03		5/7/03		5/7/03		8/27/03		8/27/03		10/23/03		10/23/03		2/23/04		6/9/04	
87	**FIELD PARAMETERS**																							
88	pH (avg)		6.17		6.84		6.84		6.87		6.86		6.69		6.71		6.52		6.53		6.36		5.41	
89	Temperature (° C) (avg)		13.6		13.9		13.9		13.6		13.5		15.5		15.7		13.8		13.8		14.3		15.2	
90	Conductivity (um/hos)		461		542		542		392		390		414		411		392		392		348		395	
91	Dissolved oxygen (mg/L) (avg)		0.34		2.24		2.24		3.22		3.32		0.98		0.82		2.37		2.15		1.48		1.12	
92																								
93	**DIOXINS AND FURANS (ng/L)**																							
94	**Method 8290**																							
95	2,3,7,8-TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																								
121																								
122																								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH
2						Dup of RW2				Dup of RW2					
3		Dup of RW2		RW2		W		RW2		W		RW2		RW2	
4		0406059-01		0408036-06		0408036-03		0411051-04		0411051-01		0502102-12		P5F0223-06	
5		6/9/04		8/05/04		8/05/04		11/9/04		11/9/04		2/23/05		6/6/05	
87	**FIELD PARAMETERS**														
88	pH (avg)	5.41		6.09		6.15		6.6		6.7		6.78		7.04	
89	Temperature (° C) (avg)	15.2		15.7		16		13.6		13.7		14.5		14.7	
90	Conductivity (um/hos)	395		530		531		356		359		184		347	
91	Dissolved oxygen (mg/L) (avg)	1.12		3.58		3.58		2.14		2.17		1.47		4.32	
92															
93	**DIOXINS AND FURANS (ng/L)**														
94	**Method 8290**														
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA	
120															
121															
122															

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2															Dup of RW2				Dup of RW2				Dup of RW2			
3			RW2		RW2		RW2		RW2		RW2		RW2		X		RW2		X		RW2		X		RW2	
4			AH76G		AU45N		BC30E		BH96F		BR64P		CD97A		CD97B		CL03N		CL03M		CT37L		CT37M		DE87P	
5			5/20/99		9/23/99		12/7/99		2/17/00		5/25/00		9/13/00		9/13/00		11/9/00		11/9/00		2/13/01		2/13/01		6/6/01	
123		**PAHs (µg/L)**																								
124		**EPA Method SW8270 SIM**																								
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
132																										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW
1																								
2		Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2		
3		X		RW2		W		RW2		W		RW2		W		RW2		W		RW2		W		RW2
4		DE87O		DM30I		DM30H		DW29E		DW29C		ED30D		ED30A		EN00D		EN00A		ER93G		ER93I		EZ17D
5		6/6/01		8/13/01		8/13/01		11/27/01		11/27/01		2/27/02		2/27/02		6/27/02		6/27/02		08/27/02		08/27/02		11/13/02
123	**PAHs (µg/L)**																							
124	**EPA Method SW8270 SIM**																							
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127	Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129	Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130	Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
132																				NA		NA		

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT
1																								
2			Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2					
3			W		RW2		W		RW2		W		RW2		W		RW2		W		RW2		RW2	
4			EZ17B		FF65I		FF65K		FL41O		FL41Q		FU31F		FU31E		FY82D		FY82A		0402113-04		0406059-02	
5			11/13/02		2/11/03		2/11/03		5/7/03		5/7/03		8/27/03		8/27/03		10/23/03		10/23/03		2/23/04		6/9/04	
123	**PAHs (µg/L)**																							
124	**EPA Method SW8270 SIM**																							
125	Naphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131	Dibenzofuran		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
132																								

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH
1															
2						Dup of RW2				Dup of RW2					
3		Dup of RW2		RW2		W		RW2		W		RW2		RW2	
4		0406059-01		0408036-06		0408036-03		0411051-04		0411051-01		0502102-12		P5F0223-06	
5		6/9/04		8/05/04		8/05/04		11/9/04		11/9/04		2/23/05		6/6/05	
123	**PAHs (µg/L)**														
124	**EPA Method SW8270 SIM**														
125	Naphthalene	NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene	NA		1	U	1	U	NA		NA		NA		NA	
128	Acenaphthene	NA		NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		1	U	1	U	NA		NA		NA		NA	
131	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA	
132															

