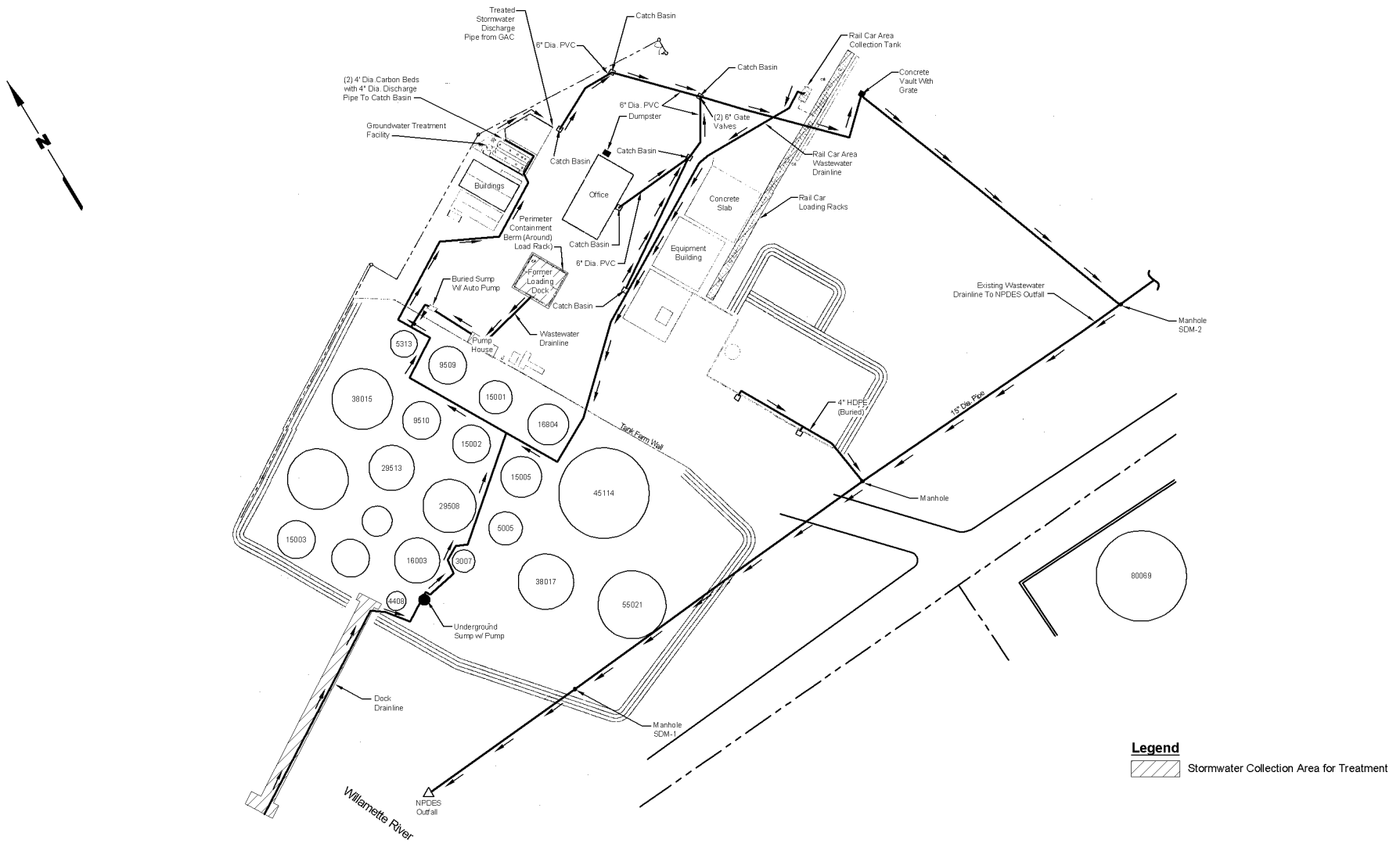

Time Oil\Phase III RI Report-Final\ X:\231\009\132\Phase III RI-Final\Fig2-2.dwg (A) "Figure 2-2" 11/4/2005

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Stormwater Flow Route and Stormdrain System**	Figure **2-2**

BZTO104(e)023776

LANDAU ASSOCIATES

December 21, 2005

Oregon Department of Environmental Quality
2020 SW Fourth Avenue, Suite 400
Portland, Oregon 97201-4987

Attn: Mr. Tom Roick

RE: RESPONSE TO DEQ COMMENTS
FINAL PHASE III REMEDIAL INVESTIGATION REPORT
TIME OIL NORTHWEST TERMINAL

Dear Tom:

On behalf of Time Oil Co. (Time Oil), this letter provides responses to comments from the Oregon Department of Environmental Quality (DEQ) regarding the *Final Phase III Remedial Investigation (RI) Report*, dated July 19, 2005, which was prepared by Landau Associates for Time Oil. DEQ's comments, which are documented in its letter to Time Oil dated October 10, 2005, are provided below along with the corresponding responses. Enclosed with this letter is the entire text of the RI report, which incorporates the revisions and additional requested information. Pages where modifications were made are referenced in the responses below. The revised text, figures, and table will replace those provided with the July 19, 2005 document.

A. ***DEQ Comment:*** *Defining the extent of the Main Tank Farm groundwater plume north of Time Oil on Port of Portland property. Please provide DEQ with construction details for the Port of Portland's existing wells and/or a proposal to install additional wells in this area if sampling the existing wells is unsuccessful.*

Response: Currently, we are planning to sample two wells located on the Port of Portland's (Port) property north of Time Oil. These wells are located within 300 ft of the northern property boundary of the Northwest Terminal. As requested, well construction details for these wells are attached to this letter. In June and November 2005, Time Oil attempted to collect groundwater samples from these wells for laboratory analysis. No samples were collected because the wells were dry. Collection of groundwater samples from these wells will again be attempted by Time Oil during the first quarter 2006 groundwater sampling event in February 2006, if sufficient groundwater is available in the wells. The analytical results for the Port wells will be provided with the associated quarterly groundwater monitoring report. If sampling of the wells is not successful in February 2006, Time Oil will provide DEQ with a recommendation on a methodology for definition of locality of facility in this area.

B. *DEQ Comment:* *Additional monitoring of the Main Tank Farm nearshore groundwater contaminant concentrations. DEQ does not agree that a complete pathway to the river from the Main Tank Farm is absent as stated on pages xii, 4-1, and 9-2 of the RI Report. A complete physical groundwater pathway to the Willamette River exists; however, it appears based on available data that groundwater contaminants are currently reaching the river at concentrations below applicable screening level values. Please submit revised pages for the RI report.*

Response: We agree that a physical groundwater transport pathway to the river exists between upland areas and the Willamette River at the terminal. We also agree that facility-related groundwater contaminants are currently reaching the river at concentrations below applicable screening level values. Therefore, the text in the report has been modified to indicate more clearly that, although a physical pathway for migration of contaminants to the river exists, no complete exposure pathway via groundwater to potential receptors in the Willamette River exists for facility-related contaminants at concentrations above applicable screening levels. Accordingly, the text on pages v, xii, xiv, 4-1, 4-4, 7-23, 8-7, and 9-2 have been revised.

C. *DEQ Comment:* *Defining site Beneficial Water Uses. Groundwater discharge (i.e., surface water recharge) to the Willamette River should be recognized as a current and future beneficial use of site groundwater. In addition, it should be noted that the Region X U.S. Environmental Protection Agency identified Maximum Contaminant Levels under the Safe Drinking Water Act (EPA, letter to the Lower Willamette Group dated September 27, 2005) and Ambient Water Quality Criteria for combined organism and water ingestion, are potential applicable or relevant and appropriate requirements for the Portland Harbor Superfund Site. These criteria should be carried forward into the Source Control Evaluation, Risk Assessment, and Feasibility Study as appropriate. Please submit revised pages for the RI report.*

Response: OAR 340-122-0080(3)(f) requires the RI to describe current and reasonably likely beneficial uses of groundwater and surface water in the locality of the facility. "Locality of the facility" means any point where a human or an ecological receptor contacts, or is reasonably likely to come into contact with, facility-related hazardous substances, OAR 340-122-0115(35). As your letter notes, facility-related groundwater contaminants are currently reaching the river at concentrations below applicable screening level values. Therefore, the Willamette River is not included in the locality of the facility, and groundwater discharge to the Willamette River is not a beneficial use of groundwater within the locality of the facility. Text on page 4-4 has been revised to reflect this information.

For the reasons stated in the Lower Willamette Group's October 10, 2005 comments on the Joint Source Control Strategy (JSCS), Time Oil disagrees that Safe Drinking Water Act Maximum Contaminant Levels and Ambient Water Quality Criteria for combined organism and water ingestion are potential applicable or relevant and appropriate requirements for the Portland Harbor Superfund Site. Time Oil will complete a Source Control Evaluation consistent with the JSCS, which instructs the responsible party to screen against the values presented in Table 3-1. Table 3-1 (rev. 9/01/05) includes MCLs but does not include AWQCs for combined organism and water ingestion. Because there is not an exposure pathway via groundwater to potential receptors in the Willamette River for facility-related contaminants at concentrations above applicable screening levels and because the Willamette River is not within the locality of the Time Oil facility, Time Oil does not currently plan to carry MCLs or AWQCs forward into the upland Risk Assessment or Feasibility Study.

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D. DEQ Comment: *Further evaluation of metals in groundwater (Page 7-26 of the RI Report)*

Response: Further evaluation of metals in groundwater will be conducted as part of the development of a source control evaluation approach. Monitored natural attenuation parameters (e.g., dissolved oxygen, oxidation-reduction potential, pH, conductivity, temperature) are being measured on a monthly basis from June through December 2005 using pre-purge, downhole techniques. This information will be used to assess whether there is a correlation between the metals concentrations with redox conditions at the terminal. The results of this assessment will be provided in a source control evaluation document to be provided to DEQ in spring 2006.

Additional Revisions:

The schedule in Section 10 has been updated (pg 10-1). We have also included three revised figures and one revised table. Figure 2-2 has been updated to show the current non-operational areas of the Terminal. Figure 6-1 now includes the location of the river outfall. On Figure 6-6, the storm drain has been extended to the river shoreline. Please note, however, that the location and elevation of the river outfall are approximate on all the figures. Table 7-1 has been revised to include the Second Quarter 2005 results from the nearshore wells. We did not attempt to revise the entire report to include the First Quarter and Second Quarter 2005 results; these results were provided to you in separate deliverables.

* * * * * * *

We hope that these responses provide you with the information you need. Please call us if you have any questions.

LANDAU ASSOCIATES, INC.

Rebekah Brooks
Project Manager

Stacy J. Pischer
Senior Project Geologist

RB/SJP/tam

cc: Mark Chandler, Time Oil Co.
Patty Dost, Schwabe Williamson & Wyatt
Mike Tischuk, Beazer East, Inc.

BZTO104(e)023779

STATE OF OREGON

MONITORING WELL REPORT

MULT 58045

Received Date 04/30/1999
Well ID Tag# L 29586
Start Card # 117785

(as required by ORS 537.765 & OAR 690-240-095) Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT

Well No. 29586
Co Job No. 3246

Name PORT OF PORTLAND
Street 700 NE MULTNOMAH
City PORTLAND State OR Zip 97208

(2) TYPE OF WORK

☒ New Construction ☐ Alter (Recondition) ☐ Alter (Repair)
☐ Conversion ☐ Deepening ☐ Abandonment

(3) DRILLING METHOD

☐ Rotary Air ☐ Rotary Mud ☐ Cable
☒ Hollow Stem Auger Other *****

(4) BORE HOLE CONSTRUCTION

Special Standards ☐ Depth of completed well 19 ft.

Diameter	From	To
10.00	0.00	19

Material	Begin Depth	End Depth	Material Amount	Units
[redacted]				
[redacted]				

Vault
0 ft.
Casing Diameter
Liner ☐
1 TO ft.

Monument

Casing or Liner	Diameter	Begin Depth	End Depth	Gauge	Material	Construction Weld	Threaded	Location Of Shoe
[redacted]								

ft.
TO
ft.

Seal
ft.
TO
ft.

From	To	Material	Amount	Seal Grout Weight	Units
0.00	1.00	Concrete	2.00		S
1.00	8.00	Bentonite	6.00		S

Filter Pack Screen ☐
8 ft.
TO
19 ft.

Diameter	From	To	Gauge	Material	Type	Slot Size
	9	19		PL		.010

Filter Pack
Material SA
Size 20.00 in.

(5) WELL TEST

Permeability Yield
Conductivity PH
Temperature of water 57 °F/C Depth artesian flow found ft.
Was water analysis done? ☐
By Whom? FISHMAN ENVIRONMENTAL
Depth of strata to be analyzed. From ft. to ft.
Remarks

Name of supervising Geologist/Engineer

(6) LOCATION OF WELL By legal description

County
Township 2.00 N Range 1.00 W Section 35
1. SW 1/4 of SW 1/4 of above section.
Legal Desc:

2. Either Street address of well location
VACANT PARCELS
or Tax lot number of well location 49

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(7) STATIC WATER LEVEL

16.0 Ft. below land surface. Date 04/05/1999
Artesian Pressure lb/sq. in. Date

(8) WATER BEARING ZONES

Depth at which water was first found 16 ft.

From	To	Est. Flow Rate	SWL
16	19		16

(9) WELL LOG

Ground elevation ft.

Material	From	To	SWL
SAND	0	19	16

Date started 04/05/1999 Completed 04/05/1999

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

MWC Number 10306
Signed By J TRENT CASTNER Date

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

MWC Number 10011
Signed By GREG MCINNIS Date

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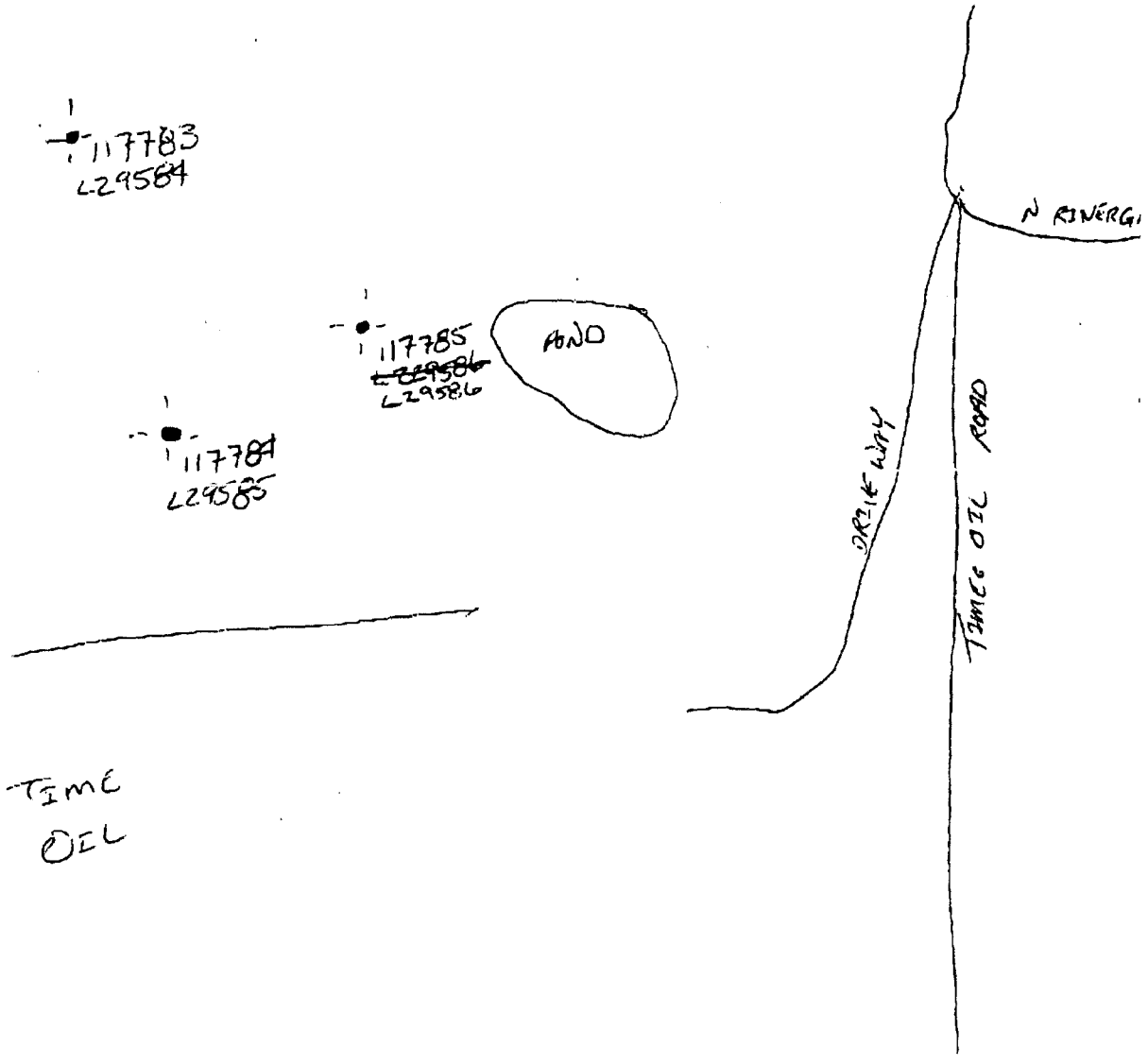
SITE MAP

N 1
1" = 150'

Multnomah
58043-58045



STATE OF OREGON

MONITORING WELL REPORT

MULT 58044

(as required by ORS 537.765 & OAR 690-240-095) Instructions for completing this report are on the last page of this form.

Received Date 04/30/1999
Well ID Tag# L 29585
Start Card # 117784

(1) OWNER/PROJECT

Well No. 29585
Co Job No. 3246

Name PORT OF PORTLAND
Street 700 NE MULTNOMAH
City PORTLAND State OR Zip 97208

(2) TYPE OF WORK

☒ New Construction ☐ Alter (Recondition) ☐ Alter (Repair)
☐ Conversion ☐ Deepening ☐ Abandonment

(3) DRILLING METHOD

☐ Rotary Air ☐ Rotary Mud ☐ Cable
☒ Hollow Stem Auger Other *****

(4) BORE HOLE CONSTRUCTION

Special Standards ☐ Depth of completed well 19 ft.

Diameter	From	To
10.00	0.00	19

Material	Begin Depth	End Depth	Material Amount	Units

Vault
0 ft.
TO
1 ft.

Casing Diameter Liner ☐

Monument
ft.
TO
ft.

Casing or Liner	Diameter	Begin Depth	End Depth	Gauge	Material	Construction Weld	Threaded	Location Of Shoe

Seal
ft.
TO
ft.

From	To	Material	Amount	Seal Grout Weight	Units
0.00	1.00	Concrete	2.00		S
1.00	8.00	Bentonite	6.00		S

Filter Pack Screen ☐
8 ft.
TO
19 ft.

Filter Pack
Material SA
Size 20.00 in.

(5) WELL TEST

Permeability Yield
Conductivity PH
Temperature of water 57 °F/C Depth artesian flow found ft.
Was water analysis done? ☐
By Whom? FISHMAN ENVIRONMENTAL
Depth of strata to be analyzed. From ft. to ft.
Remarks

Name of supervising Geologist/Engineer

(6) LOCATION OF WELL By legal description

County
Township 2.00 N Range 1.00 W Section 35
1. SW 1/4 of SW 1/4 of above section.
Legal Desc:

2. Either Street address of well location
VACANT PARCELS
or Tax lot number of well location 49

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(7) STATIC WATER LEVEL

16.0 Ft. below land surface. Date 04/05/1999
Artesian Pressure lb/sq. in. Date

(8) WATER BEARING ZONES

Depth at which water was first found 16 ft.

From	To	Est. Flow Rate	SWL
16	19		16

(9) WELL LOG

Ground elevation ft.

Material	From	To	SWL
SAND	0	19	16

Date started 04/05/1999 Completed 04/05/1999

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

MWC Number 10306
Signed By J TRENT CASTNER Date

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

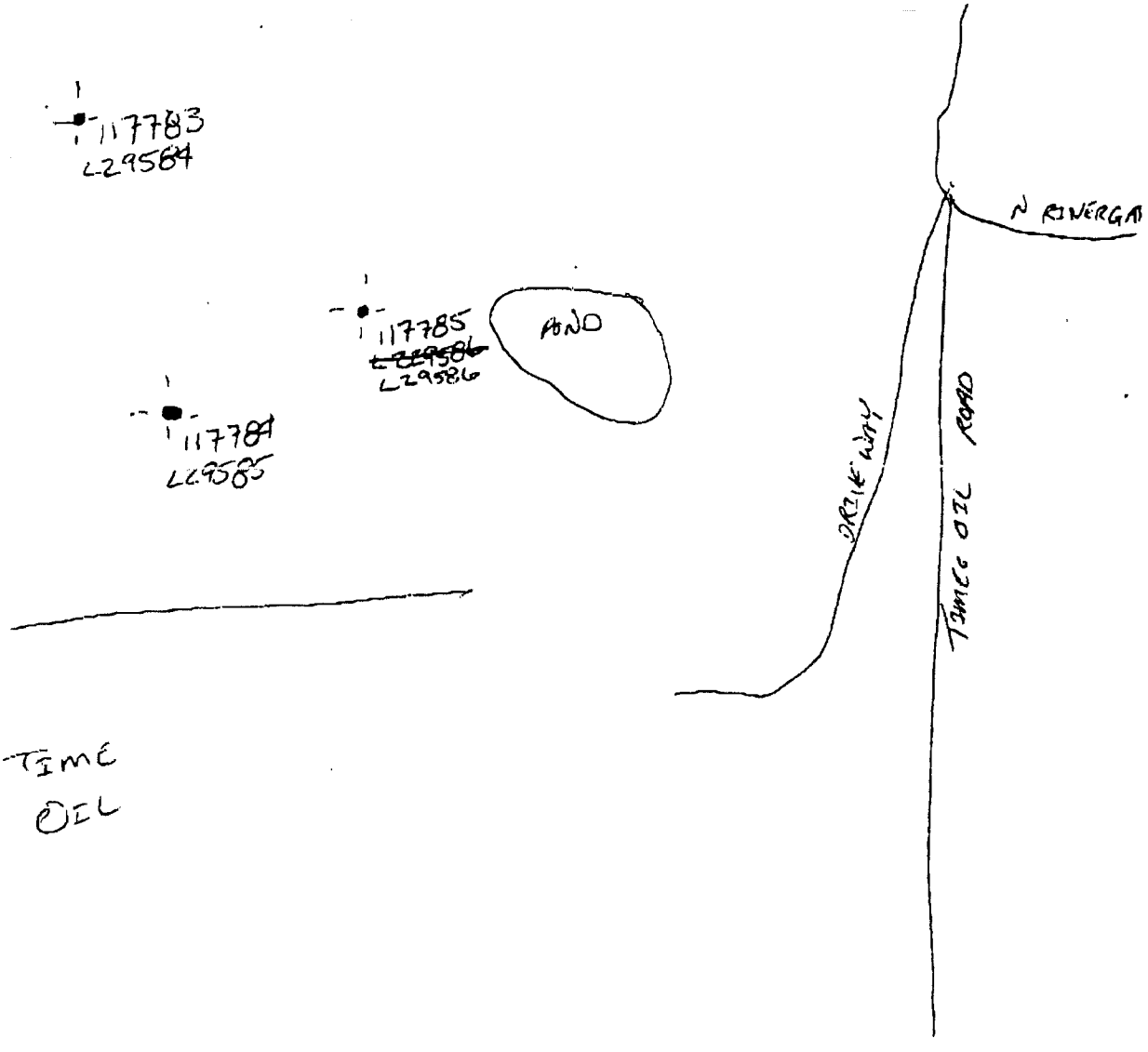
MWC Number 10011
Signed By GREG MCINNIS Date

BZTO104(e)023782

SITE MAP

N ↑
1" = 150'

Multnomah
58043-58045



Volume I - Final
Phase III Remedial Investigation Report
Time Oil Northwest Terminal
Portland, Oregon

July 19, 2005
Revised December 20, 2005

Prepared for

Time Oil Co.
2737 West Commodore Way
Seattle, WA 98100-1233

LANDAU ASSOCIATES
130 2nd Avenue South
Edmonds, WA 98020
(425) 778-0907

BZTO104(e)023784

EXECUTIVE SUMMARY

Beginning in the fall of 2001, Landau Associates conducted the third phase of a remedial investigation (RI) 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 pentachlorophenol (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 RI. 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 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 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 of 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 Terminal Tank Farm area, which temporarily stores 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 Tank

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Farm area, a strip of land approximately 80 ft wide along the entire western property boundary and outside of the tank farm wall was apparently used by owners/operators of the adjacent property to the west for approximately 25 years, ending in 2000, based on historical aerial photographs.

- **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 Tank Farm area is located at the eastern side of the Bell Terminal Tank Farm area. Historically in these areas, product was transferred from the railcar, truck, or vessel to the above-ground tanks through pipelines located near each of the receipt/distribution locations. None of the equipment in these areas is currently in use.

- **Wastewater treatment system** located in the northern portion of the facility where groundwater recovered from the two groundwater interim action recovery wells, the groundwater intercept system in the storm drain, and investigation-derived groundwater from purging of monitoring wells during quarterly sampling events is treated before discharge to the City of Portland's sanitary sewer.

- **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 a currently and historically undeveloped area. 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 PCP 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, 6,400 yd^3 of PCP-impacted soil were excavated from these areas for offsite incineration and disposal. The Phase II RI report describing this area was submitted to DEQ on February 9, 2001. The soil removal actions 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 RI report describing this area was submitted to DEQ on February 9, 2001. The soil removal actions 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 for incineration and disposal offsite during Phase I/II soil removal actions conducted in fall 2002. The Phase I RI report describing the former soil stockpile area was submitted to DEQ on April 25, 1997. The soil removal actions completion report, including removal of the soil stockpile, was submitted to DEQ on November 10, 2003.

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 obtain information adequate 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 Phase I and Phase 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 more than 250 soil samples and groundwater samples from a maximum of 82 wells for chemical analyses on a quarterly basis; monitoring groundwater levels at the 82 monitoring well locations; and logging subsurface soil conditions at more than 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 in groundwater and soil within the Phase III study area and to collect geologic, 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 27 grids and 17 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.

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- 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 Tank Farm area using direct-push sampling techniques, and collecting groundwater samples at these locations from temporary well points, and 3) collecting five discrete soil samples in certain areas where soil composite samples were collected during the preliminary evaluation and additional information was needed.

- Final stage soil and groundwater investigations were 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 (four shallow and eight deep) were installed in the Main Terminal Tank Farm area and 10 monitoring wells (seven shallow and three deep) were installed in the Bell Terminal Tank Farm area.

- A supplemental investigation was conducted within the Phase III study area from October through November 2004. Twelve additional monitoring wells were installed: one upper zone and two lower zone wells within the Main Terminal Tank Farm area, four lower zone wells on the shoreline of the Willamette River, four upper zone wells within the Bell Terminal Tank Farm area, and one lower zone well to replace the well that was damaged during implementation of the *in situ* chemical oxidation technique for remediation of shallow soil and groundwater associated with the former PCP mixing area.

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." OAR 340-122-115(34). 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 and the shoreline of the Willamette River west of the Main Terminal Tank Farm area extending to the locations of the shoreline wells. Based on the shoreline groundwater data collected in November 2004, February 2005, and June 2005, facility-related groundwater contaminants are currently reaching the river at concentrations below applicable screening level values. These data indicate that, even though there is a physical groundwater transport pathway from the upland areas of the terminal to the river, there is not a complete exposure pathway via groundwater at the Time Oil

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facility to the Willamette River. Therefore, groundwater discharge to the Willamette River is not a current or future beneficial use of the groundwater and the Willamette River is not within the locality of the Time Oil facility. Groundwater concentrations in the shoreline wells will be confirmed through a full year of groundwater monitoring. Also, Time Oil is planning to conduct a source control evaluation to determine whether there is a potential for constituents currently observed in wells within the Main Tank Farm Area to migrate to the river. Historical discharges to the river, including discharges via the storm drain will be addressed during the RI/FS for the Portland Harbor Superfund Project. Low level detections of PCP have been observed intermittently within the lower zone 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 Former Premier Edible Oils (PEO) property south of the property boundary near the river is included in the locality of facility. Other properties downgradient of the Terminal include the former PEO property located west of the Bell Terminal Tank Farm area. The property west of the Bell Terminal Tank Farm area 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, the data indicate that there appears to be a separate source for contamination in this area and also in the area on the former PEO property where product has been observed in well MW-4 on a consistent basis between 2001 and 2003 (the most recent data available). No product has been observed in soil or groundwater within the Bell Terminal Tank Farm area. 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 where significant petroleum releases are known to have occurred, such as in the area where the former diesel above-ground storage tanks (ASTs) were located near well MW-4, it is unlikely that the elevated concentrations observed near the western property boundary or on the former PEO property originate from the Bell Terminal. 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. Therefore, the locality of facility boundary was extended to the western property boundary. Data from the adjacent property is not sufficient to identify the point at which any plume moving from the Bell Terminal terminates within plumes originating at the PEO property in order to define the locality of the facility in this area with certainty.

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Data collected during the fourth quarter 2004 event from the new wells located at the north property boundary of the Main Terminal Tank Farm area, indicate that low levels of contaminants were detected in groundwater in this area. During June 2005 and November 2005, Time Oil attempted to sample two existing wells on the Port of Portland property located within 300 ft of the Terminal's north property boundary. Both wells were dry. Sampling of these wells will be attempted again during the wet season, in February 2006. If sampling of these wells is again unsuccessful, a recommendation will be provided to DEQ on a methodology for definition of the locality of facility in this area. Until sample results are collected and evaluated from this area, the locality of facility boundary in this area is approximate, but assumed to extend to the north property boundary.

Nature and Extent of Contamination: Soil

The nature and extent of contamination in soil for the Terminal was evaluated by operational 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. These areas are shown on Figure 1-2. Preliminary screening levels, based on various published federal and state criteria and site-specific background concentrations, were used to compare to the observed soil 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 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 subsurface soil samples collected at several locations within the Main Terminal Tank Farm area and the Bell Terminal Tank Farm area. These sheens were observed in soil at depths ranging between 3.5 to 34 ft BGS in the Main Terminal Tank Farm area and at depths ranging from 12.5 to 19.5 ft BGS in the Bell Terminal Tank Farm area.

- Along the western portion of the Main Terminal Tank Farm area, 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 located near the top of the river bank. 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. Concentrations of PAHs exceeding the preliminary screening levels were also reported for soil collected from the capillary fringe depth interval at three locations along the western boundary of the Main Terminal Tank Farm area, including locations LW-24D, LW-25D, and LW-35D.

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- In the Bell Terminal Tank Farm area, total petroleum hydrocarbon-contaminated soil was found within two areas: along the western property boundary where, based on historical aerial photographs, owners/operators of the adjacent property used the property until approximately 2000, and in the central portion of the tank farm. The highest concentrations of contaminants in soil occur along the western property boundary. Diesel-range and gasoline-range petroleum hydrocarbons were found at the capillary fringe in this area at concentrations of 15,100 mg/kg and 8,750 mg/kg, respectively. 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.

- In the loading rack/entrance area of the Main Terminal Tank Farm area, zinc and gasoline-range petroleum hydrocarbons are detected at concentrations exceeding preliminary screening levels. Elevated concentrations of gasoline-range petroleum hydrocarbons are associated with a composite sample collected at the capillary fringe in an area (biased area B3) where trucks were formerly loaded.

- PAHs and metals were detected in the 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. Diesel-range petroleum hydrocarbons were also detected in the surface soil, but not at concentrations exceeding the preliminary screening level.

- Within the asphalt-paved road area, TPH, PAHs, and metals were detected in the surface soil. At depths greater than 0.5 ft BGS, only metals were found in soil 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 nondetect to 180 mg/kg potentially 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. Residual levels of PCP will be determined following completion of the full scale ISCO injection events. Other constituents associated with the PCP-formulating operations (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 was evaluated by the same operational areas. Preliminary screening levels, based on various published federal and state criteria, were used for comparison to the observed groundwater concentrations. A summary of the Phase III groundwater results follows:

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Main Terminal Tank Farm Area

- 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 for the October 2003 event and ranging from nondetect to 6.5 mg/L for the November 2004 sampling event. 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.

- The gasoline-range petroleum hydrocarbon 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.

- Light non-aqueous phase liquid (LNAPL) has been previously documented in the upper zone groundwater in the Main Terminal Tank Farm area at monitoring wells N, P, Q, LW-21S, LW-27S and direct-push point GW8-1. The thickness of LNAPL present at these locations varies over time and between locations. The thicknesses range from 0.01 to 1.2 ft.

- Diesel-range and gasoline-range petroleum hydrocarbons, PAHs, VOCs, and metals are present at concentrations exceeding preliminary screening levels in the lower zone groundwater along the western portion of the Main Terminal Tank Farm area 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 area, where the confining unit is present, fewer occurrences of contaminants in the lower zone groundwater are observed.

- Concentrations of diesel- and gasoline-range TPH, benzene, and ethylbenzene in the samples from the upper and lower zone wells within the Main Terminal Tank Farm area generally decreased or did not change significantly over time.

- Concentrations of 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, but less overall than the upper zone concentrations for these constituents. 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. Gasoline-range concentrations for the lower zone wells in the Main Terminal Tank Farm area showed similar overall trends to the diesel-range concentrations.

Bell Terminal Tank Farm Area

- Groundwater data collected within the Bell Terminal Tank Farm area and on the 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.

- The maximum concentration of petroleum hydrocarbons in upper zone groundwater in the Bell Terminal Tank Farm area (796 mg/L for diesel-range hydrocarbons) was found near the western property boundary based on a direct-push sample collected in 2001. 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 Tank Farm area; however, the areas of impacted groundwater for these constituents appear to be smaller than the areas of groundwater impacted by petroleum hydrocarbons. Petroleum hydrocarbon concentrations increase across the western property boundary and on the former PEO property to maximum concentrations of 6.8 mg/L for diesel-range hydrocarbons and 38.7 mg/L for gasoline-range hydrocarbons at direct push location B-60.

- No LNAPL was observed on upper zone groundwater in the Bell Terminal Tank Farm area. LNAPL has consistently been observed between 2001 and 2003 (only data available) in well MW-4 located on the former PEO property near the locations of the former diesel ASTs.

- Except for diesel-range petroleum hydrocarbons and metals, 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.

- Lower zone groundwater concentrations in the Bell Terminal Tank Farm area for diesel- and gasoline-range TPH, benzene, and ethylbenzene are much less than the upper zone concentrations. 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.

- Concentrations of petroleum constituents in the lower zone increase significantly to the east of the extent of the confining unit boundary on the former PEO property. Based on the most recent data available (1996 and 1998 for TPH, and January 2003 for BTEX), elevated diesel-range hydrocarbon concentrations were observed with a maximum

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concentration of 35 mg/L at direct-push location G. Gasoline-range hydrocarbon and ethylbenzene concentrations exceeding the preliminary screening levels were also observed in this area with maximum concentrations of 44.5 mg/L at direct push location B-9 and 1,500 mg/L at well MW-5, respectively.

Eastern Portion of Phase III Study Area

- Although petroleum hydrocarbons were 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.

Phase II Study Area

- 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. In November 2004, the overall size of the PCP plume had diminished and concentrations within the plume had decreased significantly with the previous maximum concentration decreasing to 624 µg/L. These decreases in PCP concentrations appear to result from a large-scale soil removal action in 2002 as well as two full-scale ISCO injection events within the PCP plume area. 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 in 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.

- Occasional observations of LNAPL have also been recorded for upper zone groundwater monitoring wells within the Phase II study area. These wells include OX-1S, OX-2S, OX-3S, 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.

- PCP is detected in the lower zone groundwater within the Phase II study area, the southern portion of the Main Terminal Tank Farm area, and the western portion of the asphalt-paved road area at concentrations less than preliminary screening levels. 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.

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Asphalt-Paved Road Area

- No contaminants were detected in upper zone groundwater within the asphalt-paved road area.

Loading Rack/Entrance Area

- No lower zone groundwater monitoring wells exist in the loading rack/entrance area of the Main Terminal.

Shoreline Wells

- Groundwater results for the Willamette River shoreline wells indicate that, with the exception of chromium in wells LW-37D, LW-38D, and LW-39D and copper in well LW-37D, no concentrations exceeded the preliminary screening levels during the November 2004 event. Data for the first quarter 2005 (provided in its entirety in a separate deliverable) indicate that concentrations for all constituents are less than the preliminary screening levels in the shoreline wells. These data indicate that facility-related groundwater contaminants are currently reaching the river at concentrations below applicable screening level values. These groundwater concentrations will be confirmed through a full year of groundwater monitoring.

Site-Wide Observations

- Metals concentrations in the lower zone are typically greater than in the upper zone and may be the result of reducing conditions in the lower zone enhanced by the presence of petroleum hydrocarbons.

- 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.

- 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).

- Comparison of the diesel- and gasoline-range TPH, benzene, and ethylbenzene concentrations with groundwater elevations indicate that groundwater concentrations in upper zone wells are likely influenced by seasonal fluctuations in groundwater levels. Lower zone groundwater elevations correlate with river stage fluctuations; however, any trend in groundwater concentrations in response to fluctuations in groundwater level or river stage is not apparent from the available data.

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

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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 area, although no releases have been documented, it appears releases may have occurred in the central portion of the Bell Terminal Tank Farm area near the east-west trending conveyance pipeline due to incidental spills, along the western property boundary outside the walls of the tank farm in an area that appears to have been used by operators of the adjacent property for storage, and on the eastern portion of the former PEO property (including the former locations of diesel ASTs). 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 substances released have 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 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 were calculated to be protective for migration to groundwater that ultimately discharges to surface water.

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 indicates that contaminants have partitioned from the soil and/or NAPL into the groundwater. Petroleum hydrocarbon 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. Currently, migration pathways for PCP are being controlled through the groundwater interim action (e.g. groundwater recovery) and the ISCO injections in the PCP plume areas. Potential historical contaminant migration to the Willamette River is being addressed during the RI/FS for the Portland Harbor Superfund Project. 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

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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 downgradient extent of the diesel-range and gasoline-range hydrocarbon plumes originating from the Bell Terminal Tank Farm area 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, within and downgradient of the former PCP mixing area, and the western portion of the former PEO property to the west of the Bell Terminal tank farm 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. Because the confining unit boundary on the former PEO property is estimated within the likely source area where the diesel ASTs were located on the eastern portion of the PEO property, the elevated groundwater concentrations in this area could reflect groundwater contamination resulting from direct releases to soil where the confining unit is not present or downgradient flow of contaminated groundwater from the upper zone across the confining unit boundary. However, in the latter case, concentrations would typically decrease instead of increase in the downgradient direction.

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 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 will continue as an interim remedial action to address migration of PCP contamination in groundwater from this area. The results from the July 2004 and January 2005 ISCO injections indicate that PCP

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concentrations have been significantly reduced within the Phase II area and the extent of the PCP plume in the upper zone has been diminished.

The most critical potential exposure pathway at the Terminal is migration of contaminants via groundwater to surface water. However, as indicated by the analytical results for the groundwater samples collected from the Willamette River shoreline wells in November 2004, February 2005, and June 2005, facility-related groundwater contaminants are not currently reaching the river at concentrations above applicable screening level values. During the November 2004 event, only chromium was detected in shoreline wells LW-38D and LW-39D at concentrations exceeding the preliminary screening level, and only chromium and copper were detected in shoreline well LW-37D at a concentration exceeding the preliminary screening level. No constituent was detected at a concentration exceeding the preliminary screening levels in the shoreline wells during the February and June 2005 events. Therefore, even though there is a physical groundwater transport pathway from the upland areas of the terminal to the river, the data indicate that there is not a complete exposure pathway for migration of facility-related contaminants via groundwater to potential receptors in the Willamette River at concentrations that exceed applicable screening levels. Analytical results from future groundwater samples collected at the shoreline wells will be used to monitor the concentrations of groundwater contaminants that discharge to the Willamette 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 RI work plan, Landau Associates 2001a).

The data collected for the Phase III RI focuses on the tank farm areas and other areas of the Terminal 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 assessments 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 Phase III RI work plan (Landau Associates 2001a), the overall objective of the Phase III RI at the Terminal was 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 could be determined, and the potential risks to human health and the environment could be assessed. To achieve these objectives, more than 250 soil samples and groundwater samples from a maximum of 82 wells were collected for chemical analyses on a quarterly basis. Also, groundwater levels were monitored quarterly at the monitoring well locations and subsurface soil conditions were logged at over 160 soil boring locations.

The Phase III study area, shown on Figure 1-2, was divided into the following subareas:

- Main Terminal Tank Farm area
- Bell Terminal Tank Farm area
- Historical loading racks for the tank farms/terminal entrance

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- The eastern portion of the Phase III study area
- Asphalt Road area.

The extent of the Phases I/II study areas is also shown on Figure 2-1. The Phase I study area included the former soil stockpile that has since been removed and treated and disposed offsite. The Phase II study area encompasses the area where wood-treatment formulation activities were formerly located, including the former PCP mixing area and warehouse. These areas are described further in Section 2.1.

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.

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 being collected as part of the RI/FS for the Portland Harbor Superfund Project.

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.

- **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 sampling of site monitoring wells, implementation of *in situ* chemical oxidation in the Phase II area, performance of a source control evaluation, and the Phase II/PhaseIII 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 explorations performed for this RI, the Phase II RI, and for historical wells installed prior to 1994, as available.

- **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 through November 2004 quarterly sampling events 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-October 2003 and October-November 2004 soil sampling events.

- **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 November 2004 for wells monitored during quarterly groundwater sampling events. Because of the size of these tables, this appendix is provided only 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, outlines the regulatory framework of the RI process, and provides a summary of the current and historical facility permits and regulatory compliance.

2.1 FACILITY DESCRIPTION

The Northwest Terminal is a former bulk petroleum storage and transfer facility currently owned and operated 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 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 10 ASTs in the Bell Terminal Tank Farm area. The storage tanks range from 3,000 to 80,000 barrels in size. In 1943 when the Terminal was first established, 12 of the original tanks were moved to the Main Terminal Tank Farm area from a location south of the current property. Between the mid to late 1950s and the late 1970s, additional tanks were added in both the Main Terminal Tank Farm area and in the Bell Terminal Tank Farm area bringing the areas to their current configurations. Most of the tanks appear to have been originally constructed on a sand or gravel base with perforated pipes (1¼ -inch) extending radially from the footprint of the tank. After the base was put in place during construction, the pipes were used to pump in an asphalt-type material to seal the base of the tanks. Also, asphalt was packed around the base

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of the tanks to prevent erosion. Currently, all tanks are empty except for tank 16804 in the Main Terminal Tank Farm area, which temporarily stores 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 Tank Farm area, historical aerial photographs indicate that a strip of land approximately 80 ft wide along the entire western property boundary and outside the wall surrounding the Bell Terminal Tank Farm area was apparently used by occupants of the adjacent property for storage of equipment and possibly other unknown activities for approximately 25 years, ending in about 2000.

- **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 Tank Farm area is located at the eastern side of the Bell Terminal Tank Farm area. Historically in these areas, product was transferred from the railcar, truck, or vessel to the aboveground tanks through pipelines located near each of the receipt/distribution locations. 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 (COP). 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 quarterly self-monitoring reports (SMRs) to the COP, 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 Phase I 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 (Figure 2-2). 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 (HRW-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.

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Stormwater sampling results are documented in annual discharge-monitoring reports (DMRs) to the COP, conducted according to the permit requirements.

- **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.

- **Dock** extending approximately 380 ft into the Willamette River from the terminal. During the period of Terminal operation between 1943 and 2001, the dock was used for the mooring of tanker ships while transferring petroleum products to pipelines located on the dock. No spills or releases have been documented or reported during the overwater activities. The dock is currently not in use.

Other features within the Terminal 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 PCP mixing area and warehouse** where specialty wood treating products containing PCP in various formulations (typically with petroleum-based carriers) 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 approximately 6,400 yd^3 of PCP-impacted soil from the former PCP mixing area. Removal activities are documented in the Phases I/II removal actions completion report (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 Phases I/II 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 Phases I/II removal actions completion report (Landau Associates 2003a).

- **Former soil stockpile area (Phase I RI 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).

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- **East Property area** located in the eastern portion of the facility is a 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 (Landau Associates 2003c). 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.

Known or documented spills within the Main Terminal Tank Farm area based on Time Oil or DEQ records are summarized below. Subsequent investigations conducted in these areas to define any contamination associated with the spills are described in Section 2.2. A stormwater pollution control plan was prepared for the Terminal in December 15, 2000 and revised in August 2002 (Landau Associates 2002b).

Date	Material(s) Released	Volume Spilled (gallons)	Spill Surface (gravel, asphalt, sewer)	Action Taken (yes /no)
1975	Diesel	unknown	Soil in bermed area	Yes - Product recovery and soil removal
1990	Ethanol	~500 gallons	Soil in bermed area	Yes - Product and groundwater recovery
1994	Unleaded Gasoline	1,300 gallons	Soil in bermed area	Yes - Product recovery, soil vapor extraction test, and long-term groundwater monitoring
1999	Ethanol	2,479 gallons (suspected)	Subsurface soil	Yes - Installed recovery well and conducted groundwater monitoring; no product ever observed

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 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

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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, one sample was collected in the former PCP mixing area, one sample was collected in the former Crosby and Overton tank area, and two samples were collected in the Bell Terminal Tank Farm area (DEQ 1985), as shown on Figure 2-3. 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 nondetect or at low concentrations, except in the central portion of the Main Terminal Tank Farm area where concentrations of PAH constituents (e.g., fluorene, phenanthrene, and anthracene) ranged from 13 mg/kg to 105 mg/kg. Also, at the locations in the former PCP mixing area and former Crosby & Overton tank area, concentrations of PCP were 1,820 and 515 mg/kg and concentrations of tetrachlorophenol were 71 and 12 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 Tank Farm 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, respectively. 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 present at concentrations less than the laboratory reporting limits (i.e., nondetect) 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 2-3.

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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 the Phase III study area (specifically, near the former butane storage area), as shown on Figure 2-3. 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 Terminal Tank Farm area, five groundwater monitoring wells (N, O, P, Q, and R) were installed in and downgradient of the release area (Figure 2-3). Also, Time Oil conducted a soil vapor extraction test within the shallow soil in this area. 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, the former PCP mixing/warehouse areas, 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 East Property

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predevelopment investigation (EPPI) results report (Landau Associates 2001c), the Phases I/II removal actions completion report (Landau Associates 2003a), and the East Property soil remedial action completion report (Landau Associates 2003c).

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 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 2-4.

- 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, 5 surface soil samples, 25 new shallow and deep monitoring and recovery well borings, and 2 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 from March 1997 to the present, 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 (DEQ 2000a). 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 2-4.

- Pre-Removal Investigation (PRI) - In August 2002, soil was collected and analyzed from the following: 1) three locations in the area previously identified as "clean fill" or overburden

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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) seven locations near the perimeter of the proposed excavation to provide additional data coverage, and 3) five locations where PCP concentrations were expected to range between 5 and 20 mg/kg to demonstrate 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. PCP results for the soil remaining after the removal action, including samples from this event, are shown on Figure 2-4. The results for the groundwater protection evaluation demonstrate that use of 5 mg/kg as a cleanup target 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 for offsite incineration and disposal. 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. Because of limitations associated with excavation below the groundwater table, this was the maximum depth 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 2-4 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 removal target of 5 mg/kg, as shown on Figure 2-4. All of the final verification sample PCP results collected from the western and southwestern portions of the base of

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excavation (10 to 13 ft BGS) exceeded the 5 mg/kg target 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).

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 system (Landau Associates 1996). An additional 600 yd^3 of PCP-contaminated soil was added to the stockpile in the fall of 1996 and 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. An additional 10 yd^3 of soil from well drilling activities for the Phase II RI were added to the stockpile in August 1999.

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).

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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. 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. Results for seven soil samples represent concentrations of PCP in soil remaining following the removal activities. Figure 2-5 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 nanograms per kilogram [ng/kg (SP-1-CONF)] to 1,135.56 ng/kg (SP-3-CONF) [as total equivalency quotient (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 Crosby & Overton 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 possibly a lesser extent, from the presence of historical asphalt-containing roadbed material, based on historical aerial photographs.

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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 2-5 and 2-6 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 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 2-5 and 2-6, respectively. Soil removal activities were documented in the Phases I/II removal actions completion report (Landau Associates 2003a).

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 is 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

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PCP was observed in the soil. The soil borings and monitoring wells were also 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 nondetect or detected at concentrations below DEQ levels of concern, 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.

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 chemicals of potential concern (COPC) or chemicals 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 remedial action plan for the East Property (Landau Associates 2002d) 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

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report (Landau Associates 2003c). DEQ granted a conditional NFA determination 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, 31 quarterly events have been conducted between March 1997 and November 2004 as part of the Phase II RI activities. Since the January 1998 sampling event, quarterly data have been provided to DEQ in quarterly groundwater monitoring reports. Sampling of the Phase III RI monitoring wells began with the fourth quarter 2003 groundwater sampling event and has continued on a quarterly basis to date. For this report, only one quarter of data, the fourth quarter 2004 data collected in November 2004, is available for the wells installed in October-November 2004. A summary of analyses conducted for 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 2004 groundwater sampling event conducted in November 2004 consisted of sampling 23 upper zone wells and 27 lower water-bearing zone (lower zone) wells. Groundwater sampling locations are shown on Figure 2-7.

2.2.2.6 Groundwater Interim Action

To prevent 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 2-7.

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 2004, approximately 16 million gallons of water have been removed from the lower zone at RW-2 and transferred to the onsite wastewater treatment system for subsequent treatment and discharge to the sanitary sewer under a NPDES permit with the COP, as shown in Table 2-3. Additional information regarding the quarterly status of the groundwater interim action is provided in quarterly groundwater monitoring reports for the Terminal.

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The horizontal well was installed in the upper zone during April 2000. During installation activities for 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 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 2-4.

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 2-3 summarizes pumping for the upper zone interim action through November 2004. Approximately 271,600 gallons of groundwater have been removed from HRW-1 since startup and transferred to the onsite wastewater treatment system for subsequent treatment and discharge to the sanitary sewer under a NPDES permit with the COP. 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 2-2). 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 Willamette 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 intercept system is provided in the quarterly groundwater reports for the Terminal.

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2.2.2.7 *In Situ* Chemical Oxidation Interim Action

To further facilitate the remediation of PCP contamination in the groundwater and soil at the Terminal within the upper zone, the *in situ* chemical oxidation (ISCO) technique has been implemented. The primary objectives of the ISCO interim remedial action were 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). The specific type of chemical oxidation that was implemented for the interim action is based on Fenton's Reagent oxidation technology as applied by In-Situ Oxidation Technologies, Inc. (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 fluorine 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.

Bench Scale and Pilot Studies

Use of the ISCO technique was originally 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 results of the bench scale study and pilot test are provided in 2002 and 2003 ISOTEC reports, respectively (ISOTEC 2002, 2003).

For the pilot test, ISOTEC injected reagents into 10 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).

Full Scale Implementation

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

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approach at the site (Landau Associates 2002a). The work plan was approved by DEQ on July 6, 2004 (DEQ 2004a).

In July 2004, a full-scale ISCO injection was implemented to treat PCP-impacted soil and groundwater in the upper zone within the boundaries of the PCP plume. The details of the first full scale injection are included in the third quarter 2004 groundwater monitoring and groundwater interim action status report (Landau Associates 2005a), and are summarized below.

From July 12 through 16, 2004, Time Oil's contractor (ISOTEC) injected ISCO reagents (17 percent hydrogen peroxide, complexed iron catalyst, and tap water) at 40 (IP-1-A through IP-21-A, and IP-23-A through IP-41-A) direct-push injection points 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 2-8).

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 19 ft 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 typically consisted of approximately 200 gallons of hydrogen peroxide, 200 gallons of iron catalyst, and 60 gallons of water at each direct-push point. A total of approximately 7,650 gallons of 17 percent hydrogen peroxide, 7,650 gallons of iron catalyst, and 2,330 gallons of tap water were injected into the subsurface using the direct-push points. Based on the apparent effectiveness of the July 2004 ISCO event in reducing PCP concentrations in the upper zone groundwater, the radius of influence assumed for the injection points of approximately 25 ft appears to be accurate.

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 well. A total of approximately 1,200 gallons of 17 percent hydrogen peroxide, 1,200 gallons of iron catalyst, and 720 gallons of water were pumped into the subsurface using the lateral injection wells.

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Based on comparison of groundwater analytical data collected in February and July 2004 prior to the injection (baseline) with post-injection groundwater data, the PCP concentration in the upper zone groundwater monitoring wells (RW-1, LW-11S, LW-13S and OX-1S through OX-4S, OX-6S, OX-7S, and OX-8S) was reduced by 63 percent (OX-8S) to 92 percent (OX-3S). The PCP concentration in the deep groundwater monitoring well (LW-11D) was reduced from 1.5 µg/L to less than 0.5 µg/L. The PCP concentration in the water collected from SDM-1 was reduced from 1,000 µg/L to 158 µg/L.

Comparison of the PCP plume concentrations in the upper zone using the June 2004 (Figure 2-9) and August 2004 (Figure 2-10) data, shows an apparent reduction in the estimated lateral extent of the plume in the east-west direction. However, the north-south extent of the plume remains relatively unchanged, although PCP concentrations were significantly reduced. The extent of the PCP plume in the lower zone groundwater before and after the injection was negligible.

The mass of PCP in the upper zone groundwater prior to the ISCO injection in July 2004 was estimated to be approximately 1.01 pounds, based on the groundwater samples collected in June 2004. The mass of PCP in the upper zone groundwater following the ISCO injection in July 2004 was estimated to be approximately 0.32 pounds, based on the groundwater samples collected in August 2004. The PCP mass calculations are provided in Appendix G of the third quarter groundwater monitoring and groundwater interim action status report (Landau Associates 2005a). Based on the mass calculations, it appears that the ISCO injection in July 2004 may have caused a mass reduction of PCP of approximately 0.69 pounds, or 68 percent.

Baseline and post-injection concentrations of dioxin/furan compounds were also monitored at three wells to determine whether there was any change due to implementation of the ISCO technique. The results indicated the following:

- The Total Equivalency Quotient (TEQ) in RW-1 increased from 0.00016272 ng/L to 0.001402 ng/L.
- The TEQ in OX-2S decreased from 0.11 ng/L to 0.02922 ng/L.
- The TEQ in OX-6S increased from 0.003588 ng/L to 0.300869 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 three wells in the future to determine if there are changes in concentration trends that can be attributed to future ISCO injection events.

A second full scale ISCO injection event was conducted in January 2005. The results of this event are pending and will be provided to DEQ with the first quarter 2005 groundwater monitoring and groundwater interim action status report (Landau Associates in preparation),

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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 2002e) 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.

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 included identification of 17 potentially impacted areas based on a review of historical aerial photographs and a review of historical operations at the terminal. These areas are described in Table 2-5 and shown on Figure 2-7. During the preliminary evaluation, 35 biased soil samples were collected from these potentially impacted areas and submitted for laboratory analysis. However, because the Phase III study area also includes several acres outside of these potentially impacted areas, an area-wide soil sampling approach (in conjunction with a biased sampling approach) was used to characterize soil during the preliminary evaluation. The area-wide approach included dividing the Phase III area into 27 200-ft by 200-ft grids, randomly selecting two to three soil sample locations within each grid, and compositing samples within a grid. This approach distributed soil sample locations throughout the 24-acre wide Phase III study area. Seventy-eight area-wide soil samples were collected from the 27 random grid-based sampling locations and submitted for laboratory analysis. The biased sampling locations within the 17 potentially impacted areas, the grid layout, and the random-based grid sampling locations are shown on Figure 2-7. In addition to soil sample collection, discrete groundwater samples were collected from 23 temporary well points located within the Phase III study area. The groundwater sampling locations were

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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 2-11.

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 former PEO 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 2002e). 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 interconnection between the upper and lower groundwater zones. Twenty-seven CPT explorations were completed at locations throughout the Phase III study area (Figure 2-11). 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 Tank Farm area. Shallow groundwater samples were also collected

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from each of the ten 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.

2.4 FACILITY PERMITS AND REGULATORY COMPLIANCE

Currently and historically, stormwater and wastewater from the Terminal has been managed in compliance with stormwater permits and a wastewater permit under NPDES requirements. A list of current and past permits at the terminal and the sampling requirements are provided in the following sections.

2.4.1 STORMWATER

Stormwater primarily infiltrates at the Terminal. In areas where stormwater runoff occurs, the stormwater is routed to the onsite wastewater treatment system (WWTS) or collected into the storm drain lines for discharge to the Willamette River. Stormwater from the former industrial areas of the terminal,

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including the loading rack along the rail spur, the truck loading rack, the valve pit on the vessel dock, and the other areas where valves exist is routed to the WWTS. As described in the following section, the WWTS is under a permit from the COP (Metro) for discharge to the sanitary sewer along Time Oil road. Stormwater from the terminal entrance area and the low topographic area east of the rail spur and from the other areas of the Terminal during storm events is collected into the storm drain line for discharge into the Willamette River. The river outfall is under a NPDES permit as listed below.

The storm drain line runs east-west along the length of the Terminal about 160 ft north of the southern property boundary (Figures 2-1 and 2-2) to the river outfall. The storm drain was constructed before construction of the Terminal in 1943 and, therefore, backfill/construction details are not available. Internal inspection of a 600-ft section of the storm drain by remote video camera in April 2000 revealed that the line is a 15-inch diameter concrete pipe. The pipeline appears to be in good condition with few internal leaks. Several lateral lines to the main line were also observed in the Main Terminal Tank Farm area. One of the lateral lines was damaged during drilling of the horizontal well installed as part of the groundwater interim action (see Section 2.2.2.6). The lateral lines were subsequently isolated from the main line using internal patches.

Stormwater data collected between September 2001 and August 2002 at the catch basin closest to the river contained PCP concentrations ranging from 0.7 to 190 µg/L. Except for diesel-range petroleum hydrocarbons, petroleum compounds (gasoline, mineral spirits, kerosene, and lube oil) were not detected. Diesel-range petroleum hydrocarbons were detected twice at concentrations of 0.261 mg/L and 0.3 mg/L. These data and the groundwater flow pattern in the upper zone indicated that upper zone groundwater was likely infiltrating into the storm drain line. In October 2002, a groundwater intercept system was installed within the storm drain to capture groundwater between the two stormwater manholes closest to the river. Stormwater samples collected from the groundwater intercept system located in the catch basin closest to the river (SDM-1) continue to be analyzed as influent into the onsite WWTS on a quarterly basis; however, these concentrations represent groundwater captured by the intercept system that do not reach the river outfall. Samples are also collected from the river outfall, when exposed.

The current and historical stormwater permits are listed below.

Permit Type	File No.	Start Date	Outfalls	Parameters/Frequency
1200-T	109186	8/13/96	River	Oil & Grease; pH; total Phosphorus; COD; TOC; metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn); TSS
1200-Z	109186	11/6/97	River	Oil & Grease; total copper, lead, zinc; pH; TSS
1200-C (East Property only)	109737	11/16/01		Turbidity

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2.4.2 WASTEWATER

Wastewater effluent samples are collected from the onsite WWTS in accordance with the permit requirements. Wastewater effluent concentrations typically meet the maximum allowable limit for PCP at 40 µg/L. Wastewater effluent is discharged to the COP sanitary sewer along Time Oil Rd, under the permit described below.

Permit Type	Permit Number	Start Date	Outfalls	Volumes	Parameters/ Frequency
POTW	400-121	2/15/96	Sanitary sewer	None specified	PCP, BETX, pH

Since groundwater recovery began as part of a groundwater interim action in fall 2000, wastewater effluent concentrations from the onsite WWTS have met the maximum allowable limit except for a single occurrence in July 2003, and sporadically throughout January though April 2004. Following notification to the COP and shutdown of the system following each upset, the rate of hydrogen peroxide solution introduced to the water was increased and the sampling frequency was increased to weekly until compliance within the allowable limit was consistently achieved. In March 2004, permission was obtained from the COP to modify the WWTS to improve the efficiency of the treatment system. The modifications included the use of a higher dose of hydrogen peroxide, implementation of a batch/mix tank prior to discharge, and aeration of the batch-mix tank to improve contact between the hydrogen peroxide and groundwater being treated. In response to the upset condition in April 2004, minor changes were made to the WWTS to improve the aeration of the water prior to discharge. Since April 2004, effluent concentrations indicate that the WWTS has been operating within the established permit limits. Documentation of the upset conditions was provided to the COP. Effluent concentrations for each sampling event are provided in the respective quarterly groundwater monitoring and interim action status reports.

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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 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 Tank Farm area 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).

Historical aerial photographs indicate that prior to site development for the Terminal, similar to current conditions, the area was located in the river floodplain adjacent to the main channel with no apparent historical river channels or other river geomorphic features or surface water bodies that would impact current stormwater or groundwater flow. Historical aerial photographs showing the area in the late 1930s are shown on Figures 2-12 and 2-13. Historical aerial photographs for site conditions after Terminal development beginning in 1944 are provided in the Phase III RI work plan (Landau Associates 2001a).

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

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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) determined 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.

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 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.

- **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

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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 Aquifer and Sand and Gravel Aquifer 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 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.

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, and the shoreline west of the Main Terminal Tank Farm area extending to the locations of the shoreline wells, as shown on Figure 4-1. Based on the shoreline groundwater data collected in November 2004, February 2005, and June 2005, the river has not been included in the locality of facility because, as discussed in Section 7.2.2.2, except for chromium and copper at a few shoreline wells during the November 2004 event sampling, facility-related groundwater contaminants are currently not reaching the Willamette River at concentrations above applicable screening level values. These data indicate that, even though there is a physical groundwater transport pathway from the upland areas of the terminal to the river, there is not a complete exposure pathway via groundwater at the Time Oil facility to the Willamette River. Therefore, groundwater discharge to the Willamette River is not a current or future beneficial use of the groundwater and the Willamette River is not within the locality of the Time Oil facility. Groundwater concentrations at the shoreline wells will be confirmed through a full year of groundwater monitoring. Also, Time Oil is planning to conduct a source control evaluation to determine whether there is a potential for constituents currently observed in wells within the Main Tank Farm Area to migrate to the river. Historical discharges to the river, including discharges via the storm drain will be addressed during the RI/FS for the Portland Harbor Superfund Project. 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

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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 in the absence of the interim action, a small portion of the former PEO property south of the property boundary near the river is included in the locality of facility. Continued implementation of the groundwater interim action and implementation of the ISCO technique is expected to contain migration of and remediate groundwater impacted by, PCP originating from the former PCP formulation operations in the Phase II RI study area at the Terminal.

The Port of Portland T-5 property to the north of the Main Terminal Tank Farm area near the river is possibly down- or cross-gradient of the Terminal. Data collected from the new wells located at the north property boundary at the northern edge of the Main Terminal Tank Farm area during the fourth quarter 2004 event indicate that low levels of contaminants were detected in groundwater in this area. During June 2005, Time Oil attempted to sample two existing wells on the Port of Portland property located within 300 ft of the terminal's north property boundary. Both wells were dry. Sampling of these wells will be attempted again during the wet season, likely in late 2005 or early 2006. Until these sample results are collected and evaluated, the locality of facility boundary in this area is approximate, but assumed to extend to the north property boundary.

The property west of the Bell Terminal Tank Farm area 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, the data indicate that there appears to be a separate source for contamination in this area and also in the area on the former PEO property where product has been observed in well MW-4 on a consistent basis between 2001 and 2003 (the most recent data available) (Gradient 2003). Well MW-4 is located on the former PEO property more than 100 ft downgradient of the operating portion of the Bell Terminal Tank Farm area and about 50 ft from the western property boundary near the locations of the former diesel ASTs where significant petroleum releases are known to have occurred. No product has ever been observed within the Bell Terminal Tank Farm or within the Time Oil property boundary in this area. 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 where significant petroleum releases are known to have occurred, such as in the area where the former diesel ASTs were located near well MW-4, it is unlikely that the elevated concentrations observed near the western property boundary or on the former PEO property originate from the Bell Terminal. 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. Therefore, the locality of facility boundary was extended to the western property boundary. Data from the adjacent property is not sufficient to identify

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the point at which any plume moving from the Bell Terminal terminates within plumes originating at the PEO property in order to define the locality of the facility in this area with certainty.

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 OAR 340-122-080 and DEQ's *Guidance for Conducting Beneficial Water Use Determinations at Environmental Cleanup Sites* (DEQ 1998c) and also considered the beneficial uses of the Willamette River, as designated by OAR 340-041, Table 340A.

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The beneficial water use determination 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 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 limited use for irrigation of ornamental vegetation (i.e., not food crops) and does not include use as drinking water. Irrigation does not occur in direct proximity to the site and groundwater flow patterns are not impacted by pumping for irrigation; therefore, exposure to groundwater via irrigation is not a significant pathway. Groundwater at the Terminal is currently not used for any purposes; future groundwater use at the Terminal is expected to be limited to industrial use. However, there is insufficient yield of upper zone groundwater to facilitate its use for industrial purposes.

- A mitigation wetlands area, owned by the Port of Portland (Port), is located on the adjacent property to the north of the Terminal. Contaminants are present in soil and groundwater along the northern property boundary of the Main Terminal Tank Farm area. Time Oil attempted to sample two wells within 300 ft of the northern property boundary on the Port of Portland property in June, 2005, but the wells were dry. However, it is anticipated that 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. Time Oil will attempt to sample these wells again during the wet season, likely in late 2005 or early 2006.

- The Willamette River borders the Terminal to the west. Contaminants are present in soil and groundwater along the western boundary of the Main Terminal Tank Farm area. Groundwater samples collected in Willamette River shoreline wells indicate that facility-related groundwater contaminants are not currently reaching the river at concentrations above applicable screening level values. Therefore, the river is not considered to be within the locality of the Time Oil facility, and groundwater discharge to the Willamette River is not a current or future beneficial use of groundwater within the defined locality of the facility (see Section 7.2.2.2). Historical impacts to in-water media in the Willamette River are being addressed by sampling and evaluations conducted for the Portland Harbor Superfund RI/FS.

Shallow groundwater at the Terminal is not considered suitable for beneficial use. For the upper zone, aquifer yield is low (less than 1 gpm) and the unit is discontinuous: therefore, the upper zone would not likely support long-term use for any purpose. For the lower zone, aquifer yield appears to be adequate for use (80 to 100 gpm based on aquifer test results); however, because of its interconnection with the upper zone and its heterogeneous nature, it is possible that this yield could not be sustained for long-term

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use. For example, the lower zone groundwater recovery well, RW-2, has been pumping since fall 2000, with sustained yields of only about 8 gpm. Naturally occurring water quality appears to be suitable for both units. However, groundwater used for water supply throughout the Portland area has been typically derived from the Troutdale aquifers probably because of their significantly higher yield. Therefore, based on the significantly more favorable hydrogeologic characteristics of the Troutdale aquifers and historical groundwater use in this area, it is unlikely that the shallow water-bearing units defined at the Terminal would be used in the future for water supply. DEQ concurred with this determination in its NFA letter for the East Property (DEQ 2003a).

Continued implementation of the groundwater interim action and implementation of the ISCO technique is expected to contain migration of and remediate groundwater impacted by, 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 the soil and groundwater investigations performed for the Phase III RI. As previously discussed in Section 2.0, the Phase III investigative work was conducted in three stages: a preliminary evaluation, an interim subsurface investigation, and the final stage of the Phase III RI. Activities associated with the preliminary evaluation and the interim subsurface investigation, and the results of these investigations, were previously documented in technical memoranda titled *Phase III Preliminary Evaluation* (Landau Associates 2002e), and *Phase III Interim Subsurface Investigation* (Landau Associates 2003d). These investigations are also described below to provide the sampling strategy and rationale used to identify sample locations for the final stage of the Phase III RI. The soil analytical data for the investigations performed during the final stage of the Phase III RI, the associated data validation report, and laboratory data packages are provided in Appendices E, F, and G of this report. Groundwater data collected for the fourth quarter 2003 groundwater monitoring event and for the first, second, third, and fourth quarter 2004 groundwater monitoring events are provided in quarterly reports (Landau Associates 2004a,b,c and 2005a,b). All analyses were performed by Specialty Analytical, Inc., a laboratory located in Tualatin, Oregon, except as noted in Section 5.2.5.1.

5.1 SOIL INVESTIGATION

This section describes the soil investigations conducted for the Phase III RI, including the preliminary evaluation, the interim subsurface investigation, and the final stage soil investigation.

5.1.1 PRELIMINARY EVALUATION

The Phase III RI soil investigation began in August 2001 with the preliminary evaluation (Landau Associates 2002e). As described in Section 2.2.3.1, the preliminary evaluation 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 present, in soil; and to collect geologic, hydrogeologic, and chemical data in advance of a full-scale Phase III RI. During the preliminary evaluation, 17 potentially impacted areas were identified based on a review of historical aerial photographs and a review of historical operations at the Terminal. These areas are described in Table 2-5 and shown on Figure 2-6. During the preliminary evaluation, a biased (or focused) sampling approach was used to investigate the soil in these areas. In the smaller potentially impacted areas, the approach involved collecting three to four discrete soil samples, each representing a specific depth interval, from a central location within each area (referred to as biased sampling areas). For the larger potentially impacted areas (also referred to as biased sampling areas), the biased sampling approach involved

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collecting three to four composite soil samples, each representing a specific depth interval from two subsample locations centrally located within the potentially impacted area. The depth intervals sampled within the potentially impacted areas included the upper 6 inches (0 to 0.5 ft BGS), 1 to 1.5 ft BGS, 5 to 5.5 ft BGS, and the capillary fringe. Samples from the upper 1.5 ft of soil were collected to determine whether contamination, if any, may be due to surface spills and, therefore, act as a potential source for groundwater contamination. A total of 9 surface soil samples (0 to 0.5 ft BGS) and 16 shallow soil samples (1 to 1.5 ft BGS) were collected and analyzed. Samples were collected from an intermediate depth interval (5 to 5.5 ft BGS) within the unsaturated zone at each location, but were archived at the laboratory. The samples were analyzed if contamination was detected in the surface soil sample and the results for the shallow soil sample (1 to 1.5 ft BGS) indicated an increasing concentration trend. Only one intermediate depth soil sample (5 to 5.5 ft BGS) was analyzed. This sample was collected from potentially impacted area B11. Soil samples were collected from the capillary fringe to determine the potential for groundwater contamination at each location. A total of 16 soil samples from the capillary fringe zone were collected from the potentially impacted areas, except area B13, and submitted for laboratory analysis. No soil samples were collected from area B13 during the preliminary evaluation because soil samples from this area were previously collected in conjunction with the removal of an underground storage tank (UST) formerly located within this area (GeoEngineers 2001).

Because the Phase III study area also includes several acres outside of these potentially impacted areas, an area-wide soil sampling approach (in conjunction with the biased sampling approach) was used to characterize soil during the preliminary evaluation. The area-wide approach divided the Phase III area into 27 200-ft by 200-ft grids, from which 2 to 3 soil sample locations were randomly selected and then composited within each grid. This approach resulted in the sampling of soil at locations throughout the entire 24-acre Phase III study area. A total of 78 area-wide soil samples were collected from the 27 random grid-based sampling locations and submitted for laboratory analysis. Of these 78 soil samples, 24 were collected from the surface (0 to 0.5 ft BGS), 27 were collected from the shallow subsurface (1 to 1.5 t BGS), 1 was collected from an intermediate depth (5 to 5.5 ft BGS), and 27 were collected from the capillary fringe zone. The same rationale used for selecting sample depth intervals for the biased sampling approach was used for selecting sample depth intervals for the area-wide sampling approach. The area-wide random-based grid sampling locations and layouts are also shown on Figure 2-7.

In addition to the soil samples collected for the preliminary evaluation, five soil samples were collected by Schnitzer (SCH-56, SCH-58, SCH-59, SCH-61, and SCH-63) at locations on Time Oil property along the western property boundary, just west of the Bell Terminal Tank Farm area (Figure 2-7). The samples were collected within the capillary fringe (approximately 15 ft BGS). Landau Associates collected split soil samples for Time Oil at each location. Landau Associates also collected a

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soil sample at location SCH-60, shown on Figure 2-7. The soil samples collected by Schnitzer were analyzed for diesel-, and gasoline-range petroleum hydrocarbons; PAHs, and VOCs. The analytical results are presented in Table 5-1 (GP-#). All of the split soil samples collected by Landau Associates were analyzed for diesel- and gasoline-range petroleum hydrocarbons. Four of the split soil samples were also analyzed for PAHs and VOCs. Results for the split soil samples are also shown in Table 5-1 (SCH-#). A comparison of the split soil sample results with the Schnitzer soil sample results indicates relatively high variability between the results (i.e., the relative percent difference between the diesel-range petroleum hydrocarbon results ranged from about 7.5 to 116 percent and the relative percent difference between the gasoline-range petroleum hydrocarbon results ranged from about 76.5 to 184 percent). These concentration differences are likely related to heterogeneities in the soil sample. The split soil sample results for gasoline-range petroleum hydrocarbons were significantly higher for the samples collected by Landau Associates than the samples collected by Schnitzer. VOCs were also more frequently detected in the samples collected by Landau Associates because of significantly lower laboratory reporting limits.

Based on the results from the preliminary evaluation, the following soil data gaps were identified:

- The extent of the confining unit separating the upper water-bearing and lower water-bearing zones was not well defined throughout the Phase III study area
- The source(s) of contamination detected in the Schnitzer soil samples and the split soil samples located in the area just west of the Bell Terminal Tank Farm area, but within the Time Oil property boundary (Figure 2-7) was not determined
- The horizontal extent of soil contamination within the capillary fringe in several of the grids (2, 3, 8, 9, 12, 13, 14, 21, 22, and 23) could not be well defined based on the composite soil sample results for that specific grid
- Potential source(s) of contamination in the capillary fringe soil in the Main Terminal Tank Farm area were not clearly identified
- The horizontal extent of surface soil contamination within the eastern portion of the Phase III study area (specifically grids 7, 10, 11, 15, 17, and 19) could not be well defined based on the composite soil sample results for specific grids.

Therefore, additional investigation work was planned to address these data gaps, as described in the following sections.

Sample collection methods for the preliminary evaluation soil investigation and the Schnitzer split soil samples are described in detail in the Phase III preliminary evaluation technical memorandum (Landau Associates 2002e). Laboratory analyses performed for each soil sample are summarized in Table 5-2.

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5.1.2 INTERIM SUBSURFACE INVESTIGATION

To address the first three data gaps identified in Section 5.1.1 above, an interim subsurface investigation was performed [documented in the Phase III interim subsurface investigation technical memorandum (Landau Associates 2003d)]. The fourth and fifth data gaps were addressed by the final stage of the Phase III RI soil investigation, which followed the interim subsurface investigation. The primary goal of the interim subsurface investigation was to develop a better understanding of the subsurface geology to guide design and installation of additional monitoring wells and to complete the conceptual site model for the Terminal. To accomplish this goal, 27 subsurface explorations were performed throughout the Phase III study area using CPT. This technique provided a continuous stratigraphic description of the subsurface to about 60 ft BGS at 23 locations and to about 100 ft BGS at four locations. The CPT explorations were located in areas where subsurface information had not already been obtained (primarily the Main Terminal Tank Farm area and the Bell Terminal Tank Farm area). The CPT exploration locations are shown on Figure 2-11.

The other goals of the interim subsurface investigation included identification of the source of the soil and groundwater contamination in the area just west of the Bell Terminal Tank Farm area and further definition of the area of contaminated capillary fringe soil within the preliminary evaluation sampling grids selected for investigation at this time. Grids that were not further investigated during the interim subsurface investigation would be investigated during the final stage of Phase III soil investigation. To accomplish these goals, 49 soil samples were collected at depth intervals of 0 to 0.5 ft BGS, 1 to 1.5 ft BGS, 5 to 5.5 ft BGS, and within the capillary fringe zone from 10 direct-push borings in the Bell Terminal Tank Farm area, and 5 soil samples were collected from the capillary fringe zone at five preliminary evaluation random subsample locations (G2-1, G2-2, G12-2, G13-1, and G21-2). The depth intervals sampled during the direct-push explorations in the Bell Terminal Tank Farm area were the same as those collected during the preliminary evaluation. The same rationale for selecting the sample depth intervals used during the preliminary evaluation was applied during the interim subsurface investigation. However, samples collected from the 5 to 5.5 ft depth interval during the interim subsurface investigation were analyzed immediately by the laboratory instead of being placed on hold. The boring locations for the 49 soil samples collected in the Bell Terminal Tank Farm area were concentrated along the east-west trending pipeline located in the center of the Bell Terminal Tank Farm area. This area was targeted because this pipeline was formerly used to convey petroleum products, and leaks or breaks along the pipeline, if any, could have resulted in contamination of the underlying soil. Therefore, the pipeline was considered a potential contaminant source. Also, diesel-range and gasoline-range petroleum hydrocarbons were detected in the groundwater sample collected at the temporary well point (GW23-1) located along this pipeline (Figure 2-11) during the preliminary evaluation. The locations of the other

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five soil samples were selected with the intent of being able to eliminate or better define the specific area(s) where soil contamination exists in grids 2, 12, 13, and 21.

The results of the interim subsurface investigation confirmed that, in the western portion of the Main Terminal, the confining unit becomes thinner and eventually becomes discontinuous layers of silt and no longer acts a confining unit. The investigation also indicated that, although diesel-range and motor oil-range petroleum hydrocarbons are present in the surface or shallow soil in the Bell Terminal Tank Farm area, surface or shallow soil contamination does not appear to be widespread nor does the contamination appear to be present at elevated concentrations. The investigation did, however, indicate that in the area sampled, the higher concentrations of diesel-range and gasoline-range petroleum hydrocarbons are present in the capillary fringe soil.

Following the interim subsurface investigation, the following soil data gaps remained:

- The horizontal extent of soil contamination within the capillary fringe in grids (3, 8, 9, 14, 22, and 23) was not yet well defined
- Potential source area(s) of contamination in the capillary fringe soil in the Main Terminal Tank Farm area remained to be identified
- The horizontal extent of surface soil contamination within the eastern portion of the Phase III study area (specifically grids 7, 10, 11, 15, 17, and 19) had not yet been well defined.

The CPT exploration techniques and sample collection methods for the interim subsurface investigation are described in detail in the Phase III interim subsurface investigation technical memorandum (Landau Associates 2003d)]. Laboratory analyses performed for each soil sample are summarized in Table 5-2.

5.1.3 FINAL STAGE

The final stage of the Phase III RI was performed during September and October 2003 and during October and November 2004. For this investigation, soil samples were collected from the following locations:

- Thirty-three soil borings drilled for 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, LW-35D, LW-36D, LW-37D, LW-38D, LW-39D, LW-40S, LW-40D, LW-41S, LW-42S, LW-43-S, LW-44S, and LW-45D; these are 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 area
- 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,

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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 area (identified as sample locations G27-4 and G27-5).

The Phase III soil sample locations are shown on Figure 2-7. The soil samples collected during this investigation were collected with the purpose of filling data gaps identified based on results of the interim subsurface investigation described in Section 5.1.2 above. Soil sample collection procedures were conducted in accordance with the Phase III work plan (Landau Associates 2001a). Logs for each soil boring or well borehole are provided in Appendix A of this report.

The purpose of the hand-dug soil borings (HB-01 through HB-05) was to evaluate whether the three sets of conveyance/manifold pipes that trend northeast-southwest through the Main Terminal Tank Farm area may have been a source of soil contamination in the Main Terminal Tank Farm area and to better define the extent of contaminated soil in preliminary evaluation sampling grids 8 and 9. Soil sample results from these borings will be used to evaluate the potential for surface spills along this pipeline due to potential leaks or breaks while the pipelines were in operation. The borings were drilled using direct-push hand-probe equipment operated by Cascade Drilling, Inc. (Portland, Oregon). Using the same sample depth interval rationale as used for the preliminary evaluation and the interim subsurface investigation, soil samples were collected for chemical analyses at the hand-probe borings at the following depth intervals: 1 to 1.5 ft BGS, 5 to 5.5 ft BGS, and within the capillary fringe. No samples were collected from the 0 to 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); BTEX, 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). Laboratory analyses performed for each soil sample collected from the hand-probe borings are also summarized in Table 5-2.

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 boring for the lower zone monitoring well was drilled and installed first, followed by the boring for the upper zone monitoring well. To verify the upper zone well depth and screened interval,

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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 during drilling of the boring for 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 also due to the presence of NAPL within the soil samples. At monitoring well pair LW-40S/40D, the upper zone monitoring well was installed first, because the Oregon Water Resources Department (OWRD) required that the step-down procedure used for drilling the lower zone well be performed using slightly larger diameter augers, which required mobilization of a larger drill rig and delay of well installation. Soil samples for chemical analysis were collected from within the capillary fringe at each monitoring well soil boring, except at the well pairs where soil was only collected from one of the well borings. The capillary fringe was encountered at depths ranging between 12.5 to 16 ft BGS at most locations, except at wells LW-40S, LW-40D, and LW-45D. These wells are located on an approximate 5-ft high berm along the northern perimeter of the Main Terminal Tank Farm area, therefore, the capillary fringe at these locations was encountered at a depth of 21 ft BGS. Soil samples were also collected from the 0 to 0.5 ft depth interval, the 1 to 1.5 ft depth interval, and the 5 to 5.5 ft depth interval at soil borings for monitoring wells LW-41S, LW-42S, LW-43S, and LW-44S located in the Bell Terminal Tank Farm area. All of the soil samples from the 0 to 0.5 ft and the 1 to 1.5 ft depth intervals were submitted for laboratory analysis. The samples collected from the 5 to 5.5 ft depth intervals were archived and analyzed only if results for the samples from the upper most depth intervals indicated an increasing concentration trend with depth. Only one archived sample from this depth interval (collected at boring LW-42S) was analyzed. Laboratory analyses performed for each soil sample collected from monitoring wells soil borings are summarized in Table 5-2.

Shallow soil samples were collected from hand-dug holes within the eastern portion of the Phase III study area and the southeast portion of the Bell Terminal Tank Farm area to better define the specific area(s) where surface or shallow soil contamination exists within a preliminary evaluation sampling grid. For example, elevated concentrations of PAHs were detected in the composite surface soil sample at Grid 7. However, one of the subsample locations was near a historical roadway. To determine if the elevated concentration of PAHs could be attributed to the oiling of historical roadways, a discrete surface soil sample (G07-05) was collected adjacent to one of the previous subsample locations (G07-02). Also, to more adequately characterize the soil within the grid, discrete surface soil samples were collected at two other locations within the grid (G07-03 and G07-04). At each location, samples were collected from 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

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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.

- 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.

Laboratory analyses performed for each soil sample are also summarized in Table 5-2.

5.2 GROUNDWATER INVESTIGATION

This section describes the groundwater investigations conducted for the Phase III RI, including installation and groundwater sampling of temporary well points and permanent monitoring wells, and measurement of groundwater levels.

5.2.1 TEMPORARY WELL POINTS

The Phase III RI groundwater investigation included installation and sampling of 23 temporary well points during the preliminary evaluation, collecting split groundwater samples at 5 temporary well points, installation and sampling of 10 temporary well points and estimating static groundwater levels at 24 CPT locations during the interim subsurface investigation, installation and development of 33 permanent monitoring wells in the Phase III study area, and collection of groundwater samples from 46 permanent monitoring wells. The Phase III RI temporary well locations, Phase III RI permanent monitoring well locations, and Phase II monitoring well locations are shown on Figure 2-11. Prior to the Phase III RI groundwater investigation approximately 50 monitoring wells already existed in portions of the Phase III study area. None of these existing wells, however, were located in the Bell Terminal Tank Farm area.

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The purpose of collecting groundwater samples from temporary well points during the preliminary evaluation was to identify locations within the Phase III study area where contaminated groundwater is present and to facilitate the placement of the additional permanent monitoring wells such that long-term monitoring for contaminant migration can be performed. To achieve this goal, the temporary well points were located in areas of the Main Terminal where monitoring wells did not already exist and, because no monitoring wells were present in the Bell Terminal Tank Farm area, temporary well points were spatially distributed throughout that area. In some cases, the temporary well points in the Main Terminal Tank Farm area were purposely located adjacent to or downgradient from potentially impacted areas identified in Table 2-5. For example, GW2-2 and GW8-1 were located adjacent to or downgradient from potentially impacted area B12. This was the approximate area potentially impacted by a diesel spill that occurred in 1979 as a result of a split in tank 29508. Temporary well point GW4-1 was located downgradient of potentially impacted area B4 where three USTs and the associated dispensers were formerly located. Temporary well point GW17-1 was located downgradient of the potentially impacted area B7 where a railroad car loading rack was formerly located.

In addition to the 27 well points installed as part of the preliminary evaluation, 7 temporary well points were installed by Schnitzer at locations located on Time Oil property just west of the Bell Terminal Tank Farm area. These locations (SCH-56, SCH-57, SCH-59, SCH-60, SCH-61, SCH-62, and SCH-63) are shown on Figure 2-7. Schnitzer collected groundwater samples from each of the temporary well points using a peristaltic pump. The groundwater samples collected by Schnitzer were analyzed for diesel-, lube oil-, and gasoline-range petroleum hydrocarbons, SVOCs, and VOCs. The analytical results are presented in Table 5-3. Landau Associates collected split groundwater samples at five of the locations for Time Oil. All of the split groundwater samples collected by Landau Associates were analyzed for diesel- and lube oil-range petroleum hydrocarbons and, except for one sample, were analyzed for gasoline-range petroleum hydrocarbons. Two of the split groundwater samples were also analyzed for VOCs. The results for the split groundwater samples are also shown in Table 5-3. A comparison of the split groundwater sample results with the Schnitzer groundwater sample results indicates some variability between the results, as discussed previously (i.e., the relative percent difference between the diesel-range petroleum hydrocarbon results ranged from about 40 to 147 percent). The variability in sample results is likely due to the fact that these samples were collected directly from a borehole, instead of a monitoring well, which resulted in turbid samples. Suspended material in the groundwater sample may cause variability in the results due to contaminants adsorbed to the suspended material and, therefore, a reflection of the heterogeneity in the concentrations in the suspended soil.

During the interim subsurface investigation, discrete groundwater samples were collected from 10 temporary well points located along the east-west trending pipeline located in the center of the Bell

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Terminal Tank Farm area. As mentioned in Section 5.1.2, the pipeline was formerly used to convey petroleum products. The groundwater samples were collected to determine the impacts on groundwater, if any, due to this pipeline.

5.2.2 PERMANENT MONITORING WELLS

Nineteen 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)
- Seven wells, located in the western portion of the Main Terminal where the confining unit is discontinuous or absent, and screened across the first water-bearing zone (LW-22D, LW-23D, LW-24D, LW-25D, LW-26D, LW-35D, and LW-45D)
- Four wells installed along the Willamette River shoreline where the confining unit is discontinuous or absent, and screened across the first water-bearing zone (LW-36D, LW-37D, LW-38D, and LW-39D)
- Three well pairs each with a well screened in the lower and upper zones (LW-20S/20D, LW-27S/27D, and LW-40S/40D).

Twelve of the wells in the Main Terminal Tank Farm area were installed in September and October 2003. Seven of the wells, including those located along the Willamette River shoreline, were installed in November 2004. The placement of wells adjacent to the northern property boundary (LW-40S, LW-40D, and LW-45D) and along the western portion of the Main Terminal Tank Farm area (LW-22D, LW-23D, LW-24D, LW-25D, and LW-35D) was to characterize groundwater at the perimeter of the Main Terminal Tank Farm area. Monitoring wells were not installed along the southern tank farm perimeter during the Phase III RI because several upper zone and lower zone wells had been previously installed in this area as part of the Phase II RI. Monitoring wells were also installed in the central portion of the Main Terminal Tank Farm area (LW-19S, LW-20S, LW-20D, LW-21S, LW-26D, LW-27S, LW-27D) because analytical results for samples collected from the temporary well points indicated the presence of diesel-range and gasoline-range petroleum hydrocarbons and related constituents in the groundwater below the Main Terminal Tank Farm area. Well LW-19S was originally planned to be a lower zone monitoring well near the edge of the confining unit in the northern portion of the Main Terminal 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

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confining unit. An additional monitoring well, LW-35D, was subsequently installed to the northwest of LW-19S to characterize the lower zone in this portion of the Terminal.

Sixteen monitoring wells were installed in the Bell Terminal Tank Farm area as part of the Phase III RI, including:

- Eight wells screened in the upper zone (LW-28S, LW-31S, LW-33S, and LW-34S, LW-41S, LW-42S, LW-43S, and LW-44S)
- Three well pairs each with a well screened in the lower and upper zones (LW-32S/32D, LW-29S/29D, and LW-30S/30D).

Twelve of the wells in the Bell Terminal Tank Farm area were installed in September and October 2003. Four of the wells, LW-41S, LW-42S, LW-43S, and LW-44S were installed in November 2004. The locations of the initial 12 wells were selected to provide hydrogeologic information necessary to estimate groundwater flow patterns in the Bell Terminal Tank Farm area and to monitor for contaminants in groundwater. Initially, four wells (two sets of nested wells: LW-29S/29D and LW-30S/30D) were installed along the western property boundary of the Bell Terminal Tank Farm area to determine if contaminants previously detected in groundwater from temporary well point locations (SCH-61 and SCH-63B) are migrating from the property or onto the property in this area. Two additional upper zone monitoring wells (LW-41S and LW-42S) were later installed for additional information to better evaluate the potential migration of contaminants along this property boundary. Initially, one set of nested wells (LW-32S/32D) was installed along the east-west trending pipeline located in the center of the Bell Terminal Tank Farm area where diesel-range and gasoline-range petroleum hydrocarbons and related constituents were detected in groundwater samples collected from five temporary well points (BT-03, BT-04, BT-06, BT-08, and BT-09). A third monitoring well, LW-44S, was later installed in this area, as requested by DEQ. One upper zone well (LW-43S) was installed at a location between the western property boundary and the area along the pipeline in the central portion of the Bell Terminal to determine whether the concentrations observed in these two areas were contiguous. Monitoring well LW-33S was installed along the southern perimeter of the Bell Terminal Tank Farm area to monitor the migration of contaminants, if any, between the Bell Terminal Tank Farm area and the adjacent property to the south. Monitoring well LW-34S was installed in a location just downgradient of the former loading rack area (identified as biased sampling area B14 on Figure 2-11) to determine if former loading rack activities may have had an impact on groundwater. One well, LW-28S, was installed along the northern perimeter of the Bell Terminal Tank Farm area because the location was upgradient of any contamination detected during previous investigations.

Soil borings for each of the monitoring wells were drilled using a hollow-stem auger rig. Boreholes were drilled and the wells were constructed and installed in accordance with the Oregon

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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.

5.2.2.1 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 in the Main Terminal Tank Farm area.

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.

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

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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.

5.2.2.2 Lower Zone Monitoring Wells

Well borings for the lower zone monitoring wells extended at least 10 ft into the lower zone, except for wells installed along the shoreline of the Willamette River (beach wells). The beach wells were installed within the first encountered water-bearing unit (the upper zone does not exist in this area), but did not extend into a silt layer encountered at three of the wells (LW-36D, -37D, -39D) at about 10 to 12 ft BGS. Completed depths for the beach wells ranged from 10.2 to 16.5 ft BGS. (Note that ground surface elevations for these wells are approximately 20 ft lower than the wells installed along the riverbank and in the Main Terminal Tank Farm area.) Completed depths for the remainder of the lower zone wells 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, LW-32D, and LW-40D. No step-down procedure was used for drilling boreholes for wells LW-22D, LW-23D, LW-24D, LW-25D, LW-35D, and LW-45D located within the Main Terminal Tank Farm area because the confining unit was not encountered or the thickness of the silt layer was less than 0.5 ft 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 two 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 wells LW-26D and LW-40D were screened over a 5-ft interval to allow for the screened portion of the well to be placed in predominantly sand where silt layers existed. At wells located beyond the extent of the confining unit, a 15-ft screen interval was used to screen across the expected seasonal high and low water elevations, except for the beach wells. For these wells, the screened interval ranged from 4 to 10 ft. As discussed above, a silt layer was encountered at about 10 to 12 ft BGS in three of the wells located on the shoreline of the Willamette River; therefore, the screen length and screen position were chosen so that the base of the well was installed above the silt layer. The screen interval was installed to extend 2 to 3 ft above the water level at the time of drilling for account for seasonal fluctuations.

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.

5.2.3 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.

5.2.4 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.

5.2.5 GROUNDWATER SAMPLING

Groundwater samples were collected from the scheduled monitoring wells during the quarterly events, except where the wells contained product or when the wells were dry. A record of conditions at

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the time of sampling is provided in Section 6.0 Table 6-1 and in Section 7.0 Table 7-3. Groundwater monitoring locations are shown on Figure 2-1.

Analytical results and groundwater sampling procedures for the combined Phase II/III quarterly sampling events are provided in the respective quarterly reports (Landau Associates 2004a,b,c and 2005 a,b) and are evaluated in Section 7.0 of this report.

5.2.5.1 Groundwater Chemical Analyses

Groundwater samples collected during the fourth quarter 2004 were analyzed for the following constituents: SVOCs (EPA Method 8270); VOCs (EPA Method 8260), including methyl tert-butyl ether (MTBE) at well LW-7S; 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); gasoline-range TPH (NWTPH-G); diesel-range and motor oil-range TPH (NWTPH-Dx), and field parameters (pH, conductivity, dissolved oxygen, turbidity, and temperature). Additionally, select wells were sampled for ferrous iron (EPA Method SM3500); selenium (EPA Method 6010); benzene, ethylbenzene, toluene, and xylenes (BETX); and dioxins and furans (EPA Method SW8290) for monitoring of the ISCO events. PCP analyses using EPA Method 8270 SIM was also conducted on samples where PCP was not detected above the reporting limit using EPA Method 8270. The laboratory analyses were conducted by Specialty Analytical Inc., located in Tualatin, Oregon, except as follows: laboratory analyses prior to the first quarter 2004 event and the ferrous iron analysis were conducted by Analytical Resources, Inc. (ARI) located in Tukwila, Washington; dioxin/furan analyses were conducted by Columbia Analytical, Inc. in Houston, Texas.

5.2.6 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.

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5.2.7 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 Terminal Tank Farm area and southeast of tank 80009 in the Bell Terminal Tank Farm area). The temporary stockpiles were removed on February 19, 2004 and February 14, 2005 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 soil and groundwater at the Terminal.

5.4 DATA VALIDATION

The results of all 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)

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- Surrogate recoveries
- Laboratory matrix spikes and matrix spike duplicates (MS/MD) (including laboratory control samples)
- Duplicate analyses (field and laboratory)
- Quantitation limits
- 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. 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 and October/November 2004 Phase III RI soil investigations are provided in Appendices E, F, and G, respectively. The data validation report and laboratory data packages for the quarterly groundwater events are provided with the respective quarterly reports (Landau Associates 2004a,b,c and 2005a,b). 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

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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, general soil profiles for different areas of the Terminal based on data collected during the Phase III preliminary evaluation, boring logs from the Phase III interim subsurface investigation, and boring logs from the September/October 2003 and October/November Phase III investigations are provided in Appendix A. Except for the 2003 and 2004 investigations, these logs were provided with previous transmittals.

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. Historical aerial photographs from the late 1930s indicate that prior to construction of the Terminal the geomorphology of the area can be characterized as river floodplain (Figures 2-12 and 2-13). There are no apparent features either natural (e.g. historic river channels or surface water bodies) or manmade that would have an effect on contaminant transport.

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

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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.

- 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) reports 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 12 cross sections of the Terminal that illustrate the relationship between these units. The cross sections are presented on Figures 6-2 through

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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 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 50 Phase II and Phase III shallow wells, well points, and piezometers (including horizontal recovery well HRW-1 and ISCO wells OX-1S through OX-8S) installed within the upper zone at the Terminal.

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 Tank Farm area and the Bell Terminal Tank Farm area, and thins as it extends westward in the Main Terminal Tank Farm area and as it extends westward and southward of the Bell Terminal Tank Farm area, 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

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becomes thinner, it eventually becomes discontinuous layers of silt and no longer acts as a confining unit between the upper and lower zones. Based on soil boring logs and groundwater elevation data collected on the former PEO property, the confining unit presumably also appears to thin and becomes discontinuous on the eastern portion of the PEO property (Bridgewater 2001; Bridgewater 2002; URS 2002; Gradient 2003); however, boring logs are not available for all of the well locations on this property. The approximate boundary of the extent of the continuous confining unit is shown on Figure 6-1.

Where present at the Terminal, 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 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 and presumably on the former PEO property), 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. As discussed in Sections 6.3 and 6.4, the hydrogeologic characteristics of the upper and lower zones (e.g., hydraulic conductivity, yield) and contaminant distributions vary throughout the units. Based on local stratigraphic data, the lower zone ranges in thickness from about 15 to 40 ft, depending on the continuity of the 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 36 Phase II and Phase III wells (including recovery well RW-2) installed in the lower zone at the Terminal. Sixteen of these wells are installed in the area beyond the extent of the confining unit where the lower zone acts as an unconfined aquifer.

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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. One deep sand unit monitoring well was previously installed at the Terminal within the soil removal area for the former PCP mixing area, but was abandoned prior to soil removal activities. Currently, there are no monitoring wells installed in the deep sand unit at the Terminal.

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 November 2004, 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 from October 2003 through November 2004. 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 in Table B-1 (Appendix B).

Groundwater elevations in the upper zone measured in February and November 2004 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 include data for the Phase III monitoring wells from the November 2004 event. Groundwater elevation contour maps for the monitoring conducted since January 1998 have been provided to DEQ in the quarterly groundwater monitoring reports. Groundwater elevation data collected on the former PEO property has not been included in this report because the most recent data available is from January 2003, and therefore, are not comparable to the 2004 elevations presented in this report. However, the groundwater elevation data from the former PEO property were used to assess the

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groundwater flow elevations and flow patterns relative to those observed at the Terminal to estimate the extent of the confining unit on the former PEO property.

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 the area near and including the former PCP mixing area likely reflects the influence of the east-west trending storm drain on groundwater flow. Monitoring wells on the East Property have been abandoned; however, historical groundwater levels measured in this area indicate that there is a localized change in the groundwater flow pattern such that the groundwater flow direction in this area is approximately radial away from the north-central property boundary (near LW-101S). Groundwater elevation maps showing this area are provided in quarterly reports prior to the third quarter 2003 event.

As previously discussed, the confining unit between the upper and lower zones thins and becomes discontinuous 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 Phase III RI well LW-27S, the water level is not typical of either a lower 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 Tank Farm area, wells LW-28S and LW-33S were dry during the November 2004 groundwater sampling event, and newly installed well LW-41S has been dry during the two quarterly events since installation. At wells LW-33S and LW-41S, 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

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zone groundwater table surface fluctuates about 6 to 7 ft seasonally (between about 12 and 19 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.

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 Terminal Tank Farm area near well LW-27S at the confining unit transition, and 4) the area between wells LW-32S and LW-31S, which represents the southern portions within the Bell Terminal Tank Farm area where groundwater flow is generally to the southwest. Average horizontal gradients range from about 0.006 to 0.067, with the greatest average gradients occurring in the central part of the Terminal at the confining unit boundary (0.067). 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 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

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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 0.006 to 0.067. 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 0.8 to 36 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 RI measurements from March 1997 through November 2004, Phase II continuous water level monitoring measurements, Phase II baseline monitoring during the aquifer tests, and aquifer test results and quarterly Phase III RI measurements from October 2003 through November 2004. 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 February and November 2004 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

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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 recovery 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 occur 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.

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 observed within the upper zone along this boundary. In the Bell Terminal Tank Farm area, well LW-28S, which is located where the confining unit is thin and likely discontinuous was dry during the summer and fall 2004 quarterly sampling events. Wells LW-41S and LW-33S, located along the southern property boundary within the Bell Terminal Tank Farm area, were dry during the fourth quarter 2004 event, presumably due to the confining unit in this area being higher than at surrounding well locations, the upper zone being thinner in this area, and abnormally dry seasonal conditions. At well LW-27S, the water level appears to represent

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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.

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 Figures 6-17 and 18. 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 conditions to unconfined conditions west of the confining unit boundary.

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, which represents the northern portion of the Terminal where groundwater flow is generally west toward the river, 2) the area between wells OX-8D and LW-6D, which 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 LW-30D. Average horizontal gradients range from 0.0006 in the central area of the Terminal to 0.002 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, the 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.

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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 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.

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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 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 0.0006 to 0.002. 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 0.05 to 0.9 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, D/LW-3D, J1/J2,

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LW-4S/4D, LW-9S/9D, LW-10S/10D, LW-11S/11D, LW-20S/20D, LW-29S/29D, and LW-32S/32D. Vertical hydraulic gradients were calculated from groundwater elevations measured during the quarterly sampling events from March 1997 through November 2004 (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 0.55. 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 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 the results of an evaluation of the nature and extent of contamination in the soil and groundwater at the Terminal. The nature of the contamination was determined 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 was determined 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 following preliminary soil screening levels were used to evaluate the soil sample results representing the upper 3 ft of soil:

- EPA Region 9 preliminary remediation goals (PRGs) for industrial soil (EPA 2004).
- EPA Region 9 PRGs for the potential migration of contaminants from soil to groundwater using a dilution-attenuation factor of 20 (DAF=20)[1] (EPA 2004).
- 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 3 ft; DEQ 2001).
- Oregon DEQ generic risk-based concentrations for petroleum constituents and total petroleum hydrocarbons based on occupational, construction worker, and excavation worker exposure to soil through ingestion, dermal contact, and inhalation; occupational exposure via volatilization to outdoor air; and occupational exposure via leaching to groundwater (DEQ 2003b).
- Site-specific background concentrations for metals determined previously during the COPC and 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 COPC/CPEC screening results will be updated to include the Phase III RI data and will be presented in the Phase II/III human health and ecological risk assessments.

The following preliminary soil screening levels used for the evaluation of the soil sample results representing soil greater than 3 ft in depth include the following:

- EPA Region 9 PRGs for the potential migration of contaminants from soil to groundwater using a dilution-attenuation factor of 20 (DAF=20)[1] (EPA 2004).

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[1] The PRGs for migration to groundwater are based upon back-calculation from a non-zero maximum contaminant level (MCL), an MCL goal (MCLG), or a tap water PRG. Because these levels are based upon an exposure scenario (drinking water) that is excluded by the beneficial use determination for the Terminal, it is appropriate to use the higher DAF as a conservative method for screening.

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- Oregon DEQ generic risk-based concentrations for petroleum constituents and total petroleum hydrocarbons excavation worker exposure to soil through ingestion, dermal contact, and inhalation; occupational exposure via volatilization to outdoor air; and occupational exposure via leaching to groundwater (DEQ 2003b).

- Site-specific background concentrations for metals determined previously during the COPC/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, acute and chronic exposures to aquatic species and human consumption of organism only (Table 33A; DEQ 2004b).

- Oregon DEQ generic risk-based concentrations (RBCs) for petroleum constituents and total petroleum hydrocarbons based on construction and excavation worker exposure to groundwater, and occupational exposure via volatilization to outdoor air from groundwater (DEQ 2003b).

- 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 and areas of contaminant concentrations present at the Terminal exceeding these preliminary screening levels. The screening levels are not presented as cleanup levels. 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 based on the results of the beneficial water use determination (Section 4.3). Final screening levels to be used for determining COPCs/CPECs for the Terminal based on Phase II and Phase III soil and groundwater results will be

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identified 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 during the Phase II and the Phase III RIs. Soil concentrations discussed in the following sections are representative of soil remaining at the Terminal following completion of interim 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, cPAHs, VOCs, chlorinated phenols, and metals) were selected for presentation on the Terminal maps. The maps are presented on Figures 7-1 through 7-26. 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 petroleum hydrocarbons, benzo(a)pyrene, 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 groundwater and the frequency that the detected concentrations exceed the minimum preliminary screening levels.

For example, 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)pyrene concentrations most frequently exceeded the preliminary screening level. 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.

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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 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, when available, are presented in Tables C-1 through C-6 of Appendix C. As noted above, COPCs/CPECs will be identified through the screening process defined by DEQ guidance (DEQ 1999, 2000b) during the upcoming risk assessment.

7.1.2 CONTAMINANT DISTRIBUTION

This section evaluates the distribution of the COIs in soil at the Terminal at concentrations above the minimum preliminary screening levels, except for diesel-range petroleum hydrocarbons, for which no applicable risk-based preliminary screening levels are available. The evaluation includes both the horizontal and vertical distribution of the COIs. To facilitate evaluation of the horizontal distribution, 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 Tank Farm area, the eastern portion of the Phase III study area, the asphalt-paved road area located north of the Bell Terminal Tank Farm area, and the Phase II study area (Figure 1-2). To facilitate evaluation of the vertical distribution, soil was divided into four depth intervals: surface soil (0 to 0.5 ft BGS); shallow unsaturated soil (1 to 1.5 BGS and 5 to 5.5 ft BGS); and the capillary fringe (and deeper). If a COI was not detected in any samples for a depth interval, the constituent is not illustrated for that depth interval. The remainder of this section discusses the distribution of the selected COIs at concentrations above the preliminary screening levels 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.

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Surface Soil

A total of 15 surface soil samples (i.e., the upper 0.5 ft of soil) were collected from within the Main Terminal Tank Farm area and submitted for analysis. The distribution of the eight selected COIs in the Main Terminal Tank farm area, based on the results for these 15 soil samples, is shown on Figures 7-1 through 7-6. Of the eight selected COIs, only benzo(a)pyrene, lead, and zinc were detected at concentrations above the minimum preliminary screening levels. Diesel-range petroleum hydrocarbons were detected in the surface soil, but at concentrations below the minimum preliminary screening level of 23,000 mg/kg (DEQ risk-based concentration for direct soil exposure to construction worker; DEQ 2003b, as shown on Figure 7-1. Diesel-range petroleum hydrocarbons in the surface soil ranged from less than the laboratory reporting limit (i.e., nondetect) to 438 mg/kg. No gasoline-range petroleum hydrocarbon concentrations were greater than the laboratory reporting limit, as shown on Figure 7-2. As shown on Figure 7-3, the distribution of benzo(a)pyrene at concentrations exceeding the preliminary screening levels is limited to an area in the southern portion of the Main Terminal Tank Farm area, whereas, the distribution of lead and zinc at concentrations exceeding the respective preliminary screening levels is more widespread (shown on Figures 7-4 and 7-5, respectively). Most of the detected benzo(a)pyrene, lead, and zinc at concentrations above the respective minimum preliminary screening levels in the Main Terminal Tank Farm area surface soil are associated with composite samples; therefore, the distribution of these constituents is conservatively illustrated by plotting the composite concentrations at each subsample location.

Shallow Unsaturated Soil

A total of 24 soil samples were collected from the shallow unsaturated soil within the Main Terminal Tank Farm area and submitted for analysis. For this discussion, shallow unsaturated soil includes the 1 to 1.5 ft BGS and 5 to 5.5 ft BGS sample depth intervals. The distribution of the eight selected COIs, with respect to the minimum preliminary screening levels (if applicable), at these depths are shown on Figures 7-7 through 7-11 and 7-12 through 7-18. Similar to the shallow soil in the Main Terminal Tank Farm area, diesel-range petroleum hydrocarbons were detected at concentrations greater than 100 mg/kg in the shallow unsaturated soil. Concentrations of diesel-range petroleum hydrocarbons greater than 1,000 mg/kg (i.e., up to 7,170 mg/kg) were detected in the shallow unsaturated soil at and around the conveyance/manifold pipes where the gasoline-range petroleum hydrocarbons were also detected (Figures 7-7 and 7-12). The COIs detected at concentrations above the minimum preliminary screening levels within the shallow unsaturated soil include lead (at the 1 to 1.5 ft depth interval), zinc (at the 1 to 1.5 ft depth interval), gasoline-range petroleum hydrocarbons (at the 5 to 5.5 ft depth interval),

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and benzene (at the 5 to 5.5 ft depth interval). The distribution of lead and zinc concentrations exceeding the preliminary screening levels do not correlate except at a limited number of locations. Gasoline-range petroleum hydrocarbons and benzene concentrations above the preliminary screening levels appear to be limited to an area near the conveyance/manifold pipes that trend northeast-southwest through the Main Terminal Tank Farm area (Figures 7-13 and 7-15, respectively). The presence of benzene and gasoline-range petroleum hydrocarbons in this area at this depth may indicate a potential source for the gasoline-range petroleum hydrocarbon and benzene contamination found in the capillary fringe soil (discussed later in this section). However, these constituents were not detected or were detected at low concentrations below the preliminary screening levels within the surface soil and at the 1 to 1.5 ft depth interval.

Capillary Fringe Soil

A total of 49 soil samples were collected from the capillary fringe or deeper in the Main Terminal Tank Farm area and submitted for analysis. The results for these samples reveal that the highest concentrations of the selected COIs in the Main Terminal Tank Farm area are present in soil within the capillary fringe depth interval. Diesel-range petroleum hydrocarbon concentrations range from less than the laboratory reporting limit (i.e., nondetect) to 36,100 mg/kg. (No relevant preliminary screening level is available for diesel-range petroleum hydrocarbons present in soil below a depth of 3 ft BGS.) The distribution of diesel-range petroleum hydrocarbons in the capillary fringe soil is shown on Figure 7-19. Gasoline-range petroleum hydrocarbon concentrations range from nondetect to 8,920 mg/kg. The approximate horizontal extent of gasoline-range petroleum hydrocarbons at concentrations exceeding the preliminary screening level (110 mg/kg; DEQ risk-based concentration for occupational exposure via leaching to groundwater; DEQ 2003b) is shown on Figure 7-20. Some of the highest concentrations of each range of petroleum hydrocarbons are present in samples collected from the hand-augered borings located adjacent to the conveyance/manifold pipes (e.g., HB-01, HB-02, and HB-03); however, the maximum diesel-range petroleum hydrocarbon concentration (36,100 mg/kg or 3 percent diesel-range petroleum hydrocarbons in soil) was found near the northern property boundary at LW-19S. Components of gasoline (e.g., benzene and ethylbenzene) are also present within the capillary fringe soil in the Main Terminal Tank Farm area at concentrations exceeding the preliminary screening levels (0.03 mg/kg and 13 mg/kg, respectively), but the area of impact is much smaller, as shown on Figures 7-22 and 7-23. Benzo(a)pyrene, a component of diesel, is not present in the capillary fringe soil at concentrations exceeding the preliminary screening level of 0.21 mg/kg (Figure 7-21). The presence of lead in the capillary fringe soil in the Main Terminal Tank Farm area at concentrations exceeding the preliminary

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screening levels is limited to a few sampling locations. Zinc was the only COI not detected at concentrations exceeding the preliminary screening level in the Main Terminal Tank Farm area capillary fringe soil.

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 in Table C-2.

Surface Soil

A total of 23 surface soil samples have been collected at the Bell Terminal Tank Farm area and submitted for analysis. The distribution of the eight selected COIs in the surface soil (i.e., the upper 0.5 ft of soil) based on the results for these samples is shown on Figures 7-1 through 7-6. Of the eight selected COIs, only benzo(a)pyrene, lead, and zinc were detected at concentrations above the minimum preliminary screening levels. Gasoline-range petroleum hydrocarbons were not detected in surface soil (Figure 7-2). As shown on Figures 7-3, 7-4, and 7-5, the presence of these three constituents at concentrations exceeding the preliminary screening levels in the surface soil appears to extend throughout the Bell Terminal Tank Farm area; however, many of the sampling locations shown to contain elevated concentrations are associated with composite samples and, therefore, the contoured areas represent a conservative representation of the contaminant distribution. Diesel-range petroleum hydrocarbons were also detected in the surface soil, but at relatively low concentrations ranging from nondetect to 859 mg/kg. Many of these detected concentrations are also associated with composite samples. Samples collected from the upper 2 ft of soil within the eastern portion of the former PEO property contained diesel-range petroleum hydrocarbon concentrations ranging from 97.6 to 4,280 mg/kg, which are greater than those observed within the Bell Terminal Tank Farm area (Figure 7-7; Bridgewater 2001).

Shallow Unsaturated Soil

A total of 33 soil samples were collected from the shallow unsaturated soil in the Bell Terminal Tank Farm area and submitted for analysis. Results for these soil samples indicate that the three COIs present in the surface soil at concentrations exceeding the preliminary screening levels [benzo(a)pyrene, lead, and zinc] are also present in the shallow unsaturated soil at concentrations exceeding the preliminary screening levels, but the impacted area is much smaller and generally limited to an area near the western property boundary as shown on Figures 7-9, 7-10, and 7-11. Also, the depth of impact does not appear to extend to the 5 to 5.5 ft BGS depth interval, as shown on Figures 7-14, 7-16, and 7-17. Diesel-range

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petroleum hydrocarbons ranged from nondetect to 66 mg/kg in the shallow unsaturated soil. The other four COIs (gasoline-range petroleum hydrocarbons, benzene, ethylbenzene, and PCP) were not detected in the shallow unsaturated soil at concentrations exceeding the respective preliminary screening levels.

Capillary Fringe Soil

A total of 45 soil samples have been collected within the capillary fringe in the Bell Terminal Tank Farm area and submitted for analysis. Results for these samples indicate that of the eight selected COIs, only gasoline-range petroleum hydrocarbons were detected at concentrations exceeding the minimum preliminary screening level (Figure 7-20). Diesel-range petroleum hydrocarbons were also detected in the capillary fringe soil at concentrations ranging from nondetect to 15,100 mg/kg (Figure 7-19), but no relevant preliminary screening level is available for diesel-range petroleum hydrocarbons present in soil below a depth of 3 ft BGS. The elevated concentrations of gasoline-range and diesel-range petroleum hydrocarbons appear to be focused in three areas: adjacent to the east-west trending pipeline,, along the western property boundary outside the tank farm walls in an area previously used by owners and/or operators of the adjacent property, and in the central portion of the Bell Terminal Tank Farm area (Figures 7-19 and 7-20). The presence of diesel-range hydrocarbons at the north side of the Bell Terminal at concentrations exceeding 1,000 mg/kg is based on the results of a composite sample within grid 22. This concentration is likely due to soil collected at subsample location G22-03, located near the east-west trending pipeline. To further evaluate the nature and extent of gasoline-range and diesel-range petroleum hydrocarbons within the capillary fringe at the Bell Terminal Tank Farm area, concentrations of these compounds along the eastern portion of the adjacent property boundary were evaluated. Figures 7-19 and 7-20 show the locations on the eastern portion of the former PEO property boundary where soil samples were collected at depths within or below the capillary fringe and analyzed for diesel-range and gasoline-range petroleum hydrocarbons. As indicated on Figures 7-19 and 7-20, gasoline-range and diesel-range petroleum hydrocarbons are present in the soil at depths within or below the capillary fringe in the eastern portion of the former PEO property at concentrations similar to or greater than the concentrations detected within the Bell Terminal Tank Farm area (Bridgewater 2001). The highest diesel-range petroleum hydrocarbon concentrations were observed at locations along the east-west trending pipeline and along the western property boundary (15,100 mg/kg at LW-43S, 12,700 mg/kg at SCH56, and 10,200 mg/kg at SCH59) of the Bell Terminal Tank Farm area (Figure 7-19). These data indicate that there are likely sources of petroleum hydrocarbons originating from areas of former fuel storage on former PEO property in addition to the source originating within the central portion of the Bell Terminal. This is further supported by analytical results for soil samples collected in the upper 2 ft of soil

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at the former PEO property, which indicate the presence of diesel-range petroleum hydrocarbons in the shallow soil within the eastern portion of the former PEO property at concentrations exceeding 1,000 mg/kg (Figure 7-7; Bridgewater 2001).

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 Tank Farm area are shown on Figure 2-7. Concentrations of detected constituents in this area are provided in Table C-3.

Surface Soil

Because this area is covered with gravel fill, surface soil samples were not collected, except at location LW-7S. Of the COIs, only PCP was detected in the surface soil at this location at a concentration of 0.011 mg/kg, which is below the preliminary screening level of 0.03 mg/kg [EPA Region 9 PRG for potential migration of contaminants from soil to groundwater using a DAF of 20 (EPA 2004);Figure 7-6]. The presence of PCP in this area is likely related to activities associated with the former PCP mixing area (see discussion on the Phase II area below.)

Shallow Unsaturated Soil

Eight soil samples were collected from the shallow unsaturated soil within the loading rack/entrance area of the Main Terminal Tank Farm area. These samples were collected at a depth interval of 1 to 1.5 ft BGS. Results for the soil indicate that PAHs, TPH, and VOCs are not present in the soil in this area at this depth interval. Metals were detected in the soil at this depth, but only zinc was detected at concentrations exceeding the preliminary screening level. The locations where the concentrations of zinc exceed the preliminary screening level are shown on Figure 7-11.

Capillary Fringe

Eleven soil samples were collected from the capillary fringe in the loading rack/entrance area and submitted for analysis. The results for these samples indicate that 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 were detected in the soil at this depth; however, of the eight selected COIs, only gasoline-range petroleum hydrocarbons were detected at concentrations exceeding the minimum preliminary screening levels (Figure 7-20). These exceedances are associated with a composite sample collected from biased sampling area B3, which is the former location of the loading racks from the Main Terminal Tank Farm area to trucks. However,

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because the exceedances are associated with a composite sample, the contoured areas represent a conservative representation of the contaminant distribution.

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 in Table C-4.

Surface Soil

Thirty-eight soil samples have been collected and submitted for analysis within the upper 0 to 0.5 ft depth interval in the eastern portion of the Phase III study area. The results for these samples indicate that of the eight selected COIs, only benzo(a)pyrene, lead, and zinc are present in surface soil at concentrations exceeding the preliminary screening levels (Figures 7-3, 7-4, and 7-5). Gasoline-range petroleum hydrocarbons, benzene, ethylbenzene, and PCP were not detected. Diesel-range petroleum hydrocarbons were also detected at this depth interval at concentrations ranging from nondetect to 549 mg/kg, but below the minimum preliminary screening level of 23,000 mg/kg (Figure 7-1). The detected concentrations of diesel-range petroleum hydrocarbons and cPAHS in the surface soil appear to be associated with oiling of historical roads in this area.

Shallow Unsaturated Soil

Seventeen soil samples were collected within the shallow unsaturated soil in the eastern portion of the Phase III study area. All but one of these samples were collected at a depth interval of 1 to 1.5 ft BGS. Because the capillary fringe in this area is shallow and close in depth to the 5.0 to 5.5 ft depth interval, only one sample (composite sample BA-11) was collected at the 5.0 to 5.5 ft depth interval within this area. Results for the soil samples indicate that benzo(a)pyrene, lead, and zinc are present at concentrations exceeding the preliminary screening levels at the 1 to 1.5 ft depth interval. The approximate horizontal extent of these exceedances is shown on Figures 7-9, 7-10, and 7-11, respectively. The frequency that lead and zinc are present at concentrations exceeding preliminary screening levels decreased significantly at the 1 to 1.5 ft depth interval compared to exceedances observed in the surface soil. Diesel-range and gasoline-range petroleum hydrocarbons were not detected at the 1 to 1.5 ft depth interval, except at one location, BA-11, where diesel-range petroleum hydrocarbons were detected at a concentration of 574 mg/kg (Figure 7-7); these constituents were not analyzed in the one sample from the 5 to 5.5 ft depth interval. At the 5.0 to 5.5 ft depth interval, the results for sample B-11 indicate that

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benzo(a)pyrene (Figure 7-14) and other PAHs are not present at this depth at concentrations exceeding preliminary screening levels. Metals were not analyzed at this depth interval.

Capillary Fringe

Thirteen soil samples were collected within the capillary fringe soil in the eastern portion of the Phase III study area. At the capillary fringe depth interval, only a few PAHs [Figure 7-21 for benzo(a)pyrene] and VOCs (Figures 7-22 and 7-23 for benzene and ethylbenzene, respectively) were detected. Metals were frequently detected, but did not exceed the preliminary screening levels (Figures 7-24 and 7-25 for lead and zinc). Diesel-range and gasoline-range petroleum hydrocarbons were not detected (Figures 7-19 and 7-20).

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. One sample was collected at the 0 to 0.5 ft BGS depth interval; one sample was collected from the 1 to 1.5 ft BGS depth interval; and two samples were collected from the capillary fringe. Concentrations of detected constituents in this area are provided in Table C-5. 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); however, concentrations of metals above the preliminary screening levels were only detected in the surface soil (0 to 0.5 ft BGS; Figures 7-4 and 7-5 for lead and zinc, respectively). PAHs and petroleum hydrocarbons were only detected in the surface soil sample. Benzo(a)pyrene was the only PAH (Figure 7-3) that was detected at concentrations above the preliminary screening levels within the surface soil depth interval only. Motor oil-range petroleum hydrocarbons were detected at a concentration of 301 mg/kg, but diesel-range and gasoline-range petroleum hydrocarbons were not detected at any depth interval (Figures 7-19 and 7-20, respectively). Samples collected in this area were collected below the asphalt surface and underlying roadbase material, with one exception, 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 2-4. Concentrations of detected constituents in soil remaining in this area are provided

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in Table C-6. PCP was the constituent used to determine the extent of contamination and cleanup for the soil removal action in this area. Because of the limitations in excavating soil below the water table, the base of the removal action excavation did not extend beyond about 13 ft BGS. Consequently, PCP concentrations ranging from greater than 2 mg/kg to 180 mg/kg potentially remain within and adjacent to the former PCP mixing area at depths as shown on Figure 2-4. The effects of the ISCO injections on soil concentrations will be assessed at the completion of the full scale implementation.

Surface Soil

Because most of the surface 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, petroleum hydrocarbons, and metals were all detected in the surface soil in this area. The only PAH concentrations exceeding preliminary screening levels is benzo(a)pyrene (Figure 7-3). Lead (Figure 7-4), zinc (Figure 7-5), and copper are present at concentrations above the preliminary screening levels in small, localized areas. Concentrations of diesel-range (Figure 7-1) and motor-oil range petroleum hydrocarbons range from nondetect to 160 mg/kg and 130 mg/kg to 420 mg/kg, respectively. PCP was only detected at locations LW-1D and LB16 at concentrations exceeding the preliminary screening level of 0.03 mg/kg (Figure 7-6).

Shallow Unsaturated Soil

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 PCP (Figure 7-18) exceeds preliminary screening levels. (Note that a figure showing PCP concentrations for the 1 to 1.5 ft BGS depth interval is not included because there were no detected concentrations.) No VOCs, except BTEX, were analyzed at these depth intervals. BTEX was not detected at concentrations above the laboratory reporting limits in the soil (Figure 7-15 for benzene). Copper and zinc were the only metals analyzed and both were detected, but at concentrations below the preliminary screening levels (Figures 7-10 and 7-16 for lead; Figures 7-11 and 7-17 for zinc). Diesel-range petroleum hydrocarbons were detected in three samples from the 5.0 to 5.5 ft depth interval at concentrations ranging from 6.4 to 66 mg/kg. Motor oil-range petroleum hydrocarbons were detected in one sample at a concentration of 98 mg/kg. Gasoline-range petroleum hydrocarbons were not detected within either depth interval (Figures 7-8 and 7-13).

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Capillary Fringe

Seventy-five samples represent the soil remaining at depths within or below the capillary fringe in this area. At this depth interval, PCP is the predominant COI that was detected at concentrations above the preliminary screening level, as shown on 7-26. Soil containing PCP concentrations at these levels remained following the soil removal action in this area because of the physical constraints of excavating soil below the groundwater table. Residual PCP soil concentrations at this depth are being addressed through use of the ISCO technique in this area. Concentrations of diesel-range petroleum hydrocarbons in the soil ranged from nondetect to 4,700 mg/kg (Figure 7-19). Gasoline-range petroleum hydrocarbons at concentrations exceeding preliminary screening levels were observed at two locations, as shown on Figure 7-20. 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).

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 wells, injection wells, and recovery wells between October 2003 and November 2004 and from discrete groundwater samples collected from direct-push borings during the preliminary evaluation and the interim subsurface investigation during 2001-2002 at the Terminal. The data collected from monitoring wells in January 2003 and from direct-push borings on the adjacent former PEO property in 1996 and 1998 were also reviewed to assess the nature and extent of groundwater contamination.

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, petroleum hydrocarbons 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, only a few constituents from each of these groups of chemicals (i.e., petroleum hydrocarbons, PAHs, VOCs, and metals), which are expected to be drivers during the risk assessment, were plotted on maps of the Terminal (Figures 7-27 through 7-46). The concentrations were contoured using the minimum preliminary screening level for each selected constituent. The constituents selected for presentation and referred to throughout this discussion as selected COIs for groundwater include: diesel-range and gasoline-range petroleum hydrocarbons, benzene, ethylbenzene, and PCP. In addition, chromium and copper were included as COIs for the lower zone, with a specific focus on the

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nearshore monitoring wells, including wells located along the river bank and those on the shoreline of the Willamette River, to assess the groundwater transport pathway to the river, as shown on Figures 7-47 and 7-48.

The COIs were selected 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. 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. 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; therefore, the diesel-range petroleum hydrocarbon data are not contoured. 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 have most frequently exceeded the preliminary screening levels since monitoring began for the Phase III wells. PAHs were detected at a small number of wells (one upper zone well and four lower zone wells) at concentrations exceeding the 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 the preliminary screening level, except at two lower zone Phase III wells where only five quarters of data are available. Therefore, PAHs were not included in the selected COIs. PCP was 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. Metals, with the exception of chromium, which were often detected in soil, were generally not detected in upper zone groundwater exceeding site-specific background concentrations or the risk-based preliminary screening levels. Metals concentrations exceeding the preliminary screening levels are typically more prevalent in the lower zone groundwater. Lower zone metals concentrations tend to exceed preliminary screening levels more frequently for chromium, copper, nickel, and zinc. Chromium and copper have been included in the selected COIs for the lower zone, as described above. A discussion of an assessment of the metals concentrations is provided in Section 7.2.3.

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.

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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 7-27 to 7-36 and Figures 7-37 to 7-46, respectively, and discussed in the remainder of this section.

7.2.2.1 Upper Zone Groundwater

The analytical results for groundwater samples collected from the 45 upper zone wells during quarterly events from spring 1997 through November 2004 were evaluated for this report. For purposes of discussion and because the most recent Phase III RI well installation occurred during the fall 2004, presentation of groundwater data for this report is focused on data collected for the fourth quarter (October) 2003 event (including direct-push data from 1996 through 2002) and the fourth quarter (November) 2004 event. Trends in contaminant concentrations for quarterly data collected since 1997 or since well installation were evaluated and are discussed in Section 7.2.3. A discussion of the distribution of contaminants in the upper zone groundwater by area based on the October 2003 and November 2004 analytical data is provided below. Groundwater data collected from direct-push sampling points in 2001 during the planning stages for the Phase III RI and on the former PEO property between 1996 and 1998 for TPH constituents and for January 2003 for BTEX are also included with the October 2003 data. These are the most recent data available from locations on the PEO property for these constituents.

Main Terminal Tank Farm Area

Four upper zone wells located in the Main Terminal Tank Farm area were installed in the fall of 2003. One additional upper zone well was installed in November 2004. Therefore, the distribution of contaminants and evaluation of contaminant trends in upper zone groundwater within the Main Terminal Tank Farm area are based on a maximum of five quarters of data, collected between October 2003 and November 2004. In addition to the quarterly data, eight groundwater samples were collected from temporary well points in August through October 2001 and July 2002 for determining the locations of permanent monitoring wells. These results are presented with the October 2003 event data, which is the first quarter when data for the Phase III wells was collected. Upper zone monitoring wells are only located in the eastern half of the Main Terminal Tank Farm area. 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 6.2.3, groundwater levels in the western half of the Main Terminal Tank Farm area are consistent with those typically observed at wells screened within the

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lower zone. This is also generally true for groundwater levels on the former PEO property; however, groundwater elevations for the former PEO property are not plotted because the most recent data available is from January 2003 and are not comparable to the 2004 groundwater elevations for the Terminal presented for this report. Evaluation of the contaminant distribution in groundwater throughout the western portion of the Main Terminal Tank Farm is provided in Section 7.2.2.1.

Results for upper zone groundwater in the Main Terminal Tank Farm area for the fourth quarter 2003 and fourth quarter 2004 groundwater monitoring events indicate the presence of diesel-range and gasoline-range petroleum hydrocarbons (Figures 7-27 through 7-30). Concentrations of diesel-range petroleum hydrocarbons in groundwater samples collected during the October 2003 groundwater monitoring event and in groundwater samples collected from temporary direct-push locations during earlier groundwater investigations ranged from nondetect to 19.6 mg/L (Figure 7-27). Concentrations of diesel-range petroleum hydrocarbons in groundwater samples collected during the November 2004 sampling event ranged from nondetect to 6.45 mg/L (Figure 7-28). During the October 2003 groundwater monitoring event, concentrations of gasoline-range petroleum hydrocarbons in the upper zone groundwater exceeding the preliminary screening level (12 mg/L; DEQ RBC, construction and excavation worker; DEQ 2003b) occurred at a single location (LW-21S;Figure 7-29); however, gasoline-range petroleum hydrocarbons were not detected above the preliminary screening level in November 2004 (Figure 7-30). Maximum concentrations of diesel-range and gasoline-range petroleum hydrocarbons are typically observed in groundwater at locations near tanks or conveyance pipelines located on the eastern portion of the Main Terminal Tank Farm area. During the October 2003 event, product was observed in wells Q and P (Table 7-3) at thicknesses ranging from 0.02 to 0.24 ft and near this area at direct-push location GW8-1 in 2001. During November 2004, product was observed at wells Q, LW-21S, and LW-27S (Table 7-3) with thicknesses ranging from 0.02 to 0.25 ft.

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 the petroleum hydrocarbon constituents, as shown by the distribution of benzene and ethylbenzene concentrations on Figures 7-31 through 7-34. During the October 2003 sampling event, benzene was detected at a concentration exceeding the preliminary screening level of 51 µg/L (Oregon Ambient Water Quality Criteria, fish consumption only; DEQ 2004b) at one location (LW-21S at 1,600 µg/L; Figure 7-31). For the November 2004 sampling event, product was observed in LW-21S; therefore, this well was not sampled. Benzene was not detected in groundwater during the November 2004 groundwater monitoring event at wells at concentrations greater than the preliminary screening level (Figure 7-32). Occurrences of ethylbenzene in groundwater at concentrations exceeding the preliminary screening level (7.3 µg/L; Oregon DEQ ecological risk screening level value, surface

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water; DEQ 2001) were more widespread than observed for benzene during the October 2003 event with the maximum concentration (940 µg/L) occurring at the same well as the maximum benzene concentration (i.e., LW-21S; Figure 7-33). During the November 2004 event, the distribution of ethylbenzene near LW-21S is not as well defined because a groundwater sample was not collected from well LW-21S due to the presence of product in the well and because groundwater samples were not collected from temporary well points during this event (Figure 7-34). For the October 2003 and November 2004 events, PAH concentrations ranged from nondetect to 13.8 µg/L. Only two PAHs (fluorene and phenanthrene) were detected at concentrations exceeding preliminary screening levels [3.9 µg/L for fluorene, 620 µg/L for phenanthrene; DEQ SLVs, surface water (DEQ 2001)], at four of the 2001 temporary well point locations. For the metals analyzed, chromium was detected at concentrations exceeding the preliminary screening level [0.011 mg/L; DEQ SLV, surface water (DEQ 2001)] at three locations (LW-13S, LW-19S, and RW-1) within the Main Terminal Tank Farm area during November 2004 and at three additional wells (LW-8S, LW-20S, and LW-27S) during other 2004 events (Table D-1). However, chromium concentrations did not exceed the preliminary screening levels at any location during the October 2003 event. Other metals were observed at concentrations exceeding the screening levels, including copper, zinc, and nickel, but at only a few locations. During the October 2003 event, 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 1.1 µg/L and at a direct-push location (GW14-1) at a concentration of 4.35 µg/L (Figure 7-35), but only groundwater at the direct-push location exceeded the preliminary screening level of 3.0 µg/L (Oregon Ambient Water Quality Criteria, fish consumption only; DEQ 2004b). During the November 2004 event, PCP concentrations in this area were nondetect except at RW-1 where the concentration exceeded the preliminary screening level at a concentration of 123 µg/L (Figure 7-36). RW-1 is located downgradient of the former PCP mixing area and will be discussed in the context of the Phase II study area discussion below.

Bell Terminal Tank Farm Area

Twenty-three upper zone groundwater samples were collected from temporary well points in 2001 and 2002 in the Bell Terminal Tank Farm area. Seven permanent upper zone monitoring wells were installed in fall 2003 and an additional four upper zone wells were installed in fall 2004. Groundwater results for samples collected in October 2003 and from the temporary well points in 2001 and 2002 were combined with the most recent groundwater data from the former PEO property. For TPH constituents, the most recent groundwater data available from the former PEO property were collected in 1996 and 1998, and for BTEX constituents, the most recent data available was collected in January 2003. Data presented for November 2004 were only collected from the Terminal well locations.

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Groundwater data collected within the Bell Terminal Tank Farm area and on the eastern portion of the 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. Well MW-4 is located on the former PEO property near the locations of the former diesel ASTs and about 40 ft from the western property boundary of the Bell Terminal Tank Farm area, and about 100 ft from the operations portion of the Bell Terminal Tank Farm area, This contaminant distribution supports the presence of different sources than in the tank farm area.

Based on geologic cross-sections, soil boring data, and water level elevation data collected on the former PEO property (Bridgewater 2001; Bridgewater 2002; URS 2002; Gradient 2003), groundwater data from the eastern portion of the PEO property appear to represent concentrations in the upper zone, including wells MW-4 and MW-14, and some of the temporary Geoprobe locations. However, well boring information is not available for the monitoring wells (including MW-4) and other historical locations in this area and some of the Geoprobe borings do not extend deep enough to encounter the confining unit, if present. The estimated extent of the confining unit in this area based on available information is shown on Figure 6-1. To the west of the extent of the confining unit boundary, similar to observations within the Main Terminal Tank Farm area, groundwater data likely represents groundwater concentrations where the confining unit is absent; these groundwater concentrations are discussed under the lower zone groundwater section.

Based on data collected to date from the Bell Terminal Tank Farm area, the highest concentration of diesel-range petroleum hydrocarbons (796 mg/L) in the upper zone was observed in groundwater sample at temporary well point SCH-63B during October 2001. This temporary well point is located along the western property boundary of the Bell Terminal Tank Farm area, as shown on Figure 7-27.

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This result is comparable to the concentration of 530 mg/L detected in the split of the same sample collected by Schnitzer representatives. Based on the direct-push data collected on the former PEO property in 1996 and 1998, diesel-range petroleum hydrocarbons concentrations ranging from 6.6 to 6.8 mg/L occur about 40 to 50 ft to the west of the western property boundary of the Bell Terminal Tank Farm area. (Figure 7-27). Gasoline-range petroleum hydrocarbon concentrations in the upper zone follow a similar distribution pattern as the diesel-range petroleum hydrocarbon concentrations, with concentrations only exceeding the preliminary screening level (12 mg/L; DEQ RBC, construction and excavation worker; DEQ 2003b) on the former PEO property where a maximum concentration of 38.7 mg/L was observed at direct-push location B-60 (Figure 7-29). Even though diesel-range petroleum hydrocarbons were detected at concentrations ranging from 0.59 to 22.2 mg/L and a gasoline-range petroleum hydrocarbon concentration exceeded the preliminary screening level within the central portion of the Bell Terminal Tank Farm area (maximum concentration of 12.2 mg/L from a direct-push location in July 2002), concentrations for both these constituents appear to decrease in the downgradient direction and then increase again at the western property boundary and on the former PEO property, further supporting the presence of different sources in these areas than in the Bell Terminal Tank Farm area (Figures 7-27 and 7-29). This interpretation is also supported by the distribution of benzene and ethylbenzene concentrations (Figures 7-31 and 7-33). Data are not available from the former PEO property in 2004. 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 Tank Farm area; however, the area of impacted groundwater appears to be smaller (Figures 7-31 through 7-34). Of the petroleum constituents, only ethylbenzene concentrations exceeding the preliminary screening level (7.3 µg/L; DEQ SLV, surface water; DEQ 2001) are present at three discrete locations in the Bell Terminal Tank Farm area, based mainly on the direct-push data. One location is along the pipeline within the central portion of the tank farm, another location is along the pipeline to the west, and another location is along the western property boundary outside the walls of the tank farm (Figure 7-33). However, during November 2004, the benzene and ethylbenzene concentrations appear to have decreased and are mostly nondetect except for low concentrations of benzene near the western property boundary (Figures 7-32 and 7-24). PAHs were detected even less frequently in the upper zone groundwater than benzene and ethylbenzene (Table D-1). Additional data from locations on the former PEO property in this area are needed to better define the source of these concentrations.

Loading Rack/Entrance Area of the Main Terminal

Results for groundwater 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

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rack/entrance area. Based on these results, the extent of the gasoline-range petroleum hydrocarbon and ethylbenzene detections in the Main Terminal Tank Farm area appear to extend into the western portion of the loading rack/entrance area based on the October 2003 and November 2004 data, but only ethlybenzene concentrations at this location exceed the preliminary screening level (Figures 7-29, 7-30, 7-33, and 7-34)

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. Petroleum hydrocarbon constituents were not analyzed at these three locations; however, no VOCs or PAHs (except low concentrations of pyrene) were detected in the upper zone groundwater. No permanent monitoring wells are located in this area.

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. No permanent monitoring wells are located in this area.

Phase II Study Area

Results from permanent monitoring wells and two recovery wells were used to evaluate the distribution of contaminants in upper zone groundwater within the Phase II Study area. The only significant plume of contamination in the upper zone groundwater in the Phase II study area is PCP, as shown on Figures 7-35 and 7-36. In October 2003, PCP concentrations in an area within and downgradient of the former PCP mixing area exceeded the preliminary screening level [3.0 µg/L; Oregon AWQC for aquatic species (DEQ 2004b) and National AWQC for organisms only (EPA 2002)] with concentrations ranging from 130 µg/L to 2,100 µg/L (Figure 7-35). In November 2004, the overall size of the PCP plume had diminished and concentrations within the plume had decreased significantly with the previous maximum concentration at well OX-6S decreasing to 624 µg/L (Figure 7-36). These decreases in PCP concentrations appear to result from the July 2004 ISCO injection event within the PCP plume area (see Section 2.2.2.7). Plumes of petroleum hydrocarbon constituents originating within the Main Terminal Tank Farm area 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). In this area, ethylbenzene is the only COI that exceeds the preliminary

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screening level (7.3 µg/L; DEQ SLV, surface water; DEQ 2001) at concentrations up to 64 µg/L at RW-1 during the October 2003 event (Figure 7-33) and up to 50 µg/L at OX-2S during the November 2004 event (Figure 7-34).

7.2.2.2 Lower Zone Groundwater

Groundwater samples collected from 36 lower zone permanent monitoring wells during quarterly events from spring 1997 through November 2004 were evaluated for this report. Groundwater samples were also collected from permanent monitoring wells and temporary well points located on the former PEO property that are likely representative of the lower zone groundwater. As described earlier in Section 7.2.2.1, hydrogeologic data collected at the Bell Terminal and on the adjacent former PEO property indicate that the upper zone is discontinuous in the western portion of the Main Terminal Tank Farm area and on the former PEO property to the west of the western property boundary of the Bell Terminal Tank Farm area, as shown on Figure 6-1. Therefore, groundwater data from monitoring wells on the former PEO property, except for wells MW-4 and MW-14, presumably represent groundwater elevations and groundwater concentrations comparable to the lower zone beyond the extent of the confining unit at the Terminal. For purposes of discussion and because the most recent Phase III RI well installation occurred in fall 2004, presentation of lower zone groundwater data from the Terminal for this report is focused on data collected for the fourth quarter 2003 event (including groundwater data collected from temporary well points from 1996 through 2002) and the fourth quarter 2004 event. Trends in contaminant concentrations for quarterly data collected since 1997 or since well installation are evaluated and discussed in Section 7.2.3. A discussion of the distribution of contaminants in the lower zone groundwater by area for October 2003 and November 2004 is provided below. Groundwater data collected from temporary well points in 2001 during the planning stages for the Phase III RI and on the former PEO property between 1996 and 1998 (for TPH constituents) and in January 2003 (for BTEX) are also included with the October 2003 data. TPH data has not been collected on the former PEO property since the 1996 and 1998 events and the BTEX data from January 2003 is the most recent data available.

Main Terminal Tank Farm Area

Eight of the lower monitoring wells located in the Main Terminal Tank Farm area were installed in fall 2003. An additional seven wells were installed in October-November 2004, including the four wells located along the shoreline of the Willamette River, and the replacement well for LW-4D (LW-4DR). Therefore, the distribution of contaminants and contaminant trends in upper zone groundwater within the Main Terminal Tank Farm area are based on a maximum of five quarters of data,

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collected between October 2003 and November 2004. In addition to the quarterly data, four groundwater samples were collected from temporary well points from August through October 2001 and in July 2002 for determining the locations of permanent monitoring wells. These data are presented with the October 2003 results because this was the first quarter when the Phase III wells were sampled.

The results indicate that contaminants are present in the lower zone groundwater along the western portion of the Main Terminal Tank Farm area where the confining unit is discontinuous or not present and where the upper and lower groundwater zones converge. In this area, diesel-range petroleum hydrocarbon concentrations ranged from less than the laboratory reporting limit (i.e. nondetect) to 3.1 mg/L in October 2003 (Figure 7-37) with a maximum concentration of 6.57 observed at temporary well point GW12-1 in 2001, and ranged from nondetect to 3.91 mg/L in November 2004 (Figure 7-38). Gasoline-range petroleum hydrocarbon concentrations ranged from nondetect to 0.92 mg/L in October 2003 (Figure 7-39) with a maximum of 2.92 mg/L observed at temporary well point GW16-1 in 2001, and ranged from nondetect to 3.83 mg/L in November 2004 (Figure 7-40), but no concentrations exceeded the preliminary screening level (12 mg/L; DEQ RBC, construction and excavation worker; DEQ 2003b). Gasoline-related compounds (e.g., benzene and ethylbenzene) also have not been detected in the lower zone groundwater at the Main Terminal Tank Farm area at concentrations exceeding the preliminary screening levels. In October 2003, benzene concentrations ranged from nondetect to 40 µg/L [below the preliminary screening level of 51 µg/L; Oregon AWQC for fish consumption only (DEQ 2004b) and National AWQC for organisms only (EPA 2002); Figure 7-41]. Concentrations of benzene were lower in November 2004 with a maximum concentration of only 12.1 µg/L (Figure 7-42). In October 2003, ethylbenzene was only detected at monitoring well R and recovery well RW-2 at concentrations of 3.8 and 2.6 µg/L, respectively (below the minimum preliminary screening level of 7.3 µg/L; DEQ SLV, surface water; DEQ 2001; Figure 7-43). In November 2004, ethylbenzene was detected only at well RW-2 at a concentration of 2.06 µg/L (Figure 7-44).

Within the eastern portion of the Main Terminal Tank Farm area, where the confining unit is present, there have been fewer detections of contaminants in the lower zone groundwater. Diesel-range petroleum hydrocarbons have been detected most frequently; however, the concentrations are low (ranging from 0.4 mg/L to 2.2 mg/L in October 2003 and 0.263 to 3.13 mg/L in November 2004; Figures 7-37 and 7-38, respectively). Gasoline-range petroleum hydrocarbons were only detected in October 2003 at wells LW-26D and RW-2 (Figure 7-39) and in November 2004 at wells LW-26D, LW 27D, and RW-2 (Figure 7-40) at concentrations ranging between 0.188 to 1.23; however none of the concentrations exceeded preliminary screening levels.

No product has been observed in the lower zone.

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PCP is present in the lower zone groundwater, but only in the very southern portion of the Main Terminal Tank Farm area, and is the result of downgradient migration from the Phase II study area.. Also, the highest concentrations of benzene and ethylbenzene in the eastern portion of the Main Terminal Tank Farm area for the lower zone groundwater (and typically the only occurrences) are at recovery well RW-2 (Figures 7-41 through 7-44). Because RW-2 has been recovering PCP-impacted groundwater in this area since the fall of 2000, the presence of benzene and ethylbenzene at this location could be due to the draw of these constituents from the tank farm area toward the pumping well. Additional discussion of the PCP concentrations downgradient of the Phase II study area is included in the Phase II Area section below.

Detected concentrations of metals, including chromium, copper, lead, nickel, and zinc are present at concentrations exceeding the preliminary screening levels within the Main Terminal Tank Farm area at concentrations up to 0.93 mg/L for zinc at well LW-35D in October 2003. These metals concentrations could be the result of dissolution of metals under reducing conditions enhanced by the presence of petroleum constituents in the lower zone, as discussed in Section 7.2.3.

As shown in Table 7-1 and on Figure 7-47, groundwater results for the Willamette River shoreline wells collected during November 2004, February 2005, and June 2005 (results from 2005 events are provided in their entirety in separate deliverables; Landau Associates 2005c, d) indicate that, with the exception of chromium in wells LW-37D, LW-38D, and LW-39D and copper in well LW-37D in November 2004, no concentrations exceeded the preliminary screening levels. These data demonstrate that, even though there is a physical groundwater transport pathway from the upland areas of the terminal to the river, facility-related groundwater contaminants are not currently reaching the river at concentrations above applicable screening level values. Therefore, there is not a complete exposure pathway to potential receptors in the Willamette River via groundwater for these contaminants at concentrations above applicable screening levels. Groundwater concentrations in the shoreline wells will be confirmed during a full year of groundwater monitoring.