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			J3		J3		J3		J3		J3		J3		J3	
4			S177K		T176R		U235L		V224Q		W371M		Y314K		Z225Q	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98	
7	1	**CHLORINATED PHENOLS (µg/L)**														
8	2	**EPA Method SW8040**														
9	3	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	UJ	**0.36**		0.25	U	0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	UJ	0.25	U	0.25	U	0.25	U
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	UJ	0.25	U	0.25	U	0.25	U
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	UJ	0.25	U	0.25	U	0.25	U
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	UJ	0.25	U	0.25	U	0.25	U
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	UJ	0.25	U	0.25	U	0.25	U
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	0.25	U	0.25	UJ	0.25	U	0.25	U	0.25	U
16	10															
17	11	**SEMIVOLATILES (µg/L)**														
18	12	**EPA Method SW8270**														
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U
24	18	Naphthalene	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
25	19	2-Methylnaphthalene	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	UJ	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
33	27															
34	28	**VOLATILES (µg/L)**														
35	29	**EPA Method SW8260**														
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
37	31	Carbon Disulfide	1.0	U	1.0	U	**110**		1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
46	40	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
47	41	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	UJ	1.0	U
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA	
56	49															
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**														
58	51	**Method OR-DEQ**														
59	52	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA	
62	55															
63	56	**PRIORITY POLLUTANT**														
64	57	**METALS (mg/L)**														
65	58	Arsenic (7060)	**0.010**		**0.012**		0.05	U	0.05	U	**0.011**		**0.014**		**0.017**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			J3		J3		J3		J3		J3		J3		J3	
4			S177K		T176R		U235L		V224Q		W371M		Y314K		Z225Q	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98	
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	**0.014**		**0.018**		**0.012**	
67	60	Copper (6010)	0.002	U	**0.005**		0.002	U	**0.005**		**0.017**		**0.020**		**0.013**	
68	61	Lead (7421)	0.001	U	**0.002**		0.02	U	0.02	U	**0.006**		**0.007**		**0.003**	
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	**0.01**		**0.01**		**0.01**	
70	63	Zinc (6010)	0.004	U	**0.013**		**0.018**		**0.010**		**0.034**	J2	**0.048**		**0.036**	
71	64															
72	65	**MAJOR IONS AND CONVENTIONALS**														
73	66	Calcium (mg/L) (6010)	**94.6**		**101**		**103**		**90.2**		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**51.7**		**56.1**		**56.1**		**50.6**		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**1.8**		**1.9**		**2.0**		**1.6**		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**22.5**		**23.5**		**23.8**		**22.1**		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**470**		**460**	J2	**510**		**470**		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1.0	U	1.0	U	1.0	U	NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**470**		**460**	J2	**510**		**470**		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**580**	J2	**480**		**510**		**480**		**540**		**470**	
81	74	Chloride (mg/L) (EPA 325.2)	**9.9**		**9.3**		**11**		**12**		**12**		**13**		**12**	
82	75	N-Nitrate (mg-N/L) (Calculated)	0.010	U	0.010	U	**0.013**		**0.016**	J2	NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	**0.012**	J	**0.012**	J2	0.010	U	0.010	UJ	NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.014**		0.010	U	**0.013**		**0.016**	J2	NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	**2.8**	J	2.5	U	2.5	U	2.5	U	NA		NA		NA	
86	79															

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			J3		J3		J3		J3		J3		J3		J3	
4			S177K		T176R		U235L		V224Q		W371M		Y314K		Z225Q	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98	
87	80	**FIELD PARAMETERS**														
88	81	pH (avg)	6.78		6.80		6.85		6.70		6.53		6.46		6.43	
89	82	Temperature (° C) (avg)	13.9		16.3		13.7		13.4		13.4		14.9		11.9	
90	83	Conductivity (um/hos)	859		765		673		771		788		916		422	
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		0.74		3.45		2.45	
92	85															
93	86	**DIOXINS AND FURANS (ng/L)**														
94	87	**Method 8290**														
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA	
120																
121																
122																