Bell Terminal Tank Farm Area

Three permanent monitoring wells were installed in the lower zone within the Bell Terminal Tank Farm area in fall 2003. In addition, groundwater data were collected in 1996 and 1998 (for TPH) and January 2003 (for BTEX) from locations on the adjacent former PEO property. The data from the Bell Terminal Tank Farm area and the former PEO property were used to evaluate the distribution of contaminants in the lower zone groundwater within the Bell Terminal Tank Farm area.

The results indicate that, except for diesel-range petroleum hydrocarbons and metals, contaminants are not detected in the lower zone groundwater in the Bell Terminal Tank Farm area

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(Figures 7-37 to 7-46). Low concentrations of diesel-range petroleum hydrocarbons were detected ranging from 0.319 to 0.6 mg/L within the Bell Terminal Tank Farm area (Figures 7-37 and 7-38). As stated earlier, groundwater concentrations on the former PEO property to the west of the approximate confining unit boundary where the confining unit appears to be discontinuous are presumably representative of lower zone concentrations. In the area where the confining unit is presumably not present on the former PEO property, elevated concentrations of diesel-range petroleum hydrocarbons, and gasoline-range petroleum hydrocarbons and ethylbenzene exceeding preliminary screening levels are observed, as shown on Figures 7-37, 7-39, and 7-43. Diesel-range hydrocarbons are observed at concentrations ranging from 1.33 to 35 mg/L, with the maximum concentration (as total TPH) occurring at direct-push location G (Figure 7-37). Gasoline-range petroleum hydrocarbon concentrations range from 3.1 to 44.5 mg/L, with the maximum concentration (as total TPH), occurring at direct-push location B-9 (Figure 7-39). Benzene concentrations were nondetect for the wells sampled on the PEO property in January 2003 (Figure 7-41), but ethylbenzene concentrations were detected at concentrations up to 1,500 µg/L at well MW-5, which is located about 275 ft downgradient of the Bell Terminal Tank Farm boundary (Figure 7-43). Because the confining unit boundary is estimated within the likely source area where the former diesel ASTs were located on the eastern portion of the PEO property, the elevated groundwater concentrations in this area could reflect groundwater contamination resulting from direct releases to soil where the confining unit is not present or downgradient flow of contaminated groundwater from the upper zone across the confining unit boundary. However, in the latter case, concentrations would typically decrease instead of increase in the downgradient direction. No groundwater data are available for the former PEO property in 2004.

Metals concentrations at the three lower zone wells within the Bell Terminal (LW-29D, LW-30D, and LW-32D) exceeded preliminary screening levels for chromium, copper, nickel, and zinc. As indicated earlier, metals concentrations in the lower zone may be the result of reducing conditions enhanced by the presence of petroleum hydrocarbons.

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.

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.

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Asphalt-Paved Road Area

Only one upper zone monitoring well (LW-10S) and one lower zone monitoring well (LW-10D) exist in the asphalt-paved road area. Since February 2004 and several times prior, LW-10S has been dry during quarterly sampling events. The lack of groundwater is interpreted to be due to the well's location near the confining unit boundary. For both LW-10S and LW-10D, PCP and metals were the only analytes detected in the groundwater from these wells. In LW-10D, PCP was detected at a concentration of 0.94 µg/L in October 2003, which is less than the preliminary screening level, but PCP was not detected at this location in November 2004. The intermittent detections of PCP at this location are interpreted to represent seasonal variability in the downgradient extent of the PCP plume in the lower zone, as discussed previously. The metals detected include arsenic, chromium, copper, lead, and zinc. All but zinc and arsenic were detected at concentrations exceeding the preliminary screening levels with a maximum concentration of 0.0233 for chromium in November 2004.

Phase II Area

The analytical results for groundwater samples collected at six permanent monitoring wells located in the Phase II area were used to evaluate the distribution of contaminants in the lower zone groundwater within the Phase II area. PCP was detected at two wells (LW-3D and OX-8D) at concentrations less than 1 µg/L in October 2003, but not at concentrations exceeding preliminary screening levels (Figure 7-45). PCP was not detected at these wells in November 2004 (Figure 7-46). PCP is also in lower zone groundwater in the very southern portion of the Main Terminal Tank Farm area, and is the result of downgradient migration from the Phase II study area. The concentrations of PCP ranged from nondetect to 8.1 µg/L in October 2003 (Figure 7-45) and nondetect to 2.12 µg/L in November 2004 (Figure 7-46). The maximum PCP concentration during both events occurred at recovery well RW-2 during the October 2003 event and is the only concentration of PCP in the lower zone groundwater that exceeds the preliminary screening levels. The distribution of the PCP plume in the lower zone reflects the influence of the pumping of recovery well RW-2. Diesel-range petroleum hydrocarbons (Figures 7-37 and 7-38) have also been detected in this area at LW-11D at concentrations up to 0.66 during the October 2003 event. Other petroleum-related constituents (e.g., gasoline-range petroleum hydrocarbons, benzene, and ethylbenzene) have also been detected but none at concentrations exceeding preliminary screening levels. Metals, including lead, chromium and copper were also detected at concentrations exceeding preliminary screening levels with a maximum observed concentration of 0.0305 mg/L (chromium at well OX-8D).

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7.2.3 METALS EVALUATION

The presence of metals exceeding preliminary screening levels in lower zone groundwater was assessed to determine whether the concentrations could be attributed to greater overall background concentrations for metals in the lower zone, to dissolution of metals under reducing conditions resulting from the biodegradation of petroleum constituents accompanied by the consumption of soluble and solid phase electron acceptors (Chapelle et. al. 2002) or natural conditions, or to possible turbidity in the samples. Metals concentrations in lower zone groundwater within the Main Terminal and Bell Terminal tank farm areas (and in upper zone groundwater for chromium only in the Bell Terminal tank farm area) exceed preliminary screening levels; however, the concentrations of petroleum constituents are significantly greater within the Main Terminal tank farm area than in the Bell Terminal.

Site-specific background concentrations for metals in upper and lower zone groundwater were determined previously during the Phase I/II COPC/CPEC screening process based on data from upper zone wells located on the East Property (Landau Associates 1999a). Except for arsenic and lead, the preliminary screening levels were greater than the background concentrations. Also, metals concentrations in lower zone groundwater in upgradient portions of the Phase II area (wells LW-1D and LW-3D) are less than the preliminary screening levels, indicating that the metals concentrations observed within the tank farm areas are likely not related to background concentrations.

Turbidity has typically been measured during the quarterly sampling events in each well sampled. The groundwater sampled from the wells is mostly free of suspended material; however, if suspended material is observed, a request is made to the laboratory to not disturb the sample and extract from the supernatant portion. Comparisons of turbidity measurements with metals concentrations did not indicate a direct correlation between these parameters. Also, both dissolved and total metals analyses were conducted on the shoreline wells during the first quarter 2005 event (to be provided in a separate deliverable). The results indicate that there is not a significant difference between the dissolved and total metals concentrations and, therefore, turbidity is unlikely the cause for the presence of metals concentrations observed in the groundwater samples.

Dissolved oxygen measurements have been collected on a quarterly basis as part of the routine groundwater sampling events. However, the methodology used for collecting measurements (e.g., post-purge) may not provide reliable information for redox conditions. Therefore, based on the available information, it is not possible at this time to determine whether the metals concentrations reflect natural or petroleum constituent – induced reducing conditions or some other condition, based on metals concentrations exceeding preliminary screening levels in the upper zone at the Bell Terminal and within

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the lower zone within both tank farm areas. As part of the development of a source control evaluation approach (see Section 9.4), monitored natural attenuation parameters (e.g., dissolved oxygen, oxidation-reduction potential, pH, conductivity, temperature) are being measured on a monthly basis from June to December 2005 using pre-purge, downhole techniques. This information will be used to assess whether there is a correlation between the metals concentrations with redox conditions at the terminal. The results of this assessment will be provided in a source control evaluation document.

7.2.4 CONTAMINANT TRENDS

Contaminant trends were evaluated based primarily on groundwater data collected during the quarterly events between October 2003 and November 2004. The detected concentrations are shown in comparison to the preliminary screening values for these events by area in Appendix D. Trends of contaminant concentrations were evaluated using time versus groundwater elevation and time versus concentration plots for the period covered by the quarterly sampling events: October 2003 through November 2004 for the Phase III wells, March 1996 through November 2004 for most of the Phase II wells, and February 1999 through November 2004 for well LW-8S.

Results of the contaminant trend evaluation for the upper and lower zones are provided by RI area below. The contaminant trend discussion focuses on the selected COIs discussed in Section 7.2.1. Long-term trends in the upper and lower zones will continue to be evaluated as part of the quarterly monitoring events.

7.2.4.1 Main Terminal Tank Farm Area

The five quarters of data collected from the Phase III wells between October 2003 and November 2004 were used to evaluate contaminant trends within areas of the terminal used historically for petroleum operations in the Main Terminal Tank Farm area. Plots of petroleum hydrocarbons (diesel- and gasoline-range) for selected upper and lower zone wells; plots of diesel-range and gasoline-range petroleum hydrocarbons, 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 are shown on Figures 7-49 through 7-55. Plots of diesel- and gasoline-range petroleum hydrocarbon concentrations versus groundwater elevation for paired wells in the Main Terminal Tank Farm area (LW-20S/D) are shown on Figure 7-56.

Concentrations of diesel- and gasoline-range petroleum hydrocarbons in the samples from the upper and lower zone wells within the Main Terminal Tank Farm area generally decreased or were similar to those detected during previous quarters, with the exception of gasoline-range petroleum

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hydrocarbon concentrations in wells LW-23D and LW-25D. The diesel-range petroleum hydrocarbon concentrations in the upper zone within the Main Terminal Tank Farm area have ranged between about 3 to 12 mg/L, with the highest concentrations detected at well LW-20S during four of the five quarters (Figure 7-49). Gasoline-range petroleum hydrocarbon concentrations in the upper zone within the Main Terminal Tank Farm area are consistently highest at well LW-8S with concentrations over time ranging from greater than 4 to 15 mg/L since this well was first sampled in May 1999 (Figures 7-50 and 7-51). Concentrations of diesel-range petroleum hydrocarbon concentrations in the lower zone within the Main Terminal Tank Farm area tend to be significantly greater than gasoline-range petroleum hydrocarbon concentrations at the same locations over time (Figures 7-52 and 7-53), but less overall than the upper zone concentrations for these constituents (Figures 7-49 and 7-50). Also, petroleum hydrocarbon concentrations in groundwater from the 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 petroleum hydrocarbon concentrations mixing with lower zone groundwater downgradient of the confining unit boundary. The highest concentration of diesel-range petroleum hydrocarbons detected since quarterly monitoring began at these wells occurred at well LW-25D in February 2004 (about 6.7 mg/L; Figure 7-52). The gasoline-range petroleum hydrocarbon concentrations for the lower zone wells in the Main Terminal Tank Farm area showed similar overall trends to the diesel-range concentrations, except at wells LW-23D and LW-25D where the gasoline-range petroleum hydrocarbon concentrations slightly increased (Figures 7-52 and 7-53).

Upper zone well LW-27S has contained product during three of the last four quarters ranging in thickness from 0.69 ft in February 2004 to 0.02 ft in November 2004. Also, during the last four quarters, measurable product was observed at LW-21S at thicknesses ranging from 1.03 ft in February 2004 to 0.11 in November 2004. A product thickness of 0.24 ft was observed at well Q in October 2003 and again in November 2004 at a thickness of 0.25 ft, but not during the other 2004 groundwater sampling events. 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. The two distinct diesel-range petroleum hydrocarbon plumes in the upper and lower zones (Figures 7-27, 7-28, 7-37 and 7-38) and the ethylbenzene plumes in the upper zone (Figure 7-33 and 7-34) 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

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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 oils 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 (Landau Associates 2004c), which contained only petroleum hydrocarbon constituents (e.g., gasoline-, diesel-, and motor oil-range petroleum hydrocarbon). 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 (Figures 6-14 and 6-15) and constituents originating in the former PCP mixing area (e.g., PCP) have not been detected at well LW-8S.

Benzene and ethylbenzene concentrations for the upper zone are presented on Figures 7-31 through 7-34, and those for the lower zone are presented on Figures 7-41 through 7-44. In general, the overall distribution of these compounds remained unchanged between October 2003 and November 2004 quarters based on the available data. Upper zone monitoring wells N and Q that contained concentrations of benzene and ethylbenzene exceeding the preliminary screening levels were not sampled in August 2004 because either the well was dry (well N) or contained product (well Q). Benzene concentrations at lower zone monitoring location LW-23D located on the riverbank to the west of the Main Terminal Tank Farm area continued a decreasing trend to 12.1 µg/L in November 2004 following the high detection during the second quarter 2004 sampling event (132 µg/L) (Figure 7-54). Recovery well RW-2 has consistently contained concentrations of benzene above the laboratory reporting limit since February 2002, which, as discussed above, is likely in response to capture caused by pumping of the well. The only other detections of benzene observed in the lower zone were single occurrences at wells LW-22D, LW-26D, LW-45D, LW-4DR, mainly during the November 2004 event, but all were less than the preliminary screening levels. Ethylbenzene has only been detected at RW-2, except for a single occurrence in well R in October 2003, but all concentrations have been less than the preliminary screening level.

Comparison of the diesel- and gasoline-range petroleum hydrocarbon, benzene, and ethylbenzene concentrations with groundwater elevations at selected well locations in the Main Terminal Tank Farm area indicates that groundwater concentrations in the upper zone wells are likely influenced by seasonal fluctuations in groundwater levels, as demonstrated by the long-term data from well LW-8S (Figure 7-51). At well LW-8S, the diesel-range petroleum hydrocarbon concentrations appear to be increasing over time, benzene concentrations are decreasing, and gasoline-range petroleum hydrocarbon and ethylbenzene concentrations have stayed relatively constant since about February 2002. At lower

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zone wells LW-23D and LW-25D (Figures 7-54 and 7-55), 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 petroleum hydrocarbon 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 , and are all less than 1.0 mg/L (Figure 7-56). Also, there does not seem to be a direct correlation between diesel-range petroleum hydrocarbon concentrations and groundwater levels at these wells based on the available data.

7.2.4.2 Bell Terminal Tank Farm Area

The five quarters of data collected from the Phase III wells between November 2003 and November 2004 were used to evaluate contaminant trends within the Bell Terminal Tank Farm area. The direct-push results collected between 1996 and 2001 at locations on the former PEO property and in the planning stages for the Phase III RI within the Bell Terminal were also evaluated (Figures 7-27 through 7-36). Plots of petroleum hydrocarbons (diesel- and gasoline-range); benzene; and ethylbenzene including groundwater elevation at upper zone well (LW-32S) in the Bell Terminal Tank Farm area are provided on Figures 7-57 through 7-59. Plots of diesel- and gasoline-range petroleum hydrocarbon concentrations versus groundwater elevation for paired wells in the Bell Terminal Tank Farm area (LW-30S/D) are shown on Figure 7-60.

Concentrations of diesel- and gasoline-range petroleum hydrocarbons in the samples from the upper and lower zone Phase III wells were generally less or were similar to those detected during previous quarters, with the exception of gasoline- and diesel-range petroleum hydrocarbons concentrations at well LW-32S. Petroleum hydrocarbon concentrations in samples from these wells increased slightly in November 2004.

In the Bell Terminal Tank Farm area, diesel-range petroleum hydrocarbon concentrations in the upper zone are slightly greater than the gasoline-range concentrations, with the highest concentrations for both constituents occurring in November 2004 at LW-32S (4.44 mg/L for diesel-range petroleum hydrocarbons and 2.87 mg/L for gasoline-range petroleum hydrocarbons; Figures 7-57 and 7-58); however, the gasoline-range concentrations did not exceed preliminary screening levels. (A preliminary screening level was not established for diesel-range petroleum hydrocarbons, as discussed above). Similar or lower concentrations of both of these constituents were detected in the other upper zone wells between the third and fourth quarters of 2004. (Note that well LW-33S was dry during the October 2003 and November 2004 events; LW-28S was dry during the October 2003, August 2004, and November

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2004 events, and new well LW-41S was dry in November 2004.) 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 7-37 through 7-40. Also, diesel- and gasoline-range petroleum hydrocarbon concentrations are much less in the upper zone groundwater in the Bell Terminal Tank Farm area than in the Main Terminal Tank Farm area (Figures 7-27 through 7-30).

As shown on Figure 7-59, concentrations of benzene and ethylbenzene in upper zone well LW-32S have remained relatively constant over time and there is no apparent correlation between groundwater concentrations and groundwater levels based on the available data. Also at this well, the diesel-range petroleum hydrocarbon concentration increased slightly from 4.24 to 4.44 mg/L, and the gasoline-range petroleum hydrocarbon concentration increased slightly from 1.33 to 2.87 mg/L between the August and November 2004 events. At well pair LW-30S/LW-30D, trends in diesel-range petroleum hydrocarbon concentrations and groundwater levels at lower zone well LW-30D do not correlate; however, there may be some correlation at upper zone well LW-30S (Figure 7-60). Diesel-range petroleum hydrocarbon 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 sampling event.

7.2.4.3 Loading Rack/Entrance Area of the Main Terminal

The analytical results for groundwater samples collected from monitoring well LW-7S were used to evaluate the contaminant trends in the upper zone groundwater within the loading rack/entrance area (Figure 7-61). Based on these results, the concentrations of diesel- and gasoline-range petroleum hydrocarbons, benzene, and ethylbenzene have remained relatively constant over time, except for fluctuations that appear to be related to seasonal fluctuations in groundwater elevations. The diesel-range petroleum hydrocarbon concentration observed in June 2001 (20 mg/L) appears to be anomalous based on the historical data and may be a laboratory recording error. Benzene was not detected at this location.

No lower zone groundwater monitoring wells exist in the loading rack/entrance area of the Main Terminal Tank Farm area.

7.2.4.4 Eastern Portion of the Phase III Study Area

No permanent monitoring wells are located in this area.

7.2.4.5 Asphalt-Paved Road Area

Only one upper zone well (LW-10S) and one lower zone well (LW-10D) exist in the asphalt-paved road area. Since February 2004 and several times prior, LW-10S has been dry during quarterly

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sampling events. The lack of groundwater is interpreted to be due to the well's location near the confining unit boundary. For both LW-10S and LW-10D, only PCP and metals have been detected in the groundwater at these locations. The detections of PCP at LW-10D have occurred sporadically, but the concentrations typically do not exceed 1 μg/L or the preliminary screening level [3.0 μg/L; Oregon AWQC for aquatic species (DEQ 2004b) and National AWQC for organisms only (EPA 2002)]. Metals concentrations have remained relatively consistent over time.

7.2.4.6 Phase II Study Area

In addition to analytical data associated with the groundwater interim action and ISCO activities, the quarterly groundwater data from the Phase II wells were 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 1997 or first available after well installation through the current quarterly event). Plots of PCP concentrations (maximum concentrations of either EPA Methods 8270 or 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 7-62 and 7-63. Plots of groundwater elevations and PCP concentrations for upper zone wells LW-4S and LW-11S are shown on Figures 7-64 and 7-65. Figure 7-66 shows groundwater elevations and PCP concentrations at lower zone well LW-11D plotted with the Willamette River stage through the August 2004 event as mentioned earlier. In addition, PCP concentrations from the fourth quarter (October) 2003 and fourth quarter (November) 2004 events for the upper and lower water-bearing zones are shown on Figures 7-35, 7-36, 7-45, and 7-46 and discussed above.

As shown on Figure 7-62, the PCP concentrations at the selected upper zone wells show variable concentration trends over time. PCP concentrations at RW-1 have continued to decrease since February 2004 and the PCP concentration for November 2004 (123 μg/L) is the lowest observed at this location since November 2002, but is still above the historic low observed during November 2001 (17 μg/L). PCP concentrations at well LW-11S also have continued to decrease since February 2004 (from 2,130 to 184 μg/L), and the PCP concentration in November 2004 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 7-65. PCP concentrations at LW-13S have typically been reported at less than 1 μg/L since the fourth quarter 2001 event; PCP was not detected at LW-13S during the November 2004 event, but the laboratory reporting limit increased to 4.92U μg/L. PCP concentrations at well LW-4S appear to reflect

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seasonal changes in groundwater elevation and resulting changes in PCP concentrations at upgradient locations (Figure 7-64). 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 ISCO injection event. Further discussion on the impact of the ISCO injection event on the PCP plume is provided in Section 2.2.2.7.

As shown on Figure 7-63, the PCP concentration in the lower zone at RW-2 has continued to decrease since the May 2004 event (from 46.7 to 2.12 µg/L), but is still greater than the historic low PCP concentration recorded at this well in June 2001 (0.68 µg/L). Historically, PCPs have been detected sporadically in both LW-11D and G1A; however, during the November 2004 event, PCP was not detected in either well.

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) based on water levels measured in the Phase II wells since monitoring began in March 1997. The groundwater levels during the past year are similar to those observed during 2000 and 2002. The trends in PCP concentrations correlate with groundwater elevations at some locations. Figure 7-64 shows that there appears to be a correlation between the water level and PCP concentration in the upper zone at well LW-4S since the first quarter of 2002. Figure 7-65 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 7-66. However, no correlation is apparent between PCP concentrations and groundwater/river stage elevations at LW-11D.

PCP concentration contours for the upper and lower water-bearing zones (Figures 7-35, 7-36, 7-45 and 7-46) indicate that the overall extent of the PCP plume has narrowed and that the PCP concentrations are significantly lower for the samples collected between October 2003 and November 2004 at all well locations, except for wells LW-4S and OX-2S. This reduction appears to be due to effects from the ISCO injection event, as discussed in Section 2.2.2.7. The sample from monitoring well OX-2S, which is located downgradient of the former PCP mixing area, contained the highest concentration of PCP (1,150 µg/L) for the upper zone wells in November 2004. For the lower zone wells, RW-2 and LW-4DR were the only locations where PCP was detected, as noted earlier. The detected concentrations were all less than the preliminary screening level of 3.0 µg/L [Oregon AWQC for aquatic species (DEQ 2004b) and National AWQC for organisms only (EPA 2002)].

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7.3 OBSERVATIONS OF NAPL, SHEENS, AND ODORS

The presence or absence of NAPL, sheens, and odors in the soil was monitored during the drilling for soil borings and monitoring wells, and during Phase II CPT explorations. The presence of free product (i.e., LNAPL) on the water table was also checked as part of the quarterly measurement of water levels.

7.3.1 SOIL

The presence of NAPL, sheens, and odors within the soil at the Terminal was used to identify potentially 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 sheen was observed on soil at depths ranging between 3.5 to 34 ft BGS during drilling and sample collection. This sheen was 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 area and in one soil boring, LW-17D, located in the southern portion of the Main Terminal Tank Farm area.

Diesel- and/or petroleum-like odors in the soil were noted during drilling of 26 borings within the Main Terminal Tank Farm area. At two of these locations, P and Q, the odors resembled strong gasoline and at one location, G14-1, the odor resembled a mild ethanol. At soil borings for monitoring wells R and LW-35D, non-petroleum-like odors were noted 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.

Within the Bell Terminal Tank Farm area, slight to strong sheen was observed at depths ranging between 12.5 to 19.5 ft BGS. The sheen was 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 noted in the soil during drilling 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 sheen was observed on soil at depths ranging between 0.5 to 19.5 ft BGS. The sheen was 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 noted 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 7-2.

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7.3.2 GROUNDWATER

An evaluation of LNAPL observations documented since August 1993 indicates that LNAPL of varying thickness (0.01 to 1.2 ft) has been observed in upper zone groundwater monitoring wells N, P Q, LW-8S, LW-21S, and LW-27S, located within the Main Terminal Tank Farm area, and at location GW8-1 (Figure 2-7) in the Main Terminal Tank Farm area during the preliminary evaluation. The presence of LNAPL in the Main Terminal Tank Farm area is likely related to spills of petroleum products in this area.

Occasional observations of LNAPL have also been recorded for upper zone groundwater monitoring wells within the Phase II Study area. These wells include OX-1S, OX-2S, OX-3S, and LW-11S and piezometer PZ-2. LNAPL thicknesses at these locations ranged from 0.04 to 0.37 ft. Each of these wells is located within the PCP plume 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 7.3.2, the variability in the presence of LNAPL in the Phase II area appears to be related to seasonal fluctuations in the water table. No LNAPL was observed in the upper zone groundwater in the Bell Terminal Tank Farm area, the eastern portion of the Phase III study area, or the asphalt-paved area during past groundwater sampling events.

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 7-3.

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8.0 CONCEPTUAL SITE MODEL

This section provides the conceptual site model for the Terminal based on the hydrogeologic/geologic system and the RI and previous investigation data presented in this report. 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 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; and 5) unknown sources along the western property boundary of the Bell Terminal Tank Farm area outside the tank farm wall and on the adjacent former PEO property to the west. 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 NFA for the East Property portion of the Terminal 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 the 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 releases resulted in 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 contamination to groundwater with historical concentrations in the upper zone exceeding

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60,000 µg/L. PCP concentrations detected 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 information about the PCP formulations, there is the possibility that free-phase PCP (dense non-aqueous phase liquid (DNAPL)] with a carrier was used, providing a potential residual source of PCP. However, to date, there has been no direct observation of DNAPL at the Terminal.

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 for offsite incineration and disposal. 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 2-4. An interim remedial action using the ISCO remediation technique is currently being implemented 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 soil and groundwater at the Terminal associated with petroleum storage and handling operations include mainly petroleum hydrocarbons, PAHs, VOCs, and metals. The presence of these contaminants is 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 contamination (and related constituents) have been identified on the Terminal property based on concentrations of these contaminants detected in soil and groundwater. These areas include the Main Terminal Tank Farm area, the central portion of the Bell Terminal Tank Farm area, and an area along the western boundary of the Bell Terminal Tank Farm area. Another source area appears to occur downgradient of the Bell Terminal Tank Farm area on the former PEO property where significant historical releases have been documented in the area of the former diesel ASTs. Past releases of petroleum products have been documented in the Main Terminal Tank Farm area. Specifically, a release of diesel occurred in 1975 when Tank 29508 (shown on Figure 2-1) split along a vertical weld. An unleaded gasoline spill 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 petroleum hydrocarbon contamination in soil and groundwater in this

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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 Main Terminal 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 during truck loading/unloading and may have provided a source of petroleum products to soil and groundwater in this area.

No past releases in the Bell Terminal Tank Farm area or along the western property boundary of the Bell Terminal have been documented. Documented releases have occurred on the former PEO property located downgradient of the former Bell Terminal Tank Farm area. The western portion of a conveyance pipeline that was used to convey petroleum products was demolished by Schnitzer during construction of the former PEO facility in the mid-1970s while still in use and containing product. This pipeline trends east-west from the northernmost dock on the former PEO property through the center of the Bell Terminal. The demolition resulted in release to soil in an area near the dock; any impacts of the release to other areas is unknown. Additionally, petroleum releases on the former PEO property reportedly occurred near the locations of the former diesel ASTs, where product has consistently been observed in nearby well MW-4. As stated above, soil and groundwater concentrations suggest two potential source areas of petroleum constituents within the Bell Terminal Tank Farm area: 1) in the central portion of the Bell Terminal Tank Farm area, and 2) along the western property boundary in an area outside the tank farm wall. Other source areas located downgradient of the Bell Terminal Tank Farm area likely occur on the former PEO property near the locations of the former diesel ASTs. 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. The maximum petroleum hydrocarbon concentrations observed in soil and groundwater in the Bell Terminal Tank Farm area occur at locations in the upper zone along the western property boundary, but outside the tank farm wall. Elevated concentrations of petroleum hydrocarbons in soil and groundwater in the upper zone and in the area beyond the extent of the confining unit on the eastern portion of the adjacent former PEO property and the presence of product in upper zone well MW-4 located near the location of the former diesel ASTs appear to indicate that there are separate sources unrelated to Time Oil operations in these areas.

8.1.3 FORMER CROSBY & OVERTON TANK AREA

In the former Crosby & Overton area, PCBs and PAHs are the primary contaminants of concern due to apparent releases to soil during storage and removal of the oil historically stored in tanks or cleaning of tanks 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

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contamination appeared to be limited to surface soil in the former Crosby & Overton source area and has not been detected in groundwater. The removal of soil to depths ranging from 0.5 to 2.5 ft BGS resulted in concentrations of PCBs and cPAHs below the preliminary screening levels at most locations (Figures 2-5 and 2-6.)

8.2 GENERAL CONTAMINANT RELEASE AND TRANSPORT MECHANISMS/PATHWAYS

The release mechanisms at the Terminal are predominantly related to historic spills to soil within each of the source areas. Chemicals can be present in the subsurface in the solid or dissolved phase, or as NAPL, either as a LNAPL or, potentially, a DNAPL. Liquids released to the ground surface can percolate through the soil column to groundwater, or chemical or biochemical processes can mobilize chemicals in soil and result in 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 for fluids moving through the soil column. 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. 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 water and contaminated soil in the unsaturated zone, and/or subsurface water and NAPL. This contact may occur through one or more of the following ways:

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- Infiltration and movement of water by gravity through the unsaturated zone containing residual NAPL or contaminated soil.
- LNAPL in contact with groundwater at the water table surface
- DNAPL in contact with groundwater within the saturated zone.

The presence of PCP 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 presence of carrier compounds in the PCP formulations which will 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, and whether reducing or oxidizing conditions are present. The biodegradation of the petroleum hydrocarbons in the lower zone groundwater appear to have created reducing conditions favoring the mobilization of metals. This may explain the overall higher concentrations of metals in the lower zone under reducing conditions versus the upper zone under oxidizing 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,

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resulting in a retardation or slowing of 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 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 VOCs, such as petroleum hydrocarbons and BTEX, may be strongly attenuated through geochemical and biodegradation processes, whereas attenuation of PCP along migration pathways 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, they can be discharged with groundwater to a surface water body.

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 from activities associated with bulk fuel storage. In the Bell Terminal Tank Farm area, these releases may have occurred due to with activities associated with bulk fuel storage or unknown activities along the western property boundary and on the former PEO property. A conceptual site model for the Terminal, which includes a schematic of the source areas, release mechanisms, and transport mechanisms is provided on Figure 8-1.

Based on the hydrogeologic data for the Terminal, groundwater flow direction in the upper and lower zones is toward the Willamette River. Groundwater seeps have not been observed along the riverbank adjacent to the Terminal, so groundwater likely discharges to the river below the water line.

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Consequently, there is a potential for dissolved chemicals in groundwater or LNAPL from the Main Terminal Tank Farm area to be transported to the river by groundwater flow. There does not appear to be a current source of groundwater contamination to the river at concentrations exceeding screening levels for the following reasons:

- LNAPL has not been observed in nearshore wells.

- As described earlier, groundwater data collected from Willamette River shoreline wells installed in November 2004, February 2005, and June 2005 indicate that groundwater contaminant concentrations downgradient of the Main Terminal Tank Farm area are not currently reaching the river at concentrations above applicable screening level values. Therefore, even though there is a physical groundwater transport pathway from the upland areas of the terminal to the river, there is not a complete exposure pathway via groundwater to potential receptors in the Willamette River for facility-related contaminants at concentrations above the applicable screening levels.

- The Bell Terminal Tank Farm area boundary is located more than 600 ft from the river shoreline. Groundwater concentrations from the operational area of the Bell Terminal Tank Farm area do not exceed preliminary screening levels, except for low level metals concentrations. Elevated groundwater concentrations along the downgradient western property boundary and on the former PEO property do not appear to be related to Time Oil operations.

- The east-west trending storm drain could historically have provided a preferential pathway for the transport of PCP- impacted groundwater from the Phase II source areas to the river; however, ongoing operation of the groundwater intercept system provides capture/migration of contaminant migration to the river. Migration of PCP in groundwater is also contained through operation of the groundwater interim action system and performance of the full scale ISCO injections within the PCP plume area. PCP has not been consistently detected at the downgradient wells closest to the river or at the river outfall since operation of the groundwater interim action began.

If impacted groundwater has historically discharged to the river from the Terminal, there is the potential for impact to sediment or surface water quality. Historical impacts to the river are being addressed as part of the RI/FS for the Portland Harbor Superfund Project

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 greater than 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

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PCP formulations were less dense than water (i.e., specific gravity of less than 1) and, therefore, would migrate through the environment as LNAPL; however, at least one formulation had a density greater than 1 and could move as DNAPL through the subsurface. LNAPL has been observed in wells LW-11S and OX-2S, which are located downgradient from the PCP mixing area. DNAPL has never been observed.

Elevated levels of PCP in the upper zone and lower zone 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 have also been 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 of LNAPL that has migrated downgradient from the PCP mixing area along the water table surface. LNAPL in the downgradient wells has not been observed consistently or over a wide area and is typically associated with very low seasonal groundwater levels. This inconsistent occurrence suggests that the LNAPL exists in a residual phase within the subsurface adjacent to these wells most of the year and then is released/mobilized to the wells 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 has been encountered during any of the investigations to date. Therefore, downward migration across the confining unit likely occurs under the natural downward groundwater gradient within the upper zone plume resulting in the elevated concentrations detected in the lower zone. 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 a downgradient location from the source areas in the upper zone. 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 (Figure 2-1) 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 (i.e., the line backfill). The storm drain does not appear to fully penetrate the confining unit (where present) and, therefore, is not considered to provide a vertical pathway for groundwater flow and contaminant transport to deeper

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aquifers. Groundwater samples collected from manholes in the storm drain and at the storm drain outfall in the river (Table 2-4) indicate that the storm drain had been serving 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 changes in 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 October 2003 and November 2004 is shown on Figures 7-35 and 7-36. 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. The PCP concentrations in the upper zone are higest within and just downgradient of the former PCP mixing area. PCP appears to have migrated in a downgradient direction toward the south-southwest. Upper zone PCP concentrations within the mixing area have decreased significantly since the first sampling 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 the lack of detected concentrations in upper zone wells near the south property boundary (LW-10S, when saturated). However, low PCP concentrations were detected during the last four sampling events in the lower zone wells at the western extent of the confining unit as discussed below.

The decrease in 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 implementation of the ISCO technique. (Note that the PCP distribution based on the earlier data is an approximation, and less accurate than the distribution based on the 2000-2004 data because of the difference in the number of data points as well as potential QA/QC issues.) 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 7-45. 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

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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) have decreased significantly at this location, and since spring 1999, the PCP concentrations have been mostly below the laboratory reporting limits. Since November 2002, low level PCP concentrations (generally less than 1 μg/L) have also been detected on an intermittent basis in wells LW-6D located between LW-4D and the river and LW-10D located at the southern property boundary. These detections have not been 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 pumping PCP-impacted groundwater from the lower zone, and has generally been effective in containing PCP-contaminated groundwater migration from the area surrounding the well.

Low concentrations of PCP (1 to 3 μg/L) were detected in the deep sand unit at LW-12D2 sporadically (three times) during quarterly monitoring between May 1999 and June 2002. This well was subsequently abandoned in advance of the soil removal action in the former PCP mixing area. The historical detections in this well were likely due to downward vertical migration of contaminants via groundwater flow between the upper and lower zones. The source area for the impacts to the upper zone has been mitigated by the soil removal actions in 1989 and 2002, so the potential for ongoing groundwater impact in this area is considered to be low.

The concentrations of diesel-range and gasoline-range petroleum hydrocarbons and VOCs detected in wells downgradient of the former PCP mixing area are likely due to the presence of PCP carrier oils (e.g. mineral spirits) that are present as LNAPL and the 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 wells OX-1S, OX-2S, and LX-3S and the presence of 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 observed in nearby monitoring wells under low water table conditions or to effects from the ISCO implementation events.

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 within the capillary fringe

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in the Main Terminal and Bell Terminal 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 within the capillary fringe. The presence of the same contaminants both in groundwater and 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 petroleum hydrocarbon concentrations did not contain elevated benzene or ethylbenzene concentrations, 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 area 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 area, where the silt layer separating the upper and lower groundwater zones is present, 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 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 for 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). For contamination in the groundwater along the western property boundary of the Bell Terminal Tank Farm area or on the former PEO property, there is not enough information about the nature of the release to determine the mechanisms affecting migration. However, the downgradient extent of the diesel-range and gasoline-range petroleum hydrocarbon plumes in the Bell Terminal Tank Farm area suggests that lateral movement of the contaminants is slow, which may be due to a low rate of

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advection in this area; possible natural attenuation (through adsorption, biodegradation, etc.); and/or volatilization.

The distribution of petroleum constituent concentrations within and downgradient of the Bell Terminal tank farm area suggest the presence of three commingled groundwater plumes, as discussed earlier. 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. Because the confining unit boundary on the former PEO property is estimated within the likely source area where the former diesel ASTs were located on the eastern portion of the PEO property, the elevated groundwater concentrations in this area could reflect groundwater contamination resulting from direct releases to soil where the confining unit is not present or downgradient flow of contaminated groundwater from the upper zone across the confining unit boundary. However, in the latter case, concentrations would typically decrease instead of increase in the downgradient direction.

8.3.3 Crosby & Overton Tank Area

As discussed above, contamination of soil within the former Crosby & Overton tank area is anticipated to be the result of 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 anticipated to be 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 2-5 and 2-6 and confirm that the vertical extent of the contamination was limited. 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, the concentrations remaining in soil are considered to be protective of groundwater and additional cleanup in this area is not necessary.

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9.0 SCOPE OF FUTURE ACTIVITIES

This section outlines the scope of future activities to be conducted in support of the Phase II and Phase III RIs for the Terminal. The future Phase II RI activities will include the continued monitoring of the Phase II wells to assess the effectiveness of the continuing implementation of the groundwater interim action, full-scale ISCO injections within the extent of the PCP plume in the upper zone, and performance of a source control evaluation to assess the potential for impacts to the Willamette River. The future Phase III RI activities will include the quarterly sampling of the recently installed Phase III monitoring wells as part of the on-going quarterly monitoring program. With completion of the RI, a risk assessment and feasibility study will be initiated for the Terminal. The anticipated scopes of work for these activities are summarized in the following sections.

9.1 PHASE II/III GROUNDWATER MONITORING

For assessment of the effectiveness of the Phase II groundwater interim action and 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 (Landau Associates 2004d), 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 (2004c); DEQ has indicated that they will provide written approval soon. 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, the recently 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. The first quarterly sampling of the wells installed during October and November 2004 was conducted in November 2004. The final quarterly sampling of the Phase III wells will is anticipated to occur in August 2005. The analytical results for the Phase II and Phase III sampling events for the

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Terminal will continue to be documented in quarterly groundwater monitoring reports that will be submitted to DEQ.

9.2 GROUNDWATER INTERIM ACTION

The objective of the ongoing groundwater interim action is to contain the PCP plumes identified in the upper and lower zones at the Terminal and prevent contaminant migration 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. Additionally, seasonal pumping of horizontal well HRW-1 within the upper zone and pumping from the groundwater intercept system in the storm drain at SDM-1 will be continued. Alternatives for full–scale remediation of the PCP plume in the upper zone will be evaluated in the feasibility study. Groundwater interim action activities at the Terminal will continue to be documented in the quarterly groundwater monitoring reports.

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, the ISCO technique was implemented as an interim remedial alternative for PCP in the upper zone in July 2004 and January 2005. The results from the July 2004 are summarized in Section 2.2.2.7 and presented in the Third Quarter 2004 groundwater monitoring and groundwater interim action status report (Landau Associates 2005a). The January 2005 results are pending. Another ISCO event is anticipated for the fall of 2005 or winter 2006 when elevated water levels will maximize the effectiveness of the technique.

9.4 SOURCE CONTROL EVALUATION

A source control evaluation will be conducted to determine whether or not the facility as a whole is an ongoing source of COIs to the in-water portion of the Portland Harbor Superfund site at levels that may present risk to in-water receptors. Based upon the data collected during the RI/FS for the Terminal, the source control evaluation will consider all potential migration pathways to the river.

The source control evaluation will focus on the potential for an upland petroleum hydrocarbon source to impact the Willamette River (i.e., the potential for NAPL that has been observed in the Main Terminal Tank Farm to impact the river). Time Oil has demonstrated that, even though there is a physical groundwater transport pathway from the upland areas of the terminal to the river, there is not a complete exposure pathway via groundwater to potential receptors in the Willamette River for facility-related contaminants at concentrations above the applicable screening levels, based on groundwater

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concentrations in Willamette River shoreline wells. The evaluation will include the collection of geochemical data to evaluate the potential for natural attenuation to limit the potential for NAPL to migrate to the river and the use of a fate and transport model that takes into account the effects of natural attenuation. The results of the source control evaluation will be provided to DEQ in a report that will provide recommendations on the effectiveness of use of natural attenuation to prevent migration of NAPL to the river.

9.5 RISK ASSESSMENT

Time Oil will submit a work plan 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 include 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 work plan will be provided to DEQ for approval. Following approval of the risk assessment approach by DEQ, a document providing the results of the COPC/CPEC identification and the human health and ecological risk assessments will be provided to DEQ. The risk assessment will also include identification of hot spots of contamination in soil and groundwater using acceptable risk levels identified for the Terminal.

9.6 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 and that are protective of human health and the environment. The FS will 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 remaining within the Phase II former PCP mixing area 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 according to 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

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- Developing and evaluating specific remedial alternatives
- Recommending a preferred alternative
- Documenting the FS in a written report.

It is anticipated that recommendations 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 the remaining elements of the RI/FS at the Terminal is provided below. The subsequent elements for the project include: conducting a source control evaluation, 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 FS. 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 continued 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 Final Phase III RI Report by DEQ	September 2005
Submit the Source Control Evaluation Approach to DEQ	September 2005
Submit the Risk Assessment Work Plan to DEQ	December 2005
Review/Approve the Risk Assessment Work Plan by DEQ	March 2006
Submit Source Control Evaluation Report to DEQ	March 2006
Submit the Human Health and Ecological Risk Assessments to DEQ	July 2006
Review/Approve the Risk Assessment by DEQ	September 2006
Submit the FS to DEQ	November 2006
Review/Approve the FS by DEQ	January 2007

Groundwater Monitoring:

Submit the First Quarter 2005 Groundwater Report to DEQ	August 2005
Submit the Second Quarter 2005 Groundwater Report to DEQ	October 2005
Conduct the Third Quarter 2005 Groundwater Monitoring Event	August 2005
Receive Approval from DEQ on Reduction of Sampling Frequency	November 2005
Submit the Third Quarter 2005 Groundwater Report to DEQ	December 2005

Full-Scale ISCO Remediation:

Third Full-Scale ISCO Event	Winter 2006

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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.

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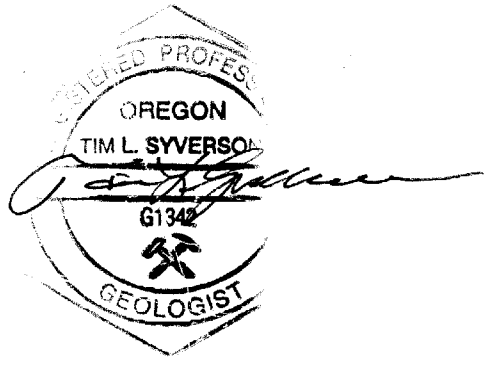

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TABLE 7-1
FOURTH QUARTER 2004 THROUGH SECOND QUARTER 2005 GROUNDWATER DATA - DETECTED ANALYTES
SHORELINE (BEACH) WELLS
TIME OIL NORTHWEST TERMINAL

Sample Identification:	Minimum Preliminary Screening Level		Shoreline (Beach) Wells												
			LW36D	LW36D	LW36D	LW37D	LW37D	LW37D	LW38D	LW38D	LW38D	LW39D	LW39D	LW39D-Dup	LW39D
Laboratory Identification:			0411059-08	0502088-01	P5F0441-04	0411059-09	0502088-02	P5F0441-05	0411059-10	0502088-03	P5F0441-03	0411059-11	0502088-04	0502088-05	P5F0441-02
Date Collected:			11/10/2004	2/17/2005	06/08/2005	11/10/2004	2/17/2005	06/08/2005	11/10/2004	2/17/2005	06/08/2005	11/10/2004	2/17/2005	2/17/2005	06/08/2005
SEMIVOLATILES (µg/L)															
EPA Method SW8270															
Acenaphthene	520	(a)	0.99 U	0.951 U	5.00 U	1.01 U	1.01 U	5.00 U	0.984 U	0.997 U	5.00 U	1.06 U	0.978 U	0.99 U	5.00 U
bis(2-Ethylhexyl)phthalate	2.2	(b)	0.99 U	0.951 U	10.00 U	1.01 U	1.01 U	10.00 U	0.984 U	0.997 U	10.00 U	1.06 U	0.978 U	**1.25**	10.00 U
Fluorene	3.9	(c)	0.99 U	0.951 U	5.00 U	1.01 U	1.01 U	5.00 U	0.984 U	0.997 U	5.00 U	1.06 U	0.978 U	0.99 U	5.00 U
Phenanthrene	6.3	(c)	0.99 U	0.951 U	5.00 U	1.01 U	1.01 U	5.00 U	0.984 U	0.997 U	5.00 U	1.06 U	0.978 U	0.99 U	5.00 U
Pentachlorophenol	3	(b)	4.95 U	4.76 U	10.00 U	5.07 U	5.04 U	10.00 U	4.92 U	4.99 U	10.00 U	5.29 U	4.89 U	4.95 U	10.00 U
PAHs (µg/L)															
EPA Method SW8270 - SIM															
Acenaphthene	520	(a)	0.0505 U	0.0478 U	0.100 U	0.054 U	0.0499 U	0.100 U	**0.12**	**0.0515**	0.100 U	**0.145**	**0.061**	**0.0612**	0.100 U
Acenaphthylene	620	(c)	0.0505 U	0.0478 U	0.100 U	0.054 U	0.0499 U	0.100 U	0.05 U	0.0515 U	0.100 U	0.0517 U	0.0509 U	0.051 U	0.100 U
Anthracene	13	(c)	0.0505 U	0.0478 U	0.100 U	0.054 U	0.0499 U	0.100 U	0.05 U	0.0515 U	0.100 U	0.0517 U	0.0509 U	0.051 U	0.100 U
Benzo(a)anthracene	0.018	(b)	0.0505 U	0.0478 U	0.100 U	0.054 U	0.0499 U	0.100 U	0.05 U	0.0515 U	0.100 U	0.0517 U	0.0509 U	0.051 U	0.100 U
Benzo(a)pyrene	0.014	(c)	0.0505 U	0.0478 U	0.100 U	0.054 U	0.0499 U	0.100 U	0.05 U	0.0515 U	0.100 U	0.0517 U	0.0509 U	0.051 U	0.100 U
Benzo(b)fluoranthene	0.018	(b)	0.0505 U	0.0478 U	0.100 U	0.054 U	0.0499 U	0.100 U	0.05 U	0.0515 U	0.100 U	0.0517 U	0.0509 U	0.051 U	0.100 U
Benzo(g,h,i)perylene	--		0.0505 U	0.0478 U	0.100 U	0.054 U	0.0499 U	0.100 U	0.05 U	0.0515 U	0.100 U	0.0517 U	0.0509 U	0.051 U	0.100 U
Benzo(k)fluoranthene	0.018	(b)	0.0505 U	0.0478 U	0.100 U	0.054 U	0.0499 U	0.100 U	0.05 U	0.0515 U	0.100 U	0.0517 U	0.0509 U	0.051 U	0.100 U
Chrysene	0.018	(b)	0.0505 U	0.0478 U	0.100 U	0.054 U	0.0499 U	0.100 U	0.05 U	0.0515 U	0.100 U	0.0517 U	0.0509 U	0.051 U	0.100 U
Fluoranthene	6.16	(c)	0.0505 U	0.0478 U	0.100 U	**0.0756**	0.0499 U	0.100 U	0.05 U	0.0515 U	0.100 U	0.0517 U	0.0509 U	0.051 U	0.100 U
Fluorene	3.9	(c)	0.0505 U	0.0478 U	0.100 U	0.054 U	0.0499 U	0.100 U	**0.19**	**0.0515**	0.100 U	0.0517 U	0.0509 U	0.051 U	0.100 U
Indeno(1,2,3-cd)pyrene	0.018	(b)	0.0505 U	0.0478 U	0.100 U	0.054 U	0.0499 U	0.100 U	0.05 U	0.0515 U	0.100 U	0.0517 U	0.0509 U	0.051 U	0.100 U
Naphthalene	620	(a)	0.0505 U	0.0478 U	0.100 U	0.054 U	0.0499 U	0.100 U	**0.08**	0.0515 U	0.100 U	**0.114**	0.0509 U	0.051 U	0.100 U
Phenanthrene	620	(c)	0.0505 U	0.0478 U	0.100 U	0.054 U	0.0499 U	0.100 U	0.05 U	0.0515 U	0.100 U	0.0517 U	0.0509 U	0.051 U	0.100 U
Pyrene	4000	(b)	0.0505 U	0.0478 U	0.100 U	**0.0864**	0.0499 U	0.100 U	0.05 U	0.0515 U	0.100 U	0.0517 U	0.0509 U	0.051 U	0.100 U
VOLATILES (µg/L)															
EPA Method SW8260															
1,2,4-Trimethylbenzene	130	(a)	1 U	1 U	1.00 U	1 U	1 U	1.00 U	1 U	1 U	1.00 U	1 U	1 U	1 U	1.00 U
Benzene	51	(b)	0.3 U	0.3 U	1.00 U	0.3 U	0.3 U	1.00 U	0.3 U	0.3 U	1.00 U	0.3 U	0.3 U	0.3 U	1.00 U
Isopropylbenzene	130	(c)	1 U	1 U	2.00 U	1 U	1 U	2.00 U	1 U	1 U	2.00 U	1 U	1 U	1 U	2.00 U
Methyl tert-Butyl Ether	31,000	(d)	1 U	1 U	1.00 U	1 U	1 U	1.00 U	1 U	1 U	1.00 U	1 U	1 U	1 U	1.00 U
n-Butylbenzene	130	(c)	1 U	1 U	5.00 U	1 U	1 U	5.00 U	1 U	1 U	5.00 U	1 U	1 U	1 U	5.00 U
n-Propylbenzene	130	(c)	1 U	1 U	1.00 U	1 U	1 U	1.00 U	1 U	1 U	1.00 U	1 U	1 U	1 U	1.00 U
Naphthalene	620	(a)	1 U	1 U	2.00 U	1 U	1 U	2.00 U	1 U	1 U	2.00 U	1 U	1 U	1 U	2.00 U
o-Xylene	1.8	(c)	1 U	1 U	1.00 U	1 U	1 U	1.00 U	1 U	1 U	1.00 U	1 U	1 U	1 U	1.00 U
sec-Butylbenzene	130	(c)	1 U	1 U	1.00 U	1 U	1 U	1.00 U	1 U	1 U	1.00 U	1 U	1 U	1 U	1.00 U
tert-Butylbenzene	130	(c)	1 U	1 U	1.00 U	1 U	1 U	1.00 U	1 U	1 U	1.00 U	1 U	1 U	1 U	1.00 U
HYDROCARBONS (mg/L)															
NWTPH-Dx															
TPH-Diesel Range	--		**0.252**	0.243 U	0.250 U	0.25 U	0.248 U	0.250 U	**0.954**	**0.375**	0.250 U	**0.455**	0.247 U	**0.758**	0.250 U
TPH-Motor Oil Range	--		**0.58**	0.486 U	0.500 U	0.5 U	0.495 U	0.500 U	**0.702**	0.475 U	0.500 U	**0.52**	0.494 U	0.509 U	0.500 U
NWTPH-G															
TPH-Gasoline Range	12	(d)	0.1 U	0.1 U	0.080 U	0.1 U	0.1 U	0.080 U	**0.120**	0.1 U	0.080 U	**0.133**	0.1 U	0.1 U	0.080 U

BZTO104(e)023931

TABLE 7-1
FOURTH QUARTER 2004 THROUGH SECOND QUARTER 2005 GROUNDWATER DATA - DETECTED ANALYTES
SHORELINE (BEACH) WELLS
TIME OIL NORTHWEST TERMINAL

Sample Identification:	Minimum Preliminary Screening Level		Shoreline (Beach) Wells												
			LW36D	LW36D	LW36D	LW37D	LW37D	LW37D	LW38D	LW38D	LW38D	LW39D	LW39D	LW39D-Dup	LW39D
Laboratory Identification:			0411059-08	0502088-01	P5F0441-04	0411059-09	0502088-02	P5F0441-05	0411059-10	0502088-03	P5F0441-03	0411059-11	0502088-04	0502088-05	P5F0441-02
Date Collected:			11/10/2004	2/17/2005	06/08/2005	11/10/2004	2/17/2005	06/08/2005	11/10/2004	2/17/2005	06/08/2005	11/10/2004	2/17/2005	2/17/2005	06/08/2005
PRIORITY POLLUTANT METALS (mg/L)															
Arsenic (7060)	1.5	(e)	0.001 U	0.001 U	**0.00106**	**0.00578**	0.001 U	0.001 U	**0.00867**	**0.00391**	**0.00438**	**0.0107**	**0.00292**	**0.00274**	**0.00105**
Chromium (6010)	0.011	(c)	0.005 U	**0.0064**	0.001 U	**0.0261**	**0.0078**	0.001 U	**0.0138**	**0.008**	0.001 U	**0.0124**	**0.0063**	**0.0064**	0.001 U
Copper (6010)	0.009	(f)	0.01 U	0.01 U	0.002 U	**0.0196**	0.01 U	0.002 U	0.01 U	0.01 U	0.002 U	0.01 U	0.01 U	0.01 U	0.002 U
Lead (7421)	0.02	(e)	0.00025 U	0.0001 U	0.001 U	**0.0098**	**0.000728**	0.001 U	0.0002 U	**0.000117**	0.001 U	**0.0003**	**0.000132**	**0.0001**	0.001 U
Nickel (6010)	0.052	(c)	0.005 U	0.005 U	0.002 U	**0.0117**	0.005 U	0.002 U	0.005 U	0.005 U	0.002 U	0.005 U	0.005 U	0.005 U	**0.00365**
Zinc (6010)	0.10	(g)	0.01 U	0.01 U	0.005 U	**0.0505**	0.01 U	0.005 U	0.01 U	0.01 U	0.005 U	0.01 U	0.01 U	0.01 U	0.005 U

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, September 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, 1999).

(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.

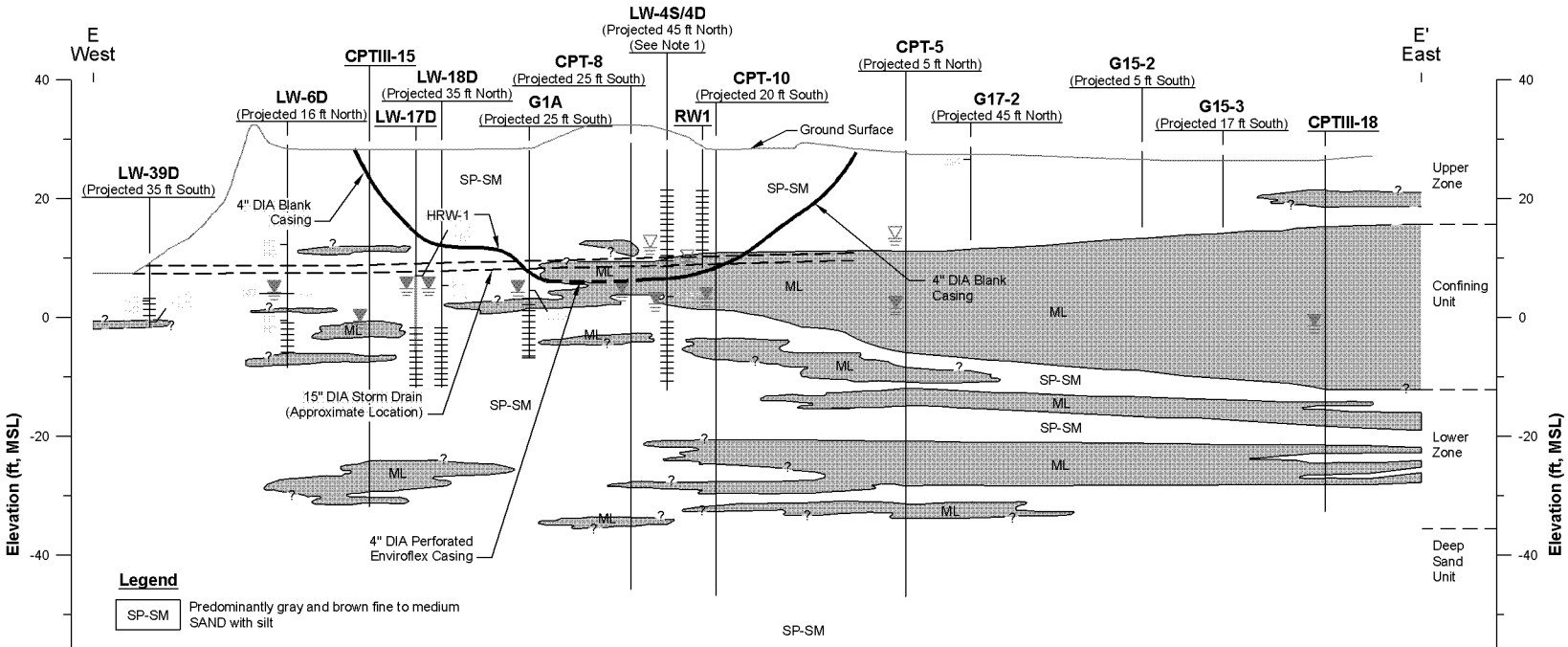
Notes:

Highlighted values are detected concentrations.

Outlined values are detected concentrations that exceed the minimum preliminary screening level.

Results are only shown for constituents where concentrations were detected in at least one of the riverbank and shoreline wells (except for pentachlorophenol). The results for the full set of analyzed constituents are included in the respective quarterly reports.

BZTO104(e)023932



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)
	Diesel-range petroleum hydrocarbon concentration in soil (mg/kg)
	Gasoline-range petroleum hydrocarbon concentration in soil (mg/kg)
	Diesel-range petroleum hydrocarbon concentration in groundwater (mg/L)
	Gasoline-range petroleum hydrocarbon concentration in groundwater (mg/L)
ND	Not Detected
	Sheen Observed on Soil

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 or October/November 2004 for wells LW-36D, LW-37D, LW-38D, LW-39D, LW-40S, LW-40D, LW-41S, LW-42S, LW-43S, LW-44S, and LW-45D.

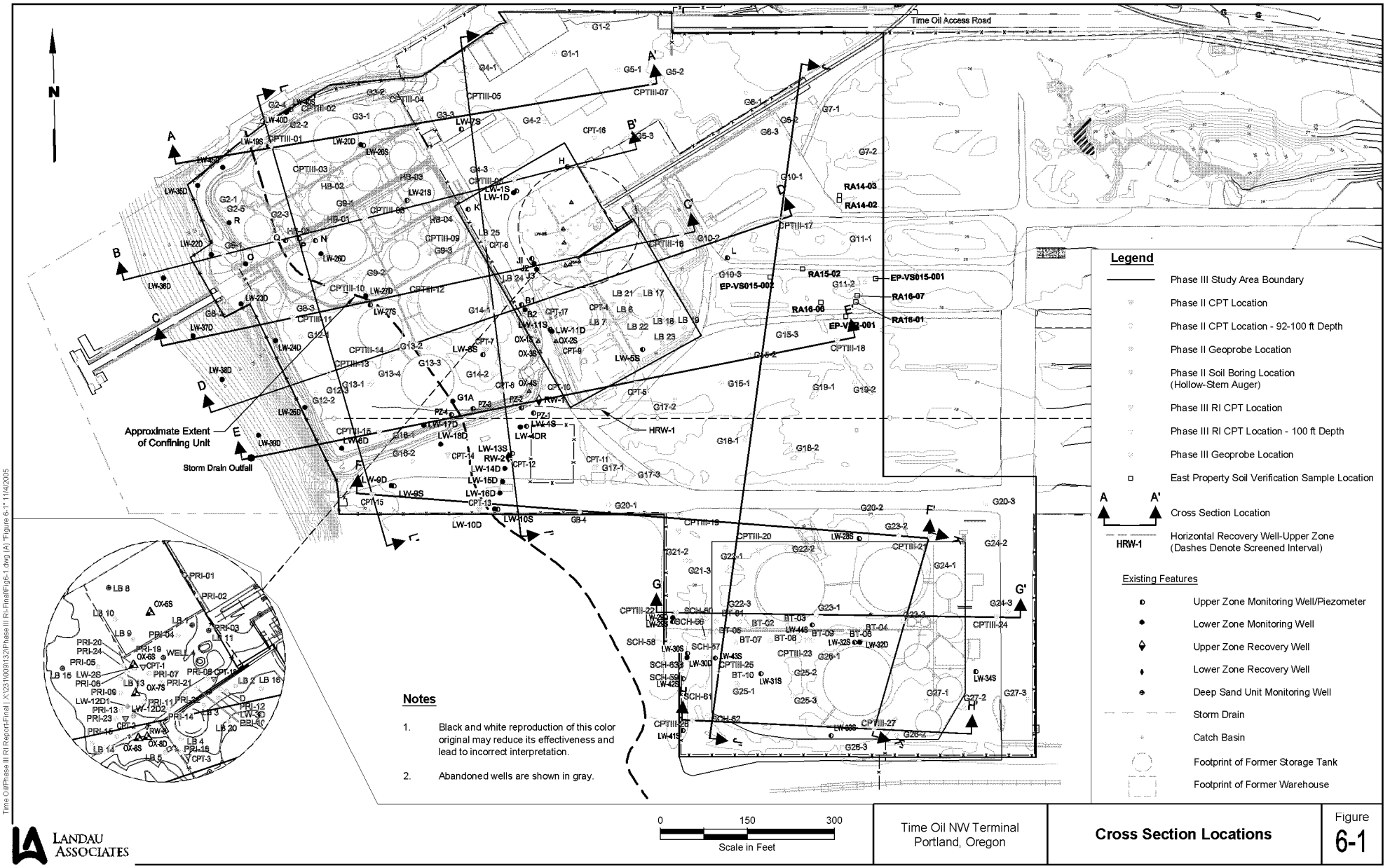
0 100 200
Scale in Feet
Vertical Exaggeration 5X

LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Cross Section E-E'**	Figure 6-6

Time Oil\Phase III RI Report\ X:\231\0009\132\Phase III RI-Final\Fig6-6.dwg (A) "Figure 6-6" 11/4/2005

BZTO104(e)023933



Time Oil\Phase III RI Report-Final\ X:\231\009\132\Phase III RI-Final\Fig6-1.dwg (A) "Figure 6-1" 11/4/2005

BZTO104(e)023934

TRANSMITTAL

LANDAU ASSOCIATES
ENVIRONMENTAL | GEOTECHNICAL | NATURAL RESOURCES

RECEIVED DEC 27 2005

To: Oregon Dept. of Environmental Quality
2020 SW Fourth Ave. Suite 400
Portland, OR 97201-4987

Date: December 21, 2005

Attn: Mr. Tom Roick

Project No.: 231009.130.132

RE: TIME OIL NORTHWEST TERMINAL

Copies	Description
1	Revised portions of the *Phase III Remedial Investigation Report, Time Oil Northwest Terminal, Portland, Oregon* (July 19, 2005; Revised December 20, 2005)
1	CD - Revised portions of the *Phase III Remedial Investigation Report, Time Oil Northwest Terminal, Portland, Oregon* (July 19, 2005; Revised December 20, 2005)
1	Monitoring Well Reports: Mult 58045 and Mult 58044

On behalf of Time Oil Co., enclosed are an electronic and unbound copy of revised text; Figures 2-2, 6-1, 6-6; and Table 7-1 of the above-noted document reflecting edits based on comments provided by DEQ in their October 10, 2005 letter to Mark Chandler, Time Oil Co. If you would like an electronic copy of a redline of the text showing exact edits, we would be happy to provide that to you.

Also, as requested, copies are enclosed of the above-noted monitoring well reports for the Port of Portland wells located on the adjacent property to the north.

LANDAU ASSOCIATES, INC.

Rebekah Brooks
Project Manager

RB/tam

12/21/05 \\Edmdata\wproc\231\TRANSMIT.FAX\DEQ RI_Trn.doc
Enclosures

cc: Mark Chandler, Time Oil Co.
Patricia Dost, Schwabe Williamson & Wyatt
Mike Tischuk, Beazer East, Inc. (electronic copy only)
Sandy Browning, Integral (electronic copy only)

BZTO104(e)023935

APPENDIX A

Groundwater Level Measurements And Quality Data

TABLE A-1
GROUNDWATER MONITORING LOCATIONS AND ANALYTICAL METHODS
THIRD QUARTER EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

Well	Semivolatiles (EPA Method 8270)	Volatiles (EPA Method 8260)	MTBE (EPA Method 8260)	BETX (EPA Method 8260)	PCP (EPA Method 8270 SIM)	PAH (EPA Method 8270 SIM)	TPH-Dx (NWTPH-Dx)	TPH-Gx (NWTPH-G)	PP Metals (a) (EPA Method 6010/7000)	TDS (EPA Method 160.1)	Chloride (EPA Method 325.2)	Ferrous Iron (EPA Method SM3500)	Selenuim (EPA Method 6010)	Dioxin/Furans (EPA Method 8290)
B1	X	X			X		X	X	X	X	X			
B2	X	X			X				X	X	X			
D	X	X			X				X	X	X			
G1A	X	X			X		X		X	X	X			
H (b)														
J1	X	X			X				X	X	X			
J2	X	X			X				X	X	X			
J3 (b)														
K				X				X						
L (b)														
N	X	X	X			X	X	X	X	X	X			
O (b)														
P (c)														
Q	X	X	X			X	X	X	X	X	X			
R (b)														
LW-1S				X				X						
LW-3D	X	X			X				X	X	X			
LW-4S	X	X			X		X		X	X	X			
LW-4D (d)														
LW-5S (b)														
LW-6D	X	X			X		X		X	X	X			
LW-7S	X	X	X		X	X	X	X	X	X	X			
LW-8S	X	X			X		X	X	X	X	X			
LW-9S (e)														
LW9D	X	X			X		X		X	X	X			
LW-10S (e)														
LW-10D	X	X			X		X		X	X	X			
LW-11S	X	X							X	X	X	X	X	
LW-11D	X	X			X		X		X	X	X			
LW-13S					X									
LW-14D					X									
LW-15D (f)														
LW-16D					X									
LW-17D					X									
LW-18D					X									
LW-19S	X	X	X			X	X	X	X	X	X			
LW-20S	X	X	X			X	X	X	X	X	X			
LW-20D	X	X	X			X	X	X	X	X	X			
LW-21S (c)														
LW-22D	X	X	X			X	X	X	X	X	X			
LW-23D	X	X	X			X	X	X	X	X	X			
LW-24D	X	X	X			X	X	X	X	X	X			

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TABLE A-1
GROUNDWATER MONITORING LOCATIONS AND ANALYTICAL METHODS
THIRD QUARTER EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

Well	Semivolatiles (EPA Method 8270)	Volatiles (EPA Method 8260)	MTBE (EPA Method 8260)	BETX (EPA Method 8260)	PCP (EPA Method 8270 SIM)	PAH (EPA Method 8270 SIM)	TPH-Dx (NWTPH-Dx)	TPH-Gx (NWTPH-G)	PP Metals (a) (EPA Method 6010/7000)	TDS (EPA Method 160.1)	Chloride (EPA Method 325.2)	Ferrous Iron (EPA Method SM3500)	Selenuim (EPA Method 6010)	Dioxin/Furans (EPA Method 8290)
LW-25D	X	X	X			X	X	X	X	X	X			
LW-26D	X	X	X			X	X	X	X	X	X			
LW-27S (c)														
LW-27D	X	X	X			X	X	X	X	X	X			
LW-28S (e)														
LW-29S	X	X	X			X	X	X	X	X	X			
LW-29D	X	X	X			X	X	X	X	X	X			
LW-30S	X	X	X			X	X	X	X	X	X			
LW-30D	X	X	X			X	X	X	X	X	X			
LW-31S	X	X	X			X	X	X	X	X	X			
LW-32S	X	X	X			X	X	X	X	X	X			
LW-32D	X	X	X			X	X	X	X	X	X			
LW-33S	X	X	X			X	X	X	X	X	X			
LW-34S	X	X	X			X	X	X	X	X	X			
LW-35D	X	X	X			X	X	X	X	X	X			
RW1	X	X			X		X	X	X	X	X	X	X	X
RW2	X	X			X		X	X	X	X	X			
PZ-1 (b)														
PZ-2 (b)														
PZ-3 (b)														
PZ-4 (b)														
OX-1S	X	X							X			X	X	
OX-2S	X	X							X			X	X	X
OX-3S	X	X							X			X	X	
OX-4S	X	X							X			X	X	
OX-5S	X	X							X			X	X	
OX-6S	X	X							X			X	X	X
OX-7S	X	X							X			X	X	
OX-8S	X	X							X			X	X	
OX-8D	X	X							X			X	X	
OX-9S	X	X							X			X	X	
HRW-1					X									
SDM-1					X									
River-Outfall					X									

Note: 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.

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TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
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	----	
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	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	----	
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	----	
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	----	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	----	
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	----	----	
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	----	
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	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
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	15.86	13.84	----	
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	----	
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	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
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	----	
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	----	
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

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	
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	----	Trace product
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	----	
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	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
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	----	
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	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
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	----	
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	----	
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	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
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	----	
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	----	
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	----	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	----	
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	----	----	
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	----	----	
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	----	
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	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
LW019S	10/23/2003	11:54	27.72	16.62	11.10	----	
LW019S	02/19/2004	15:00	27.72	13.84	13.88	----	
LW019S	06/09/2004	07:27	27.72	15.46	12.26	----	
LW019S	08/10/2004	11:07	27.72	16.35	11.37	----	
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	----	
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	
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	
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	----	----	
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	----	
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	----	
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	----	
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	----	
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	----	
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	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
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	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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 measured
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	----	
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	----	
RW3	12/06/1999	15:24	29.96	14.20	15.76	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
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	----	
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	----	
PZ4	06/27/2002	15:20	28.47	dry	----	----	
PZ4	08/26/2002	16:36	28.47	dry	----	----	
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	----	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
PZ4	08/10/2004	12:03	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	----	
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	----	
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	----	
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	----	
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	----	
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
OX006S	08/10/2004	12:17	31.03	16.09	14.94	----	
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	----	
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	----	
OX009S	08/10/2004	12:12	31.14	16.92	14.22		Reference elevation July 2004

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QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
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	----	

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Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
B2	08/10/2004	10:29	30.31	25.96	4.35	----	
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	----	
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	----	
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	----	

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Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
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	----	
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	----	
R	03/25/1997	11:36	30.47	15.56	14.91	----	
R	03/31/1997	08:43	30.47	14.85	15.62	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
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	----	
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	----	
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	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
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	----	
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	----	
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	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
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	----	
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	----	
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	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
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	----	
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	----	
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	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
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	----	
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	----	
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	----	
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	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
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	----	
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	----	
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	----	
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	----	
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	----	
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	----	
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	----	
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	----	
LW029D	10/23/2003	14:40	31.12	26.45	4.67	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
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	----	
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	----	
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	----	
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	----	
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	----	
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	----	

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GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
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	----	

TABLE A-2
GROUNDWATER LEVEL MEASUREMENTS
QUARTERLY SAMPLING EVENTS, MARCH 1997 - FEBRUARY 2004
TIME OIL NORTHWEST TERMINAL

Well	Date	Time	Reference Elevation (ft) (a)	DTW (ft) (b)	GW Elevation (ft) (c)	LNAPL Thickness (ft)	NOTES
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	----	
RIVER_GAUGE	08/10/2004	10:35	28.13	25.54	2.59	----	

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 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.
(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].

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TABLE A-3a
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	B1 08/03/2004 Primary	D 08/05/2004 Primary	J1 08/03/2004 Primary	LW007S 08/03/2004 Primary	LW008S 08/05/2004 Primary	LW013S 08/05/2004 Primary
Acenaphthene	(ug/l)	NT	NT	NT	0.05	NT	NT
Acenaphthylene	(ug/l)	NT	NT	NT	0.05U	NT	NT
Anthracene	(ug/l)	NT	NT	NT	0.05U	NT	NT
Benzo(a)anthracene	(ug/l)	NT	NT	NT	0.05U	NT	NT
Benzo(a)pyrene	(ug/l)	NT	NT	NT	0.05U	NT	NT
Benzo(b)fluoranthene	(ug/l)	NT	NT	NT	0.05U	NT	NT
Benzo(ghi)perylene	(ug/l)	NT	NT	NT	0.05U	NT	NT
Benzo(k)fluoranthene	(ug/l)	NT	NT	NT	0.05U	NT	NT
Chrysene	(ug/l)	NT	NT	NT	0.05U	NT	NT
Dibenzo(a,h)anthracene	(ug/l)	NT	NT	NT	0.05U	NT	NT
Fluoranthene	(ug/l)	NT	NT	NT	0.05U	NT	NT
Fluorene	(ug/l)	NT	NT	NT	0.05U	NT	NT
Indeno(1,2,3-cd)pyrene	(ug/l)	NT	NT	NT	0.05U	NT	NT
Naphthalene	(ug/l)	NT	NT	NT	5.83	NT	NT
Pentachlorophenol	(ug/l)	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U
Phenanthrene	(ug/l)	NT	NT	NT	0.05U	NT	NT
Pyrene	(ug/l)	NT	NT	NT	0.05U	NT	NT

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TABLE A-3a
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW019S 08/09/2004 Primary	LW020S 08/09/2004 Primary	LW020S 08/09/2004 Duplicate 1	LW020S 08/09/2004 Duplicate 2	LW029S 08/02/2004 Primary	LW030S 08/03/2004 Primary
Acenaphthene	(ug/l)	0.678	0.956J	1.21J	0.0498	0.05U	0.64
Acenaphthylene	(ug/l)	0.0698	0.107J	0.245J	0.0498	0.05U	0.32
Anthracene	(ug/l)	0.0997	0.127	0.0979	0.0498	0.05U	0.09
Benzo(a)anthracene	(ug/l)	0.0499U	0.0488U	0.049U	0.0498	0.05U	0.05U
Benzo(a)pyrene	(ug/l)	0.0499U	0.0488U	0.049U	0.0498	0.05U	0.05U
Benzo(b)fluoranthene	(ug/l)	0.0499U	0.0488U	0.049U	0.0498	0.05U	0.05U
Benzo(ghi)perylene	(ug/l)	0.0499U	0.0488U	0.049U	0.0498	0.05U	0.05U
Benzo(k)fluoranthene	(ug/l)	0.0499U	0.0488U	0.049U	0.0498	0.05U	0.05U
Chrysene	(ug/l)	0.0499U	0.0488U	0.049U	0.0498	0.05U	0.05U
Dibenzo(a,h)anthracene	(ug/l)	0.0499U	0.0488U	0.049U	0.0498	0.05U	0.05U
Fluoranthene	(ug/l)	0.0499U	0.0878	0.118	0.0498	0.05U	0.05U
Fluorene	(ug/l)	1.59	2.14J	2.75J	0.0498	0.05U	1.15
Indeno(1,2,3-cd)pyrene	(ug/l)	0.0499U	0.0488U	0.049U	0.0498	0.05U	0.05U
Naphthalene	(ug/l)	0.14	0.39	0.392	0.0498	0.06	0.55
Pentachlorophenol	(ug/l)	NT	NT	NT	0.478	NT	NT
Phenanthrene	(ug/l)	0.339	0.741J	0.93J	0.0498	0.05U	0.99
Pyrene	(ug/l)	0.0499U	0.0683J	0.0881J	0.0498	0.05U	0.05U

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TABLE A-3a
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW031S 08/02/2004 Primary	LW032S 08/02/2004 Primary	LW033S 08/02/2004 Primary	LW034S 08/02/2004 Primary	N 08/10/2004 Primary	Q 08/09/2004 Primary
Acenaphthene	(ug/l)	0.05U	0.05U	0.05U	0.05U	1.16	5.04
Acenaphthylene	(ug/l)	0.05U	0.4	0.05U	0.05U	0.253	0.239
Anthracene	(ug/l)	0.05U	0.1	0.05	0.05U	0.121	0.259
Benzo(a)anthracene	(ug/l)	0.05U	0.05U	0.05U	0.05U	0.091	0.0498U
Benzo(a)pyrene	(ug/l)	0.05U	0.05U	0.05U	0.05U	0.0506U	0.0498U
Benzo(b)fluoranthene	(ug/l)	0.05U	0.05U	0.05U	0.05U	0.0506U	0.0498U
Benzo(ghi)perylene	(ug/l)	0.05U	0.05U	0.05U	0.05U	0.0506U	0.0498U
Benzo(k)fluoranthene	(ug/l)	0.05U	0.05U	0.05U	0.05U	0.0506U	0.0498U
Chrysene	(ug/l)	0.05U	0.05U	0.05U	0.05U	0.0506U	0.0498U
Dibenzo(a,h)anthracene	(ug/l)	0.05U	0.05U	0.05U	0.05U	0.0506U	0.0498U
Fluoranthene	(ug/l)	0.05U	0.06	0.05U	0.05U	0.273	0.488
Fluorene	(ug/l)	0.05U	0.1	0.05U	0.05U	2.49	3.81
Indeno(1,2,3-cd)pyrene	(ug/l)	0.05U	0.05U	0.05U	0.05U	0.0506U	0.0498U
Naphthalene	(ug/l)	0.05U	1.78	0.05U	0.05U	54.5	0.398
Pentachlorophenol	(ug/l)	NT	NT	NT	NT	NT	NT
Phenanthrene	(ug/l)	0.05U	0.17	0.05U	0.05U	1.42	0.716
Pyrene	(ug/l)	0.05U	0.05U	0.05U	0.05U	0.273	0.179

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TABLE A-3a
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	RIVER_OUTFALL 08/09/2004 Primary
Acenaphthene	(ug/l)	NT
Acenaphthylene	(ug/l)	NT
Anthracene	(ug/l)	NT
Benzo(a)anthracene	(ug/l)	NT
Benzo(a)pyrene	(ug/l)	NT
Benzo(b)fluoranthene	(ug/l)	NT
Benzo(ghi)perylene	(ug/l)	NT
Benzo(k)fluoranthene	(ug/l)	NT
Chrysene	(ug/l)	NT
Dibenzo(a,h)anthracene	(ug/l)	NT
Fluoranthene	(ug/l)	NT
Fluorene	(ug/l)	NT
Indeno(1,2,3-cd)pyrene	(ug/l)	NT
Naphthalene	(ug/l)	NT
Pentachlorophenol	(ug/l)	0.507U
Phenanthrene	(ug/l)	NT
Pyrene	(ug/l)	NT

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TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	B1 08/03/2004 Primary	D 08/05/2004 Primary	J1 08/03/2004 Primary	LW004S 08/05/2004 Primary	LW007S 08/03/2004 Primary	LW008S 08/05/2004 Primary
1,2,4-Trichlorobenzene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
1,2-Dichlorobenzene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
1,3-Dichlorobenzene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
1,4-Dichlorobenzene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
2,4,5-Trichlorophenol	(ug/l)	4.9U	5U	5.03U	5U	4.98U	5U
2,4,6-Trichlorophenol	(ug/l)	4.9U	5U	5.03U	5U	4.98U	5U
2,4-Dichlorophenol	(ug/l)	2.94U	3U	3.02U	3U	2.99U	3U
2,4-Dimethylphenol	(ug/l)	2.94U	3U	3.02U	3U	2.99U	3U
2,4-Dinitrophenol	(ug/l)	9.8U	10U	10.1U	10U	9.96U	10U
2,4-Dinitrotoluene	(ug/l)	4.9U	5U	5.03U	5U	4.98U	5U
2,6-Dinitrotoluene	(ug/l)	4.9U	5U	5.03U	5U	4.98U	5U
2-Chloronaphthalene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
2-Chlorophenol	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
2-Methylnaphthalene	(ug/l)	0.98U	1U	1.01U	1U	1.66	6.88
2-Methylphenol	(ug/l)	1.96U	2U	2.01U	2U	1.99U	2U
2-Nitroaniline	(ug/l)	4.9U	5U	5.03U	5U	4.98U	5U
2-Nitrophenol	(ug/l)	4.9U	5U	5.03U	5U	4.98U	5U
3- & 4-Methylphenol	(ug/l)	9.8U	10U	10.1U	10U	9.96U	10U
3,3-Dichlorobenzidine	(ug/l)	4.9U	5U	5.03U	5U	4.98U	5U
3-Nitroaniline	(ug/l)	5.88U	6U	6.03U	6U	5.98U	6U
4,6-Dinitro-2-Methylphenol	(ug/l)	9.8U	10U	10.1U	10U	9.96U	10U

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TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	B1 08/03/2004 Primary	D 08/05/2004 Primary	J1 08/03/2004 Primary	LW004S 08/05/2004 Primary	LW007S 08/03/2004 Primary	LW008S 08/05/2004 Primary
4-Bromophenyl-phenylether	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
4-Chloro-3-methylphenol	(ug/l)	1.96U	2U	2.01U	2U	1.99U	2U
4-Chloroaniline	(ug/l)	2.94U	3U	3.02U	3U	2.99U	3U
4-Chlorophenylphenyl ether	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
4-Nitroaniline	(ug/l)	4.9U	5U	5.03U	5U	4.98U	5U
4-Nitrophenol	(ug/l)	4.9U	5U	5.03U	5U	4.98U	5U
Acenaphthene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Acenaphthylene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Anthracene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Benzo(a)anthracene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Benzo(a)pyrene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Benzo(b)fluoranthene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Benzo(ghi)perylene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Benzo(k)fluoranthene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Benzoic acid	(ug/l)	19.6U	20U	20.1U	20U	19.9U	20U
Benzyl alcohol	(ug/l)	4.9U	5U	5.03U	5U	4.98U	5U
Bis(2-chloroethoxy)methane	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Bis(2-chloroethyl)ether	(ug/l)	1.96U	2U	2.01U	2U	1.99U	2U
Bis(2-chloroisopropyl)ether	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Bis(2-ethylhexyl)phthalate	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Butyl benzyl phthalate	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U

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TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	B1 08/03/2004 Primary	D 08/05/2004 Primary	J1 08/03/2004 Primary	LW004S 08/05/2004 Primary	LW007S 08/03/2004 Primary	LW008S 08/05/2004 Primary
Carbazole	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Chrysene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Dibenzo(a,h)anthracene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Dibenzofuran	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Diethyl phthalate	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Dimethyl phthalate	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Di-n-butyl phthalate	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Di-n-octyl phthalate	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Fluoranthene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Fluorene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Hexachlorobenzene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Hexachlorobutadiene	(ug/l)	1.96U	2U	2.01U	2U	1.99U	2U
Hexachlorocyclopentadiene	(ug/l)	4.9U	5U	5.03U	5U	4.98U	5U
Hexachloroethane	(ug/l)	1.96U	2U	2.01U	2U	1.99U	2U
Indeno(1,2,3-cd)pyrene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Isophorone	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Naphthalene	(ug/l)	0.98U	1U	1.01U	1U	4.43	6.7
Nitrobenzene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
N-Nitrosodimethylamine	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
N-Nitroso-Di-N-Propylamine	(ug/l)	1.96U	2U	2.01U	2U	1.99U	2U
N-Nitrosodiphenylamine	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U

BZTO104(e)023972

TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE	B1	D	J1	LW004S	LW007S	LW008S
	DATE	08/03/2004	08/05/2004	08/03/2004	08/05/2004	08/03/2004	08/05/2004
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Pentachlorophenol	(ug/l)	4.9U	5U	5.03U	8.52	4.98U	5U
Phenanthrene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Phenol	(ug/l)	1.96U	2U	2.01U	2U	1.99U	2U
Pyrene	(ug/l)	0.98U	1U	1.01U	1U	0.996U	1U
Pyridine	(ug/l)	4.9U	5U	5.03U	5U	4.98U	5U

BZTO104(e)023973

TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW011S 08/05/2004 Primary	LW019S 08/09/2004 Primary	LW020S 08/09/2004 Primary	LW020S 08/09/2004 Duplicate 1	LW029S 08/02/2004 Primary	LW030S 08/03/2004 Primary
1,2,4-Trichlorobenzene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
1,2-Dichlorobenzene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
1,3-Dichlorobenzene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
1,4-Dichlorobenzene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
2,4,5-Trichlorophenol	(ug/l)	5U	5.07U	5.17U	5.19U	4.85U	4.84U
2,4,6-Trichlorophenol	(ug/l)	5U	5.07U	5.17U	5.19U	4.85U	4.84U
2,4-Dichlorophenol	(ug/l)	3U	3.04U	3.1U	3.12U	2.91U	2.91U
2,4-Dimethylphenol	(ug/l)	3U	3.04U	3.1U	3.12U	2.91U	2.91U
2,4-Dinitrophenol	(ug/l)	10U	10.1U	10.3U	10.4U	9.71U	9.69U
2,4-Dinitrotoluene	(ug/l)	5U	5.07U	5.17U	5.19U	4.85U	4.84U
2,6-Dinitrotoluene	(ug/l)	5U	5.07U	5.17U	5.19U	4.85U	4.84U
2-Chloronaphthalene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
2-Chlorophenol	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
2-Methylnaphthalene	(ug/l)	3.81	1.01U	1.03U	1.04U	0.971U	0.969U
2-Methylphenol	(ug/l)	2U	2.03U	2.07U	2.08U	1.94U	1.94U
2-Nitroaniline	(ug/l)	5U	5.07U	5.17U	5.19U	4.85U	4.84U
2-Nitrophenol	(ug/l)	5U	5.07U	5.17U	5.19U	4.85U	4.84U
3- & 4-Methylphenol	(ug/l)	10U	10.1U	10.3U	10.4U	9.71U	9.69U
3,3-Dichlorobenzidine	(ug/l)	5U	5.07U	5.17U	5.19U	4.85U	4.84U
3-Nitroaniline	(ug/l)	6U	6.09U	6.2U	6.23U	5.83U	5.81U
4,6-Dinitro-2-Methylphenol	(ug/l)	10U	10.1U	10.3U	10.4U	9.71U	9.69U

BZTO104(e)023974

TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW011S 08/05/2004 Primary	LW019S 08/09/2004 Primary	LW020S 08/09/2004 Primary	LW020S 08/09/2004 Duplicate 1	LW029S 08/02/2004 Primary	LW030S 08/03/2004 Primary
4-Bromophenyl-phenylether	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
4-Chloro-3-methylphenol	(ug/l)	2U	2.03U	2.07U	2.08U	1.94U	1.94U
4-Chloroaniline	(ug/l)	3U	3.04U	3.1U	3.12U	2.91U	2.91U
4-Chlorophenylphenyl ether	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
4-Nitroaniline	(ug/l)	5U	5.07U	5.17U	5.19U	4.85U	4.84U
4-Nitrophenol	(ug/l)	5U	5.07U	5.17U	5.19U	4.85U	4.84U
Acenaphthene	(ug/l)	1U	1.09	1.5	1.43	0.971U	0.969U
Acenaphthylene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Anthracene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Benzo(a)anthracene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Benzo(a)pyrene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Benzo(b)fluoranthene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Benzo(ghi)perylene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Benzo(k)fluoranthene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Benzoic acid	(ug/l)	20U	20.3U	20.7U	20.8U	19.4U	19.4U
Benzyl alcohol	(ug/l)	5U	5.07U	5.17U	5.19U	4.85U	4.84U
Bis(2-chloroethoxy)methane	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Bis(2-chloroethyl)ether	(ug/l)	2U	2.03U	2.07U	2.08U	1.94U	1.94U
Bis(2-chloroisopropyl)ether	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Bis(2-ethylhexyl)phthalate	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Butyl benzyl phthalate	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U

BZTO104(e)023975

TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW011S 08/05/2004 Primary	LW019S 08/09/2004 Primary	LW020S 08/09/2004 Primary	LW020S 08/09/2004 Duplicate 1	LW029S 08/02/2004 Primary	LW030S 08/03/2004 Primary
Carbazole	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Chrysene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Dibenzo(a,h)anthracene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Dibenzofuran	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Diethyl phthalate	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Dimethyl phthalate	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Di-n-butyl phthalate	(ug/l)	1U	1.01U	2.17	2.07	0.971U	0.969U
Di-n-octyl phthalate	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Fluoranthene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Fluorene	(ug/l)	1U	3.46	3.86	3.63	0.971U	1.05U
Hexachlorobenzene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Hexachlorobutadiene	(ug/l)	2U	2.03U	2.07U	2.08U	1.94U	1.94U
Hexachlorocyclopentadiene	(ug/l)	5U	5.07U	5.17U	5.19U	4.85U	4.84U
Hexachloroethane	(ug/l)	2U	2.03U	2.07U	2.08U	1.94U	1.94U
Indeno(1,2,3-cd)pyrene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Isophorone	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Naphthalene	(ug/l)	7.81	1.01U	1.03U	1.04U	0.971U	0.969U
Nitrobenzene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
N-Nitrosodimethylamine	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
N-Nitroso-Di-N-Propylamine	(ug/l)	2U	2.03U	2.07U	2.08U	1.94U	1.94U
N-Nitrosodiphenylamine	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U

BZTO104(e)023976

TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE	LW011S	LW019S	LW020S	LW020S	LW029S	LW030S
	DATE	08/05/2004	08/09/2004	08/09/2004	08/09/2004	08/02/2004	08/03/2004
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Pentachlorophenol	(ug/l)	604	5.07U	5.17U	5.19U	4.85U	4.84U
Phenanthrene	(ug/l)	1U	1.21	1.68	1.82	0.971U	1.28
Phenol	(ug/l)	2U	2.03U	2.07U	2.08U	1.94U	1.94U
Pyrene	(ug/l)	1U	1.01U	1.03U	1.04U	0.971U	0.969U
Pyridine	(ug/l)	5U	5.07U	5.17U	5.19U	4.85U	4.84U

BZTO104(e)023977

TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW031S 08/02/2004 Primary	LW032S 08/02/2004 Primary	LW033S 08/02/2004 Primary	LW034S 08/02/2004 Primary	N 08/10/2004 Primary	OX001S 08/04/2004 Primary
1,2,4-Trichlorobenzene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
1,2-Dichlorobenzene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
1,3-Dichlorobenzene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
1,4-Dichlorobenzene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
2,4,5-Trichlorophenol	(ug/l)	4.76U	4.85U	4.82U	4.92U	5U	5U
2,4,6-Trichlorophenol	(ug/l)	4.76U	4.85U	4.82U	4.92U	5U	5U
2,4-Dichlorophenol	(ug/l)	2.86U	2.91U	2.89U	2.95U	3U	3U
2,4-Dimethylphenol	(ug/l)	2.86U	2.91U	2.89U	2.95U	4.48	3U
2,4-Dinitrophenol	(ug/l)	9.52U	9.7U	9.64U	9.83U	9.99U	10U
2,4-Dinitrotoluene	(ug/l)	4.76U	4.85U	4.82U	4.92U	5U	5U
2,6-Dinitrotoluene	(ug/l)	4.76U	4.85U	4.82U	4.92U	5U	5U
2-Chloronaphthalene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
2-Chlorophenol	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
2-Methylnaphthalene	(ug/l)	0.952U	0.97U	0.964U	0.983U	37.7	6.81
2-Methylphenol	(ug/l)	1.9U	1.94U	1.93U	1.97U	2U	2U
2-Nitroaniline	(ug/l)	4.76U	4.85U	4.82U	4.92U	5U	5U
2-Nitrophenol	(ug/l)	4.76U	4.85U	4.82U	4.92U	5U	5U
3- & 4-Methylphenol	(ug/l)	9.52U	9.7U	9.64U	9.83U	9.99U	10U
3,3-Dichlorobenzidine	(ug/l)	4.76U	4.85U	4.82U	4.92U	5U	5U
3-Nitroaniline	(ug/l)	5.71U	5.82U	5.79U	5.9U	5.99U	6U
4,6-Dinitro-2-Methylphenol	(ug/l)	9.52U	9.7U	9.64U	9.83U	9.99U	10U

BZTO104(e)023978

TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW031S 08/02/2004 Primary	LW032S 08/02/2004 Primary	LW033S 08/02/2004 Primary	LW034S 08/02/2004 Primary	N 08/10/2004 Primary	OX001S 08/04/2004 Primary
4-Bromophenyl-phenylether	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
4-Chloro-3-methylphenol	(ug/l)	1.9U	1.94U	1.93U	1.97U	2U	2U
4-Chloroaniline	(ug/l)	2.86U	2.91U	2.89U	2.95U	3U	3U
4-Chlorophenylphenyl ether	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
4-Nitroaniline	(ug/l)	4.76U	4.85U	4.82U	4.92U	5U	5U
4-Nitrophenol	(ug/l)	4.76U	4.85U	4.82U	4.92U	5U	5U
Acenaphthene	(ug/l)	0.952U	0.97U	0.964U	0.983U	1.19	1U
Acenaphthylene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Anthracene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Benzo(a)anthracene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Benzo(a)pyrene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Benzo(b)fluoranthene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Benzo(ghi)perylene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Benzo(k)fluoranthene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Benzoic acid	(ug/l)	19U	19.4U	19.3U	19.7U	20U	20U
Benzyl alcohol	(ug/l)	4.76U	4.85U	4.82U	4.92U	5U	5U
Bis(2-chloroethoxy)methane	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Bis(2-chloroethyl)ether	(ug/l)	1.9U	1.94U	1.93U	1.97U	2U	2U
Bis(2-chloroisopropyl)ether	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Bis(2-ethylhexyl)phthalate	(ug/l)	0.952U	0.97U	1.99	0.983U	1.23	1U
Butyl benzyl phthalate	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U

BZTO104(e)023979

TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW031S 08/02/2004 Primary	LW032S 08/02/2004 Primary	LW033S 08/02/2004 Primary	LW034S 08/02/2004 Primary	N 08/10/2004 Primary	OX001S 08/04/2004 Primary
Carbazole	(ug/l)	0.952U	0.97U	0.964U	0.983U	2.05	1U
Chrysene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Dibenzo(a,h)anthracene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Dibenzofuran	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Diethyl phthalate	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Dimethyl phthalate	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Di-n-butyl phthalate	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Di-n-octyl phthalate	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Fluoranthene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Fluorene	(ug/l)	0.952U	0.97U	0.964U	0.983U	2.55	1U
Hexachlorobenzene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Hexachlorobutadiene	(ug/l)	1.9U	1.94U	1.93U	1.97U	2U	2U
Hexachlorocyclopentadiene	(ug/l)	4.76U	4.85U	4.82U	4.92U	5U	5U
Hexachloroethane	(ug/l)	1.9U	1.94U	1.93U	1.97U	2U	2U
Indeno(1,2,3-cd)pyrene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Isophorone	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Naphthalene	(ug/l)	0.952U	0.97U	0.964U	0.983U	53.7	11
Nitrobenzene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
N-Nitrosodimethylamine	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
N-Nitroso-Di-N-Propylamine	(ug/l)	1.9U	1.94U	1.93U	1.97U	2U	2U
N-Nitrosodiphenylamine	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U

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TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW031S 08/02/2004 Primary	LW032S 08/02/2004 Primary	LW033S 08/02/2004 Primary	LW034S 08/02/2004 Primary	N 08/10/2004 Primary	OX001S 08/04/2004 Primary
Pentachlorophenol	(ug/l)	4.76U	4.85U	4.82U	4.92U	5U	5U
Phenanthrene	(ug/l)	0.952U	0.97U	0.964U	0.983U	1.43	1U
Phenol	(ug/l)	1.9U	1.94U	1.93U	1.97U	2U	2U
Pyrene	(ug/l)	0.952U	0.97U	0.964U	0.983U	0.999U	1U
Pyridine	(ug/l)	4.76U	4.85U	4.82U	4.92U	5U	5U

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TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE	OX002S	OX003S	OX004S	OX005S	OX006S	OX006S
	DATE	08/04/2004	08/04/2004	08/04/2004	08/04/2004	08/04/2004	08/04/2004
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Duplicate 1
1,2,4-Trichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,3-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,4-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
2,4,5-Trichlorophenol	(ug/l)	5U	5U	5U	5U	5U	5U
2,4,6-Trichlorophenol	(ug/l)	5U	5U	5U	5U	5U	5U
2,4-Dichlorophenol	(ug/l)	3U	3U	3U	3U	3U	3U
2,4-Dimethylphenol	(ug/l)	3U	13.9	7.25	3U	3U	3U
2,4-Dinitrophenol	(ug/l)	10U	10U	10U	10U	10U	10U
2,4-Dinitrotoluene	(ug/l)	5U	5U	5U	5U	5U	5U
2,6-Dinitrotoluene	(ug/l)	5U	5U	5U	5U	5U	5U
2-Chloronaphthalene	(ug/l)	1U	1U	1U	1U	1U	1U
2-Chlorophenol	(ug/l)	1U	1U	1U	1U	1U	1U
2-Methylnaphthalene	(ug/l)	6.24	9.63	20.7	1U	1U	1U
2-Methylphenol	(ug/l)	2U	15.5	2U	2U	2U	2U
2-Nitroaniline	(ug/l)	5U	5U	5U	5U	5U	5U
2-Nitrophenol	(ug/l)	5U	5U	5U	5U	5U	5U
3- & 4-Methylphenol	(ug/l)	10U	22.2	10U	10U	10U	10U
3,3-Dichlorobenzidine	(ug/l)	5U	5U	5U	5U	5U	5U
3-Nitroaniline	(ug/l)	6U	6U	6U	6U	6U	6U
4,6-Dinitro-2-Methylphenol	(ug/l)	10U	10U	10U	10U	10U	10U

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TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	OX002S 08/04/2004 Primary	OX003S 08/04/2004 Primary	OX004S 08/04/2004 Primary	OX005S 08/04/2004 Primary	OX006S 08/04/2004 Primary	OX006S 08/04/2004 Duplicate 1
4-Bromophenyl-phenylether	(ug/l)	1U	1U	1U	1U	1U	1U
4-Chloro-3-methylphenol	(ug/l)	2U	2U	2U	2U	2U	2U
4-Chloroaniline	(ug/l)	3U	3U	3U	3U	3U	3U
4-Chlorophenylphenyl ether	(ug/l)	1U	1U	1U	1U	1U	1U
4-Nitroaniline	(ug/l)	5U	5U	5U	5U	5U	5U
4-Nitrophenol	(ug/l)	5U	5U	5U	5U	5U	5U
Acenaphthene	(ug/l)	1U	1U	1U	1U	1U	1U
Acenaphthylene	(ug/l)	1U	1U	1U	1U	1U	1U
Anthracene	(ug/l)	1U	1U	1U	1U	1U	1U
Benzo(a)anthracene	(ug/l)	1U	1U	1U	1U	1U	1U
Benzo(a)pyrene	(ug/l)	1U	1U	1U	1U	1U	1U
Benzo(b)fluoranthene	(ug/l)	1U	1U	1U	1U	1U	1U
Benzo(ghi)perylene	(ug/l)	1U	1U	1U	1U	1U	1U
Benzo(k)fluoranthene	(ug/l)	1U	1U	1U	1U	1U	1U
Benzoic acid	(ug/l)	20U	20U	20U	20U	20U	20U
Benzyl alcohol	(ug/l)	5U	5U	5U	5U	5U	5U
Bis(2-chloroethoxy)methane	(ug/l)	1U	1U	1U	1U	1U	1U
Bis(2-chloroethyl)ether	(ug/l)	2U	2U	2U	2U	2U	2U
Bis(2-chloroisopropyl)ether	(ug/l)	1U	1U	1U	1U	1U	1U
Bis(2-ethylhexyl)phthalate	(ug/l)	1U	1U	1U	1U	1U	1U
Butyl benzyl phthalate	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	OX002S 08/04/2004 Primary	OX003S 08/04/2004 Primary	OX004S 08/04/2004 Primary	OX005S 08/04/2004 Primary	OX006S 08/04/2004 Primary	OX006S 08/04/2004 Duplicate 1
Carbazole	(ug/l)	1U	1U	1U	1U	1U	1U
Chrysene	(ug/l)	1U	1U	1U	1U	1U	1U
Dibenzo(a,h)anthracene	(ug/l)	1U	1U	1U	1U	1U	1U
Dibenzofuran	(ug/l)	1U	1U	1U	1U	1U	1U
Diethyl phthalate	(ug/l)	1U	1U	1U	1U	1U	1U
Dimethyl phthalate	(ug/l)	1U	1U	1U	1U	1U	1U
Di-n-butyl phthalate	(ug/l)	1U	1.13U	1.1U	1U	1U	1U
Di-n-octyl phthalate	(ug/l)	1U	1U	1U	1U	1U	1U
Fluoranthene	(ug/l)	1U	1U	1U	1U	1U	1U
Fluorene	(ug/l)	1U	1U	1U	1U	1U	1U
Hexachlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Hexachlorobutadiene	(ug/l)	2U	2U	2U	2U	2U	2U
Hexachlorocyclopentadiene	(ug/l)	5U	5U	5U	5U	5U	5U
Hexachloroethane	(ug/l)	2U	2U	2U	2U	2U	2U
Indeno(1,2,3-cd)pyrene	(ug/l)	1U	1U	1U	1U	1U	1U
Isophorone	(ug/l)	1U	1U	1U	1U	1U	1U
Naphthalene	(ug/l)	9.21	20.2	28.5	1U	1U	1U
Nitrobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
N-Nitrosodimethylamine	(ug/l)	1U	1U	1U	1U	1U	1U
N-Nitroso-Di-N-Propylamine	(ug/l)	2U	2U	2U	2U	2U	2U
N-Nitrosodiphenylamine	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	OX002S 08/04/2004 Primary	OX003S 08/04/2004 Primary	OX004S 08/04/2004 Primary	OX005S 08/04/2004 Primary	OX006S 08/04/2004 Primary	OX006S 08/04/2004 Duplicate 1
Pentachlorophenol	(ug/l)	1500	59.2	96.7	5U	604	498
Phenanthrene	(ug/l)	1U	1U	1U	1U	1U	1U
Phenol	(ug/l)	2U	15.7	2U	2U	2U	2U
Pyrene	(ug/l)	1U	1U	1U	1U	1U	1U
Pyridine	(ug/l)	5U	5U	5U	5U	5U	5U

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TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	OX007S 08/04/2004 Primary	OX008S 08/04/2004 Primary	OX009S 08/05/2004 Primary	Q 08/09/2004 Primary	RW1 08/04/2004 Primary
1,2,4-Trichlorobenzene	(ug/l)	1U	1U	1U	1.03U	1U
1,2-Dichlorobenzene	(ug/l)	1U	1U	1U	1.03U	1U
1,3-Dichlorobenzene	(ug/l)	1U	1U	1U	1.03U	1U
1,4-Dichlorobenzene	(ug/l)	1U	1U	1U	1.03U	1U
2,4,5-Trichlorophenol	(ug/l)	5U	5U	5U	5.15U	5U
2,4,6-Trichlorophenol	(ug/l)	5U	5U	5U	5.15U	19.9
2,4-Dichlorophenol	(ug/l)	3U	3U	3U	3.09U	31.5
2,4-Dimethylphenol	(ug/l)	3U	3U	3U	3.09U	3U
2,4-Dinitrophenol	(ug/l)	10U	10U	10U	10.3U	10U
2,4-Dinitrotoluene	(ug/l)	5U	5U	5U	5.15U	5U
2,6-Dinitrotoluene	(ug/l)	5U	5U	5U	5.15U	5U
2-Chloronaphthalene	(ug/l)	1U	1U	1U	1.03U	42.8
2-Chlorophenol	(ug/l)	1U	1U	1U	1.03U	1U
2-Methylnaphthalene	(ug/l)	1U	1U	1U	19.8	1.84
2-Methylphenol	(ug/l)	2U	2U	2U	2.06U	2U
2-Nitroaniline	(ug/l)	5U	5U	5U	5.15U	5U
2-Nitrophenol	(ug/l)	5U	5U	5U	5.15U	5U
3- & 4-Methylphenol	(ug/l)	10U	10U	10U	10.3U	10U
3,3-Dichlorobenzidine	(ug/l)	5U	5U	5U	5.15U	5U
3-Nitroaniline	(ug/l)	6U	6U	6U	6.18U	6U
4,6-Dinitro-2-Methylphenol	(ug/l)	10U	10U	10U	10.3U	10U

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TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	OX007S 08/04/2004 Primary	OX008S 08/04/2004 Primary	OX009S 08/05/2004 Primary	Q 08/09/2004 Primary	RW1 08/04/2004 Primary
4-Bromophenyl-phenylether	(ug/l)	1U	1U	1U	1.03U	1U
4-Chloro-3-methylphenol	(ug/l)	2U	2U	2U	2.06U	2U
4-Chloroaniline	(ug/l)	3U	3U	3U	3.09U	3U
4-Chlorophenylphenyl ether	(ug/l)	1U	1U	1U	1.03U	1U
4-Nitroaniline	(ug/l)	5U	5U	5U	5.15U	5U
4-Nitrophenol	(ug/l)	5U	5U	5U	5.15U	5U
Acenaphthene	(ug/l)	1U	1U	1U	6.46	1U
Acenaphthylene	(ug/l)	1U	1U	1U	1.03U	1U
Anthracene	(ug/l)	1U	1U	1U	1.03U	1U
Benzo(a)anthracene	(ug/l)	1U	1U	1U	1.03U	1U
Benzo(a)pyrene	(ug/l)	1U	1U	1U	1.03U	1U
Benzo(b)fluoranthene	(ug/l)	1U	1U	1U	1.03U	1U
Benzo(ghi)perylene	(ug/l)	1U	1U	1U	1.03U	1U
Benzo(k)fluoranthene	(ug/l)	1U	1U	1U	1.03U	1U
Benzoic acid	(ug/l)	20U	20U	20U	20.6U	20U
Benzyl alcohol	(ug/l)	5U	5U	5U	5.15U	5U
Bis(2-chloroethoxy)methane	(ug/l)	1U	1U	1U	1.03U	1U
Bis(2-chloroethyl)ether	(ug/l)	2U	2U	2U	2.06U	2U
Bis(2-chloroisopropyl)ether	(ug/l)	1U	1U	1U	1.03U	1U
Bis(2-ethylhexyl)phthalate	(ug/l)	1U	1U	1U	1.03U	1U
Butyl benzyl phthalate	(ug/l)	1U	1U	1U	1.03U	1U

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TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	OX007S 08/04/2004 Primary	OX008S 08/04/2004 Primary	OX009S 08/05/2004 Primary	Q 08/09/2004 Primary	RW1 08/04/2004 Primary
Carbazole	(ug/l)	1U	1U	1U	1.03U	1U
Chrysene	(ug/l)	1U	1U	1U	1.03U	1U
Dibenzo(a,h)anthracene	(ug/l)	1U	1U	1U	1.03U	1U
Dibenzofuran	(ug/l)	1U	1U	1U	3.79	1U
Diethyl phthalate	(ug/l)	1U	1U	1U	1.03U	1U
Dimethyl phthalate	(ug/l)	1U	1U	1U	1.03U	1U
Di-n-butyl phthalate	(ug/l)	1U	1U	1U	1.03U	1U
Di-n-octyl phthalate	(ug/l)	1U	1U	1U	1.03U	1U
Fluoranthene	(ug/l)	1U	1U	1U	1.03U	1U
Fluorene	(ug/l)	1U	1U	1U	4.97	1U
Hexachlorobenzene	(ug/l)	1U	1U	1U	1.03U	1U
Hexachlorobutadiene	(ug/l)	2U	2U	2U	2.06U	2U
Hexachlorocyclopentadiene	(ug/l)	5U	5U	5U	5.15U	5U
Hexachloroethane	(ug/l)	2U	2U	2U	2.06U	2U
Indeno(1,2,3-cd)pyrene	(ug/l)	1U	1U	1U	1.03U	1U
Isophorone	(ug/l)	1U	1U	1U	1.03U	1U
Naphthalene	(ug/l)	1.5	1.09	1U	1.03U	7.35
Nitrobenzene	(ug/l)	1U	1U	1U	1.03U	1U
N-Nitrosodimethylamine	(ug/l)	1U	1U	1U	1.03U	1U
N-Nitroso-Di-N-Propylamine	(ug/l)	2U	2U	2U	2.06U	2U
N-Nitrosodiphenylamine	(ug/l)	1U	1U	1U	1.03U	1U

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TABLE A-3b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	OX007S 08/04/2004 Primary	OX008S 08/04/2004 Primary	OX009S 08/05/2004 Primary	Q 08/09/2004 Primary	RW1 08/04/2004 Primary
Pentachlorophenol	(ug/l)	130	76.8	5U	5.15U	160
Phenanthrene	(ug/l)	1U	1U	1U	1.08	1U
Phenol	(ug/l)	2U	2U	2U	10.7	2U
Pyrene	(ug/l)	1U	1U	1U	1.03U	1U
Pyridine	(ug/l)	5U	5U	5U	5.15U	5U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	B1 08/03/2004 Primary	D 08/05/2004 Primary	J1 08/03/2004 Primary	K 08/03/2004 Primary	LW001S 08/03/2004 Primary	LW004S 08/05/2004 Primary
1,1,1,2-Tetrachloroethane	(ug/l)	1U	1U	1U	NT	NT	1U
1,1,1-Trichloroethane	(ug/l)	1U	1U	1U	NT	NT	1U
1,1,2,2-Tetrachloroethane	(ug/l)	1U	1U	1U	NT	NT	1U
1,1,2-Trichloroethane	(ug/l)	1U	1U	1U	NT	NT	1U
1,1-Dichloroethane	(ug/l)	1U	1U	1U	NT	NT	1U
1,1-Dichloroethene	(ug/l)	1U	1U	1U	NT	NT	1U
1,1-Dichloropropene	(ug/l)	1U	1U	1U	NT	NT	1U
1,2,3-Trichlorobenzene	(ug/l)	1U	1U	1U	NT	NT	1U
1,2,3-Trichloropropane	(ug/l)	1U	1U	1U	NT	NT	1U
1,2,4-Trichlorobenzene	(ug/l)	1U	1U	1U	NT	NT	1U
1,2,4-Trimethylbenzene	(ug/l)	3.13J	1U	1U	NT	NT	1U
1,2-Dibromoethane	(ug/l)	1U	1U	1U	NT	NT	1U
1,2-Dichlorobenzene	(ug/l)	1U	1U	1U	NT	NT	1U
1,2-Dichloroethane	(ug/l)	1U	1U	1U	NT	NT	1U
1,2-Dichloropropane	(ug/l)	1U	1U	1U	NT	NT	1U
1,3,5-Trimethylbenzene	(ug/l)	1.15J	1U	1U	NT	NT	1U
1,3-Dichlorobenzene	(ug/l)	1U	1U	1U	NT	NT	1U
1,3-Dichloropropane	(ug/l)	1U	1U	1U	NT	NT	1U
1,4-Dichlorobenzene	(ug/l)	1U	1U	1U	NT	NT	1U
2,2-Dichloropropane	(ug/l)	1U	1U	1U	NT	NT	1U
2-Butanone	(ug/l)	10U	10U	10U	NT	NT	10U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	B1 08/03/2004 Primary	D 08/05/2004 Primary	J1 08/03/2004 Primary	K 08/03/2004 Primary	LW001S 08/03/2004 Primary	LW004S 08/05/2004 Primary
2-Chlorotoluene	(ug/l)	1U	1U	1U	NT	NT	1U
2-Hexanone	(ug/l)	10U	10U	10U	NT	NT	10U
4-Chlorotoluene	(ug/l)	1U	1U	1U	NT	NT	1U
4-Isopropyltoluene	(ug/l)	1U	1U	1U	NT	NT	1U
4-Methyl-2-Pentanone (MIBK)	(ug/l)	20U	20U	20U	NT	NT	20U
Acetone	(ug/l)	50U	50U	50U	NT	NT	50U
Acrylonitrile	(ug/l)	5U	5U	5U	NT	NT	5U
Benzene	(ug/l)	1.71J	0.3U	0.3U	0.3U	0.3U	0.3U
Bromobenzene	(ug/l)	1U	1U	1U	NT	NT	1U
Bromochloromethane	(ug/l)	1U	1U	1U	NT	NT	1U
Bromodichloromethane	(ug/l)	1U	1U	1U	NT	NT	1U
Bromoform	(ug/l)	1U	1U	1U	NT	NT	1U
Bromomethane	(ug/l)	1U	1U	1U	NT	NT	1U
Carbon disulfide	(ug/l)	2U	2U	2U	NT	NT	2U
Carbon tetrachloride	(ug/l)	1U	1U	1U	NT	NT	1U
Chlorobenzene	(ug/l)	1U	1U	1U	NT	NT	1U
Chloroethane	(ug/l)	1U	1U	1U	NT	NT	1U
Chloroform	(ug/l)	1U	1U	1U	NT	NT	1U
Chloromethane	(ug/l)	1U	1U	1U	NT	NT	1U
cis-1,2-Dichloroethene	(ug/l)	1U	1U	1U	NT	NT	1U
cis-1,3-Dichloropropene	(ug/l)	1U	1U	1U	NT	NT	1U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	B1 08/03/2004 Primary	D 08/05/2004 Primary	J1 08/03/2004 Primary	K 08/03/2004 Primary	LW001S 08/03/2004 Primary	LW004S 08/05/2004 Primary
Dibromochloromethane	(ug/l)	1U	1U	1U	NT	NT	1U
Dibromochloropropane	(ug/l)	1U	1U	1U	NT	NT	1U
Dibromomethane	(ug/l)	1U	1U	1U	NT	NT	1U
Dichlorodifluoromethane	(ug/l)	1U	1U	1U	NT	NT	1U
Ethylbenzene	(ug/l)	27.5J	1U	1U	1U	1U	1U
Hexachlorobutadiene	(ug/l)	1U	1U	1U	NT	NT	1U
Isopropylbenzene	(ug/l)	1.95J	1.13J	5.58J	NT	NT	1U
m,p-Xylene	(ug/l)	20.8J	2U	2U	2U	2U	2U
Methyl tert-butyl ether	(ug/l)	1U	1U	1U	NT	NT	1U
Methylene chloride	(ug/l)	20U	20U	20U	NT	NT	20U
Naphthalene	(ug/l)	1.03J	1U	1.47J	NT	NT	1U
n-Butylbenzene	(ug/l)	1U	1U	1.06J	NT	NT	1U
n-Propylbenzene	(ug/l)	2.57J	1.19J	14J	NT	NT	1U
o-Xylene	(ug/l)	2.6J	1U	1U	1U	1U	1U
sec-Butylbenzene	(ug/l)	1U	1U	1U	NT	NT	1U
Styrene	(ug/l)	1U	1U	1U	NT	NT	1U
tert-Butylbenzene	(ug/l)	1U	1U	1U	NT	NT	1U
Tetrachloroethene	(ug/l)	1U	1U	1U	NT	NT	1U
Toluene	(ug/l)	1U	1U	1U	1U	1U	1U
trans-1,2-Dichloroethene	(ug/l)	1U	1U	1U	NT	NT	1U
trans-1,3-Dichloropropene	(ug/l)	1U	1U	1U	NT	NT	1U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	B1 08/03/2004 Primary	D 08/05/2004 Primary	J1 08/03/2004 Primary	K 08/03/2004 Primary	LW001S 08/03/2004 Primary	LW004S 08/05/2004 Primary
Trichloroethene	(ug/l)	1U	1U	1U	NT	NT	1U
Trichlorofluoromethane	(ug/l)	1U	1U	1U	NT	NT	1U
Vinyl Chloride	(ug/l)	1U	1U	1U	NT	NT	1U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW007S 08/03/2004 Primary	LW008S 08/05/2004 Primary	LW011S 08/05/2004 Primary	LW019S 08/09/2004 Primary	LW020S 08/09/2004 Primary	LW020S 08/09/2004 Duplicate 1
1,1,1,2-Tetrachloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,1-Trichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,2,2-Tetrachloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,2-Trichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,3-Trichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,3-Trichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,4-Trichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,4-Trimethylbenzene	(ug/l)	3.58	3.74	234J	1U	1U	1U
1,2-Dibromoethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,3,5-Trimethylbenzene	(ug/l)	4.78	1U	56.7J	1U	1U	1U
1,3-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,3-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,4-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
2,2-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
2-Butanone	(ug/l)	10U	10U	13J	10U	10U	10U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW007S 08/03/2004 Primary	LW008S 08/05/2004 Primary	LW011S 08/05/2004 Primary	LW019S 08/09/2004 Primary	LW020S 08/09/2004 Primary	LW020S 08/09/2004 Duplicate 1
2-Chlorotoluene	(ug/l)	1U	1U	1U	1U	1U	1U
2-Hexanone	(ug/l)	10U	10U	10U	10U	10U	10U
4-Chlorotoluene	(ug/l)	1U	1U	1U	1U	1U	1U
4-Isopropyltoluene	(ug/l)	1.81	1U	6.91J	1U	1U	1U
4-Methyl-2-Pentanone (MIBK)	(ug/l)	20U	20U	20U	20U	20U	20U
Acetone	(ug/l)	50U	50U	54J	50U	50U	50U
Acrylonitrile	(ug/l)	5U	5U	5U	5U	5U	5U
Benzene	(ug/l)	0.3U	1.86	9.79J	0.3U	0.3U	0.3U
Bromobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Bromochloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Bromodichloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Bromoform	(ug/l)	1U	1U	1U	1U	1U	1U
Bromomethane	(ug/l)	1U	1U	1U	1U	1U	1U
Carbon disulfide	(ug/l)	2U	2U	2U	2U	2U	2U
Carbon tetrachloride	(ug/l)	1U	1U	1U	1U	1U	1U
Chlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Chloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
Chloroform	(ug/l)	1U	1U	1U	1U	1U	1U
Chloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
cis-1,2-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
cis-1,3-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW007S 08/03/2004 Primary	LW008S 08/05/2004 Primary	LW011S 08/05/2004 Primary	LW019S 08/09/2004 Primary	LW020S 08/09/2004 Primary	LW020S 08/09/2004 Duplicate 1
Dibromochloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Dibromochloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
Dibromomethane	(ug/l)	1U	1U	1U	1U	1U	1U
Dichlorodifluoromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Ethylbenzene	(ug/l)	78.8	17.9	83.1J	1U	1U	1U
Hexachlorobutadiene	(ug/l)	1U	1U	1U	1U	1U	1U
Isopropylbenzene	(ug/l)	54.7	232	28.2J	7.65	8.52J	6.79J
m,p-Xylene	(ug/l)	33.2	2.31	126J	2U	2U	2U
Methyl tert-butyl ether	(ug/l)	1U	1U	1U	1U	1U	1U
Methylene chloride	(ug/l)	20U	20U	20U	20U	20U	20U
Naphthalene	(ug/l)	10.1	16.7	24.5J	1U	1U	1U
n-Butylbenzene	(ug/l)	3.74	10.1	5.42J	2	2.17	1.76
n-Propylbenzene	(ug/l)	62.9	183	30.5J	9.41	10.6	10.5
o-Xylene	(ug/l)	1.02	1.21	176J	1U	1U	1U
sec-Butylbenzene	(ug/l)	4.13	25.6	8.97J	4.62	5.55J	4.41J
Styrene	(ug/l)	1U	1U	1U	1U	1U	1U
tert-Butylbenzene	(ug/l)	1U	8.83	1.55J	1U	1U	1U
Tetrachloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
Toluene	(ug/l)	1U	1U	1U	1U	1U	1U
trans-1,2-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
trans-1,3-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW007S 08/03/2004 Primary	LW008S 08/05/2004 Primary	LW011S 08/05/2004 Primary	LW019S 08/09/2004 Primary	LW020S 08/09/2004 Primary	LW020S 08/09/2004 Duplicate 1
Trichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
Trichlorofluoromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Vinyl Chloride	(ug/l)	1U	1U	1U	1U	1U	1U

Landau Associates

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW029S 08/02/2004 Primary	LW030S 08/03/2004 Primary	LW031S 08/02/2004 Primary	LW032S 08/02/2004 Primary	LW033S 08/02/2004 Primary	LW034S 08/02/2004 Primary
1,1,1,2-Tetrachloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,1-Trichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,2,2-Tetrachloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,2-Trichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,3-Trichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,3-Trichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,4-Trichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,4-Trimethylbenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dibromoethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,3,5-Trimethylbenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,3-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,3-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,4-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
2,2-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
2-Butanone	(ug/l)	10U	10U	10U	10U	10U	10U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW029S 08/02/2004 Primary	LW030S 08/03/2004 Primary	LW031S 08/02/2004 Primary	LW032S 08/02/2004 Primary	LW033S 08/02/2004 Primary	LW034S 08/02/2004 Primary
2-Chlorotoluene	(ug/l)	1U	1U	1U	1U	1U	1U
2-Hexanone	(ug/l)	10U	10U	10U	10U	10U	10U
4-Chlorotoluene	(ug/l)	1U	1U	1U	1U	1U	1U
4-Isopropyltoluene	(ug/l)	1U	1U	1U	1U	1U	1U
4-Methyl-2-Pentanone (MIBK)	(ug/l)	20U	20U	20U	20U	20U	20U
Acetone	(ug/l)	50U	50U	50U	50U	50U	50U
Acrylonitrile	(ug/l)	5U	5U	5U	5U	5U	5U
Benzene	(ug/l)	0.3U	0.3U	0.3U	0.3U	0.3U	0.3U
Bromobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Bromochloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Bromodichloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Bromoform	(ug/l)	1U	1U	1U	1U	1U	1U
Bromomethane	(ug/l)	1U	1U	1U	1U	1U	1U
Carbon disulfide	(ug/l)	2U	2U	2U	2U	2U	2U
Carbon tetrachloride	(ug/l)	1U	1U	1U	1U	1U	1U
Chlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Chloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
Chloroform	(ug/l)	1U	1U	1U	1U	1U	1U
Chloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
cis-1,2-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
cis-1,3-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW029S 08/02/2004 Primary	LW030S 08/03/2004 Primary	LW031S 08/02/2004 Primary	LW032S 08/02/2004 Primary	LW033S 08/02/2004 Primary	LW034S 08/02/2004 Primary
Dibromochloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Dibromochloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
Dibromomethane	(ug/l)	1U	1U	1U	1U	1U	1U
Dichlorodifluoromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Ethylbenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Hexachlorobutadiene	(ug/l)	1U	1U	1U	1U	1U	1U
Isopropylbenzene	(ug/l)	1U	7.68J	1U	19.4J	1U	1U
m,p-Xylene	(ug/l)	2U	2U	2U	2U	2U	2U
Methyl tert-butyl ether	(ug/l)	1U	1U	1U	1U	1U	1U
Methylene chloride	(ug/l)	20U	20U	20U	20U	20U	20U
Naphthalene	(ug/l)	1U	1U	1U	1U	1U	1U
n-Butylbenzene	(ug/l)	1U	3.46J	1U	8.47J	1U	1U
n-Propylbenzene	(ug/l)	1U	27.8J	1U	20.5J	1U	1U
o-Xylene	(ug/l)	1U	1U	1U	1U	1U	1U
sec-Butylbenzene	(ug/l)	1U	2.48J	1U	8.65J	1U	1U
Styrene	(ug/l)	1U	1U	1U	1U	1U	1U
tert-Butylbenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Tetrachloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
Toluene	(ug/l)	1U	1U	1U	1U	1U	1U
trans-1,2-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
trans-1,3-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U

TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW029S 08/02/2004 Primary	LW030S 08/03/2004 Primary	LW031S 08/02/2004 Primary	LW032S 08/02/2004 Primary	LW033S 08/02/2004 Primary	LW034S 08/02/2004 Primary
Trichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
Trichlorofluoromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Vinyl Chloride	(ug/l)	1U	1U	1U	1U	1U	1U

TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	N 08/10/2004 Primary	OX001S 08/04/2004 Primary	OX002S 08/04/2004 Primary	OX003S 08/04/2004 Primary	OX004S 08/04/2004 Primary	OX005S 08/04/2004 Primary
1,1,1,2-Tetrachloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,1-Trichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,2,2-Tetrachloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,2-Trichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,3-Trichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,3-Trichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,4-Trichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,4-Trimethylbenzene	(ug/l)	518	231J	233J	360	532	1U
1,2-Dibromoethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,3,5-Trimethylbenzene	(ug/l)	124	83J	72.3J	113	141	1U
1,3-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,3-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,4-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
2,2-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
2-Butanone	(ug/l)	10U	10U	11.3J	27	18.8	10U

BZTO104(e)024002

TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE	N	OX001S	OX002S	OX003S	OX004S	OX005S
	DATE	08/10/2004	08/04/2004	08/04/2004	08/04/2004	08/04/2004	08/04/2004
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
2-Chlorotoluene	(ug/l)	1U	1U	1U	1U	1U	1U
2-Hexanone	(ug/l)	10U	10U	10U	10U	10U	10U
4-Chlorotoluene	(ug/l)	1U	1U	1U	1U	1U	1U
4-Isopropyltoluene	(ug/l)	5.33	6.84J	9.35J	12.5	15.4	1U
4-Methyl-2-Pentanone (MIBK)	(ug/l)	20U	20U	20U	20U	20U	20U
Acetone	(ug/l)	50U	50U	108J	78.2	157	50U
Acrylonitrile	(ug/l)	5U	5U	5U	5U	5U	5U
Benzene	(ug/l)	424	118J	5.3J	156	77	0.3U
Bromobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Bromochloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Bromodichloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Bromoform	(ug/l)	1U	1U	1U	1U	1U	1U
Bromomethane	(ug/l)	1U	1U	1U	1U	1U	1U
Carbon disulfide	(ug/l)	2U	2U	3.32J	3.34	2U	2U
Carbon tetrachloride	(ug/l)	1U	1U	1U	1U	1U	1U
Chlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Chloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
Chloroform	(ug/l)	1U	1U	1U	1U	1U	1U
Chloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
cis-1,2-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
cis-1,3-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	N 08/10/2004 Primary	OX001S 08/04/2004 Primary	OX002S 08/04/2004 Primary	OX003S 08/04/2004 Primary	OX004S 08/04/2004 Primary	OX005S 08/04/2004 Primary
Dibromochloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Dibromochloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
Dibromomethane	(ug/l)	1U	1U	1U	1U	1U	1U
Dichlorodifluoromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Ethylbenzene	(ug/l)	744	163J	74.7J	250	303	1U
Hexachlorobutadiene	(ug/l)	1U	1U	1U	1U	1U	1U
Isopropylbenzene	(ug/l)	61.6	48.7J	39.4J	79.1	88.2	1U
m,p-Xylene	(ug/l)	904	466J	89.7J	605	324	2U
Methyl tert-butyl ether	(ug/l)	1U	1U	1U	1U	1U	1U
Methylene chloride	(ug/l)	20U	20U	20U	20U	20U	20U
Naphthalene	(ug/l)	112	17.7J	21.6J	50.4	66	1U
n-Butylbenzene	(ug/l)	5.14	4.21J	6.37J	8.92	10.8	1U
n-Propylbenzene	(ug/l)	102	47.8J	40.7J	78.4	114	1U
o-Xylene	(ug/l)	446	161J	137J	295	336	1U
sec-Butylbenzene	(ug/l)	4.72	8.09J	13.6J	13	14.6	1U
Styrene	(ug/l)	1U	1U	1U	1U	1U	1U
tert-Butylbenzene	(ug/l)	1U	1.63J	2.14J	2.34	2.82	1U
Tetrachloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
Toluene	(ug/l)	92.3	8.87J	1.38J	21.6	6.91	1U
trans-1,2-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
trans-1,3-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	N 08/10/2004 Primary	OX001S 08/04/2004 Primary	OX002S 08/04/2004 Primary	OX003S 08/04/2004 Primary	OX004S 08/04/2004 Primary	OX005S 08/04/2004 Primary
Trichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
Trichlorofluoromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Vinyl Chloride	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	OX006S 08/04/2004 Primary	OX006S 08/04/2004 Duplicate 1	OX007S 08/04/2004 Primary	OX008S 08/04/2004 Primary	OX009S 08/05/2004 Primary	Q 08/09/2004 Primary
1,1,1,2-Tetrachloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,1-Trichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,2,2-Tetrachloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,2-Trichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,3-Trichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,3-Trichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,4-Trichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,4-Trimethylbenzene	(ug/l)	77.6J	75.9J	54.2J	101J	1U	3.47
1,2-Dibromoethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,3,5-Trimethylbenzene	(ug/l)	10.9J	11.9J	7.29J	33.6J	1U	3.73
1,3-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,3-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,4-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
2,2-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
2-Butanone	(ug/l)	10U	10U	10U	10U	10U	10U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	OX006S 08/04/2004 Primary	OX006S 08/04/2004 Duplicate 1	OX007S 08/04/2004 Primary	OX008S 08/04/2004 Primary	OX009S 08/05/2004 Primary	Q 08/09/2004 Primary
2-Chlorotoluene	(ug/l)	1U	1U	1U	1U	1U	1U
2-Hexanone	(ug/l)	10U	10U	10U	10U	10U	10U
4-Chlorotoluene	(ug/l)	1U	1U	1U	1U	1U	1U
4-Isopropyltoluene	(ug/l)	3.4J	3.74J	1.42J	4.85J	1U	1U
4-Methyl-2-Pentanone (MIBK)	(ug/l)	20U	20U	20U	20U	20U	20U
Acetone	(ug/l)	50U	50U	50U	50U	50U	50U
Acrylonitrile	(ug/l)	5U	5U	5U	5U	5U	5U
Benzene	(ug/l)	0.3U	0.3U	0.3U	0.3U	0.3U	1030
Bromobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Bromochloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Bromodichloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Bromoform	(ug/l)	1U	1U	1U	1U	1U	1U
Bromomethane	(ug/l)	1U	1U	1U	1U	1U	1U
Carbon disulfide	(ug/l)	2U	2U	2U	2U	2U	2U
Carbon tetrachloride	(ug/l)	1U	1U	1U	1U	1U	1U
Chlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Chloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
Chloroform	(ug/l)	1U	1U	1U	1U	1U	1U
Chloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
cis-1,2-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
cis-1,3-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	OX006S 08/04/2004 Primary	OX006S 08/04/2004 Duplicate 1	OX007S 08/04/2004 Primary	OX008S 08/04/2004 Primary	OX009S 08/05/2004 Primary	Q 08/09/2004 Primary
Dibromochloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Dibromochloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
Dibromomethane	(ug/l)	1U	1U	1U	1U	1U	1U
Dichlorodifluoromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Ethylbenzene	(ug/l)	1U	1.19J	1.18J	4.15J	1U	12.1
Hexachlorobutadiene	(ug/l)	1U	1U	1U	1U	1U	1U
Isopropylbenzene	(ug/l)	2.23J	2.43J	1.62J	12.4J	1U	78.4
m,p-Xylene	(ug/l)	2U	2U	2U	2.84J	2U	27.4
Methyl tert-butyl ether	(ug/l)	1U	1U	1U	1U	1U	1U
Methylene chloride	(ug/l)	20U	20U	20U	20U	20U	20U
Naphthalene	(ug/l)	3.92J	4.48J	4.89J	6.53J	1U	1U
n-Butylbenzene	(ug/l)	2.1J	2.31J	1.25J	4.94J	1U	9.01
n-Propylbenzene	(ug/l)	4.69J	5.33J	3.26J	15.3J	1U	116
o-Xylene	(ug/l)	3.11J	3.36J	3.76J	18.8J	1U	8.17
sec-Butylbenzene	(ug/l)	8.04J	7.9J	3.37J	19.2J	1U	8.81
Styrene	(ug/l)	1U	1U	1U	1U	1U	1U
tert-Butylbenzene	(ug/l)	1U	1U	1U	2.12J	1U	1U
Tetrachloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
Toluene	(ug/l)	1U	1U	1U	1U	1U	21.2
trans-1,2-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
trans-1,3-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	OX006S 08/04/2004 Primary	OX006S 08/04/2004 Duplicate 1	OX007S 08/04/2004 Primary	OX008S 08/04/2004 Primary	OX009S 08/05/2004 Primary	Q 08/09/2004 Primary
Trichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
Trichlorofluoromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Vinyl Chloride	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	RW1 08/04/2004 Primary
1,1,1,2-Tetrachloroethane	(ug/l)	1U
1,1,1-Trichloroethane	(ug/l)	1U
1,1,2,2-Tetrachloroethane	(ug/l)	1U
1,1,2-Trichloroethane	(ug/l)	1U
1,1-Dichloroethane	(ug/l)	1U
1,1-Dichloroethene	(ug/l)	1U
1,1-Dichloropropene	(ug/l)	1U
1,2,3-Trichlorobenzene	(ug/l)	1U
1,2,3-Trichloropropane	(ug/l)	1U
1,2,4-Trichlorobenzene	(ug/l)	1U
1,2,4-Trimethylbenzene	(ug/l)	349J
1,2-Dibromoethane	(ug/l)	1U
1,2-Dichlorobenzene	(ug/l)	1U
1,2-Dichloroethane	(ug/l)	1U
1,2-Dichloropropane	(ug/l)	1U
1,3,5-Trimethylbenzene	(ug/l)	83.8J
1,3-Dichlorobenzene	(ug/l)	1U
1,3-Dichloropropane	(ug/l)	1U
1,4-Dichlorobenzene	(ug/l)	1U
2,2-Dichloropropane	(ug/l)	1U
2-Butanone	(ug/l)	10U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE	RW1
	DATE	08/04/2004
	RESULT TYPE	Primary
2-Chlorotoluene	(ug/l)	1U
2-Hexanone	(ug/l)	10U
4-Chlorotoluene	(ug/l)	1U
4-Isopropyltoluene	(ug/l)	6.33J
4-Methyl-2-Pentanone (MIBK)	(ug/l)	20U
Acetone	(ug/l)	50U
Acrylonitrile	(ug/l)	5U
Benzene	(ug/l)	8.67J
Bromobenzene	(ug/l)	1U
Bromochloromethane	(ug/l)	1U
Bromodichloromethane	(ug/l)	1U
Bromoform	(ug/l)	1U
Bromomethane	(ug/l)	1U
Carbon disulfide	(ug/l)	2U
Carbon tetrachloride	(ug/l)	1U
Chlorobenzene	(ug/l)	1U
Chloroethane	(ug/l)	1U
Chloroform	(ug/l)	1U
Chloromethane	(ug/l)	1U
cis-1,2-Dichloroethene	(ug/l)	1U
cis-1,3-Dichloropropene	(ug/l)	1U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	RW1 08/04/2004 Primary
Dibromochloromethane	(ug/l)	1U
Dibromochloropropane	(ug/l)	1U
Dibromomethane	(ug/l)	1U
Dichlorodifluoromethane	(ug/l)	1U
Ethylbenzene	(ug/l)	192J
Hexachlorobutadiene	(ug/l)	1U
Isopropylbenzene	(ug/l)	75.2J
m,p-Xylene	(ug/l)	299J
Methyl tert-butyl ether	(ug/l)	1U
Methylene chloride	(ug/l)	20U
Naphthalene	(ug/l)	17.6J
n-Butylbenzene	(ug/l)	3.86J
n-Propylbenzene	(ug/l)	58J
o-Xylene	(ug/l)	294J
sec-Butylbenzene	(ug/l)	12.3J
Styrene	(ug/l)	1U
tert-Butylbenzene	(ug/l)	2.29J
Tetrachloroethene	(ug/l)	1U
Toluene	(ug/l)	1.6J
trans-1,2-Dichloroethene	(ug/l)	1U
trans-1,3-Dichloropropene	(ug/l)	1U

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TABLE A-3c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE	RW1
	DATE	08/04/2004
	RESULT TYPE	Primary
Trichloroethene	(ug/l)	1U
Trichlorofluoromethane	(ug/l)	1U
Vinyl Chloride	(ug/l)	1U

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TABLE A-3d
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
TOTAL PETROLEUM HYDROCARBONS (NWTPH)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	B1 08/03/2004 Primary	K 08/03/2004 Primary	LW001S 08/03/2004 Primary	LW004S 08/05/2004 Primary	LW007S 08/03/2004 Primary	LW008S 08/05/2004 Primary
Diesel Range Hydrocarbons	(mg/l)	0.978	NT	NT	0.256U	0.516	5.15
Gasoline Range Hydrocarbons	(ug/l)	652	100U	100U	NT	1730	4440
TPH-Motor Oil Range	(mg/l)	0.503U	NT	NT	0.511U	0.501U	0.488U

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TABLE A-3d
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
TOTAL PETROLEUM HYDROCARBONS (NWTPH)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW019S 08/09/2004 Primary	LW020S 08/09/2004 Primary	LW020S 08/09/2004 Duplicate 1	LW029S 08/02/2004 Primary	LW030S 08/03/2004 Primary	LW031S 08/02/2004 Primary
Diesel Range Hydrocarbons	(mg/l)	6.15	9.21	8.43	0.337	1.44	0.576
Gasoline Range Hydrocarbons	(ug/l)	786	783	676	100U	719	100U
TPH-Motor Oil Range	(mg/l)	0.5U	0.511U	0.528U	0.481U	0.493U	0.475U

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TABLE A-3d
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
TOTAL PETROLEUM HYDROCARBONS (NWTPH)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW032S 08/02/2004 Primary	LW033S 08/02/2004 Primary	LW034S 08/02/2004 Primary	N 08/10/2004 Primary	Q 08/09/2004 Primary	RW1 08/04/2004 Primary
Diesel Range Hydrocarbons	(mg/l)	4.24	0.241U	0.242U	7.65	5.56	6.12
Gasoline Range Hydrocarbons	(ug/l)	1330	100U	100U	12000	2880	5480
TPH-Motor Oil Range	(mg/l)	0.488U	0.482U	0.483U	0.501U	0.495U	0.51U

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TABLE A-3e
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
PRIORITY POLLUTANT METALS (SW6000)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	B1 08/03/2004 Primary	D 08/05/2004 Primary	J1 08/03/2004 Primary	LW004S 08/05/2004 Primary	LW007S 08/03/2004 Primary	LW008S 08/05/2004 Primary
Arsenic	(ug/l)	6.36	18.5	11.4	1U	14.3	22.3
Chromium	(mg/l)	0.005U	0.019	0.0188	0.005U	0.0146	0.005U
Copper	(mg/l)	0.01U	0.01U	0.01U	0.01U	0.01U	0.01U
Ferrous Iron	(mg/l)	NT	NT	NT	NT	NT	NT
Lead	(ug/l)	0.1U	0.1U	0.317	0.1U	0.792	0.1U
Nickel	(mg/l)	0.005U	0.005U	0.005U	0.005U	0.005U	0.005U
Selenium	(mg/l)	NT	NT	NT	NT	NT	NT
Zinc	(mg/l)	0.0166	0.01U	0.0121	0.01U	0.01U	0.01U

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TABLE A-3e
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
PRIORITY POLLUTANT METALS (SW6000)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW011S 08/05/2004 Primary	LW019S 08/09/2004 Primary	LW020S 08/09/2004 Primary	LW020S 08/09/2004 Duplicate 1	LW029S 08/02/2004 Primary	LW030S 08/03/2004 Primary
Arsenic	(ug/l)	3.33	40.6	31.7	31	2.69	16.3
Chromium	(mg/l)	0.0161	0.0158	0.014	0.0176	0.0171	0.0147
Copper	(mg/l)	0.01U	0.159	0.605	0.01U	0.01U	0.01U
Ferrous Iron	(mg/l)	31.2	NT	NT	NT	NT	NT
Lead	(ug/l)	0.1U	0.177	0.1U	0.1U	0.1U	0.79
Nickel	(mg/l)	0.005U	0.005U	0.005U	0.005U	0.005U	0.005U
Selenium	(mg/l)	0.02U	NT	NT	NT	NT	NT
Zinc	(mg/l)	0.01U	0.01U	0.01U	0.0211	0.01U	0.01U

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TABLE A-3e
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
PRIORITY POLLUTANT METALS (SW6000)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW031S 08/02/2004 Primary	LW032S 08/02/2004 Primary	LW033S 08/02/2004 Primary	LW034S 08/02/2004 Primary	N 08/10/2004 Primary	OX001S 08/04/2004 Primary
Arsenic	(ug/l)	1.48	31.4	1U	1U	37.3	8.38
Chromium	(mg/l)	0.0138	0.0125	0.005U	0.0116	0.0165	0.0177
Copper	(mg/l)	0.01U	0.01U	0.01U	0.01U	0.01U	0.01U
Ferrous Iron	(mg/l)	NT	NT	NT	NT	NT	25
Lead	(ug/l)	0.1U	0.1U	0.1U	0.1U	7.33	0.113
Nickel	(mg/l)	0.005U	0.005U	0.005U	0.005U	0.005U	0.0061
Selenium	(mg/l)	NT	NT	NT	NT	NT	0.02U
Zinc	(mg/l)	0.01U	0.01U	0.01U	0.0133	0.0193	0.01U

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TABLE A-3e
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
PRIORITY POLLUTANT METALS (SW6000)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE	OX002S	OX003S	OX004S	OX005S	OX006S	OX006S
	DATE	08/04/2004	08/04/2004	08/04/2004	08/04/2004	08/04/2004	08/04/2004
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Duplicate 1
Arsenic	(ug/l)	7.52	14.8	13.7	14	13	12.7
Chromium	(mg/l)	0.005U	0.0159	0.005U	0.0155	0.0127	0.0142
Copper	(mg/l)	0.01U	0.01U	0.01U	0.01U	0.01U	0.01U
Ferrous Iron	(mg/l)	34.8	33.4	49.9	17.3	21.4	21
Lead	(ug/l)	0.258	0.426	1.07	0.1U	0.1U	0.1U
Nickel	(mg/l)	0.005U	0.0435	0.0099	0.005U	0.005U	0.005U
Selenium	(mg/l)	0.02U	0.02U	0.02U	0.02U	0.02U	0.02U
Zinc	(mg/l)	0.01U	0.019	0.0114	0.01U	0.01U	0.01U

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TABLE A-3e
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
PRIORITY POLLUTANT METALS (SW6000)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	OX007S 08/04/2004 Primary	OX008S 08/04/2004 Primary	OX009S 08/05/2004 Primary	Q 08/09/2004 Primary	RW1 08/04/2004 Primary
Arsenic	(ug/l)	14	23.3	4.4	34	6
Chromium	(mg/l)	0.0139	0.0123	0.0156	0.017	0.005U
Copper	(mg/l)	0.01U	0.01U	0.01U	0.01U	0.01U
Ferrous Iron	(mg/l)	24	30.1	0.356	NT	37.6
Lead	(ug/l)	0.1U	0.1U	0.1U	7.35	0.111
Nickel	(mg/l)	0.005U	0.005U	0.005U	0.005U	0.005U
Selenium	(mg/l)	0.02U	0.02U	0.02U	NT	0.02U
Zinc	(mg/l)	0.01U	0.01U	0.01U	0.01U	0.0244

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TABLE A-3f
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
CONVENTIONALS AND FIELD PARAMETERS
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	B1 08/03/2004 Primary	D 08/05/2004 Primary	J1 08/03/2004 Primary	K 08/03/2004 Primary	LW001S 08/03/2004 Primary	LW004S 08/05/2004 Primary
Chloride	(mg/l)	3.63	3.52	4.13	NT	NT	15.5
Dissolved Oxygen	(mg/l)	NT	2.21	NT	NT	NT	2.66
pH	(s.u.)	7.5	6.12	7.68	6.93	6.55	5.89
Redox	(mv)	NT	NT	NT	NT	NT	NT
Specific Conductivity	(us)	361	630	551	292	269	438
Temperature	(c)	15.8	14.9	17.1	16	16.7	15.2
Total Dissolved Solids	(mg/l)	215	308	276	NT	NT	244
Turbidity	(ntu)	35	11	39	19	23	11

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TABLE A-3f
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
CONVENTIONALS AND FIELD PARAMETERS
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW007S 08/03/2004 Primary	LW008S 08/05/2004 Primary	LW011S 08/05/2004 Primary	LW013S 08/05/2004 Primary	LW019S 08/09/2004 Primary	LW020S 08/09/2004 Primary
Chloride	(mg/l)	3.43	3.24	3.59	NT	0.5U	0.5U
Dissolved Oxygen	(mg/l)	NT	1.71	1.68	4.6	2.69	1.51
pH	(s.u.)	7.68	5.86	5.78	5.86	6.01	5.94
Redox	(mv)	NT	NT	-7	NT	NT	NT
Specific Conductivity	(us)	451	523	585	267	781	717
Temperature	(c)	16.1	16.5	15.6	14.2	14.7	16.9
Total Dissolved Solids	(mg/l)	265	709	356	NT	152	242
Turbidity	(ntu)	20	14	7	8	14	16

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TABLE A-3f
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
CONVENTIONALS AND FIELD PARAMETERS
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW020S 08/09/2004 Duplicate 1	LW029S 08/02/2004 Primary	LW030S 08/03/2004 Primary	LW031S 08/02/2004 Primary	LW032S 08/02/2004 Primary	LW033S 08/02/2004 Primary
Chloride	(mg/l)	0.5U	1.4	1.2	2.96	27	2.19
Dissolved Oxygen	(mg/l)	2.13	NT	2.24	NT	NT	NT
pH	(s.u.)	5.94	5.72	6.06	5.7	6.09	5.23
Redox	(mv)	NT	NT	NT	NT	NT	NT
Specific Conductivity	(us)	718	151	298	215	637	235
Temperature	(c)	16.4	15.4	15.5	15.2	14.4	16.8
Total Dissolved Solids	(mg/l)	247	79	199	100	290	100
Turbidity	(ntu)	16	45	27	41	44	30

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TABLE A-3f
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
CONVENTIONALS AND FIELD PARAMETERS
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW034S 08/02/2004 Primary	N 08/10/2004 Primary	OX001S 08/04/2004 Primary	OX002S 08/04/2004 Primary	OX003S 08/04/2004 Primary	OX004S 08/04/2004 Primary
Chloride	(mg/l)	2.98	1.68	2.52	2.81	3.73	3.42
Dissolved Oxygen	(mg/l)	NT	1.65	2.2	1.82	1.4	3.44
pH	(s.u.)	6.41	5.61	5.83	5.96	5.85	6.07
Redox	(mv)	NT	NT	12	-24	-4	-19
Specific Conductivity	(us)	303	664	351	624	592	813
Temperature	(c)	15	16.7	16	15.6	18	16.6
Total Dissolved Solids	(mg/l)	149	278	210	358	461	456
Turbidity	(ntu)	18	17	17	16	18	21