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2																
3			J3		J3		J3		J3		J3		J3		J3	
4			S177K		T176R		U235L		V224Q		W371M		Y314K		Z225Q	
5			4/2/97		7/16/97		10/22/97		1/29/98		5/19/98		8/18/98		11/12/98	
123		**PAHs (µg/L)**														
124		**EPA Method SW8270 SIM**														
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
2					Dup of LW-12D1								Dup of LW12D1													
3			LW12D1		LW120D1		LW12D1		LW12D1		LW12D1		Y		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1	
4			AH76C		AH76A		AU45L		BC27S		BH96M		BH96O		BR55B		CB85I		CL03K		CT67E		DE87M		DM52H	
5			5/20/99		5/20/99		9/23/99		12/9/99		2/18/00		2/18/00		5/22/00		8/31/00		11/10/00		2/15/01		6/6/01		8/15/01	
7	1	**CHLORINATED PHENOLS (µg/L)**																								
8	2	**EPA Method SW8040**																								
9	3	Pentachlorophenol	**28**		**32**		**1.4**		**200**		**0.28**		**0.23**	J1	0.25	UJ	0.25	U	0.25	U	**0.62**		0.25	U	0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	**1.1**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA	
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA	
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	1.2	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA	
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**1.2**		**1.4**		**0.13**	J1	**6.2**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	**1.0**		**1.0**		**0.36**		**8.0**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA	
16	10																									
17	11	**SEMIVOLATILES (µg/L)**																								
18	12	**EPA Method SW8270**																								
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	**2.2**	J1	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	**1.7**	J1	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
31	25	Pentachlorophenol	**110**	J2	**81**	J2	5.0	U	**380**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	1.0	U	**1.0**	J1	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.0**		1.0	U
33	27																									
34	28	**VOLATILES (µg/L)**																								
35	29	**EPA Method SW8260**																								
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
38	32	2-Butanone	**7.6**		5.0	U	**12**	M	5.0	U	5.0	U	5.0	U	5.0	U	9.5	U	**8.4**		5.0	U	5.0	U	**5.7**	
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.2**		1.0	U	1.0	U
46	40	1,3,5-Trimethylbenzene	**11**		**9.7**		**3.6**		**1.5**		1.0	U	1.0	U	**2.4**		**3.3**		**4.8**		**4.4**		**1.9**		**1.5**	
47	41	1,2,4-Trimethylbenzene	**46**		**46**		**15**		**4.8**		**5.1**		**4.9**		**15**		**17**		**22**		**23**		**13**		**7.5**	
48	42	Isopropylbenzene	**2.6**		**2.6**		**1.7**		**1.1**		1.0	U	1.0	U	1.0	U	**1.3**		**1.4**		**1.6**		1.0	U
49	43	n-Propylbenzene	**3.9**		**3.8**		**2.4**		**1.3**		1.0	U	1.0	U	**1.5**		**1.5**		**2.2**		**2.5**		**2.0**		1.0	U
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
51	45	sec-Butylbenzene	**1.7**		**1.7**		**1.0**		1.0	U	1.0	U	1.0	U	1.0	U	**1.2**		**1.6**		**1.9**		**1.3**		1.0	U
52	46	4-Isopropyltoluene	**2.0**		**2.0**		**1.3**		1.0	U	1.0	U	1.0	U	1.0	U	**1.1**		**1.6**		**1.9**		1.0	U	1.0	U
53	47	n-Butylbenzene	**1.7**		**1.7**	M	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.4	U	**1.7**	M	1.0	U	1.0	U
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
56	49																									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	51	**Method OR-DEQ**																								
59	52	**TPH-Diesel**	**0.96**		**0.86**		**0.98**		**0.88**		**0.66**		**0.66**		**0.82**		**0.64**		**0.78**		**0.83**		**0.77**		**0.81**	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		0.50	U	NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																									
63	56	**PRIORITY POLLUTANT**																								
64	57	**METALS (mg/L)**																								
65	58	Arsenic (7060)	**0.017**		**0.017**		**0.039**		**0.034**		**0.020**		**0.020**		**0.030**		**0.033**		**0.019**		**0.022**		**0.020**		**0.017**	

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF
1							
2							
3		LW12D1		LW12D1		LW12D1	
4		DW48J		ED34H		EN00K	
5		11/29/01		2/28/02		6/27/02	
6							
7	**CHLORINATED PHENOLS (µg/L)**						
8	**EPA Method SW8040**						
9	Pentachlorophenol	0.25	U	0.25	U	**1.6**	
10	2,4,6-Trichlorophenol	NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA	
16							
17	**SEMIVOLATILES (µg/L)**						
18	**EPA Method SW8270**						
19	Phenol	2.0	U	2.0	U	2.0	U
20	4-Methylphenol	1.0	U	1.0	U	1.0	U
21	Isophorone	1.0	U	1.0	U	1.0	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U
23	Benzoic Acid	30	U	50	U	50	U
24	Naphthalene	1.0	U	1.0	U	1.0	U
25	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U
28	Acenaphthene	1.0	U	1.0	U	1.0	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	U
30	Fluorene	1.0	U	1.0	U	1.0	U
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U
32	bis(2-Ethylhexyl)phthalate	1.0	U	4.0	U	4.0	U
33							
34	**VOLATILES (µg/L)**						
35	**EPA Method SW8260**						
36	Acetone	5.0	U	5.0	U	5.0	U
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U
38	2-Butanone	**5.6**		**8.6**		5.0	U
39	Benzene	1.0	U	1.0	U	1.0	U
40	Bromoform	1.0	U	1.0	U	1.0	U
41	Toluene	1.0	U	1.0	U	1.0	U
42	Ethylbenzene	1.0	U	1.0	U	1.0	U
43	Styrene	1.0	U	1.0	U	1.0	U
44	m,p-Xylene	1.0	U	1.0	U	1.0	U
45	o-Xylene	1.0	U	1.0	U	1.0	U
46	1,3,5-Trimethylbenzene	**3.4**		**1.5**		1.0	U
47	1,2,4-Trimethylbenzene	**21**		**8.5**		**4.7**	
48	Isopropylbenzene	**1.6**		1.0	U	1.0	U
49	n-Propylbenzene	**2.8**		**1.1**		**1.3**	
50	tert-Butylbenzene	1.0	U	1.0	U	1.0	U
51	sec-Butylbenzene	**2.8**		1.0	U	**1.1**	
52	4-Isopropyltoluene	**2.2**		1.0	U	1.0	U
53	n-Butylbenzene	2.0	U	1.0	U	1.0	U
54	Naphthalene	5.0	U	5.0	U	5.0	U
55	Methyl tert-butyl ether	NA		NA		NA	
56							
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**						
58	**Method OR-DEQ**						
59	**TPH-Diesel**	**0.97**		**1.2**		**1.0**	
60	**TPH-D Motor Oil**	NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA	
62							
63	**PRIORITY POLLUTANT**						
64	**METALS (mg/L)**						
65	Arsenic (7060)	**0.014**		**0.016**		**0.028**	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2					Dup of LW-12D1								Dup of LW12D1													
3			LW12D1		LW120D1		LW12D1		LW12D1		LW12D1		Y		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1	
4			AH76C		AH76A		AU45L		BC27S		BH96M		BH96O		BR55B		CB85I		CL03K		CT67E		DE87M		DM52H	
5			5/20/99		5/20/99		9/23/99		12/9/99		2/18/00		2/18/00		5/22/00		8/31/00		11/10/00		2/15/01		6/6/01		8/15/01	
66	59	Chromium (6010)	**0.007**		**0.007**		**0.035**		**0.091**		**0.017**		**0.019**		0.005	U	**0.006**		**0.010**		**0.008**		**0.012**		**0.032**	
67	60	Copper (6010)	**0.008**		**0.008**		**0.036**		**0.122**		**0.022**		**0.024**		**0.007**		**0.007**		**0.016**		**0.012**		**0.015**		**0.038**	
68	61	Lead (7421)	**0.002**		**0.002**		**0.011**		**0.030**		**0.005**		**0.005**		**0.003**		**0.002**		**0.006**		**0.003**		**0.013**		**0.012**	
69	62	Nickel (6010)	0.01	U	0.01	U	0.03	U	**0.07**		**0.02**		**0.02**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.03**	
70	63	Zinc (6010)	**0.026**		**0.030**		**0.079**		**0.212**		**0.047**		**0.053**		**0.016**		**0.024**		**0.037**		**0.033**		**0.029**		**0.074**	
71	64																									
72	65	**MAJOR IONS AND CONVENTIONALS**																								
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**54.8**		**60.5**		**53.1**	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**26.2**		**29.5**		**29.0**	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.9**		**1.8**		**1.9**	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**10.9**		**12.3**		**11.5**	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**320**		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		1.0	U	NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**320**		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**360**		**360**		**360**		**350**		**350**		**350**		**320**		**320**		**330**		**320**		**340**	J	**320**	
81	74	Chloride (mg/L) (EPA 325.2)	**3.8**		**3.8**		**3.3**		**4.5**		**3.8**		**4.2**		**4.1**		**6.8**		**3.3**		**4.2**	J	**3.7**		**7.8**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**5.8**		NA		NA	
86	79																									

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF
1							
2							
3		LW12D1		LW12D1		LW12D1	
4		DW48J		ED34H		EN00K	
5		11/29/01		2/28/02		6/27/02	
66	Chromium (6010)	**0.009**		**0.015**		**0.006**	
67	Copper (6010)	0.012	U	**0.020**		**0.007**	
68	Lead (7421)	**0.005**		**0.006**		**0.002**	
69	Nickel (6010)	0.01	U	0.01	U	0.01	U
70	Zinc (6010)	**0.021**		**0.032**		**0.022**	
71							
72	**MAJOR IONS AND CONVENTIONALS**						
73	Calcium (mg/L) (6010)	**58.4**		**55.1**		**59.3**	
74	Magnesium (mg/L) (6010)	**29.4**		**25.4**		**28.1**	
75	Potassium (mg/L) (6010)	**1.5**		**1.5**		**1.0**	
76	Sodium (mg/L) (6010)	**12.2**		**12.5**		**12.4**	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		**260**		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		1.0	U	NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		**260**		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**350**		**330**		**300**	
81	Chloride (mg/L) (EPA 325.2)	**3.7**		**5.2**		**3.8**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		**0.027**		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		0.010	U	NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		**0.027**		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		**5.1**		NA	
86							