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TABLE A-3f
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
CONVENTIONALS AND FIELD PARAMETERS
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	OX005S 08/04/2004 Primary	OX006S 08/04/2004 Primary	OX006S 08/04/2004 Duplicate 1	OX007S 08/04/2004 Primary	OX008S 08/04/2004 Primary	OX009S 08/05/2004 Primary
Chloride	(mg/l)	3.19	3.13	3.07	2.91	4.12	3.56
Dissolved Oxygen	(mg/l)	2.63	2.6	2.28	3.6	2.67	2.33
pH	(s.u.)	5.96	5.93	5.91	5.88	5.94	5.83
Redox	(mv)	55	11	-6	-6	-29	22
Specific Conductivity	(us)	510	517	517	489	566	365
Temperature	(c)	15.6	15.8	16.2	15.7	16.1	15.5
Total Dissolved Solids	(mg/l)	276	284	277	241	315	201
Turbidity	(ntu)	5	9	7	23	6	6

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TABLE A-3f
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
CONVENTIONALS AND FIELD PARAMETERS
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	Q 08/09/2004 Primary	RIVER_OUTFALL 08/09/2004 Primary	RW1 08/04/2004 Primary
Chloride	(mg/l)	2.1	NT	4.89
Dissolved Oxygen	(mg/l)	1.90	8.56	2.29
pH	(s.u.)	6.06	5.97	6.04
Redox	(mv)	NT	NT	-18
Specific Conductivity	(us)	866	295	750
Temperature	(c)	15.8	14.7	17
Total Dissolved Solids	(mg/l)	338	NT	495
Turbidity	(ntu)	9	35	38

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TABLE A-3g
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DIOXINS AND FURANS (SW8290)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	OX002S 08/04/2004	OX006S 08/04/2004	RW1 08/04/2004
1,2,3,4,6,7,8-HpCDD	(ng/l)	1.222349	0.381169	0.031308
1,2,3,4,6,7,8-HpCDF	(ng/l)	0.189857	0.059996	0.005138U
1,2,3,4,7,8,9-HpCDF	(ng/l)	0.013672J	0.007017J	0.011046J
1,2,3,4,7,8-HxCDD	(ng/l)	0.00237U	0.002125U	0.002938U
1,2,3,4,7,8-HxCDF	(ng/l)	0.006922J	0.005124J	0.005188J
1,2,3,6,7,8-HxCDD	(ng/l)	0.030842	0.014629J	0.002518U
1,2,3,6,7,8-HxCDF	(ng/l)	0.003692J	0.001659U	0.005326U
1,2,3,7,8,9-HxCDD	(ng/l)	0.002173U	0.001949U	0.002694U
1,2,3,7,8,9-HxCDF	(ng/l)	0.001753U	0.002002U	0.002386U
1,2,3,7,8-PeCDD	(ng/l)	0.002569U	0.002223U	0.002557U
1,2,3,7,8-PeCDF	(ng/l)	0.001628U	0.001565U	0.005954U
2,3,4,6,7,8-HxCDF	(ng/l)	0.004637J	0.001727U	0.002058U
2,3,4,7,8-PeCDF	(ng/l)	0.001557U	0.001496U	0.001846U
2,3,7,8-TCDD	(ng/l)	0.002202U	0.001655U	0.00189U
2,3,7,8-TCDF	(ng/l)	0.001855U	0.001308U	0.002108U
OCDD	(ng/l)	9.445627	1.997929	0.429978
OCDF	(ng/l)	0.901706	0.244329	0.029711J
Total HpCDD	(ng/l)	1.891967	0.588687	0.061732
Total HpCDF	(ng/l)	0.913668	0.325386	0.031417
Total HxCDD	(ng/l)	0.062692	0.037485	0.011911
Total HxCDF	(ng/l)	0.232308	0.117654	0.018357

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TABLE A-3g
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DIOXINS AND FURANS (SW8290)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	OX002S 08/04/2004	OX006S 08/04/2004	RW1 08/04/2004
Total PeCDD	(ng/l)	0.002569U	0.002223U	0.002557U
Total PeCDF	(ng/l)	0.021311	0.001496U	0.009166
Total TCDD	(ng/l)	0.002202U	0.001655U	0.00189U
Total TCDF	(ng/l)	0.001855U	0.001308U	0.016418
Total TEQ	(ng/l)	0.02922	0.008699	0.001402

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TABLE A-4a
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	B2 08/03/2004	J2 08/03/2004	LW003D 08/06/2004	LW006D 08/06/2004	LW009D 08/06/2004	LW010D 08/06/2004
Acenaphthene	(ug/l)	NT	NT	NT	NT	NT	NT
Acenaphthylene	(ug/l)	NT	NT	NT	NT	NT	NT
Anthracene	(ug/l)	NT	NT	NT	NT	NT	NT
Benzo(a)anthracene	(ug/l)	NT	NT	NT	NT	NT	NT
Benzo(a)pyrene	(ug/l)	NT	NT	NT	NT	NT	NT
Benzo(b)fluoranthene	(ug/l)	NT	NT	NT	NT	NT	NT
Benzo(ghi)perylene	(ug/l)	NT	NT	NT	NT	NT	NT
Benzo(k)fluoranthene	(ug/l)	NT	NT	NT	NT	NT	NT
Chrysene	(ug/l)	NT	NT	NT	NT	NT	NT
Dibenzo(a,h)anthracene	(ug/l)	NT	NT	NT	NT	NT	NT
Fluoranthene	(ug/l)	NT	NT	NT	NT	NT	NT
Fluorene	(ug/l)	NT	NT	NT	NT	NT	NT
Indeno(1,2,3-cd)pyrene	(ug/l)	NT	NT	NT	NT	NT	NT
Naphthalene	(ug/l)	NT	NT	NT	NT	NT	NT
Pentachlorophenol	(ug/l)	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U
Phenanthrene	(ug/l)	NT	NT	NT	NT	NT	NT
Pyrene	(ug/l)	NT	NT	NT	NT	NT	NT

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TABLE A-4a
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	LW011D 08/06/2004	LW014D 08/05/2004	LW016D 08/05/2004	LW017D 08/06/2004	LW018D 08/06/2004	LW020D 08/09/2004
Acenaphthene	(ug/l)	NT	NT	NT	NT	NT	0.11
Acenaphthylene	(ug/l)	NT	NT	NT	NT	NT	0.0502U
Anthracene	(ug/l)	NT	NT	NT	NT	NT	0.0502U
Benzo(a)anthracene	(ug/l)	NT	NT	NT	NT	NT	0.0502U
Benzo(a)pyrene	(ug/l)	NT	NT	NT	NT	NT	0.0502U
Benzo(b)fluoranthene	(ug/l)	NT	NT	NT	NT	NT	0.0502U
Benzo(ghi)perylene	(ug/l)	NT	NT	NT	NT	NT	0.0502U
Benzo(k)fluoranthene	(ug/l)	NT	NT	NT	NT	NT	0.0502U
Chrysene	(ug/l)	NT	NT	NT	NT	NT	0.0502U
Dibenzo(a,h)anthracene	(ug/l)	NT	NT	NT	NT	NT	0.0502U
Fluoranthene	(ug/l)	NT	NT	NT	NT	NT	0.0502U
Fluorene	(ug/l)	NT	NT	NT	NT	NT	0.0602
Indeno(1,2,3-cd)pyrene	(ug/l)	NT	NT	NT	NT	NT	0.0502U
Naphthalene	(ug/l)	NT	NT	NT	NT	NT	0.1
Pentachlorophenol	(ug/l)	0.5U	0.5U	0.5U	0.5U	0.5U	NT
Phenanthrene	(ug/l)	NT	NT	NT	NT	NT	0.0502U
Pyrene	(ug/l)	NT	NT	NT	NT	NT	0.0502U

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TABLE A-4a
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	LW022D 08/09/2004	LW023D 08/09/2004	LW024D 08/09/2004	LW025D 08/09/2004	LW026D 08/10/2004	LW027D 08/09/2004
Acenaphthene	(ug/l)	0.052U	0.86	1.39	1.16	0.0498U	0.104
Acenaphthylene	(ug/l)	0.052U	0.123	0.517	0.211	0.0498U	0.0522U
Anthracene	(ug/l)	0.052U	0.0512U	0.146	0.289	0.0498U	0.0522U
Benzo(a)anthracene	(ug/l)	0.052U	0.0512U	0.0487U	0.0667	0.0498U	0.0522U
Benzo(a)pyrene	(ug/l)	0.052U	0.0512U	0.0487U	0.0556U	0.0498U	0.0522U
Benzo(b)fluoranthene	(ug/l)	0.052U	0.0512U	0.0487U	0.0556U	0.0498U	0.0522U
Benzo(ghi)perylene	(ug/l)	0.052U	0.0512U	0.0487U	0.0556U	0.0498U	0.0522U
Benzo(k)fluoranthene	(ug/l)	0.052U	0.0512U	0.0487U	0.0556U	0.0498U	0.0522U
Chrysene	(ug/l)	0.052U	0.0512U	0.0487U	0.0556U	0.0498U	0.0522U
Dibenzo(a,h)anthracene	(ug/l)	0.052U	0.0512U	0.0487U	0.0556U	0.0498U	0.0522U
Fluoranthene	(ug/l)	0.052U	0.0716	0.205	0.478	0.0498U	0.0522U
Fluorene	(ug/l)	0.166	0.246	2.65	1.98	0.129	0.146
Indeno(1,2,3-cd)pyrene	(ug/l)	0.052U	0.0512U	0.0487U	0.0556U	0.0498U	0.0522U
Naphthalene	(ug/l)	0.052U	0.409	0.409	0.478	0.0498U	0.104
Pentachlorophenol	(ug/l)	NT	NT	NT	NT	NT	NT
Phenanthrene	(ug/l)	0.052U	0.102	1.72	0.945	0.0498U	0.0522U
Pyrene	(ug/l)	0.052U	0.0716	0.127	0.4	0.0498U	0.0522U

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TABLE A-4a
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
PAHS AND PENTACHLOROPHENOL (SW8270SIM)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE	LW029D 08/02/2004	LW030D 08/03/2004	LW032D 08/02/2004	LW035D 08/09/2004
Acenaphthene	(ug/l)	0.05U	0.05U	0.05U	0.0487U
Acenaphthylene	(ug/l)	0.05U	0.05U	0.05U	0.0584
Anthracene	(ug/l)	0.05U	0.05U	0.05U	0.0487U
Benzo(a)anthracene	(ug/l)	0.05U	0.05U	0.05U	0.0487U
Benzo(a)pyrene	(ug/l)	0.05U	0.05U	0.05U	0.0487U
Benzo(b)fluoranthene	(ug/l)	0.05U	0.05U	0.05U	0.0487U
Benzo(ghi)perylene	(ug/l)	0.05U	0.05U	0.05U	0.0487U
Benzo(k)fluoranthene	(ug/l)	0.05U	0.05U	0.05U	0.0487U
Chrysene	(ug/l)	0.05U	0.05U	0.05U	0.0487U
Dibenzo(a,h)anthracene	(ug/l)	0.05U	0.05U	0.05U	0.0487U
Fluoranthene	(ug/l)	0.05U	0.05U	0.05U	0.0487U
Fluorene	(ug/l)	0.05U	0.05U	0.05U	0.477
Indeno(1,2,3-cd)pyrene	(ug/l)	0.05U	0.05U	0.05U	0.0487U
Naphthalene	(ug/l)	0.05U	0.05U	0.07	0.0487U
Pentachlorophenol	(ug/l)	NT	NT	NT	NT
Phenanthrene	(ug/l)	0.05U	0.05U	0.05U	0.0487U
Pyrene	(ug/l)	0.05U	0.05U	0.05U	0.0487U

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BZTO104(e)024033

TABLE A-4b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	B2 08/03/2004 Primary	G1A 08/06/2004 Primary	J2 08/03/2004 Primary	LW003D 08/06/2004 Primary	LW006D 08/06/2004 Primary	LW009D 08/06/2004 Primary
1,2,4-Trichlorobenzene	(ug/l)	1U	1U	1.01U	1U	1U	1U
1,2-Dichlorobenzene	(ug/l)	1U	1U	1.01U	1U	1U	1U
1,3-Dichlorobenzene	(ug/l)	1U	1U	1.01U	1U	1U	1U
1,4-Dichlorobenzene	(ug/l)	1U	1U	1.01U	1U	1U	1U
2,4,5-Trichlorophenol	(ug/l)	5.02U	5U	5.04U	5U	5U	5U
2,4,6-Trichlorophenol	(ug/l)	5.02U	5U	5.04U	5U	5U	5U
2,4-Dichlorophenol	(ug/l)	3.01U	3U	3.02U	3U	3U	3U
2,4-Dimethylphenol	(ug/l)	3.01U	3U	3.02U	3U	3U	3U
2,4-Dinitrophenol	(ug/l)	10U	10U	10.1U	10U	10U	10U
2,4-Dinitrotoluene	(ug/l)	5.02U	5U	5.04U	5U	5U	5U
2,6-Dinitrotoluene	(ug/l)	5.02U	5U	5.04U	5U	5U	5U
2-Chloronaphthalene	(ug/l)	1U	1U	1.01U	1U	1U	1U
2-Chlorophenol	(ug/l)	1U	1U	1.01U	1U	1U	1U
2-Methylnaphthalene	(ug/l)	1U	1U	1.01U	1U	1U	1U
2-Methylphenol	(ug/l)	2.01U	2U	2.01U	2U	2U	2U
2-Nitroaniline	(ug/l)	5.02U	5U	5.04U	5U	5U	5U
2-Nitrophenol	(ug/l)	5.02U	5U	5.04U	5U	5U	5U
3- & 4-Methylphenol	(ug/l)	10U	10U	10.1U	10U	10U	10U
3,3-Dichlorobenzidine	(ug/l)	5.02U	5U	5.04U	5U	5U	5U
3-Nitroaniline	(ug/l)	6.02U	6U	6.04U	6U	6U	6U
4,6-Dinitro-2-Methylphenol	(ug/l)	10U	10U	10.1U	10U	10U	10U

BZTO104(e)024034

TABLE A-4b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	B2 08/03/2004 Primary	G1A 08/06/2004 Primary	J2 08/03/2004 Primary	LW003D 08/06/2004 Primary	LW006D 08/06/2004 Primary	LW009D 08/06/2004 Primary
4-Bromophenyl-phenylether	(ug/l)	1U	1U	1.01U	1U	1U	1U
4-Chloro-3-methylphenol	(ug/l)	2.01U	2U	2.01U	2U	2U	2U
4-Chloroaniline	(ug/l)	3.01U	3U	3.02U	3U	3U	3U
4-Chlorophenylphenyl ether	(ug/l)	1U	1U	1.01U	1U	1U	1U
4-Nitroaniline	(ug/l)	5.02U	5U	5.04U	5U	5U	5U
4-Nitrophenol	(ug/l)	5.02U	5U	5.04U	5U	5U	5U
Acenaphthene	(ug/l)	1U	1U	1.01U	1U	1U	1U
Acenaphthylene	(ug/l)	1U	1U	1.01U	1U	1U	1U
Anthracene	(ug/l)	1U	1U	1.01U	1U	1U	1U
Benzo(a)anthracene	(ug/l)	1U	1U	1.01U	1U	1U	1U
Benzo(a)pyrene	(ug/l)	1U	1U	1.01U	1U	1U	1U
Benzo(b)fluoranthene	(ug/l)	1U	1U	1.01U	1U	1U	1U
Benzo(ghi)perylene	(ug/l)	1U	1U	1.01U	1U	1U	1U
Benzo(k)fluoranthene	(ug/l)	1U	1U	1.01U	1U	1U	1U
Benzoic acid	(ug/l)	20.1U	20U	20.1U	20U	20U	20U
Benzyl alcohol	(ug/l)	5.02U	5U	5.04U	5U	5U	5U
Bis(2-chloroethoxy)methane	(ug/l)	1U	1U	1.01U	1U	1U	1U
Bis(2-chloroethyl)ether	(ug/l)	2.01U	2U	2.01U	2U	2U	2U
Bis(2-chloroisopropyl)ether	(ug/l)	1U	1U	1.01U	1U	1U	1U
Bis(2-ethylhexyl)phthalate	(ug/l)	1U	1U	1.01U	1U	1U	1U
Butyl benzyl phthalate	(ug/l)	1U	1U	1.01U	1U	1U	1U

BZTO104(e)024035

TABLE A-4b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE	B2	G1A	J2	LW003D	LW006D	LW009D
	DATE	08/03/2004	08/06/2004	08/03/2004	08/06/2004	08/06/2004	08/06/2004
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Carbazole	(ug/l)	1U	1U	1.01U	1U	1U	1U
Chrysene	(ug/l)	1U	1U	1.01U	1U	1U	1U
Dibenzo(a,h)anthracene	(ug/l)	1U	1U	1.01U	1U	1U	1U
Dibenzofuran	(ug/l)	1U	1U	1.01U	1U	1U	1U
Diethyl phthalate	(ug/l)	1U	1U	1.01U	1U	1U	1U
Dimethyl phthalate	(ug/l)	1U	1U	1.01U	1U	1U	1U
Di-n-butyl phthalate	(ug/l)	1U	1U	1.01U	1U	1U	1U
Di-n-octyl phthalate	(ug/l)	1U	1U	1.01U	1U	1U	1U
Fluoranthene	(ug/l)	1U	1U	1.01U	1U	1U	1U
Fluorene	(ug/l)	1U	1U	1.01U	1U	1U	1U
Hexachlorobenzene	(ug/l)	1U	1U	1.01U	1U	1U	1U
Hexachlorobutadiene	(ug/l)	2.01U	2U	2.01U	2U	2U	2U
Hexachlorocyclopentadiene	(ug/l)	5.02U	5U	5.04U	5U	5U	5U
Hexachloroethane	(ug/l)	2.01U	2U	2.01U	2U	2U	2U
Indeno(1,2,3-cd)pyrene	(ug/l)	1U	1U	1.01U	1U	1U	1U
Isophorone	(ug/l)	1U	1U	1.01U	1U	1U	1U
Naphthalene	(ug/l)	1U	1U	1.01U	1U	1U	1U
Nitrobenzene	(ug/l)	1U	1U	1.01U	1U	1U	1U
N-Nitrosodimethylamine	(ug/l)	1U	1U	1.01U	1U	1U	1U
N-Nitroso-Di-N-Propylamine	(ug/l)	2.01U	2U	2.01U	2U	2U	2U
N-Nitrosodiphenylamine	(ug/l)	1U	1U	1.01U	1U	1U	1U

BZTO104(e)024036

TABLE A-4b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	B2 08/03/2004 Primary	G1A 08/06/2004 Primary	J2 08/03/2004 Primary	LW003D 08/06/2004 Primary	LW006D 08/06/2004 Primary	LW009D 08/06/2004 Primary
Pentachlorophenol	(ug/l)	5.02U	5.22	5.04U	5U	5U	5U
Phenanthrene	(ug/l)	1U	1U	1.01U	1U	1U	1U
Phenol	(ug/l)	2.01U	2U	2.01U	2U	2U	2U
Pyrene	(ug/l)	1U	1U	1.01U	1U	1U	1U
Pyridine	(ug/l)	5.02U	5U	5.04U	5U	5U	5U

BZTO104(e)024037

TABLE A-4b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW010D 08/06/2004 Primary	LW011D 08/06/2004 Primary	LW020D 08/09/2004 Primary	LW022D 08/09/2004 Primary	LW023D 08/09/2004 Primary	LW024D 08/09/2004 Primary
1,2,4-Trichlorobenzene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
1,2-Dichlorobenzene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
1,3-Dichlorobenzene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
1,4-Dichlorobenzene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
2,4,5-Trichlorophenol	(ug/l)	5U	5U	5.31U	5.05U	5.24U	5.21U
2,4,6-Trichlorophenol	(ug/l)	5U	5U	5.31U	5.05U	5.24U	5.21U
2,4-Dichlorophenol	(ug/l)	3U	3U	3.19U	3.03U	3.14U	3.12U
2,4-Dimethylphenol	(ug/l)	3U	3U	3.19U	3.03U	3.14U	3.12U
2,4-Dinitrophenol	(ug/l)	10U	10U	10.6U	10.1U	10.5U	10.4U
2,4-Dinitrotoluene	(ug/l)	5U	5U	5.31U	5.05U	5.24U	5.21U
2,6-Dinitrotoluene	(ug/l)	5U	5U	5.31U	5.05U	5.24U	5.21U
2-Chloronaphthalene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
2-Chlorophenol	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
2-Methylnaphthalene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
2-Methylphenol	(ug/l)	2U	2U	2.13U	2.02U	2.09U	2.08U
2-Nitroaniline	(ug/l)	5U	5U	5.31U	5.05U	5.24U	5.21U
2-Nitrophenol	(ug/l)	5U	5U	5.31U	5.05U	5.24U	5.21U
3- & 4-Methylphenol	(ug/l)	10U	10U	10.6U	10.1U	10.5U	10.4U
3,3-Dichlorobenzidine	(ug/l)	5U	5U	5.31U	5.05U	5.24U	5.21U
3-Nitroaniline	(ug/l)	6U	6U	6.38U	6.06U	6.28U	6.25U
4,6-Dinitro-2-Methylphenol	(ug/l)	10U	10U	10.6U	10.1U	10.5U	10.4U

BZTO104(e)024038

TABLE A-4b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW010D 08/06/2004 Primary	LW011D 08/06/2004 Primary	LW020D 08/09/2004 Primary	LW022D 08/09/2004 Primary	LW023D 08/09/2004 Primary	LW024D 08/09/2004 Primary
4-Bromophenyl-phenylether	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
4-Chloro-3-methylphenol	(ug/l)	2U	2U	2.13U	2.02U	2.09U	2.08U
4-Chloroaniline	(ug/l)	3U	3U	3.19U	3.03U	3.14U	3.12U
4-Chlorophenylphenyl ether	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
4-Nitroaniline	(ug/l)	5U	5U	5.31U	5.05U	5.24U	5.21U
4-Nitrophenol	(ug/l)	5U	5U	5.31U	5.05U	5.24U	5.21U
Acenaphthene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.65
Acenaphthylene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Anthracene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Benzo(a)anthracene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Benzo(a)pyrene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Benzo(b)fluoranthene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Benzo(ghi)perylene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Benzo(k)fluoranthene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Benzoic acid	(ug/l)	20U	20U	21.3U	20.2U	20.9U	20.8U
Benzyl alcohol	(ug/l)	5U	5U	5.31U	5.05U	5.24U	5.21U
Bis(2-chloroethoxy)methane	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Bis(2-chloroethyl)ether	(ug/l)	2U	2U	2.13U	2.02U	2.09U	2.08U
Bis(2-chloroisopropyl)ether	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Bis(2-ethylhexyl)phthalate	(ug/l)	1U	1.71	1.86	1.01U	1.05U	1.91
Butyl benzyl phthalate	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U

BZTO104(e)024039

TABLE A-4b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW010D 08/06/2004 Primary	LW011D 08/06/2004 Primary	LW020D 08/09/2004 Primary	LW022D 08/09/2004 Primary	LW023D 08/09/2004 Primary	LW024D 08/09/2004 Primary
Carbazole	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Chrysene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Dibenzo(a,h)anthracene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Dibenzofuran	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Diethyl phthalate	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Dimethyl phthalate	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Di-n-butyl phthalate	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Di-n-octyl phthalate	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Fluoranthene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Fluorene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	4.04
Hexachlorobenzene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Hexachlorobutadiene	(ug/l)	2U	2U	2.13U	2.02U	2.09U	2.08U
Hexachlorocyclopentadiene	(ug/l)	5U	5U	5.31U	5.05U	5.24U	5.21U
Hexachloroethane	(ug/l)	2U	2U	2.13U	2.02U	2.09U	2.08U
Indeno(1,2,3-cd)pyrene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Isophorone	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Naphthalene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Nitrobenzene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
N-Nitrosodimethylamine	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
N-Nitroso-Di-N-Propylamine	(ug/l)	2U	2U	2.13U	2.02U	2.09U	2.08U
N-Nitrosodiphenylamine	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U

BZTO104(e)024040

TABLE A-4b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW010D 08/06/2004 Primary	LW011D 08/06/2004 Primary	LW020D 08/09/2004 Primary	LW022D 08/09/2004 Primary	LW023D 08/09/2004 Primary	LW024D 08/09/2004 Primary
Pentachlorophenol	(ug/l)	5U	5U	5.31U	5.05U	5.24U	5.21U
Phenanthrene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	2.58
Phenol	(ug/l)	2U	2U	2.13U	2.02U	2.09U	2.08U
Pyrene	(ug/l)	1U	1U	1.06U	1.01U	1.05U	1.04U
Pyridine	(ug/l)	5U	5U	5.31U	5.05U	5.24U	5.21U

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TABLE A-4b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW025D 08/09/2004 Primary	LW026D 08/10/2004 Primary	LW027D 08/09/2004 Primary	LW029D 08/02/2004 Primary	LW030D 08/03/2004 Primary	LW032D 08/02/2004 Primary
1,2,4-Trichlorobenzene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
1,2-Dichlorobenzene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
1,3-Dichlorobenzene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
1,4-Dichlorobenzene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
2,4,5-Trichlorophenol	(ug/l)	4.98U	5.01U	5.39U	5.07U	4.96U	5.05U
2,4,6-Trichlorophenol	(ug/l)	4.98U	5.01U	5.39U	5.07U	4.96U	5.05U
2,4-Dichlorophenol	(ug/l)	2.99U	3.01U	3.24U	3.04U	2.98U	3.03U
2,4-Dimethylphenol	(ug/l)	2.99U	3.01U	3.24U	3.04U	2.98U	3.03U
2,4-Dinitrophenol	(ug/l)	9.96U	10U	10.8U	10.1U	9.92U	10.1U
2,4-Dinitrotoluene	(ug/l)	4.98U	5.01U	5.39U	5.07U	4.96U	5.05U
2,6-Dinitrotoluene	(ug/l)	4.98U	5.01U	5.39U	5.07U	4.96U	5.05U
2-Chloronaphthalene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
2-Chlorophenol	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
2-Methylnaphthalene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
2-Methylphenol	(ug/l)	1.99U	2U	2.16U	2.03U	1.98U	2.02U
2-Nitroaniline	(ug/l)	4.98U	5.01U	5.39U	5.07U	4.96U	5.05U
2-Nitrophenol	(ug/l)	4.98U	5.01U	5.39U	5.07U	4.96U	5.05U
3- & 4-Methylphenol	(ug/l)	9.96U	10U	10.8U	10.1U	9.92U	10.1U
3,3-Dichlorobenzidine	(ug/l)	4.98U	5.01U	5.39U	5.07U	4.96U	5.05U
3-Nitroaniline	(ug/l)	5.98U	6.01U	6.47U	6.08U	5.95U	6.05U
4,6-Dinitro-2-Methylphenol	(ug/l)	9.96U	10U	10.8U	10.1U	9.92U	10.1U

BZTO104(e)024042

TABLE A-4b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW025D 08/09/2004 Primary	LW026D 08/10/2004 Primary	LW027D 08/09/2004 Primary	LW029D 08/02/2004 Primary	LW030D 08/03/2004 Primary	LW032D 08/02/2004 Primary
4-Bromophenyl-phenylether	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
4-Chloro-3-methylphenol	(ug/l)	1.99U	2U	2.16U	2.03U	1.98U	2.02U
4-Chloroaniline	(ug/l)	2.99U	3.01U	3.24U	3.04U	2.98U	3.03U
4-Chlorophenylphenyl ether	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
4-Nitroaniline	(ug/l)	4.98U	5.01U	5.39U	5.07U	4.96U	5.05U
4-Nitrophenol	(ug/l)	4.98U	5.01U	5.39U	5.07U	4.96U	5.05U
Acenaphthene	(ug/l)	1.93	1U	1.08U	1.01U	0.992U	1.01U
Acenaphthylene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Anthracene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Benzo(a)anthracene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Benzo(a)pyrene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Benzo(b)fluoranthene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Benzo(ghi)perylene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Benzo(k)fluoranthene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Benzoic acid	(ug/l)	19.9U	20U	21.6U	20.3U	19.8U	20.2U
Benzyl alcohol	(ug/l)	4.98U	5.01U	5.39U	5.07U	4.96U	5.05U
Bis(2-chloroethoxy)methane	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Bis(2-chloroethyl)ether	(ug/l)	1.99U	2U	2.16U	2.03U	1.98U	2.02U
Bis(2-chloroisopropyl)ether	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Bis(2-ethylhexyl)phthalate	(ug/l)	2.95	3.77	1.08U	1.37	1.73	2.01
Butyl benzyl phthalate	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U

BZTO104(e)024043

TABLE A-4b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW025D 08/09/2004 Primary	LW026D 08/10/2004 Primary	LW027D 08/09/2004 Primary	LW029D 08/02/2004 Primary	LW030D 08/03/2004 Primary	LW032D 08/02/2004 Primary
Carbazole	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Chrysene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Dibenzo(a,h)anthracene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Dibenzofuran	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Diethyl phthalate	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Dimethyl phthalate	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Di-n-butyl phthalate	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Di-n-octyl phthalate	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Fluoranthene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Fluorene	(ug/l)	4.12	1U	1.08U	1.01U	0.992U	1.01U
Hexachlorobenzene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Hexachlorobutadiene	(ug/l)	1.99U	2U	2.16U	2.03U	1.98U	2.02U
Hexachlorocyclopentadiene	(ug/l)	4.98U	5.01U	5.39U	5.07U	4.96U	5.05U
Hexachloroethane	(ug/l)	1.99U	2U	2.16U	2.03U	1.98U	2.02U
Indeno(1,2,3-cd)pyrene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Isophorone	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Naphthalene	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
Nitrobenzene	(ug/l)	0.199U	1U	1.08U	1.01U	0.992U	1.01U
N-Nitrosodimethylamine	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U
N-Nitroso-Di-N-Propylamine	(ug/l)	1.99U	2U	2.16U	2.03U	1.98U	2.02U
N-Nitrosodiphenylamine	(ug/l)	0.996U	1U	1.08U	1.01U	0.992U	1.01U

BZTO104(e)024044

TABLE A-4b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW025D 08/09/2004 Primary	LW026D 08/10/2004 Primary	LW027D 08/09/2004 Primary	LW029D 08/02/2004 Primary	LW030D 08/03/2004 Primary	LW032D 08/02/2004 Primary
Pentachlorophenol	(ug/l)	4.98U	5.01U	5.39U	5.07U	4.96U	5.05U
Phenanthrene	(ug/l)	2.51	1U	1.08U	1.01U	0.992U	1.01U
Phenol	(ug/l)	1.99U	2U	2.16U	2.03U	1.98U	2.02U
Pyrene	(ug/l)	0.777	1U	1.08U	1.01U	0.992U	1.01U
Pyridine	(ug/l)	4.98U	5.01U	5.39U	5.07U	4.96U	5.05U

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BZTO104(e)024045

TABLE A-4b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW035D 08/09/2004 Primary	OX008D 08/04/2004 Primary	RW2 08/05/2004 Primary	RW2 08/05/2004 Duplicate 1
1,2,4-Trichlorobenzene	(ug/l)	0.975U	1U	1U	1U
1,2-Dichlorobenzene	(ug/l)	0.975U	1U	1U	1U
1,3-Dichlorobenzene	(ug/l)	0.975U	1U	1U	1U
1,4-Dichlorobenzene	(ug/l)	0.975U	1U	1U	1U
2,4,5-Trichlorophenol	(ug/l)	4.87U	5U	5U	5U
2,4,6-Trichlorophenol	(ug/l)	4.87U	5U	5U	5U
2,4-Dichlorophenol	(ug/l)	2.92U	3U	3U	3U
2,4-Dimethylphenol	(ug/l)	2.92U	3U	3U	3U
2,4-Dinitrophenol	(ug/l)	9.75U	10U	10U	10U
2,4-Dinitrotoluene	(ug/l)	4.87U	5U	5U	5U
2,6-Dinitrotoluene	(ug/l)	4.87U	5U	5U	5U
2-Chloronaphthalene	(ug/l)	0.975U	1U	1U	1U
2-Chlorophenol	(ug/l)	0.975U	1U	1U	1U
2-Methylnaphthalene	(ug/l)	0.975U	1U	5.49	6.18
2-Methylphenol	(ug/l)	1.95U	2U	2U	2U
2-Nitroaniline	(ug/l)	4.87U	5U	5U	5U
2-Nitrophenol	(ug/l)	4.87U	5U	5U	5U
3- & 4-Methylphenol	(ug/l)	9.75U	10U	10U	10U
3,3-Dichlorobenzidine	(ug/l)	4.87U	5U	5U	5U
3-Nitroaniline	(ug/l)	5.85U	6U	6U	6U
4,6-Dinitro-2-Methylphenol	(ug/l)	9.75U	10U	10U	10U

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TABLE A-4b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW035D 08/09/2004 Primary	OX008D 08/04/2004 Primary	RW2 08/05/2004 Primary	RW2 08/05/2004 Duplicate 1
4-Bromophenyl-phenylether	(ug/l)	0.975U	1U	1U	1U
4-Chloro-3-methylphenol	(ug/l)	1.95U	2U	2U	2U
4-Chloroaniline	(ug/l)	2.92U	3U	3U	3U
4-Chlorophenylphenyl ether	(ug/l)	0.975U	1U	1U	1U
4-Nitroaniline	(ug/l)	4.87U	5U	5U	5U
4-Nitrophenol	(ug/l)	4.87U	5U	5U	5U
Acenaphthene	(ug/l)	0.975U	1U	1U	1U
Acenaphthylene	(ug/l)	0.975U	1U	1U	1U
Anthracene	(ug/l)	0.975U	1U	1U	1U
Benzo(a)anthracene	(ug/l)	0.975U	1U	1U	1U
Benzo(a)pyrene	(ug/l)	0.975U	1U	1U	1U
Benzo(b)fluoranthene	(ug/l)	0.975U	1U	1U	1U
Benzo(ghi)perylene	(ug/l)	0.975U	1U	1U	1U
Benzo(k)fluoranthene	(ug/l)	0.975U	1U	1U	1U
Benzoic acid	(ug/l)	19.5U	20U	20U	20U
Benzyl alcohol	(ug/l)	4.87U	5U	5U	5U
Bis(2-chloroethoxy)methane	(ug/l)	0.975U	1U	1U	1U
Bis(2-chloroethyl)ether	(ug/l)	1.95U	2U	2U	2U
Bis(2-chloroisopropyl)ether	(ug/l)	0.975U	1U	1U	1U
Bis(2-ethylhexyl)phthalate	(ug/l)	0.975U	4.47U	1U	1U
Butyl benzyl phthalate	(ug/l)	0.975U	1U	1U	1U

BZTO104(e)024047

TABLE A-4b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW035D 08/09/2004 Primary	OX008D 08/04/2004 Primary	RW2 08/05/2004 Primary	RW2 08/05/2004 Duplicate 1
Carbazole	(ug/l)	0.975U	1U	1U	1U
Chrysene	(ug/l)	0.975U	1U	1U	1U
Dibenzo(a,h)anthracene	(ug/l)	0.975U	1U	1U	1U
Dibenzofuran	(ug/l)	0.975U	1U	1U	1U
Diethyl phthalate	(ug/l)	0.975U	1U	1U	1U
Dimethyl phthalate	(ug/l)	0.975U	1U	1U	1U
Di-n-butyl phthalate	(ug/l)	0.975U	1U	1U	1U
Di-n-octyl phthalate	(ug/l)	0.975U	1U	1U	1U
Fluoranthene	(ug/l)	0.975U	1U	1U	1U
Fluorene	(ug/l)	0.975U	1U	1U	1U
Hexachlorobenzene	(ug/l)	0.975U	1U	1U	1U
Hexachlorobutadiene	(ug/l)	1.95U	2U	2U	2U
Hexachlorocyclopentadiene	(ug/l)	4.87U	5U	5U	5U
Hexachloroethane	(ug/l)	1.95U	2U	2U	2U
Indeno(1,2,3-cd)pyrene	(ug/l)	0.975U	1U	1U	1U
Isophorone	(ug/l)	0.975U	1U	1U	1U
Naphthalene	(ug/l)	0.975U	1U	1.58	1.87
Nitrobenzene	(ug/l)	0.975U	1U	1U	1U
N-Nitrosodimethylamine	(ug/l)	0.975U	1U	1U	1U
N-Nitroso-Di-N-Propylamine	(ug/l)	1.95U	2U	2U	2U
N-Nitrosodiphenylamine	(ug/l)	0.975U	1U	1U	1U

BZTO104(e)024048

TABLE A-4b
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
SEMIVOLATILES (SW8270)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE	LW035D	OX008D	RW2	RW2
	DATE	08/09/2004	08/04/2004	08/05/2004	08/05/2004
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1
Pentachlorophenol	(ug/l)	4.87U	5U	12.9	13.5
Phenanthrene	(ug/l)	0.975U	1U	1U	1U
Phenol	(ug/l)	1.95U	2U	2U	2U
Pyrene	(ug/l)	0.975U	1U	1U	1U
Pyridine	(ug/l)	4.87U	5U	5U	5U

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BZTO104(e)024049

TABLE A-4c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	B2 08/03/2004 Primary	G1A 08/06/2004 Primary	J2 08/03/2004 Primary	LW003D 08/06/2004 Primary	LW006D 08/06/2004 Primary	LW009D 08/06/2004 Primary
1,1,1,2-Tetrachloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,1-Trichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,2,2-Tetrachloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,2-Trichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,3-Trichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,3-Trichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,4-Trichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,4-Trimethylbenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dibromoethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,3,5-Trimethylbenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,3-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,3-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,4-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
2,2-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
2-Butanone	(ug/l)	10U	10U	10U	10U	10U	10U

BZTO104(e)024050

TABLE A-4c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	B2 08/03/2004 Primary	G1A 08/06/2004 Primary	J2 08/03/2004 Primary	LW003D 08/06/2004 Primary	LW006D 08/06/2004 Primary	LW009D 08/06/2004 Primary
2-Chlorotoluene	(ug/l)	1U	1U	1U	1U	1U	1U
2-Hexanone	(ug/l)	10U	10U	10U	10U	10U	10U
4-Chlorotoluene	(ug/l)	1U	1U	1U	1U	1U	1U
4-Isopropyltoluene	(ug/l)	1U	1U	1U	1U	1U	1U
4-Methyl-2-Pentanone (MIBK)	(ug/l)	20U	20U	20U	20U	20U	20U
Acetone	(ug/l)	50U	50U	50U	50U	50U	50U
Acrylonitrile	(ug/l)	5U	5U	5U	5U	5U	5U
Benzene	(ug/l)	0.3U	0.3U	0.3U	0.3U	0.3U	0.3U
Bromobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Bromochloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Bromodichloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Bromoform	(ug/l)	1U	1U	1U	1U	1U	1U
Bromomethane	(ug/l)	1U	1U	1U	1U	1U	1U
Carbon disulfide	(ug/l)	2U	2U	2U	2U	2U	2U
Carbon tetrachloride	(ug/l)	1U	1U	1U	1U	1U	1U
Chlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Chloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
Chloroform	(ug/l)	1U	1U	1U	1U	1U	1U
Chloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
cis-1,2-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
cis-1,3-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U

BZTO104(e)024051

TABLE A-4c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE	B2	G1A	J2	LW003D	LW006D	LW009D
	DATE	08/03/2004	08/06/2004	08/03/2004	08/06/2004	08/06/2004	08/06/2004
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Dibromochloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Dibromochloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
Dibromomethane	(ug/l)	1U	1U	1U	1U	1U	1U
Dichlorodifluoromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Ethylbenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Hexachlorobutadiene	(ug/l)	1U	1U	1U	1U	1U	1U
Isopropylbenzene	(ug/l)	1U	118	1U	1U	2.11	17.6
m,p-Xylene	(ug/l)	2U	2U	2U	2U	2U	2U
Methyl tert-butyl ether	(ug/l)	1U	1U	1U	1U	1U	1U
Methylene chloride	(ug/l)	20U	20U	20U	20U	20U	20U
Naphthalene	(ug/l)	1U	2.49	1U	1U	1U	1U
n-Butylbenzene	(ug/l)	1U	8.97	1U	1U	1U	1U
n-Propylbenzene	(ug/l)	1U	99.6	1U	1U	1U	8.72
o-Xylene	(ug/l)	1U	1U	1U	1U	1U	1U
sec-Butylbenzene	(ug/l)	1U	16.8	1U	1U	1.29	1.03
Styrene	(ug/l)	1U	1U	1U	1U	1U	1U
tert-Butylbenzene	(ug/l)	1U	2.94	1U	1U	2.09	1U
Tetrachloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
Toluene	(ug/l)	1U	1U	1U	1U	1U	1U
trans-1,2-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
trans-1,3-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-4c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE	B2	G1A	J2	LW003D	LW006D	LW009D
	DATE	08/03/2004	08/06/2004	08/03/2004	08/06/2004	08/06/2004	08/06/2004
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Trichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
Trichlorofluoromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Vinyl Chloride	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-4c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW010D 08/06/2004 Primary	LW011D 08/06/2004 Primary	LW020D 08/09/2004 Primary	LW022D 08/09/2004 Primary	LW023D 08/09/2004 Primary	LW024D 08/09/2004 Primary
1,1,1,2-Tetrachloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,1-Trichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,2,2-Tetrachloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,2-Trichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,3-Trichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,3-Trichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,4-Trichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,4-Trimethylbenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dibromoethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,3,5-Trimethylbenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,3-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,3-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,4-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
2,2-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
2-Butanone	(ug/l)	10U	10U	10U	10U	10U	10U

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TABLE A-4c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW010D 08/06/2004 Primary	LW011D 08/06/2004 Primary	LW020D 08/09/2004 Primary	LW022D 08/09/2004 Primary	LW023D 08/09/2004 Primary	LW024D 08/09/2004 Primary
2-Chlorotoluene	(ug/l)	1U	1U	1U	1U	1U	1U
2-Hexanone	(ug/l)	10U	10U	10U	10U	10U	10U
4-Chlorotoluene	(ug/l)	1U	1U	1U	1U	1U	1U
4-Isopropyltoluene	(ug/l)	1U	1U	1U	1U	1U	1U
4-Methyl-2-Pentanone (MIBK)	(ug/l)	20U	20U	20U	20U	20U	20U
Acetone	(ug/l)	50U	50U	50U	50U	50U	50U
Acrylonitrile	(ug/l)	5U	5U	5U	5U	5U	5U
Benzene	(ug/l)	0.3U	0.3U	0.3U	0.3U	26.1	0.3U
Bromobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Bromochloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Bromodichloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Bromoform	(ug/l)	1U	1U	1U	1U	1U	1U
Bromomethane	(ug/l)	1U	1U	1U	1U	1U	1U
Carbon disulfide	(ug/l)	2U	2U	2U	2U	2U	2U
Carbon tetrachloride	(ug/l)	1U	1U	1U	1U	1U	1U
Chlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Chloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
Chloroform	(ug/l)	1U	1U	1U	1U	1U	1U
Chloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
cis-1,2-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
cis-1,3-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-4c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW010D 08/06/2004 Primary	LW011D 08/06/2004 Primary	LW020D 08/09/2004 Primary	LW022D 08/09/2004 Primary	LW023D 08/09/2004 Primary	LW024D 08/09/2004 Primary
Dibromochloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Dibromochloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
Dibromomethane	(ug/l)	1U	1U	1U	1U	1U	1U
Dichlorodifluoromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Ethylbenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Hexachlorobutadiene	(ug/l)	1U	1U	1U	1U	1U	1U
Isopropylbenzene	(ug/l)	1U	1U	1U	1U	11.5	10.4
m,p-Xylene	(ug/l)	2U	2U	2U	2U	2U	2U
Methyl tert-butyl ether	(ug/l)	1U	1U	1U	1U	3.17	1U
Methylene chloride	(ug/l)	20U	20U	20U	20U	20U	20U
Naphthalene	(ug/l)	1U	1U	1U	1U	1U	1U
n-Butylbenzene	(ug/l)	1U	1U	1U	1U	1U	2.63
n-Propylbenzene	(ug/l)	1U	1U	1U	1U	5.51	13
o-Xylene	(ug/l)	1U	1U	1U	1U	1U	1U
sec-Butylbenzene	(ug/l)	1U	1U	1U	1U	1.6	4.22
Styrene	(ug/l)	1U	1U	1U	1U	1U	1U
tert-Butylbenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Tetrachloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
Toluene	(ug/l)	1U	1U	1U	1U	1U	1U
trans-1,2-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
trans-1,3-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-4c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW010D 08/06/2004 Primary	LW011D 08/06/2004 Primary	LW020D 08/09/2004 Primary	LW022D 08/09/2004 Primary	LW023D 08/09/2004 Primary	LW024D 08/09/2004 Primary
Trichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
Trichlorofluoromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Vinyl Chloride	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-4c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW025D 08/09/2004 Primary	LW026D 08/10/2004 Primary	LW027D 08/09/2004 Primary	LW029D 08/02/2004 Primary	LW030D 08/03/2004 Primary	LW032D 08/02/2004 Primary
1,1,1,2-Tetrachloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,1-Trichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,2,2-Tetrachloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1,2-Trichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
1,1-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,3-Trichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,3-Trichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,4-Trichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2,4-Trimethylbenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dibromoethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
1,2-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,3,5-Trimethylbenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,3-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
1,3-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
1,4-Dichlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
2,2-Dichloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
2-Butanone	(ug/l)	10U	10U	10U	10U	10U	10U

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TABLE A-4c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW025D 08/09/2004 Primary	LW026D 08/10/2004 Primary	LW027D 08/09/2004 Primary	LW029D 08/02/2004 Primary	LW030D 08/03/2004 Primary	LW032D 08/02/2004 Primary
2-Chlorotoluene	(ug/l)	1U	1U	1U	1U	1U	1U
2-Hexanone	(ug/l)	10U	10U	10U	10U	10U	10U
4-Chlorotoluene	(ug/l)	1U	1U	1U	1U	1U	1U
4-Isopropyltoluene	(ug/l)	1U	1U	1U	1U	1U	1U
4-Methyl-2-Pentanone (MIBK)	(ug/l)	20U	20U	20U	20U	20U	20U
Acetone	(ug/l)	50U	50U	50U	50U	50U	50U
Acrylonitrile	(ug/l)	5U	5U	5U	5U	5U	5U
Benzene	(ug/l)	0.3U	0.3U	0.3U	0.3U	0.3U	0.3U
Bromobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Bromochloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Bromodichloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Bromoform	(ug/l)	1U	1U	1U	1U	1U	1U
Bromomethane	(ug/l)	1U	1U	1U	1U	1U	1U
Carbon disulfide	(ug/l)	2U	2U	2U	2U	2U	2U
Carbon tetrachloride	(ug/l)	1U	1U	1U	1U	1U	1U
Chlorobenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Chloroethane	(ug/l)	1U	1U	1U	1U	1U	1U
Chloroform	(ug/l)	1U	1U	1U	1U	1U	1U
Chloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
cis-1,2-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
cis-1,3-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-4c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW025D 08/09/2004 Primary	LW026D 08/10/2004 Primary	LW027D 08/09/2004 Primary	LW029D 08/02/2004 Primary	LW030D 08/03/2004 Primary	LW032D 08/02/2004 Primary
Dibromochloromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Dibromochloropropane	(ug/l)	1U	1U	1U	1U	1U	1U
Dibromomethane	(ug/l)	1U	1U	1U	1U	1U	1U
Dichlorodifluoromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Ethylbenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Hexachlorobutadiene	(ug/l)	1U	1U	1U	1U	1U	1U
Isopropylbenzene	(ug/l)	17.8	1U	1U	1U	1U	1U
m,p-Xylene	(ug/l)	2U	2U	2U	2U	2U	2U
Methyl tert-butyl ether	(ug/l)	1U	2.38	1U	1U	1U	1U
Methylene chloride	(ug/l)	20U	20U	20U	20U	20U	20U
Naphthalene	(ug/l)	1U	1U	1U	1U	1U	1U
n-Butylbenzene	(ug/l)	1.87	1U	1U	1U	1U	1U
n-Propylbenzene	(ug/l)	5.78	1U	1U	1U	1U	1U
o-Xylene	(ug/l)	1U	1U	1U	1U	1U	1U
sec-Butylbenzene	(ug/l)	4.59	1U	1U	1U	1U	1U
Styrene	(ug/l)	1U	1U	1U	1U	1U	1U
tert-Butylbenzene	(ug/l)	1U	1U	1U	1U	1U	1U
Tetrachloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
Toluene	(ug/l)	1U	1U	1U	1U	1U	1U
trans-1,2-Dichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
trans-1,3-Dichloropropene	(ug/l)	1U	1U	1U	1U	1U	1U

BZTO104(e)024060

TABLE A-4c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW025D 08/09/2004 Primary	LW026D 08/10/2004 Primary	LW027D 08/09/2004 Primary	LW029D 08/02/2004 Primary	LW030D 08/03/2004 Primary	LW032D 08/02/2004 Primary
Trichloroethene	(ug/l)	1U	1U	1U	1U	1U	1U
Trichlorofluoromethane	(ug/l)	1U	1U	1U	1U	1U	1U
Vinyl Chloride	(ug/l)	1U	1U	1U	1U	1U	1U

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TABLE A-4c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW035D 08/09/2004 Primary	OX008D 08/04/2004 Primary	RW2 08/05/2004 Primary	RW2 08/05/2004 Duplicate 1
1,1,1,2-Tetrachloroethane	(ug/l)	1U	1U	1U	1U
1,1,1-Trichloroethane	(ug/l)	1U	1U	1U	1U
1,1,2,2-Tetrachloroethane	(ug/l)	1U	1U	1U	1U
1,1,2-Trichloroethane	(ug/l)	1U	1U	1U	1U
1,1-Dichloroethane	(ug/l)	1U	1U	1U	1U
1,1-Dichloroethene	(ug/l)	1U	1U	1U	1U
1,1-Dichloropropene	(ug/l)	1U	1U	1U	1U
1,2,3-Trichlorobenzene	(ug/l)	1U	1U	1U	1U
1,2,3-Trichloropropane	(ug/l)	1U	1U	1U	1U
1,2,4-Trichlorobenzene	(ug/l)	1U	1U	1U	1U
1,2,4-Trimethylbenzene	(ug/l)	1U	2.49J	36	33.8J
1,2-Dibromoethane	(ug/l)	1U	1U	1U	1U
1,2-Dichlorobenzene	(ug/l)	1U	1U	1U	1U
1,2-Dichloroethane	(ug/l)	1U	1U	1U	1U
1,2-Dichloropropane	(ug/l)	1U	1U	1U	1U
1,3,5-Trimethylbenzene	(ug/l)	1U	1U	11.5	10.2J
1,3-Dichlorobenzene	(ug/l)	1U	1U	1U	1U
1,3-Dichloropropane	(ug/l)	1U	1U	1U	1U
1,4-Dichlorobenzene	(ug/l)	1U	1U	1U	1U
2,2-Dichloropropane	(ug/l)	1U	1U	1U	1U
2-Butanone	(ug/l)	10U	10U	10U	10U

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TABLE A-4c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW035D 08/09/2004 Primary	OX008D 08/04/2004 Primary	RW2 08/05/2004 Primary	RW2 08/05/2004 Duplicate 1
2-Chlorotoluene	(ug/l)	1U	1U	1U	1U
2-Hexanone	(ug/l)	10U	10U	10U	10U
4-Chlorotoluene	(ug/l)	1U	1U	1U	1U
4-Isopropyltoluene	(ug/l)	1U	1U	1.25	1.1J
4-Methyl-2-Pentanone (MIBK)	(ug/l)	20U	20U	20U	20U
Acetone	(ug/l)	50U	50U	50U	50U
Acrylonitrile	(ug/l)	5U	5U	5U	5U
Benzene	(ug/l)	0.3U	0.3U	3.88	3.84J
Bromobenzene	(ug/l)	1U	1U	1U	1U
Bromochloromethane	(ug/l)	1U	1U	1U	1U
Bromodichloromethane	(ug/l)	1U	1U	1U	1U
Bromoform	(ug/l)	1U	1U	1U	1U
Bromomethane	(ug/l)	1U	1U	1U	1U
Carbon disulfide	(ug/l)	2U	2U	2U	2U
Carbon tetrachloride	(ug/l)	1U	1U	1U	1U
Chlorobenzene	(ug/l)	1U	1U	1U	1U
Chloroethane	(ug/l)	1U	1U	1U	1U
Chloroform	(ug/l)	1U	1U	1U	1U
Chloromethane	(ug/l)	1U	1U	1U	1U
cis-1,2-Dichloroethene	(ug/l)	1U	1U	1U	1U
cis-1,3-Dichloropropene	(ug/l)	1U	1U	1U	1U

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BZTO104(e)024063

TABLE A-4c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW035D 08/09/2004 Primary	OX008D 08/04/2004 Primary	RW2 08/05/2004 Primary	RW2 08/05/2004 Duplicate 1
Dibromochloromethane	(ug/l)	1U	1U	1U	1U
Dibromochloropropane	(ug/l)	1U	1U	1U	1U
Dibromomethane	(ug/l)	1U	1U	1U	1U
Dichlorodifluoromethane	(ug/l)	1U	1U	1U	1U
Ethylbenzene	(ug/l)	1U	1U	6.19	5.97J
Hexachlorobutadiene	(ug/l)	1U	1U	1U	1U
Isopropylbenzene	(ug/l)	1U	1U	60.9	64.8J
m,p-Xylene	(ug/l)	2U	2U	9.61	8.88J
Methyl tert-butyl ether	(ug/l)	1U	1U	1U	1U
Methylene chloride	(ug/l)	20U	20U	20U	20U
Naphthalene	(ug/l)	1U	1U	2.99	2.74J
n-Butylbenzene	(ug/l)	1U	1U	5.36	5.13J
n-Propylbenzene	(ug/l)	1U	1U	68.1	69.7J
o-Xylene	(ug/l)	1U	1U	2.75	2.51J
sec-Butylbenzene	(ug/l)	1U	1U	10.7	10.7J
Styrene	(ug/l)	1U	1U	1U	1U
tert-Butylbenzene	(ug/l)	1U	1U	1.75	1.82J
Tetrachloroethene	(ug/l)	1U	1U	1U	1U
Toluene	(ug/l)	1U	1U	1U	1U
trans-1,2-Dichloroethene	(ug/l)	1U	1U	1U	1U
trans-1,3-Dichloropropene	(ug/l)	1U	1U	1U	1U

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TABLE A-4c
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
VOLATILES (SW8260)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW035D 08/09/2004 Primary	OX008D 08/04/2004 Primary	RW2 08/05/2004 Primary	RW2 08/05/2004 Duplicate 1
Trichloroethene	(ug/l)	1U	1U	1U	1U
Trichlorofluoromethane	(ug/l)	1U	1U	1U	1U
Vinyl Chloride	(ug/l)	1U	1U	1U	1U

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TABLE A-4d
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
TOTAL PETROLEUM HYDROCARBONS (NWTPH)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	G1A 08/06/2004 Primary	LW006D 08/06/2004 Primary	LW009D 08/06/2004 Primary	LW010D 08/06/2004 Primary	LW011D 08/06/2004 Primary	LW020D 08/09/2004 Primary
Diesel Range Hydrocarbons	(mg/l)	3.25	2.05	0.254U	0.245U	0.79	0.737
Gasoline Range Hydrocarbons	(ug/l)	NT	NT	NT	NT	NT	229
TPH-Motor Oil Range	(mg/l)	0.507U	0.474U	0.508U	0.49U	0.51U	0.506U

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TABLE A-4d
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
TOTAL PETROLEUM HYDROCARBONS (NWTPH)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE	LW022D	LW023D	LW024D	LW025D	LW026D	LW027D
	DATE	08/09/2004	08/09/2004	08/09/2004	08/09/2004	08/10/2004	08/09/2004
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Diesel Range Hydrocarbons	(mg/l)	1.75	3.21	6.57	3.17	1.37	1.25
Gasoline Range Hydrocarbons	(ug/l)	100U	562	948	980	202	336
TPH-Motor Oil Range	(mg/l)	0.498U	0.5U	0.575U	0.502U	0.497U	0.539U

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TABLE A-4d
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
TOTAL PETROLEUM HYDROCARBONS (NWTPH)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE	LW029D	LW030D	LW032D	LW035D	RW2	RW2
	DATE	08/02/2004	08/03/2004	08/02/2004	08/09/2004	08/05/2004	08/05/2004
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Duplicate 1
Diesel Range Hydrocarbons	(mg/l)	0.306	0.539	0.863	2.71	1.42	1.42
Gasoline Range Hydrocarbons	(ug/l)	100U	100U	100U	100U	1720	1800
TPH-Motor Oil Range	(mg/l)	0.476U	0.478U	0.496U	0.48U	0.499U	0.493U

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TABLE A-4e
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
PRIORITY POLLUTANT METALS (SW6000)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE	B2	G1A	J2	LW003D	LW006D	LW009D
	DATE	08/03/2004	08/06/2004	08/03/2004	08/06/2004	08/06/2004	08/06/2004
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Arsenic	(ug/l)	3.63	29.3	10.8	14	15.3	30.7
Chromium	(mg/l)	0.0161	0.0156	0.005U	0.005U	0.0187	0.0175
Copper	(mg/l)	0.01U	0.01U	0.01U	0.01U	0.01U	0.01U
Ferrous Iron	(mg/l)	NT	NT	NT	NT	NT	NT
Lead	(ug/l)	0.1U	0.658	0.186	0.392	0.252	0.788
Nickel	(mg/l)	0.005U	0.13	0.005U	0.005U	0.005U	0.005U
Selenium	(mg/l)	NT	NT	NT	NT	NT	NT
Zinc	(mg/l)	0.01U	0.01U	0.021	0.01U	0.01U	0.01U

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TABLE A-4e
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
PRIORITY POLLUTANT METALS (SW6000)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW010D 08/06/2004 Primary	LW011D 08/06/2004 Primary	LW020D 08/09/2004 Primary	LW022D 08/09/2004 Primary	LW023D 08/09/2004 Primary	LW024D 08/09/2004 Primary
Arsenic	(ug/l)	19.8	5.58	28.6	7.74	43.5	43
Chromium	(mg/l)	0.0185	0.0176	0.0271	0.0194	0.0224	0.0279
Copper	(mg/l)	0.01U	0.01U	0.0957	0.01U	0.0372	0.0125
Ferrous Iron	(mg/l)	NT	NT	NT	NT	NT	NT
Lead	(ug/l)	1.23	2.74	3.05	1.21	7.92	4.23
Nickel	(mg/l)	0.005U	0.005U	0.005U	0.005U	0.005U	0.0088
Selenium	(mg/l)	NT	NT	NT	NT	NT	NT
Zinc	(mg/l)	0.01U	0.0216	0.0674	0.0123	0.0431	0.0905

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TABLE A-4e
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
PRIORITY POLLUTANT METALS (SW6000)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW025D 08/09/2004 Primary	LW026D 08/10/2004 Primary	LW027D 08/09/2004 Primary	LW029D 08/02/2004 Primary	LW030D 08/03/2004 Primary	LW032D 08/02/2004 Primary
Arsenic	(ug/l)	42.5	11.2	7.45	6.94	12.8	10
Chromium	(mg/l)	0.0161	0.0171	0.0211	0.015	0.005U	0.0183
Copper	(mg/l)	0.01U	0.0812	0.0157	0.01U	0.01U	0.01U
Ferrous Iron	(mg/l)	NT	NT	NT	NT	NT	NT
Lead	(ug/l)	8.16	2.8	1.9	0.613	2.21	1.95
Nickel	(mg/l)	0.0065	0.005U	0.005U	0.005U	0.005U	0.005U
Selenium	(mg/l)	NT	NT	NT	NT	NT	NT
Zinc	(mg/l)	0.0831	0.0173	0.0528	0.01U	0.0504	0.0238

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TABLE A-4e
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
PRIORITY POLLUTANT METALS (SW6000)
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW035D 08/09/2004 Primary	OX008D 08/04/2004 Primary	RW2 08/05/2004 Primary	RW2 08/05/2004 Duplicate 1
Arsenic	(ug/l)	1U	22.4	19.4	20
Chromium	(mg/l)	0.0172	0.0204	0.0152	0.0143
Copper	(mg/l)	0.0241	0.01U	0.01U	0.01U
Ferrous Iron	(mg/l)	NT	15.2	NT	NT
Lead	(ug/l)	3.14	2.74	0.1U	0.1U
Nickel	(mg/l)	0.0186	0.005U	0.005U	0.005U
Selenium	(mg/l)	NT	0.02U	NT	NT
Zinc	(mg/l)	0.0427	0.0238	0.01U	0.01U

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TABLE A-4f
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
CONVENTIONALS AND FIELD PARAMETERS
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE	B2	G1A	J2	LW003D	LW006D	LW009D
	DATE	08/03/2004	08/06/2004	08/03/2004	08/06/2004	08/06/2004	08/06/2004
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Chloride	(mg/l)	3.51	6.46	4.62	0.5U	2.57	1.33
Dissolved Oxygen	(mg/l)	NT	3.36	3.72	3.8	4.43	3.75
pH	(s.u.)	7.76	6.22	6.16	5.93	6.26	6.22
Redox	(mv)	NT	NT	NT	NT	NT	NT
Specific Conductivity	(us)	414	811	692	836	597	362
Temperature	(c)	15.3	14.4	15.8	14.7	15.2	15
Total Dissolved Solids	(mg/l)	286	302	382	359	259	163
Turbidity	(ntu)	118	76	20	19	24	17

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TABLE A-4f
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
CONVENTIONALS AND FIELD PARAMETERS
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE	LW010D	LW011D	LW014D	LW016D	LW017D	LW018D
	DATE	08/06/2004	08/06/2004	08/05/2004	08/05/2004	08/06/2004	08/06/2004
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Chloride	(mg/l)	1.42	4.59	NT	NT	NT	NT
Dissolved Oxygen	(mg/l)	4.91	3.15	3.07	5.43	3.04	4.09
pH	(s.u.)	6.2	6.3	6.1	6.29	6.17	6.05
Redox	(mv)	NT	NT	NT	NT	NT	NT
Specific Conductivity	(us)	236	678	356	200	607	487
Temperature	(c)	14	14.3	16	15	14.6	15.2
Total Dissolved Solids	(mg/l)	113	303	NT	NT	NT	NT
Turbidity	(ntu)	21	26	94	20	16	71

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TABLE A-4f
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
CONVENTIONALS AND FIELD PARAMETERS
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW020D 08/09/2004 Primary	LW022D 08/09/2004 Primary	LW023D 08/09/2004 Primary	LW024D 08/09/2004 Primary	LW025D 08/09/2004 Primary	LW026D 08/10/2004 Primary
Chloride	(mg/l)	3.34	1.79	2.8	3.24	2.13	2.97
Dissolved Oxygen	(mg/l)	2.23	2.34	2.46	2.57	2.36	1.36
pH	(s.u.)	6.23	5.61	6.13	6.02	5.93	5.86
Redox	(mv)	NT	NT	NT	NT	NT	NT
Specific Conductivity	(us)	590	639	998	793	456	704
Temperature	(c)	15.7	15.4	13.8	15.9	16.3	16.4
Total Dissolved Solids	(mg/l)	260	243	466	268	152	294
Turbidity	(ntu)	830	378	550	655	999	88

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TABLE A-4f
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
CONVENTIONALS AND FIELD PARAMETERS
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	LW027D 08/09/2004 Primary	LW029D 08/02/2004 Primary	LW030D 08/03/2004 Primary	LW032D 08/02/2004 Primary	LW035D 08/09/2004 Primary	OX008D 08/04/2004 Primary
Chloride	(mg/l)	3.43	3.43	7.88	2.72	1.63	7.67
Dissolved Oxygen	(mg/l)	1.5	NT	3.06	NT	3.09	3.01
pH	(s.u.)	6.16	6.05	6.12	6.05	5.59	6.38
Redox	(mv)	NT	NT	NT	NT	NT	-63
Specific Conductivity	(us)	609	726	677	646	722	605
Temperature	(c)	15.3	14.7	14.8	14.8	14.1	14.6
Total Dissolved Solids	(mg/l)	264	362	356	272	322	326
Turbidity	(ntu)	742	93	773	593	999	88

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TABLE A-4f
PHASE II AND III REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - DEEP WELLS
CONVENTIONALS AND FIELD PARAMETERS
THIRD QUARTERLY SAMPLING EVENT, AUGUST 2004
TIME OIL NORTHWEST TERMINAL

PERIOD: From 08/02/2004 thru 08/10/2004 - Inclusive
SAMPLE TYPE: Water

CONSTITUENT	SITE DATE RESULT TYPE	RW2 08/05/2004 Primary	RW2 08/05/2004 Duplicate 1
Chloride	(mg/l)	3.95	3.82
Dissolved Oxygen	(mg/l)	3.58	3.58
pH	(s.u.)	6.09	6.15
Redox	(mv)	NT	NT
Specific Conductivity	(us)	530	531
Temperature	(c)	15.7	16
Total Dissolved Solids	(mg/l)	258	254
Turbidity	(ntu)	13	8

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TABLE A-5
KEY TO FOOTNOTES AND ANALYTICAL DATA QUALIFIERS

Footnotes:

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.

M = Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match.

J = Data validation flag indicating the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

R = The sample results are rejected due to serious deficiencies in the ability to analyze the samples and meet quality control criteria. The presence or absence of the analyte cannot be verified.

[ ] = Detected constituent.

(a) The laboratory reported that hydrocarbon patterns that eluted in the gas range were detected; however the elution patterns do not match available standards.

(b) The laboratory reported that these samples have a pattern in the mineral spirits and diesel standard pattern range that does not resemble the standard patterns. This could possibly be a weathered mixture of mineral spirits and diesel.

(c) The laboratory reported that these samples have a pattern in the diesel and motor oil range that do not resemble the diesel or motor oil standard pattern. This could possibly be a weathered fuel.

(d) The laboratory reported that these samples show a pattern in the diesel range that does not resemble the diesel standard pattern. This could possibly be a weathered diesel.

(e) The laboratory reported that these samples show a pattern in the gas and diesel range that does not resemble either of the typical peak patterns for these standards.

(f) These results are questionable because of laboratory blank contamination within this data set and the lack of PCP detections in these wells historically. However, the results were not qualified because the method blank contamination could not be linked directly to the sample results.

APPENDIX B

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 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*									*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			
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	0.04									563,853			
Quarterly Totals	*1,084,029*			*0.11*									*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*									*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)	
December 2001	361,058	12/6/2001	ND (c)	0.01									717,769	12/6/2001	ND (c)	
Quarterly Totals	*680,856*			*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	
														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*				*51,118*								*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*								*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			0.38	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*				*51,118*				*95,157*				*1,371,258*			RW-2 mass removal rates based on February 11 sampling event.

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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
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*				*4,175*				*144,280*				*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 concentration (87.4 ug/L) reported for July 11, 2003 sampling event. Additional discharge samples in response to request from City of Portland.
														7/30/2003	8.6	
August 2003	366,307	8/27/2003	10	0.03	7,388			0.02	119,831	8/27/2003	120	0.41	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	18.9	
														9/29/2003	5.96	
Quarterly Totals	*959,448*				*37,492*				*335,832*				*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 concentration (87.4 ug/L) reported for July 11, 2003 sampling event. Additional discharge samples in response to request from City of Portland.
														10/13/2003	<4.76	
														10/20/2003	<4.84	
														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*								*335,832*				*3,692,635*			
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	32.1	
														1/23/2004	45.7	
														1/26/2004	31.9	
February 2004	267,885			0.02					197,525			1.31	321,085	2/19/2004	57.2	
March 2004	246,867			0.02					17,825			0.12	197,621	3/2/2004	112	
														3/4/2004	48.5	Multiple treatment system discharge samples collected due to upset.
														3/16/2004	113	
														3/19/2004	85.9	
														3/24/2004	6.23	
														3/26/2004	7.07	
Quarterly Totals	*863,258*								*356,632*				*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	3,824			0.01	146	6/9/2004	595	0.001	242,530	5/19/2004	39.3	SDM-1 flow meter replaced May 28, 2004
														5/27/2004	5.81	
June 2004	168,815			0.07	6,681			0.02	44,155			0.22	263,730	6/3/2004	ND	
														6/9/2004	7.55	
														6/15/2004	8.78	
Quarterly Totals	*446,808*				*10,505*				*44,301*				*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	ND	
														9/30/2004	ND	
Quarterly Totals	*839,329*				*2,419*				*151,961*				*1,358,828*			

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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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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Landau Associates. 2001. *Work Plan, Phase III Remedial Investigation, Time Oil Northwest Terminal, Portland, Oregon.* June 18.

Landau Associates. 2000. Report: *Phase II Remedial Investigation, Time Oil Co. Northwest Terminal.* Prepared for: Time Oil Co., Seattle, Washington. April 6.

Landau Associates. 1999. *Aquifer Test Report, Time Oil Northwest Terminal, Portland, Oregon.* Prepared for: Time Oil Co., Seattle, Washington. December 20.

Landau Associates. 1998. Technical Memorandum: *Additional Groundwater Investigation, January-February 1998, Time Oil Northwest Terminal, Portland, Oregon.* Prepared for: Oregon Department of Environmental Quality, Portland, Oregon. July 28.

Landau Associates. 1996. *Work Plan, Phases I and II, Remedial Investigation/Feasibility Study, Time Oil Co. Northwest Terminal.* Prepared for: Time Oil Co., Seattle, Washington. May 10.

Lenhard and Parker. 1990. "Estimation of Free Hydrocarbon Volume from Fluid Levels in Monitoring Wells. *Groundwater.* 28(1):57-57.

APPENDIX D

Summary of Modifications 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 attached.

- ***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 2004):
  - 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.

REFERENCES

DEQ. 2000. Letter: *Dioxin/Furans Groundwater Analysis, Time Oil Northwest Terminal.* From Thomas E. Roick, Oregon Department of Environmental Quality, to Kevin Murphy, Time Oil Co. May 18.

DEQ. 1998. Letter: *Groundwater Quality Sampling, Time Oil Co. Northwest Terminal.* From Karla Urbanowicz, Oregon Department of Environmental Quality, to Kevin Murphy, Time Oil Co. May 15.

Landau Associates. 2004. *Letter: Recommendation for Reduction of Sampling Frequency, Phase II Monitoring Wells, Time Oil Northwest Terminal.* To Tom Roick, Oregon Department of Environmental Quality. February 2.

Landau Associates. 2001a. Letter: *Recommendation for Reduction of Analyses, Time Oil Northwest Terminal, Portland, Oregon.* To Tom Roick, Oregon Department of Environmental Quality. January 30.

Landau Associates. 2001b. Letter: *Recommendation for Reduction of TPH Analyses, Time Oil Northwest Terminal, Portland, Oregon.* To Tom Roick, Oregon Department of Environmental Quality. May 17.

Landau Associates. 2000a. Letter: *Discontinuing Dioxin/Furan Analyses, Time Oil Northwest Terminal, Portland, Oregon.* To Tom Roick, Oregon Department of Environmental Quality. May 16.

Landau Associates. 2000b. Letter: *Recommended Reduction of Wells for Quarterly Monitoring, Time Oil Northwest Terminal, Portland, Oregon.* To Tom Roick, Oregon Department of Environmental Quality. August 9.

Landau Associates. 1999. Letter: *Time Oil Northwest Terminal, Portland, Oregon.* To Karla Urbanowicz, Oregon Department of Environmental Quality. January 21.

Landau Associates. 1998. Letter: *Time Oil Northwest Terminal, Portland, Oregon.* To Karla Urbanowicz, Oregon Department of Environmental Quality. May 4.

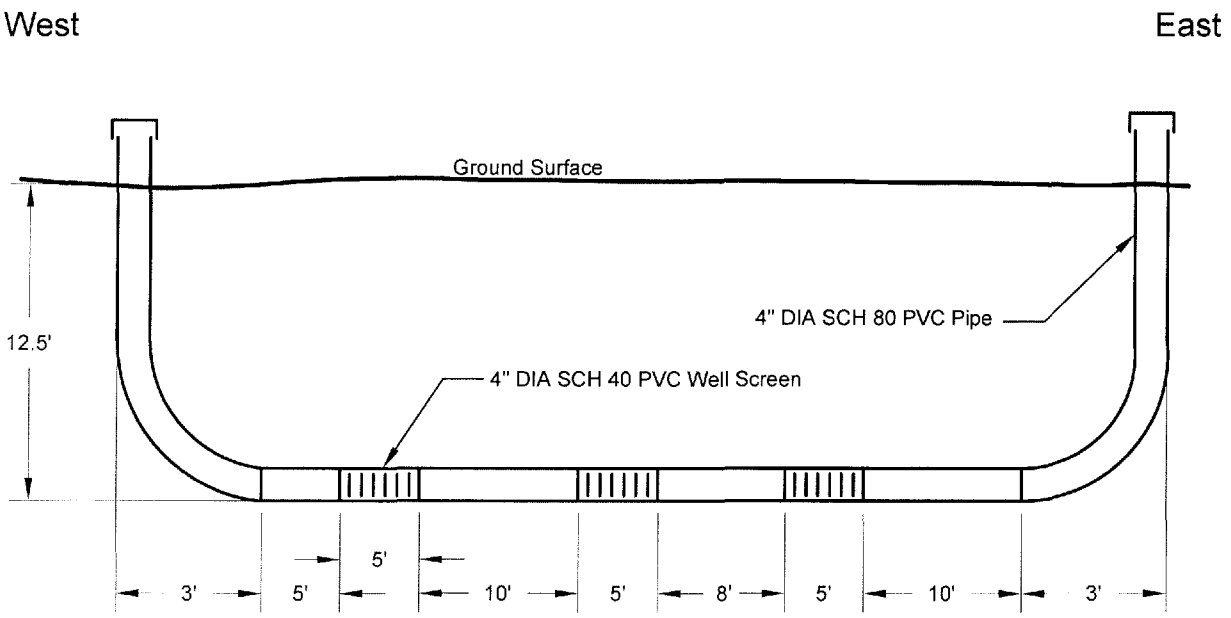
Roick, T.E. 2004. E-mail message from Thomas E. Roick, Oregon Department of Environmental Quality, to Rebekah Brooks, Landau Associates. Re: *Recommendation for Reduction of Sampling Frequency, Phase II Monitoring Wells, Time Oil Northwest Terminal.* February 3.

Roick, T.E. 2001. E-mail message from Thomas E. Roick, Oregon Department of Environmental Quality, to Rebekah Brooks, Landau Associates. Re: *Reduction of Total Petroleum Hydrocarbon Analysis, Time Oil Co. Northwest Terminal.* May 30.

Roick, T.E. 2000. E-mail message from Thomas E. Roick, Oregon Department of Environmental Quality, to Rebekah Brooks, Landau Associates. Re: *Time Oil Groundwater Monitoring.* August 15.

Urbanowicz, K. 12 February 1999. Personal communication (telephone conversation with Rebekah Brooks, Landau Associates, Edmonds, Washington). Re: *Approval of Additional Modification to Groundwater Sampling and Analysis Program, Time Oil Northwest Terminal, Portland, Oregon.* Karla Urbanowicz, Oregon Department of Environmental Quality, Portland, Oregon.

As-Built Sketches of Lateral Injection Wells



LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**MP Line 01**	Figure E-1

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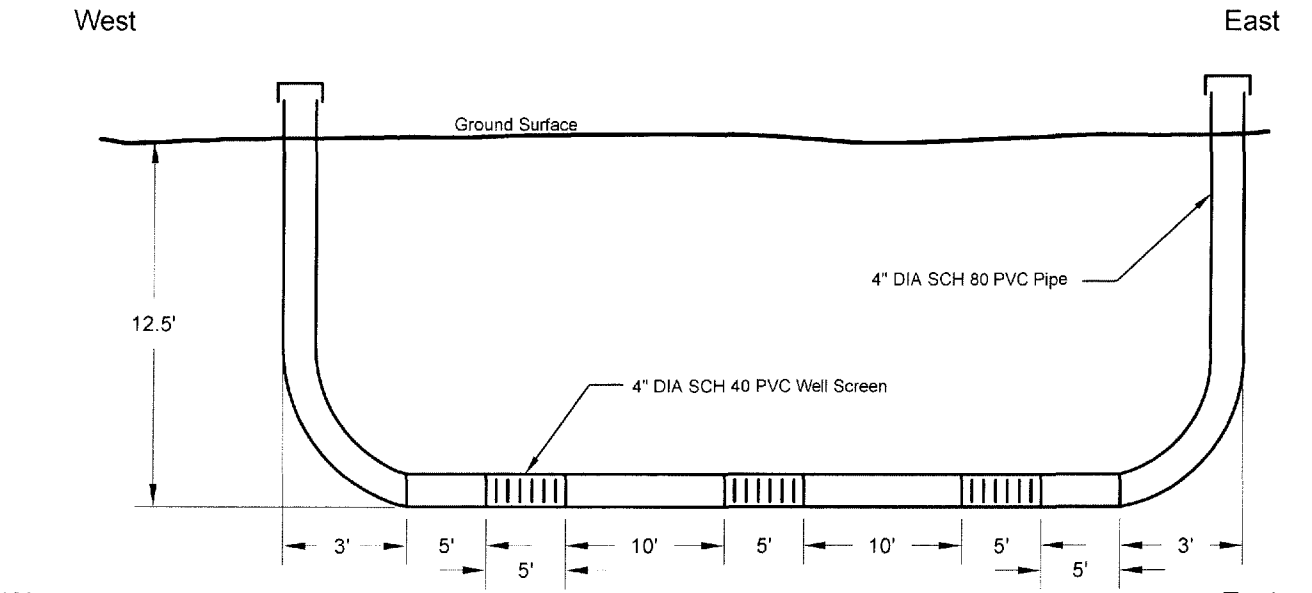
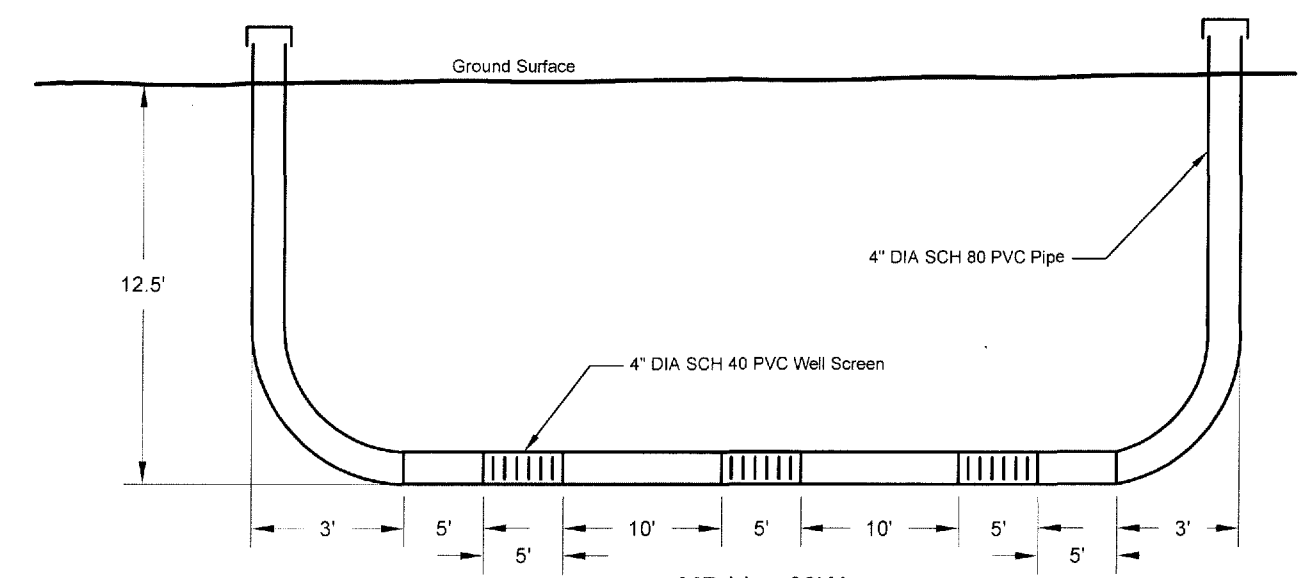


MP Line 02E



MP Line 02W

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Time Oil NW Terminal Portland, Oregon	**MP Line 02**	Figure E-2

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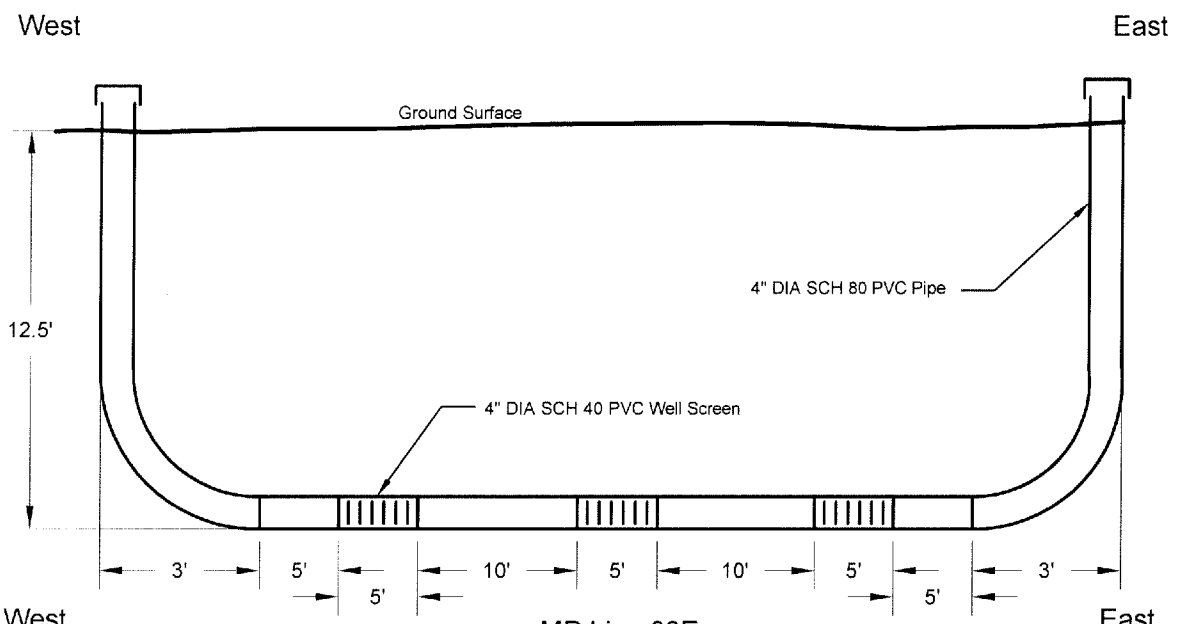

Time Oil NW Terminal Portland, Oregon	**MP Line 03**	Figure **E-3**

LANDAU ASSOCIATES

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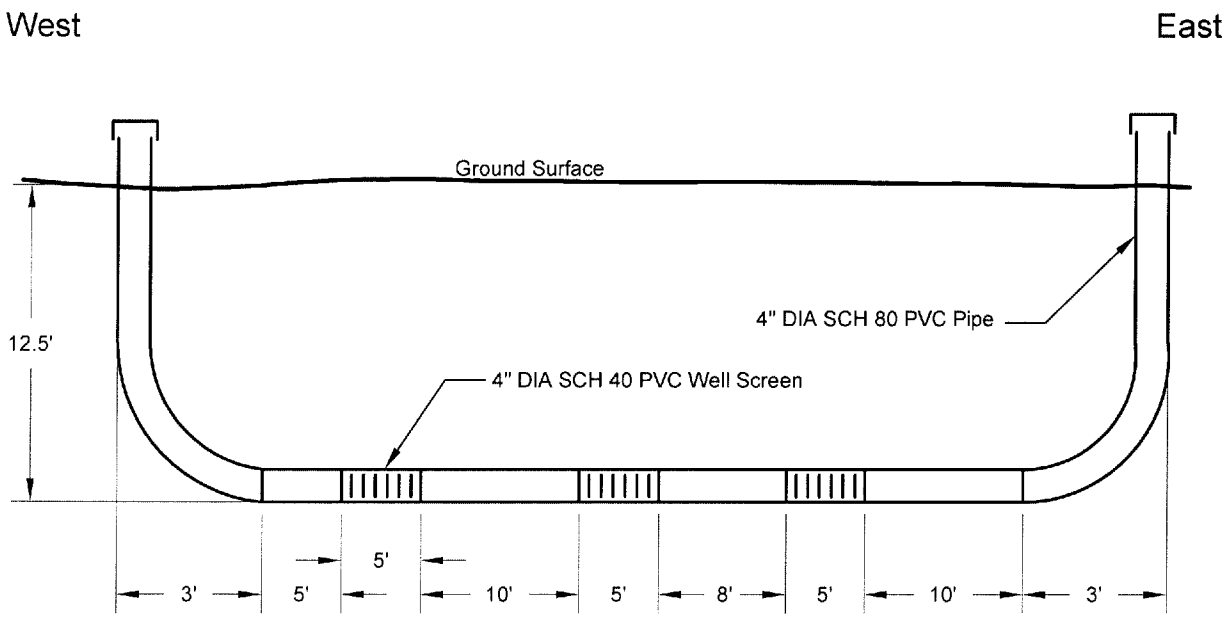
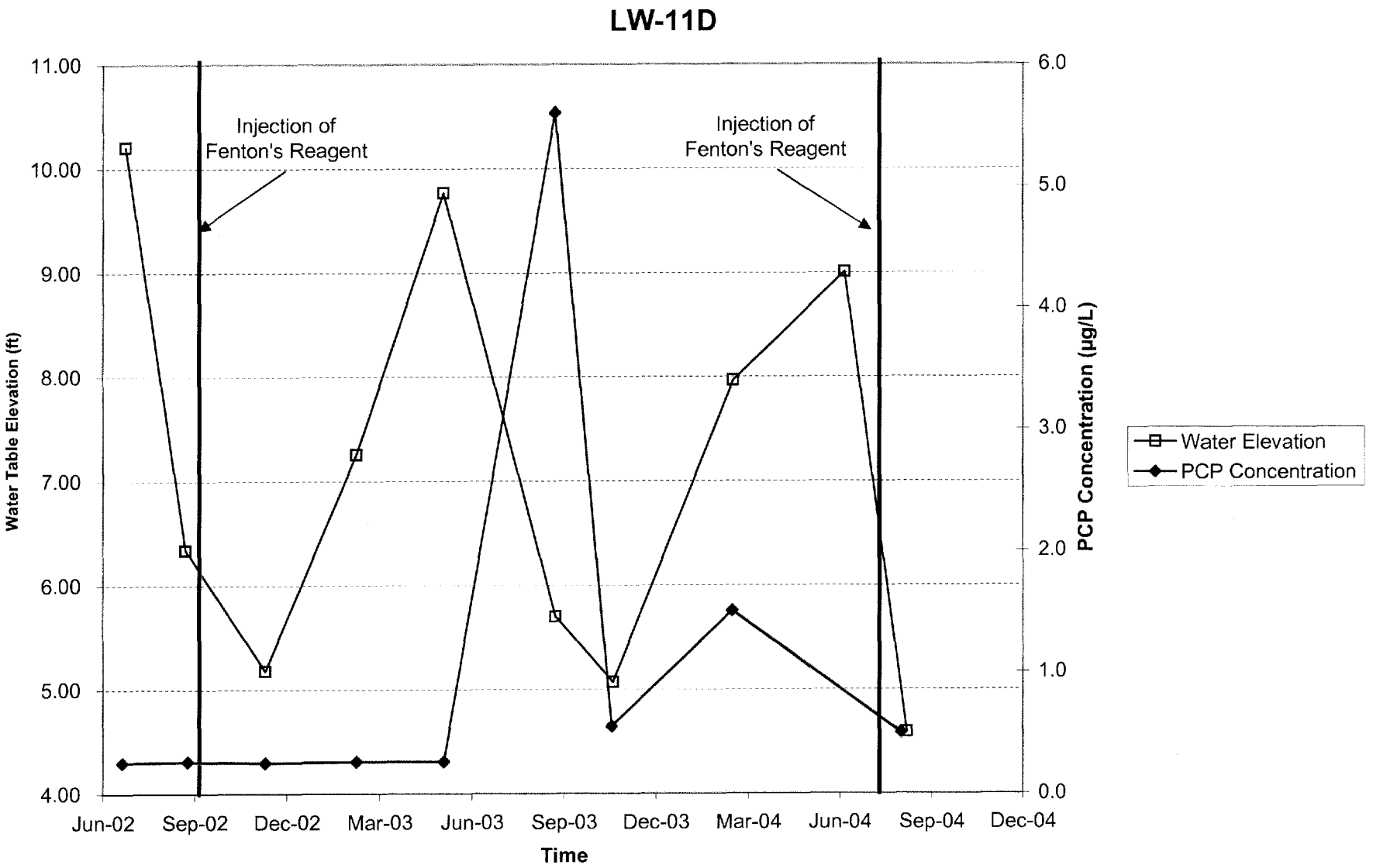


LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**MP Line 04**	Figure E-4

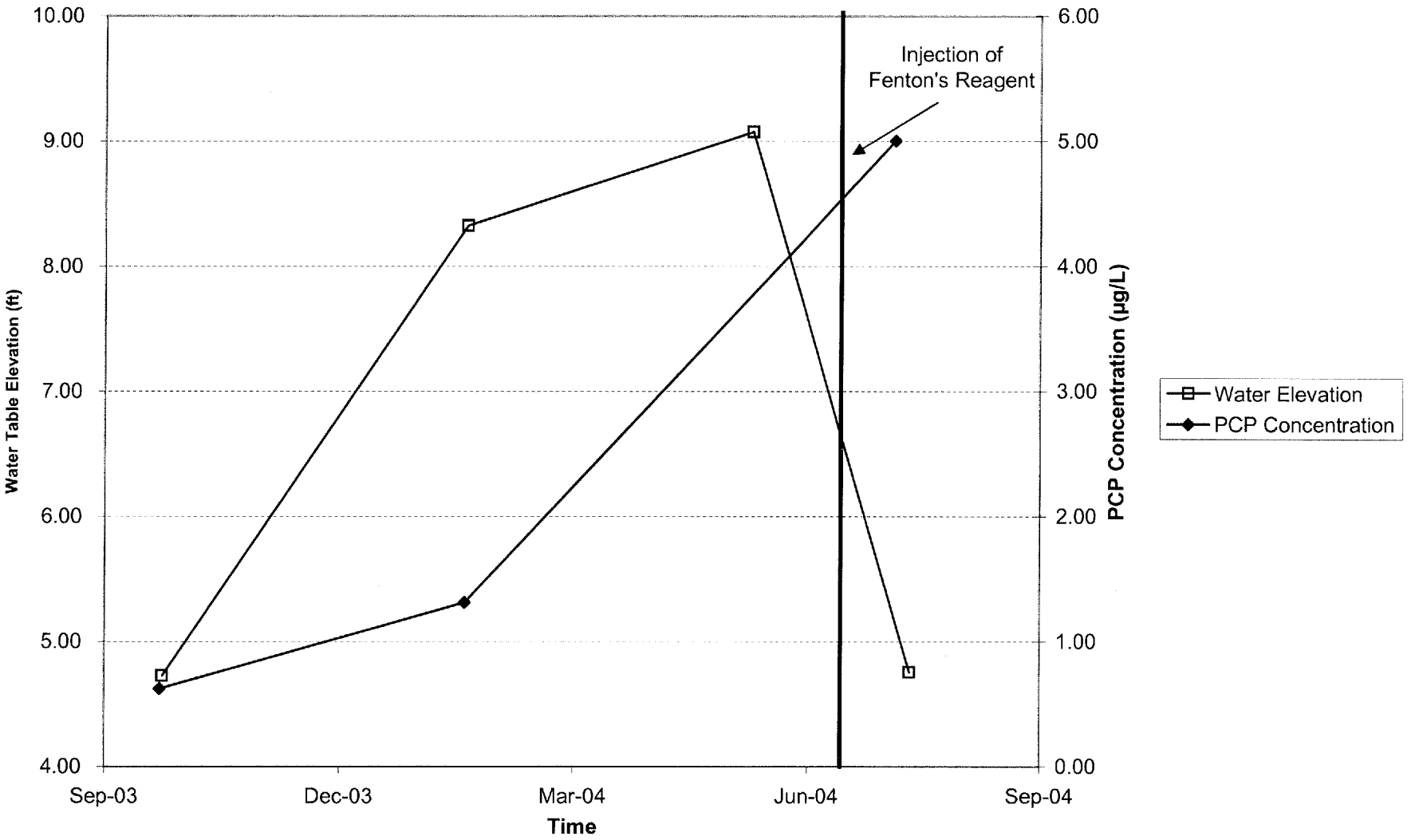
APPENDIX F

Groundwater Elevation and Chlorinated Phenol Concentration vs. Time Graphs



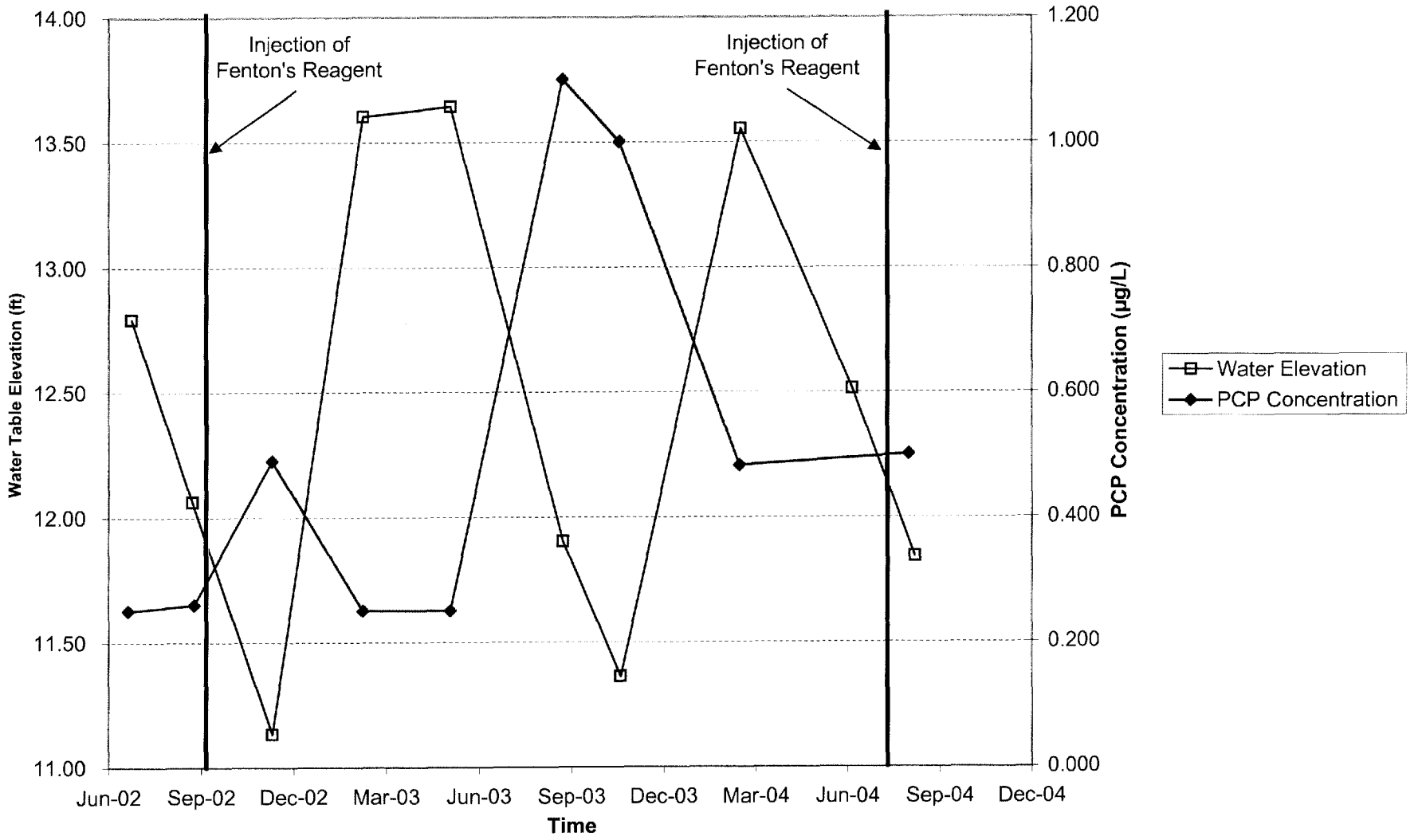
Note: PCP concentrations shown at 0.5 µg/L and below are nondetected concentrations.

OX-8D

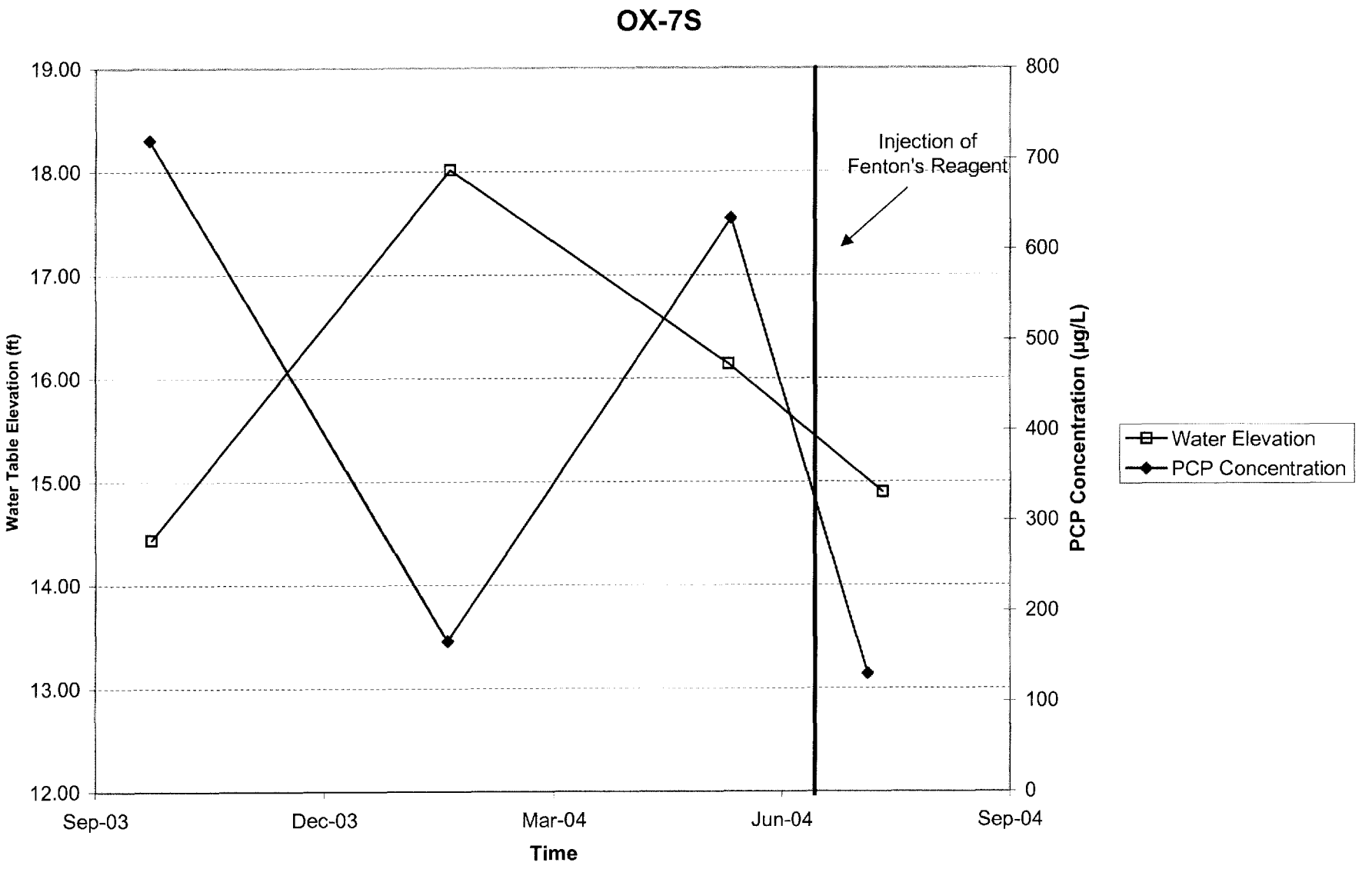


Notes: 1) Well installed in Fall 2003.
2) PCP concentrations shown at 0.5 µg/L and below are nondetected concentrations.

LW-13S



Note: PCP concentrations shown at 0.5 µg/L and below are nondetected concentrations.



Note: Well installed in Fall 2003.

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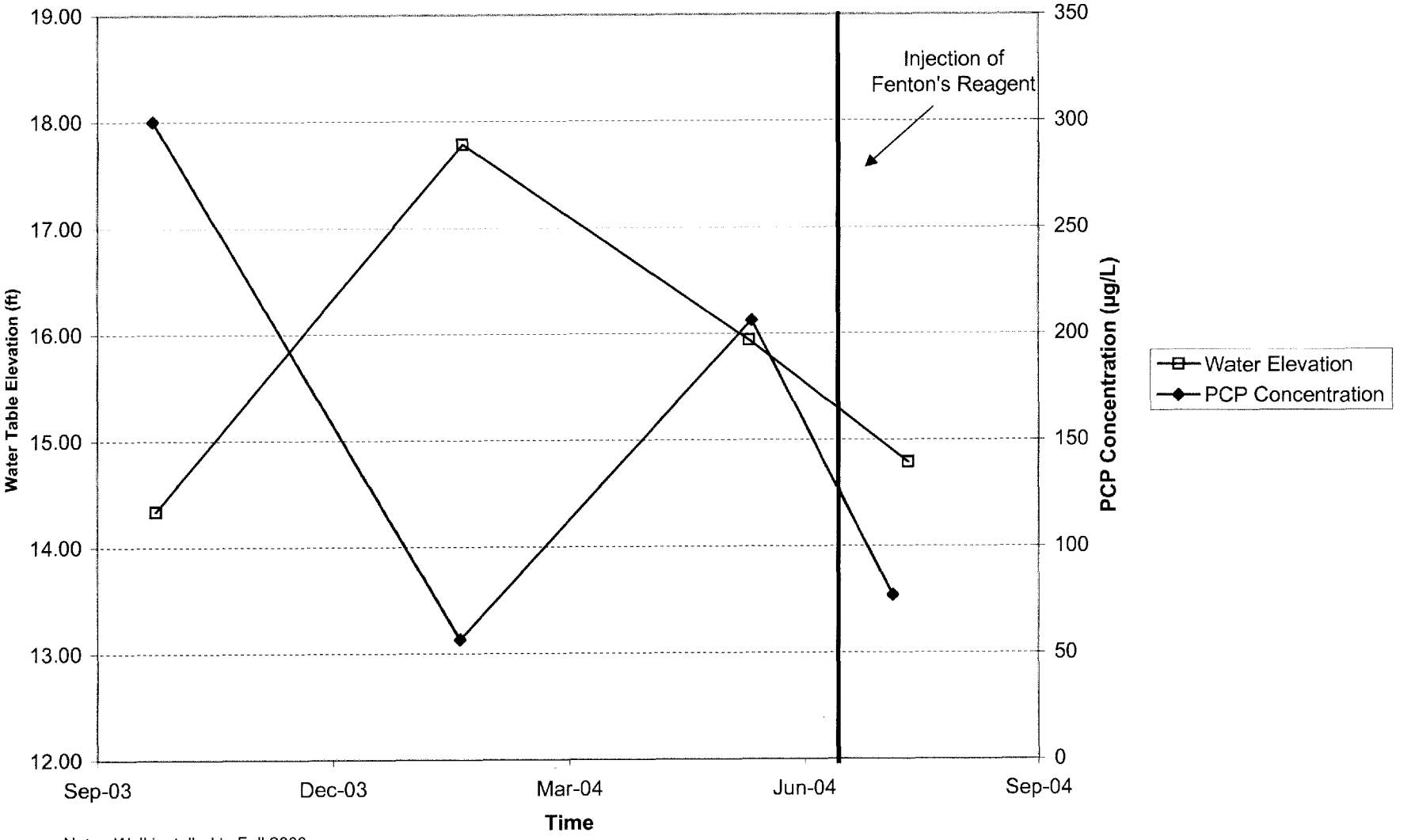
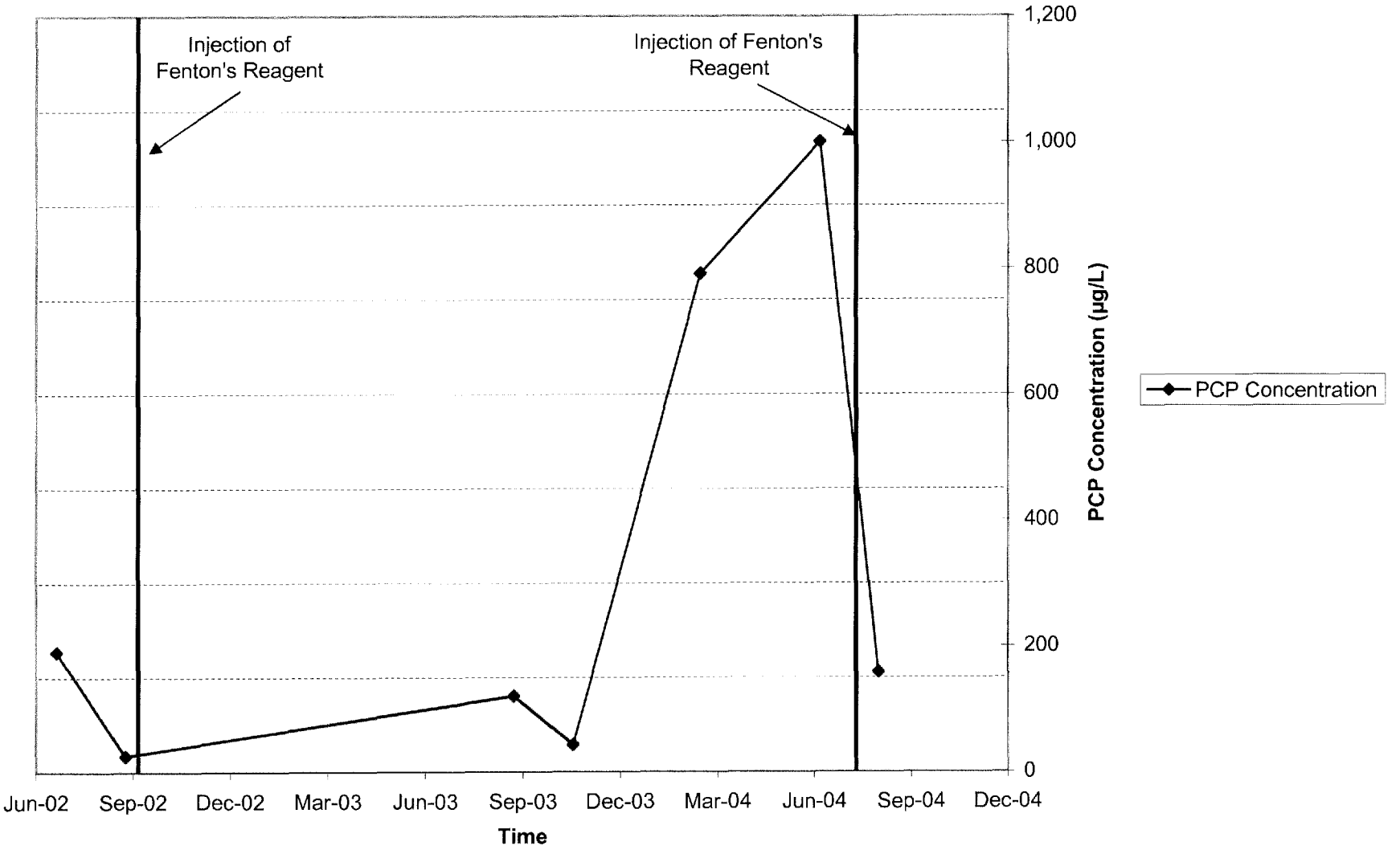
OX-8S

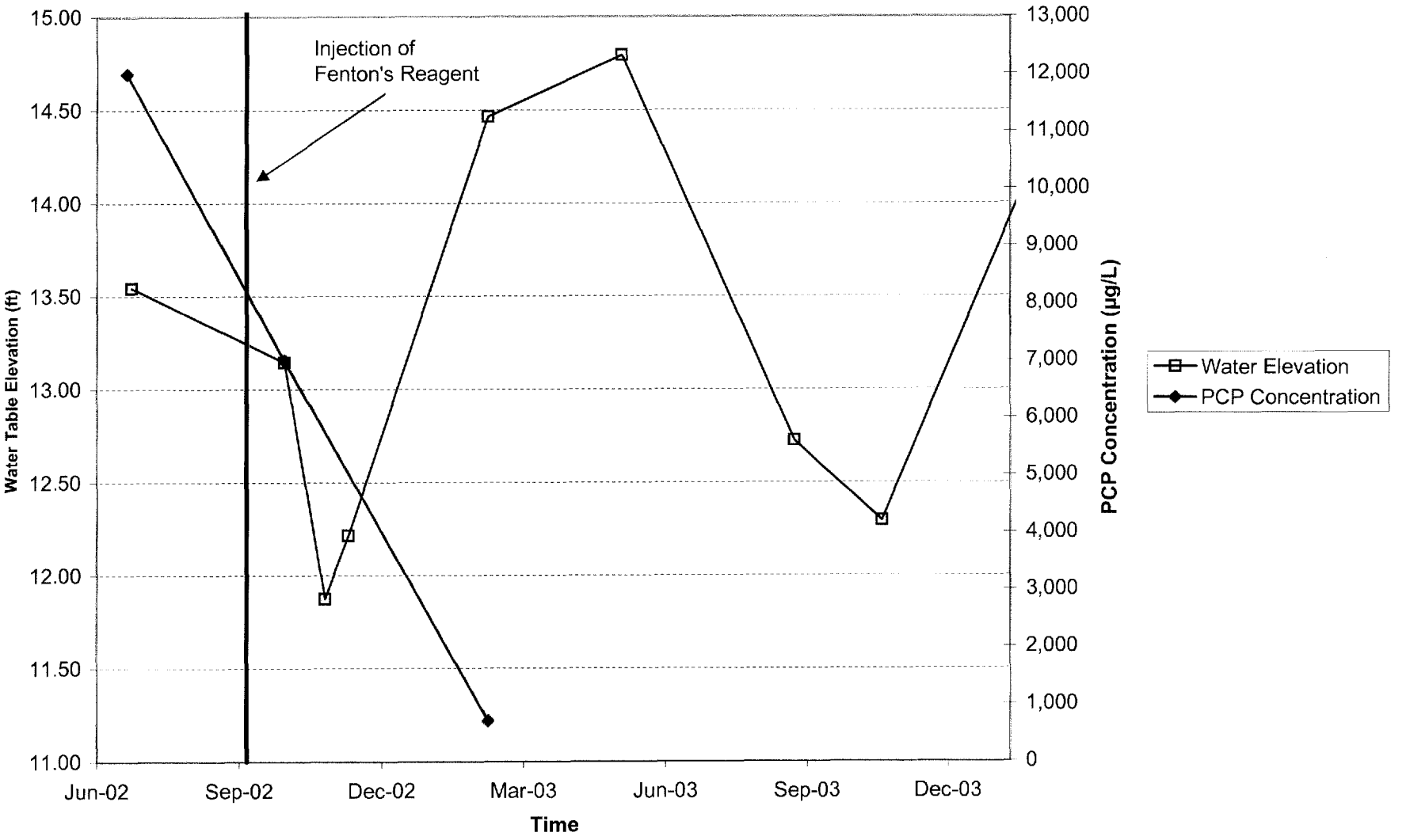


Note: Well installed in Fall 2003.

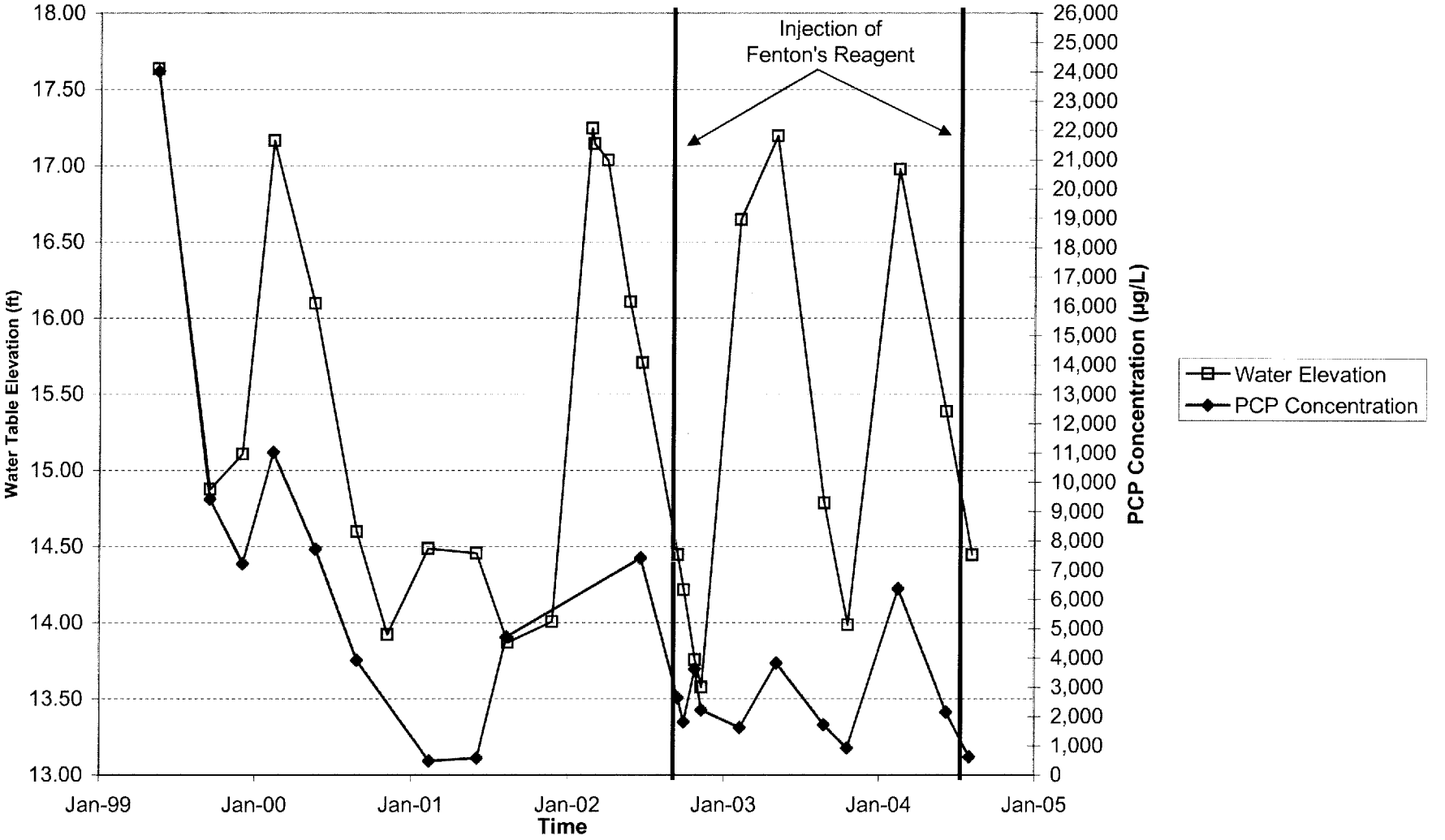
SDM-1


Injection of Fenton's Reagent
Injection of Fenton's Reagent
1,200
1,000
800
600
400
200
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

PZ-1


Injection of
Fenton's Reagent
Water Table Elevation (ft)
PCP Concentration (µg/L)
Time
15.00
14.50
14.00
13.50
13.00
12.50
12.00
11.50
11.00
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
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.

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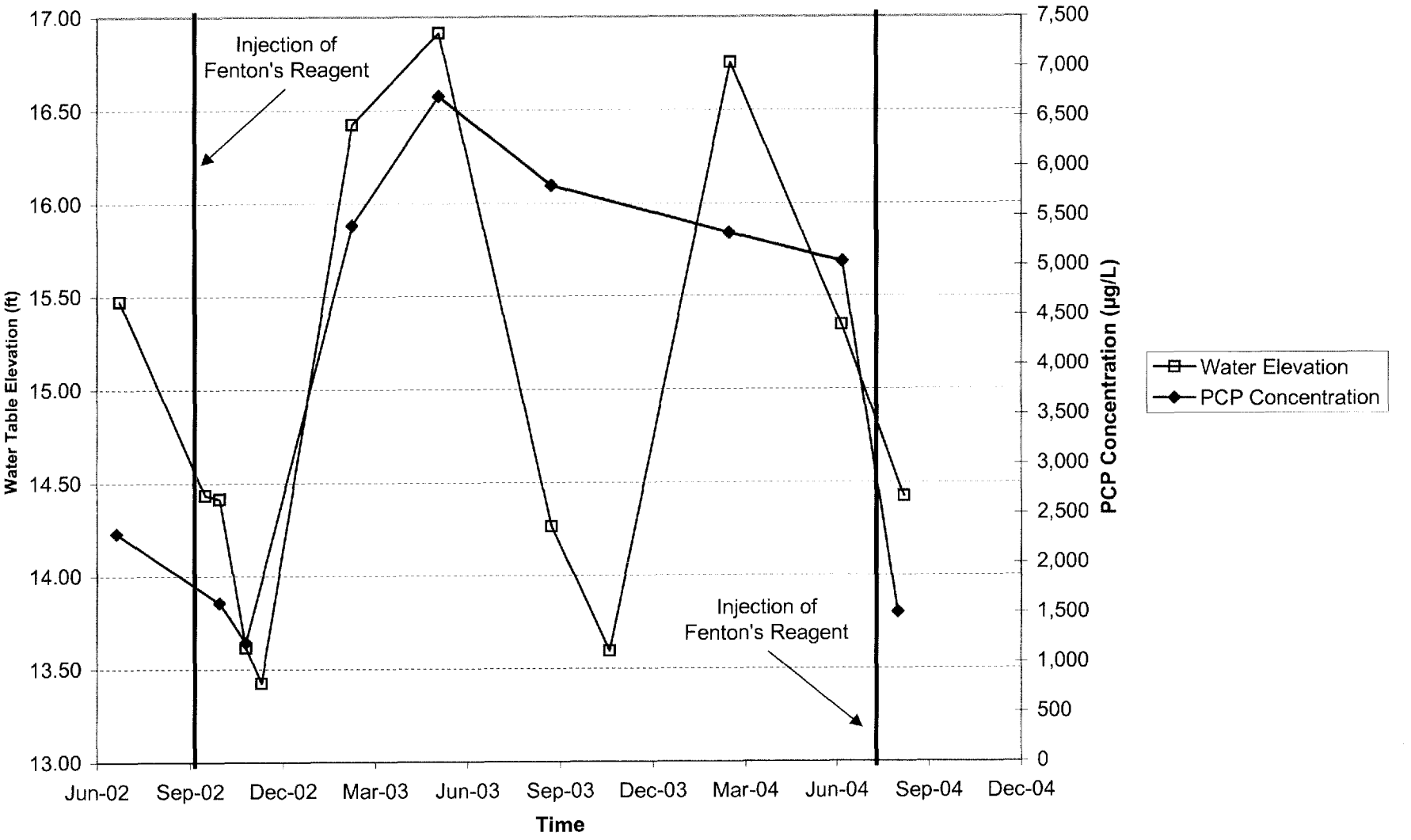
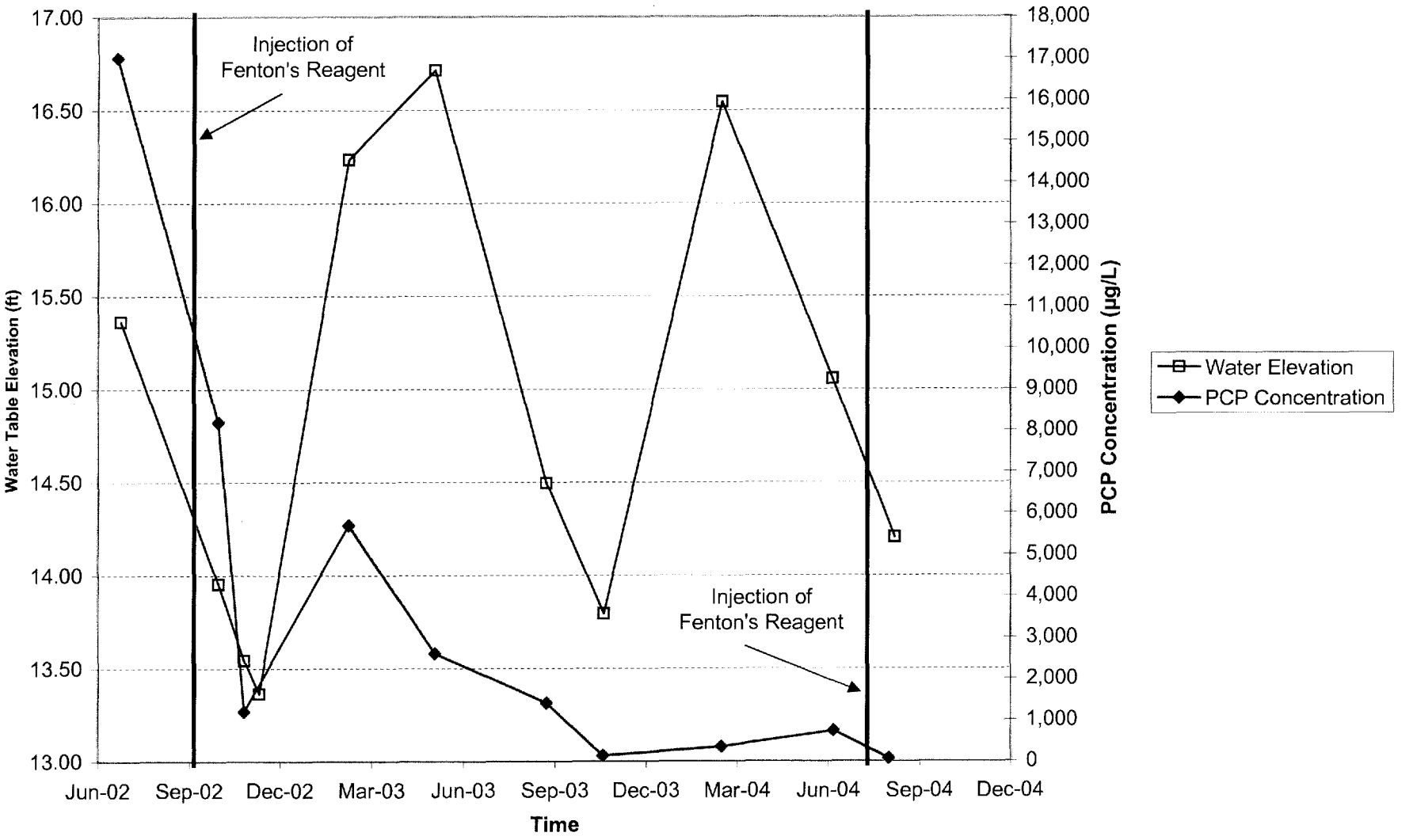
OX-2S


Injection of Fenton's Reagent
Injection of Fenton's Reagent
Water Table Elevation (ft)
PCP Concentration (µg/L)
Time
Water Elevation
PCP Concentration
17.00
16.50
16.00
15.50
15.00
14.50
14.00
13.50
13.00
7,500
7,000
6,500
6,000
5,500
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04

OX-3S



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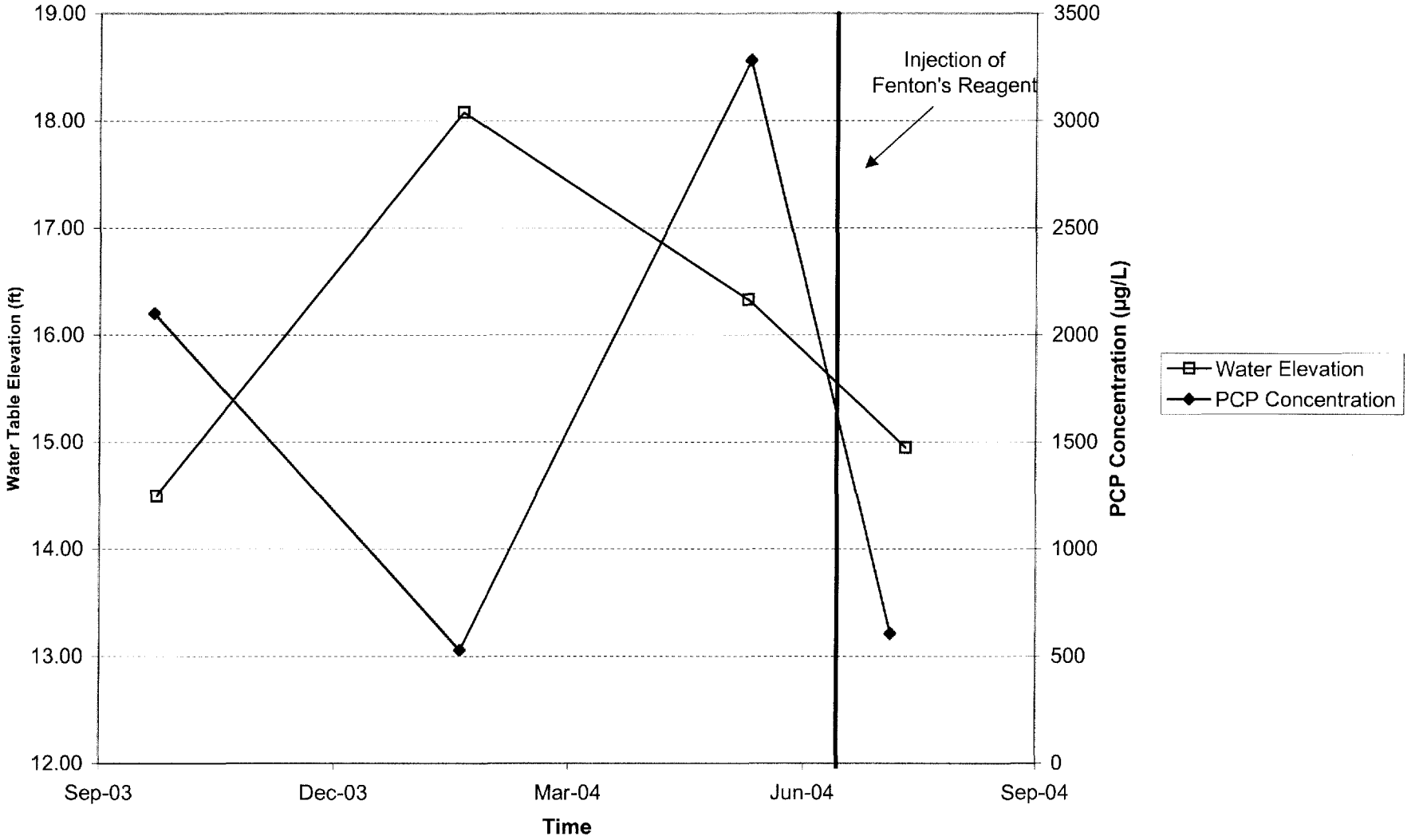
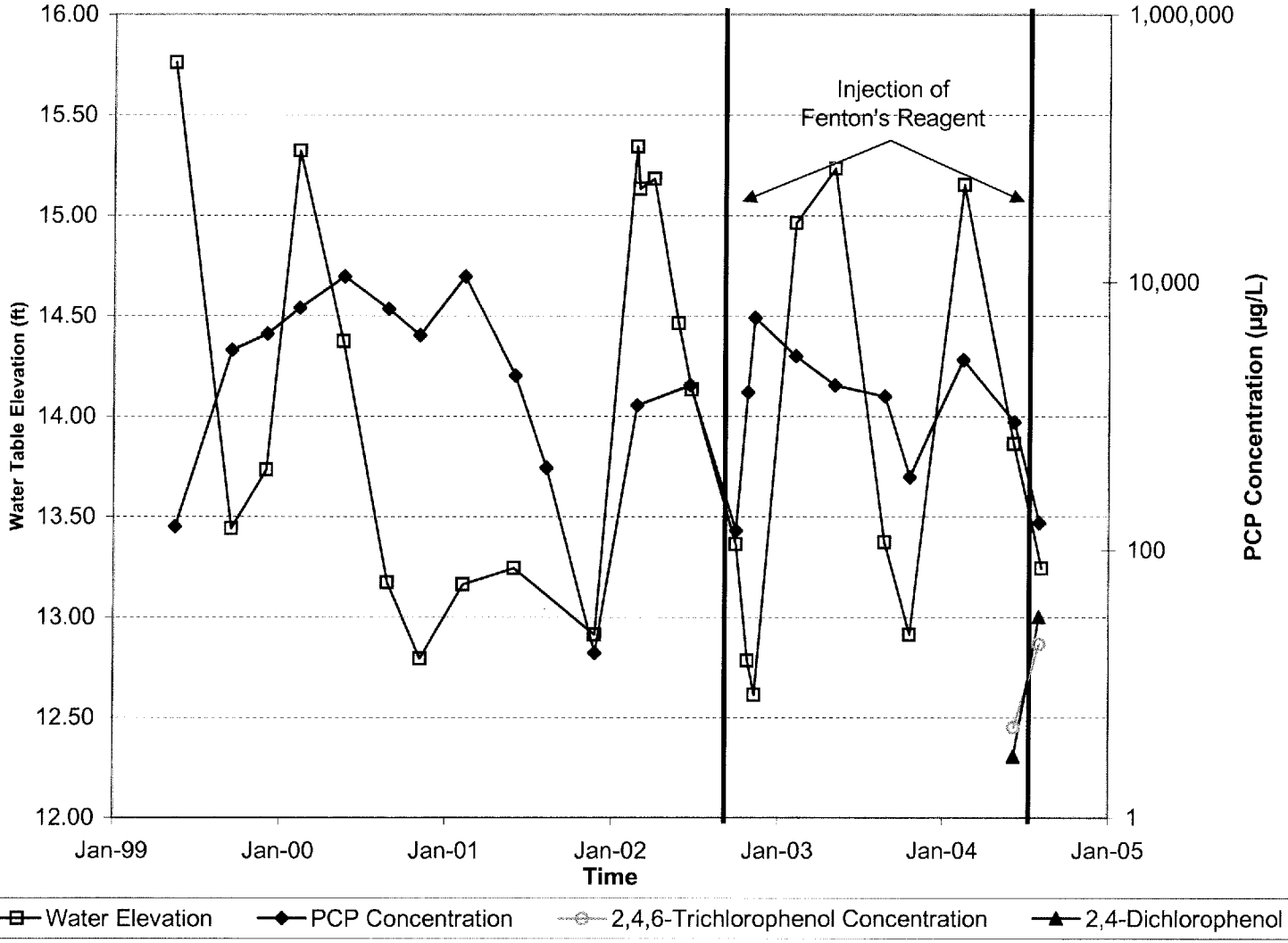
OX-6S

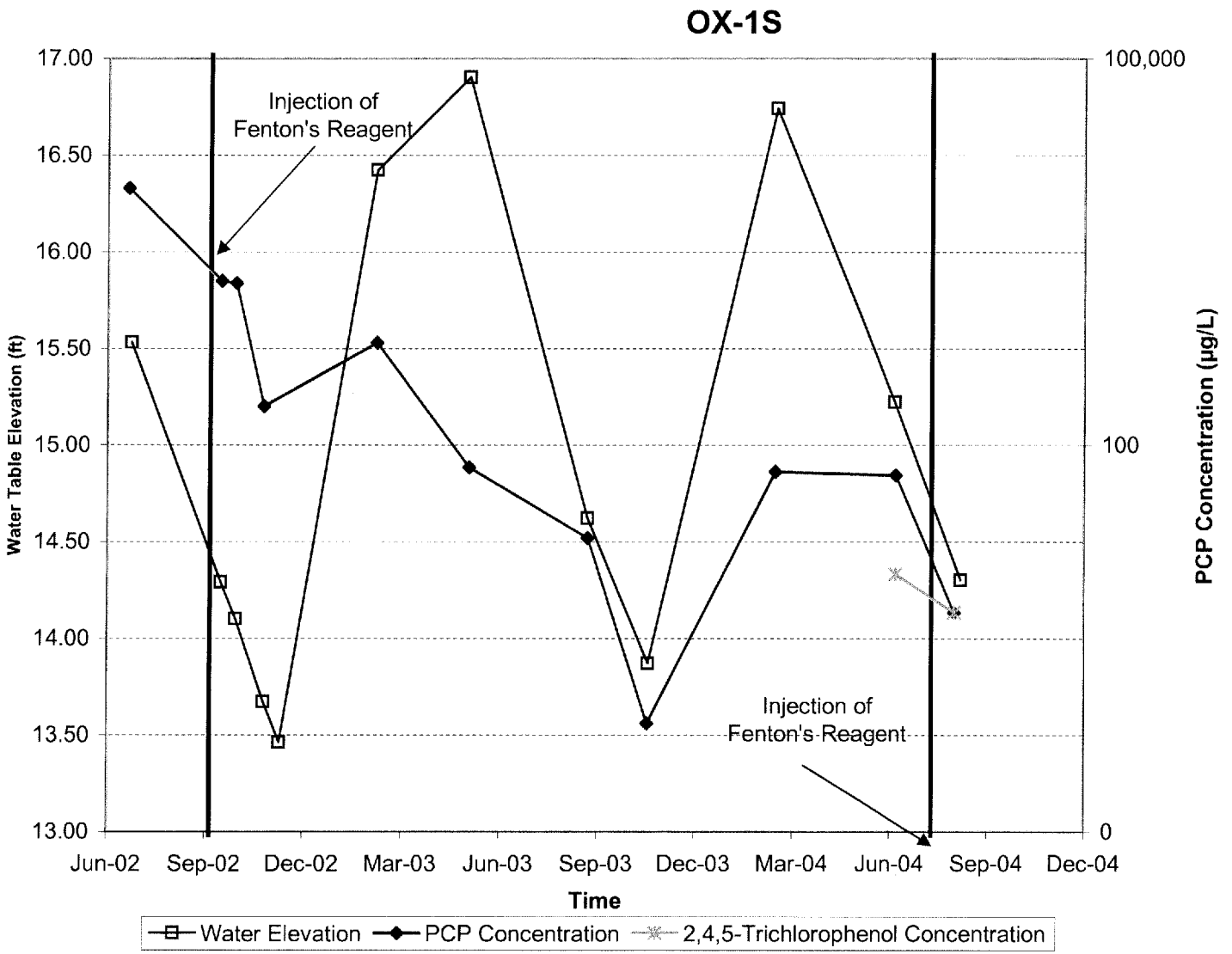


Note: Well installed in Fall 2003.

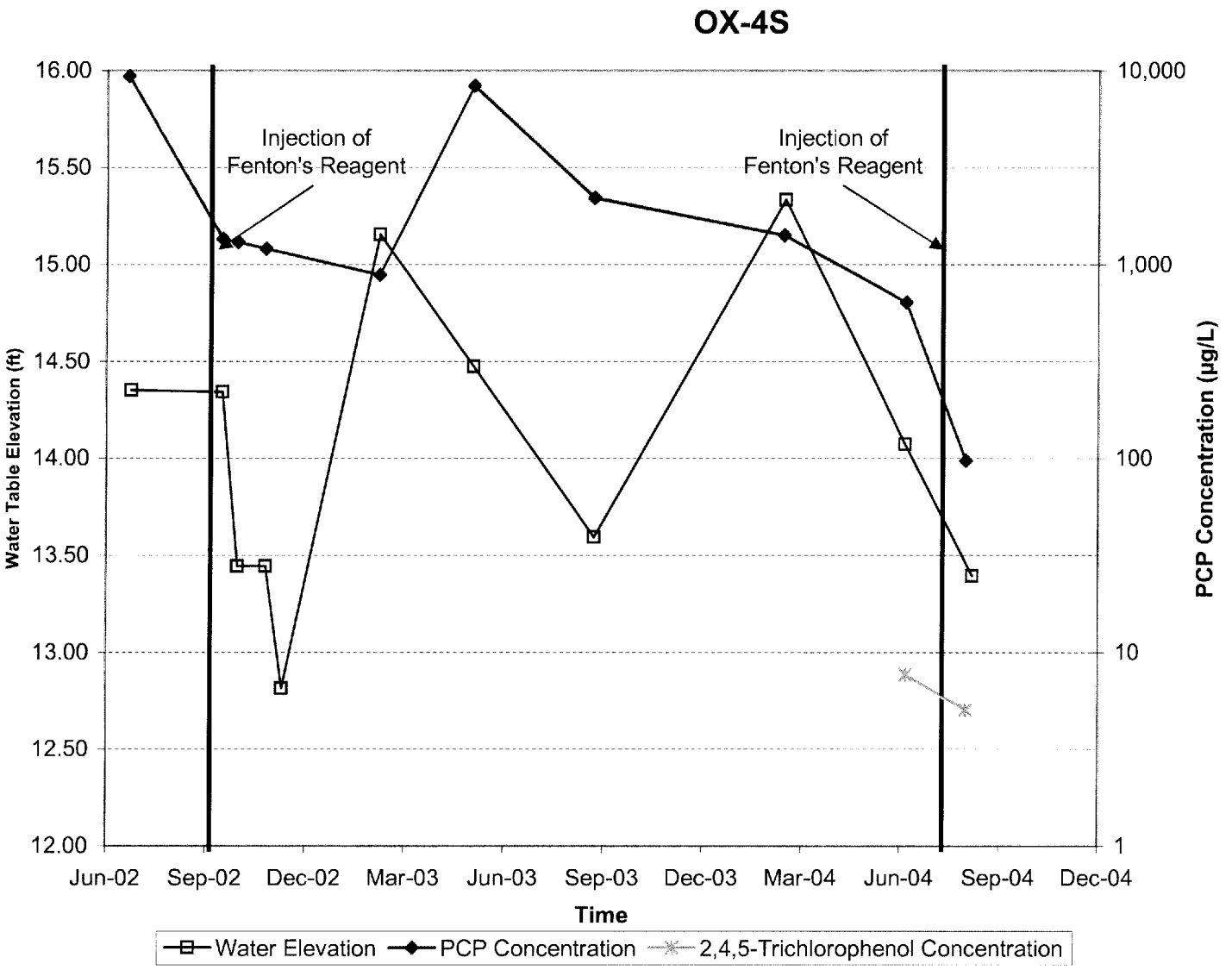
RW-1



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.



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.



Note: 2,4,5-Trichlorophenol concentrations shown at 5 µg/L and below are nondetected concentrations.

APPENDIX G

PCP Mass Removal Calculations

APPENDIX G
MASS REMOVAL ESTIMATE OF PCP IN GROUNDWATER

Pre-Injection PCP Mass in Upper Zone Groundwater (June 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 =	4,350 ft^2	Estimated Area of >100 ug/L Impact =	11,500 ft^2	Estimated Area of >10 ug/L Impact =	11,400 ft^2
Estimated Volume of >1,000 ug/L Impact =	123,000 liters	Estimated Volume of >100 ug/L Impact =	326,000 liters	Estimated Volume of >10 ug/L Impact =	323,000 liters
Calculated Mass of PCP in >1,000 ug/L Impact Area =	0.611 lb.	Calculated Mass of PCP in >100 ug/L Impact Area =	0.359 lb.	Calculated Mass of PCP in >10 ug/L Impact Area =	0.036 lb.

Total Estimated Pre-Injection Mass = 1.01 lb. (Notes 1, 2)

Post-Injection PCP Mass in Upper Zone Groundwater (August 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 =	850 ft^2	Estimated Area of >100 ug/L Impact =	6,680 ft^2	Estimated Area of >10 ug/L Impact =	13,600 ft^2
Estimated Volume of >1,000 ug/L Impact =	24,000 liters	Estimated Volume of >100 ug/L Impact =	189,000 liters	Estimated Volume of >10 ug/L Impact =	385,000 liters
Calculated Mass of PCP in >1,000 ug/L Impact Area =	0.062 lb.	Calculated Mass of PCP in >100 ug/L Impact Area =	0.217 lb.	Calculated Mass of PCP in >10 ug/L Impact Area =	0.044 lb.

Total Estimated Post-Injection Mass = 0.32 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.

APPENDIX H

Data Validation Report

TECHNICAL MEMORANDUM

LANDAU ASSOCIATES
ENVIRONMENTAL | GEOTECHNICAL | NATURAL RESOURCES

TO: Rebekah Brooks, Project Manager

cc: Tom Roick, DEQ
Mark Chandler, Time Oil Co.
Patty Dost, Schwabe, Williamson & Wyatt
Mike Tischuk, Beazer East, Inc.

FROM: Anne Halvorsen

DATE: November 15, 2004

RE: THIRD QUARTER 2004 GROUNDWATER MONITORING
LABORATORY DATA QUALITY EVALUATION
TIME OIL NORTHWEST TERMINAL

This technical memorandum provides the results of a data quality evaluation for 62 groundwater samples and 5 trip blanks collected at the Time Oil Northwest Terminal between August 2 and August 10, 2004 for the Phase II/III remedial investigation (RI) third quarter 2004 groundwater monitoring event. A data quality evaluation was performed for analyses of total petroleum hydrocarbons (NWTPH-Dx, and NWTPH-Gx); volatile organic compounds [VOCs; U.S. Environmental Protection Agency (EPA) Method 8260B]; pentachlorophenol [PCP; EPA Method 8270 with selected ion monitoring (SIM)]; polycyclic aromatic hydrocarbons (PAHs; EPA Method 8270 SIM); semivolatile organic compounds (SVOCs; EPA Method 8270C); selected priority pollutant (PP) total metals (EPA Method 6010/6020 series); chloride (EPA Method 9056); total dissolved solids (TDS; EPA Method 160.1); dioxin/furans (EPA Method 8290); and ferrous iron (EPA Method SM3500 FeD). The analyses were performed by Specialty Analytical, Tualatin, Oregon; Columbia Analytical Services (CAS), Houston, Texas; and Analytical Resources, Inc. (ARI), Tukwila, Washington. This data quality evaluation covers Specialty data packages 0408006, 0408019, 0408020, 0408025, 0408026, 0408035, 0408036, 0408044, 0408056, 0408057, and 0408066; CAS data package E2400737; and ARI data packages GX59 and GX71. 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
- Surrogate spike recoveries

- Matrix spike and matrix spike duplicate (MS/MSD) results
- Laboratory control sample (LCS) results
- Method blank 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 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.

METHOD BLANK RESULTS

Method blanks were analyzed with each batch of samples for each analysis. Contamination was detected in the method blanks, as indicated in Table 1 and as discussed below:

- Arsenic was detected in the method blank associated with total metal analyses reported in data package 0408006. The arsenic results for samples LW029S and LW031S were reported at concentrations less than five times the method blank concentration; therefore, they were qualified as non-detect (U) at the concentration reported, as indicated in Table 1. Fluorene was detected in the method blank associated with the SVOC analyses reported in data package 0408006. Results for fluorene in all project samples were not detected; therefore, no qualification of the data was necessary.

- Arsenic was detected in the method blank associated with the total metals analyses reported in data package 0408019. Project sample results were detected at concentrations greater than five times the reporting limit; therefore, no qualifiers were assigned. Fluorene was detected in the method blank associated with the SVOC analyses reported in data package 0408019. Results for fluorene in all project samples were not detected; therefore, no qualification of the data was necessary.

- Arsenic was detected in the method blank associated with total metal analyses reported in data package 0408020. The arsenic results for samples LW030S and LW030D were detected at concentrations greater than five times the method blank concentration; therefore, no qualification of the data was necessary. Fluorene was detected in the method blank associated with the SVOC analyses reported in data package 0408020. The fluorene result

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for sample LW030S was reported at a concentration less than five times the method blank concentration and was therefore qualified as non-detect (U) at the concentration reported, as indicated in Table 1.

- Arsenic was detected in the method blank associated with total metal analyses reported in data package 0408025. The arsenic result for sample RW1 was detected a concentration greater than five times the method blank concentration; therefore, no qualification of the data was necessary.

- Bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and fluorene were detected in the method blank associated with the SVOC analyses reported in data package 0408025. Bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and fluorene were not detected in sample RW1; therefore, no qualification of the data was necessary.

- Arsenic was detected in the method blank associated with total metal analyses reported in data package 0408026. The arsenic result for the associated project samples were detected at concentrations greater than five times the method blank concentration; therefore, no qualification of the data was necessary.

- Bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and fluorene were detected in the method blank associated with the SVOC analyses reported in data package 0408026. The bis(2-ethylhexyl)phthalate result for OX008D and di-n-butylphthalate results for OX003S and OX004S were less than five times the method blank concentration and therefore were qualified as non-detect (U) at the concentration reported, as indicated in Table 1.

- Napthalene and 1,4-dichlorobenzene were detected in the method blank associated with the VOC analyses reported in data package 0408026. Neither of the VOCs detected in the method blank were detected in the associated project samples; therefore, no qualification of the data was necessary.

- Total dissolved solids was detected in the method blank associated with the TDS analyses reported in data package 0408026. The total dissolved solids results for the associated project samples was detected at concentrations greater than five times the method blank concentration; therefore, no qualification of the data was necessary.

- Arsenic was detected in the method blank associated with total metal analyses reported in data package 0408035. The arsenic result for the associated project samples were detected at concentrations greater than five times the method blank concentration; therefore, no qualification of the data was necessary.

- Bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and fluorene were detected in the method blank associated with the SVOC analyses reported in data package 0408035. Bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and fluorene were not detected in the associated project samples; therefore, no qualification of the data was necessary.

- Arsenic was detected in the method blank associated with the total metals analyses reported in data package 0408036. Results for arsenic in all project samples were either not detected or were at concentrations greater than five times the method blank concentration; therefore, no qualification of the data was necessary.

- Napthalene and 1,4-dichlorobenze were detected in the method blank associated with the VOC analyses reported in data package 0408036. Naphthalene and 1,4-dichlorobenzene in

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the project samples were either not detected or were at concentrations greater than five times the method blank concentration; therefore, no qualification of the data was necessary.

- Fluorene and nitrobenzene were detected in the method blank associated with the SVOC analyses reported in data package 0408036. Fluorene and nitrobenzene were not detected in the associated project samples; therefore, no qualification of the data was necessary.

- Fluorene and nitrobenzene were detected in the method blank associated with the SVOC analyses reported in data package 0408044. Fluorene and nitrobenzene were not detected in the associated project samples; therefore, no qualification of the data was necessary.

- Arsenic and zinc were detected in the method blank associated with total metal analyses reported in data package 0408056. Results for arsenic and zinc were either not detected or were at concentrations greater than five times the method blank concentration; therefore, no qualification of the data was necessary.

- Benzo(g,h,i)perylene and nitrobenzene were detected in the method blank associated with SVOC analyses reported in data package 0408056. The benzo(g,h,i)perylene result for sample LW020S and the nitrobenzene result for sample LW025D were at concentrations less than five times the reporting limit and, therefore, were qualified as non-detect (U) at the concentration reported, as indicated in Table 1.

- Acenaphthene, benzo(a)anthracene, fluorene, pyrene, benzo(g,h,i)perylene, and indeno(1,2,3-cd)pyrene were detected in the method blank associated with PAH analyses reported in data package 0408056. Results for these analytes were either not detected or were at concentrations greater than five times the method blank concentration; therefore, no qualification of the data was necessary.

- Arsenic and zinc were detected in the method blank associated with the total metals analyses reported in data package 0408066. Results for arsenic and zinc in all project samples were at concentrations greater than five times the method blank concentration; therefore, no qualification of the data was necessary.

- Methylene chloride was detected in the method blank associated with the VOC analyses reported in data package 0408066. Results for methylene chloride in all project samples were not detected; therefore, no qualification of the data was necessary.

- Benzo(g,h,i)perylene, indeno(1,2,3-cd)pyrene, and nitrobenzene were detected in the method blank associated with the SVOC analyses reported in data package 0408066. Benzo(g,h,i)perylene, indeno(1,2,3-cd)pyrene, and nitrobenzene were not detected in the associated project samples; therefore, no qualification of the data was necessary.

- Acenaphthene, benzo(a)anthracene, benzo(g,h,i)perylene, fluorene, indeno(1,2,3-cd)pyrene, and pyrene were detected in the method blank associated with the PAH analyses reported in data package 0408066. Results for acenaphthene, benzo(a)anthracene, benzo(g,h,i)perylene, fluorene, indeno(1,2,3-cde)pyrene, and pyrene in all project samples were either not detected or were at concentrations greater than five times the method blank concentration; therefore, no qualification of the data was necessary.

- OCDD was detected in the method blank associated with the dioxin/furan analyses reported in data package E2400737. Results for OCDD in samples RW1, OX002S, and OX006S were

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at concentrations greater than five times the method blank concentration; therefore, no qualification of the data was necessary.

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). Trip blanks were submitted for analysis of VOCs. No VOCs were detected in the trip blanks with the following exception. Bromomethane and chloromethane were detected in the trip blank associated with the VOC analyses reported in data package 0408066. Bromomethane and chloromethane were not detected in the associated project samples; therefore, no qualification of the data was 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.

- **Data Package 0408006 - VOC analyses.** Recovery of surrogate 4-Bromofluorobenzene associated with the VOC analysis of LW029D, LW029S, LW031S, LW032D, LW032S, LW033S, LW034S, Trip Blank, and Method Blank was above the upper laboratory control limit, indicating a potential high bias. However, only detected results for sample LW032S were qualified as estimates (J) as indicated in Table 1. All other sample results were non-detect, therefore, qualification was unnecessary.

- **Data Package 0408006 - SVOC analyses.** Recovery of surrogate 2,4,6-tribromophenol associated with SVOC analyses of LW029D, LW029S, and LW032S was above the upper laboratory control limit, indicating a potential high bias. Additionally, recovery of surrogate 4-Terphenyl-d14 associated with SVOC analysis of LW029S was above the upper laboratory control limit, indicating a potential high bias. 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.

- **Data Package 0408019 - VOC analyses.** Recovery of surrogate 4-Bromofluorobenzene associated with the VOC analysis of B1, B2, J1, J2, Trip Blank, and Method Blank were outside the upper laboratory control limit, indicating a potential high bias. However; only detected results for samples B1 and J1 were qualified as estimates (J) as indicated in Table 1. All other sample results were non-detect, therefore, qualification was unnecessary.

- **Data Package 0408020 - BTEX analyses.** Recovery of surrogate 4-Bromofluorobenzene associated with BTEX analysis of LW001S, K, LW007S, and Method Blank were outside the upper laboratory control limit, indicating a potential high bias. However; only detected results for sample LW007S were qualified as estimates (J) as indicated in Table 1. All other sample results were non-detect, therefore, qualification was unnecessary.

- **Data Package 0408020 - VOC analyses.** Recovery of surrogate 4-Bromofluorobenzene associated with VOC analysis of LW030D, LW030S, and Method Blank were outside the

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upper laboratory control limit, indicating a potential high bias. However; only detected results for sample LW030S were qualified as estimates (J) as indicated in Table 1. All other sample results were non-detect, therefore, qualification was unnecessary.

- **Data Package 0408020 - SVOC analyses.** Recovery of surrogate 2,4,6-dibromophenol associated with the SVOC analysis of sample LW030S was slightly above the upper laboratory control limit, indicating a potential high bias. However, no qualifiers were assigned because, in accordance with the EPA guidelines (1994e), two or more surrogates of the same fraction must be outside the control limits to qualify SVOC results based on surrogate recoveries.

- **Data Package 0408025 - VOC analyses.** Recovery of surrogate 4-Bromofluorobenzene associated with VOC analysis of RW1 and Method Blank were outside the upper laboratory control limit, indicating a potential high bias. However; only detected results for sample RW1 were qualified as estimates (J) as indicated in Table 1.

- **Data Package 0408026 – VOC analyses.** Recovery of surrogate 4-Bromofluorobenzene associated with VOC analyses of Y, OX001S, OX002S, OX005S, OX006S, OX007S, OX008D, OX008S, Trip Blank, and Method Blank were outside the upper laboratory control limit, indicating a potential high bias. However; only detected results for samples Y, OX001S, OX002S, OX006S, OX007S, OX008D, OX008S, and Method Blank were qualified as estimates (J) as indicated in Table 1.

- **Data Package 0408026 – SVOC analyses.** Recovery of surrogate 2,4,6-tribromophenol associated with SVOC analyses of OX007S and recovery of surrogate phenol-d5 associated with analyses of OX002S, OX003S, and OX008S were outside the upper laboratory control limit, indicating a potential high bias. However, no qualifiers were assigned because, in accordance with the EPA guidelines (1994e), two or more surrogates of the same fraction must be outside the control limits to qualify SVOC results based on surrogate recoveries.

- **Data Package 0408035 - VOC analyses.** Recovery of surrogate 4-Bromofluorobenzene associated with VOC analysis of LW011S, OX009S, and Method Blank were outside the upper laboratory control limit, indicating a potential high bias. However; only detected results for sample LW011S and OX009S were qualified as estimates (J) as indicated in Table 1.

- **Data Package 0408035 - SVOC analyses.** Recovery of surrogate phenol-d6 associated with SVOC analyses of LW011S was above the upper laboratory control limit, indicating a potential high bias. 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.

- **Data Package 0408036 - VOC analyses.** Recovery of surrogate 4-Bromofluorobenzene associated with VOC analysis of D, W, Trip Blank, and Method Blank were outside the upper laboratory control limit, indicating a potential high bias. However; only detected results for samples D, W, Trip Blank, and Method Blank were qualified as estimates (J) as indicated in Table 1.

- **Data Package 0408036 – PCP analyses.** Recovery of surrogate 2,4,6-tribromophenol associated with the PCP (SIM) analysis of sample LW008S exceeded the upper laboratory control limit, indicating a potential high bias. The sample result was non-detect, therefore qualification was not necessary

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- **Data Package 0408044 - VOC analyses.** Recovery of surrogate 4-Bromofluorobenzene associated with the VOC analysis of LW003D, LW010D, LW011D, Trip Blank and Method Blank was above the upper laboratory control limit, indicating a potential high bias. All sample results were non-detect, therefore, qualification was unnecessary.

- **Data Package 0408044 – PCP analyses.** Recovery of surrogate 2,4,6-tribromophenol associated with the PCP (SIM) analysis of samples LW006D and LW018D exceeded the upper laboratory control limit, indicating a potential high bias. All sample results were non-detect, therefore, qualification was unnecessary.

- **Data Package 0408044 - SVOC analyses.** Recovery of surrogate phenol-d6 associated with SVOC analyses of G1A and LW006D was above the upper laboratory control limit, indicating a potential high bias. 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.

- **Data Package 0408056 - VOC analyses.** Recovery of surrogate 4-Bromofluorobenzene associated with the VOC analysis of the Method Blank was above the upper laboratory control limit, indicating a potential high bias. All detected results for the Method Blank were qualified as estimates (J) as indicated in Table 1.

- **Data Package 0408056 - SVOC analyses.** Recovery of surrogates 2-fluorobiphenyl and 2,4,6-tribromophenol associated with SVOC analyses of samples Q, LW019S, LW020S, and LW025D was above the upper laboratory control limit, indicating a potential high bias. 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.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) RESULTS

MS/MSD samples were performed and qualifiers assigned as discussed below.

- **Data Packages GX59 and GX71:** One matrix spike was performed with the ferrous iron analyses in each data package. The recovery of ferrous iron in the matrix spikes were within the laboratory control limits. No qualifiers were assigned.

- **Data Package 0408006:** One MS/MSD pair was performed with the total metals, VOC, BTEX, SVOC, PAH, NWTPH-Gx, NWTPH-Dx, and chloride analyses. Each MS/MSD pair was performed using a project sample. Recoveries and relative percent differences (RPDs) for the MS/MSDs were within the laboratory control limits with the following exceptions. The recovery value for chromium in sample LW029S in the MS was slightly below the lower laboratory control limit, indicating a potential low bias. The recovery value for chlorobenzene in the MS was slightly above the upper laboratory control limit. However, no qualification of the data was deemed necessary because the recoveries for the MSD were within the laboratory control limit. The RPD for arsenic was slightly above laboratory control limits. However, no qualification of the data was deemed necessary because the sample results for both were near the reporting limit and the difference between the parent sample and duplicate sample was less than the reporting limit.

- **Data Package 0408026:** One MS/MSD pair was performed with the total metals, VOC, SVOC, and chloride analyses. The MS/MSD pair for VOC was performed using a project

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sample. The recovery value for chlorobenzene in the MS was only slightly outside the upper laboratory control limit, indicating a potential high bias. However, no qualification of the data was deemed necessary because the recoveries for the MSD were within the laboratory control limit. The MS/MSD pair for total metals, SVOC, and chloride was not performed using a project sample; therefore, the MS/MSD results were not used for this data quality evaluation.

- **Data Package 0408035:** One MS/MSD pair was performed with the total metals, VOC, SVOC, and chloride analyses. Recoveries and relative percent differences (RPDs) for the MS/MSDs were within the laboratory control limits.

- **Data Package 0408036:** One MS/MSD pair was performed with the total metals, VOC, SVOC, NWTPH-Dx, NWTPH-Gx, PCP, and chloride analyses. The MS/MSD pair for Total metals, VOC, SVOC, NWTPH-Dx, NWTPH-Gx, PCP, and chloride was not performed using a project sample; therefore, the MS/MSD results were not used for this data quality evaluation.

- **Data Package 0408044:** One MS/MSD pair was performed with the total metals, VOC, SVOC, chloride, PCP, and NWTPH-Dx analyses. Each MS/MSD pair was performed using a project sample. Recoveries and relative percent differences (RPDs) for the MS/MSDs were within the laboratory control limits

- **Data Package 0408056:** One MS/MSD pair was performed with the total metals, VOC, SVOC, NWTPH-DX, NWTPH-Gx, PAH, and chloride analyses. The MS/MSD pair for total metals, NWTPH-Gx, and chloride was performed using a project sample. Recoveries and relative percent differences (RPDs) for the MS/MSDs were within the laboratory control limits with the following exception. The matrix spike recovery for chromium was below control limits, but the post digestion spike was in control. No qualification of the data was necessary. The MS/MSD pair for total metals (arsenic and lead), VOC, SVOC, NWTPH-DX, and PAH were not performed using a project sample; therefore, the MS/MSD results were not used for this data quality evaluation.

- **Data Package 0408057:** A MS/MSD pair was not performed with the PCP analyses. Batch precision was determined by LCS/LCSD.

- **Data Package 0408066:** One MS/MSD pair was performed with the Total metals, VOC/BTEX, SVOC, chloride, NWTPH-Dx, NWTPH-Gx, and PAH analyses. The MS/MSD pair for chloride and NWTPH-Gx was performed using a project sample. Recoveries and relative percent differences (RPDs) for the MS/MSDs were within the laboratory control limits with the exception of NWTPH-GX. The MS/MSD pair for Total metals, VOC/BTEX, SVOC, NWTPH-Dx, and PAH were not performed using a project sample; therefore, the MS/MSD results were not used for this data quality evaluation.

- **Data Package E2400737:** A MS/MSD pair was not performed with the dioxin/furan analyses. Batch precision was determined by LCS/LCSD.

LABORATORY CONTROL SAMPLE (LCS) RESULTS

At least one LCS (or blank spike sample) was analyzed with each batch of samples for each analysis. LCS duplicates were also performed with some of the analyses. Recoveries and RPDs for the LCSs and associated duplicates were within laboratory control limits except as indicated below.

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- The recovery of 2,4-dinitrotoluene associated with SVOC analyses reported in data package 0408035 was above the upper laboratory control limit. No qualification of the data was deemed necessary because the continuing calibration verification reportedly met the required criteria.

- The recovery of 2,4-dinitrotoluene, 2-chlorophenol, and N-nitrosodi-n-propylamine associated with SVOC analyses reported in data package 0408036 were outside the upper laboratory control limit. No qualification of the data was deemed necessary because all of the associated samples were non detect for SVOCs and the continuing calibration verification reportedly met the required criteria.

- The recovery of 2,4-dinitrotoluene, 2-chlorophenol, and N-nitrosodi-n-propylamine associated with SVOC analyses reported in data packages 0408044 were outside the upper laboratory control limit. No qualification of the data was deemed necessary because all of the associated samples were non detect for SVOCs. In addition, the continuing calibration verification reportedly met the required criteria.

- The recovery of benzo(g,h,i)perylene in the LCS and LCSD associated with PAH analyses reported in data package 0408056 was above the upper laboratory control limit. No qualification of the data was deemed necessary because the continuing calibration verification reportedly met the required criteria.

LABORATORY DUPLICATE RESULTS

Laboratory duplicate samples were generally performed with the TDS, NWTPH-Gx, and total metals analyses. RPDs between the laboratory duplicate results were within the laboratory control limits with the following exception:

- The RPD between the gasoline results for the laboratory duplicates performed using sample LW026D in data package 0408066, exceeded the laboratory control limit. The gasoline result for sample LW026D was qualified as estimates (J), as indicated in Table 1.

When laboratory duplicates were not performed using a project sample, the laboratory duplicate results were not evaluated.

FIELD DUPLICATE RESULTS

Three blind field duplicate pairs (OX006S/Y, RW-2/W, and LW020S/X) were collected during this sampling event. A project-specified control limit of 20 percent was used to evaluate the RPDs between the duplicate samples 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 project-specified control limits, except as indicated in Table 1 and as discussed below:

- The RPD between results for copper exceeded project-specified control limits for field duplicate pair LW020S/X. Detected and non-detected concentrations of this compound in all samples reported in the associated data package (0408056) were qualified as estimates (J, UJ), as indicated in Table 1.

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- The RPD between results for isopropyl benzene and sec-butyl benzene exceeded project-specified control limits for field duplicate pair LW0020S/X. Detected concentrations of this compound in all samples reported in the associated data package (0408056) were qualified as estimates (J), as indicated in Table 1.
- The RPD between results for acenaphthene, acenaphthylene, fluorene, phenanthrene, and pyrene exceeded project-specified control limits for field duplicate pair LW0020S/X. Detected concentrations of this compound in all samples reported in the associated data package (0408056) were 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 qualification of the data include the following:

- For data packages 0408044 and 0408036 there was no LCSD associated with the low-level Pentachlorophenol by EPA8270 Analysis. An MS/MSD was prepared for the analytical batch instead for determination of analytical precision and accuracy. During analysis it was discovered the samples were inadvertently not spiked with the target analyte.

- Another factor that may affect the use of the data but does not require verification includes the identification of lube oil in data packages 0408056 and 0408066. As indicated by the laboratory in the case narrative, in the opinion of the laboratory results for samples X, LW035D, LW022D, LW023D, Q, LW024D, LW025D, LW019D, LW020S, and N results for lube oil were determined to be non-detect based on hydrocarbon pattern recognition. The product was carry over from another hydrocarbon type. In addition, as noted by the laboratory, the detected result for diesel in sample RW1 in data package 0408025 contains a diesel range organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.

- The 1,2,3,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, and 1,2,34,6,7,8-HpCDF results for sample RW1 were qualified by the laboratory as an estimated maximum possible concentration (EMPC); therefore, the 1,2,3,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, and 1,2,34,6,7,8-HpCDF results for this sample were qualified as non-detect (U) at the EMPC, as indicated in Table 1.

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.

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REFERENCES

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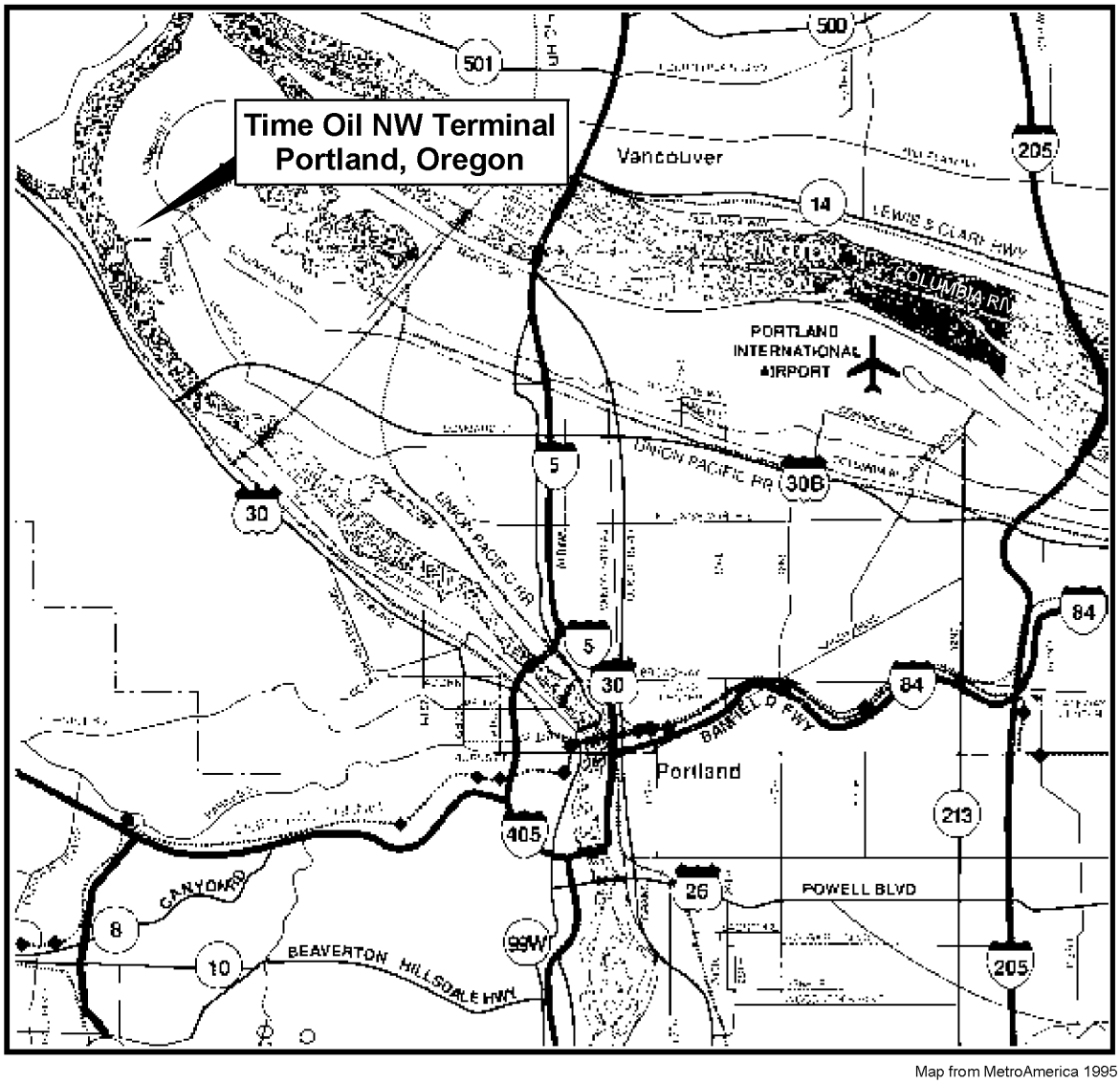
TABLE 1
SUMMARY OF DATA QUALIFIERS
THIRD QUARTER 2004 EVENT GROUNDWATER SAMPLE RESULTS
SPECIALTY DATA PACKAGES 0408006, 0408019, 0408020, 0408025, 0408026, 0408035, 0408036, 0408044, 0408056, 0408057, and 0408066
COLUMBIA DATA PACKAGE E2400737
ARI DATA PACKAGES GX59, GX71

Data Package Number	Analyte	Qualifier	Sample Number	Reason
0408006	VOCs	J	LW032S	High surrogate recovery
	Arsenic	U	LW029S	Method blank contamination
	Arsenic	U	LW031S	Method blank contamination
0408019	VOCs	J	B1	High surrogate recovery
	VOCs	J	J1	High surrogate recovery
0408020	VOCs	J	LW030S	High surrogate recovery
	Fluorene	U	LW030S	Method blank contamination
	BTEX	J	LW007S	High surrogate recovery
0408025	VOCs	J	RW1	High surrogate recovery
0408026	VOCs	J	Y	High surrogate recovery
	VOCs	J	OX001S	High surrogate recovery
	VOCs	J	OX002S	High surrogate recovery
	VOCs	J	OX006S	High surrogate recovery
	VOCs	J	OX007S	High surrogate recovery
	VOCs	J	OX008S	High surrogate recovery
	VOCs	J	OX008D	High surrogate recovery
	VOCs	J	Method Blank	High surrogate recovery
	Di-n-butylphthalate	U	OX003S	Method blank contamination
	Di-n-butylphthalate	U	OX004S	Method blank contamination
	Bis(2-ethylhexyl)phthalate	U	OX008D	Method blank contamination
0408035	VOCs	J	LW011S	High surrogate recovery
	VOCs	J	OX009S	High surrogate recovery
0408036	VOCs	J	D	High surrogate recovery
	VOCs	J	W	High surrogate recovery
	VOCs	J	Method Blank	High surrogate recovery
0408056	Isopropylbenzene (VOC)	J	LW020S	Exceeded RPD on field duplicate
	Isopropylbenzene (VOC)	J	X	Exceeded RPD on field duplicate
	sec-butylbenzene (VOC)	J	LW020S	Exceeded RPD on field duplicate
	sec-butylbenzene (VOC)	J	X	Exceeded RPD on field duplicate
	Copper	J	LW020S	Exceeded RPD on field duplicate
	Copper	UJ	X	Exceeded RPD on field duplicate
	Benzo(g,h,i)perylene	U	LW020S	Method blank contamination
	Nitrobenzene	U	LW025D	Method blank contamination
	Acenaphthene	J	LW020S	High RPD between field duplicate results
	Acenaphthene	J	X	High RPD between field duplicate results
	Acenaphthylene	J	LW020S	High RPD between field duplicate results
	Acenaphthylene	J	X	High RPD between field duplicate results
	Fluorene	J	LW020S	High RPD between field duplicate results
	Fluorene	J	X	High RPD between field duplicate results
	Phenanthrene	J	LW020S	High RPD between field duplicate results
	Phenanthrene	J	X	High RPD between field duplicate results
	Pyrene	J	LW020S	High RPD between field duplicate results
	Pyrene	J	X	High RPD between field duplicate results
0408066	Gasoline	J	LW026D	High RPD between lab duplicate results
E2400737	1,2,3,7,8-PeCDF	UJ	RW1	Estimated maximum possible concentration
	1,2,3,6,7,8-HxCDF	UJ	RW1	Estimated maximum possible concentration
	1,2,3,4,6,7,8-HpCDF	UJ	RW1	Estimated maximum possible concentration

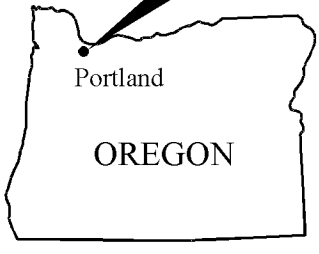
J = Indicates the analyte was positively identified; the associated numerical is the approximate concentration of the analyte in the sample.

U = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.



Map from MetroAmerica 1995

SITE LOCATION
(see enlarged map area above)



0 2 4
Approximate Scale in Miles

Time Oil | T:\2311001\Vicinity Map.cdr (C) 05/10/2002

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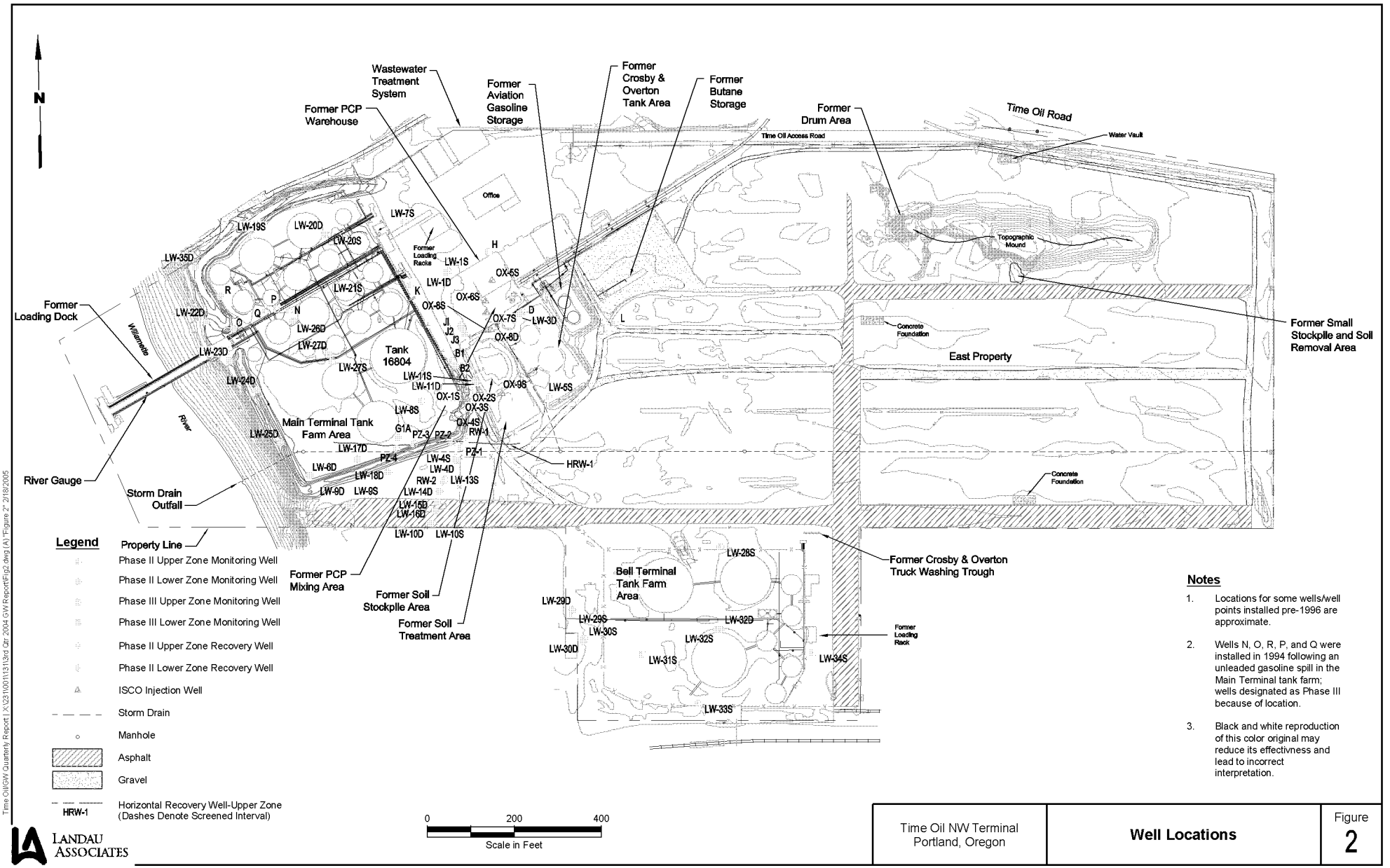
Time Oil NW Terminal Portland, Oregon	**Vicinity Map**	Figure 1

BZTO104(e)024123



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; wells 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.

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Time Oil NW Terminal Portland, Oregon	**Well Locations**	Figure 2

Time Oil/GW Quarterly Report | X:\23\1\001\13\13rd Qtr 2004 GW Report\Fig2.dwg (A) "Figure 2" 2/16/2005

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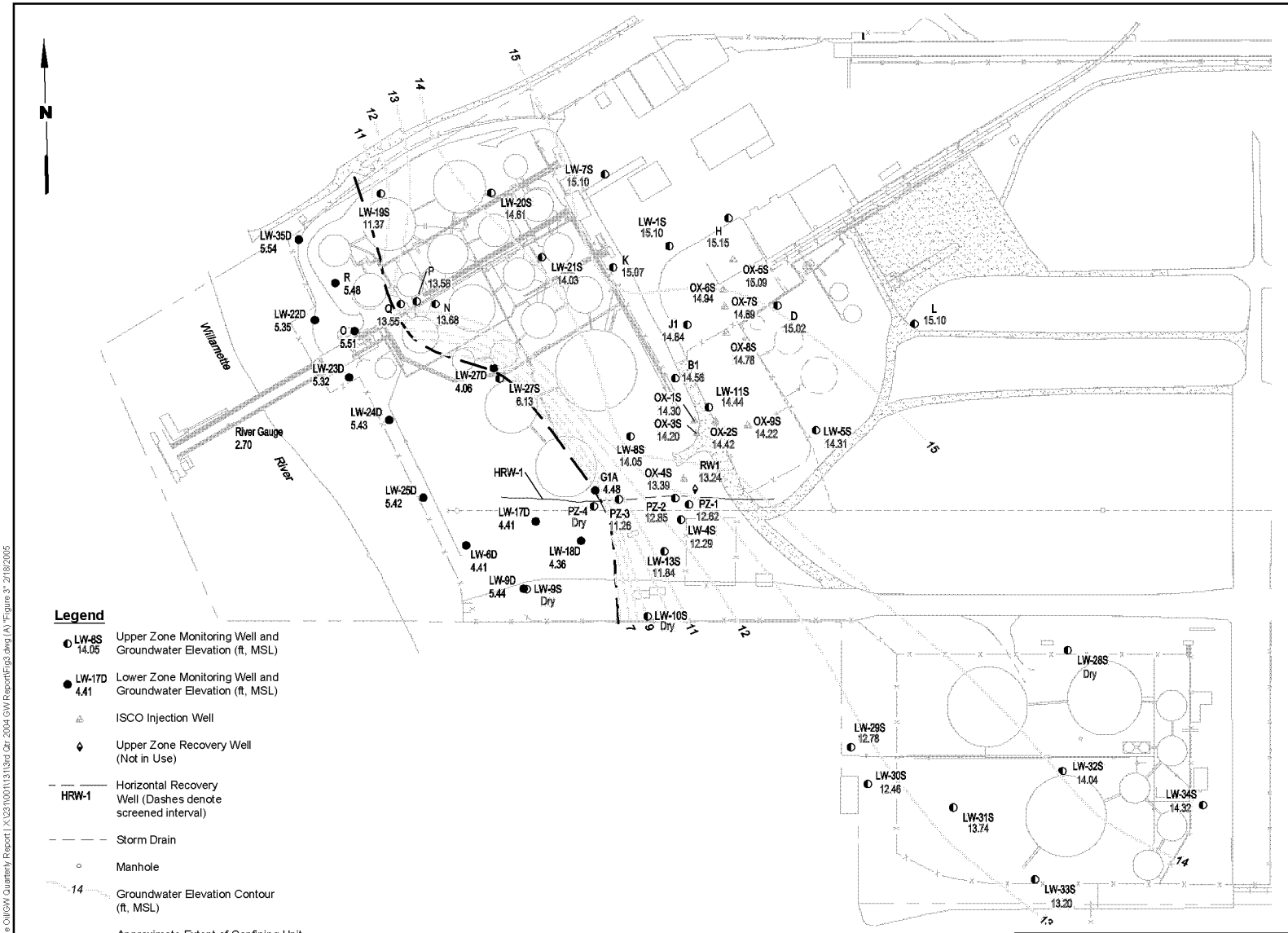

Legend

- LW-8S 14.05 — Upper Zone Monitoring Well and Groundwater Elevation (ft, MSL)
- LW-17D 4.41 — Lower Zone Monitoring Well and Groundwater Elevation (ft, MSL)
- ISCO Injection Well
- Upper Zone Recovery Well (Not in Use)
- HRW-1 — Horizontal Recovery Well (Dashes denote screened interval)
- Storm Drain
- Manhole
- 14 — Groundwater Elevation Contour (ft, MSL)
- Approximate Extent of Confining Unit Between Upper and Lower Zones

0 150 300
Scale in Feet

Notes

1. Groundwater levels measured on August 10, 2004.
2. Data presented to west of confining unit boundary represent groundwater elevations where the upper and lower zones converge.
3. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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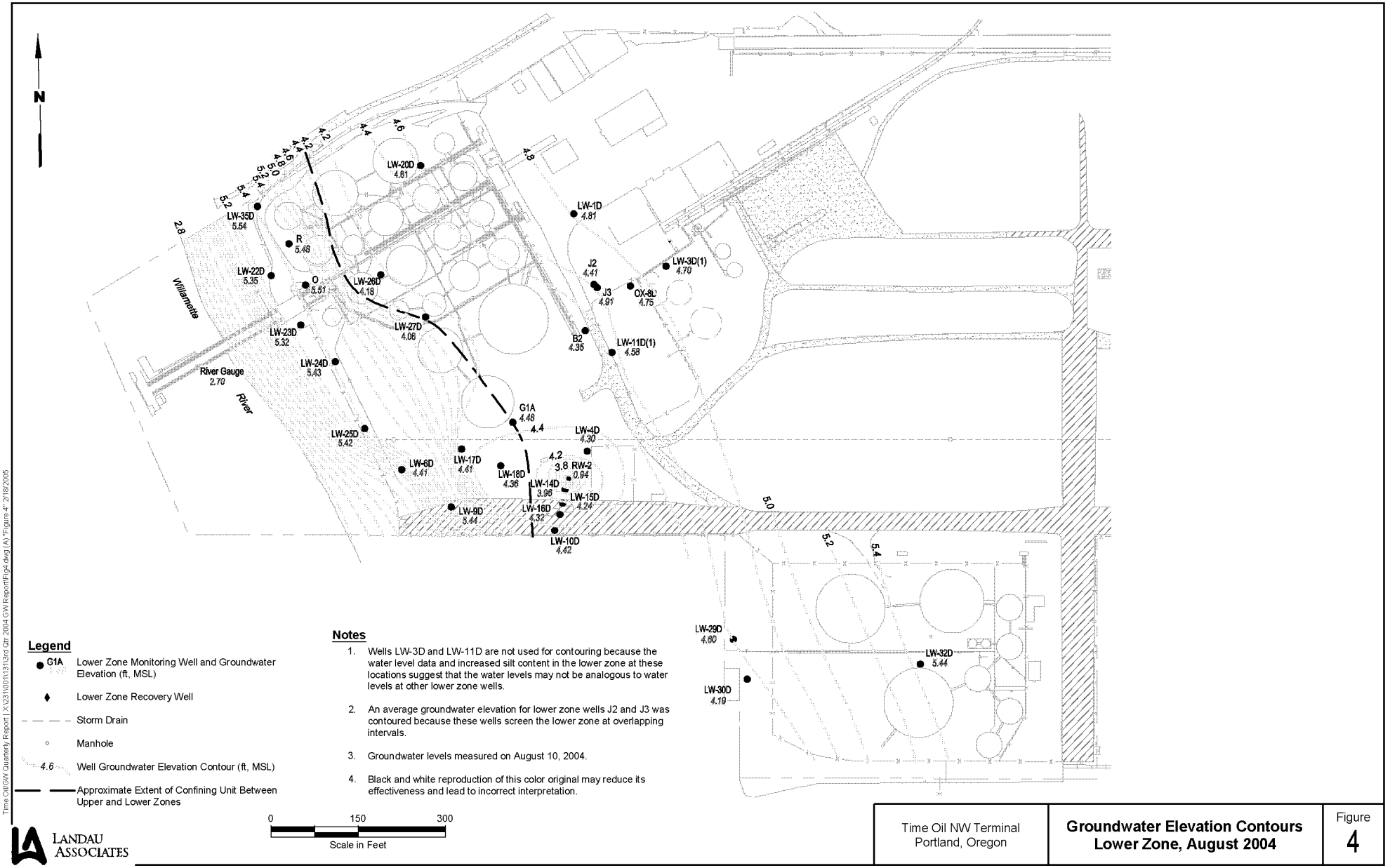
Time Oil NW Terminal Portland, Oregon	**Groundwater Elevation Contours Upper Zone, August 2004**	Figure 3

Time Oil\GW Quarterly Report | X:\231\001\13\13rd Qtr 2004 GW Report\Fig3.dwg (A) "Figure 3" 2/16/2005

BZTO104(e)024125



Legend

- G1A — Lower Zone Monitoring Well and Groundwater Elevation (ft, MSL)
- Lower Zone Recovery Well
- Storm Drain
- Manhole
- 4.6 — Well Groundwater Elevation Contour (ft, MSL)
- Approximate Extent of Confining Unit Between Upper and Lower Zones

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 August 10, 2004.
4. 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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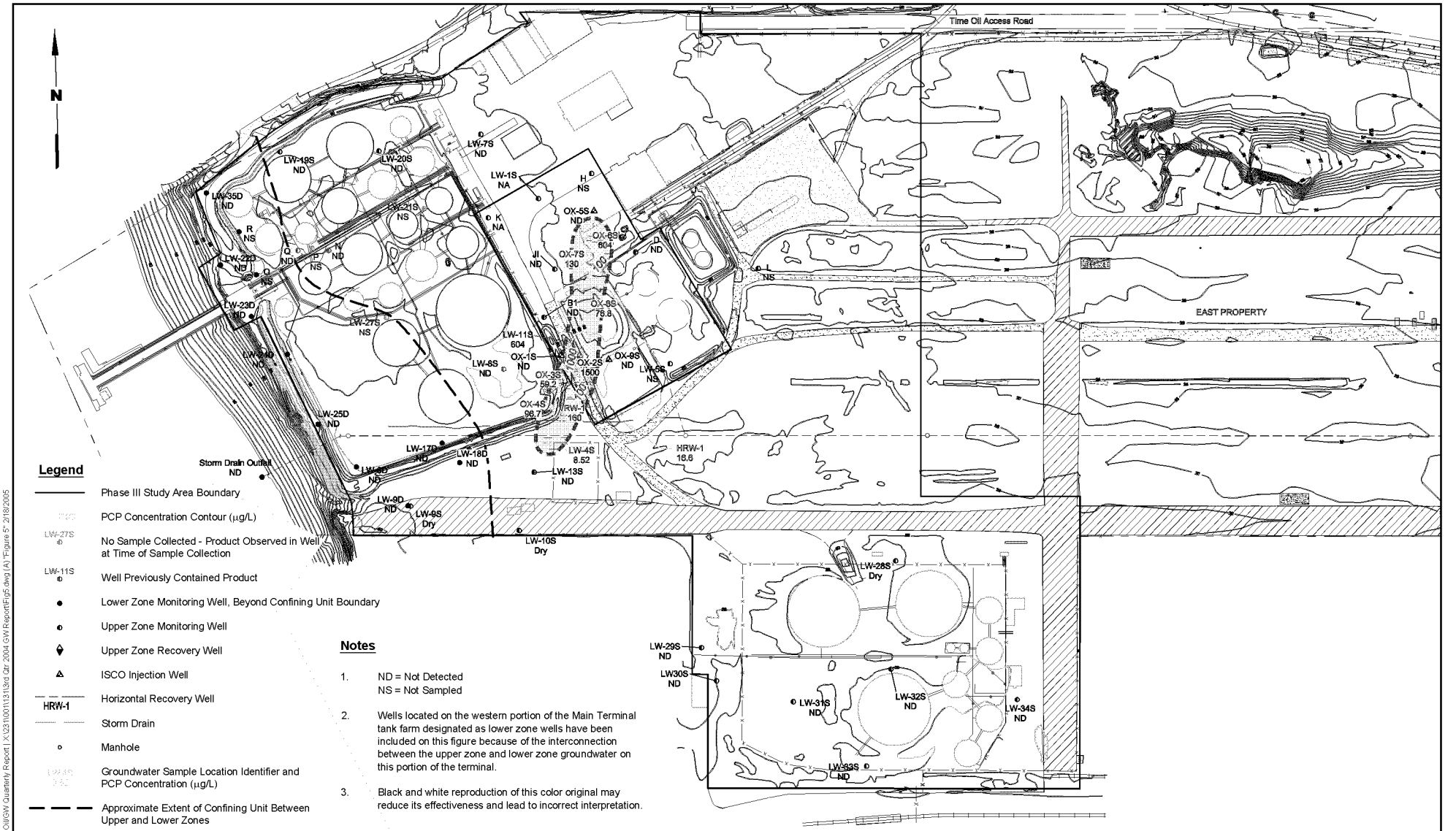
Time Oil NW Terminal Portland, Oregon	**Groundwater Elevation Contours Lower Zone, August 2004**	Figure 4

Time Oil\GW Quarterly Report | X:\231\00\013\13\3rd Qtr 2004 GW Report\Fig4.dwg (A) "Figure 4" 2/16/2005

BZTO104(e)024126



Legend

- Phase III Study Area Boundary
- PCP Concentration Contour (µg/L)
- LW-27S — No Sample Collected - Product Observed in Well at Time of Sample Collection
- LW-11S — Well Previously Contained Product
- Lower Zone Monitoring Well, Beyond Confining Unit Boundary
- Upper Zone Monitoring Well
- Upper Zone Recovery Well
- ISCO Injection Well
- HRW-1 — Horizontal Recovery Well
- Storm Drain
- Manhole
- Groundwater Sample Location Identifier and PCP Concentration (µg/L)
- Approximate Extent of Confining Unit Between Upper and Lower Zones
- Minimum Preliminary Screening Level (3.0 µg/L; National Recommended Water Quality Criteria, Organism Only)

Notes

1. ND = Not Detected
   NS = Not Sampled
2. Wells located on the western portion of the Main Terminal 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.
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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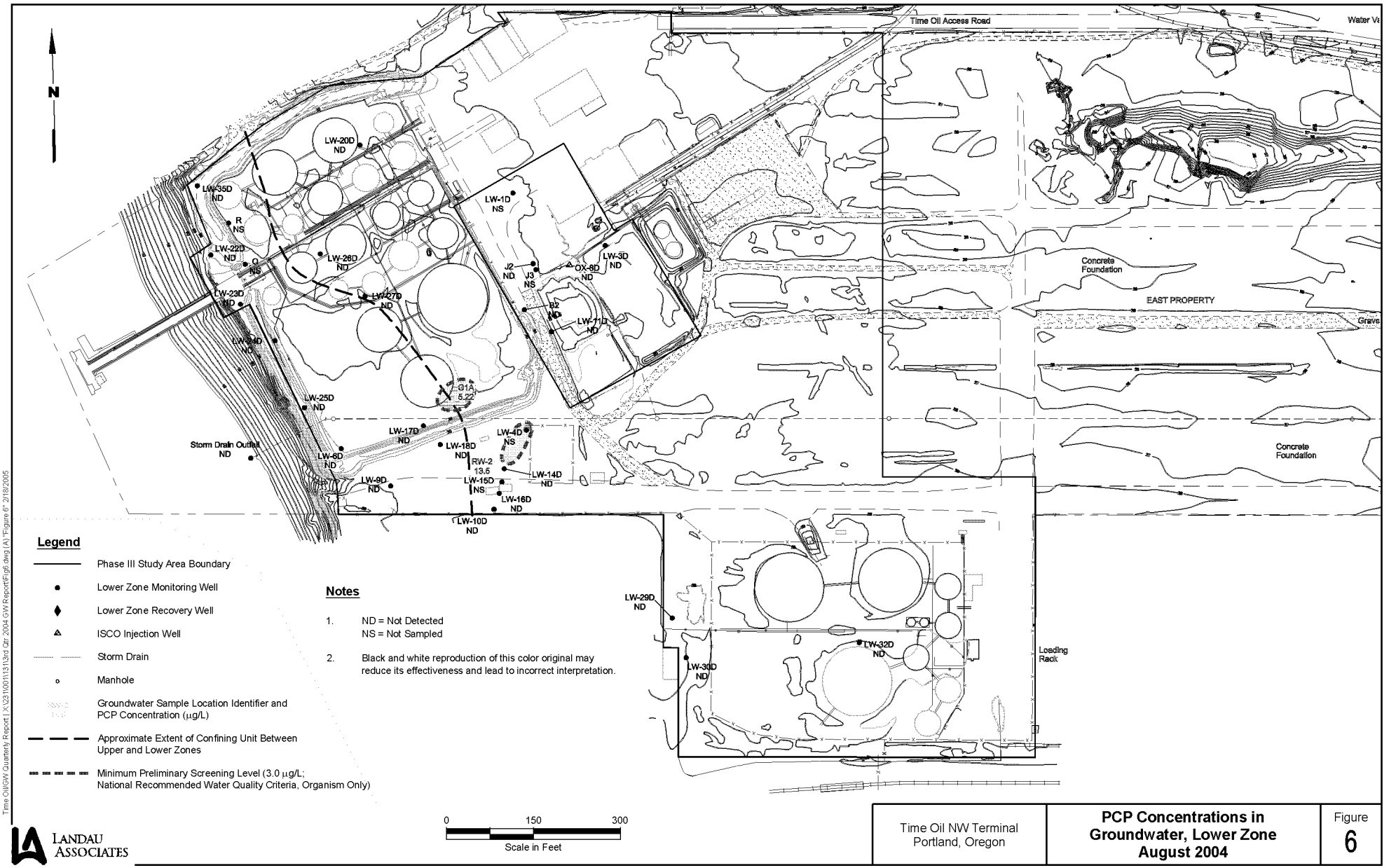
Time Oil NW Terminal Portland, Oregon	**PCP Concentrations in Groundwater, Upper Zone and Beyond Confining Unit Boundary, August 2004**	Figure 5

Time Oil\GW Quarterly Report \ X:\231\00\13\13rd Qtr 2004 GW Report\Fig5.dwg (A) "Figure 5" 2/16/2005

BZTO104(e)024127



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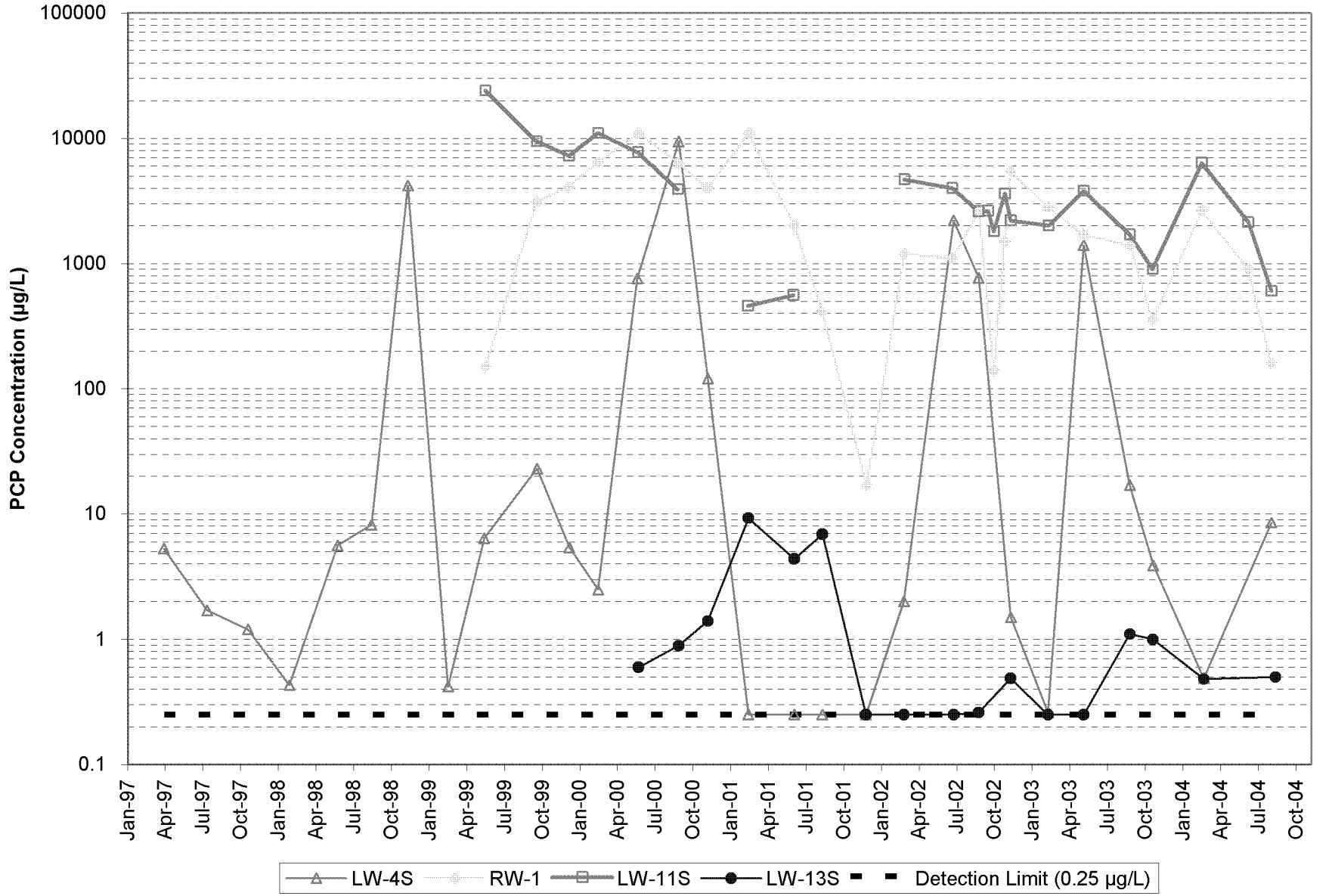
Time Oil NW Terminal Portland, Oregon	**PCP Concentrations in Groundwater, Lower Zone August 2004**	Figure **6**

Time Oil\GW Quarterly Report | X:\231\001\13\13rd Qtr 2004 GW Report\Fig6.dwg (A) "Figure 6" 2/16/2005

BZTO104(e)024128



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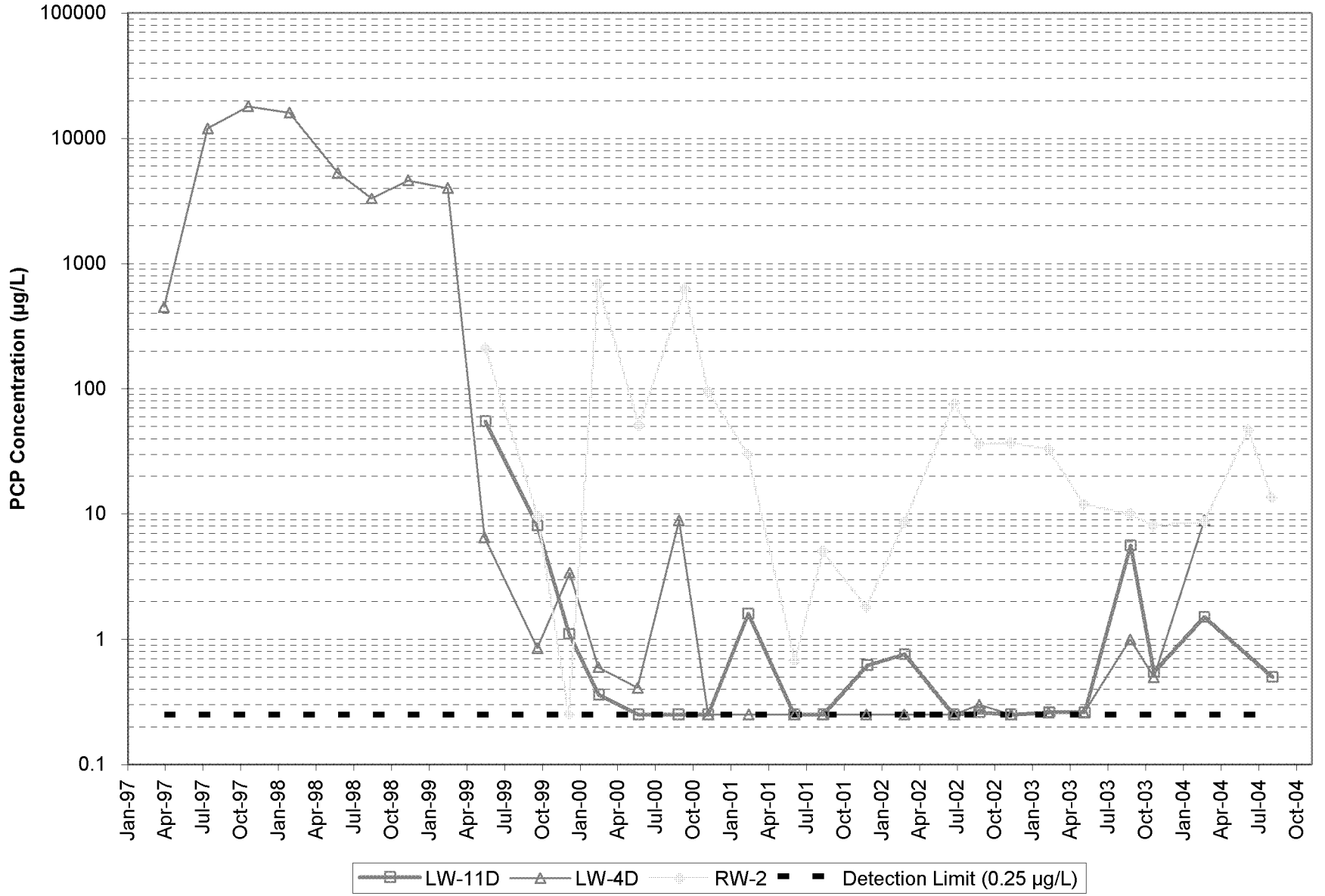
Time Oil NW Terminal
Portland, Oregon

**PCP Concentrations,
Selected Upper Zone Wells
April 1997 – August 2004**

Figure
7

BZTO104(e)024129

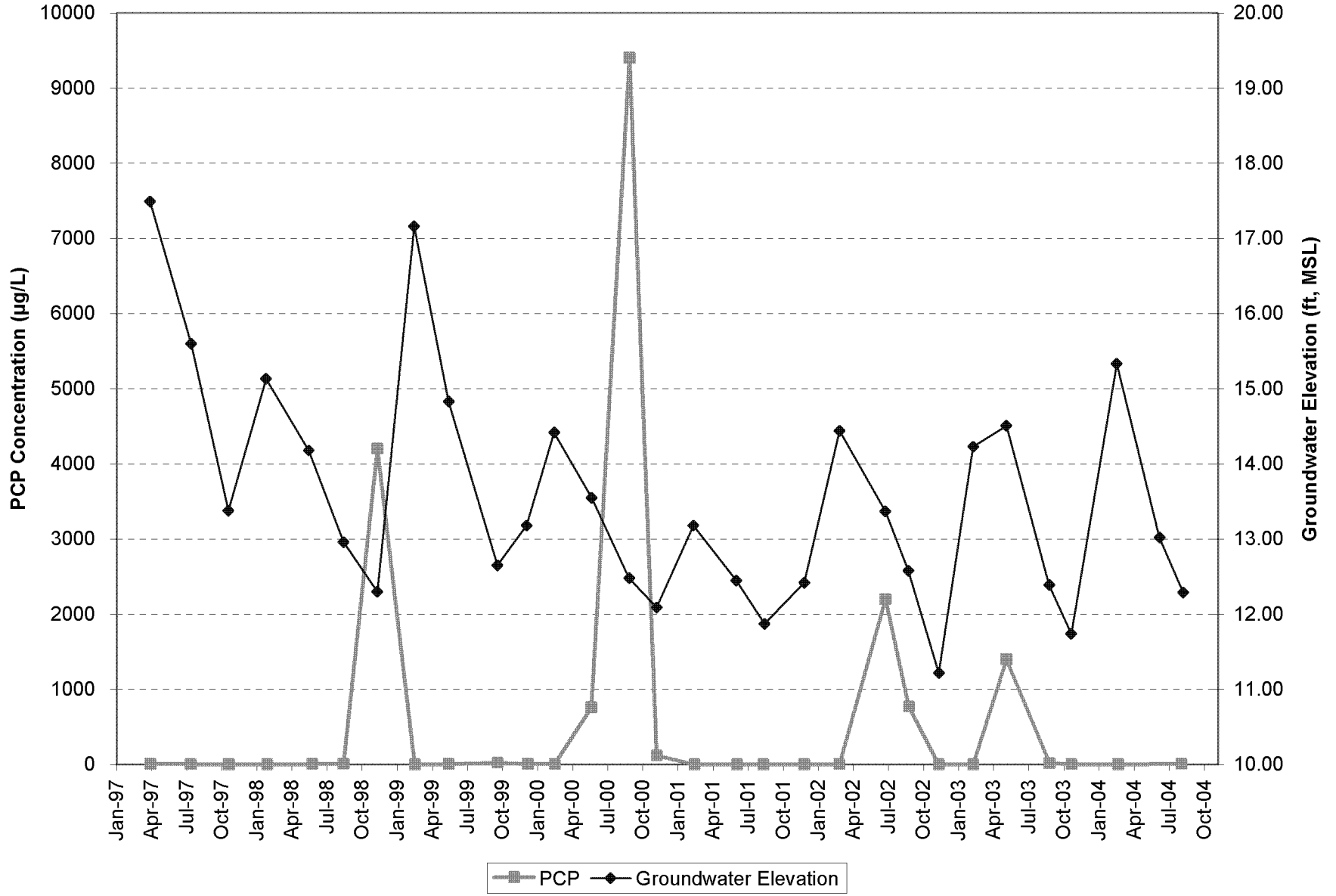


LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

**PCP Concentrations,
Selected Lower Zone Wells
April 1997 – August 2004**

Figure
8



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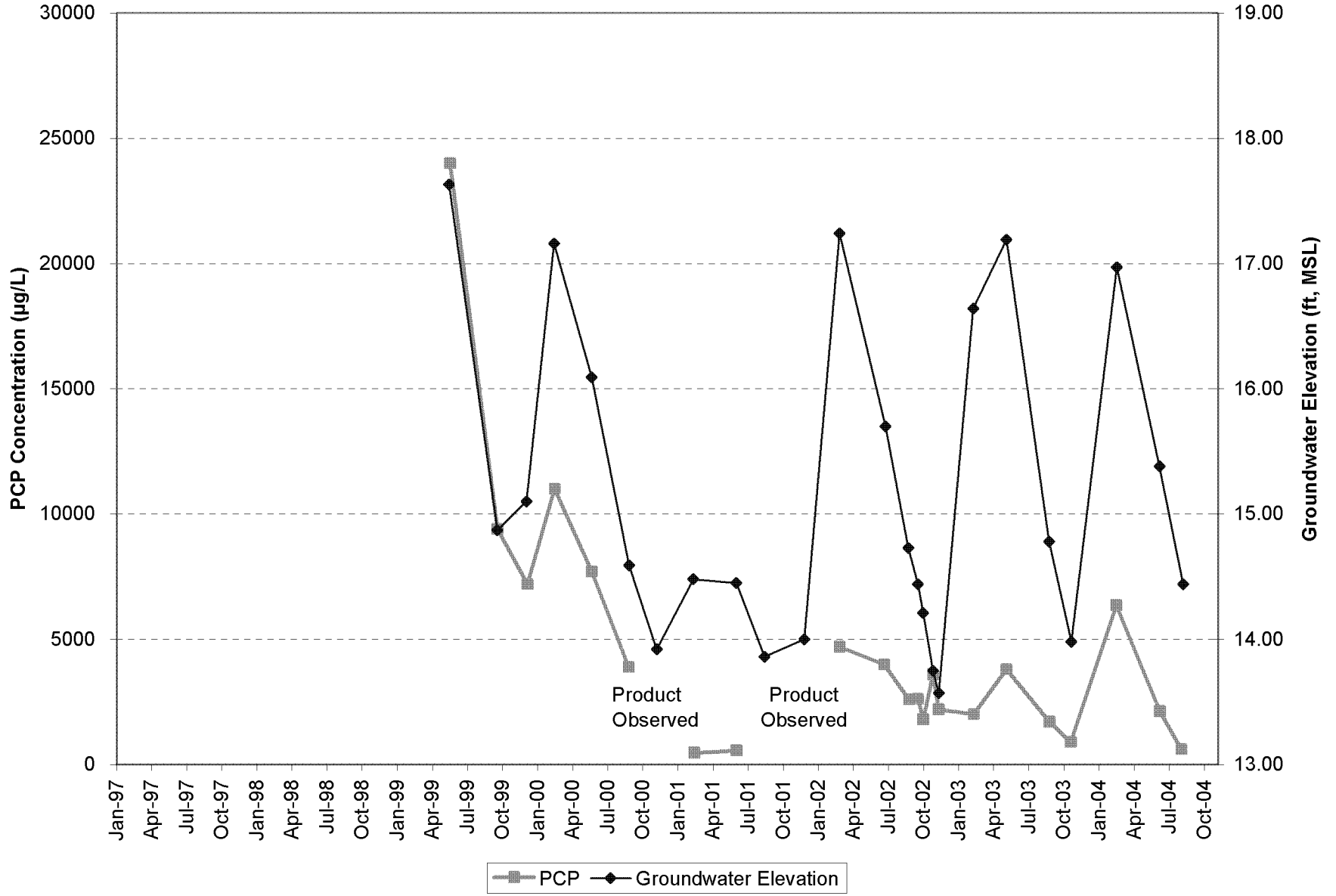
Time Oil NW Terminal
Portland, Oregon

PCP Concentrations and Groundwater Elevations, LW-4S
April 1997 – August 2004

Figure
9

BZTO104(e)024131



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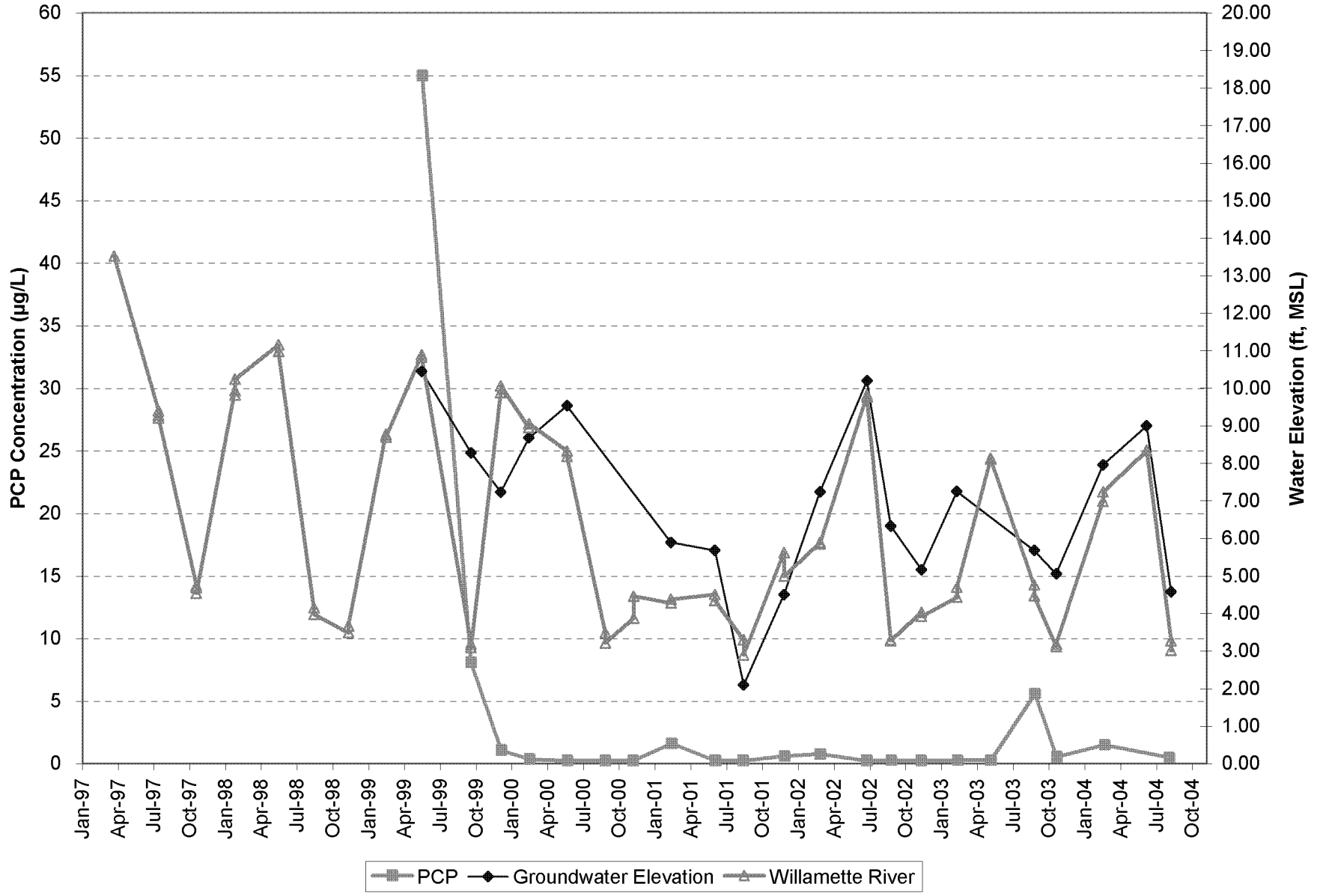
Time Oil NW Terminal
Portland, Oregon

PCP Concentrations and Groundwater Elevations, LW-11S
April 1997 – August 2004

Figure
10

BZTO104(e)024132



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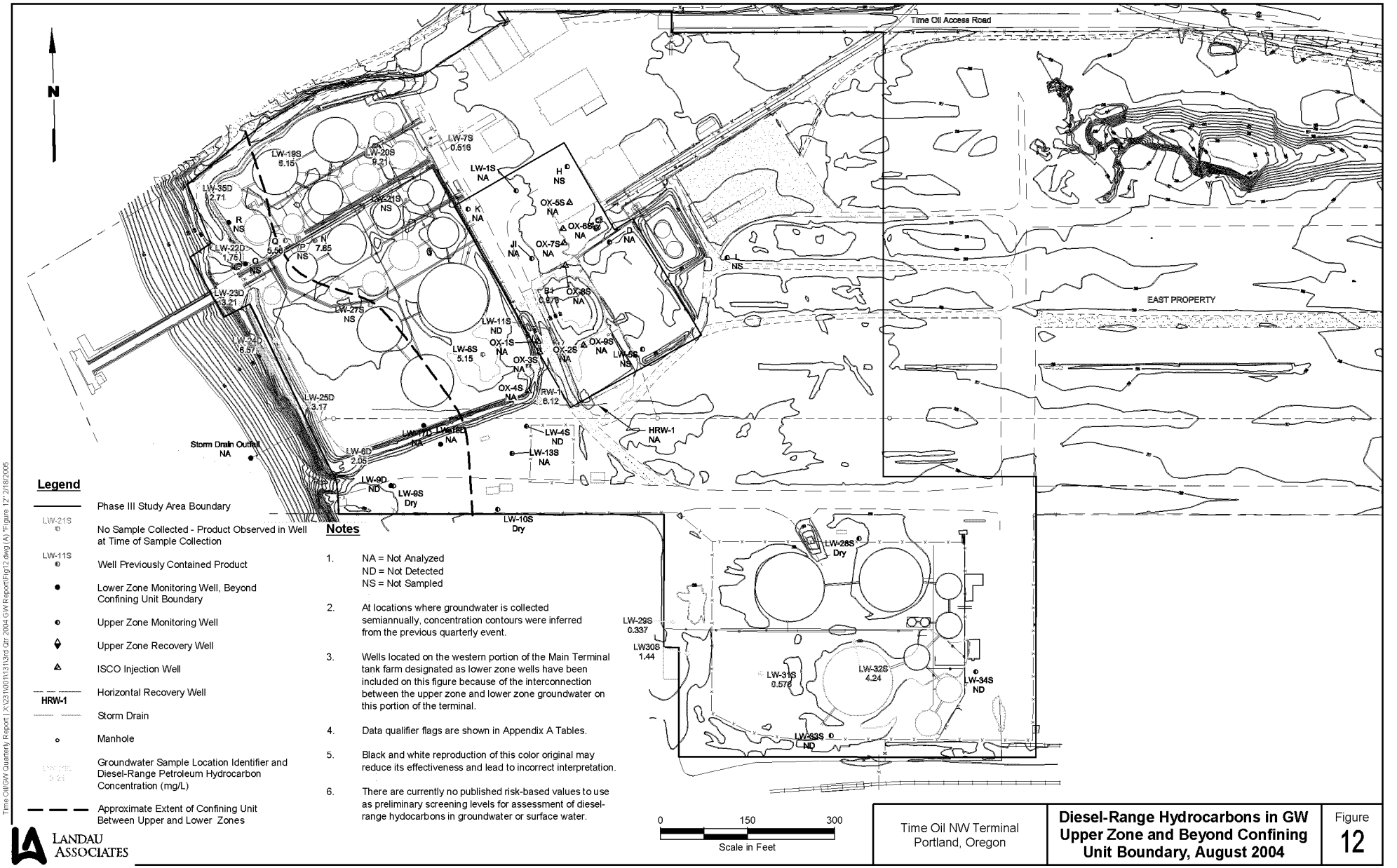
Time Oil NW Terminal
Portland, Oregon

PCP Concentrations, Groundwater Elevations, and River Stage, LW-11D
April 1997 – August 2004

Figure
11

BZTO104(e)024133



Legend

- Phase III Study Area Boundary
- LW-21S — No Sample Collected - Product Observed in Well at Time of Sample Collection
- LW-11S — Well Previously Contained Product
- Lower Zone Monitoring Well, Beyond Confining Unit Boundary
- Upper Zone Monitoring Well
- Upper Zone Recovery Well
- ISCO Injection Well
- HRW-1 — Horizontal Recovery Well
- Storm Drain
- Manhole
- Groundwater Sample Location Identifier and Diesel-Range Petroleum Hydrocarbon Concentration (mg/L)
- Approximate Extent of Confining Unit Between Upper and Lower Zones

Notes

1. NA = Not Analyzed
   ND = Not Detected
   NS = Not Sampled
2. At locations where groundwater is collected semiannually, concentration contours were inferred from the previous quarterly event.
3. Wells located on the western portion of the Main Terminal 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 A Tables.
5. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
6. There are currently no published risk-based values to use as preliminary screening levels for assessment of diesel-range hydocarbons in groundwater or surface water.

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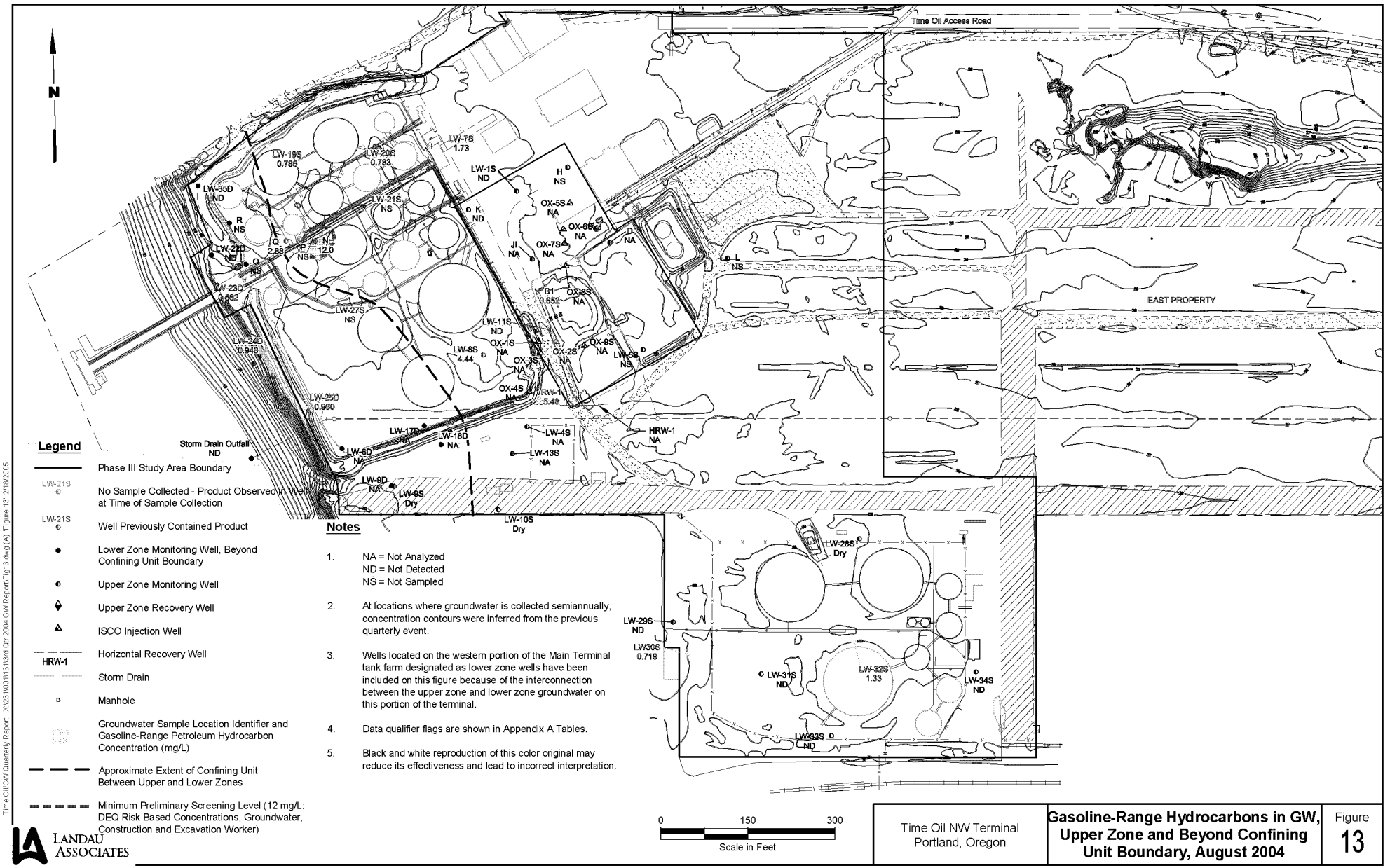
Time Oil NW Terminal
Portland, Oregon

Diesel-Range Hydrocarbons in GW Upper Zone and Beyond Confining Unit Boundary, August 2004

Figure
12

Time Oil/GW Quarterly Report | X:\23\1\001\13\13rd Qtr 2004 GW Report\Fig12.dwg (A) Figure 12" 2/18/2005

BZTO104(e)024134



Legend

- Phase III Study Area Boundary
- LW-21S — No Sample Collected - Product Observed in Well at Time of Sample Collection
- LW-21S — Well Previously Contained Product
- Lower Zone Monitoring Well, Beyond Confining Unit Boundary
- Upper Zone Monitoring Well
- Upper Zone Recovery Well
- ISCO Injection Well
- HRW-1 — Horizontal Recovery Well
- Storm Drain
- Manhole
- Groundwater Sample Location Identifier and Gasoline-Range Petroleum Hydrocarbon Concentration (mg/L)
- Approximate Extent of Confining Unit Between Upper and Lower Zones
- Minimum Preliminary Screening Level (12 mg/L: DEQ Risk Based Concentrations, Groundwater, Construction and Excavation Worker)

Notes

1. NA = Not Analyzed
   ND = Not Detected
   NS = Not Sampled
2. At locations where groundwater is collected semiannually, concentration contours were inferred from the previous quarterly event.
3. Wells located on the western portion of the Main Terminal 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 A Tables.
5. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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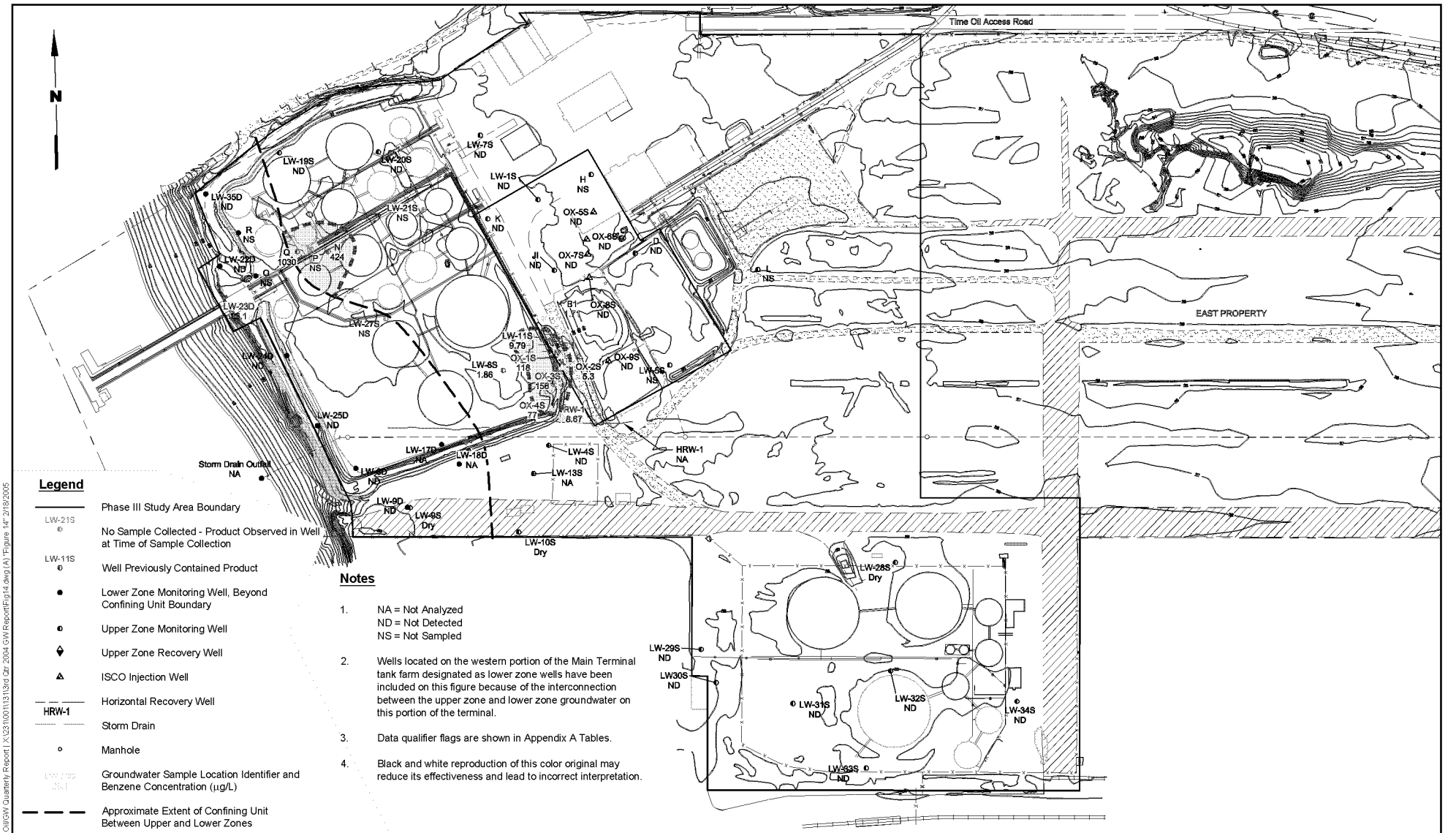
Time Oil NW Terminal
Portland, Oregon

Gasoline-Range Hydrocarbons in GW, Upper Zone and Beyond Confining Unit Boundary, August 2004

Figure 13

Time Oil\GW Quarterly Report | X:\23\100\113\13rd Qtr 2004 GW Report\Fig13.dwg (A) "Figure 13" 2/18/2005

BZTO104(e)024135



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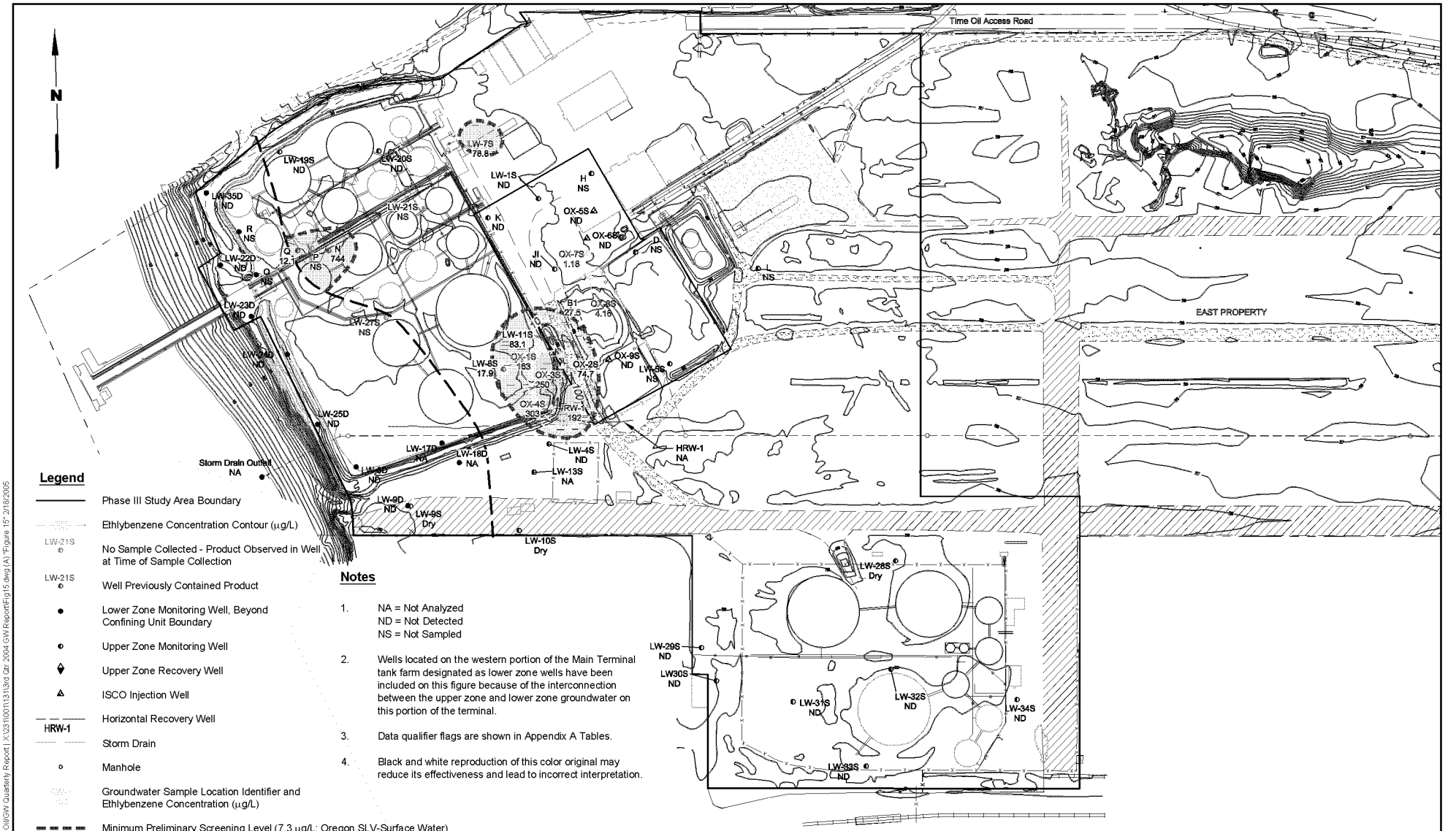
Time Oil NW Terminal
Portland, Oregon

Benzene Concentrations in GW, Upper Zone and Beyond Confining Unit Boundary, August 2004

Figure
14

Time Oil/GW Quarterly Report | X:\23\1\001\13\13rd Qtr 2004 GW Report\Fig14.dwg (A) "Figure 14" 2/18/2005

BZTO104(e)024136



Legend

- Phase III Study Area Boundary
- Ethylbenzene Concentration Contour (µg/L)
- LW-21S — No Sample Collected - Product Observed in Well at Time of Sample Collection
- LW-21S — Well Previously Contained Product
- Lower Zone Monitoring Well, Beyond Confining Unit Boundary
- Upper Zone Monitoring Well
- Upper Zone Recovery Well
- ISCO Injection Well
- HRW-1 — Horizontal Recovery Well
- Storm Drain
- Manhole
- Groundwater Sample Location Identifier and Ethylbenzene Concentration (µg/L)
- Minimum Preliminary Screening Level (7.3 µg/L; Oregon SLV-Surface Water)
- Approximate Extent of Confining Unit Between Upper and Lower Zones

Notes

1. NA = Not Analyzed
   ND = Not Detected
   NS = Not Sampled
2. Wells located on the western portion of the Main Terminal 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.
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.

0 150 300
Scale in Feet

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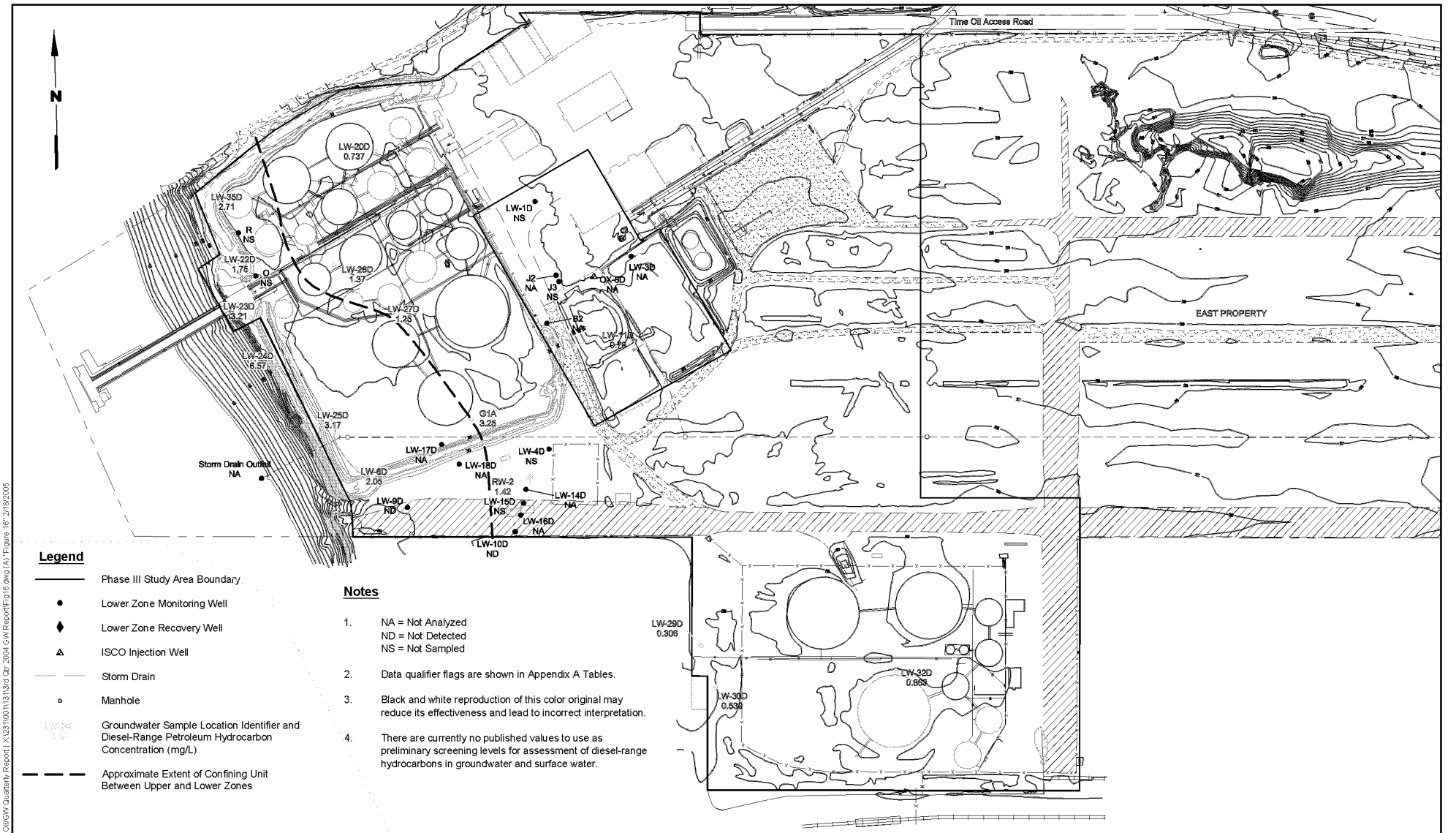
Time Oil NW Terminal
Portland, Oregon

Ethylbenzene Concentrations in GW, Upper Zone and Beyond Confining Unit Boundary, August 2004

Figure 15

Time Oil\GW Quarterly Report | X:\231\001\13\13rd Qtr 2004 GW Report\Fig15.dwg (A) "Figure 15" 2/18/2005

BZTO104(e)024137



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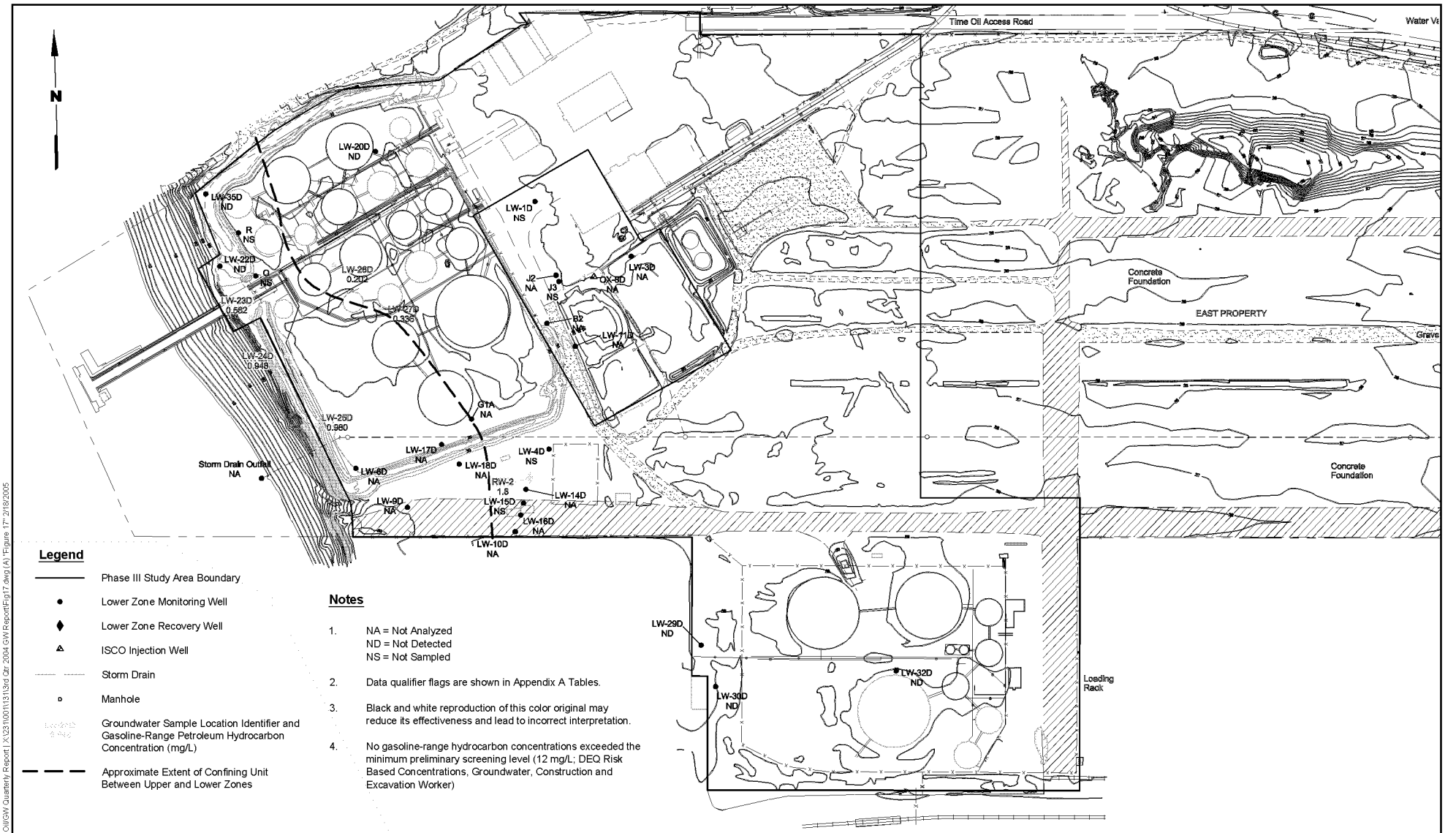
Time Oil NW Terminal Portland, Oregon	**Diesel-Range Petroleum Hydrocarbons in Groundwater, Lower Zone, August 2004**	Figure 16

Time Oil\GW Quarterly Report | X:\231\001\13\13rd Qtr 2004 GW Report\Fig16.dwg (A) "Figure 16" 2/18/2005

BZTO104(e)024138



Legend

- Phase III Study Area Boundary
- Lower Zone Monitoring Well
- Lower Zone Recovery Well
- ISCO Injection Well
- Storm Drain
- Manhole
- Groundwater Sample Location Identifier and Gasoline-Range Petroleum Hydrocarbon Concentration (mg/L)
- Approximate Extent of Confining Unit Between Upper and Lower Zones

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 gasoline-range hydrocarbon concentrations exceeded the minimum preliminary screening level (12 mg/L; DEQ Risk Based Concentrations, Groundwater, Construction and Excavation Worker)

0 150 300
Scale in Feet

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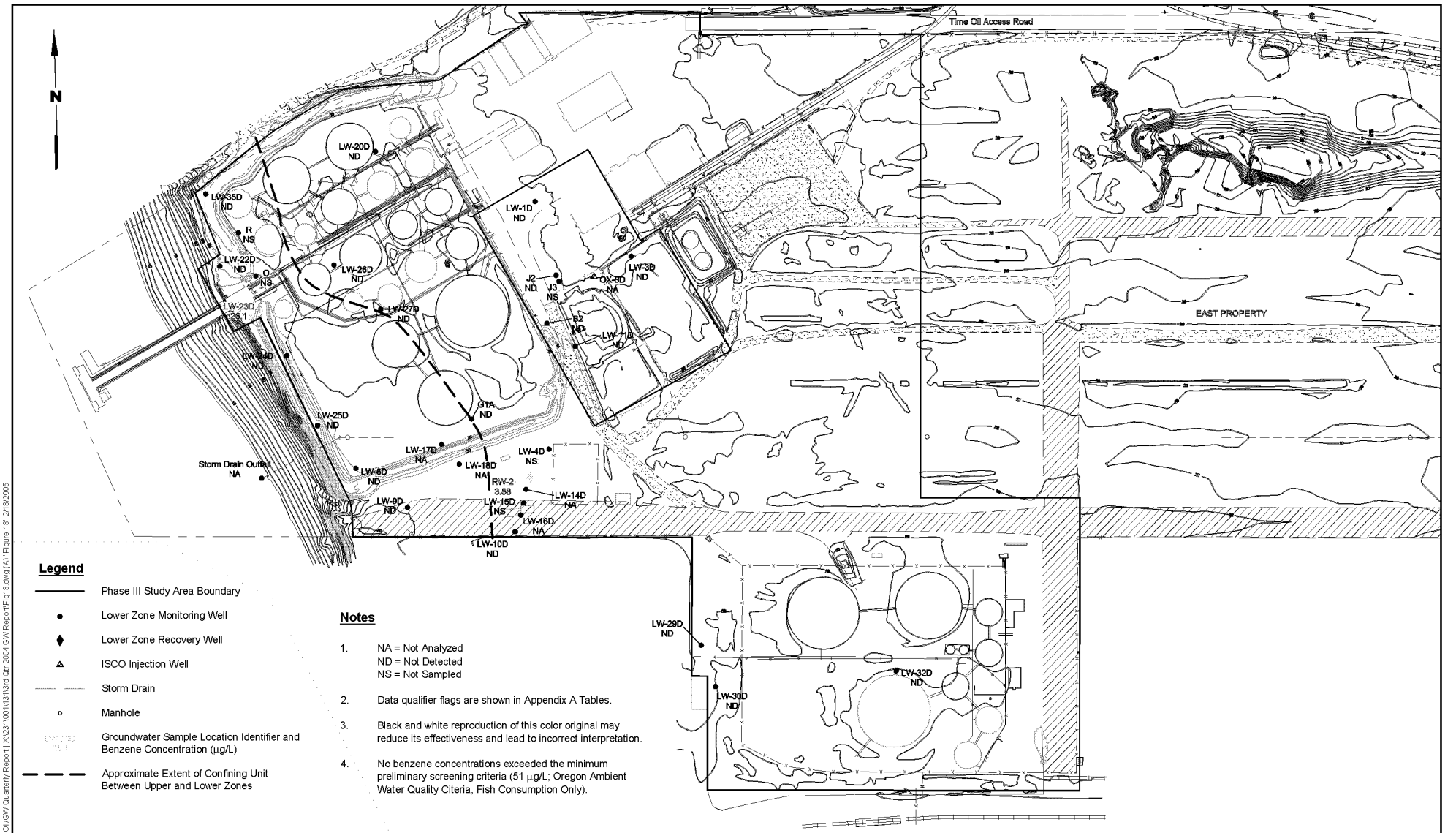
Time Oil NW Terminal Portland, Oregon	**Gasoline-Range Petroleum Hydrocarbons in Groundwater, Lower Zone, August 2004**	Figure 17

Time Oil\GW Quarterly Report | X:\231\001\13\13rd Qtr 2004 GW Report\Fig17.dwg (A) "Figure 17" 2/18/2005

BZTO104(e)024139

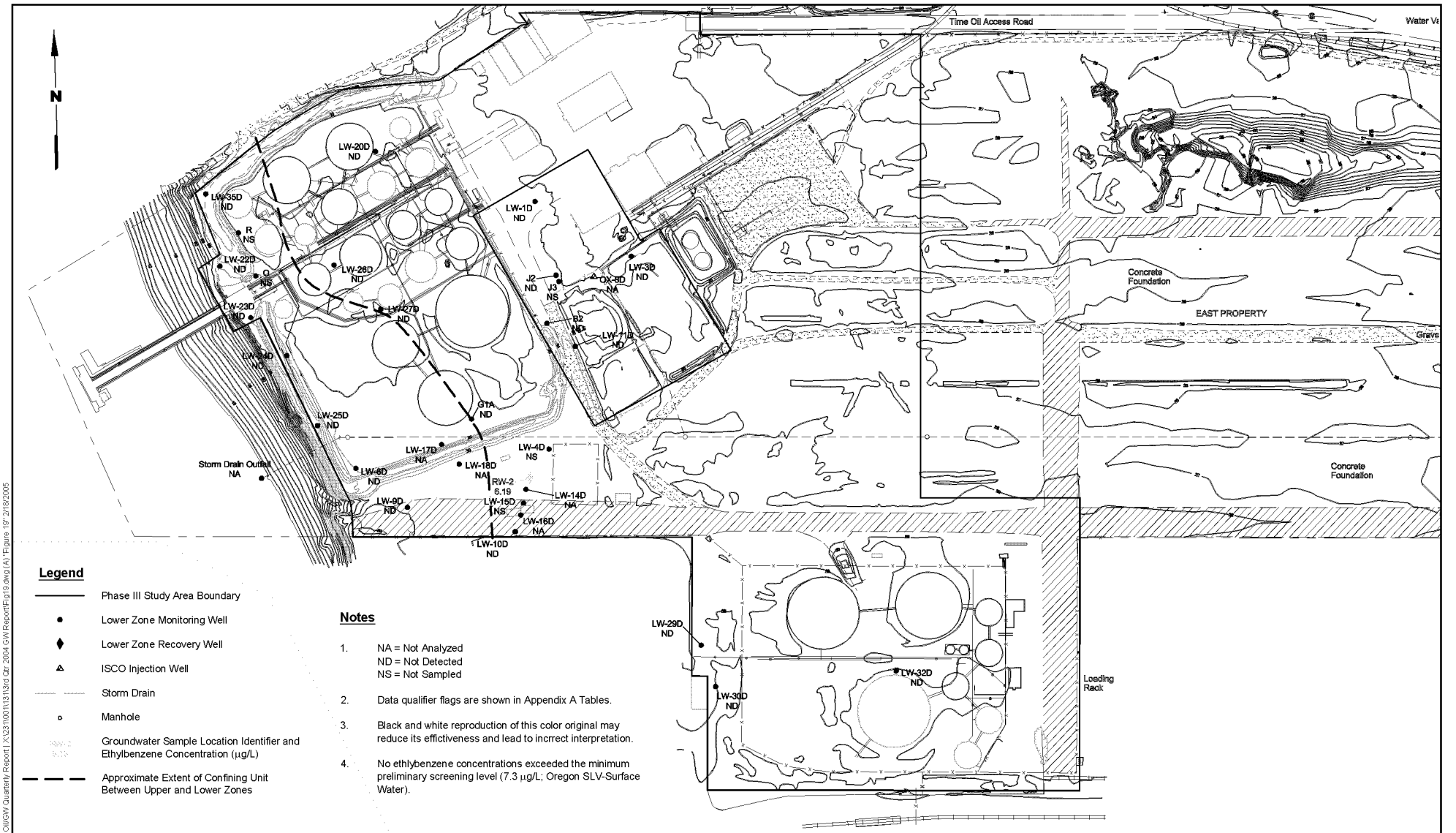


LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Benzene Concentrations in Groundwater, Lower Zone August 2004**	Figure 18

Time Oil\GW Quarterly Report | X:\231\001\13\13rd Qtr 2004 GW Report\Fig18.dwg (A) "Figure 18" 2/18/2005

BZTO104(e)024140



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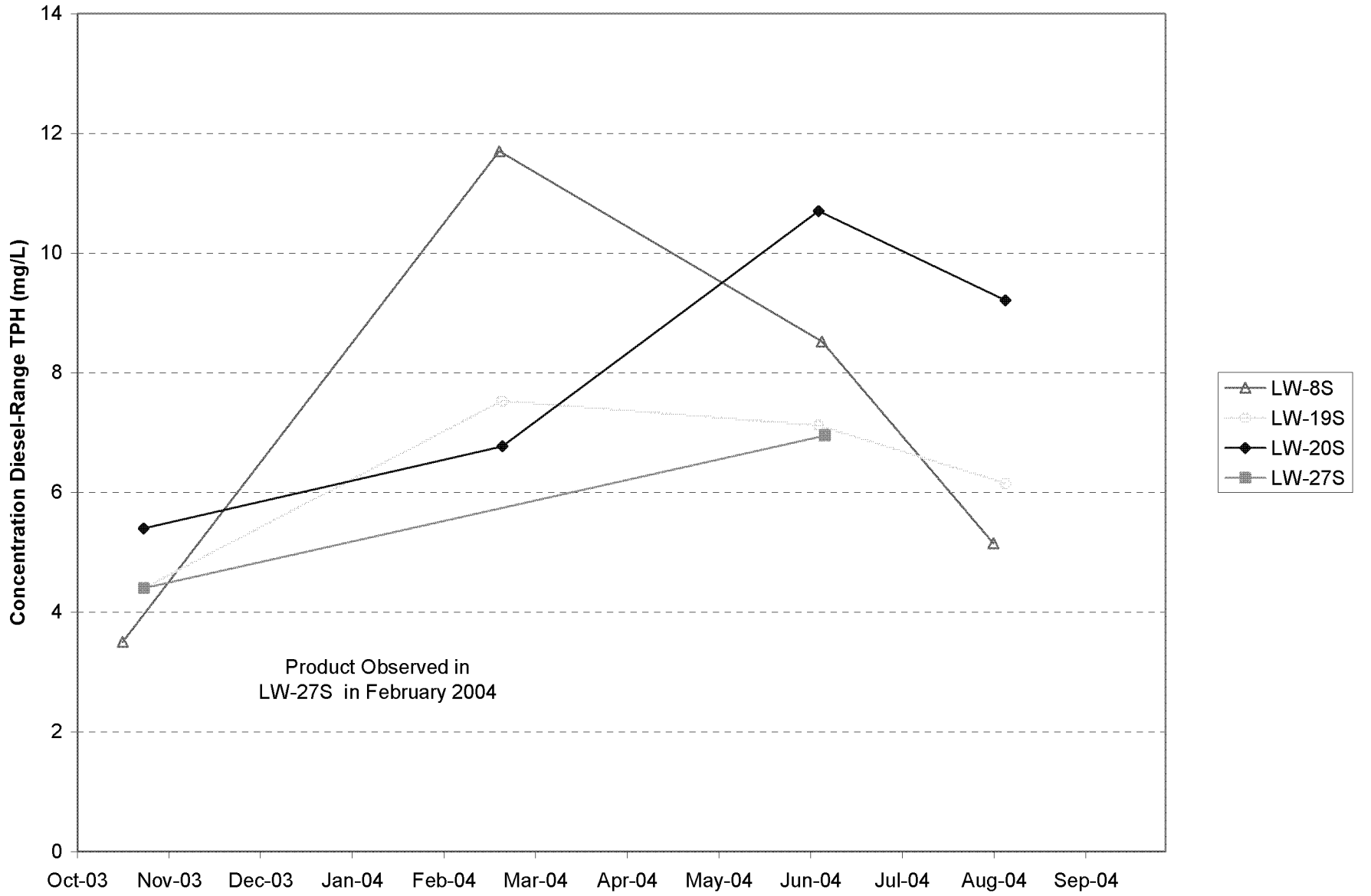
Time Oil NW Terminal Portland, Oregon	**Ethylbenzene Concentrations in Groundwater, Lower Zone August 2004**	Figure 19

Time Oil\GW Quarterly Report | X:\231\001\13\13rd Qtr 2004 GW Report\Fig19.dwg (A) "Figure 19" 2/18/2005

BZTO104(e)024141



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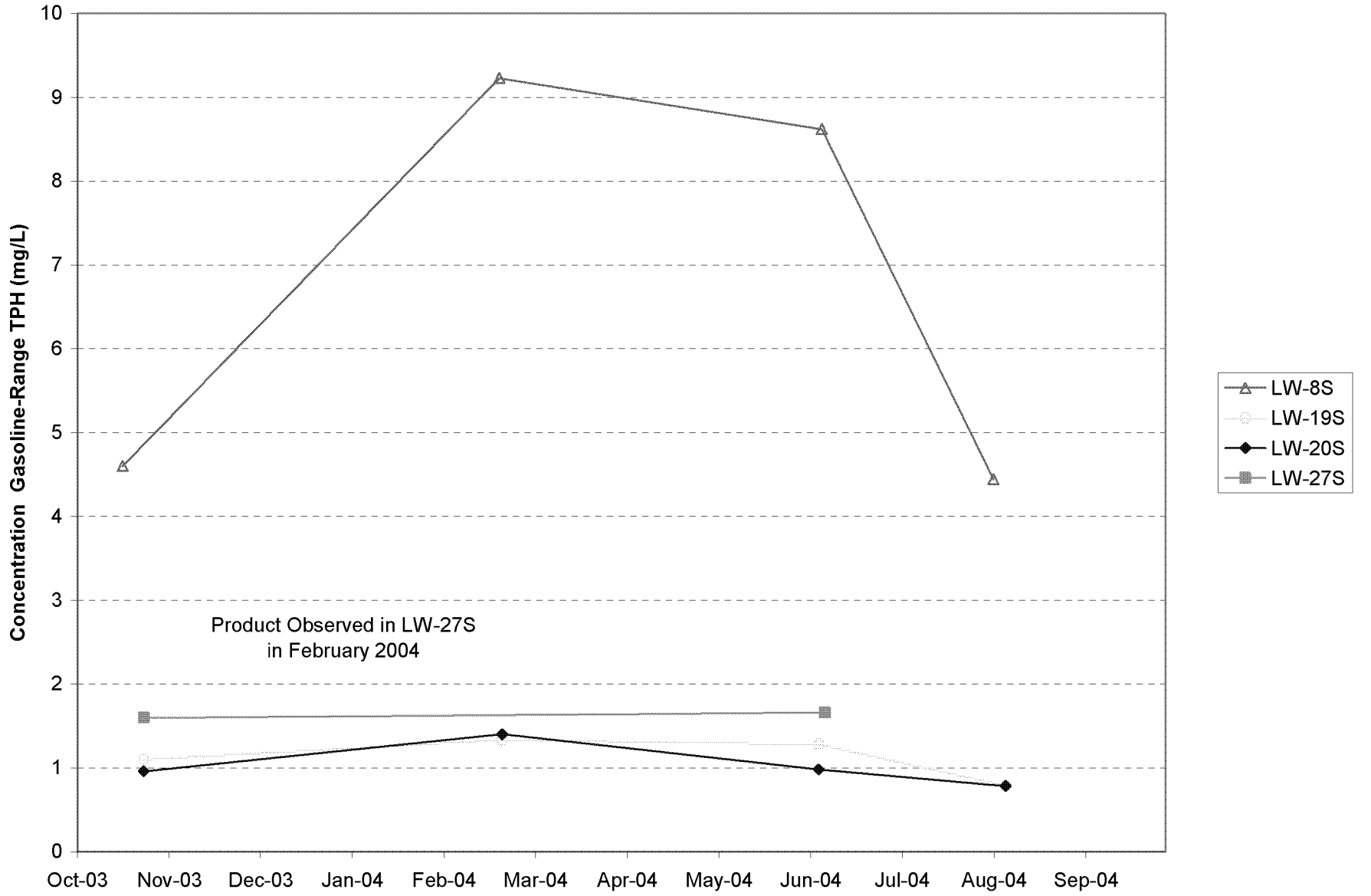
Time Oil NW Terminal
Portland, Oregon

Diesel-Range Hydrocarbons
Selected Upper Zone Wells
Main Tank Farm Area

Figure
20



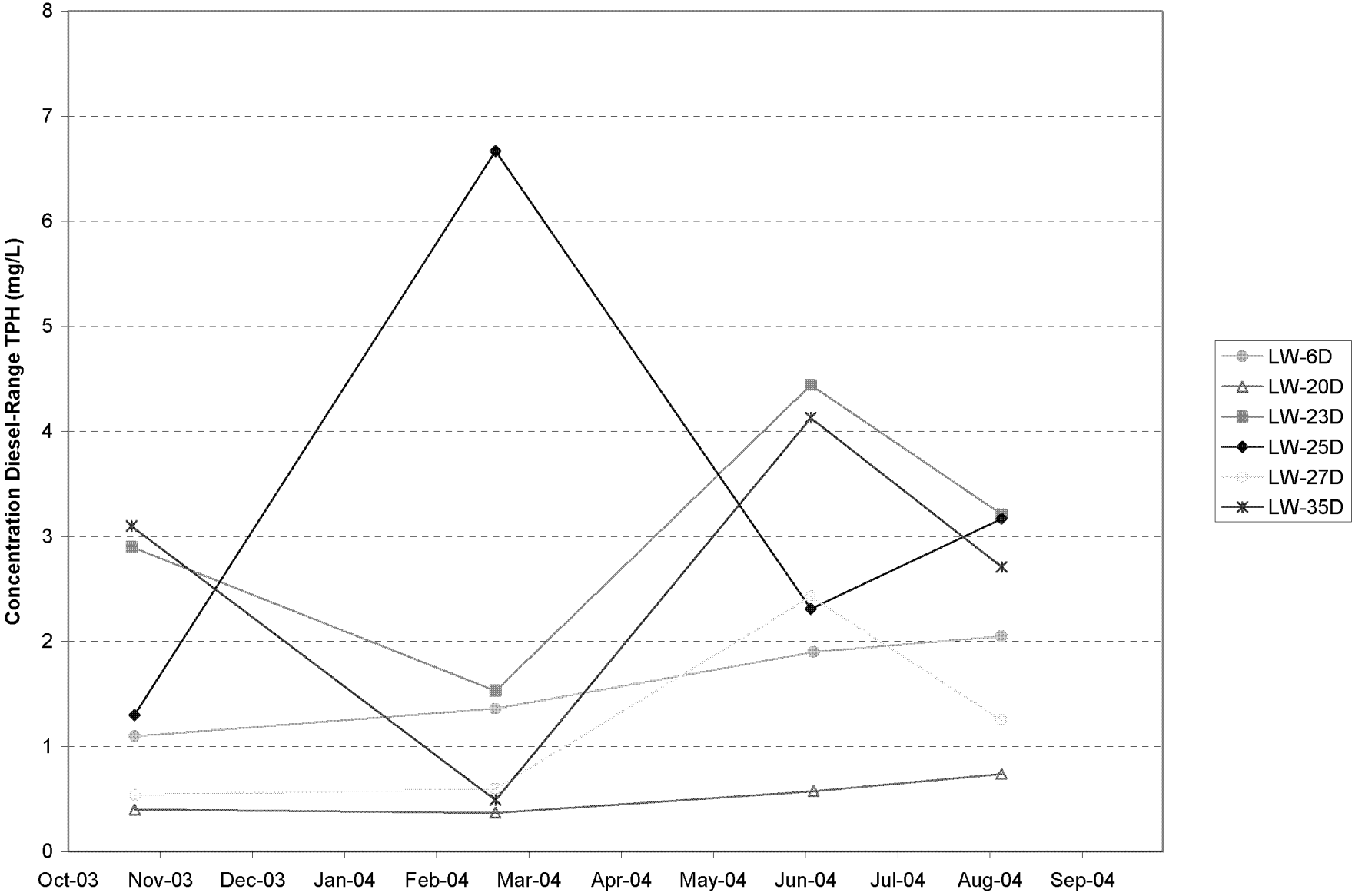
LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

Gasoline-Range Hydrocarbons
Selected Upper Zone Wells
Main Tank Farm Area

Figure
21

BZTO104(e)024143



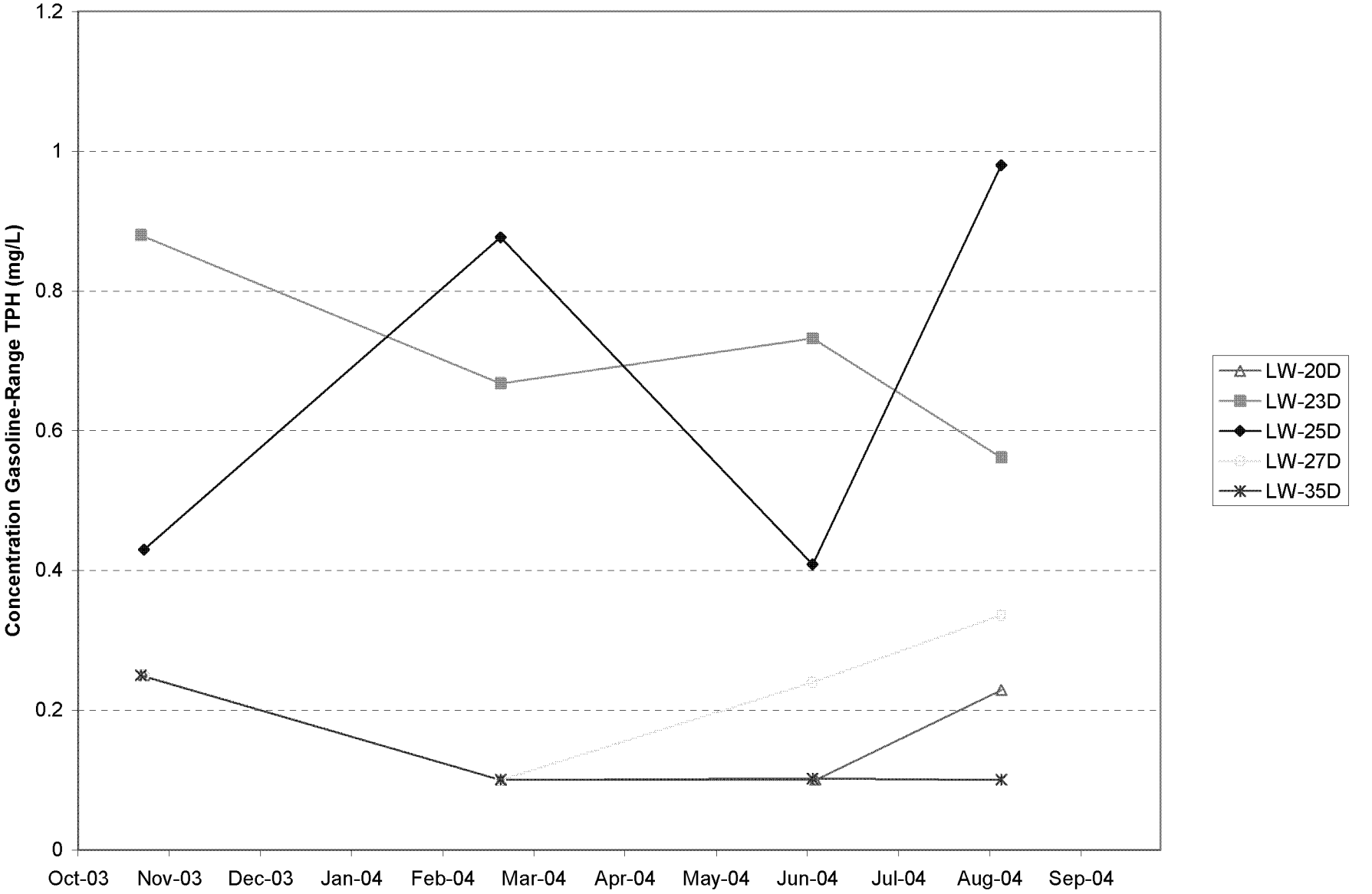
LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

Diesel-Range Hydrocarbons
Selected Lower Zone Wells
Main Tank Farm Area

Figure
22

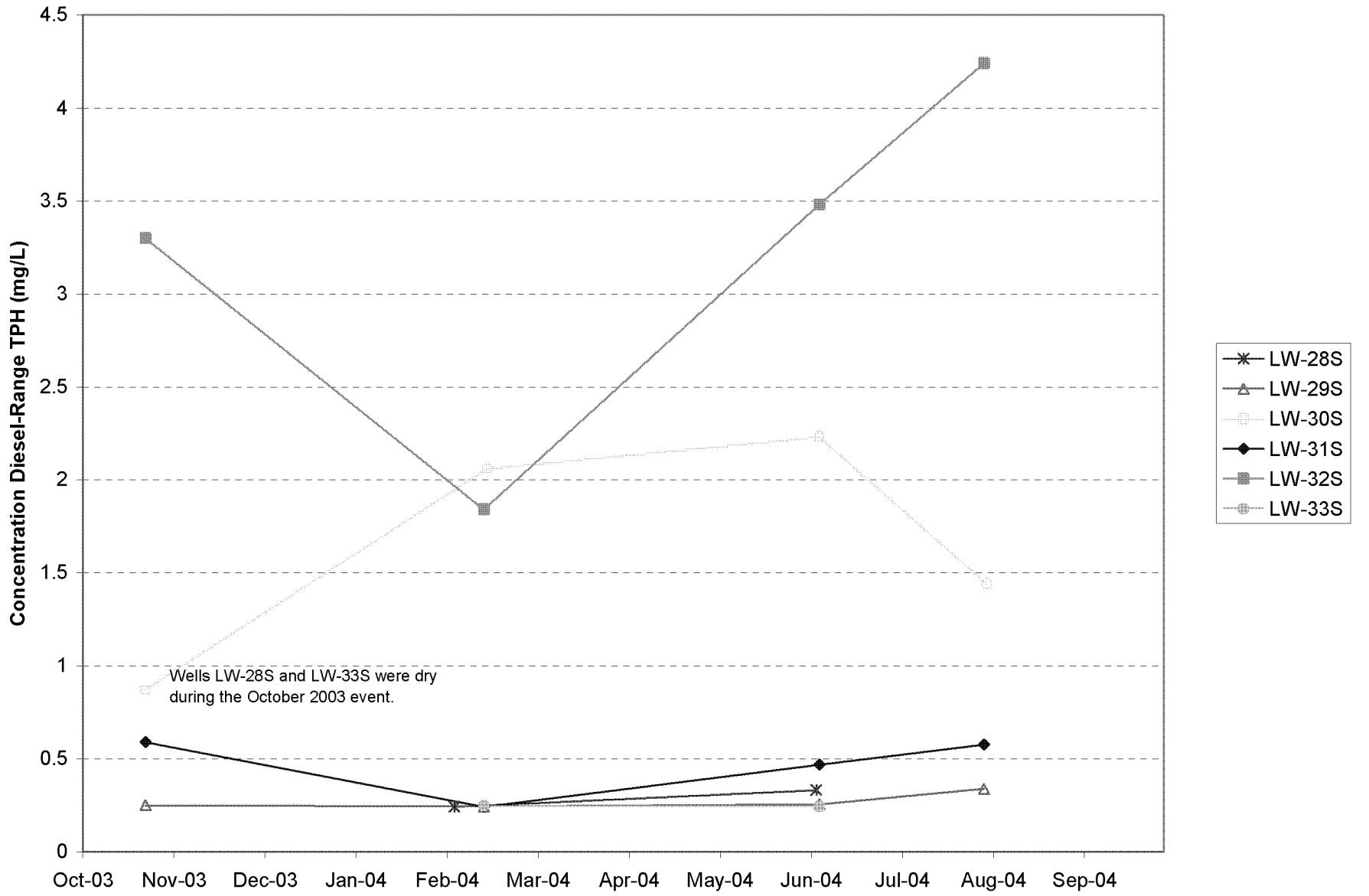
BZTO104(e)024144



LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Gasoline-Range Hydrocarbons Selected Lower Zone Wells Main Tank Farm Area**	Figure 23

BZTO104(e)024145

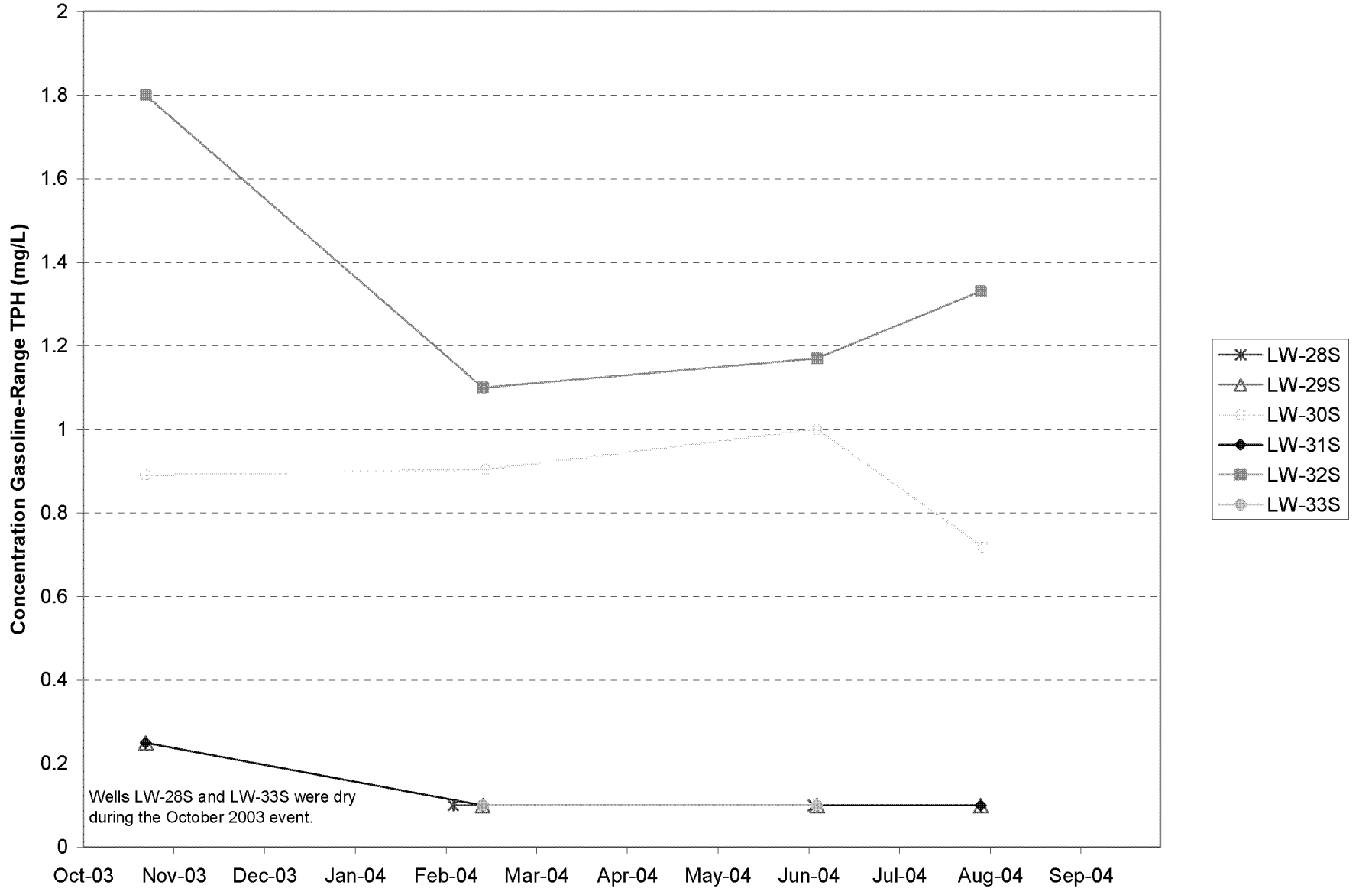


LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

Diesel-Range Hydrocarbons
Upper Zone Wells
Bell Terminal

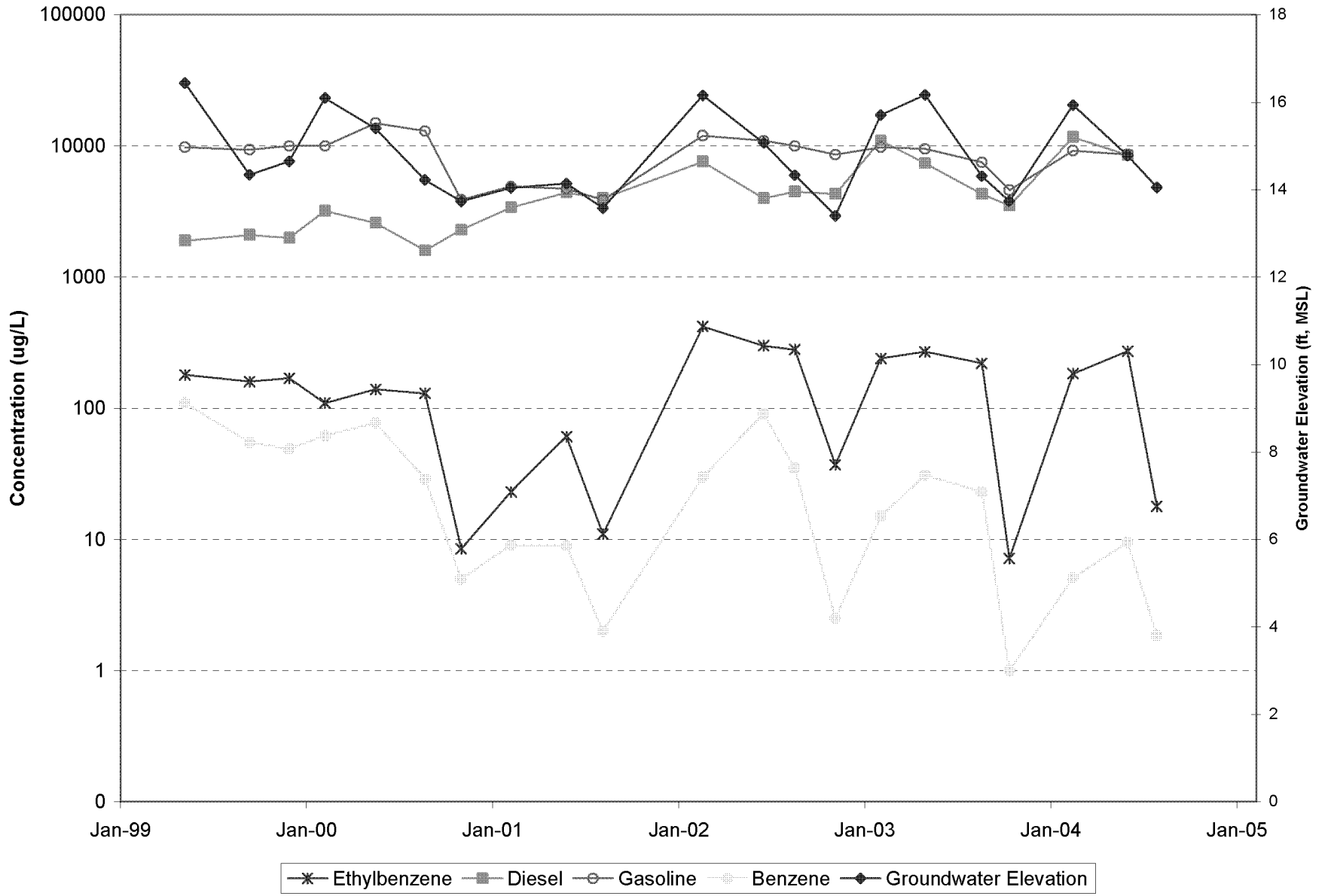
Figure
24



LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**Gasoline-Range Hydrocarbons Upper Zone Wells Bell Terminal**	Figure 25

BZTO104(e)024147



LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

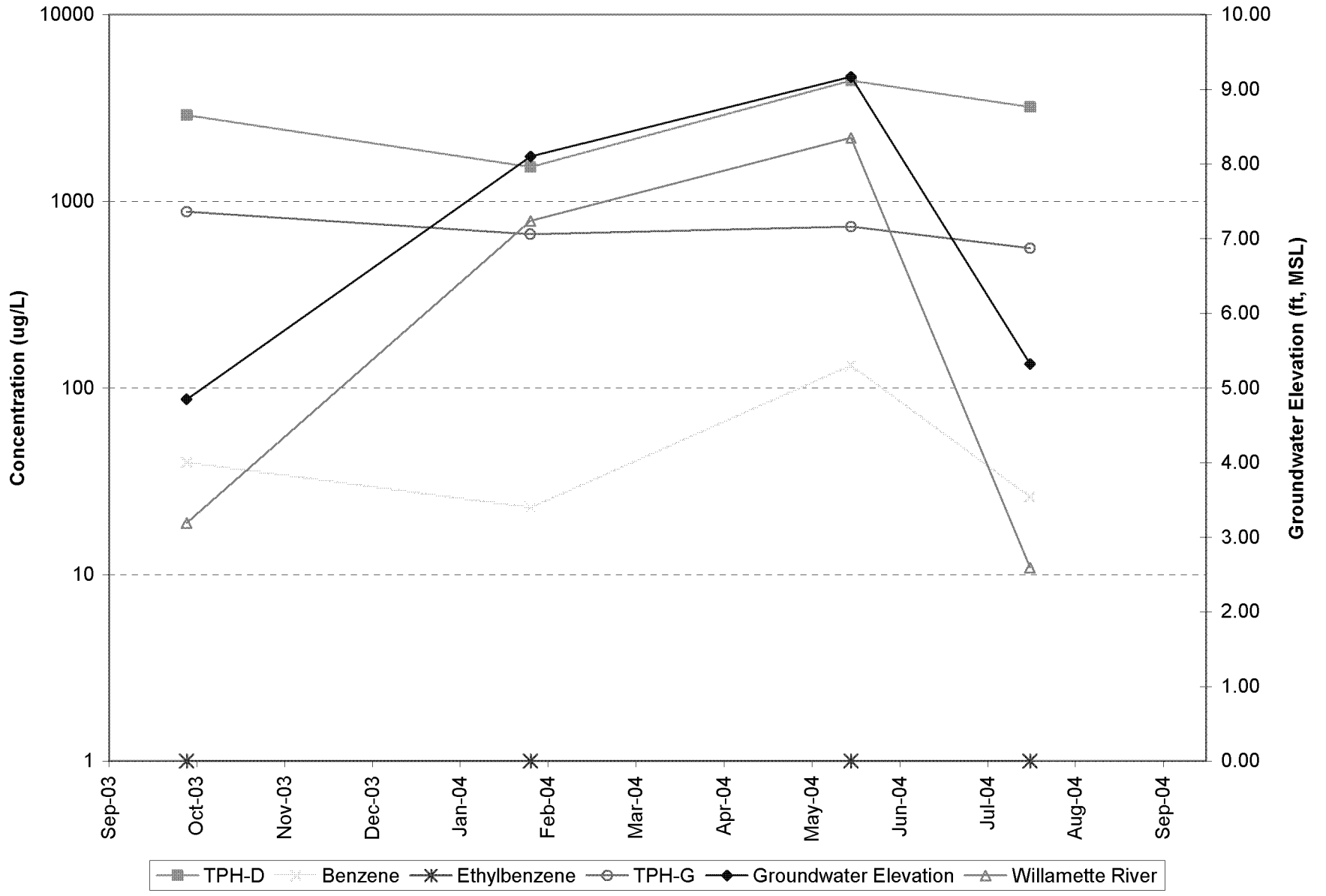
Selected Constituents
Well LW-8S, Upper Zone
Main Tank Farm Area

Figure
26

BZTO104(e)024148

2/14/05 \\Edmdata\wproc\231\001\131\2004 Qrtly\3Q04 GW Rpt Fig 28.doc

Source: edmdata\sheets\TIMEOIL\PH2RI\PLOTS2004 LW23D



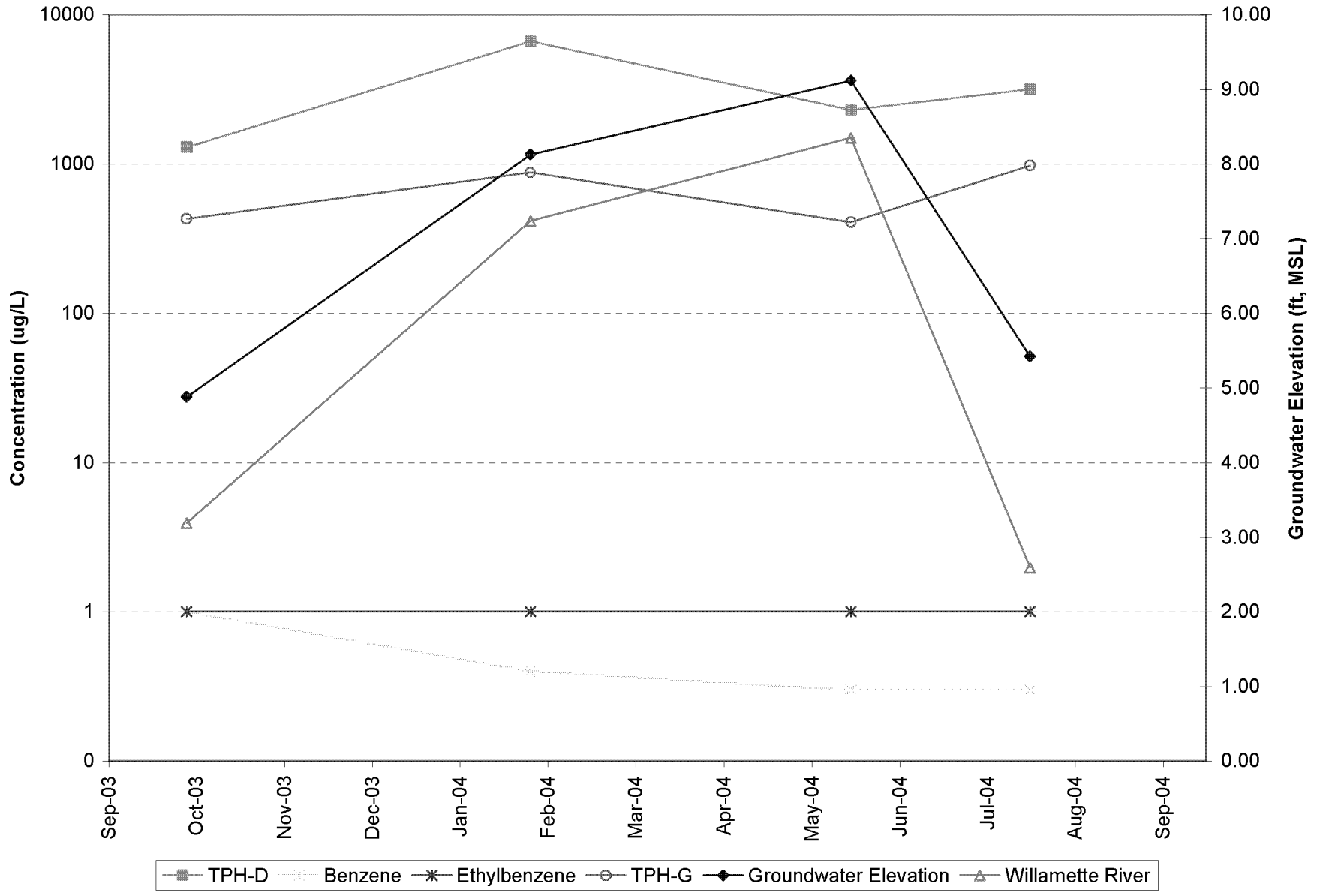
LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

Selected Constituents, Well LW-23D
Lower Zone
Main Tank Farm Area

Figure
27

BZTO104(e)024149



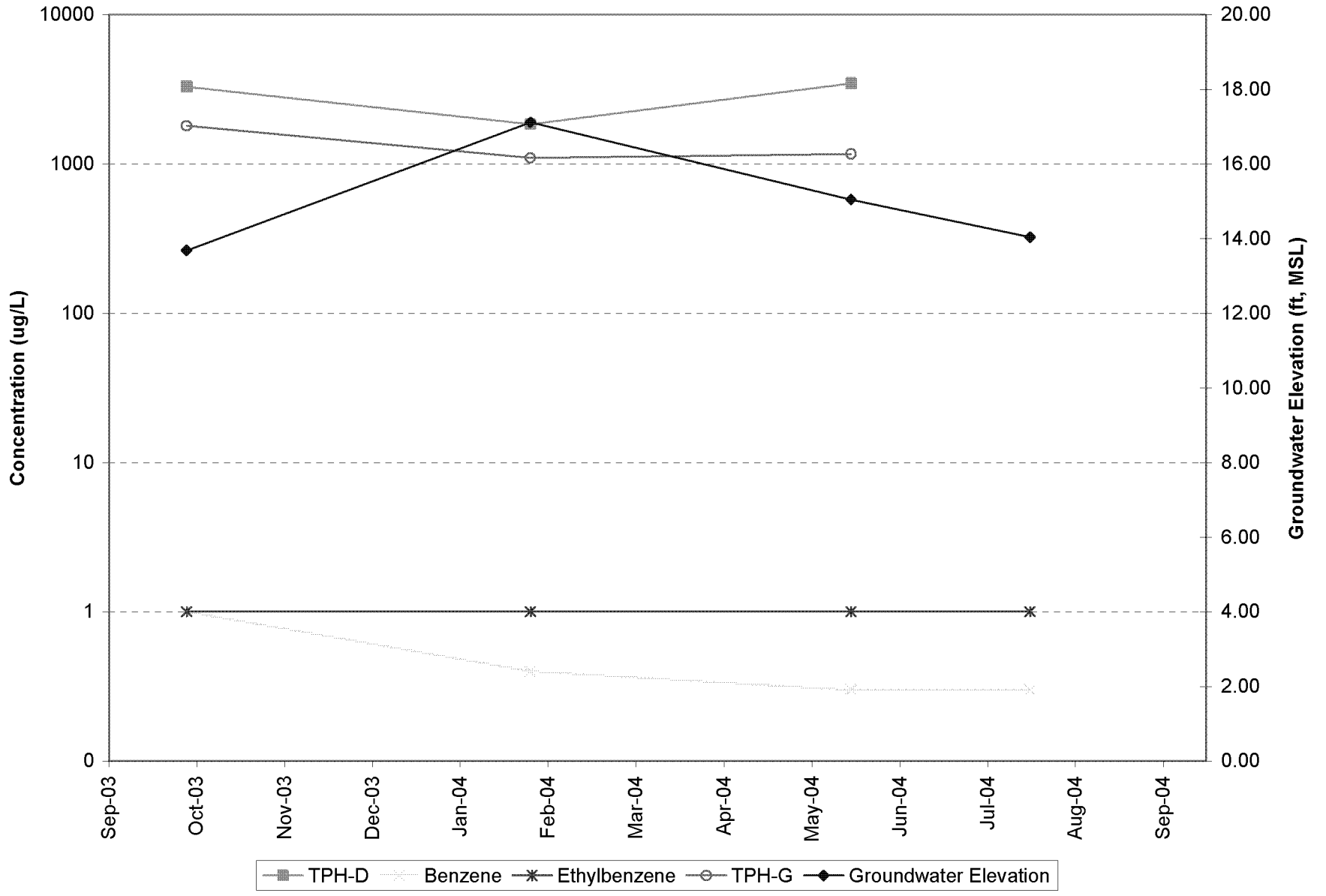
LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

Selected Constituents
Well LW-25D, Lower Zone
Main Tank Farm Area

Figure
28

BZTO104(e)024150



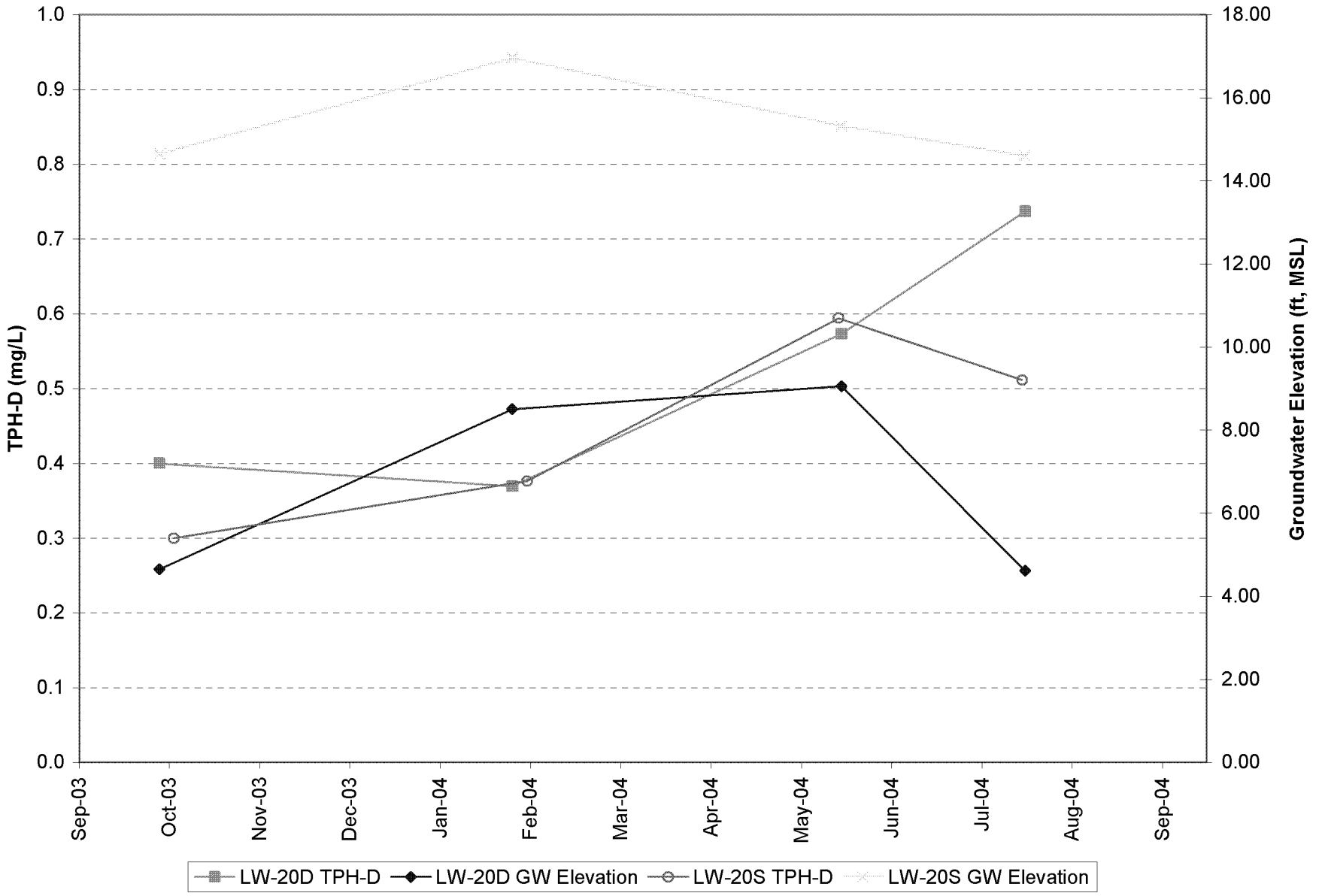
LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