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
2					Dup of LW-12D1								Dup of LW12D1													
3			LW12D1		LW120D1		LW12D1		LW12D1		LW12D1		Y		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1	
4			AH76C		AH76A		AU45L		BC27S		BH96M		BH96O		BR55B		CB85I		CL03K		CT67E		DE87M		DM52H	
5			5/20/99		5/20/99		9/23/99		12/9/99		2/18/00		2/18/00		5/22/00		8/31/00		11/10/00		2/15/01		6/6/01		8/15/01	
87	80	**FIELD PARAMETERS**																								
88	81	pH (avg)	6.96		6.96		7.13		6.96		6.95		6.85		6.95		6.85		5.68		6.82		7.15		7.20	
89	82	Temperature (° C) (avg)	13.2		13.0		14.7		11.9		11.7		11.7		15.0		13.0		12.2		13.1		14.0		14.4	
90	83	Conductivity (um/hos)	486		502		504		346		526		524		495		485		444		454		481		469	
91	84	Dissolved oxygen (mg/L) (avg)	1.86		1.67		1.01		2.36		1.79		1.43		1.26		1.74		0.93		0.13		2.10		1.96	
92	85																									
93	86	**DIOXINS AND FURANS (ng/L)**																								
94	87	**Method 8290**																								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																										
121																										
122																										

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF
1							
2							
3		LW12D1		LW12D1		LW12D1	
4		DW48J		ED34H		EN00K	
5		11/29/01		2/28/02		6/27/02	
87	**FIELD PARAMETERS**						
88	pH (avg)	6.92		6.80		7.07	
89	Temperature (° C) (avg)	13.3		13.8		14.3	
90	Conductivity (um/hos)	434		431		410	
91	Dissolved oxygen (mg/L) (avg)	4.12		7.61		4.73	
92							
93	**DIOXINS AND FURANS (ng/L)**						
94	**Method 8290**						
95	2,3,7,8-TCDF	NA		NA		NA	
96	Total TCDF	NA		NA		NA	
97	2,3,7,8-TCDD	NA		NA		NA	
98	Total TCDD	NA		NA		NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA	
101	Total PeCDF	NA		NA		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA	
103	Total PeCDD	NA		NA		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA	
108	Total HxCDF	NA		NA		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA	
112	Total HxCDD	NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA	
115	Total HpCDF	NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA	
117	Total HpCDD	NA		NA		NA	
118	OCDF	NA		NA		NA	
119	OCDD	NA		NA		NA	
120							
121							
122							

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2					Dup of LW-12D1								Dup of LW12D1													
3			LW12D1		LW120D1		LW12D1		LW12D1		LW12D1		Y		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1	
4			AH76C		AH76A		AU45L		BC27S		BH96M		BH96O		BR55B		CB85I		CL03K		CT67E		DE87M		DM52H	
5			5/20/99		5/20/99		9/23/99		12/9/99		2/18/00		2/18/00		5/22/00		8/31/00		11/10/00		2/15/01		6/6/01		8/15/01	
123		**PAHs (µg/L)**																								
124		**EPA Method SW8270 SIM**																								
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AA	AB	AC	AD	AE	AF
1							
2							
3		LW12D1		LW12D1		LW12D1	
4		DW48J		ED34H		EN00K	
5		11/29/01		2/28/02		6/27/02	
123	**PAHs (µg/L)**						
124	**EPA Method SW8270 SIM**						
125	Naphthalene	NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA	
127	Acenaphthylene	NA		NA		NA	
128	Acenaphthene	NA		NA		NA	
129	Fluorene	NA		NA		NA	
130	Anthracene	NA		NA		NA	
131	Dibenzofuran	NA		NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
3			LW-12D2		LW-12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2
4			AH76B		AU45M		BC27T		BH96N		BR55A		CB85J		CL03L		CT67F		DE87R		DM52F		DW48I		ED34I		EN00L
5			5/20/99		9/23/99		12/9/99		2/18/00		5/22/00		8/31/00		11/10/00		2/15/01		6/6/01		8/15/01		11/29/01		2/28/02		6/27/02
7	1	**CHLORINATED PHENOLS (µg/L)**																									
8	2	**EPA Method SW8040**																									
9	3	Pentachlorophenol	**0.91**		0.25	U	**3.7**		0.25	U	0.25	UJ	0.25	U	0.25	U	0.25	U	**1.7**		0.25	U	0.25	U	NA		0.25
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U	**0.22**	J1	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U	**0.50**		0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA
16	10																										
17	11	**SEMIVOLATILES (µg/L)**																									
18	12	**EPA Method SW8270**																									
19	13	Phenol	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
21	15	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50
24	18	Naphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
26	20	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
27	21	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
28	22	Acenaphthene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
29	23	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
30	24	Fluorene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
31	25	Pentachlorophenol	5.0	U	5.0	U	**2.8**	J1	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
32	26	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	**20**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	4.0	U	**5.4**
33	27																										
34	28	**VOLATILES (µg/L)**																									
35	29	**EPA Method SW8260**																									
36	30	Acetone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
37	31	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
38	32	2-Butanone	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
39	33	Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
40	34	Bromoform	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
41	35	Toluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
42	36	Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
43	37	Styrene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
44	38	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
45	39	o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
46	40	1,3,5-Trimethylbenzene	**1.1**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
47	41	1,2,4-Trimethylbenzene	**3.7**		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
48	42	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
49	43	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
50	44	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
51	45	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
52	46	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
53	47	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0
54	48	Naphthalene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
55		Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
56	49																										
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																									
58	51	**Method OR-DEQ**																									
59	52	**TPH-Diesel**	0.25	U	0.25	U	**0.32**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		NA		NA		0.25	U	NA
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		0.50	U	NA		NA		NA		NA		NA		NA
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62	55																										
63	56	**PRIORITY POLLUTANT**																									
64	57	**METALS (mg/L)**																									
65	58	Arsenic (7060)	**0.020**		**0.021**		**0.003**		**0.019**		**0.024**		**0.022**		**0.020**		**0.022**		**0.022**		**0.024**		**0.024**		**0.020**		**0.018**