Selected Constituents
Well LW-32S, Upper Zone Bell Terminal

Figure
29

BZTO104(e)024151



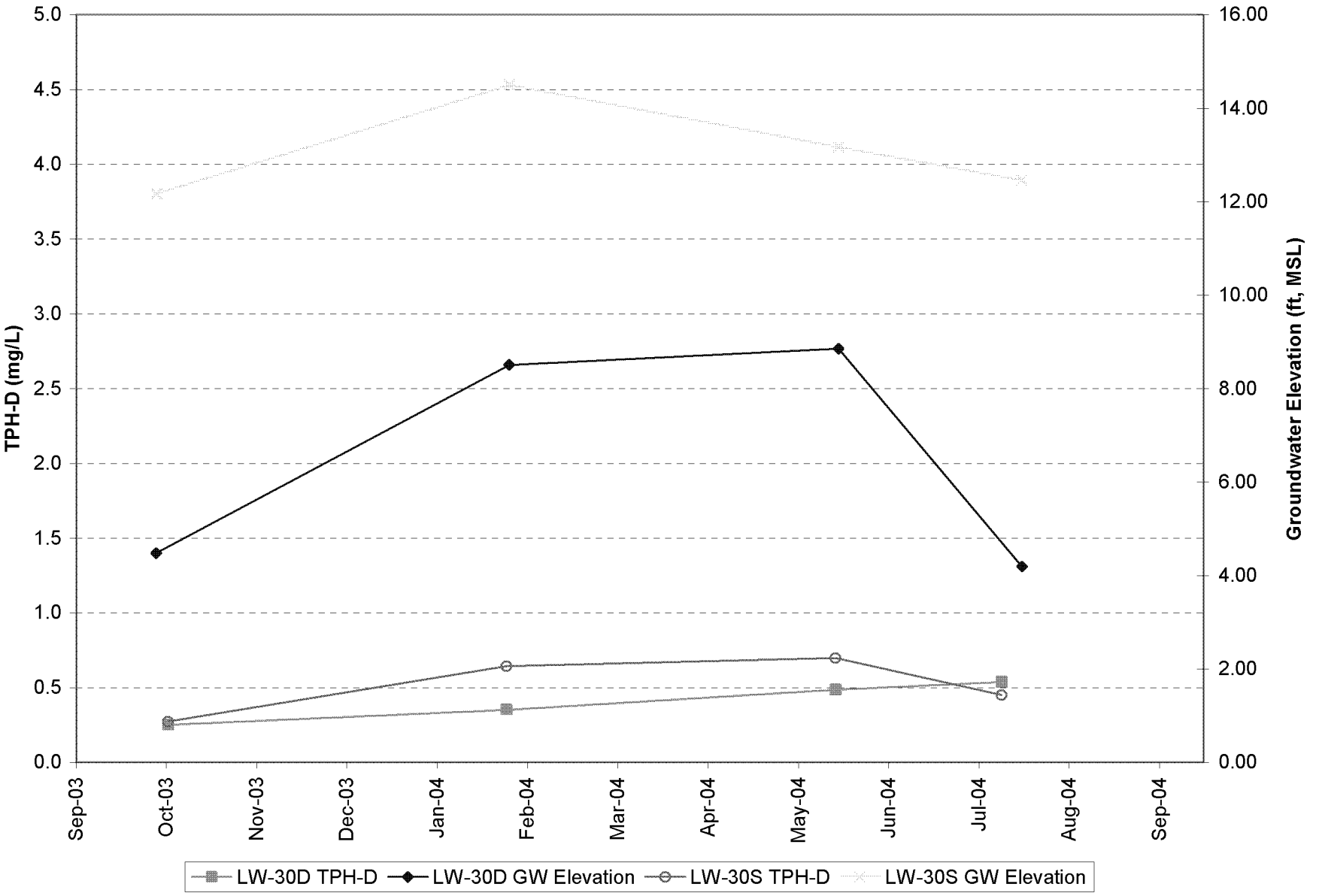
LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

Diesel-Range TPH vs. Groundwater Elevation
LW-20S and LW-20D
Main Tank Farm Area

Figure
30

BZTO104(e)024152



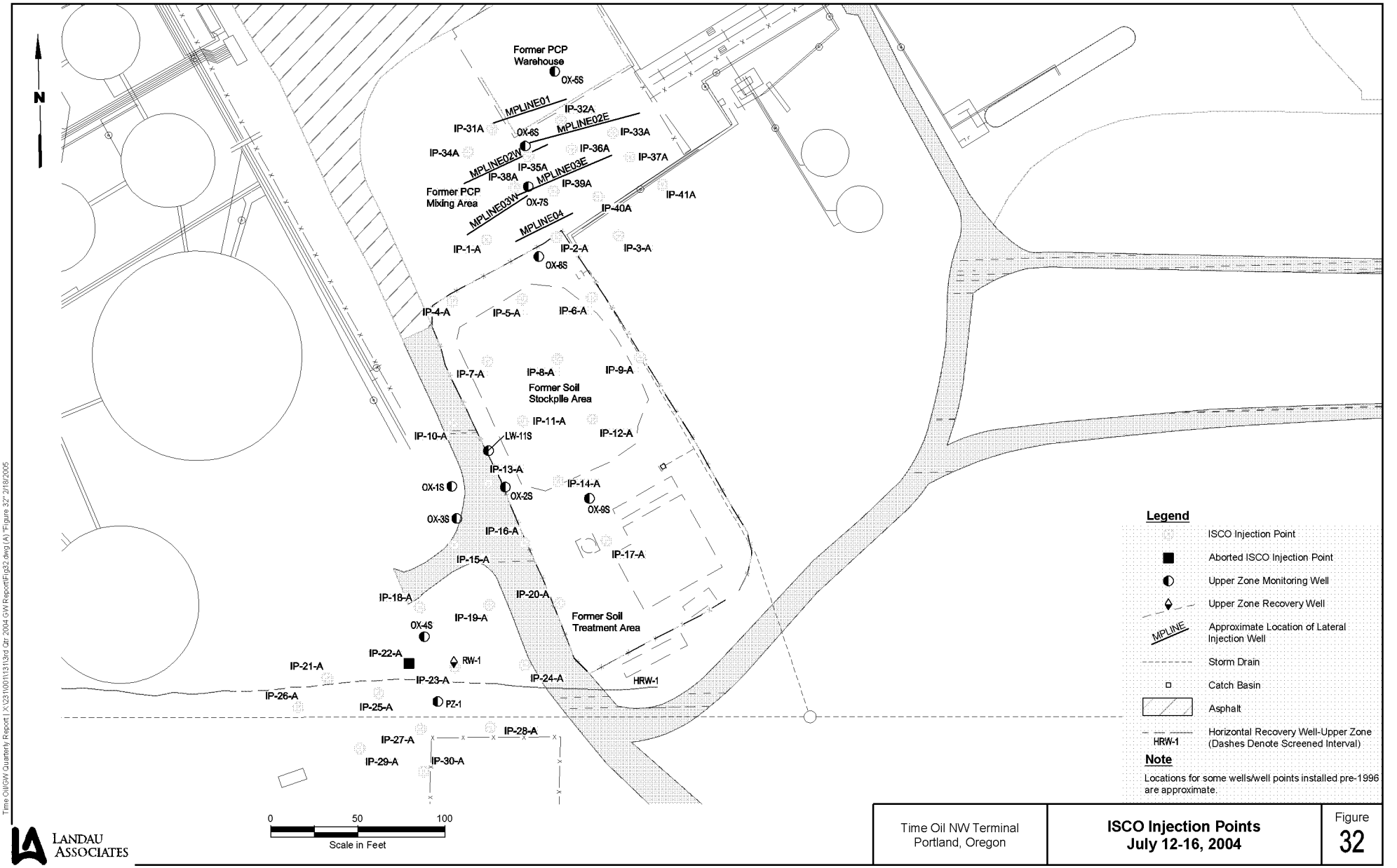
LANDAU ASSOCIATES

Time Oil NW Terminal
Portland, Oregon

Diesel-Range TPH vs. Groundwater Elevation
LW-30S and LW-30D
Bell Terminal

Figure
31

BZTO104(e)024153

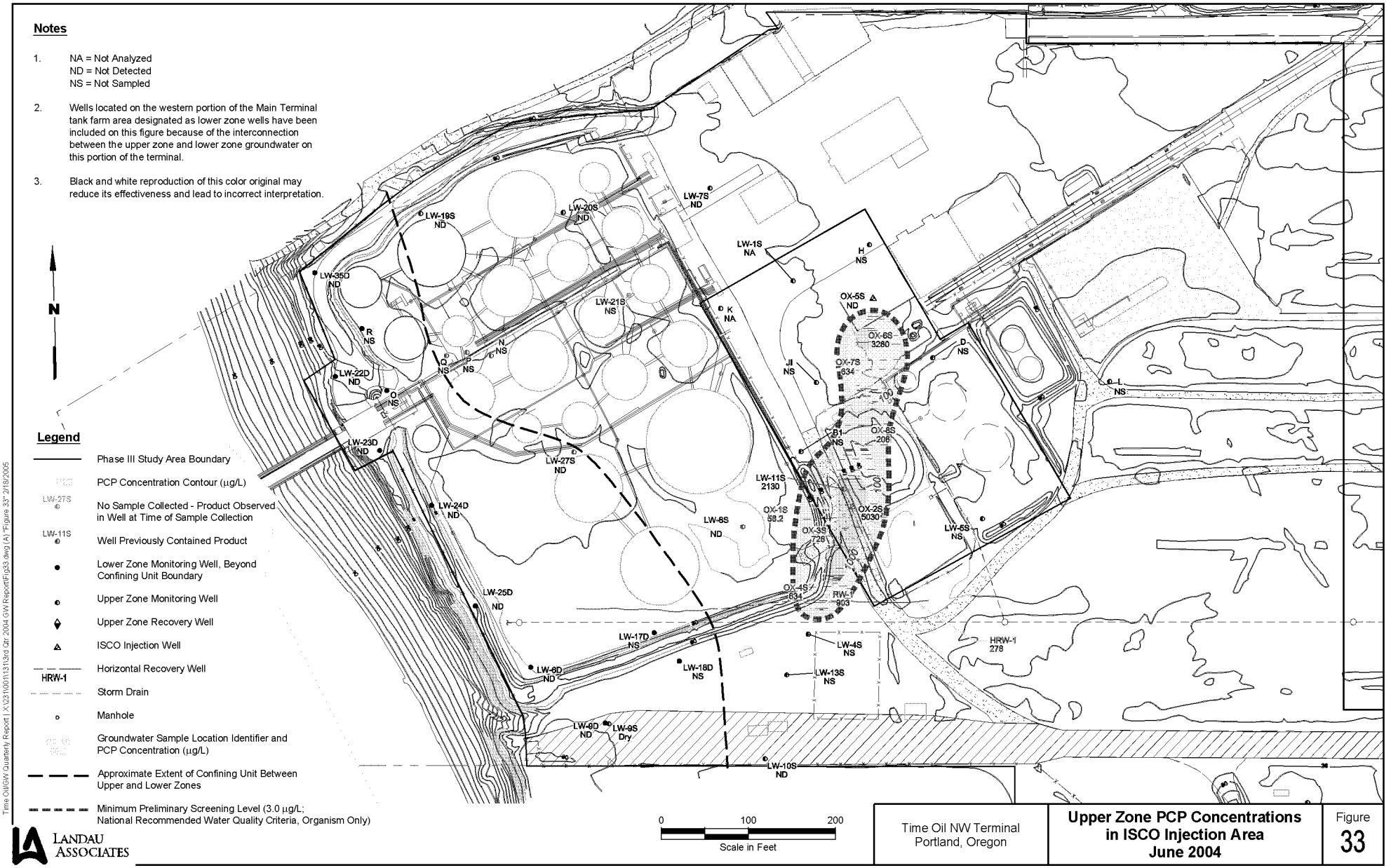


LANDAU ASSOCIATES

Time Oil NW Terminal Portland, Oregon	**ISCO Injection Points July 12-16, 2004**	Figure 32

Time Oil\GW Quarterly Report \ X:\231\001\13\13rd Qtr 2004 GW Report\Fig32.dwg (A) \Figure 32" 2/18/2005

BZTO104(e)024154



Time Oil NW Terminal
Portland, Oregon

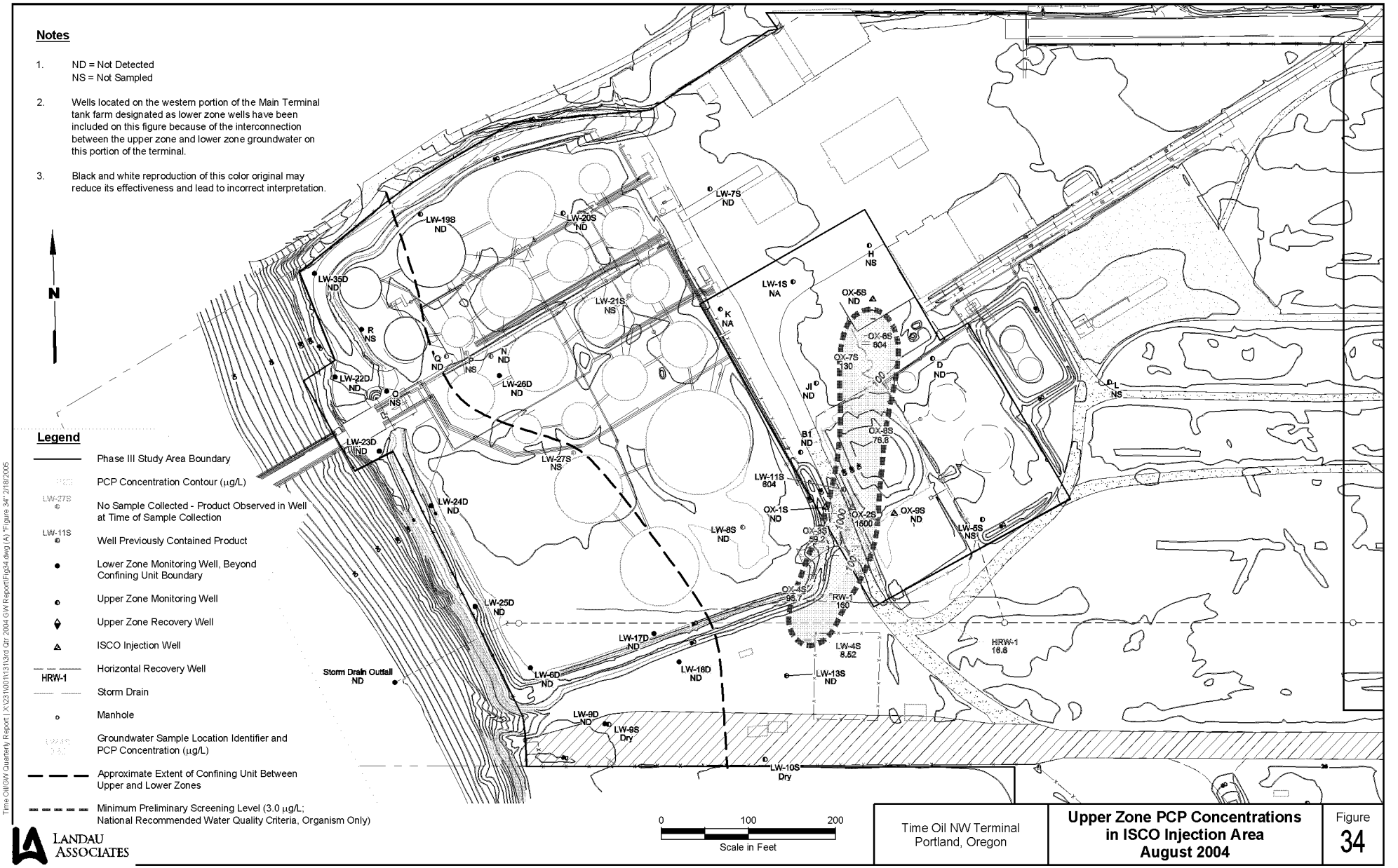
Upper Zone PCP Concentrations in ISCO Injection Area June 2004

Figure 33

LANDAU ASSOCIATES

Time Oil\GW Quarterly Report \ X:\231\00\113\13rd Qtr 2004 GW Report\Fig33.dwg (A) "Figure 33" 2/18/2005

BZTO104(e)024155



BZTO104(e)024156

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	AC
3			B2		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		CB68B
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		8/29/00
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	UJ	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	U	**1.0**		1.0	U	**0.6**	J1	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	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	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	**5.6**		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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	U	5.0	U	5.0
55		Methyl tert-butyl ether	NA		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**		0.25
60	53	**TPH-D Motor Oil**	NA		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		NA
62	55																												

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

	B	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	BF
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2	
4			CL03J		CT67G		DE68K		DM30N		DW37C		ED23B		EM75K		ES04H		EY88D		FF88P		FL41G		FU50D		FY64E		0402099-02	
5			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		10/20/03		2/19/04	
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	0.25	U	0.27	U	0.25	U	0.26	U	0.25	U	0.5	U	0.5	U	0.475	U
10	2,4,6-Trichlorophenol	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	U	0.25	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	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	U	0.25	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	2.0	U	2.1	U	2.2	U	2	U	2	U	2	U	2	U	1.95	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	1.1	U	1.1	U	1	U	1	U	1	U	1	U	9.73	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	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.973	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	3.2	U	3.3	U	3.1	U	3	U	3	U	3	U	2.92	U
23	Benzoic Acid	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	10	U	19.5	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	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.973	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	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.973	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	5.3	U	5.6	U	5.1	U	5	U	5	U	5	U	4.86	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	5.3	U	5.6	U	5.1	U	5	U	5	U	5	U	4.86	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	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.973	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	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.973	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	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.973	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	5.3	U	5.6	U	5.1	U	5	U	5	U	5	U	4.86	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	4.0	U	4.3	U	4.4	U	1	U	1	U	**6.1**		1	U	0.973	U
33																														
34	**VOLATILES (µg/L)**																													
35	**EPA Method SW8260**																													
36	Acetone	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	5	U	50	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	U	1	U	1	U	1	U	1	U	1	U	2	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	U	5	U	5	U	5	U	5	U	5	U	10	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	U	1	U	1	U	1	U	1	U	1	U	0.4	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	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	1.0	U	1	U	1	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	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	1.0	U	1	U	1	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	U	1	U	1	U	1	U	1	U	1	U	2	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	U	1	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	U	1	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	U	1	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	U	1	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	U	1	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	U	1	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	U	1	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	U	1	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	U	1	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	U	5	U	5	U	5	U	5	U	5	U	1	U
55	Methyl tert-butyl ether		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		1	U
56																														
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																													
58	**Method OR-DEQ**																													
59	**TPH-Diesel**	U	0.25	U	0.25	U	NA		NA		NA		0.25	U	NA		NA		NA		0.25	U	NA		NA		NA		NA	
60	**TPH-D Motor Oil**		0.50	U	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																														

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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	BG	BH
1			
2			
3		B2	
4		0408019-03	
5		8/03/04	
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	2.01	U
20	4-Methylphenol	10	U
21	Isophorone	1	U
22	2,4-Dimethylphenol	3.01	U
23	Benzoic Acid	20.1	U
24	Naphthalene	1	U
25	2-Methylnaphthalene	1	U
26	2,4,6-Trichlorophenol	5.02	U
27	2,4,5-Trichlorophenol	5.02	U
28	Acenaphthene	1	U
29	Dibenzofuran	1	U
30	Fluorene	1	U
31	Pentachlorophenol	5.02	U
32	bis(2-Ethylhexyl)phthalate	1	U
33			
34	**VOLATILES (µg/L)**		
35	**EPA Method SW8260**		
36	Acetone	50	U
37	Carbon Disulfide	2	U
38	2-Butanone	10	U
39	Benzene	0.3	U
40	Bromoform	1	U
41	Toluene	1	U
42	Ethylbenzene	1	U
43	Styrene	1	U
44	m,p-Xylene	2	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	1	U
55	Methyl tert-butyl ether	1	U
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			

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	AC
1																													
2																													
3			B2		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		CB68B
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		8/29/00
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**		**0.015**
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	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	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	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	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**		**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		NA
74	67	Magnesium (mg/L) (6010)	**45.2**		**47**		**14.4**		**13.5**		NA		NA		NA		**11.9**		NA		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		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		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**370**		**380**	J2	**38**		**190**		NA		NA		NA		**170**		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		1.0	U	NA		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		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**		**220**
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**		**2.5**
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		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		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		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		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	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	BF
1																														
2																														
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2	
4			CL03J		CT67G		DE68K		DM30N		DW37C		ED23B		EM75K		ES04H		EY88D		FF88P		FL41G		FU50D		FY64E		0402099-02	
5			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		10/20/03		2/19/04	
63	**PRIORITY POLLUTANT**																													
64	**METALS (mg/L)**																													
65	Arsenic (7060)		**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**		**0.002**		**0.005**	
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	**0.0087**	
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	0.01	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	0.02	U	0.001	U	0.001	U	0.001	U	0.001	U	0.0001	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	0.005	U
70	Zinc (6010)		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	0.006	U	0.01	U
71																														
72	**MAJOR IONS AND CONVENTIONALS**																													
73	Calcium (mg/L) (6010)		NA		**43.6**		**48.0**		**42.0**		**56.4**	J	**43.3**		NA		NA		NA		**46.7**		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)		NA		**19.4**		**23.8**		**18.3**		**32.6**	J	**14.5**		NA		NA		NA		**20.5**		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)		NA		**3.4**		**3.4**		**3.9**		**2.4**		**5.2**		NA		NA		NA		**3.9**		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)		NA		**11.0**		**12.1**		**11.4**		**15.0**		**9.84**		NA		NA		NA		**11.3**		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		**200**		NA		NA		NA		**240**		NA		NA		NA		**270**		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		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)		NA		**200**		NA		NA		NA		**240**		NA		NA		NA		**270**		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**240**		**260**		**260**		**270**		**280**		**240**		**190**		**210**		**360**		**250**		**220**		**240**		**250**		**218**	
81	Chloride (mg/L) (EPA 325.2)		**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**		**3.1**		**2.64**	
82	N-Nitrate (mg-N/L) (Calculated)		NA		**0.81**		NA		NA		NA		**0.73**		NA		NA		NA		**0.2**		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		0.010	J	NA		NA		NA		**0.021**		NA		NA		NA		**0.023**		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		**0.81**		NA		NA		NA		**0.75**	J	NA		NA		NA		**0.22**		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		**4.1**		NA		NA		NA		**2.6**		NA		NA		NA		**3**		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	BG	BH
1			
2			
3		B2	
4		0408019-03	
5		8/03/04	
63	**PRIORITY POLLUTANT**		
64	**METALS (mg/L)**		
65	Arsenic (7060)	**0.00363**	
66	Chromium (6010)	**0.0161**	
67	Copper (6010)	0.01	U
68	Lead (7421)	0.0001	U
69	Nickel (6010)	0.005	U
70	Zinc (6010)	0.01	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)	**286**	
81	Chloride (mg/L) (EPA 325.2)	**3.51**	
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	AC
1																													
2																													
3			B2		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		CB68B
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		8/29/00
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		7.00
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		15.6
90	83	Conductivity (um/hos)	769		675		297		385		494		643		234		357		253		285		305		653		665		346
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		1.16
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		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		NA
97	90	2,3,7,8-TCDD	NA		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		NA
99	92	1,2,3,7,8-PeCDF	NA		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		NA
101	94	Total PeCDF	NA		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		NA
103	96	Total PeCDD	NA		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		NA
105	98	1,2,3,6,7,8-HxCDF	NA		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		NA
107	100	1,2,3,7,8,9-HxCDF	NA		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		NA
109	102	1,2,3,4,7,8-HxCDD	NA		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		NA
111	104	1,2,3,7,8,9-HxCDD	NA		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		NA
113	106	1,2,3,4,6,7,8-HpCDF	NA		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		NA
115	108	Total HpCDF	NA		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		NA
117	110	Total HpCDD	NA		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		NA
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
120	113																												
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	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	BF
1																														
2																														
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2	
4			CL03J		CT67G		DE68K		DM30N		DW37C		ED23B		EM75K		ES04H		EY88D		FF88P		FL41G		FU50D		FY64E		0402099-02	
5			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		10/20/03		2/19/04	
87	**FIELD PARAMETERS**																													
88	pH (avg)		5.53		6.97		6.80		6.96		6.71		6.90		7.01		7.21		6.8		7.06		7.25		6.96		6.71		6.52	
89	Temperature (° C) (avg)		13.3		13.5		14.0		16.3		12.8		13.1		15.3		15.9		14.1		14.4		15.2		14.9		14.9		14.8	
90	Conductivity (um/hos)		319		315		611		608		384		362		272		272		595		598		319		340		560		301	
91	Dissolved oxygen (mg/L) (avg)		2.17		1.81		1.59		1.98		4.27		7.72		4.80		1.09		2.52		0		4.22		1.75		0.56		3.24	
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	BG	BH
1			
2			
3		B2	
4		0408019-03	
5		8/03/04	
87	**FIELD PARAMETERS**		
88	pH (avg)	7.76	
89	Temperature (° C) (avg)	15.3	
90	Conductivity (um/hos)	414	
91	Dissolved oxygen (mg/L) (avg)	NM	
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	AC
1																													
2																													
3			B2		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		CB68B
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		8/29/00
6																													
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		NA
126	117	2-Methylnaphthalene	NA		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		NA
128	119	Acenaphthene	NA		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		NA
130	121	Anthracene	NA		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		NA

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

	B	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	BF
1																														
2																														
3			B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2		B2	
4			CL03J		CT67G		DE68K		DM30N		DW37C		ED23B		EM75K		ES04H		EY88D		FF88P		FL41G		FU50D		FY64E		0402099-02	
5			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		10/20/03		2/19/04	
6																														
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	BG	BH
1			
2			
3		B2	
4		0408019-03	
5		8/03/04	
6			
123	**PAHs (µg/L)**		
124	**EPA Method SW8270 SIM**		
125	Naphthalene	NA	
126	2-Methylnaphthalene	NA	
127	Acenaphthylene	1	U
128	Acenaphthene	NA	
129	Fluorene	NA	
130	Anthracene	1	U
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									Dup of G1A				Dup of G1A															
3			G1A		G1A		G1A		G1B		G1A		S		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4			S177E		T176H		U258C		U258A		V224T		V224L		W391G		Y313D		Z225C		Z960O		AH27J		AU45F		BC27E	
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		12/7/99	
6																												
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	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	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	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	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	**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	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	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**		2.0	U
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	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	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	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**		10	U
24	18	Naphthalene	**9.7**		**14**		**11**		**11**		30	J2	**23**	J2	**8.4**	J2	**9.0**		**1.6**		**2.4**		**15**		**6.4**		**3.0**	
25	19	2-Methylnaphthalene	**29**		**37**		**33**		**35**		**44**	J2	**30**	J2	**19**	J2	**25**		**7.2**		**14**		**23**		**16**		**12**	
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	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	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	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	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	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	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	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	5.0	U
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	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**		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	**2.7**		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	**1.2**		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	1.0	U
42	36	Ethylbenzene	31		**49**		**74**	J2	**59**	J2	**28**		**32**		**34**		**42**		**3.1**		1.0	U	**81**		**7.4**		**2.3**	
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	**51**		**74**		**160**	J2	**120**	J2	**74**		**89**		**74**		**93**		**5.7**		**2.0**		**120**		**24**		**1.5**	
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	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**		**11**	
47	41	1,2,4-Trimethylbenzene	**130**		**150**		**350**	J2	**250**	J2	140		**160**		**120**		**99**		**8.8**		**9.9**		**110**		**57**		**14**	
48	42	Isopropylbenzene	**180**		**200**		**310**	J2	**240**	J2	**130**		**140**		**200**	E	**180**		**170**		**170**		**190**		**96**		**66**	
49	43	n-Propylbenzene	**200**		**220**		**340**	J2	**270**	J2	**140**		**160**		**210**	E	**180**		**170**		**160**		**220**		**93**		**64**	
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**		**1.7**	
51	45	sec-Butylbenzene	**18**		**25**		**33**		**27**		**14**		**17**		**24**		**30**	J2	**23**		**18**		**20**		**19**		**6.9**	
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**		1.0	U
53	47	n-Butylbenzene	**14**	M	**19**		**26**		**22**		**12**		**14**		**19**		**23**		**15**		**11**		**15**		14	U	1.0	U
54	48	Naphthalene	**20**		**32**		**73**	J2	**50**	J2	**22**		**78**		**36**		**41**		**5.2**		**5.3**		**28**		**18**		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**	**4.0**		**3.9**		**3.5**		**3.6**		**3.3**		**3.5**		**3.0**		**2.6**		**2.7**		**2.5**		**2.6**		**2.6**		**2.3**	
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																											

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		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4		BH96J		BR64I		CB85G		CL03E		CT55A		DE87L		DM30A		DW37F		ED23I		EM85J		ER93D		EZ03D		FF76E		FL66D	
5		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		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	0.25	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	**0.39**		0.25	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		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		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		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		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		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		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	2.1	U	2.2	U	2.1	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	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	1.0	U	1	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	3.0	U	3.1	U	3.3	U	3.1	U	3	U
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	10	U	50	U	50	U	50	U	52	U	54	U	52	U	50	U
24	Naphthalene	**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	1	U	1	U
25	2-Methylnaphthalene	**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	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	5.2	U	5.4	U	5.2	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	5.0	U	5.2	U	5.4	U	5.2	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	1.0	U	1	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	1.0	U	1	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	1.0	U	1	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	5.0	U	5.2	U	5.4	U	5.2	U	5	U
32	bis(2-Ethylhexyl)phthalate	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	1	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		R	5.0	U	**5.6**		5.0	U	5.0	U	**7.8**		5	U	5	U	5	U	**5.6**	M
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	1	U
38	2-Butanone	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	5	U	5	U
39	Benzene	**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	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	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	1	U
42	Ethylbenzene	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	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	1	U
44	m,p-Xylene	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	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	1	U
46	1,3,5-Trimethylbenzene	**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	1	U	1	U
47	1,2,4-Trimethylbenzene	**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	1	U	1	U
48	Isopropylbenzene	**140**		**95**		**100**		**140**		**120**		**150**		**130**		**200**		**140**		**170**		**140**		**150**		**180**		**65**	
49	n-Propylbenzene	**130**		**90**		**92**		**130**		**110**		**140**		**120**		**190**		**120**		**150**		**110**		**130**		**150**		**49**	
50	tert-Butylbenzene	**4.8**		**2.6**		**4.0**		**3.7**		**3.2**		**4.5**		**3.2**		**4.9**		**3.6**		**4.7**		**3.8**		**3.7**		**4.7**		**2.6**	
51	sec-Butylbenzene	**24**		**9.6**		**20**		**19**		**16**		**20**		**17**		**23**		**16**		**23**		**18**		**18**		**22**		**7.2**	
52	4-Isopropyltoluene	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	1	U	1	U
53	n-Butylbenzene	**17**		**6.2**	M	**14**	M	**12**		**10**		14	U	**11**		**14**	M	**12**		**13**	M	**11**	M	**11**	M	**14**	M	**4.3**	M
54	Naphthalene	**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	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**	**2.3**		**3.2**		**2.1**		**2.2**		**3.4**		**2.3**		**3.3**		**4.5**		**4.3**		**5.0**		**4.8**		**4.4**		**4.4**		**3.3**	
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																													

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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	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN
1											
2											
3		G1A		G1A		G1A		G1A		G1A	
4		FU50F		FY82N		0402105-04		0406039-03		0408044-06	
5		8/29/03		10/24/03		2/20/04		6/7/04		8/06/04	
6											
7	**CHLORINATED PHENOLS (µg/L)**										
8	**EPA Method SW8040**										
9	Pentachlorophenol	0.51	U	0.5	U	0.478	U	0.507	U	NA	
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	U	2	U	2.06	U	2.13	U	2	U
20	4-Methylphenol	1	U	1	U	10.3	U	10.6	U	10	U
21	Isophorone	1	U	1	U	1.03	U	1.06	U	1	U
22	2,4-Dimethylphenol	3	U	3	U	3.08	U	3.19	U	3	U
23	Benzoic Acid	51	U	10	U	20.6	U	21.3	U	20	U
24	Naphthalene	1	U	1	U	1.03	U	1.06	U	1	U
25	2-Methylnaphthalene	1	U	1	U	1.03	U	1.06	U	1	U
26	2,4,6-Trichlorophenol	5.1	U	5	U	5.14	U	5.32	U	5	U
27	2,4,5-Trichlorophenol	5.1	U	5	U	5.14	U	5.32	U	5	U
28	Acenaphthene	1	U	1	U	1.03	U	1.06	U	1	U
29	Dibenzofuran	1	U	1	U	1.03	U	1.06	U	1	U
30	Fluorene	1	U	1	U	1.03	U	1.06	U	1	U
31	Pentachlorophenol	5.1	U	5	U	5.14	U	5.32	U	**5.22**	
32	bis(2-Ethylhexyl)phthalate	**2.8**		1	U	1.03	U	1.06	U	1	U
33											
34	**VOLATILES (µg/L)**										
35	**EPA Method SW8260**										
36	Acetone	**9.3**	M	**7.3**	M	50	U	50	U	50	U
37	Carbon Disulfide	1	U	1	U	2	U	2	U	2	U
38	2-Butanone	**10**	M	**6.7**	M	10	U	10	U	10	U
39	Benzene	1	U	1	U	0.4	U	0.3	U	0.3	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	1	U	1	U	1	U	1	U	1	U
43	Styrene	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	1	U	1	U	2	U	2	U	2	U
45	o-Xylene	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
47	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	**180**		**150**		**67.2**		**105**		**118**	
49	n-Propylbenzene	**160**		**130**		**57.1**		**112**		**99.6**	
50	tert-Butylbenzene	**5.1**		**3.5**		1	U	**5.1**		**2.94**	
51	sec-Butylbenzene	**23**		**17**		**7.93**		**27.5**		**16.8**	
52	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	**14**		**10**		**4.23**		**15**		**8.97**	
54	Naphthalene	5	U	5	U	1	U	1	U	**2.49**	
55	Methyl tert-butyl ether	NA		NA		1	U	1	U	1	U
56											
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**										
58	**Method OR-DEQ**										
59	**TPH-Diesel**	**3.7**		**2.2**		**2.39**	J	**3.98**		**3.25**	
60	**TPH-D Motor Oil**	NA		0.5	U	0.491	UJ	0.536	U	0.507	U
61	**TPH-Gasoline**	NA		NA		NA		NA		NA	
62											

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 G1A				Dup of G1A															
3			G1A		G1A		G1A		G1B		G1A		S		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4			S177E		T176H		U258C		U258A		V224T		V224L		W391G		Y313D		Z225C		Z960O		AH27J		AU45F		BC27E	
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		12/7/99	
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**		**0.039**	
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**		0.005	U
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**		**0.003**	
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**		**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	0.02	U	0.01	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**		0.008	U
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		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		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		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		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**260**		**230**		**210**		**210**		**250**		**210**		NA		NA		NA		**240**		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	1.0	U	NA		NA		NA		1.0	U	NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**260**		**230**		**210**		**210**		**250**		**210**		NA		NA		NA		**240**		NA		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**		**420**	
81	74	Chloride (mg/L) (EPA 325.2)	**13**		**14**		**14**		**13**		**13**		**12**		**12**		**11**		**12**		**12**		**9.1**		**11**		**9.3**	
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		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		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		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		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		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4		BH96J		BR64I		CB85G		CL03E		CT55A		DE87L		DM30A		DW37F		ED23I		EM85J		ER93D		EZ03D		FF76E		FL66D	
5		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		2/12/03		5/9/03	
63	**PRIORITY POLLUTANT**																												
64	**METALS (mg/L)**																												
65	Arsenic (7060)	**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	**0.024**		**0.028**	
66	Chromium (6010)	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**		0.005	U	0.005	U
67	Copper (6010)	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**		**0.01**		0.002	U
68	Lead (7421)	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	0.001	U	0.001	U
69	Nickel (6010)	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**		0.01	U	0.01	U
70	Zinc (6010)	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**		**0.013**		**0.011**	
71																													
72	**MAJOR IONS AND CONVENTIONALS**																												
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		**65.6**		**60.3**		**67.9**		**56.9**	J	**62.8**		NA		NA		NA		**61.7**		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		**21.6**		**20.2**		**24.9**		**18.7**	J	**21.1**		NA		NA		NA		**22**		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		**1.8**		**3.4**		**2.4**		**3.6**		**3.2**		NA		NA		NA		**7**		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		**11.2**		**12.1**		**13.5**		**13.4**		**13.0**		NA		NA		NA		**17**		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		**310**		NA		NA		NA		**290**		NA		NA		NA		**300**		NA	
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	NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		**310**		NA		NA		NA		**290**		NA		NA		NA		**300**		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**450**		**390**		**460**		**380**		**350**	J	**340**	J	**330**	J	**330**		**380**		**320**		**330**		**430**		**350**		**350**	
81	Chloride (mg/L) (EPA 325.2)	**18**		**8.4**		**6.7**		**8.2**		**8.8**		**8.2**		**10**		**3.3**		**26**		**5.1**		**5**		**4.8**		**3.6**		**6**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		**0.010**		NA		NA		NA		0.010	U	NA		NA		NA		**0.045**		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.074**		NA		NA		NA		**0.023**		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		**0.010**		NA		NA		NA		**0.057**	J	NA		NA		NA		**0.068**		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		**4.7**		NA		NA		NA		**2.5**		NA		NA		NA		2.5	U	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

	B	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN
1											
2											
3		G1A		G1A		G1A		G1A		G1A	
4		FU50F		FY82N		0402105-04		0406039-03		0408044-06	
5		8/29/03		10/24/03		2/20/04		6/7/04		8/06/04	
63	**PRIORITY POLLUTANT**										
64	**METALS (mg/L)**										
65	Arsenic (7060)	**0.036**		**0.035**		**0.032**		**0.033**		**0.0293**	
66	Chromium (6010)	**0.006**		**0.01**		**0.0077**		**0.0155**		**0.0156**	
67	Copper (6010)	**0.004**		**0.007**		**0.0346**		0.01	U	0.01	U
68	Lead (7421)	0.001	U	**0.003**		**0.0004**		**0.0004**		**0.000658**	
69	Nickel (6010)	**0.05**		**0.08**		**0.0997**		**0.0955**		**0.13**	
70	Zinc (6010)	**0.009**		**0.021**		0.01	U	**0.0102**		0.01	U
71											
72	**MAJOR IONS AND CONVENTIONALS**										
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**400**		**310**		**280**		**364**		**302**	
81	Chloride (mg/L) (EPA 325.2)	**7.3**		**8.4**		**7.79**		**6.83**		**6.46**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	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									Dup of G1A				Dup of G1A															
3			G1A		G1A		G1A		G1B		G1A		S		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4			S177E		T176H		U258C		U258A		V224T		V224L		W391G		Y313D		Z225C		Z960O		AH27J		AU45F		BC27E	
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		12/7/99	
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		6.45	
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		13.0	
90	83	Conductivity (um/hos)	625		585		496		496		473		480		444		680		127		559		825		850		742	
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		2.00	
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		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4		BH96J		BR64I		CB85G		CL03E		CT55A		DE87L		DM30A		DW37F		ED23I		EM85J		ER93D		EZ03D		FF76E		FL66D	
5		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		2/12/03		5/9/03	
87	**FIELD PARAMETERS**																												
88	pH (avg)	6.68		6.47		5.92		5.84		6.42		6.83		6.79		6.58		6.64		6.48		6.69		6.76		7.18		6.92	
89	Temperature (° C) (avg)	13.9		17.2		15.0		13.7		15.2		14.4		15.5		13.4		14.3		17.5		17.7		13.7		14.4		14.9	
90	Conductivity (um/hos)	828		796		799		679		645		651		614		586		578		592		513		665		682		566	
91	Dissolved oxygen (mg/L) (avg)	0.86		0.31		0.67		0.64		1.76		1.84		1.41		4.16		7.50		2.72		0.69		1.06		1.68		2.83	
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	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN
1											
2											
3		G1A		G1A		G1A		G1A		G1A	
4		FU50F		FY82N		0402105-04		0406039-03		0408044-06	
5		8/29/03		10/24/03		2/20/04		6/7/04		8/06/04	
87	**FIELD PARAMETERS**										
88	pH (avg)	6.69		6.64		6.7		5.4		6.22	
89	Temperature (° C) (avg)	15		14.7		15.4		14.9		14.4	
90	Conductivity (um/hos)	588		603		560		473		811	
91	Dissolved oxygen (mg/L) (avg)	1.35		2.92		0.96		1.54		3.36	
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											
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 G1A				Dup of G1A															
3			G1A		G1A		G1A		G1B		G1A		S		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4			S177E		T176H		U258C		U258A		V224T		V224L		W391G		Y313D		Z225C		Z960O		AH27J		AU45F		BC27E	
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		12/7/99	
6																												
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		**2.5**		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		**16**		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.23**	M	NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.16**	M	NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	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		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A		G1A	
4		BH96J		BR64I		CB85G		CL03E		CT55A		DE87L		DM30A		DW37F		ED23I		EM85J		ER93D		EZ03D		FF76E		FL66D	
5		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		2/12/03		5/9/03	
6																													
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	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN
1											
2											
3		G1A		G1A		G1A		G1A		G1A	
4		FU50F		FY82N		0402105-04		0406039-03		0408044-06	
5		8/29/03		10/24/03		2/20/04		6/7/04		8/06/04	
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		1	U
128	Acenaphthene	NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		1	U
131	Dibenzofuran	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	AC
3			J2		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		CB49H
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		8/29/00
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	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	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	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	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	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	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	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	**2.8**		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	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	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	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	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	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	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	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	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	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	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	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	U	5.0
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	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	U	5.0
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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	U	5.0
55		Methyl tert-butyl ether	NA		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**		**0.26**
60	53	**TPH-D Motor Oil**	NA		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		NA
62	55																												

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

	B	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	BF
3			J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2	
4			CL03I		CT55E		DE68J		DM52A		DW48D		ED23D		EM85E		ES04E		EZ03L		FF76I		FL58J		FU31B		FY64I		0402105-02	
5			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		2/20/04	
7	**CHLORINATED PHENOLS (µg/L)**																													
8	**EPA Method SW8040**																													
9	Pentachlorophenol	U	0.25	U	0.25	U	0.25	U	0.25	U	**0.33**		0.25	U	0.25	U	0.28	U	0.25	U	0.26	U	0.25	U	0.5	U	0.5	U	0.483	U
10	2,4,6-Trichlorophenol	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	U	0.25	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	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	U	0.25	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	2.0	U	2.2	U	2.2	U	2	U	2	U	2	U	2	U	1.99	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	1.1	U	1.1	U	1	U	1	U	1	U	1	U	9.93	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	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.993	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	3.3	U	3.3	U	3.1	U	3	U	3	U	3	U	2.98	U
23	Benzoic Acid	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	U	19.9	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	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.993	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	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.993	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	5.6	U	5.6	U	5.1	U	5	U	5	U	5	U	4.97	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	5.6	U	5.6	U	5.1	U	5	U	5	U	5	U	4.97	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	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.993	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	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.993	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	1.1	U	1.1	U	1	U	1	U	1	U	1	U	0.993	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	5.6	U	5.6	U	5.1	U	5	U	5	U	5	U	4.97	U
32	bis(2-Ethylhexyl)phthalate	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	U	0.993	U
33																														
34	**VOLATILES (µg/L)**																													
35	**EPA Method SW8260**																													
36	Acetone	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	U	50	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	U	1	U	1	U	1	U	1	U	1	U	2	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	U	5	U	5	U	5	U	5	U	5	U	10	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	U	1	U	1	U	1	U	1	U	1	U	0.4	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	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	1.0	U	1	U	1	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	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	1.0	U	1	U	1	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	U	1	U	1	U	1	U	1	U	1	U	2	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	U	1	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	U	1	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	U	1	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	U	1	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	U	1	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	U	1	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	U	1	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	U	1	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	U	1	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	U	5	U	5	U	5	U	5	U	5	U	1	U
55	Methyl tert-butyl ether		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		1	U
56																														
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																													
58	**Method OR-DEQ**																													
59	**TPH-Diesel**		**0.40**		**0.35**		NA		NA		NA		**0.41**		NA		NA		NA		**0.39**		NA		NA		NA		NA	
60	**TPH-D Motor Oil**		0.50	U	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																														

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

	B	BG	BH
1			
2			
3		J2	
4		0408019-05	
5		8/03/04	
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	2.01	U
20	4-Methylphenol	10.1	U
21	Isophorone	1.01	U
22	2,4-Dimethylphenol	3.02	U
23	Benzoic Acid	20.1	U
24	Naphthalene	1.01	U
25	2-Methylnaphthalene	1.01	U
26	2,4,6-Trichlorophenol	5.04	U
27	2,4,5-Trichlorophenol	5.04	U
28	Acenaphthene	1.01	U
29	Dibenzofuran	1.01	U
30	Fluorene	1.01	U
31	Pentachlorophenol	5.04	U
32	bis(2-Ethylhexyl)phthalate	1.01	U
33			
34	**VOLATILES (µg/L)**		
35	**EPA Method SW8260**		
36	Acetone	50	U
37	Carbon Disulfide	2	U
38	2-Butanone	10	U
39	Benzene	0.3	U
40	Bromoform	1	U
41	Toluene	1	U
42	Ethylbenzene	1	U
43	Styrene	1	U
44	m,p-Xylene	2	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	1	U
55	Methyl tert-butyl ether	1	U
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			

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	AC
1																													
2																													
3			J2		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		CB49H
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		8/29/00
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**		**0.004**
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	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	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	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	U	0.01
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**		0.006
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		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		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		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		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**350**		**360**	J2	**170**		**380**		NA		NA		NA		**350**		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		1.0	U	NA		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		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**		**380**
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**		**4.4**
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		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		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		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		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	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	BF
1																														
2																														
3			J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2	
4			CL03I		CT55E		DE68J		DM52A		DW48D		ED23D		EM85E		ES04E		EZ03L		FF76I		FL58J		FU31B		FY64I		0402105-02	
5			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		2/20/04	
63	**PRIORITY POLLUTANT**																													
64	**METALS (mg/L)**																													
65	Arsenic (7060)		**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**		**0.008**	
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	0.005	U
67	Copper (6010)	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**		0.01	U
68	Lead (7421)	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	U	**0.0002**	
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	0.005	U
70	Zinc (6010)	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**		0.01	U
71																														
72	**MAJOR IONS AND CONVENTIONALS**																													
73	Calcium (mg/L) (6010)		NA		**53.0**		**57.1**		**49.5**		**53.9**		**55.8**		NA		NA		NA		**54.1**		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)		NA		**31.3**		**33.2**		**30.0**		**28.8**		**31.7**		NA		NA		NA		**29.2**		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)		NA		**1.8**		**2.1**		**2.1**		**2.6**		**2.8**		NA		NA		NA		**2.8**		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)		NA		**14.5**		**15.2**		**14.8**		**14.9**		**15.9**		NA		NA		NA		**15**		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		**330**		NA		NA		NA		**370**		NA		NA		NA		**310**		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		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)		NA		**330**		NA		NA		NA		**370**		NA		NA		NA		**310**		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**340**		**370**		**370**		**350**		**350**		**340**		**290**		**330**		**360**		**330**		**320**		**360**		**340**		**329**	
81	Chloride (mg/L) (EPA 325.2)		**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**		**4.42**	
82	N-Nitrate (mg-N/L) (Calculated)		NA		0.010	U	NA		NA		NA		0.010	U	NA		NA		NA		**0.046**		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		0.010	U	NA		NA		NA		**0.013**		NA		NA		NA		**0.012**		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		0.010	U	NA		NA		NA		**0.019**	J	NA		NA		NA		**0.058**		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		**5.6**		NA		NA		NA		**3.5**		NA		NA		NA		**5.9**		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	BG	BH
1			
2			
3		J2	
4		0408019-05	
5		8/03/04	
63	**PRIORITY POLLUTANT**		
64	**METALS (mg/L)**		
65	Arsenic (7060)	**0.0108**	
66	Chromium (6010)	0.005	U
67	Copper (6010)	0.01	U
68	Lead (7421)	**0.000186**	
69	Nickel (6010)	0.005	U
70	Zinc (6010)	**0.021**	
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)	**382**	
81	Chloride (mg/L) (EPA 325.2)	**4.62**	
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	AC
1																													
2																													
3			J2		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		CB49H
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		8/29/00
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		6.71
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		14.7
90	83	Conductivity (um/hos)	721		650		551		646		663		756		399		683		565		587		631		657		637		584
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		1.10
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		NA
96	89	Total TCDF	NA		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		NA
98	91	Total TCDD	NA		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		NA
100	93	2,3,4,7,8-PeCDF	NA		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		NA
102	95	1,2,3,7,8-PeCDD	NA		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		NA
104	97	1,2,3,4,7,8-HxCDF	NA		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		NA
106	99	2,3,4,6,7,8-HxCDF	NA		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		NA
108	101	Total HxCDF	NA		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		NA
110	103	1,2,3,6,7,8-HxCDD	NA		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		NA
112	105	Total HxCDD	NA		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		NA
114	107	1,2,3,4,7,8,9-HpCDF	NA		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		NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		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		NA
118	111	OCDF	NA		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		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	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	BF
1																														
2																														
3			J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2	
4			CL03I		CT55E		DE68J		DM52A		DW48D		ED23D		EM85E		ES04E		EZ03L		FF76I		FL58J		FU31B		FY64I		0402105-02	
5			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		2/20/04	
87	**FIELD PARAMETERS**																													
88	pH (avg)		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		6.67	
89	Temperature (° C) (avg)		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		13.9	
90	Conductivity (um/hos)		578		574		619		594		584		592		467		416		456		654		464		523		457		490	
91	Dissolved oxygen (mg/L) (avg)		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		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																														
122																														

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

	B	BG	BH
1			
2			
3		J2	
4		0408019-05	
5		8/03/04	
87	**FIELD PARAMETERS**		
88	pH (avg)	6.16	
89	Temperature (° C) (avg)	15.8	
90	Conductivity (um/hos)	692	
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	AC
1																													
2																													
3			J2		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		CB49H
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		8/29/00
123		**PAHs (µg/L)**																											
124		**EPA Method SW8270 SIM**																											
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		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	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	BF
1																														
2																														
3			J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2		J2	
4			CL03I		CT55E		DE68J		DM52A		DW48D		ED23D		EM85E		ES04E		EZ03L		FF76I		FL58J		FU31B		FY64I		0402105-02	
5			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		2/20/04	
6																														
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	BG	BH
1			
2			
3		J2	
4		0408019-05	
5		8/03/04	
6			
123	**PAHs (µg/L)**		
124	**EPA Method SW8270 SIM**		
125	Naphthalene	NA	
126	2-Methylnaphthalene	NA	
127	Acenaphthylene	1.01	U
128	Acenaphthene	NA	
129	Fluorene	NA	
130	Anthracene	1.01	U
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			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	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	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
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	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
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	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	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
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	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	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	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	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	5.3	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
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	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	0.25	U	**0.67**		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																											

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		LW1D		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		FY64K	
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	**0.26**		**0.26**		0.25	U	0.27	U	0.25	U	0.25	U	0.25	U	0.6	U	0.5	U
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	2.1	U	2	U	2	U	2	U	2.4	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	U	1	U	1	U	1.2	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	U	1	U	1	U	1.2	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	U	3	U	3	U	3.6	U	3	U
23	Benzoic Acid	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	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	U	1	U	1	U	1.2	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	U	1	U	1	U	1.2	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	U	5	U	5	U	6	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	U	5	U	5	U	6	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	U	1	U	1	U	1.2	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	U	1	U	1	U	1.2	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	U	1	U	1	U	1.2	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	U	5	U	5	U	6	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	4.0	U	4.0	U	4.3	U	4	U	1	U	1	U	1.2	U	1	U
33																													
34	**VOLATILES (µg/L)**																												
35	**EPA Method SW8260**																												
36	Acetone	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	**5.1**	
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	1.0	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
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	1.0	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
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	1.0	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
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	1.0	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
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	1.0	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
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	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	U	1	U	1	U	1	U	1	U	1	U
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	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	U	1	U	1	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	U	1	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	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**	0.25	U	0.25	U	**0.27**		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		NA	
62																													

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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			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	
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**	
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	U
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	U
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	U
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	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		LW1D		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		FY64K	
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	
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**		**0.006**	
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**	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**		**0.005**	
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	**0.036**	
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	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**		**0.019**	
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		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		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		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		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		**300**		NA		NA		NA		**280**		NA		NA		NA		**270**		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		**300**		NA		NA		NA		**280**		NA		NA		NA		**270**		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**380**		**360**		**380**		**360**		**360**		**320**		**320**		**300**		**340**		**320**		**280**		**300**		**320**		**330**	
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**		**2.9**	
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		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		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		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		**11**		NA		NA		NA		**6.1**		NA		NA		NA		**4.6**		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			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	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		LW1D		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		FY64K	
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)	6.55		5.47		6.64		6.96		7.11		6.86		6.36		6.86		6.96		7.03		7.12		7.31		7.05		7.07	
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		17.1	
90	Conductivity (um/hos)	553		481		476		484		503		467		445		451		389		495		508		411		388		381	
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		2.51	
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			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	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		LW1D		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		FY64K	
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	
6																													
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	AC
1																													
2																													
3			LW3D		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		CB49E
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		8/29/00
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	UJ	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	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	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	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	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	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	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	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	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	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	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	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	**1.2**		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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	U	5.0	U	5.0
55		Methyl tert-butyl ether	NA		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	**0.38**		**0.32**		0.25
60	53	**TPH-D Motor Oil**	NA		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		NA
62	55																												

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

	B	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			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D
4			CK77G		CT55C		DE68H		DM52C		DW48A		ED34F		EM85A		ES04B		EZ03A		FF88B		FL66J		FU50A		FY82I		0402113-10
5			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		10/24/03		2/23/04
6																													
7	**CHLORINATED PHENOLS (µg/L)**																												
8	**EPA Method SW8040**																												
9	Pentachlorophenol	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	**0.62**		0.489
10	2,4,6-Trichlorophenol	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
11	2,3,6-Trichlorophenol	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
12	2,4,5-Trichlorophenol	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
13	2,3,4-Trichlorophenol	U	0.25	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	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
15	2,3,4,5-Tetrachlorophenol	U	0.25	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	2.0	U	2.3	U	2.2	U	2	U	2	U	2.2	U	2.2	U	1.97
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	1.2	U	1.1	U	1	U	1	U	1.1	U	1.1	U	9.85
21	Isophorone	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U	1.1	U	0.985
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	3.5	U	3.3	U	3	U	3	U	3.3	U	3.3	U	2.96
23	Benzoic Acid	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	11	U	19.7
24	Naphthalene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U	1.1	U	0.985
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	1.2	U	1.1	U	1	U	1	U	1.1	U	1.1	U	0.985
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	5.8	U	5.4	U	5	U	5	U	5.5	U	5.5	U	4.93
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	5.8	U	5.4	U	5	U	5	U	5.5	U	5.5	U	4.93
28	Acenaphthene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U	1.1	U	0.985
29	Dibenzofuran	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U	1.1	U	0.985
30	Fluorene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.2	U	1.1	U	1	U	1	U	1.1	U	1.1	U	0.985
31	Pentachlorophenol	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	5.5	U	4.93
32	bis(2-Ethylhexyl)phthalate	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	1.1	U	0.985
33																													
34	**VOLATILES (µg/L)**																												
35	**EPA Method SW8260**																												
36	Acetone	U	**15**			R	**23**		**38**		**80**		**10**		**50**		**13**		5	U	**12**		**24**		**17**		**64**		50
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	U	1	U	1	U	1	U	1	U	1	U	2
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	U	5	U	5	U	5	U	5	U	5	U	10
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	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	1.0	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	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U	1
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	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	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U	1
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	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	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U	1
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	U	1	U	1	U	1	U	1	U	1	U	1
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	U	1	U	1	U	1	U	1	U	1	U	1
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	U	1	U	1	U	1	U	1	U	1	U	1
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	U	1	U	1	U	1	U	1	U	1	U	1
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	U	1	U	1	U	1	U	1	U	1	U	1
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	U	1	U	1	U	1	U	1	U	1	U	1
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	U	1	U	1	U	1	U	1	U	1	U	1
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	U	1	U	1	U	1	U	1	U	1	U	1
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	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		NA		1
56																													
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																												
58	**Method OR-DEQ**																												
59	**TPH-Diesel**	U	0.25	U	**0.28**		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																													

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

	B	BF	BG	BH
1				
2				
3			LW3D	
4			0408044-01	
5			8/06/04	
6				
7	**CHLORINATED PHENOLS (µg/L)**			
8	**EPA Method SW8040**			
9	Pentachlorophenol	U	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	U	2	U
20	4-Methylphenol	U	10	U
21	Isophorone	U	1	U
22	2,4-Dimethylphenol	U	3	U
23	Benzoic Acid	U	20	U
24	Naphthalene	U	1	U
25	2-Methylnaphthalene	U	1	U
26	2,4,6-Trichlorophenol	U	5	U
27	2,4,5-Trichlorophenol	U	5	U
28	Acenaphthene	U	1	U
29	Dibenzofuran	U	1	U
30	Fluorene	U	1	U
31	Pentachlorophenol	U	5	U
32	bis(2-Ethylhexyl)phthalate	U	1	U
33				
34	**VOLATILES (µg/L)**			
35	**EPA Method SW8260**			
36	Acetone	U	50	U
37	Carbon Disulfide	U	2	U
38	2-Butanone	U	10	U
39	Benzene	U	0.3	U
40	Bromoform	U	1	U
41	Toluene	U	1	U
42	Ethylbenzene	U	1	U
43	Styrene	U	1	U
44	m,p-Xylene	U	2	U
45	o-Xylene	U	1	U
46	1,3,5-Trimethylbenzene	U	1	U
47	1,2,4-Trimethylbenzene	U	1	U
48	Isopropylbenzene	U	1	U
49	n-Propylbenzene	U	1	U
50	tert-Butylbenzene	U	1	U
51	sec-Butylbenzene	U	1	U
52	4-Isopropyltoluene	U	1	U
53	n-Butylbenzene	U	1	U
54	Naphthalene	U	1	U
55	Methyl tert-butyl ether	U	1	U
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				

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	AC
1																													
2																													
3			LW3D		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		CB49E
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		8/29/00
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**		**0.017**
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	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	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	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	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	U	**0.015**
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		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		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		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		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**370**		**340**	J2	**340**		**360**		NA		NA		NA		**350**		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		1.0	U	NA		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		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**		**410**
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**		**3.5**
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		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		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		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		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	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			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D
4			CK77G		CT55C		DE68H		DM52C		DW48A		ED34F		EM85A		ES04B		EZ03A		FF88B		FL66J		FU50A		FY82I		0402113-10
5			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		10/24/03		2/23/04
63	**PRIORITY POLLUTANT**																												
64	**METALS (mg/L)**																												
65	Arsenic (7060)		**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**		**0.018**		**0.014**
66	Chromium (6010)	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	**0.006**		**0.006**
67	Copper (6010)	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**		**0.004**		0.01
68	Lead (7421)	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	**0.001**		**0.0006**
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	0.005
70	Zinc (6010)		**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**		**0.013**		0.01
71																													
72	**MAJOR IONS AND CONVENTIONALS**																												
73	Calcium (mg/L) (6010)		NA		**61.4**		**62.1**		**55.1**		**57.3**		**60.9**		NA		NA		NA		**57.8**		NA		NA		NA		NA
74	Magnesium (mg/L) (6010)		NA		**27.5**		**28.4**		**25.4**		**26.3**		**27.6**		NA		NA		NA		**27.7**		NA		NA		NA		NA
75	Potassium (mg/L) (6010)		NA		**3.2**		**3.5**		**3.4**		**3.2**		**3.9**		NA		NA		NA		**3.6**		NA		NA		NA		NA
76	Sodium (mg/L) (6010)		NA		**13.4**		**13.4**		**12.6**		**13.2**		**14.5**		NA		NA		NA		**13.7**		NA		NA		NA		NA
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		**330**		NA		NA		NA		**350**		NA		NA		NA		**310**		NA		NA		NA		NA
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		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)		NA		**330**		NA		NA		NA		**350**		NA		NA		NA		**310**		NA		NA		NA		NA
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**350**		**360**		**370**		**310**		**330**		**390**		**310**		**380**		**380**		**350**		**330**		**330**		**290**		**350**
81	Chloride (mg/L) (EPA 325.2)		**6.9**		**3.3**		**6.2**		**4.5**		**3.4**		**3.7**		**3.4**		**3.4**		**3.5**		**4.7**		**3.3**		**2.6**		**3.6**		**3.97**
82	N-Nitrate (mg-N/L) (Calculated)		NA		**0.012**		NA		NA		NA		NA		NA		NA		NA		**0.031**		NA		NA		NA		NA
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		0.010	U	NA		NA		NA		NA		NA		NA		NA		**0.032**		NA		NA		NA		NA
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		**0.012**		NA		NA		NA		NA		NA		NA		NA		**0.063**		NA		NA		NA		NA
85	Sulfate (mg/L) (EPA 375.2)		NA		**6.5**		NA		NA		NA		**5.5**		NA		NA		NA		**4.1**		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	BF	BG	BH
1				
2				
3			LW3D	
4			0408044-01	
5			8/06/04	
63	**PRIORITY POLLUTANT**			
64	**METALS (mg/L)**			
65	Arsenic (7060)		**0.014**	
66	Chromium (6010)		0.005	U
67	Copper (6010)	U	0.01	U
68	Lead (7421)		**0.000392**	
69	Nickel (6010)	U	0.005	U
70	Zinc (6010)	U	0.01	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)		**359**	
81	Chloride (mg/L) (EPA 325.2)		0.5	U
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	AC
1																													
2																													
3			LW3D		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		CB49E
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		8/29/00
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		5.92
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		14.0
90	83	Conductivity (um/hos)	706		646		627		668		504		673		159		695		635		588		657		667		627		629
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		1.04
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		NA
96	89	Total TCDF	NA		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		NA
98	91	Total TCDD	NA		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		NA
100	93	2,3,4,7,8-PeCDF	NA		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		NA
102	95	1,2,3,7,8-PeCDD	NA		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		NA
104	97	1,2,3,4,7,8-HxCDF	NA		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		NA
106	99	2,3,4,6,7,8-HxCDF	NA		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		NA
108	101	Total HxCDF	NA		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		NA
110	103	1,2,3,6,7,8-HxCDD	NA		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		NA
112	105	Total HxCDD	NA		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		NA
114	107	1,2,3,4,7,8,9-HpCDF	NA		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		NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		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		NA
118	111	OCDF	NA		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		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	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			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D
4			CK77G		CT55C		DE68H		DM52C		DW48A		ED34F		EM85A		ES04B		EZ03A		FF88B		FL66J		FU50A		FY82I		0402113-10
5			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		10/24/03		2/23/04
87	**FIELD PARAMETERS**																												
88	pH (avg)		5.58		6.29		6.56		6.54		6.47		6.50		6.30		6.45		6.39		6.8		6.87		6.52		6.33		6.45
89	Temperature (° C) (avg)		12.7		12.4		13.6		14.4		12.7		12.5		14.4		15.2		13.3		13.1		14.5		15.1		13.0		14.2
90	Conductivity (um/hos)		624		638		655		628		628		617		629		595		664		826		534		525		543		541
91	Dissolved oxygen (mg/L) (avg)		1.28		0.60		0.92		11.14		3.61		7.98		4.43		1.20		1.94		0		4.28		1.13		2.00		0.04
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	BF	BG	BH
1				
2				
3			LW3D	
4			0408044-01	
5			8/06/04	
87	**FIELD PARAMETERS**			
88	pH (avg)		5.93	
89	Temperature (° C) (avg)		14.7	
90	Conductivity (um/hos)		836	
91	Dissolved oxygen (mg/L) (avg)		3.8	
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	AC
1																													
2																													
3			LW3D		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		CB49E
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		8/29/00
6																													
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	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			LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D		LW3D
4			CK77G		CT55C		DE68H		DM52C		DW48A		ED34F		EM85A		ES04B		EZ03A		FF88B		FL66J		FU50A		FY82I		0402113-10
5			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		10/24/03		2/23/04
6																													
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	BF	BG	BH
1				
2				
3			LW3D	
4			0408044-01	
5			8/06/04	
6				
123	**PAHs (µg/L)**			
124	**EPA Method SW8270 SIM**			
125	Naphthalene		NA	
126	2-Methylnaphthalene		NA	
127	Acenaphthylene		1	U
128	Acenaphthene		NA	
129	Fluorene		NA	
130	Anthracene		1	U
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
1																									
2							Dup of LW4D										Dup of LW4D				Dup of LW4D				Dup of LW4D
3			LW4D		LW4D		LW40D		LW4D		LW4D		LW4D (a)		LW4D		LW40D		LW4D		LW40D		LW4D		LW40D
4			S167I		T176M		T176L		U235N		V232F		B802035-02		W391E		W391I		Y314E		Y314B		Z225J		Z225L
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		11/14/98
6																									
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**		**2300**
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	**16**
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	0.47
12	6	2,4,5-Trichlorophenol	11	U	39	U	30	U	76	U	**39**		NA		**90**		**90**		51	U	51	U	60	U	26
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	0.25
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**20**		**880**		**770**		**600**		**940**		**746**		**240**		**250**		**270**		**280**		**210**	J2	**160**
15	9	2,3,4,5-Tetrachlorophenol	**6.1**		**29**		**26**		**19**		**20**		NA		50	U	50	U	**16**		**14**		**8.4**		**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**		**7.6**
20	14	4-Methylphenol	**11**		**33**		**32**		1.0	U	**8.7**		100	U	**16**		**15**		1.0	U	1.0	U	**10**		**9.4**
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	1.0
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	3.0
23	17	Benzoic Acid	**22**		**28**	J2	**47**	J2	10	U	10	U	NA		10	U	10	U	10	U	10	U	10	U	10
24	18	Naphthalene	**35**		**44**		**46**		**36**		**30**		NA		**16**	J2	**21**	J2	**18**	J2	**23**	J2	**28**		**28**
25	19	2-Methylnaphthalene	**52**		**67**		**74**		**45**		**44**		NA		**24**	J2	**32**	J2	**42**		**49**		**57**		**58**
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	**20**
27	21	2,4,5-Trichlorophenol	**14**		**43**		**49**		**69**		**78**		100	U	**57**		**60**		**7.4**		**6.7**		**69**		**66**
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	1.0
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	1.0
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	1.0
31	25	Pentachlorophenol	**390**		**10000**		**12000**		**18000**		**16000**		**13500**		**5300**		**5200**		**3100**		**2900**		**4600**		**3800**
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	1.0
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**		**13**
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	1.0
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	5.0
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	1.0
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	1.0
41	35	Toluene	**10**		**6.4**		**6.3**		**17**		**11**		NA		**5.4**		**5.4**		**10**		**9.6**		**5.7**		**5.0**
42	36	Ethylbenzene	**140**		**190**		**190**		**180**		**130**		NA		**12**		**13**		**100**		**95**		**93**		**80**
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	1.0
44	38	m,p-Xylene	**390**		**580**		**600**		**730**		**500**		NA		**450**		**450**		**320**		**320**		**340**		**300**
45	39	o-Xylene	**77**		**140**		**140**		**150**		**100**		NA		**110**		**110**		**120**		**95**		**94**		**78**
46	40	1,3,5-Trimethylbenzene	**170**		**190**		**180**		**330**		**140**		NA		**160**		**150**		**180**		**170**		**120**		**99**
47	41	1,2,4-Trimethylbenzene	**580**		**630**		720		**1100**	J2	**560**		NA		**480**		**550**		**590**		**570**		**460**	J2	**590**
48	42	Isopropylbenzene	**110**		**120**		**120**		**140**	J2	**81**		NA		**7.5**		**7.4**		**100**		**85**		**54**		**46**
49	43	n-Propylbenzene	**140**		**160**		**150**		**190**		**110**		NA		**7.6**		**7.3**		**120**		**110**		**78**		**65**
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	1.0
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	1.0
52	46	4-Isopropyltoluene	**10**		**15**		**14**		**14**	J2	**10**		NA		**5.4**		**5.4**		**15**		**12**		**8.5**		**6.8**
53	47	n-Butylbenzene	**14**		**20**		**18**		**17**	J2	**13**		NA		4.4	U	4.2	U	**21**	J2	**16**	J2	**12**	J2	**8.9**
54	48	Naphthalene	**54**		**87**		**84**		**92**	J2	**78**		NA		**41**		**41**		**50**		**48**		**28**		**28**
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**	**7.2**		**12**		**12**		**15**		**11**		NA		**7.2**		**6.8**		**6.5**	J2	**8.2**	J2	**4.6**		**4.6**
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																								

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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	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
2					Dup of LW4D						Dup of LW4D				Dup of LW4D											
3			LW4D		LW40D		LW4D		LW4D		LW40D		LW4D		LW40D		LW4D		LW4D		LW4D		LW4D		LW4D	
4			Z960P		Z960K		AH49H		AU45G		AU45I		BC21J		BC27P		BH96E		BR55D		CB68D		CL03G		CT67D	
5			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		2/15/01	
7	**CHLORINATED PHENOLS (µg/L)**																									
8	**EPA Method SW8040**																									
9	Pentachlorophenol		**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	U	0.25	U
10	2,4,6-Trichlorophenol	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	U	NA	
11	2,3,6-Trichlorophenol	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	U	NA	
12	2,4,5-Trichlorophenol	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	U	NA	
13	2,3,4-Trichlorophenol	U	0.25	U	0.25	U	0.25	U	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	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	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	U	NA	
15	2,3,4,5-Tetrachlorophenol		**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	U	NA	
16																										
17	**SEMIVOLATILES (µg/L)**																									
18	**EPA Method SW8270**																									
19	Phenol		**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	U	2.0	U
20	4-Methylphenol		**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	U	1.0	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	1.0	U	1.0	U	1.0	U	1.0	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	3.0	U	3.0	U	3.0	U	3.0	U
23	Benzoic Acid	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	**11**		10	U	10	U
24	Naphthalene		**23**		**25**		1.0	U	**27**	J2	**14**	J2	**19**		**19**		**24**		**10**		**11**		**5.4**		**2.1**	
25	2-Methylnaphthalene		**64**		**65**		1.0	U	**41**	J2	**22**	J2	**30**		**30**		**30**		**18**		**18**		**11**		**11**	
26	2,4,6-Trichlorophenol	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	U	5.0	U
27	2,4,5-Trichlorophenol		**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	U	5.0	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	1.0	U	1.0	U	1.0	U	1.0	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	1.0	U	1.0	U	1.0	U	1.0	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	1.0	U	1.0	U	1.0	U	1.0	U
31	Pentachlorophenol		**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	U	5.0	U
32	bis(2-Ethylhexyl)phthalate	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	U	1.0	U
33																										
34	**VOLATILES (µg/L)**																									
35	**EPA Method SW8260**																									
36	Acetone		**16**		**15**		**16**		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.3	U	25	U	17	U	5.0	U
37	Carbon Disulfide	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	U	1.0	U
38	2-Butanone	U	15	U	**7.4**		**8.2**		**28**		**32**		5.0	U	5.0	U	5.0	U	5.0	U	25	U	**14**		**26**	
39	Benzene	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	U	1.0	U
40	Bromoform	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	U	1.0	U
41	Toluene		**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	U	1.0	U
42	Ethylbenzene		**52**		**62**		**220**		**39**		**38**		**21**		**21**		**18**		**22**		**39**		**1.3**		**1.3**	
43	Styrene	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	U	1.0	U
44	m,p-Xylene		**320**		**320**		**720**		**110**		**110**		**88**		**90**		**76**		**100**		**120**		**3.6**		**3.0**	
45	o-Xylene		**84**		**95**		**130**		**5.4**		**4.5**		**20**		**20**		**8.1**		**11**		**13**		1.0	U	1.0	U
46	1,3,5-Trimethylbenzene		**170**		**140**		**160**		**70**		**70**		**94**		**96**		**90**		**70**		**50**		**12**		**14**	
47	1,2,4-Trimethylbenzene	J2	**550**		**520**		**700**		**320**		**310**		**260**		**280**		**290**		**300**		**270**		**240**		**120**	
48	Isopropylbenzene		**42**		**43**		**92**		**65**		**68**		**40**		**39**		**79**		**54**		**62**		**56**		**58**	
49	n-Propylbenzene		**51**		**54**		**130**		**69**		**71**		**45**		**45**		**87**		**61**		**76**		**60**		**60**	
50	tert-Butylbenzene	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**		**2.8**	
51	sec-Butylbenzene	U	**8.3**		**9.2**		**16**		**14**		**14**		**7.3**		**7.3**		**15**		**9.8**		**11**		**9.1**		**9.8**	
52	4-Isopropyltoluene		**8.3**		**8.1**		**11**		**7.6**		**6.9**		**7.3**		**7.5**		**6.6**		**4.3**		**7.6**		1.0	U	1.0	U
53	n-Butylbenzene	J2	**9.7**		**10**		**16**		12	U	12	U	8.0	U	8.3	U	**14**		9.2	U	9.7	U	**7.0**		**7.8**	
54	Naphthalene		**41**		**44**		**57**		**34**		**33**		**28**		**30**		**50**		**34**		**26**		**12**		**8.9**	
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**		**6.9**		**7.3**		**5.0**		**4.2**	J2	**3.2**	J2	**3.1**		**2.9**		**3.8**		**2.8**		**3.3**		**5.4**		**4.4**	
60	**TPH-D Motor Oil**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.50	U	NA	
61	**TPH-Gasoline**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																										

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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	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV
3		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D	
4		DE87K		DM30D		DW29G		ED30H		EN00H		ER93L		EZ17F		FF65G		FL58E		FU45N		FY82L		0402113-08	
5		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	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	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	2.4	U	2.3	U	2.1	U	2	U	2	U	2	U	1.93	U
20	4-Methylphenol	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	U
21	Isophorone	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	U
22	2,4-Dimethylphenol	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	U
23	Benzoic Acid	10	U	10	U	30	U	50	U	50	U	60	U	57	U	52	U	51	U	51	U	10	U	19.3	U
24	Naphthalene	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	**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	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	U
27	2,4,5-Trichlorophenol	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	U
28	Acenaphthene	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	U
29	Dibenzofuran	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	U
30	Fluorene	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	U
31	Pentachlorophenol	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	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	U
33																									
34	**VOLATILES (µg/L)**																								
35	**EPA Method SW8260**																								
36	Acetone	**22**		**42**		**77**		**14**		20	U	**8.2**		9	U	**96**		**11**	M	**12**	J	**6.6**	M	50	U
37	Carbon Disulfide	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	U
38	2-Butanone	**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	U
39	Benzene	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	U
40	Bromoform	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	U
41	Toluene	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	U
42	Ethylbenzene	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	U
43	Styrene	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	U
44	m,p-Xylene	**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	U
45	o-Xylene	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	U
46	1,3,5-Trimethylbenzene	**13**		**3.4**		**1.4**		**2.4**		**1.1**		1	U	1	U	1	U	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	**84**		**49**		**7.2**		**48**		**9.5**		**15**		1	U	**3**		**5.5**		1	U	**1.4**		1	U
48	Isopropylbenzene	**31**		**14**		**3.9**		**14**		**5.0**		**5.7**		**4.2**		**3.7**		**7**		**2.6**		**1.9**		**2.46**	
49	n-Propylbenzene	**39**		**16**		**5.2**		**14**		**5.1**		**4.9**		**4.2**		**2.9**		**5.3**		**1.6**		**1.6**		**1**	
50	tert-Butylbenzene	**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	U
51	sec-Butylbenzene	**7.4**		**4.1**		**1.6**		**2.8**		**1.7**		**1.8**		**1.3**		1	U	**1.6**		1	U	1	U	1	U
52	4-Isopropyltoluene	**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	U
53	n-Butylbenzene	**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	U
54	Naphthalene	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	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		1	U
56																									
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	**Method OR-DEQ**																								
59	**TPH-Diesel**	**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**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.5	U	0.504	U
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																									

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
1																									
2							Dup of LW4D										Dup of LW4D				Dup of LW4D				Dup of LW4D
3			LW4D		LW4D		LW40D		LW4D		LW4D		LW4D (a)		LW4D		LW40D		LW4D		LW40D		LW4D		LW40D
4			S167I		T176M		T176L		U235N		V232F		B802035-02		W391E		W391I		Y314E		Y314B		Z225J		Z225L
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		11/14/98
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**		**0.030**
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	0.005
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	0.002
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	0.001
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	0.01
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**		**0.006**
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		NA
74	67	Magnesium (mg/L) (6010)	**21.9**		**21.7**		**22.3**		**19.4**		**17.7**		NA		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		NA
76	69	Sodium (mg/L) (6010)	**10.9**		**10.4**		**10.6**		**10.1**		**9.60**		NA		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		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		NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**240**		**200**		**200**		**200**		**140**		NA		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**		**280**
81	74	Chloride (mg/L) (EPA 325.2)	**19**	J	**15**		**15**		**16**		**15**		NA		**13**		**12**		**13**		**12**		**11**		**13**
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		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		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		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		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	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
1																										
2					Dup of LW4D						Dup of LW4D				Dup of LW4D											
3			LW4D		LW40D		LW4D		LW4D		LW40D		LW4D		LW40D		LW4D		LW4D		LW4D		LW4D		LW4D	
4			Z960P		Z960K		AH49H		AU45G		AU45I		BC21J		BC27P		BH96E		BR55D		CB68D		CL03G		CT67D	
5			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		2/15/01	
63	**PRIORITY POLLUTANT**																									
64	**METALS (mg/L)**																									
65	Arsenic (7060)		**0.030**		**0.029**		**0.029**		**0.030**		**0.033**		**0.024**		**0.025**		**0.030**		**0.025**		**0.029**		**0.028**		**0.03**	
66	Chromium (6010)	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	U	0.005	U
67	Copper (6010)	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**		**0.005**	
68	Lead (7421)	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	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**		0.01	U	0.01	U	0.01	U	0.01	U
70	Zinc (6010)		**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**		**0.016**	
71																										
72	**MAJOR IONS AND CONVENTIONALS**																									
73	Calcium (mg/L) (6010)		**50.4**		**51.7**		NA		NA		NA		NA		NA		NA		NA		NA		NA		**71.3**	
74	Magnesium (mg/L) (6010)		**21.6**		**22.0**		NA		NA		NA		NA		NA		NA		NA		NA		NA		**30.1**	
75	Potassium (mg/L) (6010)		**0.7**	J	**0.9**	J	NA		NA		NA		NA		NA		NA		NA		NA		NA		**1.6**	
76	Sodium (mg/L) (6010)		**10.6**		**10.9**		NA		NA		NA		NA		NA		NA		NA		NA		NA		**14.5**	
77	Alkalinity (mg/L CaCO3) (SM 2320)		**210**		**210**		NA		NA		NA		NA		NA		NA		NA		NA		NA		**360**	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		1.0	U	1.0	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		1.0	U
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		**210**		**210**		NA		NA		NA		NA		NA		NA		NA		NA		NA		**360**	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**360**		**320**		**310**		**300**		**270**		**260**		**290**		**270**		**270**		**360**		**370**		**430**	
81	Chloride (mg/L) (EPA 325.2)		**17**		**18**		**12**		**12**		**12**		**13**		**14**		**12**		**12**		**9.8**		**16**		**24**	J
82	N-Nitrate (mg-N/L) (Calculated)		**0.010**		0.010	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U
83	N-Nitrite (mg-N/L) (EPA 354.1)		**0.015**	J	**0.023**	J	NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.037**	J
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		**0.025**	J	**0.018**	J	NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.045**	
85	Sulfate (mg/L) (EPA 375.2)		**6.1**	J	**8.8**	J	NA		NA		NA		NA		NA		NA		NA		NA		NA		**8.6**	
86																										

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

	B	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV
1																									
2																									
3		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D	
4		DE87K		DM30D		DW29G		ED30H		EN00H		ER93L		EZ17F		FF65G		FL58E		FU45N		FY82L		0402113-08	
5		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	
63	**PRIORITY POLLUTANT**																								
64	**METALS (mg/L)**																								
65	Arsenic (7060)	**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**	
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	**0.009**		**0.01**	
67	Copper (6010)	**0.003**		**0.004**		**0.003**		**0.004**		**0.003**		**0.004**		**0.004**		**0.002**		**0.002**		**0.005**		**0.006**		0.01	U
68	Lead (7421)	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)	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	U
70	Zinc (6010)	**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	U
71																									
72	**MAJOR IONS AND CONVENTIONALS**																								
73	Calcium (mg/L) (6010)	**74.5**		**81.3**		**57.1**		**67.1**		**65.9**		NA		NA		**56.5**		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	**31.0**		**35.2**		**25.2**		**31.9**		**29.4**		NA		NA		**25.9**		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	**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**		**16.5**		**16.4**		**15.9**		**18.2**		NA		NA		**16.1**		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		**430**		NA		NA		NA		**330**		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		1.0	U	NA		NA		NA		1	U	NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		**430**		NA		NA		NA		**330**		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**460**	J	**430**	J	**350**		**400**		**360**		**430**		**390**		**360**		**400**		**390**		**340**		**417**	
81	Chloride (mg/L) (EPA 325.2)	**18**		**18**		**12**		**14**	J	**15**		**13**		**15**		**15**		**11**		**7.8**		**11**		**9.75**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		**0.012**		NA		NA		NA		0.01	U	NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	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)	NA		NA		NA		**0.024**		NA		NA		NA		**0.045**		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	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 - 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							Dup of LW4D										Dup of LW4D				Dup of LW4D				Dup of LW4D
3			LW4D		LW4D		LW40D		LW4D		LW4D		LW4D (a)		LW4D		LW40D		LW4D		LW40D		LW4D		LW40D
4			S167I		T176M		T176L		U235N		V232F		B802035-02		W391E		W391I		Y314E		Y314B		Z225J		Z225L
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		11/14/98
6																									
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		6.37
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		13.3
90	83	Conductivity (um/hos)	559		491		490		375		381		381		368		367		557		560		120		120
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		NA		NA		1.74		1.74		1.00		1.00		1.44		1.80
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	NA
96	89	Total TCDF	NA		NA		NA		NA		0.0027	U	NA		NA		NA		0.0049	U	NA		0.0023	U	NA
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		0.0029	U	NA		NA		NA		0.0063	U	NA		0.0045	U	NA
98	91	Total TCDD	NA		NA		NA		NA		0.0029	U	NA		NA		NA		0.0063	U	NA		0.0045	U	NA
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		0.0018	U	NA		NA		NA		0.0035	U	NA		**0.0012**		NA
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	NA
101	94	Total PeCDF	NA		NA		NA		NA		0.0019	U	NA		NA		NA		0.0043	U	NA		**0.0012**		NA
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	NA
103	96	Total PeCDD	NA		NA		NA		NA		0.0052	U	NA		NA		NA		**0.019**		NA		0.0072	U	NA
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	NA
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	NA
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	NA
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	NA
108	101	Total HxCDF	NA		NA		NA		NA		0.0110	U	NA		NA		NA		**0.210**		NA		0.0041	U	NA
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	NA
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	NA
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	NA
112	105	Total HxCDD	NA		NA		NA		NA		0.0036	U	NA		NA		NA		**0.043**		NA		0.0046	U	NA
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	NA
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	NA
115	108	Total HpCDF	NA		NA		NA		NA		0.0220	U	NA		NA		NA		**0.022**		NA		0.0030	U	NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		**0.0240**		NA		NA		NA		**0.031**		NA		**0.0095**		NA
117	110	Total HpCDD	NA		NA		NA		NA		**0.0400**		NA		NA		NA		**0.045**		NA		**0.0160**		NA
118	111	OCDF	NA		NA		NA		NA		**0.0140**		NA		NA		NA		**0.032**		NA		**0.0088**		NA
119	112	OCDD	NA		NA		NA		NA		**0.1500**		NA		NA		NA		**0.300**		NA		**0.0720**		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	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
1																										
2					Dup of LW4D						Dup of LW4D				Dup of LW4D											
3			LW4D		LW40D		LW4D		LW4D		LW40D		LW4D		LW40D		LW4D		LW4D		LW4D		LW4D		LW4D	
4			Z960P		Z960K		AH49H		AU45G		AU45I		BC21J		BC27P		BH96E		BR55D		CB68D		CL03G		CT67D	
5			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		2/15/01	
87	**FIELD PARAMETERS**																									
88	pH (avg)		6.86		6.85		5.88		5.99		6.60		6.68		6.65		6.72		6.66		6.02		5.96		6.49	
89	Temperature (° C) (avg)		13.3		13.2		14.7		18.8		16.3		12.8		12.9		16.4		16.5		14.4		13.3		13.8	
90	Conductivity (um/hos)		500		500		462		491		359		436		424		548		437		526		656		673	
91	Dissolved oxygen (mg/L) (avg)		2.39		2.57		2.40		1.35		1.42		1.76		1.86		0.12		1.00		1.39		0.31		0.19	
92																										
93	**DIOXINS AND FURANS (ng/L)**																									
94	**Method 8290**																									
95	2,3,7,8-TCDF		0.0017	U	NA		0.0011	U	0.0018	U	NA		0.00068	U	NA		0.0034	U	NA		NA		NA		NA	
96	Total TCDF		0.0017	U	NA		0.0011	U	0.0018	U	NA		0.00068	U	NA		0.0034	U	NA		NA		NA		NA	
97	2,3,7,8-TCDD		0.0043	U	NA		0.0016	U	0.0031	U	NA		0.00130	U	NA		0.0058	U	NA		NA		NA		NA	
98	Total TCDD		0.0043	U	NA		0.0016	U	0.0031	U	NA		0.00130	U	NA		0.0058	U	NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF		0.0028	U	NA		0.0021	U	0.0031	U	NA		0.00120	U	NA		0.0025	U	NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF		0.0036	U	NA		0.0027	U	0.0032	U	NA		0.00088	U	NA		0.0033	U	NA		NA		NA		NA	
101	Total PeCDF		0.0032	U	NA		0.0024	U	0.0032	U	NA		0.00110	U	NA		0.0029	U	NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD		0.0046	U	NA		0.0023	U	0.0048	U	NA		0.00094	U	NA		0.0051	U	NA		NA		NA		NA	
103	Total PeCDD		0.0046	U	NA		0.0023	U	0.0048	U	NA		0.00094	U	NA		0.0051	U	NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF		**0.0013**		NA		0.0035	U	0.0024	U	NA		0.00150	U	NA		0.0031	U	NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF		0.0024	U	NA		**0.0014**		0.0019	U	NA		0.00150	U	NA		0.0029	U	NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF		0.0036	U	NA		**0.0032**		**0.0024**		NA		0.0025	U	NA		0.0034	U	NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF		0.0044	U	NA		0.0039	U	0.0021	U	NA		0.00170	U	NA		0.0036	U	NA		NA		NA		NA	
108	Total HxCDF		**0.0013**		NA		**0.0046**		**0.0024**		NA		0.0025	U	NA		0.0033	U	NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD		0.0054	U	NA		0.0051	U	0.0039	U	NA		0.00150	U	NA		0.0050	U	NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD		0.0037	U	NA		0.0052	U	0.0035	U	NA		0.00170	U	NA		0.0037	U	NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD		0.0036	U	NA		0.0039	U	0.0025	U	NA		0.00150	U	NA		0.0034	U	NA		NA		NA		NA	
112	Total HxCDD		0.0042	U	NA		0.0047	U	0.0033	U	NA		0.00160	U	NA		0.0040	U	NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF		0.0026	U	NA		0.0039	U	0.0022	U	NA		0.0015	U	NA		0.0024	U	NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF		0.0045	U	NA		**0.0036**	U	0.0060	U	NA		0.00200	U	NA		0.0065	U	NA		NA		NA		NA	
115	Total HpCDF		0.0036	U	NA		**0.0051**		0.0041	U	NA		**0.0036**	J1	NA		0.0044	U	NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD		**0.0055**		NA		**0.0110**		**0.0044**		NA		**0.0090**	J1	NA		0.0059	U	NA		NA		NA		NA	
117	Total HpCDD		**0.0055**		NA		**0.0160**		**0.0044**		NA		**0.0160**	J1	NA		0.0040	U	NA		NA		NA		NA	
118	OCDF		**0.0100**		NA		**0.0100**		0.0042	U	NA		**0.0058**	J1	NA		0.0048	U	NA		NA		NA		NA	
119	OCDD		0.0420	U	NA		**0.0770**		**0.0440**		NA		0.0660	U	NA		**0.044**	J1	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	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV
1																									
2																									
3		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D	
4		DE87K		DM30D		DW29G		ED30H		EN00H		ER93L		EZ17F		FF65G		FL58E		FU45N		FY82L		0402113-08	
5		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)	6.91		6.94		6.61		6.48		6.65		7.04		6.31		7		6.97		7		6.79		6.49	
89	Temperature (° C) (avg)	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)	778		757		592		705		624		613		564		704		599		526		523		482	
91	Dissolved oxygen (mg/L) (avg)	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	
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

	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							Dup of LW4D										Dup of LW4D				Dup of LW4D				Dup of LW4D
3			LW4D		LW4D		LW40D		LW4D		LW4D		LW4D (a)		LW4D		LW40D		LW4D		LW40D		LW4D		LW40D
4			S167I		T176M		T176L		U235N		V232F		B802035-02		W391E		W391I		Y314E		Y314B		Z225J		Z225L
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		11/14/98
6																									
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	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
1																										
2					Dup of LW4D						Dup of LW4D				Dup of LW4D											
3			LW4D		LW40D		LW4D		LW4D		LW40D		LW4D		LW40D		LW4D		LW4D		LW4D		LW4D		LW4D	
4			Z960P		Z960K		AH49H		AU45G		AU45I		BC21J		BC27P		BH96E		BR55D		CB68D		CL03G		CT67D	
5			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		2/15/01	
123	**PAHs (µg/L)**																									
124	**EPA Method SW8270 SIM**																									
125	Naphthalene		**22**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
126	2-Methylnaphthalene		**60**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	Acenaphthylene		0.10	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
128	Acenaphthene		**0.44**	M	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
129	Fluorene		0.10	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
130	Anthracene		0.10	U	NA		NA		NA		NA				NA		NA		NA		NA		NA		NA	
131	Dibenzofuran		**0.34**	M	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	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV
1																									
2																									
3		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D		LW4D	
4		DE87K		DM30D		DW29G		ED30H		EN00H		ER93L		EZ17F		FF65G		FL58E		FU45N		FY82L		0402113-08	
5		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	
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	AA	AB
1																												
2																												
3			LW6D		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		BR64J	
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		5/24/00	
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	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**	
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	**1.1**	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**		1.0	U
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	30	Acetone	5.0	U	5.0	U	**5.1**		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	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	**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	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	**41**		**61**		**78**	J2	**76**		**56**		**96**		**93**		**32**		**31**		**52**		**43**		**68**		**24**	
49	43	n-Propylbenzene	**14**		**28**		**40**		**36**		**20**		**44**		**32**		**8.9**		**9.3**		**14**		**7.7**		**10**		**4.4**	
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**		**2.3**	
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**		**4.4**	
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	**1.6**		**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**		**1.7**	M
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**	**1.0**		**1.0**		**1.2**		**0.80**		**0.86**		**1.3**		**1.0**		**0.62**		**0.92**		**1.4**		**1.0**		**1.0**		**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																											

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		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4		CB85E		CL03C		CT55B		DE87G		DM30B		DW29H		ED23H		EM85I		ER93C		EZ03E		FF76F		FL66E		FU45R		FY82O	
5		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		8/28/03		10/24/03	
7	**CHLORINATED PHENOLS (µg/L)**																												
8	**EPA Method SW8040**																												
9	Pentachlorophenol	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**		**0.6**	J	**1.1**	
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	
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	2.4	U	2.2	U	2	U	2	U	2.1	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	1.2	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	1.2	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	3.6	U	3.3	U	3	U	3	U	3.1	U	3.1	U
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U	60	U	54	U	50	U	50	U	52	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	1.2	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	1.2	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	6	U	5.4	U	5	U	5	U	5.2	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	6	U	5.4	U	5	U	5	U	5.2	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	1.2	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	1.2	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	1.2	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	6	U	5.4	U	5	U	5	U	5.2	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	4.0	U	4.0	U	4.8	U	4.3	U	**13**		1	U	1	U	1	U
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	**6.8**		5	U	**16**		5	U	**9.6**		**6.2**	J	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	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	1.0	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
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	1.0	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
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	1.0	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
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	1.0	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
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	**16**		**24**		**14**		**10**		**8.8**		**2.6**		**7.0**		**2.6**		**7.5**		**3.4**		**4**		**2.7**		**3.5**		**4.2**	
49	n-Propylbenzene	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	1	U	1	U
50	tert-Butylbenzene	**3.5**		**2.8**		**2.8**		**3.4**		**2.8**		**3.1**		**3.1**		**1.8**		**3.4**		**3.2**		**3.1**		**2**		**2.3**		**2.9**	
51	sec-Butylbenzene	**6.0**		**6.4**		**5.3**		**4.7**		**4.3**		**2.4**		**3.4**		**1.7**		**3.3**		**2.2**		**2.5**		**1.8**		**2.1**		**2.1**	
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	U
53	n-Butylbenzene	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	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	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**	**1.2**		**1.2**		**1.8**		**1.4**		**1.7**		**1.8**		**1.9**		**1.6**		**2.6**		**2.2**		**2.3**		**2.2**		**1.9**		**1.1**	
60	**TPH-D Motor Oil**	NA		NA		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		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	BE	BF	BG	BH	BI	BJ
1							
2							
3		LW6D		LW6D		LW6D	
4		0402105-05		0406039-01		0408044-07	
5		2/20/04		6/7/04		8/06/04	
6							
7	**CHLORINATED PHENOLS (µg/L)**						
8	**EPA Method SW8040**						
9	Pentachlorophenol	0.483	U	0.498	U	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	1.92	U	2	U	2	U
20	4-Methylphenol	9.61	U	9.98	U	10	U
21	Isophorone	0.961	U	0.998	U	1	U
22	2,4-Dimethylphenol	2.88	U	2.99	U	3	U
23	Benzoic Acid	19.2	U	20	U	20	U
24	Naphthalene	0.961	U	0.998	U	1	U
25	2-Methylnaphthalene	0.961	U	0.998	U	1	U
26	2,4,6-Trichlorophenol	4.8	U	4.99	U	5	U
27	2,4,5-Trichlorophenol	4.8	U	4.99	U	5	U
28	Acenaphthene	0.961	U	0.998	U	1	U
29	Dibenzofuran	0.961	U	0.998	U	1	U
30	Fluorene	0.961	U	0.998	U	1	U
31	Pentachlorophenol	4.8	U	4.99	U	5	U
32	bis(2-Ethylhexyl)phthalate	0.961	U	0.998	U	1	U
33							
34	**VOLATILES (µg/L)**						
35	**EPA Method SW8260**						
36	Acetone	50	U	50	U	50	U
37	Carbon Disulfide	2	U	2	U	2	U
38	2-Butanone	10	U	10	U	10	U
39	Benzene	0.4	U	0.3	U	0.3	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	2	U	2	U	2	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	**3.43**		**2.05**		**2.11**	
49	n-Propylbenzene	1	U	1	U	1	U
50	tert-Butylbenzene	1	U	**1.76**		**2.09**	
51	sec-Butylbenzene	**1.27**		1	U	**1.29**	
52	4-Isopropyltoluene	1	U	1	U	1	U
53	n-Butylbenzene	1	U	1	U	1	U
54	Naphthalene	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**	**1.36**	J	**1.9**		**2.05**	
60	**TPH-D Motor Oil**	0.491	UJ	0.51	U	0.474	U
61	**TPH-Gasoline**	NA		NA		NA	
62							

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			LW6D		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		BR64J	
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		5/24/00	
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**		**0.012**	
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	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	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	**0.001**	
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	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**		0.006	U
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		NA	
74	67	Magnesium (mg/L) (6010)	**19.9**		**19**		**20.3**		**16.3**		NA		NA		NA		**17.6**		NA		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		NA	
76	69	Sodium (mg/L) (6010)	**15.6**		**13.9**		**14.1**		**12.1**		NA		NA		NA		**11.6**		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**250**		**190**		**210**		**200**		NA		NA		NA		**210**		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)	**250**		**190**		**210**		**200**		NA		NA		NA		**210**		NA		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**		**230**	
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**		**2.1**	
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		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		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		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		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
3		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4		CB85E		CL03C		CT55B		DE87G		DM30B		DW29H		ED23H		EM85I		ER93C		EZ03E		FF76F		FL66E		FU45R		FY82O	
5		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		8/28/03		10/24/03	
63	**PRIORITY POLLUTANT**																												
64	**METALS (mg/L)**																												
65	Arsenic (7060)	**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**		**0.014**		**0.016**	
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	**0.008**	
67	Copper (6010)	**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	**0.004**		**0.005**	
68	Lead (7421)	**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**		0.001	U	**0.003**	
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	U
70	Zinc (6010)	**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**		**0.007**		**0.013**	
71																													
72	**MAJOR IONS AND CONVENTIONALS**																												
73	Calcium (mg/L) (6010)	NA		NA		**40.8**		**44.2**		**40.8**		**40.9**		**42.5**		NA		NA		NA		**39.5**		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		**16.1**		**18.4**		**16.8**		**16.5**		**17.6**		NA		NA		NA		**16.7**		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		**2.1**		**3.2**		**2.6**		**2.0**		**2.7**		NA		NA		NA		**1.9**		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		**10.3**		**11.5**		**10.4**		**10.3**		**11.1**		NA		NA		NA		**9.6**		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		**200**		NA		NA		NA		**220**		NA		NA		NA		**300**		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		**200**		NA		NA		NA		**220**		NA		NA		NA		**300**		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**240**		**220**		**290**	J	**240**	J	**220**	J	**250**		**260**		**240**		**270**		**310**		**280**		**260**		**290**		**250**	
81	Chloride (mg/L) (EPA 325.2)	**1.4**		**2.2**		**1.8**		**2.2**		**3.8**		**2.1**		**2.8**		**2.5**		**2.2**		**2.8**		**4.2**		**1.8**		**1.6**		**2.9**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		0.010	U	NA		NA		NA		**0.010**		NA		NA		NA		**0.048**		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		0.010	U	NA		NA		NA		**0.023**		NA		NA		NA		**0.015**		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		0.010	U	NA		NA		NA		**0.033**	J	NA		NA		NA		**0.063**		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		**3.3**		NA		NA		NA		2.5	U	NA		NA		NA		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

	B	BE	BF	BG	BH	BI	BJ
1							
2							
3		LW6D		LW6D		LW6D	
4		0402105-05		0406039-01		0408044-07	
5		2/20/04		6/7/04		8/06/04	
63	**PRIORITY POLLUTANT**						
64	**METALS (mg/L)**						
65	Arsenic (7060)	**0.015**		**0.013**		**0.0153**	
66	Chromium (6010)	**0.0101**		**0.0208**		**0.0187**	
67	Copper (6010)	0.01	U	0.01	U	0.01	U
68	Lead (7421)	**0.0009**		**0.0002**		**0.000252**	
69	Nickel (6010)	0.005	U	0.005	U	0.005	U
70	Zinc (6010)	0.01	U	0.01	U	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)	**269**		**325**		**259**	
81	Chloride (mg/L) (EPA 325.2)	**3.04**		**2.91**		**2.57**	
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 - 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			LW6D		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		BR64J	
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		5/24/00	
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		6.42	
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		17.1	
90	83	Conductivity (um/hos)	504		501		377		431		369		559		134		448		360		398		409		420		421	
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		0.48	
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		NA	
96	89	Total TCDF	NA		0.0011-0.0028	U	NA		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		NA	
98	91	Total TCDD	NA		0.0011-0.0029	U	NA		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		NA	
100	93	2,3,4,7,8-PeCDF	NA		0.0029	U	NA		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		NA	
102	95	1,2,3,7,8-PeCDD	NA		0.0052	U	NA		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		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		0.0030	U	NA		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		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		0.0041	U	NA		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		NA	
108	101	Total HxCDF	NA		0.0041	U	NA		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		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		0.0076	U	NA		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		NA	
112	105	Total HxCDD	NA		0.0024-0.0089	U	NA		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		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		NA	
115	108	Total HpCDF	NA		0.0017-0.0069	U	NA		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		NA	
117	110	Total HpCDD	NA		**0.0360**		NA		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		NA	
119	112	OCDD	NA		**0.2400**		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
3		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4		CB85E		CL03C		CT55B		DE87G		DM30B		DW29H		ED23H		EM85I		ER93C		EZ03E		FF76F		FL66E		FU45R		FY82O	
5		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		8/28/03		10/24/03	
87	**FIELD PARAMETERS**																												
88	pH (avg)	5.85		5.73		6.32		6.58		6.72		6.58		6.54		6.41		6.58		6.73		6.96		6.81		6.87		6.57	
89	Temperature (° C) (avg)	15.1		13.8		16.6		14.1		15.7		13.4		15.7		16.6		17.3		13.7		14.5		14.5		16.3		14.7	
90	Conductivity (um/hos)	398		360		408		428		413		410		381		331		373		499		494		354		364		375	
91	Dissolved oxygen (mg/L) (avg)	1.36		1.20		2.16		2.06		1.50		3.91		7.27		3.07		1.39		1.14		1.68		2.47		2.1		2.86	
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	BE	BF	BG	BH	BI	BJ
1							
2							
3		LW6D		LW6D		LW6D	
4		0402105-05		0406039-01		0408044-07	
5		2/20/04		6/7/04		8/06/04	
87	**FIELD PARAMETERS**						
88	pH (avg)	6.55		5.37		6.26	
89	Temperature (° C) (avg)	15.5		15.3		15.2	
90	Conductivity (um/hos)	378		311		597	
91	Dissolved oxygen (mg/L) (avg)	2.34		1.62		4.43	
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	AA	AB
1																												
2																												
3			LW6D		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		BR64J	
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		5/24/00	
6																												
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		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D		LW6D	
4		CB85E		CL03C		CT55B		DE87G		DM30B		DW29H		ED23H		EM85I		ER93C		EZ03E		FF76F		FL66E		FU45R		FY82O	
5		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		8/28/03		10/24/03	
6																													
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	BE	BF	BG	BH	BI	BJ
1							
2							
3		LW6D		LW6D		LW6D	
4		0402105-05		0406039-01		0408044-07	
5		2/20/04		6/7/04		8/06/04	
123	**PAHs (µg/L)**						
124	**EPA Method SW8270 SIM**						
125	Naphthalene	NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA	
127	Acenaphthylene	NA		NA		1	U
128	Acenaphthene	NA		NA		NA	
129	Fluorene	NA		NA		NA	
130	Anthracene	NA		NA		1	U
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	AB	AC	AD
1																														
2																														
3			LW9D		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		ER93M	
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		08/27/02	
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	0.28	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		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		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		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		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		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		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	2.2	U
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	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	1.1	U
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.3	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	56	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	1.1	U
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	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	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	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	5.6	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	1.1	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	1.1	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	1.1	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	5.6	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	4.4	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**		5	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	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	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	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	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	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	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	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	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	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	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	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	1	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	1	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	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	1	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	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	1	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	U
55		Methyl tert-butyl ether	NA		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**		0.25	U
60	53	**TPH-D Motor Oil**	NA		NA		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		0.25	U	NA		NA		NA	
62	55																													

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

	B	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
3		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4		EZ03F		FF76K		FL66H		FU45P		FY82M		0402105-08		0406039-02		0408044-05	
5		11/12/02		2/12/03		5/9/03		8/28/03		10/24/03		2/20/04		6/7/04		8/06/04	
7	**CHLORINATED PHENOLS (µg/L)**																
8	**EPA Method SW8040**																
9	Pentachlorophenol	0.25	U	0.26	U	0.25	U	**0.55**	J	0.51	U	0.495	U	0.494	U	0.5	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	2.3	U	2.1	U	2	U	2.1	U	2	U	1.92	U	2.27	U	2	U
20	4-Methylphenol	1.1	U	1	U	1	U	1	U	1	U	9.58	U	11.4	U	10	U
21	Isophorone	1.1	U	1	U	1	U	1	U	1	U	0.958	U	1.14	U	1	U
22	2,4-Dimethylphenol	3.4	U	3.1	U	3	U	3.1	U	3.1	U	2.87	U	3.41	U	3	U
23	Benzoic Acid	57	U	52	U	50	U	52	U	10	U	19.2	U	22.7	U	20	U
24	Naphthalene	1.1	U	1	U	1	U	1	U	1	U	0.958	U	1.14	U	1	U
25	2-Methylnaphthalene	1.1	U	1	U	1	U	1	U	1	U	0.958	U	1.14	U	1	U
26	2,4,6-Trichlorophenol	5.7	U	5.2	U	5	U	5.2	U	5.1	U	4.79	U	5.68	U	5	U
27	2,4,5-Trichlorophenol	5.7	U	5.2	U	5	U	5.2	U	5.1	U	4.79	U	5.68	U	5	U
28	Acenaphthene	1.1	U	1	U	1	U	1	U	1	U	0.958	U	1.14	U	1	U
29	Dibenzofuran	1.1	U	1	U	1	U	1	U	1	U	0.958	U	1.14	U	1	U
30	Fluorene	1.1	U	1	U	1	U	1	U	1	U	0.958	U	1.14	U	1	U
31	Pentachlorophenol	5.7	U	5.2	U	5	U	5.2	U	5.1	U	4.79	U	5.68	U	5	U
32	bis(2-Ethylhexyl)phthalate	4.6	U	1	U	1	U	1	U	1	U	0.958	U	1.14	U	1	U
33																	
34	**VOLATILES (µg/L)**																
35	**EPA Method SW8260**																
36	Acetone	5	U	5	U	5	U	5	U	5	U	50	U	50	U	50	U
37	Carbon Disulfide	1	U	1	U	1	U	1	U	1	U	2	U	2	U	2	U
38	2-Butanone	5	U	5	U	5	U	5	U	5	U	10	U	10	U	10	U
39	Benzene	1	U	1	U	1	U	1	U	1	U	0.4	U	0.3	U	0.3	U
40	Bromoform	1	U	1	U	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	1	U	1	U
42	Ethylbenzene	1	U	1	U	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	1	U	1	U
44	m,p-Xylene	1	U	1	U	1	U	1	U	1	U	2	U	2	U	2	U
45	o-Xylene	1	U	1	U	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	1	U	1	U
47	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	1	U	**3.3**		1	U	**14**		**12**		**4.36**		1	U	**17.6**	
49	n-Propylbenzene	1	U	1		1	U	**7.8**		**5.4**		**1.16**		1	U	**8.72**	
50	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	1	U	1	U	1	U	**1.6**		**1.3**		1	U	1	U	**1.03**	
52	4-Isopropyltoluene	1	U	1	U	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	1	U	1	U
54	Naphthalene	5	U	5	U	5	U	5	U	5	U	1	U	1	U	1	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		1	U	1	U	1	U
56																	
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																
58	**Method OR-DEQ**																
59	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	**0.34**		0.25	U	0.246	UJ	0.246	U	0.254	U
60	**TPH-D Motor Oil**	NA		NA		NA		NA		0.5	U	0.492	UJ	0.492	U	0.508	U
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA	
62																	

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	AC	AD
1																														
2																														
3			LW9D		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		ER93M	
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		08/27/02	
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**		**0.033**	
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	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**		0.002	U
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	**0.002**	
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	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**		**0.012**	
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		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		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		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		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**150**		NA		NA		NA		**180**		NA		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		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**150**		NA		NA		NA		**180**		NA		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**		**190**	
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**		**2.5**	
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		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		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		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		**4.6**		NA		NA		NA		**5.3**		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	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
1																	
2																	
3		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4		EZ03F		FF76K		FL66H		FU45P		FY82M		0402105-08		0406039-02		0408044-05	
5		11/12/02		2/12/03		5/9/03		8/28/03		10/24/03		2/20/04		6/7/04		8/06/04	
63	**PRIORITY POLLUTANT**																
64	**METALS (mg/L)**																
65	Arsenic (7060)	0.05	U	**0.021**		**0.03**		**0.03**		**0.038**		**0.030**		**0.027**		**0.0307**	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U	**0.012**		**0.0101**		**0.0173**		**0.0175**	
67	Copper (6010)	0.002	U	**0.002**		0.002	U	**0.004**		**0.011**		0.01	U	0.01	U	0.01	U
68	Lead (7421)	0.02	U	0.001	U	0.001	U	0.001	U	**0.002**		**0.0007**		**0.0006**		**0.000788**	
69	Nickel (6010)	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.005	U	0.005	U	0.005	U
70	Zinc (6010)	**0.008**		**0.008**		0.006	U	**0.008**		**0.027**		0.01	U	0.01	U	0.01	U
71																	
72	**MAJOR IONS AND CONVENTIONALS**																
73	Calcium (mg/L) (6010)	NA		**34.3**		NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		**11.8**		NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		**1.6**		NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		**5.3**		NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		**130**		NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		1	U	NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		**130**		NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**210**		**250**		**180**		**180**		**160**		**181**		**237**		**163**	
81	Chloride (mg/L) (EPA 325.2)	**2.2**		**1.9**		**2**		1	U	**1.2**		**1.47**		**1.39**		**1.33**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		**0.11**		NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		**0.019**		NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		**0.13**		NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		**16**		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	AC	AD
1																														
2																														
3			LW9D		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		ER93M	
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		08/27/02	
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		6.89	
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		15.6	
90	83	Conductivity (um/hos)	171		160		166		198		198		227		242		259		330		324		345		361		310		249	
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		0.99	
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		NA	
96	89	Total TCDF	NA		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		NA	
98	91	Total TCDD	NA		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		NA	
100	93	2,3,4,7,8-PeCDF	NA		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		NA	
102	95	1,2,3,7,8-PeCDD	NA		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		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		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		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		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		NA	
108	101	Total HxCDF	NA		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		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		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		NA	
112	105	Total HxCDD	NA		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		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		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		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		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		NA	
118	111	OCDF	NA		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		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	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
1																	
2																	
3		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4		EZ03F		FF76K		FL66H		FU45P		FY82M		0402105-08		0406039-02		0408044-05	
5		11/12/02		2/12/03		5/9/03		8/28/03		10/24/03		2/20/04		6/7/04		8/06/04	
87	**FIELD PARAMETERS**																
88	pH (avg)	6.91		7.02		6.83		6.95		6.69		6.64		5.41		6.22	
89	Temperature (° C) (avg)	14.3		14.7		15		16.4		14.9		16.3		15.6		15	
90	Conductivity (um/hos)	314		281		171		205		255		274		125		362	
91	Dissolved oxygen (mg/L) (avg)	1		2.04		4.56		1.03		2.91		1.42		5.05		3.75	
92																	
93	**DIOXINS AND FURANS (ng/L)**																
94	**Method 8290**																
95	2,3,7,8-TCDF	NA		NA		NA		NA		NA		NA		NA		NA	
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 - 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	AC	AD
1																														
2																														
3			LW9D		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		ER93M	
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		08/27/02	
6																														
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	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
1																	
2																	
3		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D		LW9D	
4		EZ03F		FF76K		FL66H		FU45P		FY82M		0402105-08		0406039-02		0408044-05	
5		11/12/02		2/12/03		5/9/03		8/28/03		10/24/03		2/20/04		6/7/04		8/06/04	
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		1	U
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		1	U
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 - 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	AC	AD
1																														
2																														
3			LW10D		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		ER93E	
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		08/27/02	
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	0.27	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		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		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		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		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		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		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	2.2	U	
20	14	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	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	1.1	U	
22	16	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.3	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	54	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	1.1	U	
25	19	2-Methylnaphthalene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	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	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.4	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	5.4	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	1.1	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	1.1	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	1.1	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	5.4	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	4.3	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	5	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	U	
55		Methyl tert-butyl ether	NA		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		NA		
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		
62	55																													

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

	B	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
3		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4		EZ17I		FF76C		FL41N		FU45K		FY82B		0402113-02		0406073-02		0408044-03	
5		11/13/02		2/12/03		5/7/03		8/28/03		10/23/03		2/23/04		6/10/04		8/06/04	
7	**CHLORINATED PHENOLS (µg/L)**																
8	**EPA Method SW8040**																
9	Pentachlorophenol	**0.47**		0.25	U	**0.36**		**4**	J	**0.94**		0.491	U	0.509	U	0.5	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	
17	**SEMIVOLATILES (µg/L)**																
18	**EPA Method SW8270**																
19	Phenol	2.1	U	2	U	2	U	2	U	2	U	2	U	2.14	U	2	U
20	4-Methylphenol	1.1	U	1	U	1	U	1	U	1	U	9.99	U	10.7	U	10	U
21	Isophorone	1.1	U	1	U	1	U	1	U	1	U	0.999	U	1.07	U	1	U
22	2,4-Dimethylphenol	3.2	U	3	U	3	U	3.1	U	3	U	3	U	3.21	U	3	U
23	Benzoic Acid	53	U	50	U	50	U	51	U	10	U	20	U	21.4	U	20	U
24	Naphthalene	1.1	U	1	U	1	U	1	U	1	U	0.999	U	1.07	U	1	U
25	2-Methylnaphthalene	1.1	U	1	U	1	U	1	U	1	U	0.999	U	1.07	U	1	U
26	2,4,6-Trichlorophenol	5.3	U	5	U	5	U	5.1	U	5	U	5	U	5.35	U	5	U
27	2,4,5-Trichlorophenol	5.3	U	5	U	5	U	5.1	U	5	U	5	U	5.35	U	5	U
28	Acenaphthene	1.1	U	1	U	1	U	1	U	1	U	0.999	U	1.07	U	1	U
29	Dibenzofuran	1.1	U	1	U	1	U	1	U	1	U	0.999	U	1.07	U	1	U
30	Fluorene	1.1	U	1	U	1	U	1	U	1	U	0.999	U	1.07	U	1	U
31	Pentachlorophenol	5.3	U	5	U	5	U	5.1	U	5	U	5	U	5.35	U	5	U
32	bis(2-Ethylhexyl)phthalate	4.3	U	1	U	1	U	1	U	1	U	0.999	U	1.07	U	1	U
34	**VOLATILES (µg/L)**																
35	**EPA Method SW8260**																
36	Acetone	5	U	5	U	5	U	5	U	5	U	50	U	50	U	50	U
37	Carbon Disulfide	1	U	1	U	1	U	1	U	1	U	2	U	2	U	2	U
38	2-Butanone	5	U	5	U	5	U	5	U	5	U	10	U	10	U	10	U
39	Benzene	1	U	1	U	1	U	1	U	1	U	0.4	U	0.3	U	0.3	U
40	Bromoform	1	U	1	U	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	1	U	1	U
42	Ethylbenzene	1	U	1	U	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	1	U	1	U
44	m,p-Xylene	1	U	1	U	1	U	1	U	1	U	2	U	2	U	2	U
45	o-Xylene	1	U	1	U	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	1	U	1	U
47	1,2,4-Trimethylbenzene	1	U	1	U	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	1	U	1	U
49	n-Propylbenzene	1	U	1	U	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	1	U	1	U
51	sec-Butylbenzene	1	U	1	U	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	1	U	1	U
53	n-Butylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
54	Naphthalene	5	U	5	U	5	U	5	U	5	U	1	U	1	U	1	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		1	U	1	U	1	U
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	0.247	U	0.238	U	0.245	U
60	**TPH-D Motor Oil**	0.5	U	NA		NA		NA		0.5	U	0.494	U	0.476	U	0.49	U
61	**TPH-Gasoline**	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	AC	AD
1																														
2																														
3			LW10D		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		ER93E	
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		08/27/02	
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**		**0.026**	
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	**0.007**	
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**		**0.009**	
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	**0.004**	
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	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**		**0.018**	
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**		NA	
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**		NA	
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**		NA	
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**		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**110**		NA		NA		NA		**100**		NA		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		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**110**		NA		NA		NA		**100**		NA		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**		**150**	
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**		**2.2**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.012**		NA		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		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		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		**6.2**		NA		NA		NA		**7.5**		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	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
1																	
2																	
3		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4		EZ17I		FF76C		FL41N		FU45K		FY82B		0402113-02		0406073-02		0408044-03	
5		11/13/02		2/12/03		5/7/03		8/28/03		10/23/03		2/23/04		6/10/04		8/06/04	
63	**PRIORITY POLLUTANT**																
64	**METALS (mg/L)**																
65	Arsenic (7060)	0.05	U	**0.011**		**0.008**		**0.026**		**0.024**		**0.023**		**0.019**		**0.0198**	
66	Chromium (6010)	**0.009**		0.005	U	0.005	U	0.005	U	**0.012**		**0.0114**		**0.0156**		**0.0185**	
67	Copper (6010)	**0.012**		**0.004**	J	**0.003**		**0.004**		**0.011**		0.01	U	0.01	U	0.01	U
68	Lead (7421)	0.02	U	0.001	U	**0.001**		0.001	U	**0.003**		**0.0010**		0.0001	U	**0.00123**	
69	Nickel (6010)	**0.01**		0.01	U	0.01	U	0.01	U	0.01	U	0.005	U	0.005	U	0.005	U
70	Zinc (6010)	**0.026**		**0.01**		**0.019**		0.006	U	**0.024**		0.01	U	0.01	U	0.01	U
71																	
72	**MAJOR IONS AND CONVENTIONALS**																
73	Calcium (mg/L) (6010)	NA		**14.1**		NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		**5.88**		NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		**1.2**		NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		**8.5**		NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		**96**		NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		1	U	NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		**96**		NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**170**		**130**		**88**		**120**	J	**120**		**162**		**161**		**113**	
81	Chloride (mg/L) (EPA 325.2)	**2.5**		**1.9**		**1.6**		**1.4**		**1.5**		**1.56**		**1.53**		**1.42**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		**0.025**		NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		0.01	U	NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		**0.025**		NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		**7.4**		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	AC	AD
1																														
2																														
3			LW10D		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		ER93E	
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		08/27/02	
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		6.67	
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		14.3	
90	83	Conductivity (um/hos)	195		233		220		246		255		208		203		204		228		216		216		164		189		180	
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		0.95	
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		NA	
96	89	Total TCDF	NA		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		NA	
98	91	Total TCDD	NA		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		NA	
100	93	2,3,4,7,8-PeCDF	NA		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		NA	
102	95	1,2,3,7,8-PeCDD	NA		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		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		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		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		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		NA	
108	101	Total HxCDF	NA		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		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		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		NA	
112	105	Total HxCDD	NA		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		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		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		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		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		NA	
118	111	OCDF	NA		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		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	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
1																	
2																	
3		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4		EZ17I		FF76C		FL41N		FU45K		FY82B		0402113-02		0406073-02		0408044-03	
5		11/13/02		2/12/03		5/7/03		8/28/03		10/23/03		2/23/04		6/10/04		8/06/04	
87	**FIELD PARAMETERS**																
88	pH (avg)	6.35		7.14		7.18		7.07		6.48		6.47		6.71		6.2	
89	Temperature (° C) (avg)	13.7		13.6		13.4		15.8		17.9		15.7		14.5		14	
90	Conductivity (um/hos)	188		178		93		122		164		151		140		236	
91	Dissolved oxygen (mg/L) (avg)	1.22		1.47		5.73		2.33		5.66		4.49		1.71		4.91	
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 - 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	AC	AD
1																														
2																														
3			LW10D		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		ER93E	
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		08/27/02	
6																														
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	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
1																	
2																	
3		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D		LW10D	
4		EZ17I		FF76C		FL41N		FU45K		FY82B		0402113-02		0406073-02		0408044-03	
5		11/13/02		2/12/03		5/7/03		8/28/03		10/23/03		2/23/04		6/10/04		8/06/04	
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		1	U
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		1	U
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 - 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	AC
1																													
2																													
3			LW11D		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		ES04C
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		08/28/02
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	0.26
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		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		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		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		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		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		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
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	1
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
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	3.1
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	51
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	1
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	1
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	5.1
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	5.1
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
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
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
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	5.1
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	**1.9**		4.0	U	4.0	U	4.1
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**		**27**
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
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	5
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
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
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
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	1
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
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	1
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	1
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	1
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**		1
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	1
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	1
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
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	1
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	1
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	1
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	5
55		Methyl tert-butyl ether	NA		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**		**0.97**
60	53	**TPH-D Motor Oil**	NA		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		NA
62	55																												

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

	B	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR
3			LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4			EZ03B		FF88D		FL66I		FU50B		FY82J		0402113-11		0408044-02	
5			11/12/02		2/13/03		5/9/03		8/29/03		10/24/03		2/23/04		8/06/04	
7	**CHLORINATED PHENOLS (µg/L)**															
8	**EPA Method SW8040**															
9	Pentachlorophenol	U	0.25	U	0.26	U	0.26	U	**5.6**		0.55	U	**1.5**		0.5	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	U	2.2	U	2	U	2	U	2.1	U	2.2	U	1.95	U	2	U
20	4-Methylphenol	U	1.1	U	1	U	1	U	1	U	1.1	U	9.76	U	10	U
21	Isophorone	U	1.1	U	1	U	1	UJ	1	U	1.1	U	0.976	U	1	U
22	2,4-Dimethylphenol	U	3.3	U	3.1	U	3.1	U	3.1	U	3.3	U	2.93	U	3	U
23	Benzoic Acid	U	54	U	51	U	51	U	52	U	11	U	19.5	U	20	U
24	Naphthalene	U	1.1	U	1	U	1	UJ	1	U	1.1	U	0.976	U	1	U
25	2-Methylnaphthalene	U	1.1	U	1	U	1	UJ	1	U	1.1	U	0.976	U	1	U
26	2,4,6-Trichlorophenol	U	5.4	U	5.1	U	5.1	U	5.2	U	5.5	U	4.88	U	5	U
27	2,4,5-Trichlorophenol	U	5.4	U	5.1	U	5.1	U	5.2	U	5.5	U	4.88	U	5	U
28	Acenaphthene	U	1.1	U	1	U	1	UJ	1	U	1.1	U	0.976	U	1	U
29	Dibenzofuran	U	1.1	U	1	U	1	UJ	1	U	1.1	U	0.976	U	1	U
30	Fluorene	U	1.1	U	1	U	1	UJ	1	U	1.1	U	0.976	U	1	U
31	Pentachlorophenol	U	5.4	U	5.1	U	5.1	U	5.2	U	5.5	U	4.88	U	5	U
32	bis(2-Ethylhexyl)phthalate	U	4.3	U	**1.9**		1	UJ	**1.9**		**1.5**		**1.86**		**1.71**	
33																
34	**VOLATILES (µg/L)**															
35	**EPA Method SW8260**															
36	Acetone		**31**		**26**		**140**		**11**		**71**		50	U	50	U
37	Carbon Disulfide	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	10	U	10	U
39	Benzene	U	1	U	1	U	1	U	1	U	1	U	0.4	U	0.3	U
40	Bromoform	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
42	Ethylbenzene	U	1	U	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	1	U
44	m,p-Xylene	U	1	U	1	U	1	U	1	U	1	U	2	U	2	U
45	o-Xylene	U	1	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	1	U
47	1,2,4-Trimethylbenzene	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
49	n-Propylbenzene	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
50	tert-Butylbenzene	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
52	4-Isopropyltoluene	U	1	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	U	1	U	1	U
54	Naphthalene	U	5	U	5	U	5	U	5	U	5	U	1	U	1	U
55	Methyl tert-butyl ether		NA		NA		NA		NA		NA		1	U	1	U
56																
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**															
58	**Method OR-DEQ**															
59	**TPH-Diesel**		**0.8**		**0.74**		**0.91**		**1.1**		**0.66**		**0.562**		**0.79**	
60	**TPH-D Motor Oil**		NA		NA		NA		NA		0.5	U	0.504	U	0.51	U
61	**TPH-Gasoline**		NA		NA		NA		NA		NA		NA		NA	
62																

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	AC
1																													
2																													
3			LW11D		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		ES04C
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		08/28/02
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**		**0.005**
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	**0.02**
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**		**0.02**
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	**0.007**
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	**0.01**
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**		**0.053**
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		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		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		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		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**350**		NA		NA		NA		**370**		NA		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		NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		**350**		NA		NA		NA		**370**		NA		NA
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**420**		**310**		**310**		**290**		**350**		**380**		**380**		**360**		**370**		**300**		**340**		**340**		**410**		**390**
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**		**9.8**
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.024**		NA		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		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		NA
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		**6.3**		NA		NA		NA		**7.6**		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	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR
1																
2																
3			LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4			EZ03B		FF88D		FL66I		FU50B		FY82J		0402113-11		0408044-02	
5			11/12/02		2/13/03		5/9/03		8/29/03		10/24/03		2/23/04		8/06/04	
6																
63	**PRIORITY POLLUTANT**															
64	**METALS (mg/L)**															
65	Arsenic (7060)		0.05	U	**0.008**		**0.007**		**0.005**		**0.005**		**0.007**		**0.00558**	
66	Chromium (6010)		**0.032**		0.005	U	0.005	U	**0.007**		**0.016**		**0.0104**		**0.0176**	
67	Copper (6010)		**0.034**		**0.007**		**0.004**		**0.008**		**0.015**		0.01	U	0.01	U
68	Lead (7421)		0.02	U	**0.002**		**0.002**		**0.002**		**0.004**		**0.0019**		**0.00274**	
69	Nickel (6010)		**0.05**		**0.05**		**0.01**		**0.01**		**0.02**		0.005	U	0.005	U
70	Zinc (6010)		**0.096**		**0.024**		**0.019**		**0.025**		**0.041**		0.01	U	**0.0216**	
71																
72	**MAJOR IONS AND CONVENTIONALS**															
73	Calcium (mg/L) (6010)		NA		**70.4**		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)		NA		**31.7**		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)		NA		**2.6**		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)		NA		**17.5**		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		**310**		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		1	U	NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		**310**		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**470**		**380**		**320**		**260**		**290**		**361**		**303**	
81	Chloride (mg/L) (EPA 325.2)		**7.4**		**7.8**		**6.7**		**4.6**		**5.8**		**6.68**		**4.59**	
82	N-Nitrate (mg-N/L) (Calculated)		NA		**0.02**		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		0.01	U	NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		**0.02**		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		**96**		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	AC
1																													
2																													
3			LW11D		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		ES04C
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		08/28/02
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		6.44
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		15.7
90	83	Conductivity (um/hos)	630		487		617		551		643		523		544		454		493		488		473		576		694		466
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		1.30
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		NA
96	89	Total TCDF	NA		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		NA
98	91	Total TCDD	NA		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		NA
100	93	2,3,4,7,8-PeCDF	NA		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		NA
102	95	1,2,3,7,8-PeCDD	NA		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		NA
104	97	1,2,3,4,7,8-HxCDF	NA		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		NA
106	99	2,3,4,6,7,8-HxCDF	NA		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		NA
108	101	Total HxCDF	NA		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		NA
110	103	1,2,3,6,7,8-HxCDD	NA		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		NA
112	105	Total HxCDD	NA		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		NA
114	107	1,2,3,4,7,8,9-HpCDF	NA		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		NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		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		NA
118	111	OCDF	NA		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		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	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR
1																
2																
3			LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4			EZ03B		FF88D		FL66I		FU50B		FY82J		0402113-11		0408044-02	
5			11/12/02		2/13/03		5/9/03		8/29/03		10/24/03		2/23/04		8/06/04	
87	**FIELD PARAMETERS**															
88	pH (avg)		6.2		6.96		6.81		6.7		6.48		6.53		6.3	
89	Temperature (° C) (avg)		14		13.6		14.3		14.4		13.3		14.1		14.3	
90	Conductivity (um/hos)		642		704		419		334		376		485		678	
91	Dissolved oxygen (mg/L) (avg)		0.48		0		2.57		2.31		2.80		1.13		3.15	
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 - 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	AC
1																													
2																													
3			LW11D		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		ES04C
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		08/28/02
6																													
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	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR
1																
2																
3			LW11D		LW11D		LW11D		LW11D		LW11D		LW11D		LW11D	
4			EZ03B		FF88D		FL66I		FU50B		FY82J		0402113-11		0408044-02	
5			11/12/02		2/13/03		5/9/03		8/29/03		10/24/03		2/23/04		8/06/04	
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		1	U
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		1	U
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	AA	AB	AC
2					Dup of LW14D																								
3			LW14D		W		LW14D		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		FY82C
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		10/23/03
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	0.5
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	NA		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		NA
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	NA		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		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		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		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		NA
20	14	4-Methylphenol	NA		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		NA
22	16	2,4-Dimethylphenol	NA		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		NA
24	18	Naphthalene	NA		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		NA
26	20	2,4,6-Trichlorophenol	NA		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		NA
28	22	Acenaphthene	NA		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		NA
30	24	Fluorene	NA		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		NA
32	26	bis(2-Ethylhexyl)phthalate	NA		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		NA
37	31	Carbon Disulfide	NA		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		NA
39	33	Benzene	NA		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		NA
41	35	Toluene	NA		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		NA
43	37	Styrene	NA		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		NA
45	39	o-Xylene	NA		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		NA
47	41	1,2,4-Trimethylbenzene	NA		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		NA
49	43	n-Propylbenzene	NA		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		NA
51	45	sec-Butylbenzene	NA		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		NA
53	47	n-Butylbenzene	NA		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		NA
55		Methyl tert-butyl ether	NA		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		NA
60	53	**TPH-D Motor Oil**	NA		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		NA
62	55																												

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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	AD	AE	AF	AG	AH
1						
2						
3			LW14D		LW14D	
4			0402113-03		0408036-05	
5			2/23/04		8/05/04	
6						
7	**CHLORINATED PHENOLS (µg/L)**					
8	**EPA Method SW8040**					
9	Pentachlorophenol	U	0.557	U	0.5	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		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		NA	
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		NA	
62						

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	AC
1																													
2					Dup of LW14D																								
3			LW14D		W		LW14D		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		FY82C
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		10/23/03
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		NA
66	59	Chromium (6010)	NA		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		NA
68	61	Lead (7421)	NA		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		NA
70	63	Zinc (6010)	NA		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		NA
74	67	Magnesium (mg/L) (6010)	NA		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		NA
76	69	Sodium (mg/L) (6010)	NA		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		NA
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		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		NA
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		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		NA
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		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		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		NA
85	78	Sulfate (mg/L) (EPA 375.2)	NA		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	AD	AE	AF	AG	AH
1						
2						
3			LW14D		LW14D	
4			0402113-03		0408036-05	
5			2/23/04		8/05/04	
63	**PRIORITY POLLUTANT**					
64	**METALS (mg/L)**					
65	Arsenic (7060)		NA		NA	
66	Chromium (6010)		NA		NA	
67	Copper (6010)		NA		NA	
68	Lead (7421)		NA		NA	
69	Nickel (6010)		NA		NA	
70	Zinc (6010)		NA		NA	
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-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	AC
1																													
2					Dup of LW14D																								
3			LW14D		W		LW14D		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		FY82C
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		10/23/03
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		6.56
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		14.2
90	83	Conductivity (um/hos)	312		312		345		371		296		362		356		487		434		477		426		258		224		238
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		2.29
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		NA
96	89	Total TCDF	NA		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		NA
98	91	Total TCDD	NA		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		NA
100	93	2,3,4,7,8-PeCDF	NA		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		NA
102	95	1,2,3,7,8-PeCDD	NA		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		NA
104	97	1,2,3,4,7,8-HxCDF	NA		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		NA
106	99	2,3,4,6,7,8-HxCDF	NA		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		NA
108	101	Total HxCDF	NA		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		NA
110	103	1,2,3,6,7,8-HxCDD	NA		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		NA
112	105	Total HxCDD	NA		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		NA
114	107	1,2,3,4,7,8,9-HpCDF	NA		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		NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		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		NA
118	111	OCDF	NA		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		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	AD	AE	AF	AG	AH
1						
2						
3			LW14D		LW14D	
4			0402113-03		0408036-05	
5			2/23/04		8/05/04	
87	**FIELD PARAMETERS**					
88	pH (avg)		6.38		6.1	
89	Temperature (° C) (avg)		13.7		16	
90	Conductivity (um/hos)		239		356	
91	Dissolved oxygen (mg/L) (avg)		1.11		3.07	
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	AA	AB	AC
1																													
2					Dup of LW14D																								
3			LW14D		W		LW14D		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		FY82C
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		10/23/03
6																													
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	AD	AE	AF	AG	AH
1						
2						
3			LW14D		LW14D	
4			0402113-03		0408036-05	
5			2/23/04		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 - OCTOBER 2003
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					

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			LW16D		LW16D	
4			BR64U		0408036-04	
5			5/25/00		8/05/04	
63	56	**PRIORITY POLLUTANT**				
64	57	**METALS (mg/L)**				
65	58	Arsenic (7060)	NA		NA	
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
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 - OCTOBER 2003
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 - 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	AC	AD
1																																
2																																
3			LW17D		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		FY82G			
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		10/23/03			
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	0.51	U		
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	NA		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		NA			
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	NA		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		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		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		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		NA			
20	14	4-Methylphenol	NA		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		NA			
22	16	2,4-Dimethylphenol	NA		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		NA			
24	18	Naphthalene	NA		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		NA			
26	20	2,4,6-Trichlorophenol	NA		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		NA			
28	22	Acenaphthene	NA		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		NA			
30	24	Fluorene	NA		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		NA			
32	26	bis(2-Ethylhexyl)phthalate	NA		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		NA			
37	31	Carbon Disulfide	NA		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		NA			
39	33	Benzene	NA		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		NA			
41	35	Toluene	NA		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		NA			
43	37	Styrene	NA		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		NA			
45	39	o-Xylene	NA		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		NA			
47	41	1,2,4-Trimethylbenzene	NA		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		NA			
49	43	n-Propylbenzene	NA		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		NA			
51	45	sec-Butylbenzene	NA		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		NA			
53	47	n-Butylbenzene	NA		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		NA			
55		Methyl tert-butyl ether	NA		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		NA			
60	53	**TPH-D Motor Oil**	NA		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		NA			
62	55																															

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

	B	AE	AF	AG	AH
1					
2					
3		LW17D		LW17D	
4		0402105-06		0408044-08	
5		2/20/04		8/06/04	
6					
7	**CHLORINATED PHENOLS (µg/L)**				
8	**EPA Method SW8040**				
9	Pentachlorophenol	0.497	U	0.5	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	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		NA	
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		NA	
62					

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	AC	AD
1																														
2																														
3			LW17D		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		FY82G	
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		10/23/03	
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		NA	
66	59	Chromium (6010)	NA		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		NA	
68	61	Lead (7421)	NA		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		NA	
70	63	Zinc (6010)	NA		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		NA	
74	67	Magnesium (mg/L) (6010)	NA		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		NA	
76	69	Sodium (mg/L) (6010)	NA		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		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		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		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		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		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		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		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		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		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	AE	AF	AG	AH
1					
2					
3		LW17D		LW17D	
4		0402105-06		0408044-08	
5		2/20/04		8/06/04	
63	**PRIORITY POLLUTANT**				
64	**METALS (mg/L)**				
65	Arsenic (7060)	NA		NA	
66	Chromium (6010)	NA		NA	
67	Copper (6010)	NA		NA	
68	Lead (7421)	NA		NA	
69	Nickel (6010)	NA		NA	
70	Zinc (6010)	NA		NA	
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-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	AC	AD
1																														
2																														
3			LW17D		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		FY82G	
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		10/23/03	
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		6.47	
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		15.8	
90	83	Conductivity (um/hos)	305		79		440		488		544		529		62		196		399		457		401		349		431		434	
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		3.72	
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		NA	
96	89	Total TCDF	NA		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		NA	
98	91	Total TCDD	NA		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		NA	
100	93	2,3,4,7,8-PeCDF	NA		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		NA	
102	95	1,2,3,7,8-PeCDD	NA		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		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		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		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		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		NA	
108	101	Total HxCDF	NA		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		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		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		NA	
112	105	Total HxCDD	NA		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		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		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		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		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		NA	
118	111	OCDF	NA		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		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	AE	AF	AG	AH
1					
2					
3		LW17D		LW17D	
4		0402105-06		0408044-08	
5		2/20/04		8/06/04	
87	**FIELD PARAMETERS**				
88	pH (avg)	6.44		6.17	
89	Temperature (° C) (avg)	15.7		14.6	
90	Conductivity (um/hos)	367		607	
91	Dissolved oxygen (mg/L) (avg)	23.19		3.04	
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	AA	AB	AC	AD
1																														
2																														
3			LW17D		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		FY82G	
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		10/23/03	
6																														
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	AE	AF	AG	AH
1					
2					
3		LW17D		LW17D	
4		0402105-06		0408044-08	
5		2/20/04		8/06/04	
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 - 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	AC	AD
1																														
2																														
3			LW18D		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		FY82F	
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		10/23/03	
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	**0.26**		**0.44**		0.25	U	0.3	U	0.25	U	0.25	U	0.25	U	**0.58**	J	**0.58**	
10	4	2,4,6-Trichlorophenol	0.25	U	0.25	U	NA		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		NA	
12	6	2,4,5-Trichlorophenol	0.25	U	0.25	U	NA		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		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		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		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		NA	
20	14	4-Methylphenol	NA		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		NA	
22	16	2,4-Dimethylphenol	NA		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		NA	
24	18	Naphthalene	NA		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		NA	
26	20	2,4,6-Trichlorophenol	NA		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		NA	
28	22	Acenaphthene	NA		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		NA	
30	24	Fluorene	NA		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		NA	
32	26	bis(2-Ethylhexyl)phthalate	NA		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		NA	
37	31	Carbon Disulfide	NA		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		NA	
39	33	Benzene	NA		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		NA	
41	35	Toluene	NA		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		NA	
43	37	Styrene	NA		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		NA	
45	39	o-Xylene	NA		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		NA	
47	41	1,2,4-Trimethylbenzene	NA		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		NA	
49	43	n-Propylbenzene	NA		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		NA	
51	45	sec-Butylbenzene	NA		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		NA	
53	47	n-Butylbenzene	NA		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		NA	
55		Methyl tert-butyl ether	NA		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		NA	
60	53	**TPH-D Motor Oil**	NA		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		NA	
62	55																													

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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	AE	AF	AG	AH
1					
2					
3		LW18D		LW18D	
4		0402105-07		0408044-04	
5		2/20/04		8/06/04	
6					
7	**CHLORINATED PHENOLS (µg/L)**				
8	**EPA Method SW8040**				
9	Pentachlorophenol	0.488	U	0.5	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	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		NA	
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		NA	
62					

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	AC	AD
1																														
2																														
3			LW18D		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		FY82F	
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		10/23/03	
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		NA	
66	59	Chromium (6010)	NA		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		NA	
68	61	Lead (7421)	NA		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		NA	
70	63	Zinc (6010)	NA		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		NA	
74	67	Magnesium (mg/L) (6010)	NA		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		NA	
76	69	Sodium (mg/L) (6010)	NA		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		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		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		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		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		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		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		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		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		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	AE	AF	AG	AH
1					
2					
3		LW18D		LW18D	
4		0402105-07		0408044-04	
5		2/20/04		8/06/04	
63	**PRIORITY POLLUTANT**				
64	**METALS (mg/L)**				
65	Arsenic (7060)	NA		NA	
66	Chromium (6010)	NA		NA	
67	Copper (6010)	NA		NA	
68	Lead (7421)	NA		NA	
69	Nickel (6010)	NA		NA	
70	Zinc (6010)	NA		NA	
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-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	AC	AD
1																														
2																														
3			LW18D		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		FY82F	
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		10/23/03	
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		6.53	
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		17.9	
90	83	Conductivity (um/hos)	338		265		523		486		623		435		422		393		455		511		544		315		379		425	
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		4.38	
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		NA	
96	89	Total TCDF	NA		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		NA	
98	91	Total TCDD	NA		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		NA	
100	93	2,3,4,7,8-PeCDF	NA		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		NA	
102	95	1,2,3,7,8-PeCDD	NA		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		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		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		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		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		NA	
108	101	Total HxCDF	NA		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		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		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		NA	
112	105	Total HxCDD	NA		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		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		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		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		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		NA	
118	111	OCDF	NA		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		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	AE	AF	AG	AH
1					
2					
3		LW18D		LW18D	
4		0402105-07		0408044-04	
5		2/20/04		8/06/04	
87	**FIELD PARAMETERS**				
88	pH (avg)	6.42		6.05	
89	Temperature (° C) (avg)	15.7		15.2	
90	Conductivity (um/hos)	206		487	
91	Dissolved oxygen (mg/L) (avg)	2.29		4.09	
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	AA	AB	AC	AD
1																														
2																														
3			LW18D		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		FY82F	
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		10/23/03	
6																														
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	AE	AF	AG	AH
1					
2					
3		LW18D		LW18D	
4		0402105-07		0408044-04	
5		2/20/04		8/06/04	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW20D		LW20D		LW20D		LW20D	
4			FZ04N		0402115-03		0406050-10		0408056-10	
5			10/28/03		2/24/04		6/8/04		8/09/04	
6										
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	U	2.05	U	2.08	U	2.13	U
20	14	4-Methylphenol	1	U	10.2	U	10.4	U	10.6	U
21	15	Isophorone	1	U	1.02	U	1.04	U	1.06	U
22	16	2,4-Dimethylphenol	3	U	3.07	U	3.12	U	3.19	U
23	17	Benzoic Acid	10	U	20.5	U	20.8	U	21.3	U
24	18	Naphthalene	1	U	1.02	U	1.04	U	1.06	U
25	19	2-Methylnaphthalene	1	U	1.02	U	1.04	U	1.06	U
26	20	2,4,6-Trichlorophenol	5	U	5.12	U	5.19	U	5.31	U
27	21	2,4,5-Trichlorophenol	5	U	5.12	U	5.19	U	5.31	U
28	22	Acenaphthene	1	U	1.02	U	1.04	U	1.06	U
29	23	Dibenzofuran	1	U	1.02	U	1.04	U	1.06	U
30	24	Fluorene	1	U	1.02	U	1.04	U	1.06	U
31	25	Pentachlorophenol	5	U	5.12	U	5.19	U	5.31	U
32	26	bis(2-Ethylhexyl)phthalate	**3.9**		1.02	U	1.04	U	**1.86**	
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	**6**	M	50	U	50	U	50	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U
38	32	2-Butanone	5	U	10	U	10	U	10	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U
40	34	Bromoform	1	U	1	U	1	U	1	U
41	35	Toluene	1	U	1	U	1	U	1	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U
43	37	Styrene	1	U	1	U	1	U	1	U
44	38	m,p-Xylene	1	U	2	U	2	U	2	U
45	39	o-Xylene	1	U	1	U	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U
48	42	Isopropylbenzene	1	U	1	U	1	U	1	U
49	43	n-Propylbenzene	1	U	1	U	1	U	1	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U
51	45	sec-Butylbenzene	1	U	1	U	1	U	1	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U
53	47	n-Butylbenzene	1	U	1	U	1	U	1	U
54	48	Naphthalene	5	U	1	U	1	U	1	U
55		Methyl tert-butyl ether	**1.5**		1	U	1	U	1	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**	
60	53	**TPH-D Motor Oil**	0.5	U	0.492	U	0.504	U	0.506	U
61	54	**TPH-Gasoline**	0.25	U	0.1	U	0.1	U	**0.229**	
62	55									