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AB
1		
2		
3		
4		
5		
6		
7	**CHLORINATED PHENOLS (µg/L)**	
8	**EPA Method SW8040**	
9	Pentachlorophenol	U
10	2,4,6-Trichlorophenol	
11	2,3,6-Trichlorophenol	
12	2,4,5-Trichlorophenol	
13	2,3,4-Trichlorophenol	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	
15	2,3,4,5-Tetrachlorophenol	
16		
17	**SEMIVOLATILES (µg/L)**	
18	**EPA Method SW8270**	
19	Phenol	U
20	4-Methylphenol	U
21	Isophorone	U
22	2,4-Dimethylphenol	U
23	Benzoic Acid	U
24	Naphthalene	U
25	2-Methylnaphthalene	U
26	2,4,6-Trichlorophenol	U
27	2,4,5-Trichlorophenol	U
28	Acenaphthene	U
29	Dibenzofuran	U
30	Fluorene	U
31	Pentachlorophenol	U
32	bis(2-Ethylhexyl)phthalate	
33		
34	**VOLATILES (µg/L)**	
35	**EPA Method SW8260**	
36	Acetone	U
37	Carbon Disulfide	U
38	2-Butanone	U
39	Benzene	U
40	Bromoform	U
41	Toluene	U
42	Ethylbenzene	U
43	Styrene	U
44	m,p-Xylene	U
45	o-Xylene	U
46	1,3,5-Trimethylbenzene	U
47	1,2,4-Trimethylbenzene	U
48	Isopropylbenzene	U
49	n-Propylbenzene	U
50	tert-Butylbenzene	U
51	sec-Butylbenzene	U
52	4-Isopropyltoluene	U
53	n-Butylbenzene	U
54	Naphthalene	U
55	Methyl tert-butyl ether	
56		
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**	
58	**Method OR-DEQ**	
59	**TPH-Diesel**	
60	**TPH-D Motor Oil**	
61	**TPH-Gasoline**	
62		
63	**PRIORITY POLLUTANT**	
64	**METALS (mg/L)**	
65	Arsenic (7060)	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW-12D2		LW-12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2
4			AH76B		AU45M		BC27T		BH96N		BR55A		CB85J		CL03L		CT67F		DE87R		DM52F		DW48I		ED34I		EN00L
5			5/20/99		9/23/99		12/9/99		2/18/00		5/22/00		8/31/00		11/10/00		2/15/01		6/6/01		8/15/01		11/29/01		2/28/02		6/27/02
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005
67	60	Copper (6010)	0.002	U	0.002	U	**0.005**		0.002	U	0.002	U	0.002	U	**0.004**		0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002
68	61	Lead (7421)	0.001	U	0.001	U	**0.002**		0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	**0.002**		0.001	U	0.001
69	62	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01
70	63	Zinc (6010)	**0.007**		0.004	U	**0.306**		**0.009**		0.006	U	0.006	U	0.006	U	**0.009**		0.006	U	0.006	U	0.006	U	0.006	U	0.006
71	64																										
72	65	**MAJOR IONS AND CONVENTIONALS**																									
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**36.1**		**38.3**		**29.4**		**31.9**		**39.1**		**52.5**
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**16.4**		**17.3**		**13.7**		**14.0**		**17.3**		**23.0**
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**2.4**		**2.4**		**2.4**		**2.2**		**2.8**		**3.1**
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		**15.0**		**17.6**		**13.5**		**14.0**		**16.8**		**21.7**
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**220**		NA		NA		NA		**230**		NA
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		1.0	U	NA		NA		NA		1.0	U	NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**220**		NA		NA		NA		**230**		NA
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**340**		**270**		**160**		**290**		**320**		**280**		**280**		**240**		**280**	J	**210**		**210**		**330**		**330**
81	74	Chloride (mg/L) (EPA 325.2)	**3.9**		**2.7**		**4.7**		**3.9**		**3.7**		**8.2**		**3.3**		**5.6**	J	**3.2**		**7.9**		**3.1**		**24**		**4.1**
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		0.010	U	NA
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		**0.029**	J	NA		NA		NA		**0.042**		NA
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		**0.031**		NA		NA		NA		**0.048**		NA
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		**7.3**		NA		NA		NA		**6.5**		NA
86	79																										

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TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AB
1		
2		
3		
4		
5		
66	Chromium (6010)	U
67	Copper (6010)	U
68	Lead (7421)	U
69	Nickel (6010)	U
70	Zinc (6010)	U
71		
72	**MAJOR IONS AND CONVENTIONALS**	
73	Calcium (mg/L) (6010)	
74	Magnesium (mg/L) (6010)	
75	Potassium (mg/L) (6010)	
76	Sodium (mg/L) (6010)	
77	Alkalinity (mg/L CaCO3) (SM 2320)	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	
81	Chloride (mg/L) (EPA 325.2)	
82	N-Nitrate (mg-N/L) (Calculated)	
83	N-Nitrite (mg-N/L) (EPA 354.1)	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	
85	Sulfate (mg/L) (EPA 375.2)	
86		

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW-12D2		LW-12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2
4			AH76B		AU45M		BC27T		BH96N		BR55A		CB85J		CL03L		CT67F		DE87R		DM52F		DW48I		ED34I		EN00L
5			5/20/99		9/23/99		12/9/99		2/18/00		5/22/00		8/31/00		11/10/00		2/15/01		6/6/01		8/15/01		11/29/01		2/28/02		6/27/02
87	80	**FIELD PARAMETERS**																									
88	81	pH (avg)	6.69		6.81		6.88		6.75		6.61		6.64		5.48		6.56		6.89		6.96		6.68		6.50		6.66
89	82	Temperature (° C) (avg)	13.8		14.2		11.9		13.0		13.9		13.7		13.3		13.3		13.9		14.0		13.1		13.1		14.2
90	83	Conductivity (um/hos)	514		391		250		475		468		443		442		429		473		356		375		439		528
91	84	Dissolved oxygen (mg/L) (avg)	2.40		0.42		2.80		1.42		0		0.52		0.29		0.00		0.50		0.34		3.45		7.16		4.25
92	85																										
93	86	**DIOXINS AND FURANS (ng/L)**																									
94	87	**Method 8290**																									
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120																											
121																											
122																											

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AB
1		
2		
3		
4		
5		
87	**FIELD PARAMETERS**	
88	pH (avg)	
89	Temperature (° C) (avg)	
90	Conductivity (um/hos)	
91	Dissolved oxygen (mg/L) (avg)	
92		
93	**DIOXINS AND FURANS (ng/L)**	
94	**Method 8290**	
95	2,3,7,8-TCDF	
96	Total TCDF	
97	2,3,7,8-TCDD	
98	Total TCDD	
99	1,2,3,7,8-PeCDF	
100	2,3,4,7,8-PeCDF	
101	Total PeCDF	
102	1,2,3,7,8-PeCDD	
103	Total PeCDD	
104	1,2,3,4,7,8-HxCDF	
105	1,2,3,6,7,8-HxCDF	
106	2,3,4,6,7,8-HxCDF	
107	1,2,3,7,8,9-HxCDF	
108	Total HxCDF	
109	1,2,3,4,7,8-HxCDD	
110	1,2,3,6,7,8-HxCDD	
111	1,2,3,7,8,9-HxCDD	
112	Total HxCDD	
113	1,2,3,4,6,7,8-HpCDF	
114	1,2,3,4,7,8,9-HpCDF	
115	Total HpCDF	
116	1,2,3,4,6,7,8-HpCDD	
117	Total HpCDD	
118	OCDF	
119	OCDD	
120		
121		
122		