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
1										
2										
3			LW20D		LW20D		LW20D		LW20D	
4			FZ04N		0402115-03		0406050-10		0408056-10	
5			10/28/03		2/24/04		6/8/04		8/09/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	**0.021**		**0.029**		**0.027**		**0.0286**	
66	59	Chromium (6010)	0.005	U	**0.0206**		**0.0199**		**0.0271**	
67	60	Copper (6010)	**0.004**		0.01	U	0.01	U	**0.0957**	
68	61	Lead (7421)	0.001	U	**0.0020**		**0.0014**		**0.00305**	
69	62	Nickel (6010)	0.01	U	0.005	U	0.005	U	0.005	U
70	63	Zinc (6010)	**0.015**		**0.0113**		**0.0167**		**0.0674**	
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)	**220**		**244**		**222**		**260**	
81	74	Chloride (mg/L) (EPA 325.2)	**5.6**		**2.77**		**2.8**		**3.34**	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW20D		LW20D		LW20D		LW20D	
4			FZ04N		0402115-03		0406050-10		0408056-10	
5			10/28/03		2/24/04		6/8/04		8/09/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.62		6.74		6.82		6.23	
89	82	Temperature (° C) (avg)	15.8		14.1		14.8		15.7	
90	83	Conductivity (um/hos)	347		283		264		590	
91	84	Dissolved oxygen (mg/L) (avg)	2.04		2.67		1.19		2.23	
92	85									
93	86	**DIOXINS AND FURANS (ng/L)**								
94	87	**Method 8290**								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW20D		LW20D		LW20D		LW20D	
4			FZ04N		0402115-03		0406050-10		0408056-10	
5			10/28/03		2/24/04		6/8/04		8/09/04	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	0.1	U	0.0557	U	**0.06**		**0.1**	
126		2-Methylnaphthalene	0.1	U	NA		NA		NA	
127		Acenaphthylene	0.1	U	0.0557	U	0.05	U	0.0502	U
128		Acenaphthene	0.1	U	0.0557	U	0.05	U	**0.11**	
129		Fluorene	0.1	U	**0.078**		**0.17**		**0.0602**	
130		Anthracene	0.1	U	0.0557	U	0.05	U	0.0502	U
131		Dibenzofuran	0.1	U	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
1										
2										
3			LW22D		LW22D		LW22D		LW22D	
4			FZ04A		0402115-10		0406040-03		0408056-03	
5			10/27/03		2/24/04		6/7/04		8/09/04	
6										
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	**4.1**		2.05	U	1.9	U	2.02	U
20	14	4-Methylphenol	1.4	U	10.3	U	9.51	U	10.1	U
21	15	Isophorone	1.4	U	1.03	U	0.951	U	1.01	U
22	16	2,4-Dimethylphenol	4.2	U	3.08	U	2.85	U	3.03	U
23	17	Benzoic Acid	14	U	20.5	U	19	U	20.2	U
24	18	Naphthalene	1.4	U	1.03	U	0.951	U	1.01	U
25	19	2-Methylnaphthalene	1.4	U	1.03	U	0.951	U	1.01	U
26	20	2,4,6-Trichlorophenol	7	U	5.13	U	4.76	U	5.05	U
27	21	2,4,5-Trichlorophenol	7	U	5.13	U	4.76	U	5.05	U
28	22	Acenaphthene	1.4	U	1.03	U	0.951	U	1.01	U
29	23	Dibenzofuran	1.4	U	1.03	U	0.951	U	1.01	U
30	24	Fluorene	1.4	U	1.03	U	0.951	U	1.01	U
31	25	Pentachlorophenol	7	U	5.13	U	4.76	U	5.05	U
32	26	bis(2-Ethylhexyl)phthalate	1.4	U	1.03	U	0.951	U	1.01	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
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U
38	32	2-Butanone	5	U	10	U	10	U	10	U
39	33	Benzene	**2.9**		0.4	U	0.3	U	0.3	U
40	34	Bromoform	1	U	1	U	1	U	1	U
41	35	Toluene	**1.6**		1	U	1	U	1	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U
43	37	Styrene	1	U	1	U	1	U	1	U
44	38	m,p-Xylene	**1.6**		2	U	2	U	2	U
45	39	o-Xylene	1	U	1	U	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U
48	42	Isopropylbenzene	**14**		1	U	**13.8**		1	U
49	43	n-Propylbenzene	**12**		1	U	**5.59**		1	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U
51	45	sec-Butylbenzene	**1.5**		1	U	**1.26**		1	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U
53	47	n-Butylbenzene	1	U	1	U	1	U	1	U
54	48	Naphthalene	5	U	1	U	1	U	1	U
55		Methyl tert-butyl ether	**1.9**	M	1	U	1	U	1	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**	
60	53	**TPH-D Motor Oil**	0.5	U	0.497	U	0.499	U	0.498	U
61	54	**TPH-Gasoline**	**0.54**		0.1	U	**0.239**		0.1	U
62	55									

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
1										
2										
3			LW22D		LW22D		LW22D		LW22D	
4			FZ04A		0402115-10		0406040-03		0408056-03	
5			10/27/03		2/24/04		6/7/04		8/09/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	**0.023**		**0.039**		**0.026**		**0.00774**	
66	59	Chromium (6010)	**0.15**		**0.0195**		**0.0235**		**0.0194**	
67	60	Copper (6010)	**0.199**		**0.0114**		0.01	U	0.01	U
68	61	Lead (7421)	**0.056**		**0.0097**		**0.0037**		**0.00121**	
69	62	Nickel (6010)	**0.14**		0.005	U	0.005	U	0.005	U
70	63	Zinc (6010)	**0.4**		**0.0361**		**0.0175**		**0.0123**	
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)	**280**		**263**		**308**		**243**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.7**		**1.94**		**1.55**		**1.79**	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW22D		LW22D		LW22D		LW22D	
4			FZ04A		0402115-10		0406040-03		0408056-03	
5			10/27/03		2/24/04		6/7/04		8/09/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.65		6.53		5.19		5.61	
89	82	Temperature (° C) (avg)	17.2		14.5		14.6		15.4	
90	83	Conductivity (um/hos)	498		295		377		639	
91	84	Dissolved oxygen (mg/L) (avg)	4.51		2.82		3.19		2.34	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW22D		LW22D		LW22D		LW22D	
4			FZ04A		0402115-10		0406040-03		0408056-03	
5			10/27/03		2/24/04		6/7/04		8/09/04	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	0.14	U	0.0523	U	**0.106**		0.052	U
126		2-Methylnaphthalene	0.14	U	NA		NA		NA	
127		Acenaphthylene	0.14	U	0.0523	U	0.0482	U	0.052	U
128		Acenaphthene	1		0.0523	U	0.0482	U	0.052	U
129		Fluorene	0.35		0.0523	U	0.0482	U	**0.166**	
130		Anthracene	0.14	U	0.0523	U	0.0482	U	0.052	U
131		Dibenzofuran	0.14	U	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
1										
2										
3			LW23D		LW23D		LW23D		LW23D	
4			FZ04B		0402115-11		0406040-04		0408056-04	
5			10/27/03		2/24/04		6/7/04		8/09/04	
6										
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	U	2.26	U	1.94	U	2.09	U
20	14	4-Methylphenol	1	U	11.3	U	9.68	U	10.5	U
21	15	Isophorone	1	U	1.13	U	0.968	U	1.05	U
22	16	2,4-Dimethylphenol	3	U	3.39	U	2.9	U	3.14	U
23	17	Benzoic Acid	10	U	22.6	U	19.4	U	20.9	U
24	18	Naphthalene	1	U	1.13	U	0.968	U	1.05	U
25	19	2-Methylnaphthalene	1	U	1.13	U	0.968	U	1.05	U
26	20	2,4,6-Trichlorophenol	5	U	5.66	U	4.84	U	5.24	U
27	21	2,4,5-Trichlorophenol	5	U	5.66	U	4.84	U	5.24	U
28	22	Acenaphthene	1	U	1.13	U	0.968	U	1.05	U
29	23	Dibenzofuran	1	U	1.13	U	0.968	U	1.05	U
30	24	Fluorene	1	U	1.13	U	0.968	U	1.05	U
31	25	Pentachlorophenol	5	U	5.66	U	4.84	U	5.24	U
32	26	bis(2-Ethylhexyl)phthalate	**6.8**		1.13	U	0.968	U	1.05	U
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	**19**		50	U	50	U	50	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U
38	32	2-Butanone	5	U	10	U	10	U	10	U
39	33	Benzene	**40**		**22.9**		**132**		**26.1**	
40	34	Bromoform	1	U	1	U	1	U	1	U
41	35	Toluene	**1.2**		1	U	1	U	1	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U
43	37	Styrene	1	U	1	U	1	U	1	U
44	38	m,p-Xylene	**1.2**		2	U	2	U	2	U
45	39	o-Xylene	1	U	1	U	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U
48	42	Isopropylbenzene	**16**		**8.51**		**13.7**		**11.5**	
49	43	n-Propylbenzene	**8.6**		**6.71**		**6.9**		**5.51**	
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U
51	45	sec-Butylbenzene	**3.3**		**1.12**		**2.86**		**1.6**	
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U
53	47	n-Butylbenzene	**1.6**		1	U	**1.4**		1	U
54	48	Naphthalene	5	U	1	U	1	U	1	U
55		Methyl tert-butyl ether	**33**		**17.4**		**51.2**		**3.17**	
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**	
60	53	**TPH-D Motor Oil**	0.5	U	**0.648**		0.527	U	0.5	U
61	54	**TPH-Gasoline**	**0.88**		**0.67**		**0.732**		**0.562**	
62	55									

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
1										
2										
3			LW23D		LW23D		LW23D		LW23D	
4			FZ04B		0402115-11		0406040-04		0408056-04	
5			10/27/03		2/24/04		6/7/04		8/09/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	**0.021**		**0.042**		**0.044**		**0.0435**	
66	59	Chromium (6010)	**0.135**		**0.0226**		**0.0248**		**0.0224**	
67	60	Copper (6010)	**0.201**		**0.0197**		0.01	U	**0.0372**	
68	61	Lead (7421)	**0.068**		**0.0085**		**0.0047**		**0.00792**	
69	62	Nickel (6010)	**0.11**		0.005	U	0.005	U	0.005	U
70	63	Zinc (6010)	**0.348**		**0.0333**		**0.024**		**0.0431**	
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)	**330**		**349**		**456**		**466**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.4**		**2.54**		**2.54**		**2.8**	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW23D		LW23D		LW23D		LW23D	
4			FZ04B		0402115-11		0406040-04		0408056-04	
5			10/27/03		2/24/04		6/7/04		8/09/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.78		6.85		5.51		6.13	
89	82	Temperature (° C) (avg)	15.8		13.9		14.5		13.8	
90	83	Conductivity (um/hos)	547		474		547		998	
91	84	Dissolved oxygen (mg/L) (avg)	0.35		1.11		3.01		2.46	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW23D		LW23D		LW23D		LW23D	
4			FZ04B		0402115-11		0406040-04		0408056-04	
5			10/27/03		2/24/04		6/7/04		8/09/04	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	0.1	U	**0.09**		**0.517**		**0.409**	
126		2-Methylnaphthalene	0.1	U	NA		NA		NA	
127		Acenaphthylene	0.1	U	0.05	U	**0.0683**		**0.123**	
128		Acenaphthene	0.61		**0.16**		**0.429**		**0.86**	
129		Fluorene	0.31		**0.06**		**0.0585**		**0.246**	
130		Anthracene	0.11		0.05	U	0.0488	U	0.0512	U
131		Dibenzofuran	0.1	U	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
1										
2										
3			LW24D		LW24D		LW24D		LW24D	
4			FZ04U		0402115-07		0406040-07		0408056-06	
5			10/28/03		2/24/04		6/7/04		8/09/04	
6										
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	U	2.14	U	1.9	U	2.08	U
20	14	4-Methylphenol	1	U	10.7	U	9.51	U	10.4	U
21	15	Isophorone	1	U	1.07	U	0.951	U	1.04	U
22	16	2,4-Dimethylphenol	3	U	3.22	U	2.85	U	3.12	U
23	17	Benzoic Acid	10	U	21.4	U	19	U	20.8	U
24	18	Naphthalene	1	U	1.07	U	0.951	U	1.04	U
25	19	2-Methylnaphthalene	1	U	1.07	U	0.951	U	1.04	U
26	20	2,4,6-Trichlorophenol	5	U	5.36	U	4.75	U	5.21	U
27	21	2,4,5-Trichlorophenol	5	U	5.36	U	4.75	U	5.21	U
28	22	Acenaphthene	1	U	**1.37**		**1.27**		**1.65**	
29	23	Dibenzofuran	1	U	1.07	U	0.951	U	1.04	U
30	24	Fluorene	1	U	**3.55**		**3.06**		**4.04**	
31	25	Pentachlorophenol	5	U	5.36	U	4.75	U	5.21	U
32	26	bis(2-Ethylhexyl)phthalate	**5.6**		1.07	U	**1.07**		**1.91**	
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	5	U	50	U	50	U	50	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U
38	32	2-Butanone	5	U	10	U	10	U	10	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U
40	34	Bromoform	1	U	1	U	1	U	1	U
41	35	Toluene	1	U	1	U	1	U	1	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U
43	37	Styrene	1	U	1	U	1	U	1	U
44	38	m,p-Xylene	1	U	2	U	2	U	2	U
45	39	o-Xylene	1	U	1	U	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U
48	42	Isopropylbenzene	**2.2**		**7.97**		**8.96**		**10.4**	
49	43	n-Propylbenzene	1	U	**12.8**		**11.5**		**13**	
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U
51	45	sec-Butylbenzene	**1.3**		**4.81**		**4.84**		**4.22**	
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U
53	47	n-Butylbenzene	1	U	**2.85**		**3.51**		**2.63**	
54	48	Naphthalene	5	U	1	U	1	U	1	U
55		Methyl tert-butyl ether	1	U	1	U	1	U	1	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**	
60	53	**TPH-D Motor Oil**	0.5	U	**1.15**		0.541	U	0.575	U
61	54	**TPH-Gasoline**	**0.92**		**1.5**		**1.23**		**0.948**	
62	55									

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
1										
2										
3			LW24D		LW24D		LW24D		LW24D	
4			FZ04U		0402115-07		0406040-07		0408056-06	
5			10/28/03		2/24/04		6/7/04		8/09/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	**0.009**		**0.066**		**0.058**		**0.043**	
66	59	Chromium (6010)	**0.125**		**0.0423**		**0.0421**		**0.0279**	
67	60	Copper (6010)	**0.163**		**0.0474**		**0.0256**		**0.0125**	
68	61	Lead (7421)	**0.058**		**0.0182**		**0.0126**		**0.00423**	
69	62	Nickel (6010)	**0.11**		**0.0096**		**0.0069**		**0.0088**	
70	63	Zinc (6010)	**0.327**		**0.102**		**0.0779**		**0.0905**	
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)	**340**		**277**		**350**		**268**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.2**		**2.3**		**1.89**		**3.24**	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW24D		LW24D		LW24D		LW24D	
4			FZ04U		0402115-07		0406040-07		0408056-06	
5			10/28/03		2/24/04		6/7/04		8/09/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.87		6.69		5.43		6.02	
89	82	Temperature (° C) (avg)	16.9		14.8		15.5		15.9	
90	83	Conductivity (um/hos)	494		440		426		793	
91	84	Dissolved oxygen (mg/L) (avg)	0.57		1.08		1.6		2.57	
92	85									
93	86	**DIOXINS AND FURANS (ng/L)**								
94	87	**Method 8290**								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW24D		LW24D		LW24D		LW24D	
4			FZ04U		0402115-07		0406040-07		0408056-06	
5			10/28/03		2/24/04		6/7/04		8/09/04	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	0.1	U	**0.749**		**0.87**		**0.409**	
126		2-Methylnaphthalene	0.1	U	NA		NA		NA	
127		Acenaphthylene	0.1	U	**0.375**		**0.303**		**0.517**	
128		Acenaphthene	0.91		**1.56**		**1.21**		**1.39**	
129		Fluorene	0.7		**3.96**		**2.81**		**2.65**	
130		Anthracene	0.43		**0.135**		**0.162**		**0.146**	
131		Dibenzofuran	0.1	U	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
1										
2										
3			LW25D		LW25D		LW25D		LW25D	
4			FZ04V		0402115-08		0406040-08		0408056-07	
5			10/28/03		2/24/04		6/7/04		8/09/04	
6										
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	2.3	U	2.13	U	2.04	U	1.99	U
20	14	4-Methylphenol	1.2	U	10.7	U	10.2	U	9.96	U
21	15	Isophorone	1.2	U	1.07	U	1.02	U	0.996	U
22	16	2,4-Dimethylphenol	3.5	U	3.2	U	3.06	U	2.99	U
23	17	Benzoic Acid	12	U	21.3	U	20.4	U	19.9	U
24	18	Naphthalene	1.2	U	1.07	U	1.02	U	0.996	U
25	19	2-Methylnaphthalene	1.2	U	1.07	U	1.02	U	0.996	U
26	20	2,4,6-Trichlorophenol	5.8	U	5.34	U	5.11	U	4.98	U
27	21	2,4,5-Trichlorophenol	5.8	U	5.34	U	5.11	U	4.98	U
28	22	Acenaphthene	1.2	U	1.07	U	1.02	U	**1.93**	
29	23	Dibenzofuran	1.2	U	1.07	U	1.02	U	0.996	U
30	24	Fluorene	1.2	U	1.29	U	1.02	U	**4.12**	
31	25	Pentachlorophenol	5.8	U	5.34	U	5.11	U	4.98	U
32	26	bis(2-Ethylhexyl)phthalate	1.2	U	1.07	U	**3.53**		**2.95**	
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	5	U	50	U	50	U	50	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U
38	32	2-Butanone	5	U	10	U	10	U	10	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U
40	34	Bromoform	1	U	1	U	1	U	1	U
41	35	Toluene	1	U	1	U	1	U	1	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U
43	37	Styrene	1	U	1	U	1	U	1	U
44	38	m,p-Xylene	**1.6**		2	U	2	U	2	U
45	39	o-Xylene	1	U	1	U	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U
48	42	Isopropylbenzene	**5.6**		**5.01**		**1.29**		**17.8**	
49	43	n-Propylbenzene	**2**		1	U	1	U	**5.78**	
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U
51	45	sec-Butylbenzene	**1.2**		**2.43**		**1.4**		**4.59**	
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U
53	47	n-Butylbenzene	1	U	1	U	1	U	**1.87**	
54	48	Naphthalene	5	U	1	U	1	U	1	U
55		Methyl tert-butyl ether	1	U	1	U	1	U	1	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**	
60	53	**TPH-D Motor Oil**	0.5	U	**1.32**		0.494	U	0.502	U
61	54	**TPH-Gasoline**	**0.43**		**0.88**		**0.409**	J	**0.98**	
62	55									

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
1										
2										
3			LW25D		LW25D		LW25D		LW25D	
4			FZ04V		0402115-08		0406040-08		0408056-07	
5			10/28/03		2/24/04		6/7/04		8/09/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	**0.032**		**0.026**		**0.028**		**0.0425**	
66	59	Chromium (6010)	**0.31**		**0.0517**		**0.0345**		**0.0161**	
67	60	Copper (6010)	**0.373**		**0.0441**		**0.0179**		0.01	U
68	61	Lead (7421)	**0.15**		**0.0233**		**0.0108**		**0.00816**	
69	62	Nickel (6010)	**0.28**		**0.0158**		**0.0084**		**0.0065**	
70	63	Zinc (6010)	**0.83**		**0.113**		**0.0647**		**0.0831**	
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)	**210**		**250**		**232**		**152**	
81	74	Chloride (mg/L) (EPA 325.2)	**12**		**1.96**		**1.51**		**2.13**	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW25D		LW25D		LW25D		LW25D	
4			FZ04V		0402115-08		0406040-08		0408056-07	
5			10/28/03		2/24/04		6/7/04		8/09/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.55		6.58		5.05		5.93	
89	82	Temperature (° C) (avg)	18.1		14.8		16		16.3	
90	83	Conductivity (um/hos)	290		381		232		456	
91	84	Dissolved oxygen (mg/L) (avg)	2.68		1.36		3.2		2.36	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW25D		LW25D		LW25D		LW25D	
4			FZ04V		0402115-08		0406040-08		0408056-07	
5			10/28/03		2/24/04		6/7/04		8/09/04	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	0.12	U	**0.352**		**0.397**		**0.478**	
126		2-Methylnaphthalene	0.12	U	NA		NA		NA	
127		Acenaphthylene	0.12	U	**0.0771**		0.0509	U	**0.211**	
128		Acenaphthene	0.45		**0.639**		**0.112**		**1.16**	
129		Fluorene	0.57		**0.738**		**0.285**		**1.98**	
130		Anthracene	0.12	U	**0.0771**		**0.214**		**0.289**	
131		Dibenzofuran	0.12	U	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
1										
2										
3			LW26D		LW26D		LW26D		LW26D	
4			FZ04T		0402115-05		0406040-06		0408066-01	
5			10/28/03		2/24/04		6/7/04		8/10/04	
6										
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	2.2	U	2.22	U	1.94	U	2	U
20	14	4-Methylphenol	1.1	U	11.1	U	9.72	U	10	U
21	15	Isophorone	1.1	U	1.11	U	0.972	U	1	U
22	16	2,4-Dimethylphenol	3.3	U	3.33	U	2.92	U	3.01	U
23	17	Benzoic Acid	11	U	22.2	U	19.4	U	20	U
24	18	Naphthalene	1.1	U	1.11	U	0.972	U	1	U
25	19	2-Methylnaphthalene	1.1	U	1.11	U	0.972	U	1	U
26	20	2,4,6-Trichlorophenol	5.5	U	5.56	U	4.86	U	5.01	U
27	21	2,4,5-Trichlorophenol	5.5	U	5.56	U	4.86	U	5.01	U
28	22	Acenaphthene	1.1	U	1.11	U	0.972	U	1	U
29	23	Dibenzofuran	1.1	U	1.11	U	0.972	U	1	U
30	24	Fluorene	1.1	U	1.11	U	0.972	U	1	U
31	25	Pentachlorophenol	5.5	U	5.56	U	4.86	U	5.01	U
32	26	bis(2-Ethylhexyl)phthalate	1.1	U	1.11	U	0.972	U	**3.77**	
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	**11**		50	U	50	U	50	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U
38	32	2-Butanone	5	U	10	U	10	U	10	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U
40	34	Bromoform	1	U	1	U	1	U	1	U
41	35	Toluene	1	U	1	U	1	U	1	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U
43	37	Styrene	1	U	1	U	1	U	1	U
44	38	m,p-Xylene	1	U	2	U	2	U	2	U
45	39	o-Xylene	1	U	1	U	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U
48	42	Isopropylbenzene	1	U	1	U	1	U	1	U
49	43	n-Propylbenzene	1	U	1	U	1	U	1	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U
51	45	sec-Butylbenzene	1	U	1	U	1	U	1	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U
53	47	n-Butylbenzene	1	U	1	U	1	U	1	U
54	48	Naphthalene	5	U	1	U	1	U	1	U
55		Methyl tert-butyl ether	**1.2**		1	U	1	U	**2.38**	
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**	
60	53	**TPH-D Motor Oil**	0.5	U	**0.541**		0.491	U	0.497	U
61	54	**TPH-Gasoline**	**0.35**		**0.27**		**0.129**		**0.202**	J
62	55									

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
1										
2										
3			LW26D		LW26D		LW26D		LW26D	
4			FZ04T		0402115-05		0406040-06		0408066-01	
5			10/28/03		2/24/04		6/7/04		8/10/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	**0.007**		**0.010**		**0.006**		**0.0112**	
66	59	Chromium (6010)	**0.012**		**0.0159**		**0.0185**		**0.0171**	
67	60	Copper (6010)	**0.016**		0.01	U	0.01	U	**0.0812**	
68	61	Lead (7421)	**0.006**		**0.0027**		**0.0021**		**0.0028**	
69	62	Nickel (6010)	**0.01**		0.005	U	0.005	U	0.005	U
70	63	Zinc (6010)	**0.036**		**0.0116**		**0.0161**		**0.0173**	
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)	**300**		**349**		**356**		**294**	
81	74	Chloride (mg/L) (EPA 325.2)	**18**		**2.84**		**2.6**		**2.97**	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW26D		LW26D		LW26D		LW26D	
4			FZ04T		0402115-05		0406040-06		0408066-01	
5			10/28/03		2/24/04		6/7/04		8/10/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.8		6.93		5.53		5.86	
89	82	Temperature (° C) (avg)	19.0		13		17.8		16.4	
90	83	Conductivity (um/hos)	509		388		397		704	
91	84	Dissolved oxygen (mg/L) (avg)	2.65		1.38		3.7		1.36	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW26D		LW26D		LW26D		LW26D	
4			FZ04T		0402115-05		0406040-06		0408066-01	
5			10/28/03		2/24/04		6/7/04		8/10/04	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	0.11	U	**0.0843**		0.0482	U	0.0498	U
126		2-Methylnaphthalene	0.11	U	NA		NA		NA	
127		Acenaphthylene	0.11	U	**0.116**		0.0482	U	0.0498	U
128		Acenaphthene	0.11	U	**0.0632**		0.0482	U	0.0498	U
129		Fluorene	0.11	U	**0.432**		0.0482	U	**0.129**	
130		Anthracene	0.11	U	0.0527	U	0.0482	U	0.0498	U
131		Dibenzofuran	0.11	U	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
1										
2										
3			LW27D		LW27D		LW27D		LW27D	
4			FZ04S		0402115-06		0406040-05		0408056-11	
5			10/28/03		2/24/04		6/7/04		8/09/04	
6										
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	2.2	U	1.99	U	1.98	U	2.16	U
20	14	4-Methylphenol	1.1	U	9.93	U	9.89	U	10.8	U
21	15	Isophorone	1.1	U	0.993	U	0.989	U	1.08	U
22	16	2,4-Dimethylphenol	3.2	U	2.98	U	2.97	U	3.24	U
23	17	Benzoic Acid	11	U	19.9	U	19.8	U	21.6	U
24	18	Naphthalene	1.1	U	0.993	U	0.989	U	1.08	U
25	19	2-Methylnaphthalene	1.1	U	0.993	U	0.989	U	1.08	U
26	20	2,4,6-Trichlorophenol	5.4	U	4.97	U	4.95	U	5.39	U
27	21	2,4,5-Trichlorophenol	5.4	U	4.97	U	4.95	U	5.39	U
28	22	Acenaphthene	1.1	U	0.993	U	0.989	U	1.08	U
29	23	Dibenzofuran	1.1	U	0.993	U	0.989	U	1.08	U
30	24	Fluorene	1.1	U	0.993	U	0.989	U	1.08	U
31	25	Pentachlorophenol	5.4	U	4.97	U	4.95	U	5.39	U
32	26	bis(2-Ethylhexyl)phthalate	1.1	U	0.993	U	0.989	U	1.08	U
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	**7.9**		50	U	50	U	50	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U
38	32	2-Butanone	5	U	10	U	10	U	10	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U
40	34	Bromoform	1	U	1	U	1	U	1	U
41	35	Toluene	1	U	1	U	1	U	1	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U
43	37	Styrene	1	U	1	U	1	U	1	U
44	38	m,p-Xylene	1	U	2	U	2	U	2	U
45	39	o-Xylene	1	U	1	U	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U
48	42	Isopropylbenzene	1	U	1	U	1	U	1	U
49	43	n-Propylbenzene	1	U	1	U	1	U	1	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U
51	45	sec-Butylbenzene	1	U	1	U	1	U	1	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U
53	47	n-Butylbenzene	1	U	1	U	1	U	1	U
54	48	Naphthalene	5	U	1	U	1	U	1	U
55		Methyl tert-butyl ether	1	U	1	U	1	U	1	U
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**	
60	53	**TPH-D Motor Oil**	0.5	U	0.497	U	0.557	U	0.539	U
61	54	**TPH-Gasoline**	0.25	U	0.1	U	**0.24**		**0.336**	
62	55									

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
1										
2										
3			LW27D		LW27D		LW27D		LW27D	
4			FZ04S		0402115-06		0406040-05		0408056-11	
5			10/28/03		2/24/04		6/7/04		8/09/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	**0.006**		**0.006**		**0.007**		**0.00745**	
66	59	Chromium (6010)	**0.009**		**0.0181**		**0.0203**		**0.0211**	
67	60	Copper (6010)	**0.02**		0.01	U	0.01	U	**0.0157**	
68	61	Lead (7421)	**0.014**		**0.0021**		**0.0006**		**0.0019**	
69	62	Nickel (6010)	**0.01**		0.005	U	0.005	U	0.005	U
70	63	Zinc (6010)	**0.047**		**0.0145**		0.01	U	**0.0528**	
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)	**240**		**306**		**318**		**264**	
81	74	Chloride (mg/L) (EPA 325.2)	**24**		**7.2**		**3.72**		**3.43**	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW27D		LW27D		LW27D		LW27D	
4			FZ04S		0402115-06		0406040-05		0408056-11	
5			10/28/03		2/24/04		6/7/04		8/09/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.84		6.73		5.53		6.16	
89	82	Temperature (° C) (avg)	15.0		13.8		14.5		15.3	
90	83	Conductivity (um/hos)	329		345		363		609	
91	84	Dissolved oxygen (mg/L) (avg)	1.07		1.34		1.56		1.5	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW27D		LW27D		LW27D		LW27D	
4			FZ04S		0402115-06		0406040-05		0408056-11	
5			10/28/03		2/24/04		6/7/04		8/09/04	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	0.11	U	**0.0584**		**0.126**		**0.104**	
126		2-Methylnaphthalene	0.11	U	NA		NA		NA	
127		Acenaphthylene	0.11	U	0.0584	U	0.0484	U	0.0522	U
128		Acenaphthene	0.11	U	**0.0701**		**0.0871**		**0.104**	
129		Fluorene	0.11	U	0.0584	U	0.0484	U	**0.146**	
130		Anthracene	0.11	U	0.0584	U	0.0484	U	0.0522	U
131		Dibenzofuran	0.11	U	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
1										
2										
3			LW29D		LW29D		LW29D		LW29D	
4			FZ04D		0402080-07		0406050-07		0408006-07	
5			10/27/03		2/17/04		6/8/04		8/02/04	
6										
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	2.1	U	1.92	UJ	1.97	U	2.03	U
20	14	4-Methylphenol	1	U	9.61	UJ	9.87	U	10.1	U
21	15	Isophorone	1	U	0.961	UJ	0.987	U	1.01	U
22	16	2,4-Dimethylphenol	3.1	U	2.88	UJ	2.96	U	3.04	U
23	17	Benzoic Acid	10	U	19.2	UJ	19.7	U	20.3	U
24	18	Naphthalene	1	U	0.961	UJ	0.987	U	1.01	U
25	19	2-Methylnaphthalene	1	U	0.961	UJ	0.987	U	1.01	U
26	20	2,4,6-Trichlorophenol	5.2	U	4.8	UJ	4.94	U	5.07	U
27	21	2,4,5-Trichlorophenol	5.2	U	4.8	UJ	4.94	U	5.07	U
28	22	Acenaphthene	1	U	0.961	UJ	0.987	U	1.01	U
29	23	Dibenzofuran	1	U	0.961	UJ	0.987	U	1.01	U
30	24	Fluorene	1	U	0.961	UJ	0.987	U	1.01	U
31	25	Pentachlorophenol	5.2	U	4.8	UJ	4.94	U	5.07	U
32	26	bis(2-Ethylhexyl)phthalate	1	U	2.13	UJ	0.987	U	**1.37**	
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	5	U	50	U	50	U	50	U
37	31	Carbon Disulfide	**1.1**		2	U	2	U	2	U
38	32	2-Butanone	5	U	10	U	10	U	10	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U
40	34	Bromoform	1	U	1	U	1	U	1	U
41	35	Toluene	1	U	1	U	1	U	1	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U
43	37	Styrene	1	U	1	U	1	U	1	U
44	38	m,p-Xylene	1	U	2	U	2	U	2	U
45	39	o-Xylene	1	U	1	U	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U
48	42	Isopropylbenzene	1	U	1	U	1	U	1	U
49	43	n-Propylbenzene	1	U	1	U	1	U	1	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U
51	45	sec-Butylbenzene	1	U	1	U	1	U	1	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U
53	47	n-Butylbenzene	1	U	1	U	1	U	1	U
54	48	Naphthalene	5	U	1	U	1	U	1	U
55		Methyl tert-butyl ether	1	U	1	U	1	U	1	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**	
60	53	**TPH-D Motor Oil**	0.5	U	0.483	U	0.497	U	0.476	U
61	54	**TPH-Gasoline**	0.25	U	0.1	U	0.1	U	0.1	U
62	55									

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
1										
2										
3			LW29D		LW29D		LW29D		LW29D	
4			FZ04D		0402080-07		0406050-07		0408006-07	
5			10/27/03		2/17/04		6/8/04		8/02/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	**0.004**		**0.006**		**0.006**		**0.00694**	
66	59	Chromium (6010)	**0.019**		**0.0137**		**0.0164**		**0.015**	
67	60	Copper (6010)	**0.019**		0.01	U	0.01	U	0.01	U
68	61	Lead (7421)	**0.006**		**0.0017**		**0.0013**		**0.000613**	
69	62	Nickel (6010)	**0.02**		0.005	U	0.005	U	0.005	U
70	63	Zinc (6010)	**0.04**		**0.0336**		**0.0105**		0.01	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)	**370**		**391**		**432**		**362**	
81	74	Chloride (mg/L) (EPA 325.2)	**30**		**4.25**		**4.33**		**3.43**	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW29D		LW29D		LW29D		LW29D	
4			FZ04D		0402080-07		0406050-07		0408006-07	
5			10/27/03		2/17/04		6/8/04		8/02/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.69		7.14		7.02		6.05	
89	82	Temperature (° C) (avg)	16.0		13		14.5		14.7	
90	83	Conductivity (um/hos)	569		529		474		726	
91	84	Dissolved oxygen (mg/L) (avg)	3.36		2.18		1.41		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	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW29D		LW29D		LW29D		LW29D	
4			FZ04D		0402080-07		0406050-07		0408006-07	
5			10/27/03		2/17/04		6/8/04		8/02/04	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	0.1	U	0.0489	UJ	0.05	U	0.05	U
126		2-Methylnaphthalene	0.1	U	NA		NA		NA	
127		Acenaphthylene	0.1	U	0.0489	UJ	0.05	U	0.05	U
128		Acenaphthene	0.1	U	0.0489	UJ	0.05	U	0.05	U
129		Fluorene	0.1	U	0.0489	UJ	0.05	U	0.05	U
130		Anthracene	0.1	U	0.0489	UJ	0.05	U	1.01	U
131		Dibenzofuran	0.1	U	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
1										
2										
3			LW30D		LW30D		LW30D		LW30D	
4			FZ04F		0402085-02		0406050-09		0408020-05	
5			10/27/03		2/18/04		6/8/04		8/03/04	
6										
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	2.2	U	2.06	U	1.95	U	1.98	U
20	14	4-Methylphenol	1.1	U	10.3	U	9.76	U	9.92	U
21	15	Isophorone	1.1	U	1.03	U	0.976	U	0.992	U
22	16	2,4-Dimethylphenol	3.3	U	3.09	U	2.93	U	2.98	U
23	17	Benzoic Acid	11	U	20.6	U	19.5	U	19.8	U
24	18	Naphthalene	1.1	U	1.03	U	0.976	U	0.992	U
25	19	2-Methylnaphthalene	1.1	U	1.03	U	0.976	U	0.992	U
26	20	2,4,6-Trichlorophenol	5.6	U	5.15	U	4.88	U	4.96	U
27	21	2,4,5-Trichlorophenol	5.6	U	5.15	U	4.88	U	4.96	U
28	22	Acenaphthene	1.1	U	1.03	U	0.976	U	0.992	U
29	23	Dibenzofuran	1.1	U	1.03	U	0.976	U	0.992	U
30	24	Fluorene	1.1	U	1.03	U	0.976	U	0.992	U
31	25	Pentachlorophenol	5.6	U	5.15	U	4.88	U	4.96	U
32	26	bis(2-Ethylhexyl)phthalate	1.1	U	1.03	U	0.976	U	**1.73**	
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	**5.1**		50	UJ	50	U	50	U
37	31	Carbon Disulfide	1	U	**2.11**	J	2	U	2	U
38	32	2-Butanone	5	U	10	UJ	10	U	10	U
39	33	Benzene	1	U	0.4	UJ	0.3	U	0.3	U
40	34	Bromoform	1	U	1	UJ	1	U	1	U
41	35	Toluene	1	U	1	UJ	1	U	1	U
42	36	Ethylbenzene	1	U	1	UJ	1	U	1	U
43	37	Styrene	1	U	1	UJ	1	U	1	U
44	38	m,p-Xylene	1	U	2	UJ	2	U	2	U
45	39	o-Xylene	1	U	1	UJ	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	UJ	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	UJ	1	U	1	U
48	42	Isopropylbenzene	1	U	1	UJ	1	U	1	U
49	43	n-Propylbenzene	1	U	1	UJ	1	U	1	U
50	44	tert-Butylbenzene	1	U	1	UJ	1	U	1	U
51	45	sec-Butylbenzene	1	U	1	UJ	1	U	1	U
52	46	4-Isopropyltoluene	1	U	1	UJ	1	U	1	U
53	47	n-Butylbenzene	1	U	1	UJ	1	U	1	U
54	48	Naphthalene	5	U	1	UJ	1	U	1	U
55		Methyl tert-butyl ether	1	U	1	UJ	1	U	1	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**	
60	53	**TPH-D Motor Oil**	0.5	U	0.493	U	0.517	U	0.478	U
61	54	**TPH-Gasoline**	0.25	U	0.1	U	0.1	U	0.1	U
62	55									

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
1										
2										
3			LW30D		LW30D		LW30D		LW30D	
4			FZ04F		0402085-02		0406050-09		0408020-05	
5			10/27/03		2/18/04		6/8/04		8/03/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	**0.01**		**0.009**		**0.015**		**0.0128**	
66	59	Chromium (6010)	**0.026**		**0.0196**		**0.119**		0.005	U
67	60	Copper (6010)	**0.04**		**0.016**		**0.156**		0.01	U
68	61	Lead (7421)	**0.008**		**0.0033**		**0.0292**		**0.00221**	
69	62	Nickel (6010)	**0.03**		0.005	U	**0.0682**		0.005	U
70	63	Zinc (6010)	**0.07**		**0.0383**		**0.264**		**0.0504**	
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)	**270**		**304**		**248**		**356**	
81	74	Chloride (mg/L) (EPA 325.2)	**7.3**		**8.36**		**7.41**		**7.88**	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW30D		LW30D		LW30D		LW30D	
4			FZ04F		0402085-02		0406050-09		0408020-05	
5			10/27/03		2/18/04		6/8/04		8/03/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.65		6.86		6.69		6.12	
89	82	Temperature (° C) (avg)	13.8		13.8		14.7		14.8	
90	83	Conductivity (um/hos)	426		450		478		677	
91	84	Dissolved oxygen (mg/L) (avg)	1.96		2		1.34		3.06	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW30D		LW30D		LW30D		LW30D	
4			FZ04F		0402085-02		0406050-09		0408020-05	
5			10/27/03		2/18/04		6/8/04		8/03/04	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	0.11	U	0.0506	U	0.05	U	0.05	U
126		2-Methylnaphthalene	0.11	U	NA		NA		NA	
127		Acenaphthylene	0.11	U	0.0506	U	0.05	U	0.05	U
128		Acenaphthene	0.11	U	0.0506	U	0.05	U	0.05	U
129		Fluorene	0.11	U	0.0506	U	0.05	U	0.05	U
130		Anthracene	0.11	U	0.0506	U	0.05	U	0.05	U
131		Dibenzofuran	0.11	U	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
1										
2										
3			LW32D		LW32D		LW32D		LW32D	
4			FZ04I		0402080-06		0406050-05		0408006-05	
5			10/27/03		2/17/04		6/8/04		8/02/04	
6										
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	2.1	U	1.93	U	2.02	U	2.02	U
20	14	4-Methylphenol	1.1	U	9.65	U	10.1	U	10.1	U
21	15	Isophorone	1.1	U	0.965	U	1.01	U	1.01	U
22	16	2,4-Dimethylphenol	3.2	U	2.9	U	3.04	U	3.03	U
23	17	Benzoic Acid	11	U	19.3	U	20.2	U	20.2	U
24	18	Naphthalene	1.1	U	0.965	U	1.01	U	1.01	U
25	19	2-Methylnaphthalene	1.1	U	0.965	U	1.01	U	1.01	U
26	20	2,4,6-Trichlorophenol	5.3	U	4.83	U	5.06	U	5.05	U
27	21	2,4,5-Trichlorophenol	5.3	U	4.83	U	5.06	U	5.05	U
28	22	Acenaphthene	1.1	U	0.965	U	1.01	U	1.01	U
29	23	Dibenzofuran	1.1	U	0.965	U	1.01	U	1.01	U
30	24	Fluorene	1.1	U	0.965	U	1.01	U	1.01	U
31	25	Pentachlorophenol	5.3	U	4.83	U	5.06	U	5.05	U
32	26	bis(2-Ethylhexyl)phthalate	**2.2**		2.51	U	**2.21**		**2.01**	
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	5	U	50	U	50	U	50	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U
38	32	2-Butanone	5	U	10	U	10	U	10	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U
40	34	Bromoform	1	U	1	U	1	U	1	U
41	35	Toluene	1	U	1	U	1	U	1	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U
43	37	Styrene	1	U	1	U	1	U	1	U
44	38	m,p-Xylene	1	U	2	U	2	U	2	U
45	39	o-Xylene	1	U	1	U	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U
48	42	Isopropylbenzene	1	U	1	U	1	U	1	U
49	43	n-Propylbenzene	1	U	1	U	1	U	1	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U
51	45	sec-Butylbenzene	1	U	1	U	1	U	1	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U
53	47	n-Butylbenzene	1	U	1	U	1	U	1	U
54	48	Naphthalene	5	U	1	U	1	U	1	U
55		Methyl tert-butyl ether	1	U	1	U	1	U	1	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**	
60	53	**TPH-D Motor Oil**	0.5	U	0.491	U	0.559	U	0.496	U
61	54	**TPH-Gasoline**	0.25	U	0.1	U	0.1	U	0.1	U
62	55									

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
1										
2										
3			LW32D		LW32D		LW32D		LW32D	
4			FZ04I		0402080-06		0406050-05		0408006-05	
5			10/27/03		2/17/04		6/8/04		8/02/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	**0.004**		**0.009**		**0.010**		**0.01**	
66	59	Chromium (6010)	**0.063**		**0.0202**		**0.0261**		**0.0183**	
67	60	Copper (6010)	**0.082**		**0.0109**		0.01	U	0.01	U
68	61	Lead (7421)	**0.018**		**0.0028**		**0.0020**		**0.00195**	
69	62	Nickel (6010)	**0.05**		0.005	U	0.005	U	0.005	U
70	63	Zinc (6010)	**0.146**		**0.0251**		**0.0189**		**0.0238**	
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)	**270**		**332**		**343**		**272**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.7**		**2.77**		**2.92**		**2.72**	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW32D		LW32D		LW32D		LW32D	
4			FZ04I		0402080-06		0406050-05		0408006-05	
5			10/27/03		2/17/04		6/8/04		8/02/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.80		6.82		6.85		6.05	
89	82	Temperature (° C) (avg)	15.8		13.1		14.6		14.8	
90	83	Conductivity (um/hos)	436		474		421		646	
91	84	Dissolved oxygen (mg/L) (avg)	5.75		2.29		1.35		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	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW32D		LW32D		LW32D		LW32D	
4			FZ04I		0402080-06		0406050-05		0408006-05	
5			10/27/03		2/17/04		6/8/04		8/02/04	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	0.11	U	0.0473	UJ	0.05	U	**0.07**	
126		2-Methylnaphthalene	0.11	U	NA		NA		NA	
127		Acenaphthylene	0.11	U	0.0473	UJ	0.05	U	0.05	U
128		Acenaphthene	0.11	U	0.0473	UJ	0.05	U	0.05	U
129		Fluorene	0.11	U	0.0473	UJ	0.05	U	0.05	U
130		Anthracene	0.11	U	0.0473	UJ	0.05	U	0.05	U
131		Dibenzofuran	0.11	U	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
1										
2										
3			LW35D		LW35D		LW35D		LW35D	
4			FZ04K		0402115-09		0406040-02		0408056-02	
5			10/27/03		2/24/04		6/7/04		8/09/04	
6										
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	2.9	U	1.99	U	2.01	U	1.95	U
20	14	4-Methylphenol	1.4	U	9.95	U	10	U	9.75	U
21	15	Isophorone	1.4	U	0.995	U	1	U	0.975	U
22	16	2,4-Dimethylphenol	4.3	U	2.99	U	3.01	U	2.92	U
23	17	Benzoic Acid	14	U	19.9	U	20.1	U	19.5	U
24	18	Naphthalene	1.4	U	0.995	U	1	U	0.975	U
25	19	2-Methylnaphthalene	1.4	U	0.995	U	1	U	0.975	U
26	20	2,4,6-Trichlorophenol	7.1	U	4.98	U	5.02	U	4.87	U
27	21	2,4,5-Trichlorophenol	7.1	U	4.98	U	5.02	U	4.87	U
28	22	Acenaphthene	1.4	U	0.995	U	1	U	0.975	U
29	23	Dibenzofuran	1.4	U	0.995	U	1	U	0.975	U
30	24	Fluorene	1.4	U	0.995	U	1	U	0.975	U
31	25	Pentachlorophenol	7.1	U	4.98	U	5.02	U	4.87	U
32	26	bis(2-Ethylhexyl)phthalate	**2.7**		0.995	U	1	U	0.975	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
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U
38	32	2-Butanone	5	U	10	U	10	U	10	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U
40	34	Bromoform	1	U	1	U	1	U	1	U
41	35	Toluene	1	U	1	U	1	U	1	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U
43	37	Styrene	1	U	1	U	1	U	1	U
44	38	m,p-Xylene	1	U	2	U	2	U	2	U
45	39	o-Xylene	1	U	1	U	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U
48	42	Isopropylbenzene	**2.2**		**2.05**		1	U	1	U
49	43	n-Propylbenzene	1	U	1	U	1	U	1	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U
51	45	sec-Butylbenzene	1	U	1	U	1	U	1	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U
53	47	n-Butylbenzene	1	U	1	U	1	U	1	U
54	48	Naphthalene	5	U	1	U	1	U	1	U
55		Methyl tert-butyl ether	**1.5**		1	U	1	U	1	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**	
60	53	**TPH-D Motor Oil**	0.5	U	0.486	U	0.492	U	0.48	U
61	54	**TPH-Gasoline**	0.25	U	0.1	U	**0.102**		0.1	U
62	55									

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
1										
2										
3			LW35D		LW35D		LW35D		LW35D	
4			FZ04K		0402115-09		0406040-02		0408056-02	
5			10/27/03		2/24/04		6/7/04		8/09/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	**0.018**		**0.002**		**0.004**		0.001	U
66	59	Chromium (6010)	**0.35**		**0.0165**		**0.0326**		**0.0172**	
67	60	Copper (6010)	**0.37**		0.01	U	**0.0107**		**0.0241**	
68	61	Lead (7421)	**0.12**		**0.0042**		**0.0082**		**0.00314**	
69	62	Nickel (6010)	**0.32**		0.005	U	**0.0114**		**0.0186**	
70	63	Zinc (6010)	**0.93**		**0.0128**		**0.0444**		**0.0427**	
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)	**240**		**263**		**364**		**322**	
81	74	Chloride (mg/L) (EPA 325.2)	**3.2**		**1.53**		**1.97**		**1.63**	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW35D		LW35D		LW35D		LW35D	
4			FZ04K		0402115-09		0406040-02		0408056-02	
5			10/27/03		2/24/04		6/7/04		8/09/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.51		6.44		5.19		5.59	
89	82	Temperature (° C) (avg)	14.9		13.3		13.8		14.1	
90	83	Conductivity (um/hos)	526		272		428		722	
91	84	Dissolved oxygen (mg/L) (avg)	0.58		4.29		2.15		3.09	
92	85									
93	86	**DIOXINS AND FURANS (ng/L)**								
94	87	**Method 8290**								
95	88	2,3,7,8-TCDF	NA		NA		NA		NA	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW35D		LW35D		LW35D		LW35D	
4			FZ04K		0402115-09		0406040-02		0408056-02	
5			10/27/03		2/24/04		6/7/04		8/09/04	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	0.14	U	0.0509	U	**0.133**		0.0487	U
126		2-Methylnaphthalene	0.14	U	NA		NA		NA	
127		Acenaphthylene	0.14	U	0.0509	U	0.0513	U	**0.0584**	
128		Acenaphthene	0.14	U	0.0509	U	0.0513	U	0.0487	U
129		Fluorene	0.14	U	0.0509	U	0.0513	U	**0.477**	
130		Anthracene	0.14	U	0.0509	U	0.0513	U	0.0487	U
131		Dibenzofuran	0.14	U	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	AC	AD
1																														
2																														
3			O		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		CB85C	
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		8/30/00	
6																														
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		NA	
10	4	2,4,6-Trichlorophenol	NA		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		NA	
12	6	2,4,5-Trichlorophenol	NA		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		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		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		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	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	1.0	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	**1.6**		**1.0**		1.0	U	**1.2**		1.0	U	1.0	U	1.0	U	**1.9**	
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	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**		**2.9**	
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	**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	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	**45**	
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	**7.1**		5.0	U	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	**18**	
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	**1.1**		**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	**1.8**	
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	**1.5**		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	**1.3**	
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	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**	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	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**		**26**	
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**		**15**	
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	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**		**5.1**	
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	**1.9**		**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**		**2.0**	
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	5.0	U
55		Methyl tert-butyl ether	NA		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		NA	
60	53	**TPH-D Motor Oil**	NA		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		NA	
62	55																													

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

	B	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	
4		CL03P		CT55I		DE87A		DM30S		DW48E		ED23F		EM75L		ER93A		EY88A		FF88I		FL66B		FU45T		FY82Q	
5		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	
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	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	1.1	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	1.1	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	3.3	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	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	1.1	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	1.1	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	5.6	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	5.6	U	5.4	U	5.1	U	5	U	5.7	U	5.2	U
28	Acenaphthene	**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	1.1	U	1.1	U	1	U	1	U	1.1	U	1	U
30	Fluorene	**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	5.6	U	5.4	U	5.1	U	5	U	5.7	U	5.2	U
32	bis(2-Ethylhexyl)phthalate	**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	**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	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	U	5	U	5	U	5	U	5	U	5	U
39	Benzene	**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	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	**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	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	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	**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	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	**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	U	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	**33**		**26**		**37**		**32**		**64**		**31**		**30**		**5.6**		**46**		1	U	**3.4**		**27**		**27**	
49	n-Propylbenzene	**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	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	**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	U	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	**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	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**	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																											

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	AC	AD
1																														
2																														
3			O		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		CB85C	
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		8/30/00	
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		NA	
66	59	Chromium (6010)	NA		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		NA	
68	61	Lead (7421)	NA		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		NA	
70	63	Zinc (6010)	NA		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		NA	
74	67	Magnesium (mg/L) (6010)	NA		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		NA	
76	69	Sodium (mg/L) (6010)	NA		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		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		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		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		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		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		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		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		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		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	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	
4		CL03P		CT55I		DE87A		DM30S		DW48E		ED23F		EM75L		ER93A		EY88A		FF88I		FL66B		FU45T		FY82Q	
5		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	
63	**PRIORITY POLLUTANT**																										
64	**METALS (mg/L)**																										
65	Arsenic (7060)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
66	Chromium (6010)	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	
68	Lead (7421)	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	
70	Zinc (6010)	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	
74	Magnesium (mg/L) (6010)	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	
76	Sodium (mg/L) (6010)	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	
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-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	AC	AD
1																														
2																														
3			O		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		CB85C	
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		8/30/00	
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		5.85	
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		15.9	
90	83	Conductivity (um/hos)	413		412		389		471		437		531		183		366		391		441		337		427		413		409	
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		1.16	
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		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		NA	
97	90	2,3,7,8-TCDD	NA		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		NA	
99	92	1,2,3,7,8-PeCDF	NA		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		NA	
101	94	Total PeCDF	NA		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		NA	
103	96	Total PeCDD	NA		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		NA	
105	98	1,2,3,6,7,8-HxCDF	NA		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		NA	
107	100	1,2,3,7,8,9-HxCDF	NA		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		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		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		NA	
111	104	1,2,3,7,8,9-HxCDD	NA		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		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		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		NA	
115	108	Total HpCDF	NA		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		NA	
117	110	Total HpCDD	NA		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		NA	
119	112	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	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	
4		CL03P		CT55I		DE87A		DM30S		DW48E		ED23F		EM75L		ER93A		EY88A		FF88I		FL66B		FU45T		FY82Q	
5		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)	5.70		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)	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)	437		445		510		563		536		500		471		464		592		431		327		514		467	
91	Dissolved oxygen (mg/L) (avg)	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	
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

	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	AC	AD
1																														
2																														
3			O		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		CB85C	
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		8/30/00	
6																														
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		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		**0.31**		NA		NA		NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		**0.92**		NA		NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		**0.28**	M	NA		NA		NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		0.10	U	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	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	
4		CL03P		CT55I		DE87A		DM30S		DW48E		ED23F		EM75L		ER93A		EY88A		FF88I		FL66B		FU45T		FY82Q	
5		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	
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

	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	AC	AD
1																														
2																														
3			R		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		CB85D	
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		8/30/00	
6																														
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		NA	
10	4	2,4,6-Trichlorophenol	NA		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		NA	
12	6	2,4,5-Trichlorophenol	NA		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		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		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		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	**8.4**	
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	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	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	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	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	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	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	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	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	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	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	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	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	U	**1.0**		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	**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	**22**	
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	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	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**		**120**	
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	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	**6.3**	
42	36	Ethylbenzene	1.0	U	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	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	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	**5.8**	
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	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	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	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**		**33**	
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**		**18**	
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	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**		**5.6**	
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	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	2.0	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	5.0	U	5.0	U
55		Methyl tert-butyl ether	NA		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		NA	
60	53	**TPH-D Motor Oil**	NA		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		NA	
62	55																													

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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	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	
4		CL03Q		CT55J		DE87B		DM30T		DW48F		ED23G		EM75M		ER93B		EY88B		FF88J		FL66C		FU45U		FY82R	
5		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	
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	**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	1.1	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	1.1	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	3.2	U	3.3	U	3	U	3	U	3	U	3	U
23	Benzoic Acid	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	1.1	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	1.1	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	5.3	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	5.3	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	1.1	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	1.1	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	1.1	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	5.3	U	5.4	U	5	U	5	U	5	U	5	U
32	bis(2-Ethylhexyl)phthalate	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	**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	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	U	5	U	5	U	5	U	5	U	5	U
39	Benzene	**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	U	1	U	1	U	1	U	1	U	1	U
41	Toluene	**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	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	U	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	**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	U	1	U	1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	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	U	1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	**24**		**11**		**26**		**30**		**17**		**2.6**		**7.3**		**36**		**34**		**8.8**		1	U	**46**		**43**	
49	n-Propylbenzene	**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	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	**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	U	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	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	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**	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																											

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	AC	AD
1																														
2																														
3			R		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		CB85D	
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		8/30/00	
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		NA	
66	59	Chromium (6010)	NA		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		NA	
68	61	Lead (7421)	NA		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		NA	
70	63	Zinc (6010)	NA		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		NA	
74	67	Magnesium (mg/L) (6010)	NA		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		NA	
76	69	Sodium (mg/L) (6010)	NA		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		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		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		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		NA	
81	74	Chloride (mg/L) (EPA 325.2)	NA		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		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		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		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		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	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	
4		CL03Q		CT55J		DE87B		DM30T		DW48F		ED23G		EM75M		ER93B		EY88B		FF88J		FL66C		FU45U		FY82R	
5		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	
63	**PRIORITY POLLUTANT**																										
64	**METALS (mg/L)**																										
65	Arsenic (7060)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
66	Chromium (6010)	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	
68	Lead (7421)	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	
70	Zinc (6010)	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	
74	Magnesium (mg/L) (6010)	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	
76	Sodium (mg/L) (6010)	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	
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																											

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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	AC	AD
1																														
2																														
3			R		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		CB85D	
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		8/30/00	
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		6.10	
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		15.0	
90	83	Conductivity (um/hos)	503		629		1007		319		510		591		179		246		471		566		578		533		502		560	
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		1.90	
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		NA	
96	89	Total TCDF	NA		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		NA	
98	91	Total TCDD	NA		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		NA	
100	93	2,3,4,7,8-PeCDF	NA		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		NA	
102	95	1,2,3,7,8-PeCDD	NA		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		NA	
104	97	1,2,3,4,7,8-HxCDF	NA		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		NA	
106	99	2,3,4,6,7,8-HxCDF	NA		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		NA	
108	101	Total HxCDF	NA		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		NA	
110	103	1,2,3,6,7,8-HxCDD	NA		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		NA	
112	105	Total HxCDD	NA		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		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		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		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		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		NA	
118	111	OCDF	NA		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		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	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	
4		CL03Q		CT55J		DE87B		DM30T		DW48F		ED23G		EM75M		ER93B		EY88B		FF88J		FL66C		FU45U		FY82R	
5		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)	5.91		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)	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)	571		661		694		628		600		170		591		631		NM		598		244		630		644	
91	Dissolved oxygen (mg/L) (avg)	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	
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

	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	AC	AD
1																														
2																														
3			R		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		CB85D	
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		8/30/00	
123		**PAHs (µg/L)**																												
124		**EPA Method SW8270 SIM**																												
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		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	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	
4		CL03Q		CT55J		DE87B		DM30T		DW48F		ED23G		EM75M		ER93B		EY88B		FF88J		FL66C		FU45U		FY82R	
5		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	
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

	A	B	C	D	E	F	G	H
1								
2								
3			OX8D		OX8D		OX8D	
4			FY72F		0402086-05		0408026-10	
5			10/22/03		2/18/04		8/04/04	
6								
7	1	**CHLORINATED PHENOLS (µg/L)**						
8	2	**EPA Method SW8040**						
9	3	Pentachlorophenol	**0.62**		**1.31**		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	NA		NA		2	U
20	14	4-Methylphenol	NA		NA		10	U
21	15	Isophorone	NA		NA		1	U
22	16	2,4-Dimethylphenol	NA		NA		3	U
23	17	Benzoic Acid	NA		NA		20	U
24	18	Naphthalene	NA		NA		1	U
25	19	2-Methylnaphthalene	NA		NA		1	U
26	20	2,4,6-Trichlorophenol	NA		NA		5	U
27	21	2,4,5-Trichlorophenol	NA		NA		5	U
28	22	Acenaphthene	NA		NA		1	U
29	23	Dibenzofuran	NA		NA		1	U
30	24	Fluorene	NA		NA		1	U
31	25	Pentachlorophenol	NA		NA		5	U
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		4.47	U
33	27							
34	28	**VOLATILES (µg/L)**						
35	29	**EPA Method SW8260**						
36	30	Acetone	NA		NA		50	U
37	31	Carbon Disulfide	NA		NA		2	U
38	32	2-Butanone	NA		NA		10	U
39	33	Benzene	NA		NA		0.3	U
40	34	Bromoform	NA		NA		1	U
41	35	Toluene	NA		NA		1	U
42	36	Ethylbenzene	NA		NA		1	U
43	37	Styrene	NA		NA		1	U
44	38	m,p-Xylene	NA		NA		2	U
45	39	o-Xylene	NA		NA		1	U
46	40	1,3,5-Trimethylbenzene	NA		NA		1	U
47	41	1,2,4-Trimethylbenzene	NA		NA		**2.49**	J
48	42	Isopropylbenzene	NA		NA		1	U
49	43	n-Propylbenzene	NA		NA		1	U
50	44	tert-Butylbenzene	NA		NA		1	U
51	45	sec-Butylbenzene	NA		NA		1	U
52	46	4-Isopropyltoluene	NA		NA		1	U
53	47	n-Butylbenzene	NA		NA		1	U
54	48	Naphthalene	NA		NA		1	U
55		Methyl tert-butyl ether	NA		NA		1	U
56	49							
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**						
58	51	**Method OR-DEQ**						
59	52	**TPH-Diesel**	NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA	
62	55							

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
1								
2								
3			OX8D		OX8D		OX8D	
4			FY72F		0402086-05		0408026-10	
5			10/22/03		2/18/04		8/04/04	
63	56	**PRIORITY POLLUTANT**						
64	57	**METALS (mg/L)**						
65	58	Arsenic (7060)	NA		NA		**0.0224**	
66	59	Chromium (6010)	NA		NA		**0.0204**	
67	60	Copper (6010)	NA		NA		0.01	U
68	61	Lead (7421)	NA		NA		**0.00274**	
69	62	Nickel (6010)	NA		NA		0.005	U
70	63	Zinc (6010)	NA		NA		**0.0238**	
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)	NA		NA		**326**	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		**7.67**	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			OX8D		OX8D		OX8D	
4			FY72F		0402086-05		0408026-10	
5			10/22/03		2/18/04		8/04/04	
87	80	**FIELD PARAMETERS**						
88	81	pH (avg)	7.00		7.02		6.38	
89	82	Temperature (° C) (avg)	15.5		14.1		14.6	
90	83	Conductivity (um/hos)	406		418		605	
91	84	Dissolved oxygen (mg/L) (avg)	1.24		20.49		3.01	
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 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	A	B	C	D	E	F	G	H
1								
2								
3			OX8D		OX8D		OX8D	
4			FY72F		0402086-05		0408026-10	
5			10/22/03		2/18/04		8/04/04	
123		**PAHs (µg/L)**						
124		**EPA Method SW8270 SIM**						
125		Naphthalene	NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA	
127		Acenaphthylene	NA		NA		1	U
128		Acenaphthene	NA		NA		NA	
129		Fluorene	NA		NA		NA	
130		Anthracene	NA		NA		1	U
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
2															Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2
3			RW2		RW2		RW2		RW2		RW2		RW2		X		RW2		X		RW2		X		RW2		X
4			AH76G		AU45N		BC30E		BH96F		BR64P		CD97A		CD97B		CL03N		CL03M		CT37L		CT37M		DE87P		DE87O
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		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	**0.68**
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		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		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		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		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		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		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	2.0
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	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	**21**		**22**		10	U	10	U	10	U	10
24	18	Naphthalene	**1.3**		**18**		**3.8**		**9.7**		**3.7**		**16**		**16**		**13**		**14**		**2.5**		**2.2**		1.0	U	1.0
25	19	2-Methylnaphthalene	1.0	U	**33**		**1.8**		**20**		**23**		**44**		**41**		**31**		**32**		**10**		**9.1**		**2.0**		**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	5.0
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	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	**140**		**9.6**		5.0	U	**680**		**51**		**490**	J2	**440**	J2	**77**		**95**		**26**	J	**30**	J	5.0	U	5.0
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	1.0
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	5.0
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	1.0
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	5.0
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	1.0
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	1.0
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	1.0
42	36	Ethylbenzene	**25**		**45**		**13**		**22**		**3.9**		**28**		**27**		**27**		**29**		**4.8**		**4.3**		1.0	U	1.0
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	1.0
44	38	m,p-Xylene	**61**		**120**		**25**		**53**		**8.2**		**78**		**76**		**78**		**81**		**10**		**9.6**		1.0	U	1.0
45	39	o-Xylene	**20**		**37**		**11**		**26**		**2.6**		**28**		**28**		**15**		**15**		**2.1**		**2.2**		1.0	U	1.0
46	40	1,3,5-Trimethylbenzene	**100**		**91**		**42**		**120**		**49**		**100**		**100**		**58**		**66**		**12**		**11**		1.0	U	1.0
47	41	1,2,4-Trimethylbenzene	**370**		**330**		**110**		**360**		**150**		**180**	M	**190**	M	**200**		**220**		**42**		**40**		**3.6**		**3.8**
48	42	Isopropylbenzene	**78**		**65**		**29**		**79**		**52**		**70**		**73**		**57**		**68**		**30**		**29**		**11**		**11**
49	43	n-Propylbenzene	**130**		**77**		**38**		**110**		**86**		**88**		**90**		**75**		**90**		**37**		**34**		**12**		**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	1.0
51	45	sec-Butylbenzene	**18**		**17**		**5.5**		**21**		**16**		**15**		**16**		**11**		**14**		**4.9**		**4.7**		**1.6**		**1.7**
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	1.0
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	1.2
54	48	Naphthalene	**18**		**30**		**8.3**		**25**		**7.0**		**28**		**30**		**22**		**25**		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**	**2.2**		**2.6**		**1.2**		**2.4**		**1.5**		**3.4**		**3.8**		**5.2**		**5.0**		**1.7**		**1.7**		**0.86**		**0.88**
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	0.50
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**		**0.66**
62	55																										

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
2					Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2	
3			RW2		W		RW2		W		RW2		W		RW2		W		RW2		W		RW2		W	
4			DM30I		DM30H		DW29E		DW29C		ED30D		ED30A		EN00D		EN00A		ER93G		ER93I		EZ17D		EZ17B	
5			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		11/13/02	
7	**CHLORINATED PHENOLS (µg/L)**																									
8	**EPA Method SW8040**																									
9	Pentachlorophenol		**5.0**		**5.0**		**1.7**		**1.8**		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	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	U	2.2	U
20	4-Methylphenol	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	U	1.1	U
21	Isophorone	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	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	3.8	U	3.3	U	3.3	U	3.3	U
23	Benzoic Acid	U	10	U	10	U	30	U	30	U	50	U	50	U	50	U	50	U	62	U	54	U	54	U	54	U
24	Naphthalene	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**		**3.7**	
25	2-Methylnaphthalene		**6.5**		**6.4**		**5.7**	J	**7.0**	J	**18**		**17**		**11**	J	**14**	J	**15**		**13**		**11**		**9.6**	
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	6.2	U	5.4	U	5.4	U	5.4	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	6.2	U	5.4	U	5.4	U	5.4	U
28	Acenaphthene	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	U	1.1	U
29	Dibenzofuran	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	U	1.1	U
30	Fluorene	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	U	1.1	U
31	Pentachlorophenol	U	5.0	U	5.0	U	5.0	UJ	5.0	U	**8.6**		**8.2**		**76**		**75**		**26**	J	**36**	J	**37**		**35**	
32	bis(2-Ethylhexyl)phthalate	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	U	4.3	U
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	5.0	U	5.0	U	5.1	U	**5.2**		**6.4**		5	U	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
38	2-Butanone	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	U	5	U
39	Benzene	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**		**3.1**	
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
41	Toluene	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	U	1	U
42	Ethylbenzene	U	**3.1**		**3.4**		**1.5**		**1.4**		**27**		**28**		**15**		**15**		**13**		**13**		**7.9**		**7.3**	
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
44	m,p-Xylene	U	**6.8**		**7.8**		**3.0**		**2.6**		**59**		**62**		**32**		**33**		**38**		**34**		**17**		**16**	
45	o-Xylene	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**		**2.2**	
46	1,3,5-Trimethylbenzene	U	**6.5**		**6.7**		**3.9**		**3.7**		**44**		**44**		**21**		**23**		**27**		**24**		**9.8**		**9.6**	
47	1,2,4-Trimethylbenzene		**23**		**26**		**13**		**12**		**150**		**150**		**62**		**62**		**84**		**78**		**37**		**36**	
48	Isopropylbenzene		**24**		**25**		**30**		**30**		**54**		**51**		**46**		**44**		**44**		**45**		**37**		**36**	
49	n-Propylbenzene		**28**		**29**		**36**		**37**		**76**		**73**		**58**		**57**		**58**		**59**		**46**		**45**	
50	tert-Butylbenzene	U	**1.1**	M	**1.0**		**1.1**		**1.1**		**2.0**		**1.9**		**1.6**		**1.4**		**1.7**		**1.8**		**1.6**		**1.5**	
51	sec-Butylbenzene		**3.9**		**4.1**		**4.7**		**4.7**		**9.6**		**9.5**		**8.4**		**8.2**		**8.3**		**8.4**		**6.7**		**6.3**	
52	4-Isopropyltoluene	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**		**1.2**	
53	n-Butylbenzene	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**	M	**4.8**	M
54	Naphthalene	U	5.0	U	**5.0**		5.0	U	5.0	U	**15**		**16**		**8.7**		**8.5**		**10**		**9.9**		**6.3**		**5.7**	
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**		**1.4**		**1.2**		**1.4**		**1.4**		**1.9**	J	**0.89**	J	**1.8**		**1.9**		**1.7**		**1.6**		**1.3**		**1.3**	
60	**TPH-D Motor Oil**	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	U	0.5	U
61	**TPH-Gasoline**		**1.3**		**1.3**		**1.2**		NA		**4.0**	J	**3.8**		**2.6**		**2.6**		**2.9**		**3**		**2.1**		**2.4**	
62																										

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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	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX
2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2									
3		RW2		W		RW2		W		RW2		W		RW2		W		RW2		RW2		Dup of RW2		RW2	
4		FF65I		FF65K		FL41O		FL41Q		FU31F		FU31E		FY82D		FY82A		0402113-04		0406059-02		0406059-01		0408036-06	
5		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		6/9/04		8/05/04	
7	**CHLORINATED PHENOLS (µg/L)**																								
8	**EPA Method SW8040**																								
9	Pentachlorophenol	NA		NA		NA		NA		**10**		NA		NA		NA		**8.51**		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	U	2	U	2	U	2	U	2.1	U	2.1	U	2	U	2	U	1.98	U	2.05	U	1.95	U	2	U
20	4-Methylphenol	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	9.89	U	10.2	U	9.75	U	10	U
21	Isophorone	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.989	U	1.02	U	0.975	U	1	U
22	2,4-Dimethylphenol	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	2.92	U	3	U
23	Benzoic Acid	50	U	50	U	50	U	51	U	52	U	52	U	10	U	10	U	19.8	U	20.5	U	19.5	U	20	U
24	Naphthalene	**4.9**		**5.3**		**4.2**		**4**		**1.3**		**1.7**		**1.8**		**1.3**		0.989	U	**1.56**		**1.69**		**1.58**	
25	2-Methylnaphthalene	**13**		**14**		**13**		**12**		**4.8**	J	**6.2**	J	**7.2**	J	**5.4**	J	0.989	U	**5.41**		**6.08**		**5.49**	
26	2,4,6-Trichlorophenol	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	4.87	U	5	U
27	2,4,5-Trichlorophenol	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	4.87	U	5	U
28	Acenaphthene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.989	U	1.02	U	0.975	U	1	U
29	Dibenzofuran	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.989	U	1.02	U	0.975	U	1	U
30	Fluorene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.989	U	1.02	U	0.975	U	1	U
31	Pentachlorophenol	**28**		**33**		**12**		**12**		**5.5**		**6.9**		**8.1**		**6.4**		4.95	U	**47.3**		**46.7**		**12.9**	
32	bis(2-Ethylhexyl)phthalate	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.989	U	1.02	U	0.975	U	1	U
33																									
34	**VOLATILES (µg/L)**																								
35	**EPA Method SW8260**																								
36	Acetone	5	U	5	U	5	U	**6.2**	M	5	U	5	U	5	U	5	U	50	U	50	U	50	U	50	U
37	Carbon Disulfide	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	2	U	2	U	2	U	2	U
38	2-Butanone	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	10	U	10	U	10	U	10	U
39	Benzene	**2.4**		**2.4**		**3.4**		**3.8**		**5.1**		**5.4**		**3.6**		**3.4**		**5.5**		**3.57**		**3.32**		**3.88**	
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	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	U
42	Ethylbenzene	**8.2**		**8.1**		**9.5**		**10**		**4.2**		**4.2**		**2.6**		**2.7**		**10.5**		**3.41**		**3.97**		**6.19**	
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	U
44	m,p-Xylene	**15**		**14**		**12**		**13**		**7**		**7.4**		**4.3**		**4.5**		**4.66**		**3.34**		**3.08**		**9.61**	
45	o-Xylene	**2.4**		**2.2**		1	U	1	U	1	U	1	U	1	U	1	U	**1.67**		1	U	1	U	**2.75**	
46	1,3,5-Trimethylbenzene	**14**		**13**		**19**		**19**		**8.6**		**8.5**		**4.4**		**5.1**		**18.1**		**6.98**		**7.1**		**11.5**	
47	1,2,4-Trimethylbenzene	**46**		**44**		**59**		**62**		**28**		**29**		**16**		**17**		**61**		**20.5**		**19.8**		**36**	
48	Isopropylbenzene	**50**		**51**		**41**		**45**		**30**		**29**		**28**		**29**		**36.5**		**39.3**		**41**		**60.9**	
49	n-Propylbenzene	**60**		**62**		**56**		**60**		**40**		**39**		**35**		**36**		**55.3**		**60.8**		**62.7**		**68.1**	
50	tert-Butylbenzene	**1.7**		**1.8**		**1.8**		**2**		**1.4**		**1.3**		**1.2**		**1.2**		1	U	**1.56**		**1.64**		**1.75**	
51	sec-Butylbenzene	**8**		**8.1**		**8.2**		**8.8**		**5.9**		**5.7**		**5.1**		**5.4**		**7.63**		**8.48**		**8.82**		**10.7**	
52	4-Isopropyltoluene	**1.5**		**1.4**		**1.9**		**2**		**1**		**1**		1	U	1	U	**1.85**		1	U	1	U	**1.25**	
53	n-Butylbenzene	**6**	M	**6**	M	**6.5**		**6.8**		**4.4**		**4.2**		**3.6**		**3.9**		**4.54**		**4.62**		**4.5**		**5.36**	
54	Naphthalene	**6.2**		**6.3**		**6.9**		**7.5**		5	U	5	U	5	U	5	U	**3.26**		**5.64**		**6.03**		**2.99**	
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		1	U	1	U	1	U	1	U
56																									
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																								
58	**Method OR-DEQ**																								
59	**TPH-Diesel**	**1.7**		**1.8**		**1.5**		**1.5**		**1.1**		**1**		**0.73**		**0.72**		**1.04**		**1.64**		**1.45**		**1.42**	
60	**TPH-D Motor Oil**	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	0.5	U	0.499	U
61	**TPH-Gasoline**	**2.5**		**2.6**		**2.2**		**2.4**		**1.6**		**1.6**		**1.2**		**1.2**		**2.6**		**1.72**		**1.83**		**1.72**	
62																									

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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	BY	BZ
1			
2		Dup of RW2	
3		W	
4		0408036-03	
5		8/05/04	
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	U
20	4-Methylphenol	10	U
21	Isophorone	1	U
22	2,4-Dimethylphenol	3	U
23	Benzoic Acid	20	U
24	Naphthalene	**1.87**	
25	2-Methylnaphthalene	**6.18**	
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	**13.5**	
32	bis(2-Ethylhexyl)phthalate	1	U
33			
34	**VOLATILES (µg/L)**		
35	**EPA Method SW8260**		
36	Acetone	50	U
37	Carbon Disulfide	2	U
38	2-Butanone	10	U
39	Benzene	**3.84**	J
40	Bromoform	1	U
41	Toluene	1	U
42	Ethylbenzene	**5.97**	J
43	Styrene	1	U
44	m,p-Xylene	**8.88**	J
45	o-Xylene	**2.51**	J
46	1,3,5-Trimethylbenzene	**10.2**	J
47	1,2,4-Trimethylbenzene	**33.8**	J
48	Isopropylbenzene	**64.8**	J
49	n-Propylbenzene	**69.7**	J
50	tert-Butylbenzene	**1.82**	J
51	sec-Butylbenzene	**10.7**	J
52	4-Isopropyltoluene	**1.1**	J
53	n-Butylbenzene	**5.13**	J
54	Naphthalene	**2.74**	J
55	Methyl tert-butyl ether	1	U
56			
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**		
58	**Method OR-DEQ**		
59	**TPH-Diesel**	**1.42**	
60	**TPH-D Motor Oil**	0.493	U
61	**TPH-Gasoline**	**1.8**	
62			

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															Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2
3			RW2		RW2		RW2		RW2		RW2		RW2		X		RW2		X		RW2		X		RW2		X
4			AH76G		AU45N		BC30E		BH96F		BR64P		CD97A		CD97B		CL03N		CL03M		CT37L		CT37M		DE87P		DE87O
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		6/6/01
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**		**0.016**
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	**0.005**		**0.007**		0.002	U	**0.004**		0.002	U	0.002	U	**0.003**		0.002
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	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)	**0.016**		**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	**0.189**
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**		**40.7**
74	67	Magnesium (mg/L) (6010)	**9.90**		NA		NA		NA		NA		NA		NA		NA		NA		**17.1**		**15.8**		**17.2**		**19.1**
75	68	Potassium (mg/L) (6010)	**2.5**		NA		NA		NA		NA		NA		NA		NA		NA		**2.4**		**2.1**		**3.1**		**3.0**
76	69	Sodium (mg/L) (6010)	**7.68**		NA		NA		NA		NA		NA		NA		NA		NA		**12.6**		**11.7**		**12.6**		**13.6**
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**140**		NA		NA		NA		NA		NA		NA		NA		NA		**220**		**220**		NA		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		NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**140**		NA		NA		NA		NA		NA		NA		NA		NA		**220**		**220**		NA		NA
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**190**		**190**		**160**		**150**		**160**		**390**		**360**		**320**		**310**		**290**		**280**		**300**	J	**290**
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**		**7.4**
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		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		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		NA
85	78	Sulfate (mg/L) (EPA 375.2)	**9.3**		NA		NA		NA		NA		NA		NA		NA		NA		**5.2**		**4.3**		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
1																										
2					Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2	
3			RW2		W		RW2		W		RW2		W		RW2		W		RW2		W		RW2		W	
4			DM30I		DM30H		DW29E		DW29C		ED30D		ED30A		EN00D		EN00A		ER93G		ER93I		EZ17D		EZ17B	
5			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		11/13/02	
6																										
63	**PRIORITY POLLUTANT**																									
64	**METALS (mg/L)**																									
65	Arsenic (7060)		**0.019**		**0.020**		**0.018**		**0.022**		**0.020**		**0.022**		**0.019**		**0.020**		**0.021**		**0.021**		0.05	U	0.05	U
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
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	**0.008**	J	0.002	UJ
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**		**0.001**		0.02	U	0.02	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
70	Zinc (6010)	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**		**0.017**	
71																										
72	**MAJOR IONS AND CONVENTIONALS**																									
73	Calcium (mg/L) (6010)		**39.0**		**41.0**		**39.4**		**41.6**		**38.9**		**37.5**		**42.3**		**43.3**		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)		**17.1**		**17.8**		**16.4**		**17.5**		**16.2**		**15.3**		**17.0**		**17.5**		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)		**2.8**		**2.8**		**2.4**		**2.4**		**2.5**		**2.2**		**2.3**		**2.3**		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)		**12.3**		**12.9**		**11.7**		**12.4**		**11.2**		**10.9**		**12.0**		**12.3**		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		NA		NA		NA		**220**		**200**		NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		NA		NA		1.0	U	1.0	U	NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		NA		NA		**220**		**200**		NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	J	**270**	J	**290**	J	**260**		**280**		**270**		**290**		**250**		**270**		**270**		**270**		**270**		**270**	
81	Chloride (mg/L) (EPA 325.2)		**8.9**		**8.2**		**5.5**		**5.7**		**24**	J	**4.1**	J	**6.1**		**5.8**		**4.6**		**5.1**		**4.8**		**4.6**	
82	N-Nitrate (mg-N/L) (Calculated)		NA		NA		NA		NA		**0.019**		0.010	U	NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		NA		NA		NA		**0.014**	J	**0.038**	J	NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		NA		NA		NA		**0.033**		**0.028**		NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		NA		NA		NA		**6.3**	J	**9.8**	J	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	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX
1																									
2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2									
3		RW2		W		RW2		W		RW2		W		RW2		W		RW2		RW2		Dup of RW2		RW2	
4		FF65I		FF65K		FL41O		FL41Q		FU31F		FU31E		FY82D		FY82A		0402113-04		0406059-02		0406059-01		0408036-06	
5		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		6/9/04		8/05/04	
63	**PRIORITY POLLUTANT**																								
64	**METALS (mg/L)**																								
65	Arsenic (7060)	**0.019**		**0.018**		**0.019**		**0.019**		**0.018**		**0.019**		**0.019**		**0.018**		**0.022**		**0.019**		**0.019**		**0.0194**	
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	**0.0076**		**0.0136**		**0.0144**		**0.0152**	
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	0.01	U	0.01	U	0.01	U	0.01	U
68	Lead (7421)	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	0.0001	U	0.0001	U
69	Nickel (6010)	**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	0.005	U	0.005	U
70	Zinc (6010)	**0.013**	J	**0.016**	J	**0.067**		**0.064**		**0.013**		**0.014**		**0.062**	J	**0.008**	J	**0.0724**		**0.0105**		**0.011**		0.01	U
71																									
72	**MAJOR IONS AND CONVENTIONALS**																								
73	Calcium (mg/L) (6010)	**41.8**		**41.3**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	**16.4**		**16.2**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	**2.5**		**2.6**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	**11.7**		**11.7**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	**240**		**240**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1	U	1	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**240**		**240**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**260**		**260**		**270**		**270**		**290**		**280**		**230**		**250**		**237**		**254**		**276**		**258**	
81	Chloride (mg/L) (EPA 325.2)	**4.4**		**4.4**		**4.4**		**4.4**		**4.3**		**4.2**		**5.2**		**4.9**		**3.8**		**4.16**		**3.74**		**3.95**	
82	N-Nitrate (mg-N/L) (Calculated)	0.01	U	**0.015**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	**0.041**		**0.043**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.037**	J	**0.058**	J	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	**3**		2.5	U	NA		NA		NA		NA		NA		NA		NA		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

	B	BY	BZ
1			
2		Dup of RW2	
3		W	
4		0408036-03	
5		8/05/04	
63	**PRIORITY POLLUTANT**		
64	**METALS (mg/L)**		
65	Arsenic (7060)	**0.02**	
66	Chromium (6010)	**0.0143**	
67	Copper (6010)	0.01	U
68	Lead (7421)	0.0001	U
69	Nickel (6010)	0.005	U
70	Zinc (6010)	0.01	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)	**254**	
81	Chloride (mg/L) (EPA 325.2)	**3.82**	
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															Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2
3			RW2		RW2		RW2		RW2		RW2		RW2		X		RW2		X		RW2		X		RW2		X
4			AH76G		AU45N		BC30E		BH96F		BR64P		CD97A		CD97B		CL03N		CL03M		CT37L		CT37M		DE87P		DE87O
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		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		6.65
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		13.6
90	83	Conductivity (um/hos)	294		292		260		278		365		463		463		513		513		475		479		573		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		0.82
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	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 RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2	
3			RW2		W		RW2		W		RW2		W		RW2		W		RW2		W		RW2		W	
4			DM30I		DM30H		DW29E		DW29C		ED30D		ED30A		EN00D		EN00A		ER93G		ER93I		EZ17D		EZ17B	
5			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		11/13/02	
87	**FIELD PARAMETERS**																									
88	pH (avg)		6.70		6.68		6.50		6.5		6.27		6.27		6.47		6.47		6.52		6.56		6.19		6.17	
89	Temperature (° C) (avg)		15.7		15.6		13.1		13.1		13.5		13.5		14.5		14.5		13.9		13.9		13.6		13.6	
90	Conductivity (um/hos)		455		454		458		458		422		422		450		448		408		409		461		461	
91	Dissolved oxygen (mg/L) (avg)		0.52		0.37		3.34		3.22		7.06		7.05		4.87		4.72		0.60		0.31		0.55		0.34	
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	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX
1																									
2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2									
3		RW2		W		RW2		W		RW2		W		RW2		W		RW2		RW2		Dup of RW2		RW2	
4		FF65I		FF65K		FL41O		FL41Q		FU31F		FU31E		FY82D		FY82A		0402113-04		0406059-02		0406059-01		0408036-06	
5		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		6/9/04		8/05/04	
87	**FIELD PARAMETERS**																								
88	pH (avg)	6.84		6.84		6.87		6.86		6.69		6.71		6.52		6.53		6.36		5.41		5.41		6.09	
89	Temperature (° C) (avg)	13.9		13.9		13.6		13.5		15.5		15.7		13.8		13.8		14.3		15.2		15.2		15.7	
90	Conductivity (um/hos)	542		542		392		390		414		411		392		392		348		395		395		530	
91	Dissolved oxygen (mg/L) (avg)	2.24		2.24		3.22		3.32		0.98		0.82		2.37		2.15		1.48		1.12		1.12		3.58	
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	BY	BZ
1			
2		Dup of RW2	
3		W	
4		0408036-03	
5		8/05/04	
87	**FIELD PARAMETERS**		
88	pH (avg)	6.15	
89	Temperature (° C) (avg)	16	
90	Conductivity (um/hos)	531	
91	Dissolved oxygen (mg/L) (avg)	3.58	
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															Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2
3			RW2		RW2		RW2		RW2		RW2		RW2		X		RW2		X		RW2		X		RW2		X
4			AH76G		AU45N		BC30E		BH96F		BR64P		CD97A		CD97B		CL03N		CL03M		CT37L		CT37M		DE87P		DE87O
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		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		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
132																											

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
1																										
2					Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2	
3			RW2		W		RW2		W		RW2		W		RW2		W		RW2		W		RW2		W	
4			DM30I		DM30H		DW29E		DW29C		ED30D		ED30A		EN00D		EN00A		ER93G		ER93I		EZ17D		EZ17B	
5			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		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	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX
1																									
2				Dup of RW2				Dup of RW2				Dup of RW2				Dup of RW2									
3		RW2		W		RW2		W		RW2		W		RW2		W		RW2		RW2		Dup of RW2		RW2	
4		FF65I		FF65K		FL41O		FL41Q		FU31F		FU31E		FY82D		FY82A		0402113-04		0406059-02		0406059-01		0408036-06	
5		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		6/9/04		8/05/04	
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		1	U
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		1	U
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	BY	BZ
1			
2		Dup of RW2	
3		W	
4		0408036-03	
5		8/05/04	
6			
123	**PAHs (µg/L)**		
124	**EPA Method SW8270 SIM**		
125	Naphthalene	NA	
126	2-Methylnaphthalene	NA	
127	Acenaphthylene	1	U
128	Acenaphthene	NA	
129	Fluorene	NA	
130	Anthracene	1	U
131	Dibenzofuran	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	
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	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															

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	
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**	
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	AA
1																											
2					Dup of LW-12D1								Dup of LW12D1														
3			LW12D1		LW120D1		LW12D1		LW12D1		LW12D1		Y		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1
4			AH76C		AH76A		AU45L		BC27S		BH96M		BH96O		BR55B		CB85I		CL03K		CT67E		DE87M		DM52H		DW48J
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		11/29/01
6																											
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	0.25
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		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		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		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		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		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		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	10	U	10	U	30
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	**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	5.0
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	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	**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	5.0
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**		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	**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**		**5.6**
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	**1.2**		1.0	U	1.0	U	1.0
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**		**3.4**
47	41	1,2,4-Trimethylbenzene	**46**		**46**		**15**		**4.8**		**5.1**		**4.9**		**15**		**17**		**22**		**23**		**13**		**7.5**		**21**
48	42	Isopropylbenzene	**2.6**		**2.6**		**1.7**		**1.1**		1.0	U	1.0	U	1.0	U	1.0	U	**1.3**		**1.4**		**1.6**		1.0	U	**1.6**
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	**2.8**
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	**1.7**		**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	**2.8**
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	**2.2**
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	2.0
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**	**0.96**		**0.86**		**0.98**		**0.88**		**0.66**		**0.66**		**0.82**		**0.64**		**0.78**		**0.83**		**0.77**		**0.81**		**0.97**
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		0.50	U	NA		NA		NA		NA
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
62	55																										

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
1						
2						
3			LW12D1		LW12D1	
4			ED34H		EN00K	
5			2/28/02		6/27/02	
6						
7	**CHLORINATED PHENOLS (µg/L)**					
8	**EPA Method SW8040**					
9	Pentachlorophenol	U	0.25	U	**1.6**	
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	U	2.0	U	2.0	U
20	4-Methylphenol	U	1.0	U	1.0	U
21	Isophorone	U	1.0	U	1.0	U
22	2,4-Dimethylphenol	U	3.0	U	3.0	U
23	Benzoic Acid	U	50	U	50	U
24	Naphthalene	U	1.0	U	1.0	U
25	2-Methylnaphthalene	U	1.0	U	1.0	U
26	2,4,6-Trichlorophenol	U	5.0	U	5.0	U
27	2,4,5-Trichlorophenol	U	5.0	U	5.0	U
28	Acenaphthene	U	1.0	U	1.0	U
29	Dibenzofuran	U	1.0	U	1.0	U
30	Fluorene	U	1.0	U	1.0	U
31	Pentachlorophenol	U	5.0	U	5.0	U
32	bis(2-Ethylhexyl)phthalate	U	4.0	U	4.0	U
33						
34	**VOLATILES (µg/L)**					
35	**EPA Method SW8260**					
36	Acetone	U	5.0	U	5.0	U
37	Carbon Disulfide	U	1.0	U	1.0	U
38	2-Butanone		**8.6**		5.0	U
39	Benzene	U	1.0	U	1.0	U
40	Bromoform	U	1.0	U	1.0	U
41	Toluene	U	1.0	U	1.0	U
42	Ethylbenzene	U	1.0	U	1.0	U
43	Styrene	U	1.0	U	1.0	U
44	m,p-Xylene	U	1.0	U	1.0	U
45	o-Xylene	U	1.0	U	1.0	U
46	1,3,5-Trimethylbenzene		**1.5**		1.0	U
47	1,2,4-Trimethylbenzene		**8.5**		**4.7**	
48	Isopropylbenzene		1.0	U	1.0	U
49	n-Propylbenzene		**1.1**		**1.3**	
50	tert-Butylbenzene	U	1.0	U	1.0	U
51	sec-Butylbenzene		1.0	U	**1.1**	
52	4-Isopropyltoluene		1.0	U	1.0	U
53	n-Butylbenzene	U	1.0	U	1.0	U
54	Naphthalene	U	5.0	U	5.0	U
55	Methyl tert-butyl ether		NA		NA	
56						
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**					
58	**Method OR-DEQ**					
59	**TPH-Diesel**		**1.2**		**1.0**	
60	**TPH-D Motor Oil**		NA		NA	
61	**TPH-Gasoline**		NA		NA	
62						

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					Dup of LW-12D1								Dup of LW12D1														
3			LW12D1		LW120D1		LW12D1		LW12D1		LW12D1		Y		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1
4			AH76C		AH76A		AU45L		BC27S		BH96M		BH96O		BR55B		CB85I		CL03K		CT67E		DE87M		DM52H		DW48J
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		11/29/01
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**		**0.014**
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**		**0.009**
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**		0.012
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**		**0.005**
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**		0.01
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**		**0.021**
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**		**58.4**
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**26.2**		**29.5**		**29.0**		**29.4**
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.9**		**1.8**		**1.9**		**1.5**
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**10.9**		**12.3**		**11.5**		**12.2**
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**320**		NA		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		NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**320**		NA		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**		**350**
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**		**3.7**
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		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		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		NA
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		**5.8**		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
1						
2						
3			LW12D1		LW12D1	
4			ED34H		EN00K	
5			2/28/02		6/27/02	
63	**PRIORITY POLLUTANT**					
64	**METALS (mg/L)**					
65	Arsenic (7060)		**0.016**		**0.028**	
66	Chromium (6010)		**0.015**		**0.006**	
67	Copper (6010)	U	**0.020**		**0.007**	
68	Lead (7421)		**0.006**		**0.002**	
69	Nickel (6010)	U	0.01	U	0.01	U
70	Zinc (6010)		**0.032**		**0.022**	
71						
72	**MAJOR IONS AND CONVENTIONALS**					
73	Calcium (mg/L) (6010)		**55.1**		**59.3**	
74	Magnesium (mg/L) (6010)		**25.4**		**28.1**	
75	Potassium (mg/L) (6010)		**1.5**		**1.0**	
76	Sodium (mg/L) (6010)		**12.5**		**12.4**	
77	Alkalinity (mg/L CaCO3) (SM 2320)		**260**		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		1.0	U	NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		**260**		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**330**		**300**	
81	Chloride (mg/L) (EPA 325.2)		**5.2**		**3.8**	
82	N-Nitrate (mg-N/L) (Calculated)		**0.027**		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		0.010	U	NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		**0.027**		NA	
85	Sulfate (mg/L) (EPA 375.2)		**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	AA
1																											
2					Dup of LW-12D1								Dup of LW12D1														
3			LW12D1		LW120D1		LW12D1		LW12D1		LW12D1		Y		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1
4			AH76C		AH76A		AU45L		BC27S		BH96M		BH96O		BR55B		CB85I		CL03K		CT67E		DE87M		DM52H		DW48J
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		11/29/01
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		6.92
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		13.3
90	83	Conductivity (um/hos)	486		502		504		346		526		524		495		485		444		454		481		469		434
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		4.12
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
1						
2						
3			LW12D1		LW12D1	
4			ED34H		EN00K	
5			2/28/02		6/27/02	
87	**FIELD PARAMETERS**					
88	pH (avg)		6.80		7.07	
89	Temperature (° C) (avg)		13.8		14.3	
90	Conductivity (um/hos)		431		410	
91	Dissolved oxygen (mg/L) (avg)		7.61		4.73	
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	AA
1																											
2					Dup of LW-12D1								Dup of LW12D1														
3			LW12D1		LW120D1		LW12D1		LW12D1		LW12D1		Y		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1		LW12D1
4			AH76C		AH76A		AU45L		BC27S		BH96M		BH96O		BR55B		CB85I		CL03K		CT67E		DE87M		DM52H		DW48J
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		11/29/01
6																											
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
1						
2						
3			LW12D1		LW12D1	
4			ED34H		EN00K	
5			2/28/02		6/27/02	
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			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	
6																												
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	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	**0.22**	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	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	**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	U
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	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	**1.1**		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	U
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	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	0.25	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																											

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			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	
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**	
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	**0.005**		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	U
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	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)	**0.007**		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	U
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**	J	**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																											

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			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																												

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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			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	
6																												
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

	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					

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	
63	56	**PRIORITY POLLUTANT**				
64	57	**METALS (mg/L)**				
65	58	Arsenic (7060)	NA		NA	
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
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 - 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	

	A	B	C	D	E	F	G	H	I	J	K
1											
2											
3	**LOOKUP COMPOUNDS**										
4			Analytes by								
5			Mulitple methods								
6							Analytes by				
7							Mulitple methods				
8					Pentachlorophenol	3	SIM				
9	Pentachlorophenol	3	SIM		Pentachlorophenol	25	SVOC				
10		4			2-Methylnaphthalene	19	SVOC				
11		5			2-Methylnaphthalene	120	PAH	(No Specialty PAH 2-Methylnaphthalene - NA)			
12		6			Acenaphthene	22	SVOC				
13		7			Acenaphthene	122	PAH				
14		8			Dibenzofuran	23	SVOC				
15		9			Dibenzofuran	125	PAH	(No Specialty PAH Dibenzofuran - NA)			
16		10			Fluorene	24	SVOC				
17		11			Fluorene	123	PAH				
18		12			Naphthalene	18	SVOC				
19	Phenol	13			Naphthalene	48	VOC				
20	3-&4-Methylphenol	14			Naphthalene	119	PAH				
21	Isophorone	15									
22	2,4-Dimethylphenol	16									
23	Benzoic Acid	17									
24	Naphthalene	18	SVOC								
25	2-Methylnaphthalene	19	SVOC								
26	2,4,6-Trichlorophenol	20									
27	2,4,5-Trichlorophenol	21									
28	Acenaphthene	22	SVOC								
29	Dibenzofuran	23	SVOC								
30	Fluorene	24	SVOC								
31	Pentachlorophenol	25	SVOC								
32	Bis(2-ethylhexyl)phthalate	26									
33		27									
34		28									
35		29									
36	Acetone	30									
37	Carbon disulfide	31									
38	2-Butanone	32									
39	Benzene	33									
40	Bromoform	34									
41	Toluene	35									
42	Ethylbenzene	36									
43	Styrene	37									
44	m,p-Xylene	38									
45	o-Xylene	39									
46	1,3,5-Trimethylbenzene	40									
47	1,2,4-Trimethylbenzene	41									
48	Isopropylbenzene	42									
49	n-Propylbenzene	43									
50	tert-Butylbenzene	44									
51	sec-Butylbenzene	45									
52	4-Isopropyltoluene	46									
53	n-Butylbenzene	47									
54	Naphthalene	48	VOC								
55	Methyl tert-butyl ether	49									
56		50									
57		51									
58		52									
59	Diesel Range Hydrocarbons	53									
60	Lube Oil	54									
61	Gasoline Range Hydrocarbons	55									
62		56									
63		57									
64		58									
65	Arsenic	59									
66	Chromium	60									
67	Copper	61									
68	Lead	62									

	A	B	C	D	E	F	G	H	I	J	K
69	Nickel	63									
70	Zinc	64									
71		65									
72		66									
73		67									
74		68									
75		69									
76		70									
77		71									
78		72									
79		73									
80	Total Dissolved Solids	74									
81	Chloride	75									
82		76									
83		77									
84		78									
85		79									
86		80									
87		81									
88	pH	82									
89	Temperature	83									
90	Conductivity	84									
91	Dissolved oxygen	85									
92		86									
93	**DIOXINS AND FURANS (ng/L)**	87									
94	**Method 8290**	88									
95	2,3,7,8-TCDF	89									
96	Total TCDF	90									
97	2,3,7,8-TCDD	91									
98	Total TCDD	92									
99	1,2,3,7,8-PeCDF	93									
100	2,3,4,7,8-PeCDF	94									
101	Total PeCDF	95									
102	1,2,3,7,8-PeCDD	96									
103	Total PeCDD	97									
104	1,2,3,4,7,8-HxCDF	98									
105	1,2,3,6,7,8-HxCDF	99									
106	2,3,4,6,7,8-HxCDF	100									
107	1,2,3,7,8,9-HxCDF	101									
108	Total HxCDF	102									
109	1,2,3,4,7,8-HxCDD	103									
110	1,2,3,6,7,8-HxCDD	104									
111	1,2,3,7,8,9-HxCDD	105									
112	Total HxCDD	106									
113	1,2,3,4,6,7,8-HpCDF	107									
114	1,2,3,4,7,8,9-HpCDF	108									
115	Total HpCDF	109									
116	1,2,3,4,6,7,8-HpCDD	110									
117	Total HpCDD	111									
118	OCDF	112									
119	OCDD	113									
120		114									
121	**ETHANOL (mg/L)**	115									
122		116									
123	**PAHs (µg/L)**	117									
124	**EPA Method SW8270 SIM**	118									
125	Naphthalene	119	PAH								
126	2-Methylnaphthalene	120	PAH	(No Specialty 2-Methylnaphthalene - NA)							
127	Acenaphthylene	121	PAH	Use only this PAH acenaphthylene - delete SVOC							
128	Acenaphthene	122	PAH								
129	Fluorene	123	PAH								
130	Anthracene	124		Use only this PAH anthracene - delete SVOC							
131	Dibenzofuran	125	PAH	(No Specialty Dibenzofuran - NA)							

	A
1	BOLD DETECTS WHEN DATA IS STILL IN ROWS AS .CSV FILE
2	DATE FORMAT MM/DD/YY
3	REMOVE "00" FROM SITE NAMES BEFORE COPY
4	BEGINNING 1Q04 WITH SPECIALTY, TWO PAH COMPOUNDS NOT ANALYZED (2-Methlynaphthalene and Dibenzofuran) - ENTER NA FOR THESE
5	WATCH METALS (ARESENIC AND LEAD) METHOD 6020 AND GASOLINE - UNITS IN PPB - CONVERT FOR THESE TABLES
6	DETERMINE DUPS. "Dup of WellName" (Dup of B1) and Duplicate Name(X) are entered on Table
7	FIELD PARAMETERS: pH, Temp, Cond, and DO only (delete redox, turbidity)
8	USE LOOKUP TO DELETE UNNECESSARY COMPOUNDS; ADJUST ORDER OF COMPOUNDS EXISTING IN MULTIPLE METHODS (SEE LOOKUP TAB)
9	Acenaphthylene and Anthracene - Only use PAH by 8270SIM, not 8270SVOC (delete these)

	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			B1		B2		D		G1A		J1		J2		K		LW10D		LW11D		LW11S		LW13S		LW14D		LW16D
4			0408019-02		0408019-03		0408036-01		0408044-06		0408019-04		0408019-05		0408020-02		0408044-03		0408044-02		0408035-01		0408036-07		0408036-05		0408036-04
5			8/03/04		8/03/04		8/05/04		8/06/04		8/03/04		8/03/04		8/03/04		8/06/04		8/06/04		8/05/04		8/05/04		8/05/04		8/05/04
6																											
7																											
8																											
9	Pentachlorophenol	3	0.5	U	0.5	U	0.5	U	NA		0.5	U	0.5	U	NA		0.5	U	0.5	U	NA		0.5	U	0.5	U	0.5
10			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
12			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
14			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
16																											
17																											
18																											
19	Phenol	13	1.96	U	2.01	U	2	U	2	U	2.01	U	2.01	U	NA		2	U	2	U	2	U	NA		NA		NA
20	3-&4-Methylphenol	14	9.8	U	10	U	10	U	10	U	10.1	U	10.1	U	NA		10	U	10	U	10	U	NA		NA		NA
21	Isophorone	15	0.98	U	1	U	1	U	1	U	1.01	U	1.01	U	NA		1	U	1	U	1	U	NA		NA		NA
22	2,4-Dimethylphenol	16	2.94	U	3.01	U	3	U	3	U	3.02	U	3.02	U	NA		3	U	3	U	3	U	NA		NA		NA
23	Benzoic Acid	17	19.6	U	20.1	U	20	U	20	U	20.1	U	20.1	U	NA		20	U	20	U	20	U	NA		NA		NA
24	Naphthalene	18	0.98	U	1	U	1	U	1	U	1.01	U	1.01	U	NA		1	U	1	U	**7.81**		NA		NA		NA
25	2-Methylnaphthalene	19	0.98	U	1	U	1	U	1	U	1.01	U	1.01	U	NA		1	U	1	U	**3.81**		NA		NA		NA
26	2,4,6-Trichlorophenol	20	4.9	U	5.02	U	5	U	5	U	5.03	U	5.04	U	NA		5	U	5	U	5	U	NA		NA		NA
27	2,4,5-Trichlorophenol	21	4.9	U	5.02	U	5	U	5	U	5.03	U	5.04	U	NA		5	U	5	U	5	U	NA		NA		NA
28	Acenaphthene	22	0.98	U	1	U	1	U	1	U	1.01	U	1.01	U	NA		1	U	1	U	1	U	NA		NA		NA
29	Dibenzofuran	23	0.98	U	1	U	1	U	1	U	1.01	U	1.01	U	NA		1	U	1	U	1	U	NA		NA		NA
30	Fluorene	24	0.98	U	1	U	1	U	1	U	1.01	U	1.01	U	NA		1	U	1	U	1	U	NA		NA		NA
31	Pentachlorophenol	25	4.9	U	5.02	U	5	U	**5.22**		5.03	U	5.04	U	NA		5	U	5	U	**604**		NA		NA		NA
32	Bis(2-ethylhexyl)phthalate	26	0.98	U	1	U	1	U	1	U	1.01	U	1.01	U	NA		1	U	**1.71**		1	U	NA		NA		NA
33																											
34																											
35																											
36	Acetone	30	50	U	50	U	50	U	50	U	50	U	50	U	NA		50	U	50	U	**54**	J	NA		NA		NA
37	Carbon disulfide	31	2	U	2	U	2	U	2	U	2	U	2	U	NA		2	U	2	U	2	U	NA		NA		NA
38	2-Butanone	32	10	U	10	U	10	U	10	U	10	U	10	U	NA		10	U	10	U	**13**	J	NA		NA		NA
39	Benzene	33	**1.71**	J	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	**9.79**	J	NA		NA		NA
40	Bromoform	34	1	U	1	U	1	U	1	U	1	U	1	U	NA		1	U	1	U	1	U	NA		NA		NA
41	Toluene	35	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	NA		NA		NA
42	Ethylbenzene	36	**27.5**	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**83.1**	J	NA		NA		NA
43	Styrene	37	1	U	1	U	1	U	1	U	1	U	1	U	NA		1	U	1	U	1	U	NA		NA		NA
44	m,p-Xylene	38	**20.8**	J	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	**126**	J	NA		NA		NA
45	o-Xylene	39	**2.6**	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**176**	J	NA		NA		NA
46	1,3,5-Trimethylbenzene	40	**1.15**	J	1	U	1	U	1	U	1	U	1	U	NA		1	U	1	U	**56.7**	J	NA		NA		NA
47	1,2,4-Trimethylbenzene	41	**3.13**	J	1	U	1	U	1	U	1	U	1	U	NA		1	U	1	U	**234**	J	NA		NA		NA
48	Isopropylbenzene	42	**1.95**	J	1	U	**1.13**	J	**118**		**5.58**	J	1	U	NA		1	U	1	U	**28.2**	J	NA		NA		NA
49	n-Propylbenzene	43	**2.57**	J	1	U	**1.19**	J	**99.6**		**14**	J	1	U	NA		1	U	1	U	**30.5**	J	NA		NA		NA
50	tert-Butylbenzene	44	1	U	1	U	1	U	**2.94**		1	U	1	U	NA		1	U	1	U	**1.55**	J	NA		NA		NA
51	sec-Butylbenzene	45	1	U	1	U	1	U	**16.8**		1	U	1	U	NA		1	U	1	U	**8.97**	J	NA		NA		NA
52	4-Isopropyltoluene	46	1	U	1	U	1	U	1	U	1	U	1	U	NA		1	U	1	U	**6.91**	J	NA		NA		NA
53	n-Butylbenzene	47	1	U	1	U	1	U	**8.97**		**1.06**	J	1	U	NA		1	U	1	U	**5.42**	J	NA		NA		NA
54	Naphthalene	48	**1.03**	J	1	U	1	U	**2.49**		**1.47**	J	1	U	NA		1	U	1	U	**24.5**	J	NA		NA		NA
55	Methyl tert-butyl ether	49	1	U	1	U	1	U	1	U	1	U	1	U	NA		1	U	1	U	1	U	NA		NA		NA
56																											
57																											
58																											
59	Diesel Range Hydrocarbons	53	**0.978**		NA		NA		**3.25**		NA		NA		NA		0.245	U	**0.79**		NA		NA		NA		NA
60	Lube Oil	54	0.503	U	NA		NA		0.507	U	NA		NA		NA		0.49	U	0.51	U	NA		NA		NA		NA
61	Gasoline Range Hydrocarbons	55	**0.652**		NA		NA		NA		NA		NA		0.1	U	NA		NA		NA		NA		NA		NA
62																											
63																											
64																											
65	Arsenic	59	**0.00636**		**0.00363**		**0.0185**		**0.0293**		**0.0114**		**0.0108**		NA		**0.0198**		**0.00558**		**0.00333**		NA		NA		NA
66	Chromium	60	0.005	U	**0.0161**		**0.019**		**0.0156**		**0.0188**		0.005	U	NA		**0.0185**		**0.0176**		**0.0161**		NA		NA		NA
67	Copper	61	0.01	U	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	NA		NA		NA
68	Lead	62	0.0001	U	0.0001	U	0.0001	U	**0.000658**		**0.000317**		**0.000186**		NA		**0.00123**		**0.00274**		0.0001	U	NA		NA		NA
69	Nickel	63	0.005	U	0.005	U	0.005	U	**0.13**		0.005	U	0.005	U	NA		0.005	U	0.005	U	0.005	U	NA		NA		NA
70	Zinc	64	**0.0166**		0.01	U	0.01	U	0.01	U	**0.0121**		**0.021**		NA		0.01	U	**0.0216**		0.01	U	NA		NA		NA

	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
1																													
2														Dup of LW20S															
3		LW17D		LW18D		LW19S		LW1S		LW20D		LW20S		X		LW22D		LW23D		LW24D		LW25D		LW26D		LW27D		LW29D	
4		0408044-08		0408044-04		0408056-08		0408020-01		0408056-10		0408056-09		0408056-01		0408056-03		0408056-04		0408056-06		0408056-07		0408066-01		0408056-11		0408006-07	
5		8/06/04		8/06/04		8/09/04		8/03/04		8/09/04		8/09/04		8/09/04		8/09/04		8/09/04		8/09/04		8/09/04		8/10/04		8/09/04		8/02/04	
6																													
7																													
8																													
9	U	0.5	U	0.5	U	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	
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		NA		NA		2.03	U	NA		2.13	U	2.07	U	2.08	U	2.02	U	2.09	U	2.08	U	1.99	U	2	U	2.16	U	2.03	U
20		NA		NA		10.1	U	NA		10.6	U	10.3	U	10.4	U	10.1	U	10.5	U	10.4	U	9.96	U	10	U	10.8	U	10.1	U
21		NA		NA		1.01	U	NA		1.06	U	1.03	U	1.04	U	1.01	U	1.05	U	1.04	U	0.996	U	1	U	1.08	U	1.01	U
22		NA		NA		3.04	U	NA		3.19	U	3.1	U	3.12	U	3.03	U	3.14	U	3.12	U	2.99	U	3.01	U	3.24	U	3.04	U
23		NA		NA		20.3	U	NA		21.3	U	20.7	U	20.8	U	20.2	U	20.9	U	20.8	U	19.9	U	20	U	21.6	U	20.3	U
24		NA		NA		1.01	U	NA		1.06	U	1.03	U	1.04	U	1.01	U	1.05	U	1.04	U	0.996	U	1	U	1.08	U	1.01	U
25		NA		NA		1.01	U	NA		1.06	U	1.03	U	1.04	U	1.01	U	1.05	U	1.04	U	0.996	U	1	U	1.08	U	1.01	U
26		NA		NA		5.07	U	NA		5.31	U	5.17	U	5.19	U	5.05	U	5.24	U	5.21	U	4.98	U	5.01	U	5.39	U	5.07	U
27		NA		NA		5.07	U	NA		5.31	U	5.17	U	5.19	U	5.05	U	5.24	U	5.21	U	4.98	U	5.01	U	5.39	U	5.07	U
28		NA		NA		**1.09**		NA		1.06	U	**1.5**		**1.43**		1.01	U	1.05	U	**1.65**		**1.93**		1	U	1.08	U	1.01	U
29		NA		NA		1.01	U	NA		1.06	U	1.03	U	1.04	U	1.01	U	1.05	U	1.04	U	0.996	U	1	U	1.08	U	1.01	U
30		NA		NA		**3.46**		NA		1.06	U	**3.86**		**3.63**		1.01	U	1.05	U	**4.04**		**4.12**		1	U	1.08	U	1.01	U
31		NA		NA		5.07	U	NA		5.31	U	5.17	U	5.19	U	5.05	U	5.24	U	5.21	U	4.98	U	5.01	U	5.39	U	5.07	U
32		NA		NA		1.01	U	NA		**1.86**		1.03	U	1.04	U	1.01	U	1.05	U	**1.91**		**2.95**		**3.77**		1.08	U	**1.37**	
33																													
34																													
35																													
36		NA		NA		50	U	NA		50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U
37		NA		NA		2	U	NA		2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
38		NA		NA		10	U	NA		10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
39		NA		NA		0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	**26.1**		0.3	U	0.3	U	0.3	U	0.3	U	0.3	U
40		NA		NA		1	U	NA		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
41		NA		NA		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		NA		NA		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		NA		NA		1	U	NA		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
44		NA		NA		2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
45		NA		NA		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		NA		NA		1	U	NA		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
47		NA		NA		1	U	NA		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
48		NA		NA		**7.65**		NA		1	U	**8.52**	J	**6.79**	J	1	U	**11.5**		**10.4**		**17.8**		1	U	1	U	1	U
49		NA		NA		**9.41**		NA		1	U	**10.6**		**10.5**		1	U	**5.51**		**13**		**5.78**		1	U	1	U	1	U
50		NA		NA		1	U	NA		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
51		NA		NA		**4.62**		NA		1	U	**5.55**	J	**4.41**	J	1	U	**1.6**		**4.22**		**4.59**		1	U	1	U	1	U
52		NA		NA		1	U	NA		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
53		NA		NA		**2**		NA		1	U	**2.17**		**1.76**		1	U	1	U	**2.63**		**1.87**		1	U	1	U	1	U
54		NA		NA		1	U	NA		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
55		NA		NA		1	U	NA		1	U	1	U	1	U	1	U	**3.17**		1	U	1	U	**2.38**		1	U	1	U
56																													
57																													
58																													
59		NA		NA		**6.15**		NA		**0.737**		**9.21**		**8.43**		**1.75**		**3.21**		**6.57**		**3.17**		**1.37**		**1.25**		**0.306**	
60		NA		NA		0.5	U	NA		0.506	U	0.511	U	0.528	U	0.498	U	0.5	U	0.575	U	0.502	U	0.497	U	0.539	U	0.476	U
61		NA		NA		**0.786**		0.1	U	**0.229**		**0.783**		**0.676**		0.1	U	**0.562**		**0.948**		**0.98**		**0.202**	J	**0.336**		0.1	U
62																													
63																													
64																													
65		NA		NA		**0.0406**		NA		**0.0286**		**0.0317**		**0.031**		**0.00774**		**0.0435**		**0.043**		**0.0425**		**0.0112**		**0.00745**		**0.00694**	
66		NA		NA		**0.0158**		NA		**0.0271**		**0.014**		**0.0176**		**0.0194**		**0.0224**		**0.0279**		**0.0161**		**0.0171**		**0.0211**		**0.015**	
67		NA		NA		**0.159**		NA		**0.0957**		**0.605**	J	0.01	UJ	0.01	U	**0.0372**		**0.0125**		0.01	U	**0.0812**		**0.0157**		0.01	U
68		NA		NA		**0.000177**		NA		**0.00305**		0.0001	U	0.0001	U	**0.00121**		**0.00792**		**0.00423**		**0.00816**		**0.0028**		**0.0019**		**0.000613**	
69		NA		NA		0.005	U	NA		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.0088**		**0.0065**		0.005	U	0.005	U	0.005	U
70		NA		NA		0.01	U	NA		**0.0674**		0.01	U	**0.0211**		**0.0123**		**0.0431**		**0.0905**		**0.0831**		**0.0173**		**0.0528**		0.01	U

	BE	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
1																													
2																													
3	LW29S		LW30D		LW30S		LW31S		LW32D		LW32S		LW33S		LW34S		LW35D		LW3D		LW4S		LW6D		LW7S		LW8S		LW9D
4	0408006-06		0408020-05		0408020-04		0408006-02		0408006-05		0408006-04		0408006-03		0408006-01		0408056-02		0408044-01		0408036-08		0408044-07		0408019-01		0408036-02		0408044-05
5	8/02/04		8/03/04		8/03/04		8/02/04		8/02/04		8/02/04		8/02/04		8/02/04		8/09/04		8/06/04		8/05/04		8/06/04		8/03/04		8/05/04		8/06/04
6																													
7																													
8																													
9	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.5	U	NA		0.5	U	0.5	U	0.5	U	0.5
10	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
12	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
14	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
16																													
17																													
18																													
19	1.94	U	1.98	U	1.94	U	1.9	U	2.02	U	1.94	U	1.93	U	1.97	U	1.95	U	2	U	2	U	2	U	1.99	U	2	U	2
20	9.71	U	9.92	U	9.69	U	9.52	U	10.1	U	9.7	U	9.64	U	9.83	U	9.75	U	10	U	10	U	10	U	9.96	U	10	U	10
21	0.971	U	0.992	U	0.969	U	0.952	U	1.01	U	0.97	U	0.964	U	0.983	U	0.975	U	1	U	1	U	1	U	0.996	U	1	U	1
22	2.91	U	2.98	U	2.91	U	2.86	U	3.03	U	2.91	U	2.89	U	2.95	U	2.92	U	3	U	3	U	3	U	2.99	U	3	U	3
23	19.4	U	19.8	U	19.4	U	19	U	20.2	U	19.4	U	19.3	U	19.7	U	19.5	U	20	U	20	U	20	U	19.9	U	20	U	20
24	0.971	U	0.992	U	0.969	U	0.952	U	1.01	U	0.97	U	0.964	U	0.983	U	0.975	U	1	U	1	U	1	U	**4.43**		**6.7**		1
25	0.971	U	0.992	U	0.969	U	0.952	U	1.01	U	0.97	U	0.964	U	0.983	U	0.975	U	1	U	1	U	1	U	**1.66**		**6.88**		1
26	4.85	U	4.96	U	4.84	U	4.76	U	5.05	U	4.85	U	4.82	U	4.92	U	4.87	U	5	U	5	U	5	U	4.98	U	5	U	5
27	4.85	U	4.96	U	4.84	U	4.76	U	5.05	U	4.85	U	4.82	U	4.92	U	4.87	U	5	U	5	U	5	U	4.98	U	5	U	5
28	0.971	U	0.992	U	0.969	U	0.952	U	1.01	U	0.97	U	0.964	U	0.983	U	0.975	U	1	U	1	U	1	U	0.996	U	1	U	1
29	0.971	U	0.992	U	0.969	U	0.952	U	1.01	U	0.97	U	0.964	U	0.983	U	0.975	U	1	U	1	U	1	U	0.996	U	1	U	1
30	0.971	U	0.992	U	1.05	U	0.952	U	1.01	U	0.97	U	0.964	U	0.983	U	0.975	U	1	U	1	U	1	U	0.996	U	1	U	1
31	4.85	U	4.96	U	4.84	U	4.76	U	5.05	U	4.85	U	4.82	U	4.92	U	4.87	U	5	U	**8.52**		5	U	4.98	U	5	U	5
32	0.971	U	**1.73**		0.969	U	0.952	U	**2.01**		0.97	U	**1.99**		0.983	U	0.975	U	1	U	1	U	1	U	0.996	U	1	U	1
33																													
34																													
35																													
36	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50
37	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2
38	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	10
39	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	0.3	U	0.3	U	0.3	U	**1.86**		0.3
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
41	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
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	**78.8**		**17.9**		1
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
44	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	**33.2**		**2.31**		2
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	**1.02**		**1.21**		1
46	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**4.78**		1	U	1
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	**3.58**		**3.74**		1
48	1	U	1	U	**7.68**	J	1	U	1	U	**19.4**	J	1	U	1	U	1	U	1	U	1	U	**2.11**		**54.7**		**232**		**17.6**
49	1	U	1	U	**27.8**	J	1	U	1	U	**20.5**	J	1	U	1	U	1	U	1	U	1	U	1	U	**62.9**		**183**		**8.72**
50	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**2.09**		1	U	**8.83**		1
51	1	U	1	U	**2.48**	J	1	U	1	U	**8.65**	J	1	U	1	U	1	U	1	U	1	U	**1.29**		**4.13**		**25.6**		**1.03**
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	**1.81**		1	U	1
53	1	U	1	U	**3.46**	J	1	U	1	U	**8.47**	J	1	U	1	U	1	U	1	U	1	U	1	U	**3.74**		**10.1**		1
54	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**10.1**		**16.7**		1
55	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
56																													
57																													
58																													
59	**0.337**		**0.539**		**1.44**		**0.576**		**0.863**		**4.24**		0.241	U	0.242	U	**2.71**		NA		0.256	U	**2.05**		**0.516**		**5.15**		0.254
60	0.481	U	0.478	U	0.493	U	0.475	U	0.496	U	0.488	U	0.482	U	0.483	U	0.48	U	NA		0.511	U	0.474	U	0.501	U	0.488	U	0.508
61	0.1	U	0.1	U	**0.719**		0.1	U	0.1	U	**1.33**		0.1	U	0.1	U	0.1	U	NA		NA		NA		**1.73**		**4.44**		NA
62																													
63																													
64																													
65	0.00269	U	**0.0128**		**0.0163**		0.00148	U	**0.01**		**0.0314**		0.001	U	0.001	U	0.001	U	**0.014**		0.001	U	**0.0153**		**0.0143**		**0.0223**		**0.0307**
66	**0.0171**		0.005	U	**0.0147**		**0.0138**		**0.0183**		**0.0125**		0.005	U	**0.0116**		**0.0172**		0.005	U	0.005	U	**0.0187**		**0.0146**		0.005	U	**0.0175**
67	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.0241**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01
68	0.0001	U	**0.00221**		**0.00079**		0.0001	U	**0.00195**		0.0001	U	0.0001	U	0.0001	U	**0.00314**		**0.000392**		0.0001	U	**0.000252**		**0.000792**		0.0001	U	**0.000788**
69	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.0186**		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005
70	0.01	U	**0.0504**		0.01	U	0.01	U	**0.0238**		0.01	U	0.01	U	**0.0133**		**0.0427**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01

	CH	CI	CJ	CK	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
1																													
2																Dup of OX6S													
3		N		OX1S		OX2S		OX3S		OX4S		OX5S		OX6S		Y		OX7S		OX8D		OX8S		OX9S		Q		RW1	
4		0408066-02		0408026-02		0408026-03		0408026-04		0408026-05		0408026-06		0408026-07		0408026-01		0408026-08		0408026-10		0408026-09		0408035-02		0408056-05		0408025-01	
5		8/10/04		8/04/04		8/04/04		8/04/04		8/04/04		8/04/04		8/04/04		8/04/04		8/04/04		8/04/04		8/04/04		8/05/04		8/09/04		8/04/04	
6																													
7																													
8																													
9	U	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	
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	U	2	U	2	U	2	U	**15.7**		2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	**10.7**		2	U
20	U	9.99	U	10	U	10	U	**22.2**		10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10.3	U	10	U
21	U	0.999	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.03	U	1	U
22	U	**4.48**		3	U	3	U	**13.9**		**7.25**		3	U	3	U	3	U	3	U	3	U	3	U	3	U	3.09	U	3	U
23	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20.6	U	20	U
24	U	**53.7**		**11**		**9.21**		**20.2**		**28.5**		1	U	1	U	1	U	**1.5**		1	U	**1.09**		1	U	1.03	U	**7.35**	
25	U	**37.7**		**6.81**		**6.24**		**9.63**		**20.7**		1	U	1	U	1	U	1	U	1	U	1	U	1	U	**19.8**		**1.84**	
26	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	5.15	U	**19.9**	
27	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	5.15	U	5	U
28	U	**1.19**		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**6.46**		1	U
29	U	0.999	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**3.79**		1	U
30	U	**2.55**		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**4.97**		1	U
31	U	5	U	5	U	**1500**		**59.2**		**96.7**		5	U	**604**		**498**		**130**		5	U	**76.8**		5	U	5.15	U	**160**	
32	U	**1.23**		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	4.47	U	1	U	1	U	1.03	U	1	U
33																													
34																													
35																													
36	U	50	U	50	U	**108**	J	**78.2**		**157**		50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U	50	U
37	U	2	U	2	U	**3.32**	J	**3.34**		2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
38	U	10	U	10	U	**11.3**	J	**27**		**18.8**		10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
39	U	**424**		**118**	J	**5.3**	J	**156**		**77**		0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	**1030**		**8.67**	J
40	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	U	**92.3**		**8.87**	J	**1.38**	J	**21.6**		**6.91**		1	U	1	U	1	U	1	U	1	U	1	U	**21.2**		**1.6**	J
42	U	**744**		**163**	J	**74.7**	J	**250**		**303**		1	U	1	U	**1.19**	J	**1.18**	J	1	U	**4.15**	J	1	U	**12.1**		**192**	J
43	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	U	**904**		**466**	J	**89.7**	J	**605**		**324**		2	U	2	U	2	U	2	U	2	U	**2.84**	J	2	U	**27.4**		**299**	J
45	U	**446**		**161**	J	**137**	J	**295**		**336**		1	U	**3.11**	J	**3.36**	J	**3.76**	J	1	U	**18.8**	J	1	U	**8.17**		**294**	J
46	U	**124**		**83**	J	**72.3**	J	**113**		**141**		1	U	**10.9**	J	**11.9**	J	**7.29**	J	1	U	**33.6**	J	1	U	**3.73**		**83.8**	J
47	U	**518**		**231**	J	**233**	J	**360**		**532**		1	U	**77.6**	J	**75.9**	J	**54.2**	J	**2.49**	J	**101**	J	1	U	**3.47**		**349**	J
48		**61.6**		**48.7**	J	**39.4**	J	**79.1**		**88.2**		1	U	**2.23**	J	**2.43**	J	**1.62**	J	1	U	**12.4**	J	1	U	**78.4**		**75.2**	J
49		**102**		**47.8**	J	**40.7**	J	**78.4**		**114**		1	U	**4.69**	J	**5.33**	J	**3.26**	J	1	U	**15.3**	J	1	U	**116**		**58**	J
50	U	1	U	**1.63**	J	**2.14**	J	**2.34**		**2.82**		1	U	1	U	1	U	1	U	1	U	**2.12**	J	1	U	1	U	**2.29**	J
51		**4.72**		**8.09**	J	**13.6**	J	**13**		**14.6**		1	U	**8.04**	J	**7.9**	J	**3.37**	J	1	U	**19.2**	J	1	U	**8.81**		**12.3**	J
52	U	**5.33**		**6.84**	J	**9.35**	J	**12.5**		**15.4**		1	U	**3.4**	J	**3.74**	J	**1.42**	J	1	U	**4.85**	J	1	U	1	U	**6.33**	J
53	U	**5.14**		**4.21**	J	**6.37**	J	**8.92**		**10.8**		1	U	**2.1**	J	**2.31**	J	**1.25**	J	1	U	**4.94**	J	1	U	**9.01**		**3.86**	J
54	U	**112**		**17.7**	J	**21.6**	J	**50.4**		**66**		1	U	**3.92**	J	**4.48**	J	**4.89**	J	1	U	**6.53**	J	1	U	1	U	**17.6**	J
55	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
56																													
57																													
58																													
59	U	**7.65**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**5.56**		**6.12**	
60	U	0.501	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.495	U	0.51	U
61		**12**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**2.88**		**5.48**	
62																													
63																													
64																													
65		**0.0373**		**0.00838**		**0.00752**		**0.0148**		**0.0137**		**0.014**		**0.013**		**0.0127**		**0.014**		**0.0224**		**0.0233**		**0.0044**		**0.034**		**0.006**	
66		**0.0165**		**0.0177**		0.005	U	**0.0159**		0.005	U	**0.0155**		**0.0127**		**0.0142**		**0.0139**		**0.0204**		**0.0123**		**0.0156**		**0.017**		0.005	U
67	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	0.01	U
68		**0.00733**		**0.000113**		**0.000258**		**0.000426**		**0.00107**		0.0001	U	0.0001	U	0.0001	U	0.0001	U	**0.00274**		0.0001	U	0.0001	U	**0.00735**		**0.000111**	
69	U	0.005	U	**0.0061**		0.005	U	**0.0435**		**0.0099**		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
70	U	**0.0193**		0.01	U	0.01	U	**0.019**		**0.0114**		0.01	U	0.01	U	0.01	U	0.01	U	**0.0238**		0.01	U	0.01	U	0.01	U	**0.0244**	

	DK	DL	DM	DN
1				
2			Dup of RW2	
3	RW2		W	
4	0408036-06		0408036-03	
5	8/05/04		8/05/04	
6				
7				
8				
9	NA		NA	
10	NA		NA	
11	NA		NA	
12	NA		NA	
13	NA		NA	
14	NA		NA	
15	NA		NA	
16				
17				
18				
19	2	U	2	U
20	10	U	10	U
21	1	U	1	U
22	3	U	3	U
23	20	U	20	U
24	**1.58**		**1.87**	
25	**5.49**		**6.18**	
26	5	U	5	U
27	5	U	5	U
28	1	U	1	U
29	1	U	1	U
30	1	U	1	U
31	**12.9**		**13.5**	
32	1	U	1	U
33				
34				
35				
36	50	U	50	U
37	2	U	2	U
38	10	U	10	U
39	**3.88**		**3.84**	J
40	1	U	1	U
41	1	U	1	U
42	**6.19**		**5.97**	J
43	1	U	1	U
44	**9.61**		**8.88**	J
45	**2.75**		**2.51**	J
46	**11.5**		**10.2**	J
47	**36**		**33.8**	J
48	**60.9**		**64.8**	J
49	**68.1**		**69.7**	J
50	**1.75**		**1.82**	J
51	**10.7**		**10.7**	J
52	**1.25**		**1.1**	J
53	**5.36**		**5.13**	J
54	**2.99**		**2.74**	J
55	1	U	1	U
56				
57				
58				
59	**1.42**		**1.42**	
60	0.499	U	0.493	U
61	**1.72**		**1.8**	
62				
63				
64				
65	**0.0194**		**0.02**	
66	**0.0152**		**0.0143**	
67	0.01	U	0.01	U
68	0.0001	U	0.0001	U
69	0.005	U	0.005	U
70	0.01	U	0.01	U

	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
71																											
72																											
73			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
75			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
77			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
79			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
80	Total Dissolved Solids	74	**215**		**286**		**308**		**302**		**276**		**382**		NA		**113**		**303**		**356**		NA		NA		NA
81	Chloride	75	**3.63**		**3.51**		**3.52**		**6.46**		**4.13**		**4.62**		NA		**1.42**		**4.59**		**3.59**		NA		NA		NA
82			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
84			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
86																											
87																											
88	pH	82	7.5		7.76		6.12		6.22		7.68		6.16		6.93		6.2		6.3		5.78		5.86		6.1		6.29
89	Temperature	83	15.8		15.3		14.9		14.4		17.1		15.8		16		14		14.3		15.6		14.2		16		15
90	Conductivity	84	361		414		630		811		551		692		292		236		678		585		267		356		200
91	Dissolved oxygen	85	NM		NM		2.21		3.36		NM		3.72		NM		4.91		3.15		1.68		4.6		3.07		5.43
92																											
93																											
94																											
95	2,3,7,8-TCDF	89	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
96	Total TCDF	90	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
97	2,3,7,8-TCDD	91	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
98	Total TCDD	92	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
99	1,2,3,7,8-PeCDF	93	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
100	2,3,4,7,8-PeCDF	94	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
101	Total PeCDF	95	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
102	1,2,3,7,8-PeCDD	96	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
103	Total PeCDD	97	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
104	1,2,3,4,7,8-HxCDF	98	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
105	1,2,3,6,7,8-HxCDF	99	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
106	2,3,4,6,7,8-HxCDF	100	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
107	1,2,3,7,8,9-HxCDF	101	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
108	Total HxCDF	102	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
109	1,2,3,4,7,8-HxCDD	103	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
110	1,2,3,6,7,8-HxCDD	104	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
111	1,2,3,7,8,9-HxCDD	105	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
112	Total HxCDD	106	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
113	1,2,3,4,6,7,8-HpCDF	107	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
114	1,2,3,4,7,8,9-HpCDF	108	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
115	Total HpCDF	109	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
116	1,2,3,4,6,7,8-HpCDD	110	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
117	Total HpCDD	111	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
118	OCDF	112	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
119	OCDD	113	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
122																											
123																											
124																											
125	Naphthalene	119	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
126			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127	Acenaphthylene	121	0.98	U	1	U	1	U	1	U	1.01	U	1.01	U	NA		1	U	1	U	1	U	NA		NA		NA
128	Acenaphthene	122	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
129	Fluorene	123	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
130	Anthracene	124	0.98	U	1	U	1	U	1	U	1.01	U	1.01	U			1	U	1	U	1	U	NA		NA		NA
131			NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

	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
71																													
72																													
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		NA		NA		**152**		NA		**260**		**242**		**247**		**243**		**466**		**268**		**152**		**294**		**264**		**362**	
81		NA		NA		0.5	U	NA		**3.34**		0.5	U	0.5	U	**1.79**		**2.8**		**3.24**		**2.13**		**2.97**		**3.43**		**3.43**	
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		6.17		6.05		6.01		6.55		6.23		5.94		5.94		5.61		6.13		6.02		5.93		5.86		6.16		6.05	
89		14.6		15.2		14.7		16.7		15.7		16.9		16.4		15.4		13.8		15.9		16.3		16.4		15.3		14.7	
90		607		487		781		269		590		717		718		639		998		793		456		704		609		726	
91		3.04		4.09		2.69		NM		2.23		1.51		2.13		2.34		2.46		2.57		2.36		1.36		1.5		NM	
92																													
93																													
94																													
95		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	
97		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	
99		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	
101		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	
103		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	
105		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	
107		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	
109		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	
111		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	
113		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	
115		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	
117		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	
119		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	
122																													
123																													
124																													
125		NA		NA		**0.14**		NA		**0.1**		**0.39**		**0.392**		0.052	U	**0.409**		**0.409**		**0.478**		0.0498	U	**0.104**		0.05	U
126		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127		NA		NA		1.01	U	NA		0.0502	U	**0.107**	J	**0.245**	J	0.052	U	**0.123**		**0.517**		**0.211**		0.0498	U	0.0522	U	0.05	U
128		NA		NA		**0.678**		NA		**0.11**		**0.956**	J	**1.21**	J	0.052	U	**0.86**		**1.39**		**1.16**		0.0498	U	**0.104**		0.05	U
129		NA		NA		**1.59**		NA		**0.0602**		**2.14**	J	**2.75**	J	**0.166**		**0.246**		**2.65**		**1.98**		**0.129**		**0.146**		0.05	U
130		NA		NA		**0.0997**		NA		0.0502	U	**0.127**		**0.0979**		0.052	U	0.0512	U	**0.146**		**0.289**		0.0498	U	0.0522	U	1.01	U
131		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

	BE	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
71																													
72																													
73	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
75	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
77	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
79	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
80	**79**		**356**		**199**		**100**		**272**		**290**		**100**		**149**		**322**		**359**		**244**		**259**		**265**		**709**		**163**
81	**1.4**		**7.88**		**1.2**		**2.96**		**2.72**		**27**		**2.19**		**2.98**		**1.63**		0.5	U	**15.5**		**2.57**		**3.43**		**3.24**		**1.33**
82	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
84	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
86																													
87																													
88	5.72		6.12		6.06		5.7		6.05		6.09		5.23		6.41		5.59		5.93		5.89		6.26		7.68		5.86		6.22
89	15.4		14.8		15.5		15.2		14.8		14.4		16.8		15		14.1		14.7		15.2		15.2		16.1		16.5		15
90	151		677		298		215		646		637		235		303		722		836		438		597		451		523		362
91	NM		3.06		2.24		NM		NM		NM		NM		NM		3.09		3.8		2.66		4.43		NM		1.71		3.75
92																													
93																													
94																													
95	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
97	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
99	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
101	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
103	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
105	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
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108	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
110	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
112	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
114	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
116	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
118	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
120																													
121	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
122																													
123																													
124																													
125	**0.06**		0.05	U	**0.55**		0.05	U	**0.07**		**1.78**		0.05	U	0.05	U	0.0487	U	NA		NA		NA		**5.83**		NA		NA
126	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA
127	0.05	U	0.05	U	**0.32**		0.05	U	0.05	U	**0.4**		0.05	U	0.05	U	**0.0584**		1	U	1	U	1	U	0.05	U	1	U	1
128	0.05	U	0.05	U	**0.64**		0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.0487	U	NA		NA		NA		**0.05**		NA		NA
129	0.05	U	0.05	U	**1.15**		0.05	U	0.05	U	**0.1**		0.05	U	0.05	U	**0.477**		NA		NA		NA		0.05	U	NA		NA
130	0.05	U	0.05	U	**0.09**		0.05	U	0.05	U	**0.1**		**0.05**		0.05	U	0.0487	U	1	U	1	U	1	U	0.05	U	1	U	1
131	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA

	CH	CI	CJ	CK	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
71																													
72																													
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		**278**		**210**		**358**		**461**		**456**		**276**		**284**		**277**		**241**		**326**		**315**		**201**		**338**		**495**	
81		**1.68**		**2.52**		**2.81**		**3.73**		**3.42**		**3.19**		**3.13**		**3.07**		**2.91**		**7.67**		**4.12**		**3.56**		**2.1**		**4.89**	
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		6.16		5.83		5.96		5.85		6.07		5.96		5.93		5.91		5.88		6.38		5.94		5.83		6.16		6.04	
89		15.8		16		15.6		18		16.6		15.6		15.8		16.2		15.7		14.6		16.1		15.5		15.8		17	
90		692		351		624		592		813		510		517		517		489		605		566		365		692		750	
91		3.72		2.2		1.82		1.4		3.44		2.63		2.6		2.28		3.6		3.01		2.67		2.33		3.72		2.29	
92																													
93																													
94																													
95		NA		NA		0.001855	U	NA		NA		NA		0.001308	U	NA		NA		NA		NA		NA		NA		0.002108	U
96		NA		NA		0.001855	U	NA		NA		NA		0.001308	U	NA		NA		NA		NA		NA		NA		**0.016418**	
97		NA		NA		0.002202	U	NA		NA		NA		0.001655	U	NA		NA		NA		NA		NA		NA		0.00189	U
98		NA		NA		0.002202	U	NA		NA		NA		0.001655	U	NA		NA		NA		NA		NA		NA		0.00189	U
99		NA		NA		0.001628	U	NA		NA		NA		0.001565	U	NA		NA		NA		NA		NA		NA		0.005954	UJ
100		NA		NA		0.001557	U	NA		NA		NA		0.001496	U	NA		NA		NA		NA		NA		NA		0.001846	U
101		NA		NA		**0.021311**		NA		NA		NA		0.001496	U	NA		NA		NA		NA		NA		NA		**0.009166**	
102		NA		NA		0.002569	U	NA		NA		NA		0.002223	U	NA		NA		NA		NA		NA		NA		0.002557	U
103		NA		NA		0.002569	U	NA		NA		NA		0.002223	U	NA		NA		NA		NA		NA		NA		0.002557	U
104		NA		NA		**0.006922**	J	NA		NA		NA		**0.005124**	J	NA		NA		NA		NA		NA		NA		**0.005188**	J
105		NA		NA		**0.003692**	J	NA		NA		NA		0.001659	U	NA		NA		NA		NA		NA		NA		0.005326	UJ
106		NA		NA		**0.004637**	J	NA		NA		NA		0.001727	U	NA		NA		NA		NA		NA		NA		0.002058	U
107		NA		NA		0.001753	U	NA		NA		NA		0.002002	U	NA		NA		NA		NA		NA		NA		0.002386	U
108		NA		NA		**0.232308**		NA		NA		NA		**0.117654**		NA		NA		NA		NA		NA		NA		**0.018357**	
109		NA		NA		0.00237	U	NA		NA		NA		0.002125	U	NA		NA		NA		NA		NA		NA		0.002938	U
110		NA		NA		**0.030842**		NA		NA		NA		**0.014629**	J	NA		NA		NA		NA		NA		NA		0.002518	U
111		NA		NA		0.002173	U	NA		NA		NA		0.001949	U	NA		NA		NA		NA		NA		NA		0.002694	U
112		NA		NA		**0.062692**		NA		NA		NA		**0.037485**		NA		NA		NA		NA		NA		NA		**0.011911**	
113		NA		NA		**0.189857**		NA		NA		NA		**0.059996**		NA		NA		NA		NA		NA		NA		0.005138	UJ
114		NA		NA		**0.013672**	J	NA		NA		NA		**0.007017**	J	NA		NA		NA		NA		NA		NA		**0.011046**	J
115		NA		NA		**0.913668**		NA		NA		NA		**0.325386**		NA		NA		NA		NA		NA		NA		**0.031417**	
116		NA		NA		**1.222349**		NA		NA		NA		**0.381169**		NA		NA		NA		NA		NA		NA		**0.031308**	
117		NA		NA		**1.891967**		NA		NA		NA		**0.588687**		NA		NA		NA		NA		NA		NA		**0.061732**	
118		NA		NA		**0.901706**		NA		NA		NA		**0.244329**		NA		NA		NA		NA		NA		NA		**0.029711**	J
119		NA		NA		**9.445627**		NA		NA		NA		**1.997929**		NA		NA		NA		NA		NA		NA		**0.429978**	
120																													
121		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
122																													
123																													
124																													
125		**54.5**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.398**		NA	
126		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
127	U	**0.253**		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**0.239**		1	U
128		**1.16**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**5.04**		NA	
129		**2.49**		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**3.81**		NA	
130	U	**0.121**		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**0.259**		1	U
131		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

	DK	DL	DM	DN
71				
72				
73	NA		NA	
74	NA		NA	
75	NA		NA	
76	NA		NA	
77	NA		NA	
78	NA		NA	
79	NA		NA	
80	**258**		**254**	
81	**3.95**		**3.82**	
82	NA		NA	
83	NA		NA	
84	NA		NA	
85	NA		NA	
86				
87				
88	6.09		6.15	
89	15.7		16	
90	530		531	
91	3.58		3.58	
92				
93				
94				
95	NA		NA	
96	NA		NA	
97	NA		NA	
98	NA		NA	
99	NA		NA	
100	NA		NA	
101	NA		NA	
102	NA		NA	
103	NA		NA	
104	NA		NA	
105	NA		NA	
106	NA		NA	
107	NA		NA	
108	NA		NA	
109	NA		NA	
110	NA		NA	
111	NA		NA	
112	NA		NA	
113	NA		NA	
114	NA		NA	
115	NA		NA	
116	NA		NA	
117	NA		NA	
118	NA		NA	
119	NA		NA	
120				
121	NA		NA	
122				
123				
124				
125	NA		NA	
126	NA		NA	
127	1	U	1	U
128	NA		NA	
129	NA		NA	
130	1	U	1	U
131	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			B1		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		BH96T	
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)		2/16/00	
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	NA		**0.14**	J1
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		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	NA		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	NA		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	NA		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	NA		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	NA		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	**3.1**	M	2.0	U	2.0	U	NA		**4.6**	
20	14	4-Methylphenol	**43**		1.0	U	1.0	U	**24**		**39**		**28**		**31**		**35**		**7.1**		1.0	U	**7.0**		NA		**57**	
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	NA		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	NA		**7.7**	
23	17	Benzoic Acid	10	U	10	U	10	U	**10**		10	U	10	U	10	U	10	U	**27**		10	U	10	U	NA		10	U
24	18	Naphthalene	**16**		**12**		**18**		**16**		**20**	J2	**6.8**		**4.4**		**35**		**26**		1.0	U	**12**		NA		**51**	
25	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		**19**	
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	NA		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	NA		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	NA		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	NA		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	NA		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	NA		5.0	U
32	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		1.0	U
33	27																											
34	28	**VOLATILES (µg/L)**																										
35	29	**EPA Method SW8260**																										
36	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		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	45	U	5.0	U	5.0	U	NA		1.0	U
38	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		55	U
39	33	Benzene	1.0	U	1.0	U	1.0	U	**250**		**440**		**190**		**160**		**2400**		**210**		**66**		**190**		NA		**4700**	
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	45	U	5.0	U	5.0	U	NA		1.0	U
41	35	Toluene	**6.4**		1.0	U	1.0	U	**4.4**		**1400**		**450**		**190**		**4000**		**3700**		**920**		**290**		NA		**4700**	
42	36	Ethylbenzene	**5.4**		**5.5**		**1.1**		**1.2**		**11**		**19**		**11**		**140**		**220**		**160**		**32**		NA		**160**	
43	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		**29**	
44	38	m,p-Xylene	**1.2**		**2.5**		**1.1**		**1.7**		**22**		**50**		**33**		**450**		**730**		**390**		**100**		NA		**1000**	
45	39	o-Xylene	**1.1**		**1.2**		1.0	U	1.0	U	**7.4**		**22**		**14**		**210**		**360**		**200**		**44**		NA		**490**	
46	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		**46**	
47	41	1,2,4-Trimethylbenzene	**4.6**		**8.8**		**47**	J2	**36**		**110**		**30**		**19**		**140**		**88**		**44**		**24**		NA		**150**	
48	42	Isopropylbenzene	**7.7**		**9.5**		**34**	J2	**23**		**34**		**11**		**7.4**		**28**		45	U	**9.1**		**6.2**		NA		**28**	
49	43	n-Propylbenzene	**3.1**		**4.9**		**21**		**17**		**29**		**13**		**8.8**		**36**		45	U	**9.7**		**8.2**		NA		**40**	
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	45	U	5.0	U	5.0	U	NA		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	45	U	5.0	U	5.0	U	NA		**2.8**	
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	45	U	5.0	U	5.0	U	NA		**2.7**	
53	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		**4.5**	
54	48	Naphthalene	**25**		**20**	J2	**52**	J2	**23**		**31**		**12**		**11**		**56**		230	U	25	U	25	U	NA		**82**	
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**	**0.68**		**0.75**		**1.1**		**1.2**		**1.2**		**0.51**		**1.0**		**9.5**		**2.0**		**0.37**		**0.46**		NA		**4.8**	
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																											

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	BD
1																													
2														Dup of B1										Dup of B1					
3		B1		B1		B1		B1		B1		B1		X		B1		B1		B1		B1		X		B1		B1	
4		BR55M		CB68E		CL03B		CT67H		DE68L		DM30L		DM30K		DW37B		ED23A		EM75J		ES04G		ES04A		EY88C		FF88O	
5		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		11/11/02		2/13/03	
6																													
7	**CHLORINATED PHENOLS (µg/L)**																												
8	**EPA Method SW8040**																												
9	Pentachlorophenol	**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	0.25	U	0.25	U
10	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		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		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		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		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		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		NA	
16																													
17	**SEMIVOLATILES (µg/L)**																												
18	**EPA Method SW8270**																												
19	Phenol	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	2.2	U	2	U
20	4-Methylphenol	**20**		**47**		**5.6**		**8.4**		**130**	J	**50**		**54**		**44**		**170**		**46**		1.2	U	**1.3**		1.1	U	**36**	
21	Isophorone	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	1.1	U	1	U
22	2,4-Dimethylphenol	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**		3.3	U	6.7	U
23	Benzoic Acid	**160**		**73**		10	U	10	U	500	UJ	10	U	10	U	50	U	50	U	50	U	58	U	58	U	54	U	51	U
24	Naphthalene	**34**		**27**		**2.0**		**5.1**		50	UJ	**13**		**14**		1.0	U	**17**		**15**		**2.8**		**3.3**		1.1	U	1	U
25	2-Methylnaphthalene	**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**		1.1	U	1	U
26	2,4,6-Trichlorophenol	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	5.4	U	5.1	U
27	2,4,5-Trichlorophenol	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	5.4	U	5.1	U
28	Acenaphthene	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	1.1	U	1	U
29	Dibenzofuran	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	1.1	U	1	U
30	Fluorene	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	1.1	U	1	U
31	Pentachlorophenol	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	5.4	U	5.1	U
32	bis(2-Ethylhexyl)phthalate	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	4.3	U	1	U
33																													
34	**VOLATILES (µg/L)**																												
35	**EPA Method SW8260**																												
36	Acetone	5.0	U	**410**		5.0	U	**1200**		**1100**		**230**		**280**		37	U	**250**		**18**		25	U	25	U	5	U	**78**	
37	Carbon Disulfide	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	1	U	1	U
38	2-Butanone	**6.1**		120	U	**28**		**260**		100	U	100	U	**160**		**13**		**54**		15	U	25	U	25	U	5	U	**8.2**	M
39	Benzene	**990**		**1100**		**160**		**610**		**560**		**180**	J	**230**	J	**120**		**1000**		**240**		**160**		**130**		**19**		**65**	
40	Bromoform	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	1	U	1	U
41	Toluene	**1800**		**3600**		**1200**		**2000**		**3400**		**1400**	J	**1900**	J	**800**		**2800**		**520**		**210**		**210**		**61**		**100**	
42	Ethylbenzene	**110**		**300**		**100**		**160**		**220**		**130**		**150**		**86**		**170**		**97**		**88**		**74**		**22**		**51**	
43	Styrene	**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	1	U	1	U
44	m,p-Xylene	**340**		**990**		**320**		**590**		**830**		**450**		**530**		**350**		**290**		**270**		**230**		**210**		**71**		**130**	
45	o-Xylene	**180**		**420**		**160**		**240**		**370**		**210**		**250**		**180**		**210**		**150**		**120**		**100**		**26**		**75**	
46	1,3,5-Trimethylbenzene	**18**		**37**		**15**		**31**		**37**		**33**		**37**		**29**		**37**		**22**		**18**		**19**		**9.3**		**18**	
47	1,2,4-Trimethylbenzene	**72**		**160**		**61**		**100**		**160**		**110**		**130**		**100**		**94**		**73**		**54**		**56**		**30**		**57**	
48	Isopropylbenzene	**10**		25	U	**9.0**		30	U	20	U	20	U	20	U	**11**		**12**		**11**		**7**		**8.5**		**21**		**9.7**	
49	n-Propylbenzene	**17**		**31**		**15**		30	U	**33**		**22**		**24**		**19**		**15**		**16**		**12**		**13**		**26**		**15**	
50	tert-Butylbenzene	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	1	U	1	U
51	sec-Butylbenzene	**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	**2.2**		1	U
52	4-Isopropyltoluene	**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	1	U	**1.1**	
53	n-Butylbenzene	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	**2.2**		2.8	U
54	Naphthalene	**36**		120	U	**25**		150	U	100	U	100	U	100	U	**39**		**37**		**24**		25	U	25	U	**9.1**		**13**	
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**	**0.44**		**1.4**		**0.37**		**2.1**		**47**		**8.7**	J	**6.9**	J	**0.94**		**12**		**1.3**		**0.64**		**0.9**		**0.84**		**6.8**	
60	**TPH-D Motor Oil**	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	0.5	U	0.5	U
61	**TPH-Gasoline**	**17**		**36**		**8.8**		**15**		**25**		**19**		**19**		**6.8**		**16**		**7.6**		**4.8**	J	**3.4**	J	**2.4**		**4.6**	
62																													