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1																											
2																											
3			LW-12D2		LW-12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2		LW12D2
4			AH76B		AU45M		BC27T		BH96N		BR55A		CB85J		CL03L		CT67F		DE87R		DM52F		DW48I		ED34I		EN00L
5			5/20/99		9/23/99		12/9/99		2/18/00		5/22/00		8/31/00		11/10/00		2/15/01		6/6/01		8/15/01		11/29/01		2/28/02		6/27/02
123		**PAHs (µg/L)**																									
124		**EPA Method SW8270 SIM**																									
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	B	AB
1		
2		
3		
4		
5		
123	**PAHs (µg/L)**	
124	**EPA Method SW8270 SIM**	
125	Naphthalene	
126	2-Methylnaphthalene	
127	Acenaphthylene	
128	Acenaphthene	
129	Fluorene	
130	Anthracene	
131	Dibenzofuran	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			LW15D		LW15D	
4			BR64T		CL03T	
5			5/25/00		11/9/00	
6						
7	1	**CHLORINATED PHENOLS (µg/L)**				
8	2	**EPA Method SW8040**				
9	3	Pentachlorophenol	**0.33**		0.25	U
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U
11	5	2,3,6-Trichlorophenol	0.25	U	0.25	U
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U
13	7	2,3,4-Trichlorophenol	0.25	U	0.25	U
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	0.25	U
15	9	2,3,4,5-Tetrachlorophenol	0.25	U	0.25	U
16	10					
17	11	**SEMIVOLATILES (µg/L)**				
18	12	**EPA Method SW8270**				
19	13	Phenol	NA		NA	
20	14	4-Methylphenol	NA		NA	
21	15	Isophorone	NA		NA	
22	16	2,4-Dimethylphenol	NA		NA	
23	17	Benzoic Acid	NA		NA	
24	18	Naphthalene	NA		NA	
25	19	2-Methylnaphthalene	NA		NA	
26	20	2,4,6-Trichlorophenol	NA		NA	
27	21	2,4,5-Trichlorophenol	NA		NA	
28	22	Acenaphthene	NA		NA	
29	23	Dibenzofuran	NA		NA	
30	24	Fluorene	NA		NA	
31	25	Pentachlorophenol	NA		NA	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA	
33	27					
34	28	**VOLATILES (µg/L)**				
35	29	**EPA Method SW8260**				
36	30	Acetone	NA		NA	
37	31	Carbon Disulfide	NA		NA	
38	32	2-Butanone	NA		NA	
39	33	Benzene	NA		NA	
40	34	Bromoform	NA		NA	
41	35	Toluene	NA		NA	
42	36	Ethylbenzene	NA		NA	
43	37	Styrene	NA		NA	
44	38	m,p-Xylene	NA		NA	
45	39	o-Xylene	NA		NA	
46	40	1,3,5-Trimethylbenzene	NA		NA	
47	41	1,2,4-Trimethylbenzene	NA		NA	
48	42	Isopropylbenzene	NA		NA	
49	43	n-Propylbenzene	NA		NA	
50	44	tert-Butylbenzene	NA		NA	
51	45	sec-Butylbenzene	NA		NA	
52	46	4-Isopropyltoluene	NA		NA	
53	47	n-Butylbenzene	NA		NA	
54	48	Naphthalene	NA		NA	
55		Methyl tert-butyl ether	NA		NA	
56	49					
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**				
58	51	**Method OR-DEQ**				
59	52	**TPH-Diesel**	NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA	
61	54	**TPH-Gasoline**	NA		NA	
62	55					
63	56	**PRIORITY POLLUTANT**				
64	57	**METALS (mg/L)**				
65	58	Arsenic (7060)	NA		NA	

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			LW15D		LW15D	
4			BR64T		CL03T	
5			5/25/00		11/9/00	
66	59	Chromium (6010)	NA		NA	
67	60	Copper (6010)	NA		NA	
68	61	Lead (7421)	NA		NA	
69	62	Nickel (6010)	NA		NA	
70	63	Zinc (6010)	NA		NA	
71	64					
72	65	**MAJOR IONS AND CONVENTIONALS**				
73	66	Calcium (mg/L) (6010)	NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA	
86	79					

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			LW15D		LW15D	
4			BR64T		CL03T	
5			5/25/00		11/9/00	
87	80	**FIELD PARAMETERS**				
88	81	pH (avg)	6.69		6.12	
89	82	Temperature (° C) (avg)	14.6		12.8	
90	83	Conductivity (um/hos)	324		265	
91	84	Dissolved oxygen (mg/L) (avg)	0.67		1.25	
92	85					
93	86	**DIOXINS AND FURANS (ng/L)**				
94	87	**Method 8290**				
95	88	2,3,7,8-TCDF	NA		NA	
96	89	Total TCDF	NA		NA	
97	90	2,3,7,8-TCDD	NA		NA	
98	91	Total TCDD	NA		NA	
99	92	1,2,3,7,8-PeCDF	NA		NA	
100	93	2,3,4,7,8-PeCDF	NA		NA	
101	94	Total PeCDF	NA		NA	
102	95	1,2,3,7,8-PeCDD	NA		NA	
103	96	Total PeCDD	NA		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA	
108	101	Total HxCDF	NA		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA	
112	105	Total HxCDD	NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA	
115	108	Total HpCDF	NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA	
117	110	Total HpCDD	NA		NA	
118	111	OCDF	NA		NA	
119	112	OCDD	NA		NA	
120						
121						
122						

TABLE F-11
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
DETECTED CONSTITUENTS
APRIL 1997 - FEBRUARY 2005
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F
1						
2						
3			LW15D		LW15D	
4			BR64T		CL03T	
5			5/25/00		11/9/00	
123		**PAHs (µg/L)**				
124		**EPA Method SW8270 SIM**				
125		Naphthalene	NA		NA	
126		2-Methylnaphthalene	NA		NA	
127		Acenaphthylene	NA		NA	
128		Acenaphthene	NA		NA	
129		Fluorene	NA		NA	
130		Anthracene	NA		NA	
131		Dibenzofuran	NA		NA	