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN
1											
2											
3		B1		B1		B1		B1		B1	
4		FL41H		FU50E		FY64D		0402099-01		0408019-02	
5		5/7/03		8/29/03		10/20/03		2/19/04		8/03/04	
6											
7	**CHLORINATED PHENOLS (µg/L)**										
8	**EPA Method SW8040**										
9	Pentachlorophenol	0.25	U	0.5	U	0.52	U	**2.46**	J	0.5	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	**3.1**	M	2	U	2.1	U	1.91	U	1.96	U
20	4-Methylphenol	**28**		1	U	1	U	**12**		9.8	U
21	Isophorone	1	U	1	U	1	U	0.956	U	0.98	U
22	2,4-Dimethylphenol	3	U	3	U	**4.4**		2.87	U	2.94	U
23	Benzoic Acid	50	U	50	U	10	U	19.1	U	19.6	U
24	Naphthalene	**1.8**		**2.7**		**3.5**		**1.23**		0.98	U
25	2-Methylnaphthalene	1	U	**1.4**		**3**		0.956	U	0.98	U
26	2,4,6-Trichlorophenol	5	U	5	U	5.2	U	4.78	U	4.9	U
27	2,4,5-Trichlorophenol	5	U	5	U	5.2	U	4.78	U	4.9	U
28	Acenaphthene	1	U	1	U	1	U	0.956	U	0.98	U
29	Dibenzofuran	1	U	1	U	1	U	0.956	U	0.98	U
30	Fluorene	1	U	1	U	1	U	0.956	U	0.98	U
31	Pentachlorophenol	5	U	5	U	5.2	U	4.78	U	4.9	U
32	bis(2-Ethylhexyl)phthalate	1	U	1	U	**6.3**		0.956	U	0.98	U
33											
34	**VOLATILES (µg/L)**										
35	**EPA Method SW8260**										
36	Acetone	**61**	M	**28**		5	U	50	U	50	U
37	Carbon Disulfide	1	U	1	U	1	U	2	U	2	U
38	2-Butanone	**8.1**	M	5	U	5	U	10	U	10	U
39	Benzene	**82**		**20**		**5.6**		**36.9**		**1.71**	J
40	Bromoform	1	U	1	U	1	U	1	U	1	U
41	Toluene	**100**		**22**		**2.1**		**9.07**		1	U
42	Ethylbenzene	**130**	J	**80**		**31**		**55.2**		**27.5**	J
43	Styrene	1	U	1	U	1	U	1	U	1	U
44	m,p-Xylene	**110**	J	**99**		**40**		**25.2**		**20.8**	J
45	o-Xylene	**86**	J	**35**		**9.2**		**15.2**		**2.6**	J
46	1,3,5-Trimethylbenzene	**11**	J	**9.3**		**3.6**		**9.64**		**1.15**	J
47	1,2,4-Trimethylbenzene	**30**	J	**28**		**12**		**26.6**		**3.13**	J
48	Isopropylbenzene	**6.3**	J	**5.2**		**3.3**		**5.53**		**1.95**	J
49	n-Propylbenzene	**7.6**	J	**7.3**		**4.5**		**8.05**		**2.57**	J
50	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	**1**	J	**1**		1	U	1	U	1	U
52	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U
53	n-Butylbenzene	**1.8**	J	**1.6**	M	1	U	1	U	1	U
54	Naphthalene	**5.8**		**7.3**		5	U	**5.47**		**1.03**	J
55	Methyl tert-butyl ether	NA		NA		NA		1	U	1	U
56											
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**										
58	**Method OR-DEQ**										
59	**TPH-Diesel**	**2.4**		**1.6**		**2.7**		**2.26**		**0.978**	
60	**TPH-D Motor Oil**	0.5	U	0.5	U	0.5	U	0.477	U	0.503	U
61	**TPH-Gasoline**	**4.8**		**3.0**		**1.2**		**2.6**		**0.652**	
62											

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			B1		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		BH96T	
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)		2/16/00	
63	56	**PRIORITY POLLUTANT**																										
64	57	**METALS (mg/L)**																										
65	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		**0.006**	
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		0.005	U
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		**0.004**	
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		0.001	U
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		**0.06**	
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		**0.020**	
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		NA	
74	67	Magnesium (mg/L) (6010)	**16.3**		**9.41**		**6.93**		**9.05**		NA		NA		NA		**3.94**		NA		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		NA	
76	69	Sodium (mg/L) (6010)	**8.65**		**7.49**		**7.88**		**7.63**		NA		NA		NA		**6.29**		NA		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		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)	**190**		**140**	J2	**130**		**170**		NA		NA		NA		**43**		NA		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		**250**	
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		**3.8**	
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		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		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		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		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	BD
1																													
2														Dup of B1										Dup of B1					
3		B1		B1		B1		B1		B1		B1		X		B1		B1		B1		B1		X		B1		B1	
4		BR55M		CB68E		CL03B		CT67H		DE68L		DM30L		DM30K		DW37B		ED23A		EM75J		ES04G		ES04A		EY88C		FF88O	
5		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		11/11/02		2/13/03	
63	**PRIORITY POLLUTANT**																												
64	**METALS (mg/L)**																												
65	Arsenic (7060)	**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	0.05	U	**0.012**	
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	**0.03**		**0.017**	
67	Copper (6010)	**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	**0.073**		**0.107**	
68	Lead (7421)	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	**0.03**		**0.028**	
69	Nickel (6010)	**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	**0.05**		**0.04**	
70	Zinc (6010)	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	**0.119**		**0.085**	
71																													
72	**MAJOR IONS AND CONVENTIONALS**																												
73	Calcium (mg/L) (6010)	NA		NA		NA		**23.9**		**88.1**		**15.2**		**16.4**		**19.2**	J	**35.7**		NA		NA		NA		NA		**17.3**	
74	Magnesium (mg/L) (6010)	NA		NA		NA		**9.46**		**40.8**		**6.11**		**6.64**		**7.26**	J	**15.7**		NA		NA		NA		NA		**8.66**	
75	Potassium (mg/L) (6010)	NA		NA		NA		**2.6**		**5.1**		**2.1**		**2.5**		**2.4**		**4.6**		NA		NA		NA		NA		**3.6**	
76	Sodium (mg/L) (6010)	NA		NA		NA		**8.18**		**13.3**		**6.43**		**6.89**		**7.22**		**12.3**		NA		NA		NA		NA		**7.8**	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		**160**		NA		NA		NA		NA		**140**		NA		NA		NA		NA		**70**	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		1.0	U	NA		NA		NA		NA		1.0	U	NA		NA		NA		NA		1	U
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		**160**		NA		NA		NA		NA		**140**		NA		NA		NA		NA		**70**	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**220**		**170**		**140**		**250**		**1400**		**140**		**130**		**150**		**430**		**330**		**140**		**140**		**150**		**170**	
81	Chloride (mg/L) (EPA 325.2)	**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**		**3**		**6.4**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		0.010	U	NA		NA		NA		NA		0.010	U	NA		NA		NA		NA		**0.029**	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		**0.012**	J	NA		NA		NA		NA		**0.021**		NA		NA		NA		NA		**0.03**	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		**0.015**		NA		NA		NA		NA		**0.020**	J	NA		NA		NA		NA		**0.059**	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		**2.8**		NA		NA		NA		NA		2.5	U	NA		NA		NA		NA		**5.7**	
86																													

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN
1											
2											
3		B1		B1		B1		B1		B1	
4		FL41H		FU50E		FY64D		0402099-01		0408019-02	
5		5/7/03		8/29/03		10/20/03		2/19/04		8/03/04	
63	**PRIORITY POLLUTANT**										
64	**METALS (mg/L)**										
65	Arsenic (7060)	**0.007**		**0.007**		**0.007**		**0.003**		**0.00636**	
66	Chromium (6010)	**0.008**		0.005	U	**0.006**		0.005	U	0.005	U
67	Copper (6010)	**0.041**		**0.004**		**0.015**		**0.0117**		0.01	U
68	Lead (7421)	**0.009**		0.001	U	**0.005**		**0.0007**		0.0001	U
69	Nickel (6010)	**0.03**		0.01	U	**0.01**		**0.0075**		0.005	U
70	Zinc (6010)	**0.037**	J	**0.007**		**0.018**		0.01	U	**0.0166**	
71											
72	**MAJOR IONS AND CONVENTIONALS**										
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**140**		**210**		**210**		**116**		**215**	
81	Chloride (mg/L) (EPA 325.2)	**2.9**		**2.4**		**3**		**3.31**		**3.63**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	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

	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			B1		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		BH96T	
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)		2/16/00	
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		4.81	
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		12.3	
90	83	Conductivity (um/hos)	466		359		286		457		392		605		379		363		254		263		306		NM		335	
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		2.15	
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	114	**ETHANOL (mg/L)**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**4200**	J2	**6300**	J2	**5100**	
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	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														Dup of B1										Dup of B1					
3		B1		B1		B1		B1		B1		B1		X		B1		B1		B1		B1		X		B1		B1	
4		BR55M		CB68E		CL03B		CT67H		DE68L		DM30L		DM30K		DW37B		ED23A		EM75J		ES04G		ES04A		EY88C		FF88O	
5		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		11/11/02		2/13/03	
87	**FIELD PARAMETERS**																												
88	pH (avg)	6.02		6.13		4.89		5.53		4.70		6.43		6.49		6.14		4.97		6.50		6.50		6.50		6.8		6.34	
89	Temperature (° C) (avg)	14.9		17.7		13.4		13.1		14.0		15.1		15.2		13.0		13.1		16.4		16.7		16.8		15.8		14.2	
90	Conductivity (um/hos)	297		243		222		297		1883		259		248		270		501		718		432		413		268		274	
91	Dissolved oxygen (mg/L) (avg)	1.55		1.51		0.84		1.08		1.42		1.59		1.61		3.58		5.92		4.21		0.79		0.60		1.64		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		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)**	**16**		5.0	U	5.0	U	**5.0**		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	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN
1											
2											
3		B1		B1		B1		B1		B1	
4		FL41H		FU50E		FY64D		0402099-01		0408019-02	
5		5/7/03		8/29/03		10/20/03		2/19/04		8/03/04	
87	**FIELD PARAMETERS**										
88	pH (avg)	6.23		6.52		6.51		4.99		7.5	
89	Temperature (° C) (avg)	14.4		16		15.9		14		15.8	
90	Conductivity (um/hos)	170		285		285		97		361	
91	Dissolved oxygen (mg/L) (avg)	2.54		1.73		1.48		1.77		NM	
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	AA	AB
1																												
2																												
3			B1		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		BH96T	
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)		2/16/00	
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		NA	
126	119	2-Methylnaphthalene	NA		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		NA	
128	121	Acenaphthene	NA		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		NA	
130	123	Anthracene	NA		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		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	BD
1																													
2														Dup of B1										Dup of B1					
3		B1		B1		B1		B1		B1		B1		X		B1		B1		B1		B1		X		B1		B1	
4		BR55M		CB68E		CL03B		CT67H		DE68L		DM30L		DM30K		DW37B		ED23A		EM75J		ES04G		ES04A		EY88C		FF88O	
5		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		11/11/02		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		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-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN
1											
2											
3		B1		B1		B1		B1		B1	
4		FL41H		FU50E		FY64D		0402099-01		0408019-02	
5		5/7/03		8/29/03		10/20/03		2/19/04		8/03/04	
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		0.98	U
128	Acenaphthene	NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		0.98	U
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	AA	AB
1																												
2																												
3			D		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		BH96B	
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)		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**		0.25	U	**0.45**		0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	NA		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	NA		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	NA		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	NA		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	NA		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	NA		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	NA		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	UJ	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	NA		2.0	U
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		1.0	U
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		1.0	U
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		3.0	U
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		10	U
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		1.0	U
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		1.0	U
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		5.0	U
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		5.0	U
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		1.0	U
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		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	NA		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	NA		5.0	U
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	**2.4**		1.0	U	NA		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	NA		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	NA		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	NA		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	NA		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	NA		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	NA		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	**3.7**		NA		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	NA		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	**1.9**		NA		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	NA		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	**2.6**		NA		1.0	U
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		**1.0**	
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		**2.5**	
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		**1.1**	
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		1.0	U
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		**2.0**	
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	NA		1.0	U
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		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	NA		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**	**0.82**		**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		**0.40**	
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																											

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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	BD
3		D		D		D		D		D		D		D		D		D		D		D		D		D		D	
4		BR55E		CB49D		CK77F		CT37F		DE68G		DM30M		DW37E		ED34G		EM85B		ER93P		EZ03C		FF76G		FL58K		FU45C	
5		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		5/8/03		8/28/03	
7	**CHLORINATED PHENOLS (µg/L)**																												
8	**EPA Method SW8040**																												
9	Pentachlorophenol	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	0.25	U	**0.86**	J
10	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		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		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		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		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		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		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	2.6	U	2.2	U	2.1	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	1.0	U	1.3	U	1.1	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	1.0	U	1.3	U	1.1	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	3.0	U	3.9	U	3.3	U	3.1	U	3	U	3	U
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	50	U	50	U	50	U	66	U	54	U	52	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	**3**		1.0	U	1.3	U	1.1	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	1.0	U	1.3	U	1.1	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	5.0	U	6.6	U	5.4	U	5.2	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	6.6	U	5.4	U	5.2	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	1.3	U	1.1	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	1.0	U	1.3	U	1.1	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	1.0	U	1.3	U	1.1	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	5.0	U	6.6	U	5.4	U	5.2	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	**12**		4.0	U	4.0	U	5.3	U	4.3	U	1	U	**150**		1	U
33																													
34	**VOLATILES (µg/L)**																												
35	**EPA Method SW8260**																												
36	Acetone	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	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	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	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	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	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	1	U
42	Ethylbenzene	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	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	1	U
44	m,p-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.6**		1.0	U	1.0	U	1	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	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	**2.0**		**1.9**		1.0	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	**23**		**38**		**1.2**		1	U	1	U	1	U	1	U	1	U
48	Isopropylbenzene	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	1	U	**3.4**	
49	n-Propylbenzene	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	1	U	**2.6**	
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	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	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	1	U	**1.2**	
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	**1.8**		1.0	U	1	U	1	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	**1.5**		1.0	U	1	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	7.5	U	5.0	U	**8.2**		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		NA	
56																													
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																												
58	**Method OR-DEQ**																												
59	**TPH-Diesel**	0.25	U	0.25	U	0.25	U	**0.26**		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																													

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BE	BF	BG	BH	BI	BJ
1							
2							
3		D		D		D	
4		FY82H		0402105-03		0408036-01	
5		10/23/03		2/20/04		8/05/04	
6							
7	**CHLORINATED PHENOLS (µg/L)**						
8	**EPA Method SW8040**						
9	Pentachlorophenol	**0.61**		0.498	U	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	1.98	U	2	U
20	4-Methylphenol	1	U	9.91	U	10	U
21	Isophorone	1	U	0.991	U	1	U
22	2,4-Dimethylphenol	3	U	2.97	U	3	U
23	Benzoic Acid	10	U	19.8	U	20	U
24	Naphthalene	1	U	0.991	U	1	U
25	2-Methylnaphthalene	1	U	0.991	U	1	U
26	2,4,6-Trichlorophenol	5.1	U	4.96	U	5	U
27	2,4,5-Trichlorophenol	5.1	U	4.96	U	5	U
28	Acenaphthene	1	U	0.991	U	1	U
29	Dibenzofuran	1	U	0.991	U	1	U
30	Fluorene	1	U	0.991	U	1	U
31	Pentachlorophenol	5.1	U	4.96	U	5	U
32	bis(2-Ethylhexyl)phthalate	1	U	0.991	U	1	U
33							
34	**VOLATILES (µg/L)**						
35	**EPA Method SW8260**						
36	Acetone	5	U	50	U	50	U
37	Carbon Disulfide	1	U	2	U	2	U
38	2-Butanone	5	U	10	U	10	U
39	Benzene	1	U	0.4	U	0.3	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	2	U	2	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	**1.1**		1	U	**1.13**	J
49	n-Propylbenzene	1	U	1	U	**1.19**	J
50	tert-Butylbenzene	1	U	1	U	1	U
51	sec-Butylbenzene	1	U	1	U	1	U
52	4-Isopropyltoluene	1	U	1	U	1	U
53	n-Butylbenzene	1	U	1	U	1	U
54	Naphthalene	5	U	1	U	1	U
55	Methyl tert-butyl ether	NA		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							

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			D		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		BH96B	
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)		2/17/00	
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		**0.019**	
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		0.005	U
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		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	**0.004**		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	0.01	U	NA		0.01	U
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		0.006	U
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		NA	
74	67	Magnesium (mg/L) (6010)	**16.2**		**15.4**		**18.8**		**20.9**		NA		NA		NA		**16.9**		NA		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		NA	
76	69	Sodium (mg/L) (6010)	**8.31**		**7.96**		**9.13**		**9.54**		NA		NA		NA		**9.67**		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**200**		**180**		**220**		**280**		NA		NA		NA		**210**		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)	**200**		**180**		**220**		**280**		NA		NA		NA		**210**		NA		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		**310**	
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		**3.4**	
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		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		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		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		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	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		D		D		D		D		D		D		D		D		D		D		D		D		D		D	
4		BR55E		CB49D		CK77F		CT37F		DE68G		DM30M		DW37E		ED34G		EM85B		ER93P		EZ03C		FF76G		FL58K		FU45C	
5		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		5/8/03		8/28/03	
63	**PRIORITY POLLUTANT**																												
64	**METALS (mg/L)**																												
65	Arsenic (7060)	**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**		**0.022**		**0.017**	
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	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**		0.002	U	**0.003**		0.002	U	0.002	U	0.002	U	0.002	U
68	Lead (7421)	**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	**0.002**		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	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	**0.019**		0.006	U	0.006	U	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		**40.6**		**43.4**		**34.3**		**40.1**	J	**32.2**		NA		NA		NA		**75.2**		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		**13.8**		**14.9**		**12.0**		**14.0**	J	**11.3**		NA		NA		NA		**26.1**		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		**1.8**		**2.2**		**1.9**		**2.2**		**2.0**		NA		NA		NA		**3**		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		**7.40**		**7.64**		**6.73**		**7.77**		**7.57**		NA		NA		NA		**10.8**		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		**200**		NA		NA		NA		**140**		NA		NA		NA		**350**		NA		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		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		**200**		NA		NA		NA		**140**		NA		NA		NA		**350**		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**290**		**230**		**220**		**240**		**240**		**180**		**220**		**200**		**260**		**320**		**320**		**360**		**350**		**290**	
81	Chloride (mg/L) (EPA 325.2)	**3.2**		**3.1**		**5.4**		**5.4**		**2.4**		**4.5**		**2.4**		**2.9**		**3.3**		**3**		**3.1**		**4.2**		**3.5**		**1.8**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		0.010	U	NA		NA		NA		**0.020**		NA		NA		NA		**0.19**		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		0.010	U	NA		NA		NA		0.010	U	NA		NA		NA		0.01	U	NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		0.010	UJ	NA		NA		NA		**0.020**		NA		NA		NA		**0.19**		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		**6.1**		NA		NA		NA		**12**		NA		NA		NA		**4**		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	BE	BF	BG	BH	BI	BJ
1							
2							
3		D		D		D	
4		FY82H		0402105-03		0408036-01	
5		10/23/03		2/20/04		8/05/04	
63	**PRIORITY POLLUTANT**						
64	**METALS (mg/L)**						
65	Arsenic (7060)	**0.018**		**0.021**		**0.0185**	
66	Chromium (6010)	0.005	U	**0.0078**		**0.019**	
67	Copper (6010)	0.002	U	0.01	U	0.01	U
68	Lead (7421)	0.001	U	**0.0021**		0.0001	U
69	Nickel (6010)	0.01	U	0.005	U	0.005	U
70	Zinc (6010)	0.006	U	0.01	U	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)	**260**		**291**		**308**	
81	Chloride (mg/L) (EPA 325.2)	**2.4**		**3.69**		**3.52**	
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	AB
1																												
2																												
3			D		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		BH96B	
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)		2/17/00	
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		6.69	
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		13.7	
90	83	Conductivity (um/hos)	391		409		366		487		424		481		415		472		422		414		319		NM		531	
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		5.09	
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		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		10	U	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	BD
1																													
2																													
3		D		D		D		D		D		D		D		D		D		D		D		D		D		D	
4		BR55E		CB49D		CK77F		CT37F		DE68G		DM30M		DW37E		ED34G		EM85B		ER93P		EZ03C		FF76G		FL58K		FU45C	
5		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		5/8/03		8/28/03	
87	**FIELD PARAMETERS**																												
88	pH (avg)	6.77		6.47		5.41		6.52		6.65		6.94		6.62		6.58		6.42		6.77		6.63		7.06		6.82		6.93	
89	Temperature (° C) (avg)	12.1		15.4		14.3		14.2		14.4		14.5		15.0		11.9		13.8		15.7		14.6		15.6		14.5		14.9	
90	Conductivity (um/hos)	446		357		300		331		344		331		334		260		452		442		532		707		495		410	
91	Dissolved oxygen (mg/L) (avg)	1.99		1.56		2.04		1.29		1.29		1.54		4.01		7.74		4.39		0.69		2.16		0		2.71		1.84	
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	BE	BF	BG	BH	BI	BJ
1							
2							
3		D		D		D	
4		FY82H		0402105-03		0408036-01	
5		10/23/03		2/20/04		8/05/04	
87	**FIELD PARAMETERS**						
88	pH (avg)	6.71		6.61		6.12	
89	Temperature (° C) (avg)	15.0		13.1		14.9	
90	Conductivity (um/hos)	382		441		630	
91	Dissolved oxygen (mg/L) (avg)	1.66		2.36		2.21	
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			D		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		BH96B	
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)		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		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	BD
1																													
2																													
3		D		D		D		D		D		D		D		D		D		D		D		D		D		D	
4		BR55E		CB49D		CK77F		CT37F		DE68G		DM30M		DW37E		ED34G		EM85B		ER93P		EZ03C		FF76G		FL58K		FU45C	
5		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		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		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-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BE	BF	BG	BH	BI	BJ
1							
2							
3		D		D		D	
4		FY82H		0402105-03		0408036-01	
5		10/23/03		2/20/04		8/05/04	
123	**PAHs (µg/L)**						
124	**EPA Method SW8270 SIM**						
125	Naphthalene	NA		NA		NA	
126	2-Methylnaphthalene	NA		NA		NA	
127	Acenaphthylene	NA		NA		1	U
128	Acenaphthene	NA		NA		NA	
129	Fluorene	NA		NA		NA	
130	Anthracene	NA		NA		1	U
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	
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	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			

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	
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.034**	
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	AC
3			H		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		CT37N
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		2/12/01
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	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	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	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	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	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	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	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	U	NA		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		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		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		NA
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	NA		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		NA
55	48.5	Methyl tert-butyl ether	NA		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		NA
60	53	**TPH-D Motor Oil**	NA		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		NA
62	55																												

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AD	AE	AF	AG	AH
1						
2						
3			H		H	
4			ED16K		FF88N	
5			2/25/02		2/13/03	
6						
7	**CHLORINATED PHENOLS (µg/L)**					
8	**EPA Method SW8040**					
9	Pentachlorophenol	U	0.26	U	0.25	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		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		NA	
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		NA	
62						

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	AC
1																													
2																													
3			H		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		CT37N
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		2/12/01
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**		**0.015**
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	0.005
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**		**0.004**
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	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	U	0.01
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	0.006
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		NA
74	67	Magnesium (mg/L) (6010)	**7.80**		**9.86**		**8.80**		**8.27**		NA		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		NA
76	69	Sodium (mg/L) (6010)	**5.41**		**6.27**		**5.92**		**5.70**		NA		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		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		NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**100**		**110**		**110**		**120**		NA		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		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		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		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		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		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		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	AD	AE	AF	AG	AH
1						
2						
3			H		H	
4			ED16K		FF88N	
5			2/25/02		2/13/03	
63	**PRIORITY POLLUTANT**					
64	**METALS (mg/L)**					
65	Arsenic (7060)		**0.021**		**0.017**	
66	Chromium (6010)	U	0.005	U	0.005	U
67	Copper (6010)		**0.007**		**0.004**	
68	Lead (7421)	U	**0.001**		0.001	U
69	Nickel (6010)	U	0.01	U	0.01	U
70	Zinc (6010)	U	**0.008**		**0.01**	
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	AB	AC
1																													
2																													
3			H		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		CT37N
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		2/12/01
87	80	**FIELD PARAMETERS**																											
88	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		6.54
89	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		13.3
90	83	Conductivity (um/hos)	212		283		225		243		186		251		100		193		193		193		258		223		191		230
91	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		3.06
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		NA
96	89	Total TCDF	NA		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		NA
98	91	Total TCDD	NA		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		NA
100	93	2,3,4,7,8-PeCDF	NA		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		NA
102	95	1,2,3,7,8-PeCDD	NA		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		NA
104	97	1,2,3,4,7,8-HxCDF	NA		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		NA
106	99	2,3,4,6,7,8-HxCDF	NA		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		NA
108	101	Total HxCDF	NA		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		NA
110	103	1,2,3,6,7,8-HxCDD	NA		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		NA
112	105	Total HxCDD	NA		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		NA
114	107	1,2,3,4,7,8,9-HpCDF	NA		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		NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		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		NA
118	111	OCDF	NA		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		NA
120																													
121		**ETHANOL (mg/L)**	NA		NA		NA		NA		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	AD	AE	AF	AG	AH
1						
2						
3			H		H	
4			ED16K		FF88N	
5			2/25/02		2/13/03	
87	**FIELD PARAMETERS**					
88	pH (avg)		6.29		7.01	
89	Temperature (° C) (avg)		13.4		14.9	
90	Conductivity (um/hos)		292		369	
91	Dissolved oxygen (mg/L) (avg)		4.89		0	
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	AB	AC
1																													
2																													
3			H		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		CT37N
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		2/12/01
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-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	AD	AE	AF	AG	AH
1						
2						
3			H		H	
4			ED16K		FF88N	
5			2/25/02		2/13/03	
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	S	T	U	V	W	X	Y
1																									
2					Dup of J1								Dup of J1												
3			J1		J1D		J1		J1		J1		J4		J1		J1		J1		J1		J1		J1
4			S177H		S177I		T176P		U235J		V224O		V224K		W371N		Y314I		Z225O		Z960C		AH49C		AU22H
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		9/20/99
6																									
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**		**1.7**
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
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
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	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
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	J1	0.25
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	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
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
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
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
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
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**		**1.1**
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**		**1.2**
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	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
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
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
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
31	25	Pentachlorophenol	**44**		**52**		**20**		**11**		**11**		**8.8**		**10**		**6.5**		5.0	U	**12**		**4.4**	J1	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	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	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
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
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
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
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
42	36	Ethylbenzene	**6.5**		**5.9**		**12**		**7.5**		**4.0**		**3.3**		**8.4**		**5.5**		**2.5**		**6.2**		**1.9**		**1.5**
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
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	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
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	U	**1.4**
47	41	1,2,4-Trimethylbenzene	**41**		**36**		**47**		**37**	J2	**26**	J2	**19**	J2	**46**		**29**		**16**		**44**		**8.8**		**6.4**
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**		**2.4**
49	43	n-Propylbenzene	**8.7**		**7.2**		**14**		**14**		**8.0**	J2	**5.0**	J2	**14**		**11**		**7.5**		**12**		**3.4**		**4.4**
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	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	U	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	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	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	**5.4**		5.0	U	5.0
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**	**0.30**		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	U	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																								

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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	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
3			J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1
4			BC27K		9912050-03A		BH96R		BR64D		CB49G		CL03H		CT55F		DE68I		DM52B		DW48C		ED23C		EM85D		ES04F		EZ03K
5			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		08/28/02		11/12/02
7	**CHLORINATED PHENOLS (µg/L)**																												
8	**EPA Method SW8040**																												
9	Pentachlorophenol		**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**		**3.1**		**0.57**
10	2,4,6-Trichlorophenol	U	0.25	U	NA		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	U	0.25	U	NA		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	U	0.25	U	NA		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	U	0.25	U	NA		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	U	0.25	U	NA		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	U	0.25	U	NA		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	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	U	2.3	U	2
20	4-Methylphenol	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	U	1.2	U	1
21	Isophorone	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	U	1.2	U	1
22	2,4-Dimethylphenol	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	U	3.5	U	3
23	Benzoic Acid	U	10	U	NA		10	U	10	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U	58	U	50
24	Naphthalene		**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**		1.2	U	**1**
25	2-Methylnaphthalene		**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	U	1.2	U	1
26	2,4,6-Trichlorophenol	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	U	5.8	U	5
27	2,4,5-Trichlorophenol	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	U	5.8	U	5
28	Acenaphthene	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	U	1.2	U	1
29	Dibenzofuran	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	U	1.2	U	1
30	Fluorene	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	U	1.2	U	1
31	Pentachlorophenol	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	U	5.8	U	5
32	bis(2-Ethylhexyl)phthalate	U	**0.6**	J1	NA		1.0	U	1.0	U	1.0	U	1.0	U	**25**		1.0	U	1.0	U	4.0	U	4.0	U	4.7	U	4		
33																													
34	**VOLATILES (µg/L)**																												
35	**EPA Method SW8260**																												
36	Acetone	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**	M	5	U	5
37	Carbon Disulfide	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	U	1	U	1
38	2-Butanone	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	U	5	U	5
39	Benzene	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	U	1	U	1
40	Bromoform	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	U	1	U	1
41	Toluene	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	U	1	U	1
42	Ethylbenzene		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**		1	U	1
43	Styrene	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	U	1	U	1
44	m,p-Xylene	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	U	1	U	1
45	o-Xylene	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	U	1	U	1
46	1,3,5-Trimethylbenzene		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	U	1	U	1
47	1,2,4-Trimethylbenzene		**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	U	1	U	1
48	Isopropylbenzene		**1.2**		NA		**1.3**		**8.2**		**1.5**		**2.5**		**3.3**		**4.7**		1.0	U	**1.3**		**3.5**		**8.4**		**5.2**		**3.5**
49	n-Propylbenzene		**1.9**		NA		**2.0**		**13**		**3.3**		**3.8**		**5.7**		**8.3**		**1.1**		**2.2**		**4.0**		**12**		**7.8**		**4.9**
50	tert-Butylbenzene	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	U	1	U	1
51	sec-Butylbenzene	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**		1	U	1
52	4-Isopropyltoluene	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	U	1	U	1
53	n-Butylbenzene	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	U	1	U	1
54	Naphthalene	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	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**	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		NA		NA
60	**TPH-D Motor Oil**		NA		NA		NA		NA		NA		0.50	U	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																													

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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	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN
1														
2														
3			J1		J1		J1		J1		J1		J1	
4			FF76J		FL58I		FU31A		FY64H		0402105-01		0408019-04	
5			2/12/03		5/8/03		8/27/03		10/21/03		2/20/04		8/03/04	
6														
7	**CHLORINATED PHENOLS (µg/L)**													
8	**EPA Method SW8040**													
9	Pentachlorophenol		**0.35**		**0.73**		**1.3**		**0.65**		**1.13**		0.5	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	U	2.1	U	2	U	2	U	2.1	U	1.93	UJ	2.01	U
20	4-Methylphenol	U	1	U	1	U	1	U	1.1	U	9.63	U	10.1	U
21	Isophorone	U	1	U	1	U	1	U	1.1	U	0.963	U	1.01	U
22	2,4-Dimethylphenol	U	3.1	U	3	U	3	U	3.2	U	2.89	U	3.02	U
23	Benzoic Acid	U	52	U	50	U	50	U	11	U	19.3	U	20.1	U
24	Naphthalene		1	U	1	U	**1.5**		**2.1**		**1.41**		1.01	U
25	2-Methylnaphthalene	U	1	U	1	U	1	U	**1.4**		**1**		1.01	U
26	2,4,6-Trichlorophenol	U	5.2	U	5	U	5	U	5.3	U	4.82	U	5.03	U
27	2,4,5-Trichlorophenol	U	5.2	U	5	U	5	U	5.3	U	4.82	U	5.03	U
28	Acenaphthene	U	1	U	1	U	1	U	1.1	U	0.963	U	1.01	U
29	Dibenzofuran	U	1	U	1	U	1	U	1.1	U	0.963	U	1.01	U
30	Fluorene	U	1	U	1	U	1	U	1.1	U	0.963	U	1.01	U
31	Pentachlorophenol	U	5.2	U	5	U	5	U	5.3	U	4.82	U	5.03	U
32	bis(2-Ethylhexyl)phthalate	U	1	U	1	U	1	U	1.1	U	0.963	U	1.01	U
33														
34	**VOLATILES (µg/L)**													
35	**EPA Method SW8260**													
36	Acetone	U	5	U	5	U	5	U	5	U	50	U	50	U
37	Carbon Disulfide	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	10	U	10	U
39	Benzene	U	1	U	1	U	1	U	1	U	0.4	U	0.3	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	U	1	U	1	U	1	U	1	U	**2.82**		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	2	U	2	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	**4.5**		1	U	1	U	1	U	**6.76**		1	U
48	Isopropylbenzene		**5.4**		**1.1**		**14**		**7.1**		**17**		**5.58**	J
49	n-Propylbenzene		**7.9**		**1.5**		**21**		**11**		**21.7**		**14**	J
50	tert-Butylbenzene	U	1	U	1	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	U	**1.6**		1	U	**2**		1	U	**3.14**		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	**1.7**		1	U	**1.74**		**1.06**	J
54	Naphthalene	U	5	U	5	U	**5**		5	U	**4.77**		**1.47**	J
55	Methyl tert-butyl ether		NA		NA		NA		NA		1	U	1	U
56														
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**													
58	**Method OR-DEQ**													
59	**TPH-Diesel**		**0.4**		NA		NA		NA		NA		NA	
60	**TPH-D Motor Oil**		NA		NA		NA		NA		NA		NA	
61	**TPH-Gasoline**		NA		NA		NA		NA		NA		NA	
62														

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					Dup of J1								Dup of J1												
3			J1		J1D		J1		J1		J1		J4		J1		J1		J1		J1		J1		J1
4			S177H		S177I		T176P		U235J		V224O		V224K		W371N		Y314I		Z225O		Z960C		AH49C		AU22H
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		9/20/99
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**		**0.015**
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
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
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	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
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**		0.004
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		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		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		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		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**120**		**120**		**100**	J2	**130**		**140**		**140**		NA		NA		NA		**74**		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)	**120**		**120**		**100**	J2	**130**		**140**		**140**		NA		NA		NA		**74**		NA		NA
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		NT		**160**	J2	**180**		**170**		**170**		180		170		140		**140**		**150**		**170**
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**		**2.6**
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		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		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		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		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	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
3			J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1
4			BC27K		9912050-03A		BH96R		BR64D		CB49G		CL03H		CT55F		DE68I		DM52B		DW48C		ED23C		EM85D		ES04F		EZ03K
5			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		08/28/02		11/12/02
63	**PRIORITY POLLUTANT**																												
64	**METALS (mg/L)**																												
65	Arsenic (7060)		**0.015**		NA		**0.013**		**0.011**		**0.010**		**0.012**		**0.010**		**0.011**		**0.014**		**0.013**		**0.012**		**0.014**		**0.01**		0.05
66	Chromium (6010)	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	U	0.005	U	0.005
67	Copper (6010)	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	U	**0.003**		0.002
68	Lead (7421)	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	U	0.001	U	0.02
69	Nickel (6010)	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	U	0.01	U	0.01
70	Zinc (6010)	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	U	**0.007**		**0.006**
71																													
72	**MAJOR IONS AND CONVENTIONALS**																												
73	Calcium (mg/L) (6010)		NA		NA		NA		NA		NA		NA		**20.6**		**20.5**		**22.7**		**21.1**		**29.4**		NA		NA		NA
74	Magnesium (mg/L) (6010)		NA		NA		NA		NA		NA		NA		**7.21**		**7.38**		**8.65**		**7.62**		**10.1**		NA		NA		NA
75	Potassium (mg/L) (6010)		NA		NA		NA		NA		NA		NA		**2.3**		**2.4**		**2.6**		**2.6**		**3.4**		NA		NA		NA
76	Sodium (mg/L) (6010)		NA		NA		NA		NA		NA		NA		**6.48**		**6.15**		**6.58**		**6.56**		**8.36**		NA		NA		NA
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		NA		NA		NA		NA		NA		**100**		NA		NA		NA		**130**		NA		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		NA
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		NA		NA		NA		NA		**100**		NA		NA		NA		**130**		NA		NA		NA
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**160**		NA		**200**		**160**		**160**		**160**		**150**		**160**		**150**		**140**		**210**		**160**		**160**		**180**
81	Chloride (mg/L) (EPA 325.2)		**3.1**		NA		**4.3**		**2.5**		**2.0**		**2.3**		**3.0**		**2.6**		**6.2**		**2.6**		**8.8**		**3.6**		**3.2**		**3.5**
82	N-Nitrate (mg-N/L) (Calculated)		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**2.4**		NA		NA		NA
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.018**		NA		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		**2.4**	J	NA		NA		NA
85	Sulfate (mg/L) (EPA 375.2)		NA		NA		NA		NA		NA		NA		**10**		NA		NA		NA		**14**		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	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN
1														
2														
3			J1		J1		J1		J1		J1		J1	
4			FF76J		FL58I		FU31A		FY64H		0402105-01		0408019-04	
5			2/12/03		5/8/03		8/27/03		10/21/03		2/20/04		8/03/04	
63	**PRIORITY POLLUTANT**													
64	**METALS (mg/L)**													
65	Arsenic (7060)	U	**0.014**		**0.014**		**0.009**		**0.006**		**0.009**		**0.0114**	
66	Chromium (6010)	U	0.005	U	0.005	U	0.005	U	0.005	U	**0.0232**	J	**0.0188**	
67	Copper (6010)	U	**0.004**		0.002	U	0.002	U	**0.002**		0.01	U	0.01	U
68	Lead (7421)	U	**0.002**		0.001	U	0.001	U	0.001	U	**0.0004**		**0.000317**	
69	Nickel (6010)	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.0151**		0.005	U
70	Zinc (6010)		**0.007**		0.006	U	0.006	U	0.006	U	0.01	U	**0.0121**	
71														
72	**MAJOR IONS AND CONVENTIONALS**													
73	Calcium (mg/L) (6010)		**43.2**		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)		**16.8**		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)		**3.1**		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)		**8.7**		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		**130**		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		1	U	NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		**130**		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**260**		**150**		**220**		**190**		**240**	J	**276**	
81	Chloride (mg/L) (EPA 325.2)		**2.9**		**3.8**		**2.3**		**2.2**		**2.76**		**4.13**	
82	N-Nitrate (mg-N/L) (Calculated)		**0.039**		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		**0.015**		NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		**0.054**		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		**110**		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

	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					Dup of J1								Dup of J1												
3			J1		J1D		J1		J1		J1		J4		J1		J1		J1		J1		J1		J1
4			S177H		S177I		T176P		U235J		V224O		V224K		W371N		Y314I		Z225O		Z960C		AH49C		AU22H
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		9/20/99
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		6.33
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		16.6
90	83	Conductivity (um/hos)	319		319		256		239		314		315		289		330		138		207		241		222
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		NA		NA		2.85		2.20		1.82		1.84		2.33		2.24
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	U	NA
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	U	NA
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	U	NA
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	U	NA
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	U	NA
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	U	NA
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	U	NA
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	U	NA
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	U	NA
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	U	NA
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**		NA
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**		NA
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	U	NA
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**		NA
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	U	NA
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	U	NA
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	U	NA
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	U	NA
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**		NA
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	U	NA
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**		NA
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**		NA
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**		NA
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**		NA
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	U	NA
120	113																								
121	114	**ETHANOL (mg/L)**	NA		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	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
1																													
2																													
3			J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1
4			BC27K		9912050-03A		BH96R		BR64D		CB49G		CL03H		CT55F		DE68I		DM52B		DW48C		ED23C		EM85D		ES04F		EZ03K
5			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		08/28/02		11/12/02
87	**FIELD PARAMETERS**																												
88	pH (avg)		6.57		NM		6.59		6.38		6.58		5.27		6.17		6.64		6.85		6.60		6.42		6.52		6.79		6.4
89	Temperature (° C) (avg)		12.4		NM		14.3		14.8		15.6		14.4		14.3		13.6		15.8		14.6		13.6		15.4		15.7		15.6
90	Conductivity (um/hos)		245		NM		272		291		248		212		202		226		278		241		284		224		241		232
91	Dissolved oxygen (mg/L) (avg)		2.78		NM		1.57		1.74		1.62		1.09		0.57		1.51		1.44		3.88		6.41		4.98		1.34		3.21
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		10	U	NA		NA		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	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN
1														
2														
3			J1		J1		J1		J1		J1		J1	
4			FF76J		FL58I		FU31A		FY64H		0402105-01		0408019-04	
5			2/12/03		5/8/03		8/27/03		10/21/03		2/20/04		8/03/04	
87	**FIELD PARAMETERS**													
88	pH (avg)		6.9		6.6		6.46		6.80		6.23		7.68	
89	Temperature (° C) (avg)		13.7		13.7		15.8		17.8		14		17.1	
90	Conductivity (um/hos)		474		223		343		255		324		551	
91	Dissolved oxygen (mg/L) (avg)		0		3.1		2.23		1.65		1.21		NM	
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	X	Y
1																									
2					Dup of J1								Dup of J1												
3			J1		J1D		J1		J1		J1		J4		J1		J1		J1		J1		J1		J1
4			S177H		S177I		T176P		U235J		V224O		V224K		W371N		Y314I		Z225O		Z960C		AH49C		AU22H
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		9/20/99
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		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	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
1																													
2																													
3			J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1		J1
4			BC27K		9912050-03A		BH96R		BR64D		CB49G		CL03H		CT55F		DE68I		DM52B		DW48C		ED23C		EM85D		ES04F		EZ03K
5			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		08/28/02		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		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-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN
1														
2														
3			J1		J1		J1		J1		J1		J1	
4			FF76J		FL58I		FU31A		FY64H		0402105-01		0408019-04	
5			2/12/03		5/8/03		8/27/03		10/21/03		2/20/04		8/03/04	
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		1.01	U
128	Acenaphthene		NA		NA		NA		NA		NA		NA	
129	Fluorene		NA		NA		NA		NA		NA		NA	
130	Anthracene		NA		NA		NA		NA		NA		1.01	U
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	AB
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	
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		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																											

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	BD
1																													
2																													
3		K		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		FU45B	
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		8/28/03	
6																													
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	NA		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		NA	
21	Isophorone	NA		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		NA	
23	Benzoic Acid	NA		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		NA	
25	2-Methylnaphthalene	NA		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		NA	
27	2,4,5-Trichlorophenol	NA		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		NA	
29	Dibenzofuran	NA		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		NA	
31	Pentachlorophenol	NA		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		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		NA	
37	Carbon Disulfide	NA		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		NA	
39	Benzene	NA		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		NA	
41	Toluene	NA		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		NA	
43	Styrene	NA		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		NA	
45	o-Xylene	NA		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		NA	
47	1,2,4-Trimethylbenzene	NA		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		NA	
49	n-Propylbenzene	NA		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		NA	
51	sec-Butylbenzene	NA		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		NA	
53	n-Butylbenzene	NA		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		NA	
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																													

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BE	BF	BG	BH	BI	BJ	BK	BL
1									
2									
3		K		K		K		K	
4		FY64G		0402098-01		0406060-01		0408020-02	
5		10/21/03		2/19/04		6/9/04		8/03/04	
6									
7	**CHLORINATED PHENOLS (µg/L)**								
8	**EPA Method SW8040**								
9	Pentachlorophenol	NA		NA		NA		NA	
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		0.4	U	0.3	U	0.3	U
40	Bromoform	NA		NA		NA		NA	
41	Toluene	NA		1	U	1	U	1	U
42	Ethylbenzene	NA		1	U	1	U	1	U
43	Styrene	NA		NA		NA		NA	
44	m,p-Xylene	NA		2	U	2	U	2	U
45	o-Xylene	NA		1	U	1	U	1	U
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	1	U	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**	0.25	U	0.1	U	0.1	U	0.1	U
62									

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													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	
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**	
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	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		K		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		FU45B	
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		8/28/03	
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**		**0.002**	
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	**0.006**	
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**		**0.012**	
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	**0.005**	
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**		**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	**0.029**	
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		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		**16.0**		**13.7**		**18.2**		NA		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		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		**11.2**		**8.24**		**12.2**		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-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BE	BF	BG	BH	BI	BJ	BK	BL
1									
2									
3		K		K		K		K	
4		FY64G		0402098-01		0406060-01		0408020-02	
5		10/21/03		2/19/04		6/9/04		8/03/04	
63	**PRIORITY POLLUTANT**								
64	**METALS (mg/L)**								
65	Arsenic (7060)	0.001	U	NA		NA		NA	
66	Chromium (6010)	0.005	U	NA		NA		NA	
67	Copper (6010)	**0.006**		NA		NA		NA	
68	Lead (7421)	0.001	U	NA		NA		NA	
69	Nickel (6010)	**0.03**		NA		NA		NA	
70	Zinc (6010)	**0.014**		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-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													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	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		K		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		FU45B	
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		8/28/03	
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		6.25	
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		15.9	
90	Conductivity (um/hos)	157		161		323		694		531		350		645		78		199		157		325		835		143		193	
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		2.26	
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	BE	BF	BG	BH	BI	BJ	BK	BL
1									
2									
3		K		K		K		K	
4		FY64G		0402098-01		0406060-01		0408020-02	
5		10/21/03		2/19/04		6/9/04		8/03/04	
87	**FIELD PARAMETERS**								
88	pH (avg)	6.37		5.18		4.41		6.93	
89	Temperature (° C) (avg)	17.3		11.4		15.2		16	
90	Conductivity (um/hos)	250		109		197		292	
91	Dissolved oxygen (mg/L) (avg)	2.57		6.06		2.12		NM	
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	**ETHANOL (mg/L)**	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	AA	AB
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	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		K		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		FU45B	
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		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		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-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BE	BF	BG	BH	BI	BJ	BK	BL
1									
2									
3		K		K		K		K	
4		FY64G		0402098-01		0406060-01		0408020-02	
5		10/21/03		2/19/04		6/9/04		8/03/04	
123	**PAHs (µg/L)**								
124	**EPA Method SW8270 SIM**								
125	Naphthalene	0.1	U	NA		NA		NA	
126	2-Methylnaphthalene	0.1	U	NA		NA		NA	
127	Acenaphthylene	0.1	U	NA		NA		NA	
128	Acenaphthene	0.1	U	NA		NA		NA	
129	Fluorene	0.1	U	NA		NA		NA	
130	Anthracene	0.1	U	NA		NA			
131	Dibenzofuran	0.1	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

	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			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	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	U	1.0	U	1.0	U	1.0	U	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	**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	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																											

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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		L		L		L	
4		CT37D		ED16E		FF88K	
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	0.25	U	0.26	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	2.0	U	2.0	U	2	U
20	4-Methylphenol	1.0	U	1.0	U	1	U
21	Isophorone	1.0	U	1.0	U	1	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.1	U
23	Benzoic Acid	10	U	50	U	51	U
24	Naphthalene	1.0	U	1.0	U	1	U
25	2-Methylnaphthalene	1.0	U	1.0	U	1	U
26	2,4,6-Trichlorophenol	5.0	U	5.0	U	5.1	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.1	U
28	Acenaphthene	1.0	U	1.0	U	1	U
29	Dibenzofuran	1.0	U	1.0	U	1	U
30	Fluorene	1.0	U	1.0	U	1	U
31	Pentachlorophenol	5.0	U	5.0	U	5.1	U
32	bis(2-Ethylhexyl)phthalate	1.0	U	4.0	U	1	U
33							
34	**VOLATILES (µg/L)**						
35	**EPA Method SW8260**						
36	Acetone	6.1	U	5.0	U	5	U
37	Carbon Disulfide	1.0	U	1.0	U	1	U
38	2-Butanone	5.0	U	5.0	U	5	U
39	Benzene	1.0	U	1.0	U	1	U
40	Bromoform	1.0	U	1.0	U	1	U
41	Toluene	1.0	U	1.0	U	1	U
42	Ethylbenzene	1.0	U	1.0	U	1	U
43	Styrene	1.0	U	1.0	U	1	U
44	m,p-Xylene	1.0	U	1.0	U	1	U
45	o-Xylene	1.0	U	1.0	U	1	U
46	1,3,5-Trimethylbenzene	1.0	U	1.0	U	1	U
47	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1	U
48	Isopropylbenzene	1.0	U	1.0	U	1	U
49	n-Propylbenzene	1.0	U	1.0	U	1	U
50	tert-Butylbenzene	1.0	U	1.0	U	1	U
51	sec-Butylbenzene	1.0	U	1.0	U	1	U
52	4-Isopropyltoluene	1.0	U	1.0	U	1	U
53	n-Butylbenzene	1.0	U	1.0	U	1	U
54	Naphthalene	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**	0.25	U	0.25	U	0.25	U
60	**TPH-D Motor Oil**	NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA	
62							

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			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	
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	U
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	U
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	U
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	U
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	U
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	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	
63	**PRIORITY POLLUTANT**						
64	**METALS (mg/L)**						
65	Arsenic (7060)	0.001	U	0.001	U	**0.001**	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U
67	Copper (6010)	0.002	U	0.002	U	**0.004**	
68	Lead (7421)	0.001	U	0.001	U	**0.001**	
69	Nickel (6010)	0.01	U	0.01	U	0.01	U
70	Zinc (6010)	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
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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			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	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	AB
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	

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DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	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	

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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	AC
3			LW1S		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		CB49C
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		8/28/00
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	U	0.25	UJ	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	**1.1**		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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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		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	U	0.25
60	53	**TPH-D Motor Oil**	NA		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		NA
62	55																												

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	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	BF
3			LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S	
4			CK77D		CT37B		DE68F		DM52E		DW48M		ED16J		EM75G		ER92C		EY88E		FF88M		FL41F		FU31C		FY64J		0402098-02	
5			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		2/19/04	
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	0.25	U	0.28	U	0.25	U	0.25	U	0.26	U	0.54	U	0.5	U	NA	
10	2,4,6-Trichlorophenol	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	U	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	U	0.25	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	0.25	U	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	U	0.25	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	2.0	U	2.2	U	2	U	2	U	2	U	2.2	U	2	U	NA	
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	1.1	U	1	U	1	U	1	U	1.1	U	1	U	NA	
21	Isophorone	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.1	U	1	U	NA	
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	3.3	U	3	U	3	U	3.1	U	3.3	U	3	U	NA	
23	Benzoic Acid	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	U	NA	
24	Naphthalene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.1	U	1	U	NA	
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	1.1	U	1	U	1	U	1	U	1.1	U	1	U	NA	
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	5.6	U	5	U	5	U	5.1	U	5.4	U	5	U	NA	
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	5.6	U	5	U	5	U	5.1	U	5.4	U	5	U	NA	
28	Acenaphthene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.1	U	1	U	NA	
29	Dibenzofuran	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.1	U	1	U	NA	
30	Fluorene	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1	U	1	U	1	U	1.1	U	1	U	NA	
31	Pentachlorophenol	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.6	U	5	U	5	U	5.1	U	5.4	U	5	U	NA	
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	4.4	U	4	U	1	U	1	U	1.1	U	1	U	NA	
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	5.0	U	5.0	U	5	U	5	U	5	U	5	U	5	U	5	U	NA	
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	U	1	U	1	U	1	U	1	U	1	U	NA	
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	U	5	U	5	U	5	U	5	U	5	U	NA	
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	U	1	U	1	U	1	U	1	U	1	U	0.4	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	U	1	U	1	U	1	U	1	U	1	U	NA	
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	U	1	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	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	1.0	U	1	U	1	U	1	U	1	U	1	U	1	U	NA	
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	U	1	U	1	U	1	U	1	U	1	U	2	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	U	1	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	U	1	U	1	U	1	U	1	U	1	U	NA	
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	U	1	U	1	U	1	U	1	U	1	U	NA	
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	U	1	U	1	U	1	U	1	U	1	U	NA	
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	U	1	U	1	U	1	U	1	U	1	U	NA	
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	U	1	U	1	U	1	U	1	U	1	U	NA	
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	U	1	U	1	U	1	U	1	U	1	U	NA	
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	U	1	U	1	U	1	U	1	U	1	U	NA	
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	U	1	U	1	U	1	U	1	U	1	U	NA	
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	U	5	U	5	U	5	U	5	U	5	U	NA	
55	Methyl tert-butyl ether		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		1	U	NA	
56																														
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																													
58	**Method OR-DEQ**																													
59	**TPH-Diesel**	U	0.25	U	0.25	U	NA		NA		NA		0.25	U	NA		NA		NA		0.25	U	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		0.25	U	0.1	U
62																														

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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	BG	BH	BI	BJ
1					
2					
3		LW1S		LW1S	
4		0406060-02		0408020-01	
5		6/9/04		8/03/04	
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	0.3	U	0.3	U
40	Bromoform	NA		NA	
41	Toluene	1	U	1	U
42	Ethylbenzene	1	U	1	U
43	Styrene	NA		NA	
44	m,p-Xylene	2	U	2	U
45	o-Xylene	1	U	1	U
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		NA	
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**	0.1	U	0.1	U
62					

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	AC
1																													
2																													
3			LW1S		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		CB49C
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		8/28/00
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**		**0.010**
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	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	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	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	U	0.01
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	0.006
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		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		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		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		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**80**		**77**		**88**		**94**		NA		NA		NA		**87**		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		1.0	U	NA		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		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**		**160**
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**		**3.5**
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		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		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		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		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	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	BF
1																														
2																														
3			LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S	
4			CK77D		CT37B		DE68F		DM52E		DW48M		ED16J		EM75G		ER92C		EY88E		FF88M		FL41F		FU31C		FY64J		0402098-02	
5			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		2/19/04	
63	**PRIORITY POLLUTANT**																													
64	**METALS (mg/L)**																													
65	Arsenic (7060)		**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**		NA	
66	Chromium (6010)	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	U	NA	
67	Copper (6010)	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**		NA	
68	Lead (7421)	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	U	NA	
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	NA	
70	Zinc (6010)	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**		NA	
71																														
72	**MAJOR IONS AND CONVENTIONALS**																													
73	Calcium (mg/L) (6010)		NA		**25.5**		**28.4**		**25.8**		**27.3**		**30.4**		NA		NA		NA		**36.9**		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)		NA		**9.47**		**10.6**		**10.2**		**10.4**		**11.7**		NA		NA		NA		**13.6**		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)		NA		**2.0**		**2.4**		**2.2**		**2.4**		**3.4**		NA		NA		NA		**3.2**		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)		NA		**7.23**		**7.87**		**7.24**		**7.20**		**10.2**		NA		NA		NA		**9.8**		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		**120**		NA		NA		NA		**120**		NA		NA		NA		**150**		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		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)		NA		**120**		NA		NA		NA		**120**		NA		NA		NA		**150**		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**170**		**170**		**180**		**160**		**170**		**160**		**200**		**210**		**210**		**180**		**190**		**190**		**200**			
81	Chloride (mg/L) (EPA 325.2)		**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		**0.17**		NA		NA		NA		**0.91**		NA		NA		NA		**0.66**		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		0.010	U	NA		NA		NA		0.010	U	NA		NA		NA		0.01	U	NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		**0.17**	J	NA		NA		NA		**0.91**		NA		NA		NA		**0.66**		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		**6.8**		NA		NA		NA		**5.7**		NA		NA		NA		**4.2**		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	BG	BH	BI	BJ
1					
2					
3		LW1S		LW1S	
4		0406060-02		0408020-01	
5		6/9/04		8/03/04	
63	**PRIORITY POLLUTANT**				
64	**METALS (mg/L)**				
65	Arsenic (7060)	NA		NA	
66	Chromium (6010)	NA		NA	
67	Copper (6010)	NA		NA	
68	Lead (7421)	NA		NA	
69	Nickel (6010)	NA		NA	
70	Zinc (6010)	NA		NA	
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	AB	AC
1																													
2																													
3			LW1S		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		CB49C
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		8/28/00
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		6.49
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		16.0
90	83	Conductivity (um/hos)	190		203		154		213		195		193		100		174		146		197		212		206		182		196
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		1.80
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		NA
96	89	Total TCDF	NA		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		NA
98	91	Total TCDD	NA		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		NA
100	93	2,3,4,7,8-PeCDF	NA		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		NA
102	95	1,2,3,7,8-PeCDD	NA		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		NA
104	97	1,2,3,4,7,8-HxCDF	NA		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		NA
106	99	2,3,4,6,7,8-HxCDF	NA		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		NA
108	101	Total HxCDF	NA		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		NA
110	103	1,2,3,6,7,8-HxCDD	NA		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		NA
112	105	Total HxCDD	NA		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		NA
114	107	1,2,3,4,7,8,9-HpCDF	NA		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		NA
116	109	1,2,3,4,6,7,8-HpCDD	NA		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		NA
118	111	OCDF	NA		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		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	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	BF
1																														
2																														
3			LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S	
4			CK77D		CT37B		DE68F		DM52E		DW48M		ED16J		EM75G		ER92C		EY88E		FF88M		FL41F		FU31C		FY64J		0402098-02	
5			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		2/19/04	
87	**FIELD PARAMETERS**																													
88	pH (avg)		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		5.92	
89	Temperature (° C) (avg)		15.2		14.9		14.6		15.8		15.4		14.3		16.1		16.3		16		16		14.9		16.8		18.3		15.7	
90	Conductivity (um/hos)		207		217		250		245		245		257		370		265		367		327		233		228		237		277	
91	Dissolved oxygen (mg/L) (avg)		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		2.32	
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																														

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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	BG	BH	BI	BJ
1					
2					
3		LW1S		LW1S	
4		0406060-02		0408020-01	
5		6/9/04		8/03/04	
87	**FIELD PARAMETERS**				
88	pH (avg)	5.1		6.55	
89	Temperature (° C) (avg)	16.2		16.7	
90	Conductivity (um/hos)	207		269	
91	Dissolved oxygen (mg/L) (avg)	1.46		NM	
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	AB	AC
1																													
2																													
3			LW1S		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		CB49C
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		8/28/00
123		**PAHs (µg/L)**																											
124		**EPA Method SW8270 SIM**																											
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		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-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	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	BF
1																														
2																														
3			LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S		LW1S	
4			CK77D		CT37B		DE68F		DM52E		DW48M		ED16J		EM75G		ER92C		EY88E		FF88M		FL41F		FU31C		FY64J		0402098-02	
5			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		2/19/04	
123	**PAHs (µg/L)**																													
124	**EPA Method SW8270 SIM**																													
125	Naphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1	U	NA	
126	2-Methylnaphthalene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1	U	NA	
127	Acenaphthylene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1	U	NA	
128	Acenaphthene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1	U	NA	
129	Fluorene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1	U	NA	
130	Anthracene		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1	U	NA	
131	Dibenzofuran		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.1	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	BG	BH	BI	BJ
1					
2					
3		LW1S		LW1S	
4		0406060-02		0408020-01	
5		6/9/04		8/03/04	
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-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 LW4S		
3			LW4S		LW4S		LW4S		LW4S		LW4S (a)		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW40S		LW4S
4			S167J		T176G		U235O		V232E		B802035-01		W391F		Y314F		Z225K		Z960L		AH49G		AU45B		AU45A		BC27Q
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		12/9/99
6																											
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**		**5.4**
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	0.25
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	0.25
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	0.25
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	0.25
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**		**0.63**
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	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	5.00	U	2.0	U	2.0	U	2.0	U	2.0	U	**170**	J2	2.0	U	2.0	U	2.0
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	1.0
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	1.0
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	3.0
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	10
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	1.0
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	1.0
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	5.0
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	5.0
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	1.0
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	1.0
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	1.0
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**		**4.9**
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	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	NA		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	NA		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	NA		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	**12**		**13**		5.0
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	1.0
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	1.0
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	1.0
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	1.0
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	1.0
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**		1.0
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**		1.0
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	1.0
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	1.0
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**		1.0
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	1.0
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	1.0
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	1.0
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	1.0
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	1.0
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	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	NA		**0.44**		**0.32**		**3.6**		0.25	U	0.25	U	**0.42**		**0.56**		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																										

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			Dup of LW4S																									
3			LW40S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S	
4			BC27O		BH96D		BR55C		CB68C		CL03F		CT67C		DE87J		DM30C		DW29F		ED30G		EN00G		ER93K		EZ17E	
5			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		11/13/02	
6																												
7	**CHLORINATED PHENOLS (µg/L)**																											
8	**EPA Method SW8040**																											
9	Pentachlorophenol		**5.4**		**2.5**		**740**	J2	**7200**		**48**		0.25	U	0.25	U	0.25	U	0.25	U	**2.0**		NA		NA		**1.5**	
10	2,4,6-Trichlorophenol	U	0.25	U	0.25	U	**0.35**	J2	**2.2**		0.25	U	NA		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	U	0.25	U	0.25	U	**0.27**	J2	**6.1**		0.25	U	NA		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	U	0.25	U	0.25	U	**2.7**	J2	37	U	3.8	U	NA		NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	U	0.25	U	0.25	U	0.25	U	**2.9**		0.25	U	NA		NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol		**0.59**		**0.32**		**190**	J2	**730**		**4.1**		NA		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	U	0.25	U	0.25	U	**1.6**		**130**		**5.9**		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	UJ	2.0	U	200	U	**730**		**100**		2.0	U	**3.3**		2.0	U	2.1	U	**56**		**210**		2.2	U
20	4-Methylphenol	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**		1.1	U
21	Isophorone	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	1.1	U
22	2,4-Dimethylphenol	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	3.3	U
23	Benzoic Acid	U	10	U	10	UJ	10	U	**44**		**96**		**200**		10	U	10	U	30	U	53	U	50	U	62	U	54	U
24	Naphthalene	U	1.0	U	1.0	UJ	**15**		**21**		**13**		**8.5**		**19**		**19**		1.0	U	1.1	U	**14**		**5.6**		1.1	U
25	2-Methylnaphthalene	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**		1.1	U
26	2,4,6-Trichlorophenol	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**		5.4	U
27	2,4,5-Trichlorophenol	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	5.4	U
28	Acenaphthene	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	1.1	U
29	Dibenzofuran	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	1.1	U
30	Fluorene	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	1.1	U
31	Pentachlorophenol	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**		5.4	U
32	bis(2-Ethylhexyl)phthalate	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	4.3	U
33																												
34	**VOLATILES (µg/L)**																											
35	**EPA Method SW8260**																											
36	Acetone	U	5.0	U	5.0	U	**25**		**83**		**49**		**41**		5.0	U	15	U	5.0	U	5.0	U	**120**		**320**		19	U
37	Carbon Disulfide	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	1	U
38	2-Butanone	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**		5	U
39	Benzene	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	1	U
40	Bromoform	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	1	U
41	Toluene	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**		1	U
42	Ethylbenzene	U	1.0	U	1.0	U	**9.8**		**94**		**61**		**79**		**190**		**140**		1.0	U	1.0	U	**68**		**94**	J	**4.8**	
43	Styrene	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	1	U
44	m,p-Xylene	U	1.0	U	1.0	U	**17**		**110**		**170**		**240**		**600**		**460**		1.0	U	1.0	U	**95**		**150**		**3.8**	
45	o-Xylene	U	1.0	U	1.0	U	**140**		**210**		**88**		**120**		**240**		**180**		1.0	U	1.0	U	**180**		**180**		**5.9**	
46	1,3,5-Trimethylbenzene	U	1.0	U	1.0	U	**3.2**		**140**		**46**		**58**		**130**		**94**		1.0	U	1.0	U	**58**		**150**	J	**1.7**	
47	1,2,4-Trimethylbenzene	U	1.0	U	1.0	U	**33**		**500**		**160**		**130**		**350**		**280**		**1.5**		1.0	U	**230**		**540**	J	**19**	
48	Isopropylbenzene	U	1.0	U	1.0	U	**28**		**48**		**19**		**28**		**62**		**37**		1.0	U	1.0	U	**38**		**63**	J	**4.5**	
49	n-Propylbenzene	U	1.0	U	1.0	U	**9.8**		**79**		**27**		**36**		**79**		**48**		**1.1**		1.0	U	**43**		**94**	J	**5.4**	
50	tert-Butylbenzene	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	1	U
51	sec-Butylbenzene	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	**2**	
52	4-Isopropyltoluene	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**		1	U
53	n-Butylbenzene	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	1	U
54	Naphthalene	U	5.0	U	5.0	U	**26**		**31**		**19**		**18**		**48**		**27**		5.0	U	5.0	U	**21**		15	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	**3.6**		**15**		**19**		**3.4**		**7.9**		**4.1**		0.25	U	**0.34**		**25**		**9.9**		**3.2**	
60	**TPH-D Motor Oil**		NA		NA		NA		NA		5.0	U	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																												

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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	BG	BH	BI	BJ	BK	BL	BM	BN
1													
2													
3		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S	
4		FF65F		FL58F		FU45O		FY82K		0402113-07		0408036-08	
5		2/11/03		5/8/03		8/28/03		10/24/03		2/23/04		8/05/04	
6													
7	**CHLORINATED PHENOLS (µg/L)**												
8	**EPA Method SW8040**												
9	Pentachlorophenol	0.26	U	NA		NA		**3.9**		0.49	U	NA	
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	U	2	U	2	U	2.05	U	2	U
20	4-Methylphenol	1	U	1	U	1	U	1	U	10.2	U	10	U
21	Isophorone	1	U	1	U	1	U	1	U	1.02	U	1	U
22	2,4-Dimethylphenol	3.1	U	3	U	3	U	3	U	3.07	U	3	U
23	Benzoic Acid	51	U	50	U	50	U	10	U	20.5	U	20	U
24	Naphthalene	1	U	**4.8**		1	U	1	U	1.02	U	1	U
25	2-Methylnaphthalene	1	U	1	U	1	U	1	U	1.02	U	1	U
26	2,4,6-Trichlorophenol	5.1	U	5	U	5	U	5	U	5.12	U	5	U
27	2,4,5-Trichlorophenol	5.1	U	5	U	5	U	5	U	5.12	U	5	U
28	Acenaphthene	1	U	1	U	1	U	1	U	1.02	U	1	U
29	Dibenzofuran	1	U	1	U	1	U	1	U	1.02	U	1	U
30	Fluorene	1	U	1	U	1	U	1	U	1.02	U	1	U
31	Pentachlorophenol	5.1	U	**1400**		**17**		5	U	5.12	U	**8.52**	
32	bis(2-Ethylhexyl)phthalate	1	U	**1**		1	U	1	U	1.02	U	1	U
33													
34	**VOLATILES (µg/L)**												
35	**EPA Method SW8260**												
36	Acetone	5	U	**7.2**	M	5	U	5	U	50	U	50	U
37	Carbon Disulfide	1	U	1	U	1	U	1	U	2	U	2	U
38	2-Butanone	5	U	5	U	5	U	5	U	10	U	10	U
39	Benzene	1	U	**3.2**		1	U	1	U	0.4	U	0.3	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	**11**		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	**14**		1	U	1	U	2	U	2	U
45	o-Xylene	1	U	**59**		1	U	1	U	1	U	1	U
46	1,3,5-Trimethylbenzene	1	U	**18**		1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	1	U	**210**		**1.2**	J	**1.4**		1	U	1	U
48	Isopropylbenzene	1	U	**24**		1	U	1	U	1	U	1	U
49	n-Propylbenzene	1	U	**27**		1	U	1	U	1	U	1	U
50	tert-Butylbenzene	1	U	**1.7**		1	U	1	U	1	U	1	U
51	sec-Butylbenzene	1	U	**8.3**		1	U	1	U	1	U	1	U
52	4-Isopropyltoluene	1	U	**5.7**		1	U	1	U	1	U	1	U
53	n-Butylbenzene	1	U	**5**	M	1	U	1	U	1	U	1	U
54	Naphthalene	5	U	**42**		5	U	5	U	1	U	1	U
55	Methyl tert-butyl ether	NA		NA		NA		NA		1	U	1	U
56													
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**												
58	**Method OR-DEQ**												
59	**TPH-Diesel**	0.25	U	**5.3**		**0.36**		**0.26**		0.244	U	0.256	U
60	**TPH-D Motor Oil**	NA		NA		NA		0.5	U	0.487	U	0.511	U
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA	
62													

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 LW4S		
3			LW4S		LW4S		LW4S		LW4S		LW4S (a)		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW40S		LW4S
4			S167J		T176G		U235O		V232E		B802035-01		W391F		Y314F		Z225K		Z960L		AH49G		AU45B		AU45A		BC27Q
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		12/9/99
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	0.001
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	0.005
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	0.002
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	0.001
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	0.01
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	0.008
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		NA
74	67	Magnesium (mg/L) (6010)	**5.92**		**7.1**		**4.46**		**4.60**		NA		NA		NA		NA		**2.98**		NA		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		NA
76	69	Sodium (mg/L) (6010)	**13.2**		**13.7**		**11.6**		**10.0**		NA		NA		NA		NA		**6.10**		NA		NA		NA		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**75**		**64**		**62**		**64**		NA		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		NA		1.0	U	NA		NA		NA		NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**75**		**64**		**62**		**64**		NA		NA		NA		NA		**43**		NA		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**		**120**
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**		**4.3**
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		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		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		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		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	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1																												
2			Dup of LW4S																									
3			LW40S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S	
4			BC27O		BH96D		BR55C		CB68C		CL03F		CT67C		DE87J		DM30C		DW29F		ED30G		EN00G		ER93K		EZ17E	
5			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		11/13/02	
63	**PRIORITY POLLUTANT**																											
64	**METALS (mg/L)**																											
65	Arsenic (7060)	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**		0.05	U
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	**0.07**	
67	Copper (6010)	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**		**0.163**	
68	Lead (7421)	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**		**0.04**	
69	Nickel (6010)	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	**0.11**	
70	Zinc (6010)	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**		**0.17**	
71																												
72	**MAJOR IONS AND CONVENTIONALS**																											
73	Calcium (mg/L) (6010)		NA		NA		NA		NA		NA		**164**		**149**		**144**		**13.9**		**25.8**		**163**		NA		NA	
74	Magnesium (mg/L) (6010)		NA		NA		NA		NA		NA		**56.0**		**48.2**		**43.6**		**4.06**		**7.66**		**49.6**		NA		NA	
75	Potassium (mg/L) (6010)		NA		NA		NA		NA		NA		**5.6**		**5.9**		**6.4**		**2.5**		**3.5**		**7.9**		NA		NA	
76	Sodium (mg/L) (6010)		NA		NA		NA		NA		NA		**9.87**		**9.35**		**11.5**		**4.35**		**7.39**		**15.0**		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		NA		NA		NA		NA		**810**		NA		NA		NA		**80**		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		**810**		NA		NA		NA		**80**		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**120**		**150**		**490**		**420**		**990**		**760**		**720**	J	**580**	J	**95**		**300**		**890**		**380**		**320**	
81	Chloride (mg/L) (EPA 325.2)		**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**		**7.3**	
82	N-Nitrate (mg-N/L) (Calculated)		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**8.4**		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		NA		NA		NA		NA		**0.013**	J	NA		NA		NA		**0.022**		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**8.4**		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		NA		NA		NA		NA		**8.4**		NA		NA		NA		**18**		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	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN
1													
2													
3		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S	
4		FF65F		FL58F		FU45O		FY82K		0402113-07		0408036-08	
5		2/11/03		5/8/03		8/28/03		10/24/03		2/23/04		8/05/04	
63	**PRIORITY POLLUTANT**												
64	**METALS (mg/L)**												
65	Arsenic (7060)	0.001	U	0.001	U	**0.002**		**0.001**		0.001	U	0.001	U
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	**0.006**		**0.0071**		0.005	U
67	Copper (6010)	**0.002**		**0.028**		**0.003**		**0.006**		0.01	U	0.01	U
68	Lead (7421)	0.001	U	0.001	U	0.001	U	0.001	U	0.0001	U	0.0001	U
69	Nickel (6010)	0.01	U	**0.01**		0.01	U	0.01	U	0.005	U	0.005	U
70	Zinc (6010)	0.006	U	0.006	U	0.006	U	**0.009**		0.01	U	0.01	U
71													
72	**MAJOR IONS AND CONVENTIONALS**												
73	Calcium (mg/L) (6010)	**7.7**		NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	**2.25**		NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	**1.8**		NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	**4**		NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	**36**		NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1	U	NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**36**		NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**66**		**290**		**200**		**140**		**166**		**244**	
81	Chloride (mg/L) (EPA 325.2)	1	U	**9.8**		**5.8**		**3**		**6.03**		**15.5**	
82	N-Nitrate (mg-N/L) (Calculated)	**0.76**		NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	0.01	U	NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.76**		NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	**6.4**		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

	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 LW4S		
3			LW4S		LW4S		LW4S		LW4S		LW4S (a)		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW40S		LW4S
4			S167J		T176G		U235O		V232E		B802035-01		W391F		Y314F		Z225K		Z960L		AH49G		AU45B		AU45A		BC27Q
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		12/9/99
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		6.57
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		13.0
90	83	Conductivity (um/hos)	212		212		173		163		163		263		301		111		110		192		229		229		177
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		4.58
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	AE	AG	AI	AK	AM	AO	AQ	AS	AU	AW	AY	BA
2		Dup of LW4S												
3		LW40S	LW4S	LW4S	LW4S	LW4S	LW4S	LW4S	LW4S	LW4S	LW4S	LW4S	LW4S	LW4S
4		BC27O	BH96D	BR55C	CB68C	CL03F	CT67C	DE87J	DM30C	DW29F	ED30G	EN00G	ER93K	EZ17E
5		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	11/13/02
87	**FIELD PARAMETERS**													
88	pH (avg)	6.57	6.48	6.28	5.70	5.74	6.31	6.80	6.75	6.21	5.64	6.23	6.68	6.2
89	Temperature (° C) (avg)	12.9	13.1	14.5	15.1	14.3	13.5	14.2	16.2	14.6	12.6	14.4	15.8	16.1
90	Conductivity (um/hos)	177	209	478	433	884	809	1400	973	129	253	843	477	465
91	Dissolved oxygen (mg/L) (avg)	4.75	0.93	1.91	1.36	0.62	0.00	0.00	0.84	4	7.53	5.19	0.62	2.03
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	BG	BH	BI	BJ	BK	BL	BM	BN
1													
2													
3		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S	
4		FF65F		FL58F		FU45O		FY82K		0402113-07		0408036-08	
5		2/11/03		5/8/03		8/28/03		10/24/03		2/23/04		8/05/04	
87	**FIELD PARAMETERS**												
88	pH (avg)	6.59		6.33		6.82		6.65		5.8		5.89	
89	Temperature (° C) (avg)	10.9		13		16.1		15.2		11.6		15.2	
90	Conductivity (um/hos)	85		383		231		217		166		438	
91	Dissolved oxygen (mg/L) (avg)	0		2.4		1.86		2.95		2.27		2.66	
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	**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	X	Y	Z	AA
1																									Dup of LW4S		
2			LW4S		LW4S		LW4S		LW4S		LW4S (a)		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW40S		LW4S
3			S167J		T176G		U235O		V232E		B802035-01		W391F		Y314F		Z225K		Z960L		AH49G		AU45B		AU45A		BC27Q
4			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		12/9/99
5																											
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			Dup of LW4S																									
3			LW40S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S	
4			BC27O		BH96D		BR55C		CB68C		CL03F		CT67C		DE87J		DM30C		DW29F		ED30G		EN00G		ER93K		EZ17E	
5			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		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		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	

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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	BG	BH	BI	BJ	BK	BL	BM	BN
1													
2													
3		LW4S		LW4S		LW4S		LW4S		LW4S		LW4S	
4		FF65F		FL58F		FU45O		FY82K		0402113-07		0408036-08	
5		2/11/03		5/8/03		8/28/03		10/24/03		2/23/04		8/05/04	
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		1	U
128	Acenaphthene	NA		NA		NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		NA		NA		1	U
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	AB
1																												
2					Dup of LW5S																							
3			LW5S		LW5D		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S	
4			S167E		S167F		T160A		U235G		V232G		W391C		Y336E		Z225G		Z960J		AH49F		AU22E		BC27C		BH96C	
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		2/17/00	
6																												
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	**0.18**	J1
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		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																											

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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
1									
2									
3		LW5S		LW5S		LW5S		LW5S	
4		BR64F		CT37E		ED16F		FF88C	
5		5/24/00		2/12/01		2/25/02		2/13/03	
6									
7	**CHLORINATED PHENOLS (µg/L)**								
8	**EPA Method SW8040**								
9	Pentachlorophenol	0.25	U	0.25	U	0.25	U	0.25	U
10	2,4,6-Trichlorophenol	0.25	U	NA		NA		NA	
11	2,3,6-Trichlorophenol	0.25	U	NA		NA		NA	
12	2,4,5-Trichlorophenol	0.25	U	NA		NA		NA	
13	2,3,4-Trichlorophenol	0.25	U	NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	0.25	U	NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	0.25	U	NA		NA		NA	
16									
17	**SEMIVOLATILES (µg/L)**								
18	**EPA Method SW8270**								
19	Phenol	2.0	U	2.0	U	2.0	U	2	U
20	4-Methylphenol	1.0	U	1.0	U	1.0	U	1	U
21	Isophorone	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	U
23	Benzoic Acid	10	U	10	U	50	U	50	U
24	Naphthalene	1.0	U	1.0	U	1.0	U	1	U
25	2-Methylnaphthalene	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	U
27	2,4,5-Trichlorophenol	5.0	U	5.0	U	5.0	U	5	U
28	Acenaphthene	1.0	U	1.0	U	1.0	U	1	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1	U
30	Fluorene	1.0	U	1.0	U	1.0	U	1	U
31	Pentachlorophenol	5.0	U	5.0	U	5.0	U	5	U
32	bis(2-Ethylhexyl)phthalate	1.0	U	1.0	U	4.0	U	1	U
33									
34	**VOLATILES (µg/L)**								
35	**EPA Method SW8260**								
36	Acetone	5.0	U	6.6	U	5.0	U	5	U
37	Carbon Disulfide	1.0	U	1.0	U	1.0	U	1	U
38	2-Butanone	5.0	U	5.0	U	5.0	U	5	U
39	Benzene	1.0	U	1.0	U	1.0	U	1	U
40	Bromoform	1.0	U	1.0	U	1.0	U	1	U
41	Toluene	1.0	U	1.0	U	1.0	U	1	U
42	Ethylbenzene	1.0	U	1.0	U	1.0	U	1	U
43	Styrene	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	U
45	o-Xylene	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	U
47	1,2,4-Trimethylbenzene	1.0	U	1.0	U	1.0	U	1	U
48	Isopropylbenzene	1.0	U	1.0	U	1.0	U	1	U
49	n-Propylbenzene	1.0	U	1.0	U	1.0	U	1	U
50	tert-Butylbenzene	1.0	U	1.0	U	1.0	U	1	U
51	sec-Butylbenzene	1.0	U	1.0	U	1.0	U	1	U
52	4-Isopropyltoluene	1.0	U	1.0	U	1.0	U	1	U
53	n-Butylbenzene	1.0	U	1.0	U	1.0	U	1	U
54	Naphthalene	5.0	U	5.0	U	5.0	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**	0.25	U	0.25	U	0.25	U	0.25	U
60	**TPH-D Motor Oil**	NA		NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA	
62									

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					Dup of LW5S																							
3			LW5S		LW5D		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S	
4			S167E		S167F		T160A		U235G		V232G		W391C		Y336E		Z225G		Z960J		AH49F		AU22E		BC27C		BH96C	
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		2/17/00	
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**		**0.003**	
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	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	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	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	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	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		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		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		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		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**86**		**82**		**72**		**58**		**77**		NA		NA		NA		**78**		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		1.0	U	NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**86**		**82**		**72**		**58**		**77**		NA		NA		NA		**78**		NA		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**		**100**	
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**		**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		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		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		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		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	AI	AJ
1									
2									
3		LW5S		LW5S		LW5S		LW5S	
4		BR64F		CT37E		ED16F		FF88C	
5		5/24/00		2/12/01		2/25/02		2/13/03	
63	**PRIORITY POLLUTANT**								
64	**METALS (mg/L)**								
65	Arsenic (7060)	**0.003**		**0.002**		**0.003**		**0.003**	
66	Chromium (6010)	0.005	U	0.005	U	0.005	U	0.005	U
67	Copper (6010)	0.002	U	0.002	U	0.002	U	**0.013**	
68	Lead (7421)	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
70	Zinc (6010)	0.006	U	0.006	U	0.006	U	**0.013**	
71									
72	**MAJOR IONS AND CONVENTIONALS**								
73	Calcium (mg/L) (6010)	NA		**16.3**		**22.4**		**20.5**	
74	Magnesium (mg/L) (6010)	NA		**4.44**		**6.49**		**5.99**	
75	Potassium (mg/L) (6010)	NA		**2.6**		**3.4**		**3**	
76	Sodium (mg/L) (6010)	NA		**9.64**		**11.4**		**10.1**	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		**81**		**100**		**88**	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		1.0	U	1.0	U	1	U
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		**81**		**100**		**88**	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**97**		**140**		**150**		**140**	
81	Chloride (mg/L) (EPA 325.2)	**1.6**		**6.3**		**1.1**		**2.1**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		**1.2**		**1.6**		**0.73**	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		0.010	U	0.010	U	0.01	U
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		**1.2**	J	**1.6**		**0.73**	
85	Sulfate (mg/L) (EPA 375.2)	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	AA	AB
1																												
2					Dup of LW5S																							
3			LW5S		LW5D		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S	
4			S167E		S167F		T160A		U235G		V232G		W391C		Y336E		Z225G		Z960J		AH49F		AU22E		BC27C		BH96C	
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		2/17/00	
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		6.49	
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		11.8	
90	83	Conductivity (um/hos)	175		175		197		125		175		177		171		80		169		200		146		133		149	
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		2.51	
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
1									
2									
3		LW5S		LW5S		LW5S		LW5S	
4		BR64F		CT37E		ED16F		FF88C	
5		5/24/00		2/12/01		2/25/02		2/13/03	
87	**FIELD PARAMETERS**								
88	pH (avg)	6.42		6.17		5.91		6.79	
89	Temperature (° C) (avg)	14.6		13.7		12.4		13.3	
90	Conductivity (um/hos)	144		148		221		208	
91	Dissolved oxygen (mg/L) (avg)	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	
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	**ETHANOL (mg/L)**	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	AA	AB
1																												
2					Dup of LW5S																							
3			LW5S		LW5D		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S		LW5S	
4			S167E		S167F		T160A		U235G		V232G		W391C		Y336E		Z225G		Z960J		AH49F		AU22E		BC27C		BH96C	
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		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		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
1									
2									
3		LW5S		LW5S		LW5S		LW5S	
4		BR64F		CT37E		ED16F		FF88C	
5		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	
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-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							Dup of LW7S																					
3			LW7S		LW7S		LW7D		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S	
4			S167M		T176S		T176T		U235W		V208D		W371I		Y314G		Z225R		Z960N		AH27E		AU22F		BB82A		BH75E	
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		2/15/00	
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	0.25	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	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	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	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	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	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	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	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	**23**		**43**		**42**		**13**		**13**		**19**	J2	**10**		**6.5**		**4.0**		**17**		**19**		**7.8**		**1.6**	
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**		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	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	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	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	**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	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	**160**		**140**		**160**		**86**		**71**		**62**		**69**		**36**		**14**		**56**		**80**		**40**		**5.6**	
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	**110**		**100**		**120**		**37**		**43**		**30**		**33**		**21**		**8.4**		**22**		**28**		**17**		**2.8**	
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	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**		**2.3**	
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**		1.1	U
48	42	Isopropylbenzene	**22**		**45**		**42**		**60**	J2	**20**		**29**		**33**		**38**		**7.9**		**27**		**36**		**29**		**8.1**	
49	43	n-Propylbenzene	**31**		**64**		60		**78**		**34**		**43**		**46**		**59**		**13**		**42**		**48**		**41**		**15**	
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	**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**		**1.7**	
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**		1.0	U
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	2.4	U
54	48	Naphthalene	**64**		**66**	J2	**87**	J2	**35**	J2	**37**		**28**		**32**		**22**		**9.1**		**29**		**41**		**9.6**		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**	**0.48**		**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**		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																											

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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	BD
1																													
2																													
3		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S	
4		BR55H		CB49A		CK77C		CT37A		DE68A		DM52J		DW29A		ED16G		EM75E		ER92A		EZ03M		FF88E		FL41B		FU45A	
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		8/28/03	
6																													
7	**CHLORINATED PHENOLS (µg/L)**																												
8	**EPA Method SW8040**																												
9	Pentachlorophenol	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	0.25	U	0.50	UJ
10	2,4,6-Trichlorophenol	0.25	U	0.25	U	0.25	U	NA		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		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		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		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		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		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	2.2	U	2.3	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	1.0	U	1.1	U	1.1	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	1.0	U	1.1	U	1.1	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	3.0	U	3.3	U	3.4	U	3.1	U	3	U	3.1	U
23	Benzoic Acid	10	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U	56	U	57	U	51	U	50	U	51	U
24	Naphthalene	**5.7**		**12**		**5.2**		**3.7**		2.0		**1.8**		**1.3**		1.0	U	**9.0**		**5.2**		**1.8**		**2.1**		**1.2**		**4.4**	
25	2-Methylnaphthalene	**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	1	U	**1.3**	
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	5.6	U	5.7	U	5.1	U	5	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	5.6	U	5.7	U	5.1	U	5	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	1.1	U	1.1	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	1.0	U	1.1	U	1.1	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	1.0	U	1.1	U	1.1	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	5.0	U	5.6	U	5.7	U	5.1	U	5	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	**4.3**		4.0	U	4.0	U	4.4	U	4.5	U	1	U	1	U	1	U
33																													
34	**VOLATILES (µg/L)**																												
35	**EPA Method SW8260**																												
36	Acetone	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	**36**	M	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	U	1	U	1	U	1	U	1	U
38	2-Butanone	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	**7.6**	M	**18**	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	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	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	1	U
42	Ethylbenzene	**19**		**40**		**23**		**15**		**4.6**		**18**		**17**		**8.6**		**31**		**42**		**24**		**8.3**		**10**	J	**42**	
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	1	U
44	m,p-Xylene	**8.8**		**15**		**19**		**9.1**		**5.4**		**10**		**13**		**3.7**		**15**		**18**		**12**		**6.3**		**5**	J	**20**	J
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	1	U
46	1,3,5-Trimethylbenzene	**2.1**		**3.0**		**2.8**		**1.5**		1.0	U	**1.6**		**1.4**		1.0	U	**20**		**4**		**1.4**		**1**		1	U	**3.4**	
47	1,2,4-Trimethylbenzene	**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**		**1.1**	J	**3.2**	J
48	Isopropylbenzene	**11**		**18**		**22**		**16**		**1.3**		**21**		**20**		**6.1**		**20**		**26**		**26**		**14**		**8.7**	J	**31**	
49	n-Propylbenzene	**18**		**28**		**33**		**25**		**1.3**		**27**		**27**		**11**		**30**		**40**		**36**		**23**		**14**	J	**40**	
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	U	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	**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**		**1.5**	J	**2.9**	
52	4-Isopropyltoluene	**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	1	U	**1.2**	
53	n-Butylbenzene	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	**1.8**	J	**3**	
54	Naphthalene	**12**		**18**		**13**		**5.7**		5.0	U	**7.0**		5.0	U	5.0	U	**14**		**12**		**5.4**		5	U	5	U	**6.6**	
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**	0.25	U	**0.32**		**0.32**		**0.32**		**20**		**0.26**		**0.42**		0.25	U	**0.31**		**0.53**		**0.5**		**0.31**		0.25	U	**0.54**	
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.5	U	NA		NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62																													

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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	BE	BF	BG	BH	BI	BJ	BK	BL
1									
2									
3		LW7S		LW7S		LW7S		LW7S	
4		FY64F		0402099-03		0406059-05		0408019-01	
5		10/20/03		2/19/04		6/9/04		8/03/04	
6									
7	**CHLORINATED PHENOLS (µg/L)**								
8	**EPA Method SW8040**								
9	Pentachlorophenol	0.5	U	0.486	U	0.499	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	U	1.95	U	2.02	U	1.99	U
20	4-Methylphenol	1	U	9.75	U	10.1	U	9.96	U
21	Isophorone	1	U	0.975	U	1.01	U	0.996	U
22	2,4-Dimethylphenol	3	U	2.92	U	3.02	U	2.99	U
23	Benzoic Acid	10	U	19.5	U	20.2	U	19.9	U
24	Naphthalene	**4.4**		0.975	U	**5.13**		**4.43**	
25	2-Methylnaphthalene	**1.9**		0.975	U	1.01	U	**1.66**	
26	2,4,6-Trichlorophenol	5	U	4.87	U	5.04	U	4.98	U
27	2,4,5-Trichlorophenol	5	U	4.87	U	5.04	U	4.98	U
28	Acenaphthene	1	U	0.975	U	1.01	U	0.996	U
29	Dibenzofuran	1	U	0.975	U	1.01	U	0.996	U
30	Fluorene	1	U	0.975	U	1.01	U	0.996	U
31	Pentachlorophenol	5	U	4.87	U	5.04	U	4.98	U
32	bis(2-Ethylhexyl)phthalate	1	U	0.975	U	1.01	U	0.996	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	**17**	M	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	**29**		**7.76**		**50.8**		**78.8**	
43	Styrene	1	U	1	U	1	U	1	U
44	m,p-Xylene	**16**		2	U	**21.6**		**33.2**	
45	o-Xylene	1	U	1	U	1	U	**1.02**	
46	1,3,5-Trimethylbenzene	**3.3**		1	U	**4.24**		**4.78**	
47	1,2,4-Trimethylbenzene	**2.2**		1	U	**3.34**		**3.58**	
48	Isopropylbenzene	**42**		**13.6**		**24.9**		**54.7**	
49	n-Propylbenzene	**54**		**27.5**		**41.8**		**62.9**	
50	tert-Butylbenzene	1	U	1	U	1	U	1	U
51	sec-Butylbenzene	**3.7**		**2.18**		**2.15**		**4.13**	
52	4-Isopropyltoluene	**1.6**		1	U	1	U	**1.81**	
53	n-Butylbenzene	**4.3**		**2.67**		**2.16**		**3.74**	
54	Naphthalene	**5.5**		1	U	**11.3**		**10.1**	
55	Methyl tert-butyl ether	1	U	1	U	1	U	1	U
56									
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**								
58	**Method OR-DEQ**								
59	**TPH-Diesel**	**0.6**		**0.333**		**0.651**		**0.516**	
60	**TPH-D Motor Oil**	0.5	U	0.476	U	**0.567**		0.501	U
61	**TPH-Gasoline**	**2.1**		**1.2**		**0.38**		**1.73**	
62									

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							Dup of LW7S																					
3			LW7S		LW7S		LW7D		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S	
4			S167M		T176S		T176T		U235W		V208D		W371I		Y314G		Z225R		Z960N		AH27E		AU22F		BB82A		BH75E	
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		2/15/00	
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**		**0.017**	
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)	**0.004**		**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	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	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)	**0.015**		**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**		0.006	U
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		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		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		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		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**120**		**93**	**J2**	**130**	**J2**	**160**		**150**		NA		NA		NA		**140**		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		1.0	U	NA		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		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**		**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**		**3.6**	
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		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		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		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		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	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		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S	
4		BR55H		CB49A		CK77C		CT37A		DE68A		DM52J		DW29A		ED16G		EM75E		ER92A		EZ03M		FF88E		FL41B		FU45A	
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		8/28/03	
63	**PRIORITY POLLUTANT**																												
64	**METALS (mg/L)**																												
65	Arsenic (7060)	**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**		**0.015**		**0.013**	
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	**0.016**		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	**0.008**		**0.014**		**0.002**	
68	Lead (7421)	**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**		**0.006**		**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**		**0.03**		0.01	U
70	Zinc (6010)	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**		**0.108**	J	0.006	U
71																													
72	**MAJOR IONS AND CONVENTIONALS**																												
73	Calcium (mg/L) (6010)	NA		NA		NA		**29.4**		**37.4**		**41.0**		**36.2**		**35.4**		NA		NA		NA		**47.7**		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		**10.5**		**13.4**		**15.3**		**13.0**		**13.3**		NA		NA		NA		**18.9**		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		**2.5**		**3.1**		**3.2**		**3.4**		**3.5**		NA		NA		NA		**4.1**		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		**13.0**		**15.6**		**18.8**		**18.8**		**19.4**		NA		NA		NA		**17.6**		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		**160**		NA		NA		NA		**180**		NA		NA		NA		**220**		NA		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		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		**160**		NA		NA		NA		**180**		NA		NA		NA		**220**		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**160**		**190**		**210**		**200**		**250**		**250**		**230**		**230**		**260**		**290**		**250**		**240**		**230**		**220**	
81	Chloride (mg/L) (EPA 325.2)	**3.5**		**2.9**		**4.1**		**2.8**		**3.3**		**5.3**		**2.6**		**3.6**		**3.5**		**7.4**		**4.7**		**5.1**		**2.1**		**2.5**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		0.010	U	NA		NA		NA		0.010	U	NA		NA		NA		**0.053**		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		0.010	U	NA		NA		NA		0.010	U	NA		NA		NA		**0.013**		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		0.010	UJ	NA		NA		NA		0.010	U	NA		NA		NA		**0.066**		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		**3.0**		NA		NA		NA		**7.9**		NA		NA		NA		2.5	U	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	BE	BF	BG	BH	BI	BJ	BK	BL
1									
2									
3		LW7S		LW7S		LW7S		LW7S	
4		FY64F		0402099-03		0406059-05		0408019-01	
5		10/20/03		2/19/04		6/9/04		8/03/04	
63	**PRIORITY POLLUTANT**								
64	**METALS (mg/L)**								
65	Arsenic (7060)	**0.012**		**0.013**		**0.015**		**0.0143**	
66	Chromium (6010)	0.005	U	0.005	U	**0.0148**		**0.0146**	
67	Copper (6010)	**0.003**		0.01	U	0.01	U	0.01	U
68	Lead (7421)	0.001	U	**0.0005**		0.0001	U	**0.000792**	
69	Nickel (6010)	0.01	U	0.005	U	0.005	U	0.005	U
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)	**220**		**203**		**259**		**265**	
81	Chloride (mg/L) (EPA 325.2)	**2.9**		**5.73**		**3.53**		**3.43**	
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-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							Dup of LW7S																					
3			LW7S		LW7S		LW7D		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S	
4			S167M		T176S		T176T		U235W		V208D		W371I		Y314G		Z225R		Z960N		AH27E		AU22F		BB82A		BH75E	
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		2/15/00	
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		6.73	
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		15.5	
90	83	Conductivity (um/hos)	278		299		303		310		323		315		308		121		309		293		267		297		296	
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		1.20	
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	BD
1																													
2																													
3		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S	
4		BR55H		CB49A		CK77C		CT37A		DE68A		DM52J		DW29A		ED16G		EM75E		ER92A		EZ03M		FF88E		FL41B		FU45A	
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		8/28/03	
87	**FIELD PARAMETERS**																												
88	pH (avg)	6.52		6.36		5.18		6.46		6.70		6.93		6.60		6.21		6.56		6.66		6.6		6.99		7.1		6.8	
89	Temperature (° C) (avg)	14.5		15.5		14.9		14.2		14.1		15.2		15.1		14.1		15.1		15.5		15.6		14.7		14.4		15.7	
90	Conductivity (um/hos)	263		299		302		300		419		433		378		351		408		364		352		492		320		308	
91	Dissolved oxygen (mg/L) (avg)	0.87		1.66		2.02		2.78		1.37		1.06		3.24		4.55		5.27		1.46		0.41		0		5.9		2.76	
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	BE	BF	BG	BH	BI	BJ	BK	BL
1									
2									
3		LW7S		LW7S		LW7S		LW7S	
4		FY64F		0402099-03		0406059-05		0408019-01	
5		10/20/03		2/19/04		6/9/04		8/03/04	
87	**FIELD PARAMETERS**								
88	pH (avg)	6.77		5.97		5.13		7.68	
89	Temperature (° C) (avg)	15.6		14.6		15.6		16.1	
90	Conductivity (um/hos)	308		300		352		451	
91	Dissolved oxygen (mg/L) (avg)	1.08		1.26		1.23		NM	
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	**ETHANOL (mg/L)**	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	AA	AB
1																												
2							Dup of LW7S																					
3			LW7S		LW7S		LW7D		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S	
4			S167M		T176S		T176T		U235W		V208D		W371I		Y314G		Z225R		Z960N		AH27E		AU22F		BB82A		BH75E	
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		2/15/00	
123		**PAHs (µg/L)**																										
124		**EPA Method SW8270 SIM**																										
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		**4.0**		NA		NA		NA		NA	
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		**1.3**		NA		NA		NA		NA	
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA	
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA		NA		NA	
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	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	BD
1																													
2																													
3		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S		LW7S	
4		BR55H		CB49A		CK77C		CT37A		DE68A		DM52J		DW29A		ED16G		EM75E		ER92A		EZ03M		FF88E		FL41B		FU45A	
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		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		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-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BE	BF	BG	BH	BI	BJ	BK	BL
1									
2									
3		LW7S		LW7S		LW7S		LW7S	
4		FY64F		0402099-03		0406059-05		0408019-01	
5		10/20/03		2/19/04		6/9/04		8/03/04	
123	**PAHs (µg/L)**								
124	**EPA Method SW8270 SIM**								
125	Naphthalene	4.1		NA		**5.73**		**5.83**	
126	2-Methylnaphthalene	1.6		NA		NA		NA	
127	Acenaphthylene	0.1	U	NA		0.05	U	0.05	U
128	Acenaphthene	0.1	U	NA		0.05	U	**0.05**	
129	Fluorene	0.1	U	NA		0.05	U	0.05	U
130	Anthracene	0.1	U	NA		0.05	U	0.05	U
131	Dibenzofuran	0.1	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

	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 LW8S						Dup of LW8S						Dup of LW8S	
3			LW8S		LW8S		LW8S		LW8S		LW8S		Z		LW8S		LW8S		W		LW8S		LW8S		W	
4			AH27K		AU36D		BC30G		9912050-05A		BH96W		BH96V		BR64N		CB68F		CB68H		CL03A		CT67J		CT67I	
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		2/15/01	
6																										
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	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		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		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		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		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		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		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	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	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	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	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	10	U
24	18	Naphthalene	**99**		**74**		**120**		NA		**55**		**54**		**70**		**40**		**38**		**4.3**		**6.7**		**6.4**	
25	19	2-Methylnaphthalene	**76**		**58**		**72**		NA		**71**		**73**		**77**		**30**		**30**		**4.7**		**7.0**		**6.8**	
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	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	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	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	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	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	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	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	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	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	5.0	U
39	33	Benzene	**110**		**55**		**49**		NA		**62**		**60**		**77**		**29**		**29**		**5.0**		**9.1**		**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	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	1.0	U
42	36	Ethylbenzene	**180**		**160**		**170**		NA		**110**		**98**		**140**		**130**		**120**		**8.5**		**22**		**23**	
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	1.0	U
44	38	m,p-Xylene	**290**		**320**		**260**		NA		**160**		**130**		**180**		**200**		**200**		**2.2**		**4.7**		**5.0**	
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	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**		**5.0**	
47	41	1,2,4-Trimethylbenzene	**280**		**180**		**180**		NA		**140**		**120**		**130**		**130**		**120**		**2.6**		**6.4**		**7.1**	
48	42	Isopropylbenzene	**290**		**130**		**160**		NA		**190**		**180**		**250**		**120**		**120**		**100**		**100**		**130**	
49	43	n-Propylbenzene	**190**		**110**		**140**		NA		**150**		**150**		**170**		**100**		**98**		**56**		**83**		**100**	
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**		**6.2**	
51	45	sec-Butylbenzene	**22**		**23**		**25**		NA		**30**		**29**		**28**		**20**		20		**11**		**14**		**15**	
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	1.0	U
53	47	n-Butylbenzene	**12**		**18**		16	U	NA		**15**		**14**		**15**		**14**		13		**4.1**		**6.8**		**7.1**	
54	48	Naphthalene	**150**		**120**		**160**		NA		**180**		**160**		**150**		**110**		**100**		**6.6**		**19**		**20**	
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**	**1.9**		**2.1**		**2.0**		NA		**2.2**	J2	**3.2**	J2	**2.6**		**1.6**		**1.6**		**2.3**		**3.4**		**3.2**	
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	0.50	U
61	54	**TPH-Gasoline**	**9.8**		**9.4**		**10**		NA		**9.5**		**10**		**15**		**13**		**13**		**3.9**		**4.6**		**4.9**	
62	55																									

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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	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
2								Dup of LW8S								Dup of LW8S								Dup of LW8S			
3		LW8S		LW8S		LW8S		X		LW8S		LW8S		LW8S		X		LW8S		LW8S		LW8S		X		LW8S	
4		DE68N		DM30J		ED23J		ED23K		EM85G		ER92E		EZ17G		EZ17A		FF65C		FL58B		FU45I		FU45H		FY64L	
5		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		8/28/03		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	0.27	U	0.25	U	0.25	U	1.2	U	0.26	U	**2.1**	J	**6.3**	J	0.55	U
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	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	2.1	U	2.2	U
20	4-Methylphenol	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.2	U	1.1	U	1	U	1	UJ	1	U	1.1	U	1.1	U
21	Isophorone	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.2	U	1.1	U	1	U	1	UJ	1	U	1.1	U	1.1	U
22	2,4-Dimethylphenol	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.3	U	3.5	U	3.4	U	3	U	3.1	UJ	3.1	U	3.2	U	3.3	U
23	Benzoic Acid	10	U	10	U	50	U	50	U	50	U	54	U	58	U	57	U	50	U	51	UJ	51	U	53	U	11	U
24	Naphthalene	**22**		**2.3**		**54**		**57**		**57**		**62**		**11**		**11**		**44**		**24**	J	**39**		**40**		**2.2**	
25	2-Methylnaphthalene	**14**		**2.6**		**69**		**74**		**51**		**44**		**22**		**25**		**47**		**49**	J	**31**		**34**		**3.1**	
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	5.7	U	5	U	5.1	UJ	5.1	U	5.3	U	5.5	U
27	2,4,5-Trichlorophenol	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	5.3	U	5.5	U
28	Acenaphthene	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	1.1	U	1.1	U
29	Dibenzofuran	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.1	U	1.2	U	1.1	U	1	U	1	UJ	1	U	1.1	U	1.1	U
30	Fluorene	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	1.6	U	1.1	U
31	Pentachlorophenol	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	5.3	U	5.5	U
32	bis(2-Ethylhexyl)phthalate	**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	1.1	U	1.1	U
33																											
34	**VOLATILES (µg/L)**																										
35	**EPA Method SW8260**																										
36	Acetone	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	5	U	5	U
37	Carbon Disulfide	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	1	U	1	U
38	2-Butanone	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	5	U	5	U
39	Benzene	**9.0**		**2.0**		**30**		**30**		**91**	J	**35**		**2.5**		**2.4**		**15**		**31**		**19**		**23**		1	U
40	Bromoform	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	1	U	1	U
41	Toluene	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	1	U	1	U
42	Ethylbenzene	**61**		**11**		**420**	J	**390**		**300**	J	**280**		**37**		**33**		**240**		**270**		**180**		**220**		**7.2**	
43	Styrene	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	1	U	1	U
44	m,p-Xylene	**17**		1.0	U	**56**		**60**		**44**	J	**37**		**1**		1	U	**4.6**		**8.2**		**11**	J	**15**	J	1	U
45	o-Xylene	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	1	U	1	U
46	1,3,5-Trimethylbenzene	**15**		**1.7**		**62**		**64**		**67**	J	**68**		**7.7**		**6.3**		**9.1**		**9.6**		**13**	J	**16**	J	1	U
47	1,2,4-Trimethylbenzene	**23**		**1.8**		**130**		**140**		**150**	J	**170**		**13**		**11**		**23**		**29**		**28**	J	**36**	J	1	U
48	Isopropylbenzene	**130**		**67**		**240**	J	**240**		**260**	J	**240**		**180**		**170**		**240**		**340**		**260**		**280**		**140**	
49	n-Propylbenzene	**110**		**40**		**210**	J	**210**		**250**	J	**220**		**160**		**150**		**200**		**260**		**230**		**260**		**94**	
50	tert-Butylbenzene	**6.0**		**4.7**		**10**		**10**		**12**	MJ	**8.4**		**7.6**		**7.1**		**9.4**		**12**		**9.1**		**10**		**7.4**	
51	sec-Butylbenzene	**16**		**8.7**		**31**		**32**		**40**	J	**24**		**24**		**23**		**29**		**33**		**28**		**32**		**19**	
52	4-Isopropyltoluene	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	**2**		1	U
53	n-Butylbenzene	8.0	U	**3.2**	M	**18**		**18**		**20**	MJ	**16**	M	**14**	M	**13**	M	**13**	M	**14**		**14**		**16**		**9**	
54	Naphthalene	**35**		5.0	U	**180**		**100**		**140**		**150**		**19**		**17**		**76**		**51**		**83**		**120**		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**	**4.4**		**4.0**		**7.1**		**7.6**		**4.0**		**4.5**		**4.3**		**4.2**		**11**		**7.4**		**4.3**		**4.2**		**3.5**	
60	**TPH-D Motor Oil**	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	0.5	U	0.5	U
61	**TPH-Gasoline**	**4.7**		**3.9**		**12**	J	**12**		**11**		**10**		**7.8**		**8.6**		**9.8**		**9.5**	J	**7.4**		**7.5**		**4.6**	
62																											

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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
1									
2						Dup of LW8S			
3		LW8S		LW8S		X		LW8S	
4		0402113-09		0406059-07		0406059-06		0408036-02	
5		2/23/04		6/9/04		6/9/04		8/05/04	
6									
7	**CHLORINATED PHENOLS (µg/L)**								
8	**EPA Method SW8040**								
9	Pentachlorophenol	0.504	U	0.517	U	0.491	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	2.06	U	2.08	U	1.99	U	2	U
20	4-Methylphenol	10.3	U	10.4	U	9.94	U	10	U
21	Isophorone	1.03	U	1.04	U	0.994	U	1	U
22	2,4-Dimethylphenol	3.1	U	3.12	U	2.98	U	3	U
23	Benzoic Acid	20.6	U	20.8	U	19.9	U	20	U
24	Naphthalene	**15.2**		**25.4**		**29.2**		**6.7**	
25	2-Methylnaphthalene	**20.3**		**19.6**		**22.1**		**6.88**	
26	2,4,6-Trichlorophenol	5.16	U	5.21	U	4.97	U	5	U
27	2,4,5-Trichlorophenol	5.16	U	5.21	U	4.97	U	5	U
28	Acenaphthene	1.03	U	1.04	U	0.994	U	1	U
29	Dibenzofuran	1.03	U	1.04	U	0.994	U	1	U
30	Fluorene	1.03	U	1.04	U	0.994	U	1	U
31	Pentachlorophenol	5.16	U	5.21	U	4.97	U	5	U
32	bis(2-Ethylhexyl)phthalate	1.03	U	1.04	U	0.994	U	1	U
33									
34	**VOLATILES (µg/L)**								
35	**EPA Method SW8260**								
36	Acetone	50	U	50	U	50	U	50	U
37	Carbon Disulfide	2	U	2	U	2	U	2	U
38	2-Butanone	10	U	10	U	10	U	10	U
39	Benzene	**5.11**		**9.45**		**9.52**		**1.86**	
40	Bromoform	1	U	1	U	1	U	1	U
41	Toluene	1	U	1	U	1	U	1	U
42	Ethylbenzene	**184**		**272**	J	**204**	J	**17.9**	
43	Styrene	1	U	1	U	1	U	1	U
44	m,p-Xylene	2	U	2	U	2	U	**2.31**	
45	o-Xylene	1	U	1	U	1	U	**1.21**	
46	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U
47	1,2,4-Trimethylbenzene	1	U	1	U	1	U	**3.74**	
48	Isopropylbenzene	**239**		**244**		**215**		**232**	
49	n-Propylbenzene	**205**		**275**		**228**		**183**	
50	tert-Butylbenzene	**6.52**		**8.3**		**8.1**		**8.83**	
51	sec-Butylbenzene	**23.1**		**29.8**		**29.5**		**25.6**	
52	4-Isopropyltoluene	1	U	1	U	1	U	1	U
53	n-Butylbenzene	**8.07**		**10.2**		**9.5**		**10.1**	
54	Naphthalene	**24.5**		**51.7**		**46.6**		**16.7**	
55	Methyl tert-butyl ether	1	U	1	U	1	U	1	U
56									
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**								
58	**Method OR-DEQ**								
59	**TPH-Diesel**	**11.7**		**8.52**		**8.36**		**5.15**	
60	**TPH-D Motor Oil**	0.504	U	0.496	U	0.506	U	0.488	U
61	**TPH-Gasoline**	**9.2**		**8.62**		**8.37**		**4.44**	
62									

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 LW8S						Dup of LW8S						Dup of LW8S	
3			LW8S		LW8S		LW8S		LW8S		LW8S		Z		LW8S		LW8S		W		LW8S		LW8S		W	
4			AH27K		AU36D		BC30G		9912050-05A		BH96W		BH96V		BR64N		CB68F		CB68H		CL03A		CT67J		CT67I	
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		2/15/01	
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**		**0.022**	
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	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	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	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	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	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**		**25.6**	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**6.81**		**6.85**	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**2.6**		**2.5**	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**7.52**		**7.55**	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**170**		**160**	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		1.0	U	1.0	U
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**170**		**160**	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**220**		**200**		**210**		NA		**190**		**210**		**180**		**210**		**210**		**190**		**220**		**210**	
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	**4.9**	J
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U	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	**0.035**	J
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**0.041**		**0.035**	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**2.8**		2.5	U
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 LW8S								Dup of LW8S								Dup of LW8S			
3		LW8S		LW8S		LW8S		X		LW8S		LW8S		LW8S		X		LW8S		LW8S		LW8S		X		LW8S	
4		DE68N		DM30J		ED23J		ED23K		EM85G		ER92E		EZ17G		EZ17A		FF65C		FL58B		FU45I		FU45H		FY64L	
5		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		8/28/03		10/21/03	
63	**PRIORITY POLLUTANT**																										
64	**METALS (mg/L)**																										
65	Arsenic (7060)	**0.024**		**0.028**		**0.027**		**0.030**		**0.025**		**0.028**		0.05	U	0.05	U	**0.024**		**0.026**		**0.021**		**0.024**		**0.021**	
66	Chromium (6010)	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	0.005	U	**0.007**	
67	Copper (6010)	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	**0.002**		**0.007**	
68	Lead (7421)	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	0.001	U	**0.002**	
69	Nickel (6010)	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	0.01	U	**0.02**	
70	Zinc (6010)	**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	0.006	U	**0.027**	
71																											
72	**MAJOR IONS AND CONVENTIONALS**																										
73	Calcium (mg/L) (6010)	**31.1**		**27.5**		**41.6**		**38.6**		NA		NA		NA		NA		**33.8**		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	**8.18**		**7.58**		**9.98**		**9.30**		NA		NA		NA		NA		**8.4**		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	**2.8**		**2.8**		**4.2**		**4.0**		NA		NA		NA		NA		**3.4**		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	**8.47**		**7.86**		**9.95**		**9.31**		NA		NA		NA		NA		**7.8**		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		**220**		**230**		NA		NA		NA		NA		**190**		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		1.0	U	1.0	U	NA		NA		NA		NA		1	U	NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		**220**		**230**		NA		NA		NA		NA		**190**		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**250**		**200**		**300**		**290**		**240**		**220**		**200**		**200**		**280**		**260**		**250**		**250**		**260**	
81	Chloride (mg/L) (EPA 325.2)	**2.8**		**5.3**		**4.2**		**3.6**		**4.4**		**2.7**		**2.9**		**2.9**		**3.7**		**2.3**		**2.3**		**2.2**		**4.8**	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		0.010	U	**0.012**		NA		NA		NA		NA		0.01	U	NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		**0.059**		**0.054**		NA		NA		NA		NA		**0.072**		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		**0.044**	J	**0.066**	J	NA		NA		NA		NA		**0.062**		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	NA		NA		2.5	U	**3.2**		NA		NA		NA		NA		**3.8**		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	BA	BB	BC	BD	BE	BF	BG	BH
1									
2						Dup of LW8S			
3		LW8S		LW8S		X		LW8S	
4		0402113-09		0406059-07		0406059-06		0408036-02	
5		2/23/04		6/9/04		6/9/04		8/05/04	
63	**PRIORITY POLLUTANT**								
64	**METALS (mg/L)**								
65	Arsenic (7060)	**0.025**		**0.023**		**0.023**		**0.0223**	
66	Chromium (6010)	**0.0064**		**0.0144**		**0.0161**		0.005	U
67	Copper (6010)	0.01	U	0.01	U	0.01	U	0.01	U
68	Lead (7421)	**0.0001**		0.0001	U	0.0001	U	0.0001	U
69	Nickel (6010)	0.005	U	0.005	U	0.005	U	0.005	U
70	Zinc (6010)	0.01	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)	**263**		**271**		**300**		**709**	
81	Chloride (mg/L) (EPA 325.2)	**3.31**		**2.96**		**3.39**		**3.24**	
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-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 LW8S						Dup of LW8S						Dup of LW8S	
3			LW8S		LW8S		LW8S		LW8S		LW8S		Z		LW8S		LW8S		W		LW8S		LW8S		W	
4			AH27K		AU36D		BC30G		9912050-05A		BH96W		BH96V		BR64N		CB68F		CB68H		CL03A		CT67J		CT67I	
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		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		6.28	
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		13.6	
90	83	Conductivity (um/hos)	357		303		328		NM		351		351		354		330		330		352		404		403	
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		0.53	
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		10	U	NA		NA		5.0	U	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	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 LW8S								Dup of LW8S								Dup of LW8S			
3		LW8S		LW8S		LW8S		X		LW8S		LW8S		LW8S		X		LW8S		LW8S		LW8S		X		LW8S	
4		DE68N		DM30J		ED23J		ED23K		EM85G		ER92E		EZ17G		EZ17A		FF65C		FL58B		FU45I		FU45H		FY64L	
5		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		8/28/03		10/21/03	
87	**FIELD PARAMETERS**																										
88	pH (avg)	6.49		6.61		6.37		6.37		6.23		6.42		6.17		6.16		6.74		6.58		6.64		6.65		6.57	
89	Temperature (° C) (avg)	14.4		15.0		13.6		13.6		15.3		16.1		14.7		14.6		15.2		12.9		16.5		16.5		19.0	
90	Conductivity (um/hos)	402		467		489		490		405		330		353		351		503		397		349		348		352	
91	Dissolved oxygen (mg/L) (avg)	1.58		1.85		6.71		6.75		3.92		0.87		1.82		1.94		1.29		3.35		1.61		1.57		1.03	
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
1									
2						Dup of LW8S			
3		LW8S		LW8S		X		LW8S	
4		0402113-09		0406059-07		0406059-06		0408036-02	
5		2/23/04		6/9/04		6/9/04		8/05/04	
87	**FIELD PARAMETERS**								
88	pH (avg)	6.21		4.87		4.87		5.86	
89	Temperature (° C) (avg)	14.1		14.7		14.7		16.5	
90	Conductivity (um/hos)	402		368		368		523	
91	Dissolved oxygen (mg/L) (avg)	1.26		0.74		0.74		1.71	
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	**ETHANOL (mg/L)**	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 LW8S						Dup of LW8S						Dup of LW8S	
3			LW8S		LW8S		LW8S		LW8S		LW8S		Z		LW8S		LW8S		W		LW8S		LW8S		W	
4			AH27K		AU36D		BC30G		9912050-05A		BH96W		BH96V		BR64N		CB68F		CB68H		CL03A		CT67J		CT67I	
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		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		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 LW8S								Dup of LW8S								Dup of LW8S			
3		LW8S		LW8S		LW8S		X		LW8S		LW8S		LW8S		X		LW8S		LW8S		LW8S		X		LW8S	
4		DE68N		DM30J		ED23J		ED23K		EM85G		ER92E		EZ17G		EZ17A		FF65C		FL58B		FU45I		FU45H		FY64L	
5		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		8/28/03		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	
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
1									
2						Dup of LW8S			
3		LW8S		LW8S		X		LW8S	
4		0402113-09		0406059-07		0406059-06		0408036-02	
5		2/23/04		6/9/04		6/9/04		8/05/04	
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		1	U
128	Acenaphthene	NA		NA		NA		NA	
129	Fluorene	NA		NA		NA		NA	
130	Anthracene	NA		NA		NA		1	U
131	Dibenzofuran	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
1																						
2																						
3			LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S	
4			AH76O		BC30A		BH96G		BR64K		ED30B		EN00B		FF76B		FL41M		0402113-01		0406073-01	
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		2/23/04		6/10/04	
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**		0.493	U	0.478	U
10	4	2,4,6-Trichlorophenol	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	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	
13	7	2,3,4-Trichlorophenol	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	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	
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	1.98	U	NA	
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	9.9	U	NA	
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	0.99	U	NA	
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	2.97	U	NA	
23	17	Benzoic Acid	10	U	10	U	10	U	10	U	50	U	50	U	50	U	50	U	19.8	U	NA	
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	0.99	U	NA	
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	0.99	U	NA	
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	4.95	U	NA	
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	4.95	U	NA	
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	0.99	U	NA	
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	0.99	U	NA	
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	0.99	U	NA	
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	4.95	U	NA	
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	0.99	U	NA	
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	50	U	NA	
37	31	Carbon Disulfide	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	2	U	NA	
38	32	2-Butanone	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	10	U	NA	
39	33	Benzene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	0.4	U	NA	
40	34	Bromoform	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	NA	
41	35	Toluene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	NA	
42	36	Ethylbenzene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	NA	
43	37	Styrene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	NA	
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	2	U	NA	
45	39	o-Xylene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	NA	
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	1	U	NA	
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	1	U	NA	
48	42	Isopropylbenzene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	NA	
49	43	n-Propylbenzene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	NA	
50	44	tert-Butylbenzene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	NA	
51	45	sec-Butylbenzene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	NA	
52	46	4-Isopropyltoluene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	NA	
53	47	n-Butylbenzene	1.0	U	NA		1.0	U	1.0	U	1.0	U	1.0	U	1	U	1	U	1	U	NA	
54	48	Naphthalene	5.0	U	NA		5.0	U	5.0	U	5.0	U	5.0	U	5	U	5	U	1	U	NA	
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		1	U	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	0.25	U	NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		0.501	U	NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																					

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																						
3			LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S	
4			AH76O		BC30A		BH96G		BR64K		ED30B		EN00B		FF76B		FL41M		0402113-01		0406073-01	
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		2/23/04		6/10/04	
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	0.001	U	NA	
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	0.005	U	NA	
67	60	Copper (6010)	0.002	U	NA		**0.004**		0.002	U	0.002	U	**0.012**		**0.003**		0.002	U	0.01	U	NA	
68	61	Lead (7421)	0.001	U	NA		**0.003**		**0.001**		**0.001**		**0.001**		0.001	U	0.001	U	**0.0004**		NA	
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	0.005	U	NA	
70	63	Zinc (6010)	**0.004**		NA		**0.016**		**0.007**		**0.008**	J	**0.043**		**0.01**		0.006	U	0.01	U	NA	
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		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		**3.27**		**9.50**		**2.58**		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		**2.5**		**3.9**		**2.5**		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		**5.27**		**8.31**		**6**		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		**34**		NA		**36**		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		1.0	U	NA		1	U	NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		**34**		NA		**36**		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**84**		NA		**100**		**90**		**100**		**120**		**74**		**74**		**81**		NA	
81	74	Chloride (mg/L) (EPA 325.2)	**1.3**		NA		**3.2**		**2.2**		**1.4**	J	**2.3**		**1.2**		**1.6**		**1.04**		NA	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		**3.4**		NA		**2.1**		NA		NA		NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		**0.014**		NA		0.01	U	NA		NA		NA	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		**3.4**		NA		**2.1**		NA		NA		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		**12**		NA		**5.6**		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	O	P	Q	R	S	T	U	V
1																						
2																						
3			LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S	
4			AH76O		BC30A		BH96G		BR64K		ED30B		EN00B		FF76B		FL41M		0402113-01		0406073-01	
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		2/23/04		6/10/04	
87	80	**FIELD PARAMETERS**																				
88	81	pH (avg)	6.01		NM		6.66		6.45		6.09		6.44		7.19		6.78		6.17		NA	
89	82	Temperature (° C) (avg)	13.6		NM		13.4		13.0		12.6		14.3		11.9		13		13.9		NA	
90	83	Conductivity (um/hos)	93		NM		111		129		109		149		110		88		75		NA	
91	84	Dissolved oxygen (mg/L) (avg)	5.76		NM		2.87		4.30		8.85		7.22		7.33		9.77		6.53		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		NA		NA		NA	
96	89	Total TCDF	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	
98	91	Total TCDD	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	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	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	
103	96	Total PeCDD	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	
105	98	1,2,3,6,7,8-HxCDF	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	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	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	
110	103	1,2,3,6,7,8-HxCDD	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	
112	105	Total HxCDD	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	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	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	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	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	
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																						
2																						
3			LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S		LW10S	
4			AH76O		BC30A		BH96G		BR64K		ED30B		EN00B		FF76B		FL41M		0402113-01		0406073-01	
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		2/23/04		6/10/04	
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		NA		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		NA		NA		NA		NA	
131		Dibenzofuran	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
2					Dup of LW11S												Dup of LW11S									
3			LW11S		LW110S		LW11S		LW11S		LW11S		LW11S		LW11S		X		LW11S		LW11S		LW11S		LW11S	
4			AH76E		AH76D		AU36F		BC27J		9912050-06A		BH96U		BR55L		BR55K		CB49J		CK77K		CT55H		DE68M	
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		6/4/01	
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	NA	
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		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		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		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		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**750**		**750**		**450**		**360**		NA		**560**		**940**		**850**		**250**		NA		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		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**		**2.6**	
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**		**2.3**	
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	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	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	10	U
24	18	Naphthalene	**41**		**38**		**20**		**12**		NA		**23**		**22**		**20**		**13**		NA		**5.7**		**3.1**	
25	19	2-Methylnaphthalene	**14**		**13**		**8.9**		**5.7**		NA		**9.0**		**9.0**		**9.4**		**4.9**		NA		**3.9**		**2.0**	
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	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	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	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	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	1.0	U
31	25	Pentachlorophenol	**24000**		**20000**		**8000**		**5400**		NA		**11000**		**6800**	J2	**6500**	J2	**3600**		NA		**460**	J	**560**	
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	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	**17**	
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	1.0	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	5.0	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	**1.7**	
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	1.0	U
41	35	Toluene	**51**		**48**		**23**		**14**		NA		**17**		**37**		**36**		**15**		NA		**2.4**		**5.3**	
42	36	Ethylbenzene	**160**		**150**		**86**		**54**		NA		**75**		**110**		**110**		**69**		NA		**24**		**33**	
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	1.0	U
44	38	m,p-Xylene	**360**		**350**		**160**		**96**		NA		**140**		**220**		**210**		**120**		NA		**53**		**57**	
45	39	o-Xylene	**300**		**290**		**170**		**96**		NA		**130**		**240**		**210**		**120**		NA		**40**		**50**	
46	40	1,3,5-Trimethylbenzene	**100**		**92**		**68**		**43**		NA		**62**		**88**		**89**		**53**		NA		**48**		**32**	
47	41	1,2,4-Trimethylbenzene	**410**		**430**		**180**		**130**		NA		**200**		**370**		**320**		**180**		NA		**150**		**120**	
48	42	Isopropylbenzene	**50**	J2	**40**	J2	**27**		**18**		NA		**27**		**40**		**38**		**22**		NA		**13**		**12**	
49	43	n-Propylbenzene	**66**		**56**		**40**		**26**		NA		**42**		**53**		**52**		**32**		NA		**24**		**21**	
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	**1.3**	M
51	45	sec-Butylbenzene	**15**		**13**		**10**		**9.1**		NA		**14**		**14**		**13**		**8.8**		NA		**7.5**		**7.3**	
52	46	4-Isopropyltoluene	**11**		**9.9**		1.0	U	1.0	U	NA		**10**		**9.8**		**9.4**		**5.9**		NA		**7.1**		**6.6**	
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	7.6	U
54	48	Naphthalene	**46**		**38**		**19**		**15**		NA		**25**		**45**		**44**		**22**		NA		10	U	**11**	
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**	**14**		**13**		**10**		**8.8**		NA		**12**		**10**		**9.6**		**5.9**		NA		**2.2**		**1.7**	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		**1.1**		**0.50**		**0.77**		NA		NA		0.50	U	0.50	U
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		**11**		**24**		**20**		**14**		NA		**4.8**		**2.9**	
62	55																									

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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	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
2										Dup of LW11S						Dup of LW11S									
3		LW11S		LW11S		LW11S		LW11S		OX005S		LW11S		LW11S		X		LW11S		LW11S		LW11S		LW11S	
4		ED34D		EM66C		ES04D		EX87C		EX87A		EZ03I		FF76H		FF76L		FL58H		FU45D		FY72I		0402086-06	
5		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		2/18/04	
7	**CHLORINATED PHENOLS (µg/L)**																								
8	**EPA Method SW8040**																								
9	Pentachlorophenol	NA		NA		NA		**3600**		**3700**		NA		NA		NA		NA		NA		NA		NA	
10	2,4,6-Trichlorophenol	NA		NA		NA		**1.3**		**1.3**		NA		NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	NA		NA		NA		**0.4**		**0.37**		NA		NA		NA		NA		NA		NA		NA	
12	2,4,5-Trichlorophenol	NA		NA		NA		0.58	U	0.6	U	NA		NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	NA		NA		NA		0.25	U	0.29	U	NA		NA		NA		NA		NA		NA		NA	
14	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		**380**		**380**		NA		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol	NA		NA		NA		**3.2**	J	**4.2**	J	NA		NA		NA		NA		NA		NA		NA	
16																									
17	**SEMIVOLATILES (µg/L)**																								
18	**EPA Method SW8270**																								
19	Phenol	2.0	U	2.0	U	2.2	U	NA		NA		2.2	U	2	U	2	U	2	U	2.1	U	2	U	1.96	U
20	4-Methylphenol	**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	9.8	U
21	Isophorone	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	0.98	U
22	2,4-Dimethylphenol	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	2.94	U
23	Benzoic Acid	50	U	50	U	54	U	NA		NA		56	U	51	U	51	U	50	U	53	U	10	U	19.6	U
24	Naphthalene	**5.3**		**6.7**		**4.9**		NA		NA		**4.7**		**4.9**		**5.1**		**10**		**5.6**		**3.2**		**9.22**	
25	2-Methylnaphthalene	**1.7**		**2.6**		**1.7**		NA		NA		**2.8**		**3.6**		**3.7**		**4.5**		**3.7**		**2.9**		**4.2**	
26	2,4,6-Trichlorophenol	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	4.9	U
27	2,4,5-Trichlorophenol	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	4.9	U
28	Acenaphthene	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	0.98	U
29	Dibenzofuran	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	0.98	U
30	Fluorene	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	0.98	U
31	Pentachlorophenol	**4700**		**4000**		**2600**		NA		NA		**2200**		**1600**	J	**2000**	J	**3800**		**1700**		**900**		**6350**	
32	bis(2-Ethylhexyl)phthalate	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	0.98	U
33																									
34	**VOLATILES (µg/L)**																								
35	**EPA Method SW8260**																								
36	Acetone	**28**		5.0	U	11	UJ	**99**	M	**110**		**46**	M	**18**	M	**22**	M	**23**	M	**10**	MJ	**7**	M	50	UJ
37	Carbon Disulfide	1.0	U	1.0	U	1	UJ	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	2	UJ
38	2-Butanone	**13**		5.0	U	**23**	J	**12**		**14**		**7.4**		5	U	5	U	5	U	**9.5**	M	**7.5**	M	10	UJ
39	Benzene	**6.6**		**12**		**9.1**		**2.9**		**2.6**		**2.7**		**11**	J	**14**	J	**18**		**5.4**		**2.1**		**30.3**	J
40	Bromoform	1.0	U	1.0	U	1	UJ	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	UJ
41	Toluene	**9.1**		**10**		**3.6**	J	**3**		**2.8**		**1.3**		**3.9**	J	**4.8**	J	**6.4**		**1.2**		1	U	1	UJ
42	Ethylbenzene	**36**		**56**		**44**		**56**		**55**		**25**		**34**		**39**		**75**		**29**		**14**		**71.6**	J
43	Styrene	1.0	U	1.0	U	1	UJ	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	UJ
44	m,p-Xylene	**71**		**100**		**69**	J	**67**		**67**		**26**		**52**		**62**		**120**		**48**	J	**20**		**61.6**	J
45	o-Xylene	**77**		**94**		**68**	J	**88**		**83**		**37**		**48**		**55**		**130**		**50**		**23**		**123**	J
46	1,3,5-Trimethylbenzene	**29**		**35**		**28**		**28**	J	**22**	J	**8.3**		**16**		**19**		**46**		**28**		**16**		**34.8**	J
47	1,2,4-Trimethylbenzene	**140**		**150**		**120**		**160**		**150**		**84**		**95**		**110**		**210**		**120**	J	**73**		**160**	J
48	Isopropylbenzene	**14**		**16**		**16**		**22**		**18**		**10**		**12**		**14**		**27**		**15**		**7.6**		**15.9**	J
49	n-Propylbenzene	**20**		**24**		**24**		**31**		**27**		**15**		**20**		**23**		**37**		**20**		**13**		**18.6**	J
50	tert-Butylbenzene	**1.4**		**2.8**	J	**1.8**		**2**		**1.8**		**1.3**	M	**1.5**	M	**1.6**	M	**2.4**		**1.6**		**1**		1	UJ
51	sec-Butylbenzene	**6.9**		**7.4**		**5.8**		**10**		**9.3**		**5.6**		**7.4**		**7.8**		**11**		**7.9**		**4.7**		**7.19**	J
52	4-Isopropyltoluene	**3.9**		**6.0**		**5.8**	J	**7**		**6.4**		**3.2**		**5.2**		**5.8**		**7.4**		**4.6**		**3.2**		**4.32**	J
53	n-Butylbenzene	**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	**3.41**	J
54	Naphthalene	**12**		**17**		**15**	J	**22**		**19**		**7.8**		**10**		**12**		**22**		**9.4**		5	U	**15.1**	J
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**	**7.4**		**8.0**		**7.9**		NA		NA		**4.7**		**4.5**		**4.4**		**8.6**		**4**		**2.3**		**3.07**	
60	**TPH-D Motor Oil**	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	**0.573**	
61	**TPH-Gasoline**	8.9		**9.7**		**7.3**		NA		NA		**6.1**		**7.1**		**7.7**		**8.6**	J	**4.8**		**2.8**		**6.8**	
62																									

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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	AY	AZ	BA	BB
1					
2					
3		LW11S		LW11S	
4		0406074-09		0408035-01	
5		6/10/04		8/05/04	
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	2.03	U	2	U
20	4-Methylphenol	10.2	U	10	U
21	Isophorone	1.02	U	1	U
22	2,4-Dimethylphenol	3.05	U	3	U
23	Benzoic Acid	20.3	U	20	U
24	Naphthalene	**3.55**		**7.81**	
25	2-Methylnaphthalene	**2.07**		**3.81**	
26	2,4,6-Trichlorophenol	5.09	U	5	U
27	2,4,5-Trichlorophenol	5.09	U	5	U
28	Acenaphthene	1.02	U	1	U
29	Dibenzofuran	1.02	U	1	U
30	Fluorene	1.02	U	1	U
31	Pentachlorophenol	**2130**		**604**	
32	bis(2-Ethylhexyl)phthalate	1.02	U	1	U
33					
34	**VOLATILES (µg/L)**				
35	**EPA Method SW8260**				
36	Acetone	50	U	**54**	J
37	Carbon Disulfide	2	U	2	U
38	2-Butanone	**11.6**		**13**	J
39	Benzene	**11.6**		**9.79**	J
40	Bromoform	1	U	1	U
41	Toluene	1	U	1	U
42	Ethylbenzene	**38.6**		**83.1**	J
43	Styrene	1	U	1	U
44	m,p-Xylene	**59**		**126**	J
45	o-Xylene	**67.8**		**176**	J
46	1,3,5-Trimethylbenzene	**27.7**		**56.7**	J
47	1,2,4-Trimethylbenzene	**99.4**		**234**	J
48	Isopropylbenzene	**12**		**28.2**	J
49	n-Propylbenzene	**18.1**		**30.5**	J
50	tert-Butylbenzene	**1.16**		**1.55**	J
51	sec-Butylbenzene	**5.49**		**8.97**	J
52	4-Isopropyltoluene	**3.19**		**6.91**	J
53	n-Butylbenzene	**2.47**		**5.42**	J
54	Naphthalene	**8.95**		**24.5**	J
55	Methyl tert-butyl ether	1	U	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		NA	
62					

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 LW11S												Dup of LW11S									
3			LW11S		LW110S		LW11S		LW11S		LW11S		LW11S		LW11S		X		LW11S		LW11S		LW11S		LW11S	
4			AH76E		AH76D		AU36F		BC27J		9912050-06A		BH96U		BR55L		BR55K		CB49J		CK77K		CT55H		DE68M	
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		6/4/01	
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**		**0.007**	
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	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	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	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	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	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**		**28.6**	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**6.41**		**9.34**	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**1.6**		**2.7**	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**4.03**		**6.10**	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**140**		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		1.0	U	NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**140**		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**230**		**240**		**150**		**200**		NA		**160**		**160**		**170**		**220**		NA		**190**		**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**		**3.2**	
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U	NA	
83	76	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		0.010	U	NA	
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	NA	
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		NA		NA		NA		NA		NA		NA		NA		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

	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 LW11S						Dup of LW11S									
3		LW11S		LW11S		LW11S		LW11S		OX005S		LW11S		LW11S		X		LW11S		LW11S		LW11S		LW11S	
4		ED34D		EM66C		ES04D		EX87C		EX87A		EZ03I		FF76H		FF76L		FL58H		FU45D		FY72I		0402086-06	
5		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		2/18/04	
63	**PRIORITY POLLUTANT**																								
64	**METALS (mg/L)**																								
65	Arsenic (7060)	**0.006**		**0.006**		**0.006**		NA		NA		0.05	U	**0.004**		**0.004**		**0.005**		**0.005**		**0.006**		**0.004**	
66	Chromium (6010)	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	**0.0069**	
67	Copper (6010)	**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**		0.01	U
68	Lead (7421)	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	**0.0002**	
69	Nickel (6010)	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	0.005	U
70	Zinc (6010)	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	0.01	U
71																									
72	**MAJOR IONS AND CONVENTIONALS**																								
73	Calcium (mg/L) (6010)	**59.0**		NA		NA		NA		NA		NA		**22.5**		**23.1**		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	**18.2**		NA		NA		NA		NA		NA		**7.52**		**7.8**		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	**4.0**		NA		NA		NA		NA		NA		**2.9**		**3**		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	**8.55**		NA		NA		NA		NA		NA		**12.5**		**12.9**		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	**230**		NA		NA		140		**140**		NA		**120**		**120**		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	NA		NA		1	U	1	U	NA		1	U	1	U	NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**230**		NA		NA		140		**140**		NA		**120**		**120**		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**410**		**180**		**160**		NA		NA		**560**		**170**		**160**		**190**		**270**		**240**		**274**	
81	Chloride (mg/L) (EPA 325.2)	**58**		**2.7**		**3.8**		NA		NA		**4.7**		**3.1**		**3**		**4.9**		**3.3**		**4**		**3.13**	
82	N-Nitrate (mg-N/L) (Calculated)	0.010	U	NA		NA		NA		NA		NA		**0.042**	J	**0.031**	J	NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	**0.031**		NA		NA		NA		NA		NA		0.01	U	0.01	U	NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	**0.040**		NA		NA		NA		NA		NA		**0.042**	J	**0.031**	J	NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	**13**		NA		NA		NA		NA		NA		**24**		**26**		NA		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	AY	AZ	BA	BB
1					
2					
3		LW11S		LW11S	
4		0406074-09		0408035-01	
5		6/10/04		8/05/04	
63	**PRIORITY POLLUTANT**				
64	**METALS (mg/L)**				
65	Arsenic (7060)	**0.005**		**0.00333**	
66	Chromium (6010)	**0.0173**		**0.0161**	
67	Copper (6010)	0.01	U	0.01	U
68	Lead (7421)	0.0001	U	0.0001	U
69	Nickel (6010)	0.005	U	0.005	U
70	Zinc (6010)	0.01	U	0.01	U
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)	**389**		**356**	
81	Chloride (mg/L) (EPA 325.2)	**3.92**		**3.59**	
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

1																										
2				Dup of LW11S												Dup of LW11S										
3			LW11S	LW110S		LW11S		LW11S		LW11S		LW11S		LW11S		X		LW11S		LW11S		LW11S		LW11S		
4			AH76E	AH76D		AU36F		BC27J		9912050-06A		BH96U		BR55L		BR55K		CB49J		CK77K		CT55H		DE68M		
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		6/4/01		
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		6.50		
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		14.1		
90	83	Conductivity (um/hos)	285	286		226		323		NM		291		234		234		346		NM		296		270		
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		0.96		
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		NA		
96	89	Total TCDF	NA	NA		**0.018**		**0.0011**	J1	NA		**0.0064**		NA		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		NA		
98	91	Total TCDD	NA	NA		0.0056	U	0.00130	U	NA		0.0044	U	NA		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		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		NA		
101	94	Total PeCDF	NA	NA		0.0220	U	0.00140	U	NA		0.0034	U	NA		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		NA		
103	96	Total PeCDD	NA	NA		0.0061	U	0.00160	U	NA		0.0044	U	NA		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		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		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		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		NA		
108	101	Total HxCDF	NA	NA		**0.015**		0.0170	U	NA		**0.1600**		NA		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		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		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		NA		
112	105	Total HxCDD	NA	NA		**0.035**		**0.0068**	J1	NA		**0.0310**		NA		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		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		NA		
115	108	Total HpCDF	NA	NA		**0.043**		**0.0320**	J1	NA		**0.3800**		NA		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		NA		
117	110	Total HpCDD	NA	NA		**0.410**		**0.0780**		NA		**1.1000**		NA		NA		NA		NA		NA		NA		
118	111	OCDF	NA	NA		0.220	U	**0.0280**	J1	NA		**0.5100**		NA		NA		NA		NA		NA		NA		
119	112	OCDD	NA	NA		**1.900**		**0.2800**		NA		**5.3000**		NA		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	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
1																									
2										Dup of LW11S						Dup of LW11S									
3		LW11S		LW11S		LW11S		LW11S		OX005S		LW11S		LW11S		X		LW11S		LW11S		LW11S		LW11S	
4		ED34D		EM66C		ES04D		EX87C		EX87A		EZ03I		FF76H		FF76L		FL58H		FU45D		FY72I		0402086-06	
5		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		2/18/04	
87	**FIELD PARAMETERS**																								
88	pH (avg)	6.29		6.14		6.44		6.47		6.48		6.21		6.9		6.92		6.6		6.65		6.65		6.53	
89	Temperature (° C) (avg)	13.6		15.6		16.4		16.4		16.4		15.5		14.6		14.7		13.7		14.3		15.8		14.3	
90	Conductivity (um/hos)	460		205		218		554		554		528		323		324		248		356		300		341	
91	Dissolved oxygen (mg/L) (avg)	7.46		4.17		1.31		0		0		0		0		0		2.96		1.61		1.97		1.52	
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		**6.88**	J	NA	
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**7.91**		NA	
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		3.08	U	NA	
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		3.08	U	NA	
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**30.1**		NA	
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**23.8**	J	NA	
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**664**		NA	
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		5.19	U	NA	
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**144**		NA	
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**185**		NA	
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**101**		NA	
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**141**		NA	
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		11	U	NA	
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**6013**		NA	
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**31**		NA	
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**812**		NA	
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**111**		NA	
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**2769**		NA	
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**5015**		NA	
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**335**		NA	
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**23730**		NA	
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**34761**	J	NA	
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**53330**		NA	
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**25345**	J	NA	
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**276444**	J	NA	
120																									
121	**ETHANOL (mg/L)**	NA		NA		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	AY	AZ	BA	BB
1					
2					
3		LW11S		LW11S	
4		0406074-09		0408035-01	
5		6/10/04		8/05/04	
87	**FIELD PARAMETERS**				
88	pH (avg)	6.31		5.78	
89	Temperature (° C) (avg)	14.3		15.6	
90	Conductivity (um/hos)	418		585	
91	Dissolved oxygen (mg/L) (avg)	1.24		1.68	
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
1																										
2					Dup of LW11S												Dup of LW11S									
3			LW11S		LW110S		LW11S		LW11S		LW11S		LW11S		LW11S		X		LW11S		LW11S		LW11S		LW11S	
4			AH76E		AH76D		AU36F		BC27J		9912050-06A		BH96U		BR55L		BR55K		CB49J		CK77K		CT55H		DE68M	
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		6/4/01	
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 LW11S						Dup of LW11S									
3		LW11S		LW11S		LW11S		LW11S		OX005S		LW11S		LW11S		X		LW11S		LW11S		LW11S		LW11S	
4		ED34D		EM66C		ES04D		EX87C		EX87A		EZ03I		FF76H		FF76L		FL58H		FU45D		FY72I		0402086-06	
5		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		2/18/04	
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	AY	AZ	BA	BB
1					
2					
3		LW11S		LW11S	
4		0406074-09		0408035-01	
5		6/10/04		8/05/04	
123	**PAHs (µg/L)**				
124	**EPA Method SW8270 SIM**				
125	Naphthalene	NA		NA	
126	2-Methylnaphthalene	NA		NA	
127	Acenaphthylene	NA		1	U
128	Acenaphthene	NA		NA	
129	Fluorene	NA		NA	
130	Anthracene	NA		1	U
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	W	X	Y	Z	AA	AB
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	
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	U
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																											

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
1											
2											
3		LW13S		LW13S		LW13S		LW13S		LW13S	
4		FL58C		FU45M		FY82E		0402113-06		0408036-07	
5		5/8/03		8/28/03		10/23/03		2/23/04		8/05/04	
6											
7	**CHLORINATED PHENOLS (µg/L)**										
8	**EPA Method SW8040**										
9	Pentachlorophenol	0.25	U	**1.1**	J	**1.0**		0.482	U	0.5	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	NA		NA		NA		NA		NA	
20	4-Methylphenol	NA		NA		NA		NA		NA	
21	Isophorone	NA		NA		NA		NA		NA	
22	2,4-Dimethylphenol	NA		NA		NA		NA		NA	
23	Benzoic Acid	NA		NA		NA		NA		NA	
24	Naphthalene	NA		NA		NA		NA		NA	
25	2-Methylnaphthalene	NA		NA		NA		NA		NA	
26	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA	
27	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA	
28	Acenaphthene	NA		NA		NA		NA		NA	
29	Dibenzofuran	NA		NA		NA		NA		NA	
30	Fluorene	NA		NA		NA		NA		NA	
31	Pentachlorophenol	NA		NA		NA		NA		NA	
32	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA	
33											
34	**VOLATILES (µg/L)**										
35	**EPA Method SW8260**										
36	Acetone	NA		NA		NA		NA		NA	
37	Carbon Disulfide	NA		NA		NA		NA		NA	
38	2-Butanone	NA		NA		NA		NA		NA	
39	Benzene	NA		NA		NA		NA		NA	
40	Bromoform	NA		NA		NA		NA		NA	
41	Toluene	NA		NA		NA		NA		NA	
42	Ethylbenzene	NA		NA		NA		NA		NA	
43	Styrene	NA		NA		NA		NA		NA	
44	m,p-Xylene	NA		NA		NA		NA		NA	
45	o-Xylene	NA		NA		NA		NA		NA	
46	1,3,5-Trimethylbenzene	NA		NA		NA		NA		NA	
47	1,2,4-Trimethylbenzene	NA		NA		NA		NA		NA	
48	Isopropylbenzene	NA		NA		NA		NA		NA	
49	n-Propylbenzene	NA		NA		NA		NA		NA	
50	tert-Butylbenzene	NA		NA		NA		NA		NA	
51	sec-Butylbenzene	NA		NA		NA		NA		NA	
52	4-Isopropyltoluene	NA		NA		NA		NA		NA	
53	n-Butylbenzene	NA		NA		NA		NA		NA	
54	Naphthalene	NA		NA		NA		NA		NA	
55	Methyl tert-butyl ether	NA		NA		NA		NA		NA	
56											
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**										
58	**Method OR-DEQ**										
59	**TPH-Diesel**	NA		NA		NA		NA		NA	
60	**TPH-D Motor Oil**	NA		NA		NA		NA		NA	
61	**TPH-Gasoline**	NA		NA		NA		NA		NA	
62											

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																											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	
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	
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	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
1											
2											
3		LW13S		LW13S		LW13S		LW13S		LW13S	
4		FL58C		FU45M		FY82E		0402113-06		0408036-07	
5		5/8/03		8/28/03		10/23/03		2/23/04		8/05/04	
63	**PRIORITY POLLUTANT**										
64	**METALS (mg/L)**										
65	Arsenic (7060)	NA		NA		NA		NA		NA	
66	Chromium (6010)	NA		NA		NA		NA		NA	
67	Copper (6010)	NA		NA		NA		NA		NA	
68	Lead (7421)	NA		NA		NA		NA		NA	
69	Nickel (6010)	NA		NA		NA		NA		NA	
70	Zinc (6010)	NA		NA		NA		NA		NA	
71											
72	**MAJOR IONS AND CONVENTIONALS**										
73	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA	
74	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA	
75	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA	
76	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		NA		NA		NA	
81	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA	
82	N-Nitrate (mg-N/L) (Calculated)	NA		NA		NA		NA		NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		NA		NA		NA		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		NA		NA		NA		NA	
85	Sulfate (mg/L) (EPA 375.2)	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

	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 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	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
1											
2											
3		LW13S		LW13S		LW13S		LW13S		LW13S	
4		FL58C		FU45M		FY82E		0402113-06		0408036-07	
5		5/8/03		8/28/03		10/23/03		2/23/04		8/05/04	
87	**FIELD PARAMETERS**										
88	pH (avg)	6.36		6.67		6.38		6.23		5.86	
89	Temperature (° C) (avg)	11.9		15.6		14.7		13.2		14.2	
90	Conductivity (um/hos)	81		131		119		70		267	
91	Dissolved oxygen (mg/L) (avg)	6.14		3.68		5.65		4.4		4.6	
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	AA	AB
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	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
1											
2											
3		LW13S		LW13S		LW13S		LW13S		LW13S	
4		FL58C		FU45M		FY82E		0402113-06		0408036-07	
5		5/8/03		8/28/03		10/23/03		2/23/04		8/05/04	
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
1										
2										
3			LW19S		LW19S		LW19S		LW19S	
4			FZ04O		0402115-04		0406050-12		0408056-08	
5			10/28/03		2/24/04		6/8/04		8/09/04	
6										
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	U	2	U	2.03	U	2.03	U
20	14	4-Methylphenol	1	U	10	U	10.2	U	10.1	U
21	15	Isophorone	1	U	1	U	1.02	U	1.01	U
22	16	2,4-Dimethylphenol	3	U	3	U	3.05	U	3.04	U
23	17	Benzoic Acid	10	U	20	U	20.3	U	20.3	U
24	18	Naphthalene	1	U	1	U	1.02	U	1.01	U
25	19	2-Methylnaphthalene	1	U	1	U	1.02	U	1.01	U
26	20	2,4,6-Trichlorophenol	5	U	5	U	5.08	U	5.07	U
27	21	2,4,5-Trichlorophenol	5	U	5	U	5.08	U	5.07	U
28	22	Acenaphthene	**1.1**		**1.18**		1.02	U	**1.09**	
29	23	Dibenzofuran	**1.5**		**1.02**		**1.08**		1.01	U
30	24	Fluorene	**3.5**		**2.82**		**3.04**		**3.46**	
31	25	Pentachlorophenol	5	U	5	U	5.08	U	5.07	U
32	26	bis(2-Ethylhexyl)phthalate	1	U	1	U	1.02	U	1.01	U
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	**5.1**	M	50	U	50	U	50	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U
38	32	2-Butanone	5	U	10	U	10	U	10	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U
40	34	Bromoform	1	U	1	U	1	U	1	U
41	35	Toluene	1	U	1	U	1	U	1	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U
43	37	Styrene	1	U	1	U	1	U	1	U
44	38	m,p-Xylene	1	U	2	U	2	U	2	U
45	39	o-Xylene	1	U	1	U	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U
48	42	Isopropylbenzene	**6.5**		**6.65**		**7.29**		**7.65**	
49	43	n-Propylbenzene	**8.9**		**9.37**		**12.3**		**9.41**	
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U
51	45	sec-Butylbenzene	**4.7**		**4.92**		**5.87**		**4.62**	
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U
53	47	n-Butylbenzene	**2.9**	M	**2.78**		**3.17**		**2**	
54	48	Naphthalene	5	U	1	U	1	U	1	U
55	48.5	Methyl tert-butyl ether	1	U	1	U	1	U	1	U
56	49									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**								
58	51	**Method OR-DEQ**								
59	52	**TPH-Diesel**	**4.4**		**7.53**		**7.12**		**6.15**	
60	53	**TPH-D Motor Oil**	0.5	U	**1.07**		0.516	U	0.5	U
61	54	**TPH-Gasoline**	**1.1**		**1.3**		**1.28**		**0.786**	
62	55									

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
1										
2										
3			LW19S		LW19S		LW19S		LW19S	
4			FZ04O		0402115-04		0406050-12		0408056-08	
5			10/28/03		2/24/04		6/8/04		8/09/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	**0.046**		**0.040**		**0.039**		**0.0406**	
66	59	Chromium (6010)	0.005	U	**0.0095**		0.005	U	**0.0158**	
67	60	Copper (6010)	0.002	U	0.01	U	0.01	U	**0.159**	
68	61	Lead (7421)	**0.001**		**0.0005**		0.0001	U	**0.000177**	
69	62	Nickel (6010)	0.01	U	0.005	U	0.005	U	0.005	U
70	63	Zinc (6010)	0.006	U	0.01	U	0.01	U	0.01	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)	**140**		**256**		**148**		**152**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.1**		**2.18**		**1.19**		0.5	U
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-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
1										
2										
3			LW19S		LW19S		LW19S		LW19S	
4			FZ04O		0402115-04		0406050-12		0408056-08	
5			10/28/03		2/24/04		6/8/04		8/09/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.65		6.63		6.64		6.01	
89	82	Temperature (° C) (avg)	14.4		12.8		15		14.7	
90	83	Conductivity (um/hos)	506		492		452		781	
91	84	Dissolved oxygen (mg/L) (avg)	1.72		1.26		1.05		2.69	
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		**ETHANOL (mg/L)**	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
1										
2										
3			LW19S		LW19S		LW19S		LW19S	
4			FZ04O		0402115-04		0406050-12		0408056-08	
5			10/28/03		2/24/04		6/8/04		8/09/04	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	0.1	U	**0.369**		**0.76**		**0.14**	
126		2-Methylnaphthalene	0.1	U	NA		NA		NA	
127		Acenaphthylene	0.1	U	**0.159**		**0.3**		1.01	U
128		Acenaphthene	0.84		**0.857**		**1.19**		**0.678**	
129		Fluorene	2.5		**2.35**		**3.88**		**1.59**	
130		Anthracene	0.1	U	0.0498	U	**0.18**		**0.0997**	
131		Dibenzofuran	0.77		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							Dup of LW20S						Dup of LW20S	
3			LW20S		LW20S		X		LW20S		LW20S		X	
4			FZ04M		0402115-02		0402115-01		0406050-11		0408056-09		0408056-01	
5			10/28/03		2/24/04		2/24/04		6/8/04		8/09/04		8/09/04	
6														
7	1	**CHLORINATED PHENOLS (µg/L)**												
8	2	**EPA Method SW8040**												
9	3	Pentachlorophenol	NA		NA		NA		NA		NA		NA	
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	2.2	U	2.02	U	2.1	U	1.98	U	2.07	U	2.08	U
20	14	4-Methylphenol	1.1	U	10.1	U	10.5	U	9.92	U	10.3	U	10.4	U
21	15	Isophorone	1.1	U	1.01	U	1.05	U	0.992	U	1.03	U	1.04	U
22	16	2,4-Dimethylphenol	3.3	U	3.03	U	3.15	U	2.98	U	3.1	U	3.12	U
23	17	Benzoic Acid	11	U	20.2	U	21	U	19.8	U	20.7	U	20.8	U
24	18	Naphthalene	1.1	U	1.01	U	1.05	U	0.992	U	1.03	U	1.04	U
25	19	2-Methylnaphthalene	1.1	U	1.01	U	1.05	U	0.992	U	1.03	U	1.04	U
26	20	2,4,6-Trichlorophenol	5.6	U	5.05	U	5.25	U	4.96	U	5.17	U	5.19	U
27	21	2,4,5-Trichlorophenol	5.6	U	5.05	U	5.25	U	4.96	U	5.17	U	5.19	U
28	22	Acenaphthene	**1.4**		**1.25**		1.05	U	**1.32**		**1.5**		**1.43**	
29	23	Dibenzofuran	1.1	U	**1.43**		**1.49**		**1.24**		1.03	U	1.04	U
30	24	Fluorene	**3.8**		**3.7**		**3.53**		**3.64**		**3.86**		**3.63**	
31	25	Pentachlorophenol	5.6	U	5.05	U	5.25	U	4.96	U	5.17	U	5.19	U
32	26	bis(2-Ethylhexyl)phthalate	1.1	U	1.01	U	1.05	U	0.992	U	1.03	U	1.04	U
33	27													
34	28	**VOLATILES (µg/L)**												
35	29	**EPA Method SW8260**												
36	30	Acetone	5	U	50	UJ	50	U	50	U	50	U	50	U
37	31	Carbon Disulfide	1	U	2	UJ	2	U	2	U	2	U	2	U
38	32	2-Butanone	5	U	10	UJ	10	U	10	U	10	U	10	U
39	33	Benzene	1	U	**0.95**	J	**0.85**	J	0.3	U	0.3	U	0.3	U
40	34	Bromoform	1	U	1	UJ	1	U	1	U	1	U	1	U
41	35	Toluene	1	U	1	UJ	1	U	1	U	1	U	1	U
42	36	Ethylbenzene	1	U	1	UJ	1	U	1	U	1	U	1	U
43	37	Styrene	1	U	1	UJ	1	U	1	U	1	U	1	U
44	38	m,p-Xylene	1	U	2	UJ	2	U	2	U	2	U	2	U
45	39	o-Xylene	1	U	1	UJ	1	U	1	U	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	UJ	1	U	1	U	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	UJ	1	U	1	U	1	U	1	U
48	42	Isopropylbenzene	**7**		**7.89**	J	**5.82**	J	**7.53**		**8.52**	J	**6.79**	J
49	43	n-Propylbenzene	**9.2**		**10.8**	J	**9.94**		**13.5**		**10.6**		**10.5**	
50	44	tert-Butylbenzene	1	U	1	UJ	1	U	1	U	1	U	1	U
51	45	sec-Butylbenzene	**5.1**		**6.27**	J	**5.19**		**6.65**		**5.55**	J	**4.41**	J
52	46	4-Isopropyltoluene	1	U	1	UJ	1	U	1	U	1	U	1	U
53	47	n-Butylbenzene	**2.2**		**3.43**	J	**2.78**		**3.12**		**2.17**		**1.76**	
54	48	Naphthalene	5	U	1	UJ	1	U	1	U	1	U	1	U
55	48.5	Methyl tert-butyl ether	1	U	1	UJ	1	U	1	U	1	U	1	U
56	49													
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**												
58	51	**Method OR-DEQ**												
59	52	**TPH-Diesel**	**5.4**		**6.77**		**6.29**		**10.7**		**9.21**		**8.43**	
60	53	**TPH-D Motor Oil**	0.5	U	**1.06**		**0.998**		0.498	U	0.511	U	0.528	U
61	54	**TPH-Gasoline**	**0.96**		**1.4**		**1.2**		**0.981**		**0.783**		**0.676**	
62	55													

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							Dup of LW20S						Dup of LW20S	
3			LW20S		LW20S		X		LW20S		LW20S		X	
4			FZ04M		0402115-02		0402115-01		0406050-11		0408056-09		0408056-01	
5			10/28/03		2/24/04		2/24/04		6/8/04		8/09/04		8/09/04	
63	56	**PRIORITY POLLUTANT**												
64	57	**METALS (mg/L)**												
65	58	Arsenic (7060)	**0.04**		**0.020**		**0.019**		**0.029**		**0.0317**		**0.031**	
66	59	Chromium (6010)	0.005	U	**0.013**		**0.0123**	J	**0.0133**		**0.014**		**0.0176**	
67	60	Copper (6010)	0.002	U	0.01	U	0.01	U	0.01	U	**0.605**	J	0.01	UJ
68	61	Lead (7421)	0.001	U	**0.0005**	J	**0.0007**	J	**0.0001**		0.0001	U	0.0001	U
69	62	Nickel (6010)	0.01	U	0.005	U	**0.016**		0.005	U	0.005	U	0.005	U
70	63	Zinc (6010)	**0.01**		0.01	U	0.01	U	0.01	U	0.01	U	**0.0211**	
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)	**270**		**240**		**237**		**281**		**242**		**247**	
81	74	Chloride (mg/L) (EPA 325.2)	**2**		**1.45**		**1.79**		**1.91**		0.5	U	0.5	U
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							Dup of LW20S						Dup of LW20S	
3			LW20S		LW20S		X		LW20S		LW20S		X	
4			FZ04M		0402115-02		0402115-01		0406050-11		0408056-09		0408056-01	
5			10/28/03		2/24/04		2/24/04		6/8/04		8/09/04		8/09/04	
87	80	**FIELD PARAMETERS**												
88	81	pH (avg)	6.33		6.12		6.12		6.56		5.94		5.94	
89	82	Temperature (° C) (avg)	16.5		11.6		11.7		14.5		16.9		16.4	
90	83	Conductivity (um/hos)	445		314		314		445		717		718	
91	84	Dissolved oxygen (mg/L) (avg)	1.79		1.82		1.79		1.94		1.51		2.13	
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							Dup of LW20S						Dup of LW20S	
3			LW20S		LW20S		X		LW20S		LW20S		X	
4			FZ04M		0402115-02		0402115-01		0406050-11		0408056-09		0408056-01	
5			10/28/03		2/24/04		2/24/04		6/8/04		8/09/04		8/09/04	
123		**PAHs (µg/L)**												
124		**EPA Method SW8270 SIM**												
125		Naphthalene	0.11	U	**0.429**		**0.518**		**0.85**		**0.39**		**0.392**	
126		2-Methylnaphthalene	0.11	U	NA		NA		NA		NA		NA	
127		Acenaphthylene	0.11	U	**0.256**		**0.352**		**0.39**		**0.107**	J	**0.245**	J
128		Acenaphthene	1.3		**0.91**	J	**1.19**	J	**1.41**		**0.956**	J	**1.21**	J
129		Fluorene	3.3		**2.55**	J	**3.52**	J	**3.92**		**2.14**	J	**2.75**	J
130		Anthracene	0.14		**0.0716**		**0.0932**		**0.17**		**0.127**		**0.0979**	
131		Dibenzofuran	0.59		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			LW21S	
4			FZ04Q	
5			10/28/03	
6				
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			

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	
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.025**	
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	E	F
1						
2						
3			LW27S		LW27S	
4			FZ04R		0406072-01	
5			10/28/03		6/10/04	
6						
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	2.4	U	1.93	U
20	14	4-Methylphenol	1.2	U	9.66	U
21	15	Isophorone	1.2	U	0.966	U
22	16	2,4-Dimethylphenol	3.7	U	2.9	U
23	17	Benzoic Acid	12	U	19.3	U
24	18	Naphthalene	1.2	U	0.966	U
25	19	2-Methylnaphthalene	1.2	U	0.966	U
26	20	2,4,6-Trichlorophenol	6.1	U	4.83	U
27	21	2,4,5-Trichlorophenol	6.1	U	4.83	U
28	22	Acenaphthene	**1.2**		**1.25**	
29	23	Dibenzofuran	1.2	U	0.966	U
30	24	Fluorene	**2.3**		**2.68**	
31	25	Pentachlorophenol	6.1	U	4.83	U
32	26	bis(2-Ethylhexyl)phthalate	1.2	U	0.966	U
33	27					
34	28	**VOLATILES (µg/L)**				
35	29	**EPA Method SW8260**				
36	30	Acetone	**6**		50	U
37	31	Carbon Disulfide	1	U	2	U
38	32	2-Butanone	5	U	10	U
39	33	Benzene	1	U	0.3	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	2	U
45	39	o-Xylene	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U
48	42	Isopropylbenzene	**12**		**6.97**	
49	43	n-Propylbenzene	**13**		**9.41**	
50	44	tert-Butylbenzene	1	U	1	U
51	45	sec-Butylbenzene	**4**		**2.24**	
52	46	4-Isopropyltoluene	1	U	1	U
53	47	n-Butylbenzene	**3.3**		**2.24**	
54	48	Naphthalene	5	U	1	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**	**4.4**		**6.95**	
60	53	**TPH-D Motor Oil**	0.5	U	0.498	U
61	54	**TPH-Gasoline**	**1.6**		**1.66**	
62	55					

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			LW27S		LW27S	
4			FZ04R		0406072-01	
5			10/28/03		6/10/04	
63	56	**PRIORITY POLLUTANT**				
64	57	**METALS (mg/L)**				
65	58	Arsenic (7060)	**0.038**		**0.024**	
66	59	Chromium (6010)	0.005	U	**0.0144**	
67	60	Copper (6010)	**0.002**		0.01	U
68	61	Lead (7421)	**0.002**		0.0001	U
69	62	Nickel (6010)	0.01	U	0.005	U
70	63	Zinc (6010)	**0.008**		0.01	U
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)	**270**		**311**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.9**		**1.9**	
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			LW27S		LW27S	
4			FZ04R		0406072-01	
5			10/28/03		6/10/04	
87	80	**FIELD PARAMETERS**				
88	81	pH (avg)	6.62		6.33	
89	82	Temperature (° C) (avg)	14.9		12.8	
90	83	Conductivity (um/hos)	400		413	
91	84	Dissolved oxygen (mg/L) (avg)	1.53		0.81	
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			LW27S		LW27S	
4			FZ04R		0406072-01	
5			10/28/03		6/10/04	
123		**PAHs (µg/L)**				
124		**EPA Method SW8270 SIM**				
125		Naphthalene	0.12	U	**1.28**	
126		2-Methylnaphthalene	0.12	U	NA	
127		Acenaphthylene	0.12	U	**0.21**	
128		Acenaphthene	1.1		**1.24**	
129		Fluorene	2.3		**2.89**	
130		Anthracene	0.16		**0.06**	
131		Dibenzofuran	0.71		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			LW28S		LW28S	
4			0402080-02		0406040-01	
5			2/17/04		6/7/04	
6						
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	1.92	U	1.94	U
20	14	4-Methylphenol	9.62	U	9.71	U
21	15	Isophorone	0.962	U	0.971	U
22	16	2,4-Dimethylphenol	2.89	U	2.91	U
23	17	Benzoic Acid	19.2	U	19.4	U
24	18	Naphthalene	0.962	U	0.971	U
25	19	2-Methylnaphthalene	0.962	U	0.971	U
26	20	2,4,6-Trichlorophenol	4.81	U	4.85	U
27	21	2,4,5-Trichlorophenol	4.81	U	4.85	U
28	22	Acenaphthene	0.962	U	0.971	U
29	23	Dibenzofuran	0.962	U	0.971	U
30	24	Fluorene	0.962	U	0.971	U
31	25	Pentachlorophenol	4.81	U	4.85	U
32	26	bis(2-Ethylhexyl)phthalate	0.962	U	0.971	U
33	27					
34	28	**VOLATILES (µg/L)**				
35	29	**EPA Method SW8260**				
36	30	Acetone	50	U	50	U
37	31	Carbon Disulfide	2	U	2	U
38	32	2-Butanone	10	U	10	U
39	33	Benzene	0.4	U	0.3	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	2	U	2	U
45	39	o-Xylene	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U
48	42	Isopropylbenzene	1	U	1	U
49	43	n-Propylbenzene	1	U	1	U
50	44	tert-Butylbenzene	1	U	1	U
51	45	sec-Butylbenzene	1	U	1	U
52	46	4-Isopropyltoluene	1	U	1	U
53	47	n-Butylbenzene	1	U	1	U
54	48	Naphthalene	1	U	1	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**	0.242	U	**0.331**	
60	53	**TPH-D Motor Oil**	0.484	U	0.513	U
61	54	**TPH-Gasoline**	0.1	U	0.1	U
62	55					

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			LW28S		LW28S	
4			0402080-02		0406040-01	
5			2/17/04		6/7/04	
63	56	**PRIORITY POLLUTANT**				
64	57	**METALS (mg/L)**				
65	58	Arsenic (7060)	0.001	U	0.001	U
66	59	Chromium (6010)	0.005	U	0.005	U
67	60	Copper (6010)	0.01	U	0.01	U
68	61	Lead (7421)	0.0001	U	**0.0002**	
69	62	Nickel (6010)	0.005	U	**0.0094**	
70	63	Zinc (6010)	0.01	U	0.01	U
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)	**75**		**92**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.17**		**1.04**	
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			LW28S		LW28S	
4			0402080-02		0406040-01	
5			2/17/04		6/7/04	
87	80	**FIELD PARAMETERS**				
88	81	pH (avg)	5.84		4.93	
89	82	Temperature (° C) (avg)	11.5		13.2	
90	83	Conductivity (um/hos)	61		67	
91	84	Dissolved oxygen (mg/L) (avg)	6.56		4.51	
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			LW28S		LW28S	
4			0402080-02		0406040-01	
5			2/17/04		6/7/04	
123		**PAHs (µg/L)**				
124		**EPA Method SW8270 SIM**				
125		Naphthalene	**0.0675**	J	0.05	U
126		2-Methylnaphthalene	NA		NA	
127		Acenaphthylene	0.0482	UJ	0.05	U
128		Acenaphthene	0.0482	UJ	0.05	U
129		Fluorene	0.0482	UJ	**0.0599**	
130		Anthracene	0.0482	UJ	0.05	U
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
1										
2										
3			LW29S		LW29S		LW29S		LW29S	
4			FZ04C		0402080-08		0406050-06		0408006-06	
5			10/27/03		2/17/04		6/8/04		8/02/04	
6										
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	U	1.96	U	2.01	U	1.94	U
20	14	4-Methylphenol	1	U	9.79	U	10.1	U	9.71	U
21	15	Isophorone	1	U	0.979	U	1.01	U	0.971	U
22	16	2,4-Dimethylphenol	3	U	2.94	U	3.02	U	2.91	U
23	17	Benzoic Acid	10	U	19.6	U	20.1	U	19.4	U
24	18	Naphthalene	1	U	0.979	U	1.01	U	0.971	U
25	19	2-Methylnaphthalene	1	U	0.979	U	1.01	U	0.971	U
26	20	2,4,6-Trichlorophenol	5	U	4.9	U	5.04	U	4.85	U
27	21	2,4,5-Trichlorophenol	5	U	4.9	U	5.04	U	4.85	U
28	22	Acenaphthene	1	U	0.979	U	1.01	U	0.971	U
29	23	Dibenzofuran	1	U	0.979	U	1.01	U	0.971	U
30	24	Fluorene	1	U	0.979	U	1.01	U	0.971	U
31	25	Pentachlorophenol	5	U	4.9	U	5.04	U	4.85	U
32	26	bis(2-Ethylhexyl)phthalate	1	U	0.979	U	1.01	U	0.971	U
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	5	U	50	U	50	U	50	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U
38	32	2-Butanone	5	U	10	U	10	U	10	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U
40	34	Bromoform	1	U	1	U	1	U	1	U
41	35	Toluene	1	U	1	U	1	U	1	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U
43	37	Styrene	1	U	1	U	1	U	1	U
44	38	m,p-Xylene	1	U	2	U	2	U	2	U
45	39	o-Xylene	1	U	1	U	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U
48	42	Isopropylbenzene	1	U	1	U	1	U	1	U
49	43	n-Propylbenzene	1	U	1	U	1	U	1	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U
51	45	sec-Butylbenzene	1	U	1	U	1	U	1	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U
53	47	n-Butylbenzene	1	U	1	U	1	U	1	U
54	48	Naphthalene	5	U	1	U	1	U	1	U
55	48.5	Methyl tert-butyl ether	1	U	1	U	1	U	1	U
56	49									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**								
58	51	**Method OR-DEQ**								
59	52	**TPH-Diesel**	0.25	U	0.243	U	0.255	U	**0.337**	
60	53	**TPH-D Motor Oil**	0.5	U	0.485	U	0.511	U	0.481	U
61	54	**TPH-Gasoline**	0.25	U	0.1	U	0.1	U	0.1	U
62	55									

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
1										
2										
3			LW29S		LW29S		LW29S		LW29S	
4			FZ04C		0402080-08		0406050-06		0408006-06	
5			10/27/03		2/17/04		6/8/04		8/02/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	**0.002**		**0.002**		**0.001**		0.00269	U
66	59	Chromium (6010)	0.005	U	0.005	U	**0.0178**		**0.0171**	
67	60	Copper (6010)	0.002	U	0.01	U	0.01	U	0.01	U
68	61	Lead (7421)	0.001	U	0.0001	U	0.0001	U	0.0001	U
69	62	Nickel (6010)	0.01	U	0.005	U	0.005	U	0.005	U
70	63	Zinc (6010)	**0.007**		0.01	U	0.01	U	0.01	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)	**91**		**98**		**103**		**79**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.8**		**1.03**		**1.32**		**1.4**	
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-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
1										
2										
3			LW29S		LW29S		LW29S		LW29S	
4			FZ04C		0402080-08		0406050-06		0408006-06	
5			10/27/03		2/17/04		6/8/04		8/02/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.56		6.65		6.65		5.72	
89	82	Temperature (° C) (avg)	14.7		12.7		13.6		15.4	
90	83	Conductivity (um/hos)	112		129		88		151	
91	84	Dissolved oxygen (mg/L) (avg)	1.44		2.33		2.36		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	
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		**ETHANOL (mg/L)**	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
1										
2										
3			LW29S		LW29S		LW29S		LW29S	
4			FZ04C		0402080-08		0406050-06		0408006-06	
5			10/27/03		2/17/04		6/8/04		8/02/04	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	0.1	U	0.0489	UJ	0.05	U	**0.06**	
126		2-Methylnaphthalene	0.1	U	NA		NA		NA	
127		Acenaphthylene	0.1	U	0.0489	UJ	0.05	U	0.05	U
128		Acenaphthene	0.1	U	0.0489	UJ	0.05	U	0.05	U
129		Fluorene	0.1	U	0.0489	UJ	0.05	U	0.05	U
130		Anthracene	0.1	U	0.0489	UJ	0.05	U	0.05	U
131		Dibenzofuran	0.1	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

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2					Dup of LW30S							
3			LW30S		X		LW30S		LW30S		LW30S	
4			FZ04E		FZ04L		0402085-01		0406050-08		0408020-04	
5			10/27/03		10/27/03		2/18/04		6/8/04		8/03/04	
6												
7	1	**CHLORINATED PHENOLS (µg/L)**										
8	2	**EPA Method SW8040**										
9	3	Pentachlorophenol	NA		NA		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA	
16	10											
17	11	**SEMIVOLATILES (µg/L)**										
18	12	**EPA Method SW8270**										
19	13	Phenol	2.2	U	2.2	U	1.95	U	1.97	U	1.94	U
20	14	4-Methylphenol	1.1	U	1.1	U	9.75	U	9.85	U	9.69	U
21	15	Isophorone	1.1	U	1.1	U	0.975	U	0.985	U	0.969	U
22	16	2,4-Dimethylphenol	3.3	U	3.3	U	2.92	U	2.96	U	2.91	U
23	17	Benzoic Acid	11	U	11	U	19.5	U	19.7	U	19.4	U
24	18	Naphthalene	1.1	U	1.1	U	0.975	U	0.985	U	0.969	U
25	19	2-Methylnaphthalene	1.1	U	1.1	U	0.975	U	0.985	U	0.969	U
26	20	2,4,6-Trichlorophenol	5.5	U	5.4	U	4.87	U	4.93	U	4.84	U
27	21	2,4,5-Trichlorophenol	5.5	U	5.4	U	4.87	U	4.93	U	4.84	U
28	22	Acenaphthene	1.1	U	1.1	U	0.975	U	**1.02**		0.969	U
29	23	Dibenzofuran	1.1	U	1.1	U	0.975	U	0.985	U	0.969	U
30	24	Fluorene	**1.4**		**1.5**		**1.39**		**2.02**		1.05	U
31	25	Pentachlorophenol	5.5	U	5.4	U	4.87	U	4.93	U	4.84	U
32	26	bis(2-Ethylhexyl)phthalate	1.1	U	**1.7**		0.975	U	0.985	U	0.969	U
33	27											
34	28	**VOLATILES (µg/L)**										
35	29	**EPA Method SW8260**										
36	30	Acetone	5	U	5	U	50	U	50	U	50	U
37	31	Carbon Disulfide	1	U	1	U	2	U	2	U	2	U
38	32	2-Butanone	5	U	5	U	10	U	10	U	10	U
39	33	Benzene	1	U	1	U	0.4	U	0.3	U	0.3	U
40	34	Bromoform	1	U	1	U	1	U	1	U	1	U
41	35	Toluene	1	U	1	U	1	U	1	U	1	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U	1	U
43	37	Styrene	1	U	1	U	1	U	1	U	1	U
44	38	m,p-Xylene	1	U	**1**		2	U	2	U	2	U
45	39	o-Xylene	1	U	1	U	1	U	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	**1.3**		1	U	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U	1	U
48	42	Isopropylbenzene	**9.8**		**9.6**		**7.32**		**8.76**		**7.68**	J
49	43	n-Propylbenzene	**25**		**23**		**26.7**		**36.4**		**27.8**	J
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U	1	U
51	45	sec-Butylbenzene	**2.5**		**2.4**		**1.64**		**2.3**		**2.48**	J
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U	1	U
53	47	n-Butylbenzene	**3.5**		**3.2**	M	**3.13**		**3.98**		**3.46**	J
54	48	Naphthalene	5	U	5	U	1	U	1	U	1	U
55	48.5	Methyl tert-butyl ether	1	U	1	U	1	U	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**		**2.06**		**2.23**		**1.44**	
60	53	**TPH-D Motor Oil**	0.5	U	0.5	U	0.486	U	0.497	U	0.493	U
61	54	**TPH-Gasoline**	**0.84**		**0.89**		**0.90**		**1**		**0.719**	
62	55											

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					Dup of LW30S							
3			LW30S		X		LW30S		LW30S		LW30S	
4			FZ04E		FZ04L		0402085-01		0406050-08		0408020-04	
5			10/27/03		10/27/03		2/18/04		6/8/04		8/03/04	
63	56	**PRIORITY POLLUTANT**										
64	57	**METALS (mg/L)**										
65	58	Arsenic (7060)	**0.013**		**0.013**		**0.018**		**0.015**		**0.0163**	
66	59	Chromium (6010)	0.005	U	0.005	U	**0.008**		0.005	U	**0.0147**	
67	60	Copper (6010)	0.002	U	0.002	U	0.01	U	0.01	U	0.01	U
68	61	Lead (7421)	0.001	U	0.001	U	**0.0015**		**0.0012**		**0.00079**	
69	62	Nickel (6010)	0.01	U	0.01	U	0.005	U	0.005	U	0.005	U
70	63	Zinc (6010)	0.006	U	**0.007**		0.01	U	0.01	U	0.01	U
71	64											
72	65	**MAJOR IONS AND CONVENTIONALS**										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**130**		**140**		**173**		**179**		**199**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.3**		**1.3**		**1.35**		**1.41**		**1.2**	
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					Dup of LW30S							
3			LW30S		X		LW30S		LW30S		LW30S	
4			FZ04E		FZ04L		0402085-01		0406050-08		0408020-04	
5			10/27/03		10/27/03		2/18/04		6/8/04		8/03/04	
87	80	**FIELD PARAMETERS**										
88	81	pH (avg)	6.59		6.59		6.64		6.67		6.06	
89	82	Temperature (° C) (avg)	14.7		14.7		13.5		13.6		15.5	
90	83	Conductivity (um/hos)	192		193		239		210		298	
91	84	Dissolved oxygen (mg/L) (avg)	2.46		2.27		1.22		2.55		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	
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					Dup of LW30S							
3			LW30S		X		LW30S		LW30S		LW30S	
4			FZ04E		FZ04L		0402085-01		0406050-08		0408020-04	
5			10/27/03		10/27/03		2/18/04		6/8/04		8/03/04	
123		**PAHs (µg/L)**										
124		**EPA Method SW8270 SIM**										
125		Naphthalene	0.11	U	0.11	U	**0.379**		**0.51**		**0.55**	
126		2-Methylnaphthalene	0.11	U	0.11	U	NA		NA		NA	
127		Acenaphthylene	0.11	U	0.11	U	**0.126**		**0.19**		**0.32**	
128		Acenaphthene	0.84		0.84		**0.864**		**0.83**		**0.64**	
129		Fluorene	1.6		1.7		**1.38**		**1.54**		**1.15**	
130		Anthracene	0.11	U	0.11	U	**0.0583**		**0.08**		**0.09**	
131		Dibenzofuran	0.8		0.82		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
1										
2										
3			LW31S		LW31S		LW31S		LW31S	
4			FZ04G		0402080-03		0406050-02		0408006-02	
5			10/27/03		2/17/04		6/8/04		8/02/04	
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	U	1.93	U	1.9	U	1.9	U
20	14	4-Methylphenol	1	U	9.66	U	9.52	U	9.52	U
21	15	Isophorone	1	U	0.966	U	0.952	U	0.952	U
22	16	2,4-Dimethylphenol	3	U	2.9	U	2.86	U	2.86	U
23	17	Benzoic Acid	10	U	19.3	U	19	U	19	U
24	18	Naphthalene	1	U	0.966	U	0.952	U	0.952	U
25	19	2-Methylnaphthalene	1	U	0.966	U	0.952	U	0.952	U
26	20	2,4,6-Trichlorophenol	5.1	U	4.83	U	4.76	U	4.76	U
27	21	2,4,5-Trichlorophenol	5.1	U	4.83	U	4.76	U	4.76	U
28	22	Acenaphthene	1	U	0.966	U	0.952	U	0.952	U
29	23	Dibenzofuran	1	U	0.966	U	0.952	U	0.952	U
30	24	Fluorene	1	U	0.966	U	0.952	U	0.952	U
31	25	Pentachlorophenol	5.1	U	4.83	U	4.76	U	4.76	U
32	26	bis(2-Ethylhexyl)phthalate	**2.4**		0.966	U	0.952	U	0.952	U
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	5	U	50	UJ	50	U	50	U
37	31	Carbon Disulfide	1	U	2	UJ	2	U	2	U
38	32	2-Butanone	5	U	10	UJ	10	U	10	U
39	33	Benzene	1	U	0.4	UJ	0.3	U	0.3	U
40	34	Bromoform	1	U	1	UJ	1	U	1	U
41	35	Toluene	1	U	1	UJ	1	U	1	U
42	36	Ethylbenzene	1	U	1	UJ	1	U	1	U
43	37	Styrene	1	U	1	UJ	1	U	1	U
44	38	m,p-Xylene	1	U	2	UJ	2	U	2	U
45	39	o-Xylene	1	U	1	UJ	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	UJ	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	UJ	1	U	1	U
48	42	Isopropylbenzene	1	U	1	UJ	1	U	1	U
49	43	n-Propylbenzene	1	U	1	UJ	1	U	1	U
50	44	tert-Butylbenzene	1	U	1	UJ	1	U	1	U
51	45	sec-Butylbenzene	1	U	1	UJ	1	U	1	U
52	46	4-Isopropyltoluene	1	U	1	UJ	1	U	1	U
53	47	n-Butylbenzene	1	U	1	UJ	1	U	1	U
54	48	Naphthalene	5	U	1	UJ	1	U	1	U
55	48.5	Methyl tert-butyl ether	1	U	1	UJ	1	U	1	U
56	49									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**								
58	51	**Method OR-DEQ**								
59	52	**TPH-Diesel**	**0.59**		0.242	U	**0.469**		**0.576**	
60	53	**TPH-D Motor Oil**	0.5	U	0.483	U	0.492	U	0.475	U
61	54	**TPH-Gasoline**	0.25	U	0.1	U	0.1	U	0.1	U
62	55									

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
1										
2										
3			LW31S		LW31S		LW31S		LW31S	
4			FZ04G		0402080-03		0406050-02		0408006-02	
5			10/27/03		2/17/04		6/8/04		8/02/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	0.001	U	0.001	U	0.001	U	0.00148	U
66	59	Chromium (6010)	0.005	U	0.005	U	**0.0187**		**0.0138**	
67	60	Copper (6010)	0.002	U	0.01	U	0.01	U	0.01	U
68	61	Lead (7421)	0.001	U	0.0001	U	0.0001	U	0.0001	U
69	62	Nickel (6010)	0.01	U	0.005	U	0.005	U	0.005	U
70	63	Zinc (6010)	**0.008**		0.01	U	0.01	U	0.01	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)	**140**		**101**		**143**		**100**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.7**		**1.08**		**2.53**		**2.96**	
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-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
1										
2										
3			LW31S		LW31S		LW31S		LW31S	
4			FZ04G		0402080-03		0406050-02		0408006-02	
5			10/27/03		2/17/04		6/8/04		8/02/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	5.90		6.15		5.86		5.7	
89	82	Temperature (° C) (avg)	14.7		12.8		13		15.2	
90	83	Conductivity (um/hos)	187		98		128		215	
91	84	Dissolved oxygen (mg/L) (avg)	3.10		4.42		2.6		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	
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		**ETHANOL (mg/L)**	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
1										
2										
3			LW31S		LW31S		LW31S		LW31S	
4			FZ04G		0402080-03		0406050-02		0408006-02	
5			10/27/03		2/17/04		6/8/04		8/02/04	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	0.1	U	0.0486	UJ	0.05	U	0.05	U
126		2-Methylnaphthalene	0.1	U	NA		NA		NA	
127		Acenaphthylene	0.1	U	0.0486	UJ	0.05	U	0.05	U
128		Acenaphthene	0.1	U	0.0486	UJ	0.05	U	0.05	U
129		Fluorene	0.1	U	0.0486	UJ	0.05	U	0.05	U
130		Anthracene	0.1	U	0.0486	UJ	0.05	U	0.05	U
131		Dibenzofuran	0.1	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

	A	B	C	D	E	F	G	H	I	J
1										
2										
3			LW32S		LW32S		LW32S		LW32S	
4			FZ04H		0402080-05		0406050-04		0408006-04	
5			10/27/03		2/17/04		6/8/04		8/02/04	
6										
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	2.1	U	1.96	U	1.99	U	1.94	U
20	14	4-Methylphenol	1	U	9.8	U	9.93	U	9.7	U
21	15	Isophorone	1	U	0.98	U	0.993	U	0.97	U
22	16	2,4-Dimethylphenol	3.1	U	2.94	U	2.98	U	2.91	U
23	17	Benzoic Acid	10	U	19.6	U	19.9	U	19.4	U
24	18	Naphthalene	1	U	0.98	U	0.993	U	0.97	U
25	19	2-Methylnaphthalene	1	U	0.98	U	0.993	U	0.97	U
26	20	2,4,6-Trichlorophenol	5.2	U	4.9	U	4.97	U	4.85	U
27	21	2,4,5-Trichlorophenol	5.2	U	4.9	U	4.97	U	4.85	U
28	22	Acenaphthene	1	U	0.98	U	0.993	U	0.97	U
29	23	Dibenzofuran	1	U	0.98	U	0.993	U	0.97	U
30	24	Fluorene	1	U	0.98	U	0.993	U	0.97	U
31	25	Pentachlorophenol	5.2	U	4.9	U	4.97	U	4.85	U
32	26	bis(2-Ethylhexyl)phthalate	**2.1**		0.98	U	0.993	U	0.97	U
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	5	U	50	UJ	50	U	50	U
37	31	Carbon Disulfide	1	U	2	UJ	2	U	2	U
38	32	2-Butanone	5	U	10	UJ	10	U	10	U
39	33	Benzene	1	U	0.4	UJ	0.3	U	0.3	U
40	34	Bromoform	1	U	1	UJ	1	U	1	U
41	35	Toluene	1	U	1	UJ	1	U	1	U
42	36	Ethylbenzene	1	U	1	UJ	1	U	1	U
43	37	Styrene	1	U	1	UJ	1	U	1	U
44	38	m,p-Xylene	1	U	2	UJ	2	U	2	U
45	39	o-Xylene	1	U	1	UJ	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	UJ	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	UJ	1	U	1	U
48	42	Isopropylbenzene	**18**		**4.27**	J	**7.05**		**19.4**	J
49	43	n-Propylbenzene	**20**		**4.87**	J	**9.16**		**20.5**	J
50	44	tert-Butylbenzene	**1**		1	UJ	1	U	1	U
51	45	sec-Butylbenzene	**6.5**		**2.52**	J	**3.73**		**8.65**	J
52	46	4-Isopropyltoluene	1	U	1	UJ	1	U	1	U
53	47	n-Butylbenzene	**6.1**		**2.24**	J	**2.69**		**8.47**	J
54	48	Naphthalene	5	U	1	UJ	1	U	1	U
55	48.5	Methyl tert-butyl ether	1	U	1	UJ	1	U	1	U
56	49									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**								
58	51	**Method OR-DEQ**								
59	52	**TPH-Diesel**	**3.3**		**1.84**		**3.48**		**4.24**	
60	53	**TPH-D Motor Oil**	0.5	U	0.488	U	0.5	U	0.488	U
61	54	**TPH-Gasoline**	**1.8**		**1.1**		**1.17**		**1.33**	
62	55									

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
1										
2										
3			LW32S		LW32S		LW32S		LW32S	
4			FZ04H		0402080-05		0406050-04		0408006-04	
5			10/27/03		2/17/04		6/8/04		8/02/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	**0.034**		**0.023**		**0.026**		**0.0314**	
66	59	Chromium (6010)	0.005	U	**0.0124**		**0.0162**		**0.0125**	
67	60	Copper (6010)	0.002	U	0.01	U	0.01	U	0.01	U
68	61	Lead (7421)	0.001	U	0.0001	U	0.0001	U	0.0001	U
69	62	Nickel (6010)	0.01	U	0.005	U	0.005	U	0.005	U
70	63	Zinc (6010)	**0.008**		0.01	U	0.01	U	0.01	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)	**250**		**196**		**232**		**290**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.8**		**1.71**		**3.19**		**27**	
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-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
1										
2										
3			LW32S		LW32S		LW32S		LW32S	
4			FZ04H		0402080-05		0406050-04		0408006-04	
5			10/27/03		2/17/04		6/8/04		8/02/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.35		6.46		6.36		6.09	
89	82	Temperature (° C) (avg)	14.6		12.8		13.4		14.4	
90	83	Conductivity (um/hos)	409		265		316		637	
91	84	Dissolved oxygen (mg/L) (avg)	1.65		1.65		1.45		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	
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		**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
1										
2										
3			LW32S		LW32S		LW32S		LW32S	
4			FZ04H		0402080-05		0406050-04		0408006-04	
5			10/27/03		2/17/04		6/8/04		8/02/04	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	0.1	U	**0.498**	J	**0.63**		**1.78**	
126		2-Methylnaphthalene	0.1	U	NA		NA		NA	
127		Acenaphthylene	0.1	U	**0.0976**	J	**0.08**		**0.4**	
128		Acenaphthene	0.52		**0.38**	J	**0.3**		0.05	U
129		Fluorene	0.67		**0.488**	J	**0.36**		**0.1**	
130		Anthracene	0.1	U	0.0488	UJ	**0.05**		**0.1**	
131		Dibenzofuran	0.38		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
1								
2								
3			LW33S		LW33S		LW33S	
4			0402080-04		0406050-03		0408006-03	
5			2/17/04		6/8/04		8/02/04	
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	1.94	U	1.94	U	1.93	U
20	14	4-Methylphenol	9.68	U	9.71	U	9.64	U
21	15	Isophorone	0.968	U	0.971	U	0.964	U
22	16	2,4-Dimethylphenol	2.9	U	2.91	U	2.89	U
23	17	Benzoic Acid	19.4	U	19.4	U	19.3	U
24	18	Naphthalene	0.968	U	0.971	U	0.964	U
25	19	2-Methylnaphthalene	0.968	U	0.971	U	0.964	U
26	20	2,4,6-Trichlorophenol	4.84	U	4.85	U	4.82	U
27	21	2,4,5-Trichlorophenol	4.84	U	4.85	U	4.82	U
28	22	Acenaphthene	0.968	U	0.971	U	0.964	U
29	23	Dibenzofuran	0.968	U	0.971	U	0.964	U
30	24	Fluorene	0.968	U	0.971	U	0.964	U
31	25	Pentachlorophenol	4.84	U	4.85	U	4.82	U
32	26	bis(2-Ethylhexyl)phthalate	0.968	U	0.971	U	**1.99**	
33	27							
34	28	**VOLATILES (µg/L)**						
35	29	**EPA Method SW8260**						
36	30	Acetone	50	U	50	U	50	U
37	31	Carbon Disulfide	2	U	2	U	2	U
38	32	2-Butanone	10	U	10	U	10	U
39	33	Benzene	0.4	U	0.3	U	0.3	U
40	34	Bromoform	1	U	1	U	1	U
41	35	Toluene	1	U	1	U	1	U
42	36	Ethylbenzene	1	U	1	U	1	U
43	37	Styrene	1	U	1	U	1	U
44	38	m,p-Xylene	2	U	2	U	2	U
45	39	o-Xylene	1	U	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U
48	42	Isopropylbenzene	1	U	1	U	1	U
49	43	n-Propylbenzene	1	U	1	U	1	U
50	44	tert-Butylbenzene	1	U	1	U	1	U
51	45	sec-Butylbenzene	1	U	1	U	1	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U
53	47	n-Butylbenzene	1	U	1	U	1	U
54	48	Naphthalene	1	U	1	U	1	U
55	48.5	Methyl tert-butyl ether	1	U	1	U	1	U
56	49							
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**						
58	51	**Method OR-DEQ**						
59	52	**TPH-Diesel**	0.247	U	0.244	U	0.241	U
60	53	**TPH-D Motor Oil**	0.494	U	0.487	U	0.482	U
61	54	**TPH-Gasoline**	0.1	U	0.1	U	0.1	U
62	55							

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
1								
2								
3			LW33S		LW33S		LW33S	
4			0402080-04		0406050-03		0408006-03	
5			2/17/04		6/8/04		8/02/04	
63	56	**PRIORITY POLLUTANT**						
64	57	**METALS (mg/L)**						
65	58	Arsenic (7060)	0.001	U	0.001	U	0.001	U
66	59	Chromium (6010)	**0.0113**		0.005	U	0.005	U
67	60	Copper (6010)	0.01	U	0.01	U	0.01	U
68	61	Lead (7421)	0.0001	U	0.0001	U	0.0001	U
69	62	Nickel (6010)	0.005	U	0.005	U	0.005	U
70	63	Zinc (6010)	**0.0111**		0.01	U	0.01	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)	**105**		**150**		**100**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.39**		**1.93**		**2.19**	
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-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
1								
2								
3			LW33S		LW33S		LW33S	
4			0402080-04		0406050-03		0408006-03	
5			2/17/04		6/8/04		8/02/04	
87	80	**FIELD PARAMETERS**						
88	81	pH (avg)	6.18		6.08		5.23	
89	82	Temperature (° C) (avg)	11.7		14.2		16.8	
90	83	Conductivity (um/hos)	113		140		235	
91	84	Dissolved oxygen (mg/L) (avg)	4.61		1.85		NM	
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		**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
1								
2								
3			LW33S		LW33S		LW33S	
4			0402080-04		0406050-03		0408006-03	
5			2/17/04		6/8/04		8/02/04	
123		**PAHs (µg/L)**						
124		**EPA Method SW8270 SIM**						
125		Naphthalene	0.0483	UJ	0.05	U	0.05	U
126		2-Methylnaphthalene	NA		NA		NA	
127		Acenaphthylene	0.0483	UJ	0.05	U	0.05	U
128		Acenaphthene	0.0483	UJ	0.05	U	0.05	U
129		Fluorene	0.0483	UJ	0.05	U	0.05	U
130		Anthracene	0.0483	UJ	0.05	U	**0.05**	
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
1										
2										
3			LW34S		LW34S		LW34S		LW34S	
4			FZ04J		0402080-01		0406050-01		0408006-01	
5			10/27/03		2/17/04		6/8/04		8/02/04	
6										
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	U	1.93	U	1.97	U	1.97	U
20	14	4-Methylphenol	1	U	9.65	U	9.85	U	9.83	U
21	15	Isophorone	1	U	0.965	U	0.985	U	0.983	U
22	16	2,4-Dimethylphenol	3.1	U	2.9	U	2.96	U	2.95	U
23	17	Benzoic Acid	10	U	19.3	U	19.7	U	19.7	U
24	18	Naphthalene	1	U	0.965	U	0.985	U	0.983	U
25	19	2-Methylnaphthalene	1	U	0.965	U	0.985	U	0.983	U
26	20	2,4,6-Trichlorophenol	5.1	U	4.83	U	4.93	U	4.92	U
27	21	2,4,5-Trichlorophenol	5.1	U	4.83	U	4.93	U	4.92	U
28	22	Acenaphthene	1	U	0.965	U	0.985	U	0.983	U
29	23	Dibenzofuran	1	U	0.965	U	0.985	U	0.983	U
30	24	Fluorene	1	U	0.965	U	0.985	U	0.983	U
31	25	Pentachlorophenol	5.1	U	4.83	U	4.93	U	4.92	U
32	26	bis(2-Ethylhexyl)phthalate	**4.9**		0.965	U	0.985	U	0.983	U
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	5	U	50	U	50	U	50	U
37	31	Carbon Disulfide	1	U	2	U	2	U	2	U
38	32	2-Butanone	5	U	10	U	10	U	10	U
39	33	Benzene	1	U	0.4	U	0.3	U	0.3	U
40	34	Bromoform	1	U	1	U	1	U	1	U
41	35	Toluene	1	U	1	U	1	U	1	U
42	36	Ethylbenzene	1	U	1	U	1	U	1	U
43	37	Styrene	1	U	1	U	1	U	1	U
44	38	m,p-Xylene	1	U	2	U	2	U	2	U
45	39	o-Xylene	1	U	1	U	1	U	1	U
46	40	1,3,5-Trimethylbenzene	1	U	1	U	1	U	1	U
47	41	1,2,4-Trimethylbenzene	1	U	1	U	1	U	1	U
48	42	Isopropylbenzene	1	U	1	U	1	U	1	U
49	43	n-Propylbenzene	1	U	1	U	1	U	1	U
50	44	tert-Butylbenzene	1	U	1	U	1	U	1	U
51	45	sec-Butylbenzene	1	U	1	U	1	U	1	U
52	46	4-Isopropyltoluene	1	U	1	U	1	U	1	U
53	47	n-Butylbenzene	1	U	1	U	1	U	1	U
54	48	Naphthalene	5	U	1	U	1	U	1	U
55	48.5	Methyl tert-butyl ether	1	U	1	U	1	U	1	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	0.242	U	0.242	U
60	53	**TPH-D Motor Oil**	0.5	U	0.484	U	0.484	U	0.483	U
61	54	**TPH-Gasoline**	0.25	U	0.1	U	0.1	U	0.1	U
62	55									

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
1										
2										
3			LW34S		LW34S		LW34S		LW34S	
4			FZ04J		0402080-01		0406050-01		0408006-01	
5			10/27/03		2/17/04		6/8/04		8/02/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	**0.001**		0.001	U	0.001	U	0.001	U
66	59	Chromium (6010)	0.005	U	0.005	U	0.005	U	**0.0116**	
67	60	Copper (6010)	0.002	U	0.01	U	0.01	U	0.01	U
68	61	Lead (7421)	0.001	U	0.0001	U	**0.0002**		0.0001	U
69	62	Nickel (6010)	0.01	U	0.005	U	0.005	U	0.005	U
70	63	Zinc (6010)	**0.009**		0.01	U	0.01	U	**0.0133**	
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)	**180**		**121**		**201**		**149**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.9**		**1.29**		**2.85**		**2.98**	
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-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
1										
2										
3			LW34S		LW34S		LW34S		LW34S	
4			FZ04J		0402080-01		0406050-01		0408006-01	
5			10/27/03		2/17/04		6/8/04		8/02/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.01		6.42		6.03		6.41	
89	82	Temperature (° C) (avg)	15.4		12.2		13.8		15	
90	83	Conductivity (um/hos)	234		142		218		303	
91	84	Dissolved oxygen (mg/L) (avg)	2.62		5.01		1.43		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	
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		**ETHANOL (mg/L)**	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
1										
2										
3			LW34S		LW34S		LW34S		LW34S	
4			FZ04J		0402080-01		0406050-01		0408006-01	
5			10/27/03		2/17/04		6/8/04		8/02/04	
123		**PAHs (µg/L)**								
124		**EPA Method SW8270 SIM**								
125		Naphthalene	0.1	U	0.049	UJ	0.05	U	0.05	U
126		2-Methylnaphthalene	0.1	U	NA		NA		NA	
127		Acenaphthylene	0.1	U	0.049	UJ	0.05	U	0.05	U
128		Acenaphthene	0.1	U	0.049	UJ	0.05	U	0.05	U
129		Fluorene	0.1	U	0.049	UJ	0.05	U	0.05	U
130		Anthracene	0.1	U	0.049	UJ	0.05	U	0.05	U
131		Dibenzofuran	0.1	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

	A	B	C	D
1				
2				
3			N	
4			0408066-02	
5			8/10/04	
6				
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	9.99	U
21	15	Isophorone	0.999	U
22	16	2,4-Dimethylphenol	**4.48**	
23	17	Benzoic Acid	20	U
24	18	Naphthalene	**53.7**	
25	19	2-Methylnaphthalene	**37.7**	
26	20	2,4,6-Trichlorophenol	5	U
27	21	2,4,5-Trichlorophenol	5	U
28	22	Acenaphthene	**1.19**	
29	23	Dibenzofuran	0.999	U
30	24	Fluorene	**2.55**	
31	25	Pentachlorophenol	5	U
32	26	bis(2-Ethylhexyl)phthalate	**1.23**	
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	50	U
37	31	Carbon Disulfide	2	U
38	32	2-Butanone	10	U
39	33	Benzene	**424**	
40	34	Bromoform	1	U
41	35	Toluene	**92.3**	
42	36	Ethylbenzene	**744**	
43	37	Styrene	1	U
44	38	m,p-Xylene	**904**	
45	39	o-Xylene	**446**	
46	40	1,3,5-Trimethylbenzene	**124**	
47	41	1,2,4-Trimethylbenzene	**518**	
48	42	Isopropylbenzene	**61.6**	
49	43	n-Propylbenzene	**102**	
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	**4.72**	
52	46	4-Isopropyltoluene	**5.33**	
53	47	n-Butylbenzene	**5.14**	
54	48	Naphthalene	**112**	
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**	**7.65**	
60	53	**TPH-D Motor Oil**	0.501	U
61	54	**TPH-Gasoline**	**12**	
62	55			

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			N	
4			0408066-02	
5			8/10/04	
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.0373**	
66	59	Chromium (6010)	**0.0165**	
67	60	Copper (6010)	0.01	U
68	61	Lead (7421)	**0.00733**	
69	62	Nickel (6010)	0.005	U
70	63	Zinc (6010)	**0.0193**	
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)	**278**	
81	74	Chloride (mg/L) (EPA 325.2)	**1.68**	
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			N	
4			0408066-02	
5			8/10/04	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.16	
89	82	Temperature (° C) (avg)	15.8	
90	83	Conductivity (um/hos)	692	
91	84	Dissolved oxygen (mg/L) (avg)	3.72	
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			N	
4			0408066-02	
5			8/10/04	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	**54.5**	
126		2-Methylnaphthalene	NA	
127		Acenaphthylene	**0.253**	
128		Acenaphthene	**1.16**	
129		Fluorene	**2.49**	
130		Anthracene	**0.121**	
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
1																				
2																				
3			OX1S		OX1S		OX1S		OX1S		OX1S		OX1S		OX1S		OX1S		OX1S	
4			EM65A		EX87D		FF48G		FL41I		FU45F		FY72G		0402086-07		0406074-01		0408026-02	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		10/22/03		2/18/04		6/10/04		8/04/04	
6																				
7	1	**CHLORINATED PHENOLS (µg/L)**																		
8	2	**EPA Method SW8040**																		
9	3	Pentachlorophenol	NA		**200**		**620**		**67**		**19**	J	**0.69**		**62.1**		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		**1.1**		NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		**0.56**		NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		25	U	NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		0.25	U	NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		**70**		NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		**6.9**		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		1.97	U	2	U
20	14	4-Methylphenol	NA		NA		NA		NA		NA		NA		NA		9.83	U	10	U
21	15	Isophorone	NA		NA		NA		NA		NA		NA		NA		0.983	U	1	U
22	16	2,4-Dimethylphenol	NA		NA		NA		NA		NA		NA		NA		2.95	U	3	U
23	17	Benzoic Acid	NA		NA		NA		NA		NA		NA		NA		19.7	U	20	U
24	18	Naphthalene	NA		NA		NA		NA		NA		NA		NA		**10.4**		**11**	
25	19	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		**5.53**		**6.81**	
26	20	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		4.92	U	5	U
27	21	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		**9.9**		5	U
28	22	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		0.983	U	1	U
29	23	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		0.983	U	1	U
30	24	Fluorene	NA		NA		NA		NA		NA		NA		NA		0.983	U	1	U
31	25	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		**58.2**		5	U
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA		NA		NA		0.983	U	1	U
33	27																			
34	28	**VOLATILES (µg/L)**																		
35	29	**EPA Method SW8260**																		
36	30	Acetone	**19**		**56**		NA		NA		NA		NA		NA		50	U	50	U
37	31	Carbon Disulfide	1.0	U	1	U	NA		NA		NA		NA		NA		2	U	2	U
38	32	2-Butanone	6.8	U	**5.4**		NA		NA		NA		NA		NA		10	U	10	U
39	33	Benzene	**320**		**65**		NA		NA		NA		NA		NA		**112**		**118**	J
40	34	Bromoform	1.0	U	1	U	NA		NA		NA		NA		NA		1	U	1	U
41	35	Toluene	**29**		**3.9**		NA		NA		NA		NA		NA		**4.66**		**8.87**	J
42	36	Ethylbenzene	**180**		**43**		NA		NA		NA		NA		NA		**118**		**163**	J
43	37	Styrene	1.0	U	1	U	NA		NA		NA		NA		NA		1	U	1	U
44	38	m,p-Xylene	**740**		**110**		NA		NA		NA		NA		NA		**273**		**466**	J
45	39	o-Xylene	**280**		**42**		NA		NA		NA		NA		NA		**112**		**161**	J
46	40	1,3,5-Trimethylbenzene	**160**		**54**		NA		NA		NA		NA		NA		**73.5**		**83**	J
47	41	1,2,4-Trimethylbenzene	**460**		**160**		NA		NA		NA		NA		NA		**208**		**231**	J
48	42	Isopropylbenzene	**140**		**27**		NA		NA		NA		NA		NA		**35.5**		**48.7**	J
49	43	n-Propylbenzene	1.0	U	**38**		NA		NA		NA		NA		NA		**54.7**		**47.8**	J
50	44	tert-Butylbenzene	**100**		1	U	NA		NA		NA		NA		NA		**1.95**		**1.63**	J
51	45	sec-Butylbenzene	1.0	U	**6.8**		NA		NA		NA		NA		NA		**9.01**		**8.09**	J
52	46	4-Isopropyltoluene	**29**		**6.9**		NA		NA		NA		NA		NA		**6.85**		**6.84**	J
53	47	n-Butylbenzene	28	U	**6.1**	M	NA		NA		NA		NA		NA		**4.85**		**4.21**	J
54	48	Naphthalene	**83**		**15**		NA		NA		NA		NA		NA		**18.2**		**17.7**	J
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		1	U	1	U
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	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																			

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
1																				
2																				
3			OX1S		OX1S		OX1S		OX1S		OX1S		OX1S		OX1S		OX1S		OX1S	
4			EM65A		EX87D		FF48G		FL41I		FU45F		FY72G		0402086-07		0406074-01		0408026-02	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		10/22/03		2/18/04		6/10/04		8/04/04	
63	56	**PRIORITY POLLUTANT**																		
64	57	**METALS (mg/L)**																		
65	58	Arsenic (7060)	**0.02**		NA		NA		NA		NA		NA		NA		**0.015**		**0.00838**	
66	59	Chromium (6010)	0.005	U	NA		NA		NA		NA		NA		NA		**0.0173**		**0.0177**	
67	60	Copper (6010)	0.002	U	NA		NA		NA		NA		NA		NA		0.01	U	0.01	U
68	61	Lead (7421)	0.001	U	NA		NA		NA		NA		NA		NA		0.0001	U	**0.000113**	
69	62	Nickel (6010)	0.01	U	NA		NA		NA		NA		NA		NA		**0.0078**		**0.0061**	
70	63	Zinc (6010)	**0.009**		NA		NA		NA		NA		NA		NA		0.01	U	0.01	U
71	64																			
72	65	**MAJOR IONS AND CONVENTIONALS**																		
73	66	Calcium (mg/L) (6010)	**32.4**		NA		NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**8.55**		NA		NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**3.4**		NA		NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**7.45**		NA		NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**160**		**190**		NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1	U	NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**160**		**190**		NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**240**		NA		NA		NA		NA		NA		NA		**301**		**210**	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		**3.07**		**2.52**	
82	75	N-Nitrate (mg-N/L) (Calculated)	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	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	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	
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
1																				
2																				
3			OX1S		OX1S		OX1S		OX1S		OX1S		OX1S		OX1S		OX1S		OX1S	
4			EM65A		EX87D		FF48G		FL41I		FU45F		FY72G		0402086-07		0406074-01		0408026-02	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		10/22/03		2/18/04		6/10/04		8/04/04	
87	80	**FIELD PARAMETERS**																		
88	81	pH (avg)	5.99		6.52		6.53		6.74		6.71		6.57		6.52		6.23		5.83	
89	82	Temperature (° C) (avg)	14.3		16.4		15		13		14.9		15.9		14.2		14.2		16	
90	83	Conductivity (um/hos)	302		427		369		274		262		317		270		387		351	
91	84	Dissolved oxygen (mg/L) (avg)	3.97		0.7		0.79		3.39		2.08		1.26		1.14		0.94		2.2	
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	
96	89	Total TCDF	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	
98	91	Total TCDD	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	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	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	
103	96	Total PeCDD	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	
105	98	1,2,3,6,7,8-HxCDF	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	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	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	
110	103	1,2,3,6,7,8-HxCDD	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	
112	105	Total HxCDD	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	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	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	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																				
121		**ETHANOL (mg/L)**	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
1																				
2																				
3			OX1S		OX1S		OX1S		OX1S		OX1S		OX1S		OX1S		OX1S		OX1S	
4			EM65A		EX87D		FF48G		FL41I		FU45F		FY72G		0402086-07		0406074-01		0408026-02	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		10/22/03		2/18/04		6/10/04		8/04/04	
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		1	U
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		1	U
131		Dibenzofuran	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
1																		
2																		
3			OX2S		OX2S		OX2S		OX2S		OX2S		OX2S		OX2S		OX2S	
4			EM65B		EX87B		FF48H		FL58G		FU45E		0402086-09		0406074-02		0408026-03	
5			6/24/02		10/29/02		2/10/03		5/8/03		8/28/03		2/18/04		6/10/04		8/04/04	
6																		
7	1	**CHLORINATED PHENOLS (µg/L)**																
8	2	**EPA Method SW8040**																
9	3	Pentachlorophenol	NA		**1200**		**5400**		**6700**		**5800**	J	**5320**		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		0.26	U	NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		**0.28**		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		0.94	U	NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		0.26	U	NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		**110**		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		**6.5**		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		2.05	U	2	U
20	14	4-Methylphenol	NA		NA		NA		NA		NA		NA		10.2	U	10	U
21	15	Isophorone	NA		NA		NA		NA		NA		NA		1.02	U	1	U
22	16	2,4-Dimethylphenol	NA		NA		NA		NA		NA		NA		3.07	U	3	U
23	17	Benzoic Acid	NA		NA		NA		NA		NA		NA		20.5	U	20	U
24	18	Naphthalene	NA		NA		NA		NA		NA		NA		**13.5**		**9.21**	
25	19	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		**6.53**		**6.24**	
26	20	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		5.12	U	5	U
27	21	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		5.12	U	5	U
28	22	Acenaphthene	NA		NA		NA		NA		NA		NA		1.02	U	1	U
29	23	Dibenzofuran	NA		NA		NA		NA		NA		NA		1.02	U	1	U
30	24	Fluorene	NA		NA		NA		NA		NA		NA		1.02	U	1	U
31	25	Pentachlorophenol	NA		NA		NA		NA		NA		NA		**5030**		**1500**	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA		NA		1.02	U	1	U
33	27																	
34	28	**VOLATILES (µg/L)**																
35	29	**EPA Method SW8260**																
36	30	Acetone	**16**		**22**	M	NA		NA		NA		NA		50	U	**108**	J
37	31	Carbon Disulfide	3.0	U	1	U	NA		NA		NA		NA		2	U	**3.32**	J
38	32	2-Butanone	15	U	5	U	NA		NA		NA		NA		10	U	**11.3**	J
39	33	Benzene	3.0	U	**1.1**		NA		NA		NA		NA		**6.51**		**5.3**	J
40	34	Bromoform	3.0	U	1	U	NA		NA		NA		NA		1	U	1	U
41	35	Toluene	**6.7**		1	U	NA		NA		NA		NA		**1.19**		**1.38**	J
42	36	Ethylbenzene	**43**		**24**		NA		NA		NA		NA		**91.3**		**74.7**	J
43	37	Styrene	3.0	U	1	U	NA		NA		NA		NA		1	U	1	U
44	38	m,p-Xylene	**72**		**29**		NA		NA		NA		NA		**105**		**89.7**	J
45	39	o-Xylene	**79**		**36**		NA		NA		NA		NA		**190**		**137**	J
46	40	1,3,5-Trimethylbenzene	**46**		**21**		NA		NA		NA		NA		**83.1**		**72.3**	J
47	41	1,2,4-Trimethylbenzene	**190**		**110**		NA		NA		NA		NA		**307**		**233**	J
48	42	Isopropylbenzene	**18**		**14**		NA		NA		NA		NA		**48.5**		**39.4**	J
49	43	n-Propylbenzene	**28**		**25**		NA		NA		NA		NA		**62.8**		**40.7**	J
50	44	tert-Butylbenzene	3.0	U	**1.8**		NA		NA		NA		NA		**2.91**		**2.14**	J
51	45	sec-Butylbenzene	3.0	U	**8.4**		NA		NA		NA		NA		**22.9**		**13.6**	J
52	46	4-Isopropyltoluene	**5.2**		**6.3**		NA		NA		NA		NA		**10.1**		**9.35**	J
53	47	n-Butylbenzene	5.8	U	**6.7**	M	NA		NA		NA		NA		**6.92**		**6.37**	J
54	48	Naphthalene	15	U	**11**		NA		NA		NA		NA		**22.6**		**21.6**	J
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		1	U	1	U
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	
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																	

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			OX2S		OX2S		OX2S		OX2S		OX2S		OX2S		OX2S		OX2S	
4			EM65B		EX87B		FF48H		FL58G		FU45E		0402086-09		0406074-02		0408026-03	
5			6/24/02		10/29/02		2/10/03		5/8/03		8/28/03		2/18/04		6/10/04		8/04/04	
63	56	**PRIORITY POLLUTANT**																
64	57	**METALS (mg/L)**																
65	58	Arsenic (7060)	**0.01**		NA		NA		NA		NA		NA		**0.004**		**0.00752**	
66	59	Chromium (6010)	0.005	U	NA		NA		NA		NA		NA		**0.0134**		0.005	U
67	60	Copper (6010)	0.002	U	NA		NA		NA		NA		NA		0.01	U	0.01	U
68	61	Lead (7421)	0.001	U	NA		NA		NA		NA		NA		0.0001	U	**0.000258**	
69	62	Nickel (6010)	0.01	U	NA		NA		NA		NA		NA		0.005	U	0.005	U
70	63	Zinc (6010)	**0.009**		NA		NA		NA		NA		NA		0.01	U	0.01	U
71	64																	
72	65	**MAJOR IONS AND CONVENTIONALS**																
73	66	Calcium (mg/L) (6010)	**33**		NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**10.7**		NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**2.7**		NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**6.06**		NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**120**		**200**		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1	U	NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**120**		**200**		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**220**		NA		NA		NA		NA		NA		**389**		**358**	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		**3.58**		**2.81**	
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-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			OX2S		OX2S		OX2S		OX2S		OX2S		OX2S		OX2S		OX2S	
4			EM65B		EX87B		FF48H		FL58G		FU45E		0402086-09		0406074-02		0408026-03	
5			6/24/02		10/29/02		2/10/03		5/8/03		8/28/03		2/18/04		6/10/04		8/04/04	
87	80	**FIELD PARAMETERS**																
88	81	pH (avg)	6.15		6.40		6.7		6.49		6.66		6.57		6.25		5.96	
89	82	Temperature (° C) (avg)	15.5		15.9		14.2		13.6		14.9		13.6		14.8		15.6	
90	83	Conductivity (um/hos)	249		599		222		267		263		313		434		624	
91	84	Dissolved oxygen (mg/L) (avg)	4.10		0		1.49		2.21		1.43		1.48		1.07		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		0.00099	U	0.001855	U
96	89	Total TCDF	NA		NA		NA		NA		NA		NA		**0.008498**		0.001855	U
97	90	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		0.001186	U	0.002202	U
98	91	Total TCDD	NA		NA		NA		NA		NA		NA		0.001186	U	0.002202	U
99	92	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		**0.005426**	J	0.001628	U
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		**0.003945**	J	0.001557	U
101	94	Total PeCDF	NA		NA		NA		NA		NA		NA		**0.093578**		**0.021311**	
102	95	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		0.001145	U	0.002569	U
103	96	Total PeCDD	NA		NA		NA		NA		NA		NA		0.001145	U	0.002569	U
104	97	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		**0.027685**		**0.006922**	J
105	98	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		**0.012362**	J	**0.003692**	J
106	99	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		**0.01246**	J	**0.004637**	J
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		0.001979	U	0.001753	U
108	101	Total HxCDF	NA		NA		NA		NA		NA		NA		**0.873515**		**0.232308**	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		**0.00466**	J	0.00237	U
110	103	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		**0.115964**		**0.030842**	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		**0.011181**	J	0.002173	U
112	105	Total HxCDD	NA		NA		NA		NA		NA		NA		**0.294442**		**0.062692**	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		**0.705588**		**0.189857**	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		**0.035143**		**0.013672**	J
115	108	Total HpCDF	NA		NA		NA		NA		NA		NA		**3.428142**		**0.913668**	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		**4.502444**		**1.222349**	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		**7.076281**		**1.891967**	
118	111	OCDF	NA		NA		NA		NA		NA		NA		**3.277332**		**0.901706**	
119	112	OCDD	NA		NA		NA		NA		NA		NA		**33.577997**	J	**9.445627**	
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			OX2S		OX2S		OX2S		OX2S		OX2S		OX2S		OX2S		OX2S	
4			EM65B		EX87B		FF48H		FL58G		FU45E		0402086-09		0406074-02		0408026-03	
5			6/24/02		10/29/02		2/10/03		5/8/03		8/28/03		2/18/04		6/10/04		8/04/04	
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		1	U
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		1	U
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
1																				
2																				
3			OX3S		OX3S		OX3S		OX3S		OX3S		OX3S		OX3S		OX3S		OX3S	
4			EM65C		EX87E		FF48F		FL41J		FU45G		FY72H		0402086-08		0406074-03		0408026-04	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		10/22/03		2/18/04		6/10/04		8/04/04	
6																				
7	1	**CHLORINATED PHENOLS (µg/L)**																		
8	2	**EPA Method SW8040**																		
9	3	Pentachlorophenol	NA		**1200**	J	**5700**		**2600**		**1400**	J	**130**		**344**		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		**2.4**	J	NA		NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		**1.3**	J	NA		NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		9.2	UJ	NA		NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		0.25	UJ	NA		NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		**320**	J	NA		NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		**29**	J	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		1.95	U	**15.7**	
20	14	4-Methylphenol	NA		NA		NA		NA		NA		NA		NA		9.77	U	**22.2**	
21	15	Isophorone	NA		NA		NA		NA		NA		NA		NA		0.977	U	1	U
22	16	2,4-Dimethylphenol	NA		NA		NA		NA		NA		NA		NA		2.93	U	**13.9**	
23	17	Benzoic Acid	NA		NA		NA		NA		NA		NA		NA		19.5	U	20	U
24	18	Naphthalene	NA		NA		NA		NA		NA		NA		NA		**29.9**		**20.2**	
25	19	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		**13.5**		**9.63**	
26	20	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		4.88	U	5	U
27	21	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		4.88	U	5	U
28	22	Acenaphthene	NA		NA		NA		NA		NA		NA		NA		0.977	U	1	U
29	23	Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		0.977	U	1	U
30	24	Fluorene	NA		NA		NA		NA		NA		NA		NA		0.977	U	1	U
31	25	Pentachlorophenol	NA		NA		NA		NA		NA		NA		NA		**728**		**59.2**	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA		NA		NA		0.977	U	1	U
33	27																			
34	28	**VOLATILES (µg/L)**																		
35	29	**EPA Method SW8260**																		
36	30	Acetone	120	U	**240**		NA		NA		NA		NA		NA		50	U	**78.2**	
37	31	Carbon Disulfide	25	U	1	U	NA		NA		NA		NA		NA		2	U	**3.34**	
38	32	2-Butanone	120	U	**20**		NA		NA		NA		NA		NA		10	U	**27**	
39	33	Benzene	**66**		**94**		NA		NA		NA		NA		NA		**130**		**156**	
40	34	Bromoform	25	U	1	U	NA		NA		NA		NA		NA		1	U	1	U
41	35	Toluene	**63**		**31**		NA		NA		NA		NA		NA		**7.84**		**21.6**	
42	36	Ethylbenzene	**280**		**110**		NA		NA		NA		NA		NA		**206**		**250**	
43	37	Styrene	25	U	1	U	NA		NA		NA		NA		NA		1	U	1	U
44	38	m,p-Xylene	**820**		**430**		NA		NA		NA		NA		NA		**477**		**605**	
45	39	o-Xylene	**370**		**150**		NA		NA		NA		NA		NA		**225**		**295**	
46	40	1,3,5-Trimethylbenzene	**160**		**120**		NA		NA		NA		NA		NA		**92.3**		**113**	
47	41	1,2,4-Trimethylbenzene	**520**		**350**		NA		NA		NA		NA		NA		**331**		**360**	
48	42	Isopropylbenzene	**57**		**56**		NA		NA		NA		NA		NA		**70.1**		**79.1**	
49	43	n-Propylbenzene	**83**		**75**		NA		NA		NA		NA		NA		**103**		**78.4**	
50	44	tert-Butylbenzene	25	U	1	U	NA		NA		NA		NA		NA		**2.81**		**2.34**	
51	45	sec-Butylbenzene	25	U	**13**		NA		NA		NA		NA		NA		**15**		**13**	
52	46	4-Isopropyltoluene	25	U	**13**		NA		NA		NA		NA		NA		**12.1**		**12.5**	
53	47	n-Butylbenzene	25	U	**11**	M	NA		NA		NA		NA		NA		**8.37**		**8.92**	
54	48	Naphthalene	120	U	**37**		NA		NA		NA		NA		NA		**48.7**		**50.4**	
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		1	U	1	U
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	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA	
62	55																			

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
1																				
2																				
3			OX3S		OX3S		OX3S		OX3S		OX3S		OX3S		OX3S		OX3S		OX3S	
4			EM65C		EX87E		FF48F		FL41J		FU45G		FY72H		0402086-08		0406074-03		0408026-04	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		10/22/03		2/18/04		6/10/04		8/04/04	
63	56	**PRIORITY POLLUTANT**																		
64	57	**METALS (mg/L)**																		
65	58	Arsenic (7060)	**0.02**		NA		NA		NA		NA		NA		NA		**0.021**		**0.0148**	
66	59	Chromium (6010)	0.005	U	NA		NA		NA		NA		NA		NA		**0.0119**		**0.0159**	
67	60	Copper (6010)	**0.002**		NA		NA		NA		NA		NA		NA		0.01	U	0.01	U
68	61	Lead (7421)	0.001	U	NA		NA		NA		NA		NA		NA		0.0001	U	**0.000426**	
69	62	Nickel (6010)	0.01	U	NA		NA		NA		NA		NA		NA		0.005	U	**0.0435**	
70	63	Zinc (6010)	**0.012**		NA		NA		NA		NA		NA		NA		0.01	U	**0.019**	
71	64																			
72	65	**MAJOR IONS AND CONVENTIONALS**																		
73	66	Calcium (mg/L) (6010)	**40.2**		NA		NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**11**		NA		NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**3.8**		NA		NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**8.75**		NA		NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**160**		**270**		NA		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1	U	NA		NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**160**		**270**		NA		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**270**		NA		NA		NA		NA		NA		NA		**369**		**461**	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		NA		**4.44**		**3.73**	
82	75	N-Nitrate (mg-N/L) (Calculated)	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	
84	77	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	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	
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
1																				
2																				
3			OX3S		OX3S		OX3S		OX3S		OX3S		OX3S		OX3S		OX3S		OX3S	
4			EM65C		EX87E		FF48F		FL41J		FU45G		FY72H		0402086-08		0406074-03		0408026-04	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		10/22/03		2/18/04		6/10/04		8/04/04	
87	80	**FIELD PARAMETERS**																		
88	81	pH (avg)	5.94		6.44		6.59		6.73		6.7		6.65		6.54		6.16		5.85	
89	82	Temperature (° C) (avg)	14.4		15.3		15.1		13.5		15.2		16.2		14.1		15		18	
90	83	Conductivity (um/hos)	342		502		381		340		287		318		386		447		592	
91	84	Dissolved oxygen (mg/L) (avg)	4.34		0		1.24		2.93		2.07		2.14		1.76		0.74		1.4	
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	
96	89	Total TCDF	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	
98	91	Total TCDD	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	
100	93	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	94	Total PeCDF	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	
103	96	Total PeCDD	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	
105	98	1,2,3,6,7,8-HxCDF	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	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	101	Total HxCDF	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	
110	103	1,2,3,6,7,8-HxCDD	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	
112	105	Total HxCDD	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	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	108	Total HpCDF	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	
117	110	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	111	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	112	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																				
121		**ETHANOL (mg/L)**	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
1																				
2																				
3			OX3S		OX3S		OX3S		OX3S		OX3S		OX3S		OX3S		OX3S		OX3S	
4			EM65C		EX87E		FF48F		FL41J		FU45G		FY72H		0402086-08		0406074-03		0408026-04	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		10/22/03		2/18/04		6/10/04		8/04/04	
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		1	U
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		1	U
131		Dibenzofuran	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
1																		
2																		
3			OX4S		OX4S		OX4S		OX4S		OX4S		OX4S		OX4S		OX4S	
4			EM65D		EX87F		FF48I		FL41K		FU45J		0402086-11		0406074-04		0408026-05	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		2/18/04		6/10/04		8/04/04	
6																		
7	1	**CHLORINATED PHENOLS (µg/L)**																
8	2	**EPA Method SW8040**																
9	3	Pentachlorophenol	NA		**1200**	J	**880**		**8300**		**2200**	J	**1410**		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		**2.7**	J	NA		NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		**0.81**	J	NA		NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		11	UJ	NA		NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		0.25	UJ	NA		NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		**320**	J	NA		NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		**32**	J	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		1.99	U	2	U
20	14	4-Methylphenol	NA		NA		NA		NA		NA		NA		9.93	U	10	U
21	15	Isophorone	NA		NA		NA		NA		NA		NA		0.993	U	1	U
22	16	2,4-Dimethylphenol	NA		NA		NA		NA		NA		NA		2.98	U	**7.25**	
23	17	Benzoic Acid	NA		NA		NA		NA		NA		NA		19.9	U	20	U
24	18	Naphthalene	NA		NA		NA		NA		NA		NA		**43.7**		**28.5**	
25	19	2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		**42.9**		**20.7**	
26	20	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		4.97	U	5	U
27	21	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		**7.59**		5	U
28	22	Acenaphthene	NA		NA		NA		NA		NA		NA		0.993	U	1	U
29	23	Dibenzofuran	NA		NA		NA		NA		NA		NA		0.993	U	1	U
30	24	Fluorene	NA		NA		NA		NA		NA		NA		0.993	U	1	U
31	25	Pentachlorophenol	NA		NA		NA		NA		NA		NA		**634**		**96.7**	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		NA		NA		NA		NA		**1.42**		1	U
33	27																	
34	28	**VOLATILES (µg/L)**																
35	29	**EPA Method SW8260**																
36	30	Acetone	120	U	**12**	M	NA		NA		NA		NA		50	U	**157**	
37	31	Carbon Disulfide	25	U	**1.3**		NA		NA		NA		NA		2	U	2	U
38	32	2-Butanone	120	U	5	U	NA		NA		NA		NA		10	U	**18.8**	
39	33	Benzene	25	U	**24**		NA		NA		NA		NA		**109**		**77**	
40	34	Bromoform	25	U	1	U	NA		NA		NA		NA		1	U	1	U
41	35	Toluene	**71**		**23**		NA		NA		NA		NA		**2.77**		**6.91**	
42	36	Ethylbenzene	**440**		**330**		NA		NA		NA		NA		**292**		**303**	
43	37	Styrene	25	U	1	U	NA		NA		NA		NA		1	U	1	U
44	38	m,p-Xylene	**1300**		**820**		NA		NA		NA		NA		**236**		**324**	
45	39	o-Xylene	**500**		**430**		NA		NA		NA		NA		**318**		**336**	
46	40	1,3,5-Trimethylbenzene	**220**		**200**		NA		NA		NA		NA		**158**		**141**	
47	41	1,2,4-Trimethylbenzene	**590**		**580**		NA		NA		NA		NA		**524**		**532**	
48	42	Isopropylbenzene	**86**		**120**		NA		NA		NA		NA		**108**		**88.2**	
49	43	n-Propylbenzene	**110**		**120**		NA		NA		NA		NA		**125**		**114**	
50	44	tert-Butylbenzene	25	U	1	U	NA		NA		NA		NA		**3.95**		**2.82**	
51	45	sec-Butylbenzene	25	U	**22**		NA		NA		NA		NA		**24.6**		**14.6**	
52	46	4-Isopropyltoluene	25	U	**24**		NA		NA		NA		NA		**22.3**		**15.4**	
53	47	n-Butylbenzene	25	U	**25**	M	NA		NA		NA		NA		**17.7**		**10.8**	
54	48	Naphthalene	120	U	**99**		NA		NA		NA		NA		**64.9**		**66**	
55	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		1	U	1	U
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	
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																	

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			OX4S		OX4S		OX4S		OX4S		OX4S		OX4S		OX4S		OX4S	
4			EM65D		EX87F		FF48I		FL41K		FU45J		0402086-11		0406074-04		0408026-05	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		2/18/04		6/10/04		8/04/04	
63	56	**PRIORITY POLLUTANT**																
64	57	**METALS (mg/L)**																
65	58	Arsenic (7060)	**0.021**		NA		NA		NA		NA		NA		**0.015**		**0.0137**	
66	59	Chromium (6010)	0.005	U	NA		NA		NA		NA		NA		**0.034**		0.005	U
67	60	Copper (6010)	0.002	U	NA		NA		NA		NA		NA		**0.0256**		0.01	U
68	61	Lead (7421)	0.001	U	NA		NA		NA		NA		NA		**0.0084**		**0.00107**	
69	62	Nickel (6010)	0.01	U	NA		NA		NA		NA		NA		**0.0219**		**0.0099**	
70	63	Zinc (6010)	**0.008**		NA		NA		NA		NA		NA		**0.0674**		**0.0114**	
71	64																	
72	65	**MAJOR IONS AND CONVENTIONALS**																
73	66	Calcium (mg/L) (6010)	**37.9**		NA		NA		NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	**10.4**		NA		NA		NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	**3.6**		NA		NA		NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	**8.42**		NA		NA		NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**160**		**240**		NA		NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	1.0	U	1	U	NA		NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**160**		**240**		NA		NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	**250**		NA		NA		NA		NA		NA		**271**		**456**	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		NA		NA		NA		**4.11**		**3.42**	
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-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			OX4S		OX4S		OX4S		OX4S		OX4S		OX4S		OX4S		OX4S	
4			EM65D		EX87F		FF48I		FL41K		FU45J		0402086-11		0406074-04		0408026-05	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		2/18/04		6/10/04		8/04/04	
87	80	**FIELD PARAMETERS**																
88	81	pH (avg)	6.74		NM		6.39		6.09		6.41		6.27		6.19		6.07	
89	82	Temperature (° C) (avg)	14.5		NM		14.7		14		18		13.8		14.9		16.6	
90	83	Conductivity (um/hos)	326		NM		336		142		262		242		384		813	
91	84	Dissolved oxygen (mg/L) (avg)	4.42		NM		2.19		2.47		2.16		2.22		1.1		3.44	
92	85																	
93	86	**DIOXINS AND FURANS (ng/L)**																
94	87	**Method 8290**																
95	88	2,3,7,8-TCDF	NA		NA		NA		NA		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			OX4S		OX4S		OX4S		OX4S		OX4S		OX4S		OX4S		OX4S	
4			EM65D		EX87F		FF48I		FL41K		FU45J		0402086-11		0406074-04		0408026-05	
5			6/24/02		10/29/02		2/10/03		5/7/03		8/28/03		2/18/04		6/10/04		8/04/04	
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		1	U
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		1	U
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
1										
2										
3			OX5S		OX5S		OX5S		OX5S	
4			FY72A		0402086-01		0406074-05		0408026-06	
5			10/22/03		2/18/04		6/10/04		8/04/04	
6										
7	1	**CHLORINATED PHENOLS (µg/L)**								
8	2	**EPA Method SW8040**								
9	3	Pentachlorophenol	0.5	U	0.482	U	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	NA		NA		1.95	U	2	U
20	14	4-Methylphenol	NA		NA		9.73	U	10	U
21	15	Isophorone	NA		NA		0.973	U	1	U
22	16	2,4-Dimethylphenol	NA		NA		2.92	U	3	U
23	17	Benzoic Acid	NA		NA		19.5	U	20	U
24	18	Naphthalene	NA		NA		0.973	U	1	U
25	19	2-Methylnaphthalene	NA		NA		0.973	U	1	U
26	20	2,4,6-Trichlorophenol	NA		NA		4.86	U	5	U
27	21	2,4,5-Trichlorophenol	NA		NA		4.86	U	5	U
28	22	Acenaphthene	NA		NA		0.973	U	1	U
29	23	Dibenzofuran	NA		NA		0.973	U	1	U
30	24	Fluorene	NA		NA		0.973	U	1	U
31	25	Pentachlorophenol	NA		NA		4.86	U	5	U
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		0.973	U	1	U
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	NA		NA		50	U	50	U
37	31	Carbon Disulfide	NA		NA		2	U	2	U
38	32	2-Butanone	NA		NA		10	U	10	U
39	33	Benzene	NA		NA		0.3	U	0.3	U
40	34	Bromoform	NA		NA		1	U	1	U
41	35	Toluene	NA		NA		1	U	1	U
42	36	Ethylbenzene	NA		NA		1	U	1	U
43	37	Styrene	NA		NA		1	U	1	U
44	38	m,p-Xylene	NA		NA		2	U	2	U
45	39	o-Xylene	NA		NA		1	U	1	U
46	40	1,3,5-Trimethylbenzene	NA		NA		1	U	1	U
47	41	1,2,4-Trimethylbenzene	NA		NA		1	U	1	U
48	42	Isopropylbenzene	NA		NA		1	U	1	U
49	43	n-Propylbenzene	NA		NA		1	U	1	U
50	44	tert-Butylbenzene	NA		NA		1	U	1	U
51	45	sec-Butylbenzene	NA		NA		1	U	1	U
52	46	4-Isopropyltoluene	NA		NA		1	U	1	U
53	47	n-Butylbenzene	NA		NA		1	U	1	U
54	48	Naphthalene	NA		NA		1	U	1	U
55	48.5	Methyl tert-butyl ether	NA		NA		1	U	1	U
56	49									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**								
58	51	**Method OR-DEQ**								
59	52	**TPH-Diesel**	NA		NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA	
62	55									

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
1										
2										
3			OX5S		OX5S		OX5S		OX5S	
4			FY72A		0402086-01		0406074-05		0408026-06	
5			10/22/03		2/18/04		6/10/04		8/04/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	NA		NA		**0.010**		**0.014**	
66	59	Chromium (6010)	NA		NA		**0.0126**		**0.0155**	
67	60	Copper (6010)	NA		NA		0.01	U	0.01	U
68	61	Lead (7421)	NA		NA		0.0001	U	0.0001	U
69	62	Nickel (6010)	NA		NA		0.005	U	0.005	U
70	63	Zinc (6010)	NA		NA		0.01	U	0.01	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)	NA		NA		**255**		**276**	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		**3.44**		**3.19**	
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-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
1										
2										
3			OX5S		OX5S		OX5S		OX5S	
4			FY72A		0402086-01		0406074-05		0408026-06	
5			10/22/03		2/18/04		6/10/04		8/04/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.59		6.63		6.27		5.96	
89	82	Temperature (° C) (avg)	16.5		12.9		12.3		15.6	
90	83	Conductivity (um/hos)	288		234		346		510	
91	84	Dissolved oxygen (mg/L) (avg)	1.18		3.16		1.76		2.63	
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		**ETHANOL (mg/L)**	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
1										
2										
3			OX5S		OX5S		OX5S		OX5S	
4			FY72A		0402086-01		0406074-05		0408026-06	
5			10/22/03		2/18/04		6/10/04		8/04/04	
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		1	U
128		Acenaphthene	NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		1	U
131		Dibenzofuran	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											Dup of OX6S	
3			OX6S		OX6S		OX6S		OX6S		Y	
4			FY72B		0402086-02		0406074-06		0408026-07		0408026-01	
5			10/22/03		2/18/04		6/10/04		8/04/04		8/04/04	
6												
7	1	**CHLORINATED PHENOLS (µg/L)**										
8	2	**EPA Method SW8040**										
9	3	Pentachlorophenol	**2100**		**527**		NA		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA	
16	10											
17	11	**SEMIVOLATILES (µg/L)**										
18	12	**EPA Method SW8270**										
19	13	Phenol	NA		NA		2	U	2	U	2	U
20	14	4-Methylphenol	NA		NA		10	U	10	U	10	U
21	15	Isophorone	NA		NA		1	U	1	U	1	U
22	16	2,4-Dimethylphenol	NA		NA		3	U	3	U	3	U
23	17	Benzoic Acid	NA		NA		20	U	20	U	20	U
24	18	Naphthalene	NA		NA		1	U	1	U	1	U
25	19	2-Methylnaphthalene	NA		NA		1	U	1	U	1	U
26	20	2,4,6-Trichlorophenol	NA		NA		5.01	U	5	U	5	U
27	21	2,4,5-Trichlorophenol	NA		NA		5.01	U	5	U	5	U
28	22	Acenaphthene	NA		NA		1	U	1	U	1	U
29	23	Dibenzofuran	NA		NA		1	U	1	U	1	U
30	24	Fluorene	NA		NA		1	U	1	U	1	U
31	25	Pentachlorophenol	NA		NA		**3280**		**604**		**498**	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		1	U	1	U	1	U
33	27											
34	28	**VOLATILES (µg/L)**										
35	29	**EPA Method SW8260**										
36	30	Acetone	NA		NA		50	U	50	U	50	U
37	31	Carbon Disulfide	NA		NA		2	U	2	U	2	U
38	32	2-Butanone	NA		NA		10	U	10	U	10	U
39	33	Benzene	NA		NA		0.3	U	0.3	U	0.3	U
40	34	Bromoform	NA		NA		1	U	1	U	1	U
41	35	Toluene	NA		NA		1	U	1	U	1	U
42	36	Ethylbenzene	NA		NA		**1.31**		1	U	**1.19**	J
43	37	Styrene	NA		NA		1	U	1	U	1	U
44	38	m,p-Xylene	NA		NA		2	U	2	U	2	U
45	39	o-Xylene	NA		NA		**5.49**		**3.11**	J	**3.36**	J
46	40	1,3,5-Trimethylbenzene	NA		NA		**17.7**		**10.9**	J	**11.9**	J
47	41	1,2,4-Trimethylbenzene	NA		NA		**83.7**		**77.6**	J	**75.9**	J
48	42	Isopropylbenzene	NA		NA		**4.94**		**2.23**	J	**2.43**	J
49	43	n-Propylbenzene	NA		NA		**9.71**		**4.69**	J	**5.33**	J
50	44	tert-Butylbenzene	NA		NA		1	U	1	U	1	U
51	45	sec-Butylbenzene	NA		NA		**6.54**		**8.04**	J	**7.9**	J
52	46	4-Isopropyltoluene	NA		NA		**2.71**		**3.4**	J	**3.74**	J
53	47	n-Butylbenzene	NA		NA		**2.06**		**2.1**	J	**2.31**	J
54	48	Naphthalene	NA		NA		**5.3**		**3.92**	J	**4.48**	J
55	48.5	Methyl tert-butyl ether	NA		NA		1	U	1	U	1	U
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											

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											Dup of OX6S	
3			OX6S		OX6S		OX6S		OX6S		Y	
4			FY72B		0402086-02		0406074-06		0408026-07		0408026-01	
5			10/22/03		2/18/04		6/10/04		8/04/04		8/04/04	
63	56	**PRIORITY POLLUTANT**										
64	57	**METALS (mg/L)**										
65	58	Arsenic (7060)	NA		NA		**0.013**		**0.013**		**0.0127**	
66	59	Chromium (6010)	NA		NA		**0.0147**		**0.0127**		**0.0142**	
67	60	Copper (6010)	NA		NA		0.01	U	0.01	U	0.01	U
68	61	Lead (7421)	NA		NA		0.0001	U	0.0001	U	0.0001	U
69	62	Nickel (6010)	NA		NA		0.005	U	0.005	U	0.005	U
70	63	Zinc (6010)	NA		NA		0.01	U	0.01	U	0.01	U
71	64											
72	65	**MAJOR IONS AND CONVENTIONALS**										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		**284**		**284**		**277**	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		**3.13**		**3.13**		**3.07**	
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											Dup of OX6S	
3			OX6S		OX6S		OX6S		OX6S		Y	
4			FY72B		0402086-02		0406074-06		0408026-07		0408026-01	
5			10/22/03		2/18/04		6/10/04		8/04/04		8/04/04	
87	80	**FIELD PARAMETERS**										
88	81	pH (avg)	6.67		6.63		6.38		5.93		5.91	
89	82	Temperature (° C) (avg)	16.3		14.4		14.6		15.8		16.2	
90	83	Conductivity (um/hos)	352		353		374		517		517	
91	84	Dissolved oxygen (mg/L) (avg)	2.63		1.23		1.38		2.6		2.28	
92	85											
93	86	**DIOXINS AND FURANS (ng/L)**										
94	87	**Method 8290**										
95	88	2,3,7,8-TCDF	NA		NA		0.001007	U	0.001308	U	NA	
96	89	Total TCDF	NA		NA		0.001007	U	0.001308	U	NA	
97	90	2,3,7,8-TCDD	NA		NA		0.001143	U	0.001655	U	NA	
98	91	Total TCDD	NA		NA		0.001143	U	0.001655	U	NA	
99	92	1,2,3,7,8-PeCDF	NA		NA		0.000721	U	0.001565	U	NA	
100	93	2,3,4,7,8-PeCDF	NA		NA		0.000702	U	0.001496	U	NA	
101	94	Total PeCDF	NA		NA		**0.00675**		0.001496	U	NA	
102	95	1,2,3,7,8-PeCDD	NA		NA		0.001091	U	0.002223	U	NA	
103	96	Total PeCDD	NA		NA		0.001091	U	0.002223	U	NA	
104	97	1,2,3,4,7,8-HxCDF	NA		NA		**0.002389**	J	**0.005124**	J	NA	
105	98	1,2,3,6,7,8-HxCDF	NA		NA		0.000732	U	0.001659	U	NA	
106	99	2,3,4,6,7,8-HxCDF	NA		NA		0.000802	U	0.001727	U	NA	
107	100	1,2,3,7,8,9-HxCDF	NA		NA		0.000894	U	0.002002	U	NA	
108	101	Total HxCDF	NA		NA		**0.037855**		**0.117654**		NA	
109	102	1,2,3,4,7,8-HxCDD	NA		NA		0.001267	U	0.002125	U	NA	
110	103	1,2,3,6,7,8-HxCDD	NA		NA		**0.006653**	J	**0.014629**	J	NA	
111	104	1,2,3,7,8,9-HxCDD	NA		NA		0.001076	U	0.001949	U	NA	
112	105	Total HxCDD	NA		NA		**0.017614**		**0.037485**		NA	
113	106	1,2,3,4,6,7,8-HpCDF	NA		NA		**0.023098**		**0.059996**		NA	
114	107	1,2,3,4,7,8,9-HpCDF	NA		NA		0.001711	U	**0.007017**	J	NA	
115	108	Total HpCDF	NA		NA		**0.125689**		**0.325386**		NA	
116	109	1,2,3,4,6,7,8-HpCDD	NA		NA		**0.160343**		**0.381169**		NA	
117	110	Total HpCDD	NA		NA		**0.251496**		**0.588687**		NA	
118	111	OCDF	NA		NA		**0.087928**		**0.244329**		NA	
119	112	OCDD	NA		NA		**0.761183**		**1.997929**		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											Dup of OX6S	
3			OX6S		OX6S		OX6S		OX6S		Y	
4			FY72B		0402086-02		0406074-06		0408026-07		0408026-01	
5			10/22/03		2/18/04		6/10/04		8/04/04		8/04/04	
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		1	U	1	U
128		Acenaphthene	NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		1	U	1	U
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
1										
2										
3			OX7S		OX7S		OX7S		OX7S	
4			FY72C		0402086-03		0406074-07		0408026-08	
5			10/22/03		2/18/04		6/10/04		8/04/04	
6										
7	1	**CHLORINATED PHENOLS (µg/L)**								
8	2	**EPA Method SW8040**								
9	3	Pentachlorophenol	**720**		**166**		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	NA		NA		1.98	U	2	U
20	14	4-Methylphenol	NA		NA		9.92	U	10	U
21	15	Isophorone	NA		NA		0.992	U	1	U
22	16	2,4-Dimethylphenol	NA		NA		2.98	U	3	U
23	17	Benzoic Acid	NA		NA		19.8	U	20	U
24	18	Naphthalene	NA		NA		**1.86**		**1.5**	
25	19	2-Methylnaphthalene	NA		NA		0.992	U	1	U
26	20	2,4,6-Trichlorophenol	NA		NA		4.96	U	5	U
27	21	2,4,5-Trichlorophenol	NA		NA		4.96	U	5	U
28	22	Acenaphthene	NA		NA		0.992	U	1	U
29	23	Dibenzofuran	NA		NA		0.992	U	1	U
30	24	Fluorene	NA		NA		0.992	U	1	U
31	25	Pentachlorophenol	NA		NA		**634**		**130**	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		0.992	U	1	U
33	27									
34	28	**VOLATILES (µg/L)**								
35	29	**EPA Method SW8260**								
36	30	Acetone	NA		NA		50	U	50	U
37	31	Carbon Disulfide	NA		NA		2	U	2	U
38	32	2-Butanone	NA		NA		10	U	10	U
39	33	Benzene	NA		NA		0.3	U	0.3	U
40	34	Bromoform	NA		NA		1	U	1	U
41	35	Toluene	NA		NA		1	U	1	U
42	36	Ethylbenzene	NA		NA		1	U	**1.18**	J
43	37	Styrene	NA		NA		1	U	1	U
44	38	m,p-Xylene	NA		NA		2	U	2	U
45	39	o-Xylene	NA		NA		**2.79**		**3.76**	J
46	40	1,3,5-Trimethylbenzene	NA		NA		**3.24**		**7.29**	J
47	41	1,2,4-Trimethylbenzene	NA		NA		**27.3**		**54.2**	J
48	42	Isopropylbenzene	NA		NA		**1.23**		**1.62**	J
49	43	n-Propylbenzene	NA		NA		**1.85**		**3.26**	J
50	44	tert-Butylbenzene	NA		NA		1	U	1	U
51	45	sec-Butylbenzene	NA		NA		**1.4**		**3.37**	J
52	46	4-Isopropyltoluene	NA		NA		1	U	**1.42**	J
53	47	n-Butylbenzene	NA		NA		1	U	**1.25**	J
54	48	Naphthalene	NA		NA		**4.59**		**4.89**	J
55	48.5	Methyl tert-butyl ether	NA		NA		1	U	1	U
56	49									
57	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**								
58	51	**Method OR-DEQ**								
59	52	**TPH-Diesel**	NA		NA		NA		NA	
60	53	**TPH-D Motor Oil**	NA		NA		NA		NA	
61	54	**TPH-Gasoline**	NA		NA		NA		NA	
62	55									

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
1										
2										
3			OX7S		OX7S		OX7S		OX7S	
4			FY72C		0402086-03		0406074-07		0408026-08	
5			10/22/03		2/18/04		6/10/04		8/04/04	
63	56	**PRIORITY POLLUTANT**								
64	57	**METALS (mg/L)**								
65	58	Arsenic (7060)	NA		NA		**0.011**		**0.014**	
66	59	Chromium (6010)	NA		NA		**0.0162**		**0.0139**	
67	60	Copper (6010)	NA		NA		0.01	U	0.01	U
68	61	Lead (7421)	NA		NA		0.0001	U	0.0001	U
69	62	Nickel (6010)	NA		NA		0.005	U	0.005	U
70	63	Zinc (6010)	NA		NA		0.01	U	0.01	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)	NA		NA		**315**		**241**	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		**2.88**		**2.91**	
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-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
1										
2										
3			OX7S		OX7S		OX7S		OX7S	
4			FY72C		0402086-03		0406074-07		0408026-08	
5			10/22/03		2/18/04		6/10/04		8/04/04	
87	80	**FIELD PARAMETERS**								
88	81	pH (avg)	6.60		6.57		6.3		5.88	
89	82	Temperature (° C) (avg)	16.1		13.8		14.2		15.7	
90	83	Conductivity (um/hos)	326		393		370		489	
91	84	Dissolved oxygen (mg/L) (avg)	1.76		2.2		3.02		3.6	
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		**ETHANOL (mg/L)**	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
1										
2										
3			OX7S		OX7S		OX7S		OX7S	
4			FY72C		0402086-03		0406074-07		0408026-08	
5			10/22/03		2/18/04		6/10/04		8/04/04	
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		1	U
128		Acenaphthene	NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		1	U
131		Dibenzofuran	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					Dup of OX8S							
3			OX8S		Y		OX8S		OX8S		OX8S	
4			FY72E		FY72D		0402086-04		0406074-08		0408026-09	
5			10/22/03		10/22/03		2/18/04		6/10/04		8/04/04	
6												
7	1	**CHLORINATED PHENOLS (µg/L)**										
8	2	**EPA Method SW8040**										
9	3	Pentachlorophenol	**260**		**300**		**56.4**		NA		NA	
10	4	2,4,6-Trichlorophenol	NA		NA		NA		NA		NA	
11	5	2,3,6-Trichlorophenol	NA		NA		NA		NA		NA	
12	6	2,4,5-Trichlorophenol	NA		NA		NA		NA		NA	
13	7	2,3,4-Trichlorophenol	NA		NA		NA		NA		NA	
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA	
15	9	2,3,4,5-Tetrachlorophenol	NA		NA		NA		NA		NA	
16	10											
17	11	**SEMIVOLATILES (µg/L)**										
18	12	**EPA Method SW8270**										
19	13	Phenol	NA		NA		NA		1.97	U	2	U
20	14	4-Methylphenol	NA		NA		NA		9.84	U	10	U
21	15	Isophorone	NA		NA		NA		0.984	U	1	U
22	16	2,4-Dimethylphenol	NA		NA		NA		2.95	U	3	U
23	17	Benzoic Acid	NA		NA		NA		19.7	U	20	U
24	18	Naphthalene	NA		NA		NA		**3.38**		**1.09**	
25	19	2-Methylnaphthalene	NA		NA		NA		0.984	U	1	U
26	20	2,4,6-Trichlorophenol	NA		NA		NA		4.92	U	5	U
27	21	2,4,5-Trichlorophenol	NA		NA		NA		4.92	U	5	U
28	22	Acenaphthene	NA		NA		NA		0.984	U	1	U
29	23	Dibenzofuran	NA		NA		NA		0.984	U	1	U
30	24	Fluorene	NA		NA		NA		0.984	U	1	U
31	25	Pentachlorophenol	NA		NA		NA		**206**		**76.8**	
32	26	bis(2-Ethylhexyl)phthalate	NA		NA		NA		0.984	U	1	U
33	27											
34	28	**VOLATILES (µg/L)**										
35	29	**EPA Method SW8260**										
36	30	Acetone	NA		NA		NA		50	U	50	U
37	31	Carbon Disulfide	NA		NA		NA		2	U	2	U
38	32	2-Butanone	NA		NA		NA		10	U	10	U
39	33	Benzene	NA		NA		NA		0.3	U	0.3	U
40	34	Bromoform	NA		NA		NA		1	U	1	U
41	35	Toluene	NA		NA		NA		1	U	1	U
42	36	Ethylbenzene	NA		NA		NA		**3.06**		**4.15**	J
43	37	Styrene	NA		NA		NA		1	U	1	U
44	38	m,p-Xylene	NA		NA		NA		2	U	**2.84**	J
45	39	o-Xylene	NA		NA		NA		**12.4**		**18.8**	J
46	40	1,3,5-Trimethylbenzene	NA		NA		NA		**32**		**33.6**	J
47	41	1,2,4-Trimethylbenzene	NA		NA		NA		**109**		**101**	J
48	42	Isopropylbenzene	NA		NA		NA		**10.6**		**12.4**	J
49	43	n-Propylbenzene	NA		NA		NA		**19.6**		**15.3**	J
50	44	tert-Butylbenzene	NA		NA		NA		**2.14**		**2.12**	J
51	45	sec-Butylbenzene	NA		NA		NA		**20.1**		**19.2**	J
52	46	4-Isopropyltoluene	NA		NA		NA		**4.03**		**4.85**	J
53	47	n-Butylbenzene	NA		NA		NA		**3.89**		**4.94**	J
54	48	Naphthalene	NA		NA		NA		**6.04**		**6.53**	J
55	48.5	Methyl tert-butyl ether	NA		NA		NA		1	U	1	U
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											

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					Dup of OX8S							
3			OX8S		Y		OX8S		OX8S		OX8S	
4			FY72E		FY72D		0402086-04		0406074-08		0408026-09	
5			10/22/03		10/22/03		2/18/04		6/10/04		8/04/04	
63	56	**PRIORITY POLLUTANT**										
64	57	**METALS (mg/L)**										
65	58	Arsenic (7060)	NA		NA		NA		**0.012**		**0.0233**	
66	59	Chromium (6010)	NA		NA		NA		**0.0143**		**0.0123**	
67	60	Copper (6010)	NA		NA		NA		0.01	U	0.01	U
68	61	Lead (7421)	NA		NA		NA		0.0001	U	0.0001	U
69	62	Nickel (6010)	NA		NA		NA		0.005	U	0.005	U
70	63	Zinc (6010)	NA		NA		NA		0.01	U	0.01	U
71	64											
72	65	**MAJOR IONS AND CONVENTIONALS**										
73	66	Calcium (mg/L) (6010)	NA		NA		NA		NA		NA	
74	67	Magnesium (mg/L) (6010)	NA		NA		NA		NA		NA	
75	68	Potassium (mg/L) (6010)	NA		NA		NA		NA		NA	
76	69	Sodium (mg/L) (6010)	NA		NA		NA		NA		NA	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
78	71	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		NA		NA		NA	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NA		NA		NA		**379**		**315**	
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		NA		**4.22**		**4.12**	
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					Dup of OX8S							
3			OX8S		Y		OX8S		OX8S		OX8S	
4			FY72E		FY72D		0402086-04		0406074-08		0408026-09	
5			10/22/03		10/22/03		2/18/04		6/10/04		8/04/04	
87	80	**FIELD PARAMETERS**										
88	81	pH (avg)	6.65		6.65		6.65		6.33		5.94	
89	82	Temperature (° C) (avg)	16.3		16.3		12.8		13.9		16.1	
90	83	Conductivity (um/hos)	337		337		451		437		566	
91	84	Dissolved oxygen (mg/L) (avg)	2.26		2.3		1.58		1.21		2.67	
92	85											
93	86	**DIOXINS AND FURANS (ng/L)**										
94	87	**Method 8290**										
95	88	2,3,7,8-TCDF	3.8	U	NA		NA		NA		NA	
96	89	Total TCDF	3.8	U	NA		NA		NA		NA	
97	90	2,3,7,8-TCDD	3.5	U	NA		NA		NA		NA	
98	91	Total TCDD	3.5	U	NA		NA		NA		NA	
99	92	1,2,3,7,8-PeCDF	2.8	U	NA		NA		NA		NA	
100	93	2,3,4,7,8-PeCDF	2.6	U	NA		NA		NA		NA	
101	94	Total PeCDF	2.6	U	NA		NA		NA		NA	
102	95	1,2,3,7,8-PeCDD	3.2	U	NA		NA		NA		NA	
103	96	Total PeCDD	3.2	U	NA		NA		NA		NA	
104	97	1,2,3,4,7,8-HxCDF	2.3	U	NA		NA		NA		NA	
105	98	1,2,3,6,7,8-HxCDF	2.1	U	NA		NA		NA		NA	
106	99	2,3,4,6,7,8-HxCDF	2.3	U	NA		NA		NA		NA	
107	100	1,2,3,7,8,9-HxCDF	2.5	U	NA		NA		NA		NA	
108	101	Total HxCDF	**9.2**		NA		NA		NA		NA	
109	102	1,2,3,4,7,8-HxCDD	2.9	U	NA		NA		NA		NA	
110	103	1,2,3,6,7,8-HxCDD	2.2	U	NA		NA		NA		NA	
111	104	1,2,3,7,8,9-HxCDD	2.5	U	NA		NA		NA		NA	
112	105	Total HxCDD	2.2	U	NA		NA		NA		NA	
113	106	1,2,3,4,6,7,8-HpCDF	**7.5**	J	NA		NA		NA		NA	
114	107	1,2,3,4,7,8,9-HpCDF	3.8	U	NA		NA		NA		NA	
115	108	Total HpCDF	**34**		NA		NA		NA		NA	
116	109	1,2,3,4,6,7,8-HpCDD	**36**		NA		NA		NA		NA	
117	110	Total HpCDD	**57**		NA		NA		NA		NA	
118	111	OCDF	**35**	J	NA		NA		NA		NA	
119	112	OCDD	**230**		NA		NA		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
1												
2					Dup of OX8S							
3			OX8S		Y		OX8S		OX8S		OX8S	
4			FY72E		FY72D		0402086-04		0406074-08		0408026-09	
5			10/22/03		10/22/03		2/18/04		6/10/04		8/04/04	
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		1	U
128		Acenaphthene	NA		NA		NA		NA		NA	
129		Fluorene	NA		NA		NA		NA		NA	
130		Anthracene	NA		NA		NA		NA		1	U
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			OX9S	
4			0408035-02	
5			8/05/04	
6				
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	10	U
21	15	Isophorone	1	U
22	16	2,4-Dimethylphenol	3	U
23	17	Benzoic Acid	20	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	50	U
37	31	Carbon Disulfide	2	U
38	32	2-Butanone	10	U
39	33	Benzene	0.3	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	2	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	1	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**	NA	
60	53	**TPH-D Motor Oil**	NA	
61	54	**TPH-Gasoline**	NA	
62	55			

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			OX9S	
4			0408035-02	
5			8/05/04	
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.0044**	
66	59	Chromium (6010)	**0.0156**	
67	60	Copper (6010)	0.01	U
68	61	Lead (7421)	0.0001	U
69	62	Nickel (6010)	0.005	U
70	63	Zinc (6010)	0.01	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)	**201**	
81	74	Chloride (mg/L) (EPA 325.2)	**3.56**	
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			OX9S	
4			0408035-02	
5			8/05/04	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	5.83	
89	82	Temperature (° C) (avg)	15.5	
90	83	Conductivity (um/hos)	365	
91	84	Dissolved oxygen (mg/L) (avg)	2.33	
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			OX9S	
4			0408035-02	
5			8/05/04	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	NA	
126		2-Methylnaphthalene	NA	
127		Acenaphthylene	1	U
128		Acenaphthene	NA	
129		Fluorene	NA	
130		Anthracene	1	U
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						
3			PZ1		PZ1	
4			EM65E		FF48K	
5			6/24/02		2/10/03	
6						
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					

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	
63	56	**PRIORITY POLLUTANT**				
64	57	**METALS (mg/L)**				
65	58	Arsenic (7060)	**0.005**		NA	
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	
6				
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			

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	
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	NA	
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	
6				
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			

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	
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	NA	
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
1				
2				
3			Q	
4			0408056-05	
5			8/09/04	
6				
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	**10.7**	
20	14	4-Methylphenol	10.3	U
21	15	Isophorone	1.03	U
22	16	2,4-Dimethylphenol	3.09	U
23	17	Benzoic Acid	20.6	U
24	18	Naphthalene	1.03	U
25	19	2-Methylnaphthalene	**19.8**	
26	20	2,4,6-Trichlorophenol	5.15	U
27	21	2,4,5-Trichlorophenol	5.15	U
28	22	Acenaphthene	**6.46**	
29	23	Dibenzofuran	**3.79**	
30	24	Fluorene	**4.97**	
31	25	Pentachlorophenol	5.15	U
32	26	bis(2-Ethylhexyl)phthalate	1.03	U
33	27			
34	28	**VOLATILES (µg/L)**		
35	29	**EPA Method SW8260**		
36	30	Acetone	50	U
37	31	Carbon Disulfide	2	U
38	32	2-Butanone	10	U
39	33	Benzene	**1030**	
40	34	Bromoform	1	U
41	35	Toluene	**21.2**	
42	36	Ethylbenzene	**12.1**	
43	37	Styrene	1	U
44	38	m,p-Xylene	**27.4**	
45	39	o-Xylene	**8.17**	
46	40	1,3,5-Trimethylbenzene	**3.73**	
47	41	1,2,4-Trimethylbenzene	**3.47**	
48	42	Isopropylbenzene	**78.4**	
49	43	n-Propylbenzene	**116**	
50	44	tert-Butylbenzene	1	U
51	45	sec-Butylbenzene	**8.81**	
52	46	4-Isopropyltoluene	1	U
53	47	n-Butylbenzene	**9.01**	
54	48	Naphthalene	1	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**	**5.56**	
60	53	**TPH-D Motor Oil**	0.495	U
61	54	**TPH-Gasoline**	**2.88**	
62	55			

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			Q	
4			0408056-05	
5			8/09/04	
63	56	**PRIORITY POLLUTANT**		
64	57	**METALS (mg/L)**		
65	58	Arsenic (7060)	**0.034**	
66	59	Chromium (6010)	**0.017**	
67	60	Copper (6010)	0.01	U
68	61	Lead (7421)	**0.00735**	
69	62	Nickel (6010)	0.005	U
70	63	Zinc (6010)	0.01	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)	**338**	
81	74	Chloride (mg/L) (EPA 325.2)	**2.1**	
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			Q	
4			0408056-05	
5			8/09/04	
87	80	**FIELD PARAMETERS**		
88	81	pH (avg)	6.16	
89	82	Temperature (° C) (avg)	15.8	
90	83	Conductivity (um/hos)	692	
91	84	Dissolved oxygen (mg/L) (avg)	3.72	
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			Q	
4			0408056-05	
5			8/09/04	
123		**PAHs (µg/L)**		
124		**EPA Method SW8270 SIM**		
125		Naphthalene	**0.398**	
126		2-Methylnaphthalene	NA	
127		Acenaphthylene	**0.239**	
128		Acenaphthene	**5.04**	
129		Fluorene	**3.81**	
130		Anthracene	**0.259**	
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
1																													
2																	Dup of RW1						Dup of RW1						
3			RW1		RW1		RW1		RW1		RW1		RW1		RW1		W		RW1		RW1		W		RW1		RW1		
4			AH76F		AU36E		BC21U		BH96X		BR64O		CB68G		CK77B		CK77A		CT67K		DE87Q		DE87M		DM30G		DW37D		
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		11/28/01		
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		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		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		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		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		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		NA		
15	9	2,3,4,5-Tetrachlorophenol	**1.1**		**7.3**		**9.3**		**9.3**		**21**		**24**		**16**		**16**		NA		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**		**2.1**		
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**		1.0	U	
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	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	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	10	U	50	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**		**13**		
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	**3.7**		
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	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**		5.0	U	
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	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	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	1.0	U	1.0	U
31	25	Pentachlorophenol	**150**		**3100**		**4100**		**2800**		**7300**		**5400**		**4000**		**3900**		**1400**	J	**1900**		**2000**		**410**		**17**		
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	1.0	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	**30**		5.0	U	**39**	M	30	U	**16**		**14**		**28**		**13**		**13**		**7.2**	M	**8.4**		
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	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**		**30**		
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**		**24**		
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	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**		**5.7**		
42	36	Ethylbenzene	**1.3**		**51**		**34**		**31**		**130**		**120**		**96**		**86**		**80**		**71**		**72**		**82**		**74**		
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	1.0	U	
44	38	m,p-Xylene	**1.6**		**52**		**23**		**32**		**170**		**150**		**92**		**82**		**160**		**140**		**140**		**200**		**270**		
45	39	o-Xylene	**1.6**		**130**		**71**		**73**		**250**		**240**		**160**		**150**		**110**		**100**		**100**		**120**		**87**		
46	40	1,3,5-Trimethylbenzene	1.0	U	**41**		**12**		**38**		**120**		**64**		**29**		**25**		**58**		**37**		**38**		**40**		**53**		
47	41	1,2,4-Trimethylbenzene	**2.2**		**160**		**75**		**170**		**500**		**320**		**240**		**250**		**160**		**160**		**160**		**150**		**200**		
48	42	Isopropylbenzene	**3.5**		**36**		**23**		**21**		**58**		**47**		**26**		**21**		**28**		**28**		**28**		**29**		**26**		
49	43	n-Propylbenzene	**1.5**		**37**		**24**		**35**		**82**		**61**		**36**		**31**		**45**		**34**		**36**		**36**		**32**		
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	1.0	U	
51	45	sec-Butylbenzene	**3.2**		**17**		**8.6**		**14**		**21**		**16**		**11**		**10**		**10**		**7.7**		**7.8**		**6.8**		1.0	U	
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**		**5.5**		
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	**4.7**	M	
54	48	Naphthalene	5.0	U	**7.1**		**7.3**		**8.9**		25	U	30	U	**11**		**12**		**29**		**25**		**28**		**14**		**24**		
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**	**1.0**		**7.5**		**5.7**		**5.1**		**12**		**13**		**6.4**		**5.7**		**4.1**		**4.9**		**4.5**		**4.3**		**4.7**		
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	2.0	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**		**5.2**		
62	55																												

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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
2		Dup of RW1						Dup of RW1										Dup of RW1								Dup of RW1
3		X		RW1		RW1		X		RW1		RW1		RW1		RW1		X		RW1		RW1		RW1		W
4		DW37A		ED34A		EM66B		EM66A		ER93J		EZ17H		FF65D		FL41L		FL41P		FU50C		FY72J		0402086-10		0402113-05
5		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		2/18/04		2/23/04
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	2.0	U	**66**		**57**	J	**76**	J	**16**		**10**		**8.9**		2.1	U	2	U	**24**		**3.7**	M	1.96	U	1.96
20	4-Methylphenol	1.0	U	**4.6**		**21**		**25**		**5.4**		1.2	U	**6.9**		1	U	1	U	**5.3**		1	U	9.8	U	9.78
21	Isophorone	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	0.98	U	0.978
22	2,4-Dimethylphenol	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	2.94	U	2.93
23	Benzoic Acid	50	U	50	U	50	U	50	U	54	U	58	U	50	U	52	U	51	U	50	U	10	U	19.6	U	19.6
24	Naphthalene	**12**		**6.9**		**11**	J	**15**	J	**16**		**8.6**		**14**		**3.7**		**3.7**		**9**		**5.1**		**15.6**		**3.63**
25	2-Methylnaphthalene	**3.3**		**2.3**		**5.1**		**6.1**		**6**		**4.4**		**6.5**		**1.6**		**1.6**		**2.8**		1	U	**6.33**		**10.4**
26	2,4,6-Trichlorophenol	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	**14.8**		4.89
27	2,4,5-Trichlorophenol	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**		4.9	U	4.89
28	Acenaphthene	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	0.98	U	0.978
29	Dibenzofuran	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	0.98	U	0.978
30	Fluorene	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	0.98	U	0.978
31	Pentachlorophenol	**17**		**1200**		**880**	J	**1100**	J	**2600**		**5400**		**2800**		**1700**		**1600**		**1400**		**350**		**2630**		**8.69**
32	bis(2-Ethylhexyl)phthalate	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	0.98	U	0.978
33																										
34	**VOLATILES (µg/L)**																									
35	**EPA Method SW8260**																									
36	Acetone	**7.6**		**110**	J	50	U	48	U	15	U	5	U	**16**	M	**20**		**24**	M	**26**	MJ	**15**	M	50	U	50
37	Carbon Disulfide	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	2	U	2
38	2-Butanone	**30**	M	**47**	J	15	U	**16**	J	**32**	M	5	U	5	U	5	U	5	U	5	U	**46**	M	10	U	10
39	Benzene	**23**		**1.9**	J	3.0	U	3.0	U	**4.8**		**22**		**12**		**1**		**2**		**4.9**	J	**4.9**		**7.42**		**5.96**
40	Bromoform	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	1	U	1
41	Toluene	**5.3**		**12**	J	**16**		**14**	J	**15**		**13**		1	U	1	U	1	U	**3**	J	1	U	1	U	1
42	Ethylbenzene	**74**		**81**	J	**140**		**120**	J	**120**		**130**		**57**		**14**	J	**37**	J	**68**	J	**64**		**106**		**11.9**
43	Styrene	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	1	U	1
44	m,p-Xylene	**280**		**97**	J	**310**		**250**	J	**230**		**160**		**41**		**12**	J	**34**	J	**90**	J	**62**		**45.6**		**5.89**
45	o-Xylene	**87**		**170**	J	**220**		**190**	J	**200**		**200**		**73**		**25**	J	**66**		**120**	J	**90**		**142**		**2.22**
46	1,3,5-Trimethylbenzene	**52**		**40**	J	**100**		**100**	J	**97**		**87**		**19**		**9.8**	J	**30**	J	**67**	J	**31**		**55.2**		**20.8**
47	1,2,4-Trimethylbenzene	**200**		**170**	J	**370**		**310**	J	**380**		**410**		**110**		**64**	J	**160**	J	**230**		**170**		**180**		**67.9**
48	Isopropylbenzene	**26**		**29**	J	**42**		**47**	J	**53**		**60**		**20**		**12**	J	**24**	J	**42**	J	**34**		**43.9**		**40.8**
49	n-Propylbenzene	**31**		**34**	J	**63**		**64**	J	**72**		**80**		**29**		**14**	J	**32**	J	**52**	J	**40**		**57.2**		**61.9**
50	tert-Butylbenzene	1.0	U	**1.8**	J	3.0	U	3.0	U	3	U	**3**		**1**		**1.7**		**2.3**		**3.1**	J	**2**		**1.15**		1
51	sec-Butylbenzene	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**		**12.9**		**8.99**
52	4-Isopropyltoluene	**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**		**5.2**		**2.19**
53	n-Butylbenzene	**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	**5.52**		**5.23**
54	Naphthalene	**22**		**21**	J	**19**		**20**	J	**45**		**19**		**19**		5	U	**10**		**19**	J	**13**		**27.6**		**4.49**
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**	**5.0**		**4.9**		**6.8**	J	**17**	J	**9.4**		**13**		**6.8**		**5.1**		**5.4**		**8.1**		**5.8**		**11.2**	J	**1.08**
60	**TPH-D Motor Oil**	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	**1.22**	J	0.492
61	**TPH-Gasoline**	**5.3**		12		**13**		**14**		**14**		**18**		**6.9**		**5.2**	J	**6.7**	J	**8.2**		**7**		**6.3**		**2.4**
62																										

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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	BB	BC	BD	BE	BF
1						
2						
3			RW1		RW1	
4			0406074-10		0408025-01	
5			6/10/04		8/04/04	
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	U	1.9	U	2	U
20	4-Methylphenol	U	9.49	U	10	U
21	Isophorone	U	0.949	U	1	U
22	2,4-Dimethylphenol	U	2.85	U	3	U
23	Benzoic Acid	U	19	U	20	U
24	Naphthalene		**8.1**		**7.35**	
25	2-Methylnaphthalene		**4.13**		**1.84**	
26	2,4,6-Trichlorophenol	U	4.74	U	**19.9**	
27	2,4,5-Trichlorophenol	U	4.74	U	5	U
28	Acenaphthene	U	0.949	U	1	U
29	Dibenzofuran	U	0.949	U	1	U
30	Fluorene	U	0.949	U	1	U
31	Pentachlorophenol		**903**		**160**	
32	bis(2-Ethylhexyl)phthalate	U	0.949	U	1	U
33						
34	**VOLATILES (µg/L)**					
35	**EPA Method SW8260**					
36	Acetone	U	50	U	50	U
37	Carbon Disulfide	U	2	U	2	U
38	2-Butanone	U	10	U	10	U
39	Benzene		**6.78**		**8.67**	J
40	Bromoform	U	1	U	1	U
41	Toluene	U	1	U	**1.6**	J
42	Ethylbenzene		**90.7**		**192**	J
43	Styrene	U	1	U	1	U
44	m,p-Xylene		**110**		**299**	J
45	o-Xylene		**130**		**294**	J
46	1,3,5-Trimethylbenzene		**66.6**		**83.8**	J
47	1,2,4-Trimethylbenzene		**226**		**349**	J
48	Isopropylbenzene		**35.7**		**75.2**	J
49	n-Propylbenzene		**57.3**		**58**	J
50	tert-Butylbenzene	U	**1.95**		**2.29**	J
51	sec-Butylbenzene		**10.5**		**12.3**	J
52	4-Isopropyltoluene		**5.98**		**6.33**	J
53	n-Butylbenzene		**4.07**		**3.86**	J
54	Naphthalene		**16.7**		**17.6**	J
55	Methyl tert-butyl ether	U	1	U	1	U
56						
57	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**					
58	**Method OR-DEQ**					
59	**TPH-Diesel**		NA		**6.12**	
60	**TPH-D Motor Oil**	U	NA		0.51	U
61	**TPH-Gasoline**		NA		**5.48**	
62						

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																	Dup of RW1						Dup of RW1					
3			RW1		RW1		RW1		RW1		RW1		RW1		RW1		W		RW1		RW1		W		RW1		RW1	
4			AH76F		AU36E		BC21U		BH96X		BR64O		CB68G		CK77B		CK77A		CT67K		DE87Q		DE87M		DM30G		DW37D	
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		11/28/01	
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**		**0.009**	
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	**0.008**	J
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	**0.008**	J
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	**0.002**	J
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	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	**0.026**	J
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**		**58.7**	J
74	67	Magnesium (mg/L) (6010)	**11.7**		NA		NA		NA		NA		NA		NA		NA		**15.2**		**11.9**		**12.2**		**15.2**		**19.5**	J
75	68	Potassium (mg/L) (6010)	**4.0**		NA		NA		NA		NA		NA		NA		NA		**4.0**		**2.8**		**3.4**		**3.5**		**4.2**	
76	69	Sodium (mg/L) (6010)	**6.03**		NA		NA		NA		NA		NA		NA		NA		**6.67**		**6.01**		**5.59**		**6.62**		**8.18**	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**140**		NA		NA		NA		NA		NA		NA		NA		**230**		NA		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		NA	
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**140**		NA		NA		NA		NA		NA		NA		NA		**230**		NA		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	**290**	
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**		**8.4**	
82	75	N-Nitrate (mg-N/L) (Calculated)	0.010	U	NA		NA		NA		NA		NA		NA		NA		0.010	U	NA		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		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		NA	
85	78	Sulfate (mg/L) (EPA 375.2)	**3.8**		NA		NA		NA		NA		NA		NA		NA		**3.0**		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	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA
1																										
2		Dup of RW1						Dup of RW1										Dup of RW1								Dup of RW1
3		X		RW1		RW1		X		RW1		RW1		RW1		RW1		X		RW1		RW1		RW1		W
4		DW37A		ED34A		EM66B		EM66A		ER93J		EZ17H		FF65D		FL41L		FL41P		FU50C		FY72J		0402086-10		0402113-05
5		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		2/18/04		2/23/04
63	**PRIORITY POLLUTANT**																									
64	**METALS (mg/L)**																									
65	Arsenic (7060)	**0.008**		**0.008**		**0.006**		**0.006**		**0.008**		0.05	U	**0.004**		**0.005**		**0.005**		**0.006**		**0.005**		**0.004**		**0.021**
66	Chromium (6010)	**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	**0.0093**		**0.0077**
67	Copper (6010)	**0.013**	J	**0.028**		**0.005**		**0.006**		**0.004**		**0.018**		**0.006**		**0.004**		**0.005**		**0.003**		**0.005**		**0.0172**		0.01
68	Lead (7421)	**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	**0.0005**		0.0001
69	Nickel (6010)	**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	0.005	U	0.005
70	Zinc (6010)	**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**		0.01	U	0.01
71																										
72	**MAJOR IONS AND CONVENTIONALS**																									
73	Calcium (mg/L) (6010)	**65.4**	J	**152**		NA		NA		NA		NA		**31.7**		NA		NA		NA		NA		NA		NA
74	Magnesium (mg/L) (6010)	**21.8**	J	**51.9**		NA		NA		NA		NA		**10.6**		NA		NA		NA		NA		NA		NA
75	Potassium (mg/L) (6010)	**5.1**		**6.7**		NA		NA		NA		NA		**3.6**		NA		NA		NA		NA		NA		NA
76	Sodium (mg/L) (6010)	**9.48**		**12.0**		NA		NA		NA		NA		**7.9**		NA		NA		NA		NA		NA		NA
77	Alkalinity (mg/L CaCO3) (SM 2320)	NA		**480**		NA		NA		NA		NA		**130**		NA		NA		NA		NA		NA		NA
78	Carbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		1.0	U	NA		NA		NA		NA		1	U	NA		NA		NA		NA		NA		NA
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		**480**		NA		NA		NA		NA		**130**		NA		NA		NA		NA		NA		NA
80	Total Dissolved Solids (mg/L) (EPA 160.1)	**280**		**1100**		**1900**		**2000**		**230**		**260**		**230**		**240**		**240**		**320**		**320**		**242**		**239**
81	Chloride (mg/L) (EPA 325.2)	**8.3**		**11**		**8.8**		**8.0**		**6.4**		**7.0**		**5.4**		**6**		**6**		**5.9**		**7.8**		**4.79**		**3.95**
82	N-Nitrate (mg-N/L) (Calculated)	NA		**0.044**		NA		NA		NA		NA		**0.043**		NA		NA		NA		NA		NA		NA
83	N-Nitrite (mg-N/L) (EPA 354.1)	NA		0.010	U	NA		NA		NA		NA		**0.043**		NA		NA		NA		NA		NA		NA
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)	NA		**0.044**		NA		NA		NA		NA		**0.086**		NA		NA		NA		NA		NA		NA
85	Sulfate (mg/L) (EPA 375.2)	NA		**5.7**		NA		NA		NA		NA		**46**		NA		NA		NA		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	BB	BC	BD	BE	BF
1						
2						
3			RW1		RW1	
4			0406074-10		0408025-01	
5			6/10/04		8/04/04	
63	**PRIORITY POLLUTANT**					
64	**METALS (mg/L)**					
65	Arsenic (7060)		**0.012**		**0.006**	
66	Chromium (6010)		**0.0382**		0.005	U
67	Copper (6010)	U	**0.0286**		0.01	U
68	Lead (7421)	U	**0.0082**		**0.000111**	
69	Nickel (6010)	U	**0.0199**		0.005	U
70	Zinc (6010)	U	**0.102**		**0.0244**	
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)		**472**		**495**	
81	Chloride (mg/L) (EPA 325.2)		**6.59**		**4.89**	
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	AB
1																												
2																	Dup of RW1						Dup of RW1					
3			RW1		RW1		RW1		RW1		RW1		RW1		RW1		W		RW1		RW1		W		RW1		RW1	
4			AH76F		AU36E		BC21U		BH96X		BR64O		CB68G		CK77B		CK77A		CT67K		DE87Q		DE87M		DM30G		DW37D	
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		11/28/01	
87	80	**FIELD PARAMETERS**																										
88	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		6.51	
89	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		13.7	
90	83	Conductivity (um/hos)	244		271		273		211		440		314		305		303		506		377		377		389		584	
91	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		3.36	
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		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	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	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
1																										
2		Dup of RW1						Dup of RW1										Dup of RW1								Dup of RW1
3		X		RW1		RW1		X		RW1		RW1		RW1		RW1		X		RW1		RW1		RW1		W
4		DW37A		ED34A		EM66B		EM66A		ER93J		EZ17H		FF65D		FL41L		FL41P		FU50C		FY72J		0402086-10		0402113-05
5		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		2/18/04		2/23/04
87	**FIELD PARAMETERS**																									
88	pH (avg)	6.5		6.15		6.16		6.14		6.71		6.03		6.4		6.82		6.84		6.65		6.73		6.68		6.34
89	Temperature (° C) (avg)	13.5		12.8		15.6		15.6		15.6		17.3		15.3		14.2		14.2		15.4		17.5		13.8		14.3
90	Conductivity (um/hos)	583		878		803		805		291		394		366		308		308		430		415		343		345
91	Dissolved oxygen (mg/L) (avg)	3.43		7.27		3.86		3.54		0.00		0.00		0		1.79		1.75		1.59		2.65		1.35		1.32
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		3.0	U	NA		NA
96	Total TCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		3.0	U	NA		NA
97	2,3,7,8-TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		4.1	U	NA		NA
98	Total TCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.4	U	NA		NA
99	1,2,3,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.9	U	NA		NA
100	2,3,4,7,8-PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.7	U	NA		NA
101	Total PeCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.7	U	NA		NA
102	1,2,3,7,8-PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.9	U	NA		NA
103	Total PeCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**6.5**		NA		NA
104	1,2,3,4,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.2	U	NA		NA
105	1,2,3,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		1.9	U	NA		NA
106	2,3,4,6,7,8-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.1	U	NA		NA
107	1,2,3,7,8,9-HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.3	U	NA		NA
108	Total HxCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**20.2**		NA		NA
109	1,2,3,4,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.8	U	NA		NA
110	1,2,3,6,7,8-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		3.0	U	NA		NA
111	1,2,3,7,8,9-HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		2.4	U	NA		NA
112	Total HxCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**19.9**		NA		NA
113	1,2,3,4,6,7,8-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**18.1**	J	NA		NA
114	1,2,3,4,7,8,9-HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		4.3	U	NA		NA
115	Total HpCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**86**		NA		NA
116	1,2,3,4,6,7,8-HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**125**		NA		NA
117	Total HpCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**211**		NA		NA
118	OCDF	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**119**		NA		NA
119	OCDD	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		**1226**		NA		NA
120																										
121	**ETHANOL (mg/L)**	NA		NA		NA		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	BB	BC	BD	BE	BF
1						
2						
3			RW1		RW1	
4			0406074-10		0408025-01	
5			6/10/04		8/04/04	
87	**FIELD PARAMETERS**					
88	pH (avg)		6.35		6.04	
89	Temperature (° C) (avg)		16.3		17	
90	Conductivity (um/hos)		575		750	
91	Dissolved oxygen (mg/L) (avg)		2.42		2.29	
92						
93	**DIOXINS AND FURANS (ng/L)**					
94	**Method 8290**					
95	2,3,7,8-TCDF		0.001172	U	0.002108	U
96	Total TCDF		**0.01243**		**0.016418**	
97	2,3,7,8-TCDD		0.001296	U	0.00189	U
98	Total TCDD		0.001296	U	0.00189	U
99	1,2,3,7,8-PeCDF		**0.002537**	J	0.005954	UJ
100	2,3,4,7,8-PeCDF		0.000886	U	0.001846	U
101	Total PeCDF		**0.008505**		**0.009166**	
102	1,2,3,7,8-PeCDD		0.001184	U	0.002557	U
103	Total PeCDD		0.001184	U	0.002557	U
104	1,2,3,4,7,8-HxCDF		0.000811	U	**0.005188**	J
105	1,2,3,6,7,8-HxCDF		0.000804	U	0.005326	UJ
106	2,3,4,6,7,8-HxCDF		0.000882	U	0.002058	U
107	1,2,3,7,8,9-HxCDF		0.000982	U	0.002386	U
108	Total HxCDF		0.000804	U	**0.018357**	
109	1,2,3,4,7,8-HxCDD		0.001465	U	0.002938	U
110	1,2,3,6,7,8-HxCDD		0.001233	U	0.002518	U
111	1,2,3,7,8,9-HxCDD		0.001245	U	0.002694	U
112	Total HxCDD		0.001233	U	**0.011911**	
113	1,2,3,4,6,7,8-HpCDF		0.001827	U	0.005138	UJ
114	1,2,3,4,7,8,9-HpCDF		0.002484	U	**0.011046**	J
115	Total HpCDF		**0.001856**		**0.031417**	
116	1,2,3,4,6,7,8-HpCDD		**0.003583**	J	**0.031308**	
117	Total HpCDD		**0.006947**		**0.061732**	
118	OCDF		0.006121	UJ	**0.029711**	J
119	OCDD		0.036956	U	**0.429978**	
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	AB
1																												
2																	Dup of RW1						Dup of RW1					
3			RW1		RW1		RW1		RW1		RW1		RW1		RW1		W		RW1		RW1		W		RW1		RW1	
4			AH76F		AU36E		BC21U		BH96X		BR64O		CB68G		CK77B		CK77A		CT67K		DE87Q		DE87M		DM30G		DW37D	
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		11/28/01	
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
1																										
2		Dup of RW1						Dup of RW1										Dup of RW1								Dup of RW1
3		X		RW1		RW1		X		RW1		RW1		RW1		RW1		X		RW1		RW1		RW1		W
4		DW37A		ED34A		EM66B		EM66A		ER93J		EZ17H		FF65D		FL41L		FL41P		FU50C		FY72J		0402086-10		0402113-05
5		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		2/18/04		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-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

	B	BB	BC	BD	BE	BF
1						
2						
3			RW1		RW1	
4			0406074-10		0408025-01	
5			6/10/04		8/04/04	
123	**PAHs (µg/L)**					
124	**EPA Method SW8270 SIM**					
125	Naphthalene		NA		NA	
126	2-Methylnaphthalene		NA		NA	
127	Acenaphthylene		NA		1	U
128	Acenaphthene		NA		NA	
129	Fluorene		NA		NA	
130	Anthracene		NA		1	U
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			RW3		RW3	
4			BC30H		9912050-07A	
5			12/8/99		12/8/1999 (d)	
6						
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					

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)	
63	56	**PRIORITY POLLUTANT**				
64	57	**METALS (mg/L)**				
65	58	Arsenic (7060)	**0.014**		NA	
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	W
1																							
2									Dup of LW2S														
3			LW2S		LW2S		LW2S		LW2D		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S
4			S177G		T176C		U235M		U235E		V224N		W391A		Y336G		Z225A		Z960Q		AH27F		AU22G
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		9/20/99
6																							
7	1	**CHLORINATED PHENOLS (µg/L)**																					
8	2	**EPA Method SW8040**																					
9	3	Pentachlorophenol	**2600**		**2900**		**4400**		**4800**		**7600**		**8500**		**5000**		**3800**		**6000**		**560**		**1500**
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	**0.16**
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	0.86	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	0.57
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	0.25
14	8	2,3,5,6- and 2,3,4,6-Tetrachlorophenol	**150**		**150**		**190**		**190**		**290**		**370**		**180**		**130**		**300**		**20**		**47**
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**		**2.2**
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	**5.5**		**2.3**		**20**		**17**		**13**		**10**	J2	**13**		**14**		**8.4**		1.0	U	**4.3**
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
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	**3900**		**3000**		**6000**		**7300**		**7900**		**7300**		**4200**		**4100**		**5400**		**500**		**1600**
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**		1.0
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	5.0
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	1.0
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**		**28**
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	1.0
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	1.0
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	1.0
42	36	Ethylbenzene	**5.7**		**11**		**32**		**32**		**17**		**5.1**		**9.7**		**12**		**11**		**2.0**		**6.3**
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	1.0
44	38	m,p-Xylene	**13**		**16**		**37**		**36**		**32**		**12**		**17**		**24**		**18**		**2.6**		**11**
45	39	o-Xylene	**23**		**35**		**91**		**92**		**63**		**23**		**39**		**61**		**42**		**6.9**		**29**
46	40	1,3,5-Trimethylbenzene	**53**		**49**		**130**		**110**		**80**		**34**		**54**		**62**		**93**		**8.7**		**45**
47	41	1,2,4-Trimethylbenzene	**210**		**200**		**640**	J2	**790**	J2	**490**		**160**		**180**		**280**		**330**		**44**		**120**
48	42	Isopropylbenzene	**7.5**		**14**		**62**	J2	**49**	J2	**19**		**6.4**		**10**		**12**		**16**		**2.2**		**7.0**
49	43	n-Propylbenzene	**16**		**26**		**110**		**90**		**38**		**15**		**21**		**22**		**35**		**4.8**		**15**
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	1.0
51	45	sec-Butylbenzene	**7.6**		**11**		**40**	J2	**27**	J2	**22**		**8.2**		**12**	J2	**12**		**15**		**2.9**		**8.0**
52	46	4-Isopropyltoluene	**9.6**		**9.6**		**31**	J2	**22**	J2	**21**		**9.1**		**12**		**12**		**12**		**2.0**		**8.8**
53	47	n-Butylbenzene	**8.5**		**8.4**	M	**29**	J2	**18**	J2	**16**		**7.7**		**10**		**10**		**12**		**1.9**		**7.0**
54	48	Naphthalene	**12.0**		**14**		**75**	J2	**58**	J2	**31**		**14**		**19**		**18**		**22**		5.0	U	**16**
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**	**4.4**		**5.0**		**11**		**11**		**10**		**5.6**		**5.2**		**5.0**		**6.2**		**1.1**		**2.3**
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																						

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
3			LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S	
4			BC27H		9912050-04A		BH75F		BR64C		CB49I		CK77I		CT55G		DE68C		DM52I		DW48K		ED23E		EM85F	
5			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		6/26/02	
7	**CHLORINATED PHENOLS (µg/L)**																									
8	**EPA Method SW8040**																									
9	Pentachlorophenol		**1300**		NA		**2100**		**1000**		**720**		**1100**		**650**	J	NA		NA		NA		NA		NA	
10	2,4,6-Trichlorophenol	J1	**0.12**	J1	NA		**0.42**		0.25	U	0.25	U	0.25	U	NA		NA		NA		NA		NA		NA	
11	2,3,6-Trichlorophenol	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	0.33	U	NA		0.37	U	0.25	U	0.74	U	0.33	U	NA		NA		NA		NA		NA		NA	
13	2,3,4-Trichlorophenol	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		**36**		NA		**84**		**28**		**28**		**47**		NA		NA		NA		NA		NA		NA	
15	2,3,4,5-Tetrachlorophenol		**1.6**		NA		**2.2**		**2.1**		**1.0**		**1.5**		NA		NA		NA		NA		NA		NA	
16																										
17	**SEMIVOLATILES (µg/L)**																									
18	**EPA Method SW8270**																									
19	Phenol	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	2.0	U
20	4-Methylphenol	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	1.0	U
21	Isophorone	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	U
22	2,4-Dimethylphenol	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	U
23	Benzoic Acid	U	10	U	NA		10	U	10	U	10	U	10	U	10	U	10	U	10	U	30	U	50	U	50	U
24	Naphthalene		**36**		NA		**8.2**		**5.2**		**1.4**		**9.2**		**12**		**21**		**6.8**		**14**		1.0	U	**6.2**	
25	2-Methylnaphthalene	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	1.0	U
26	2,4,6-Trichlorophenol	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	U
27	2,4,5-Trichlorophenol	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	U
28	Acenaphthene	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	U
29	Dibenzofuran	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	U
30	Fluorene	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	U
31	Pentachlorophenol		**1800**		NA		**2100**		**1300**	J2	**200**		**1500**		**1200**	J	**1300**		**700**		**8000**		**320**		**950**	
32	bis(2-Ethylhexyl)phthalate	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	4.0	U
33																										
34	**VOLATILES (µg/L)**																									
35	**EPA Method SW8260**																									
36	Acetone	U	**29**		NA		5.0	U	5.0	U	5.0	U	**27**			R	**33**		**20**		**39**		5.0	U	**8.2**	
37	Carbon Disulfide	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	1.0	U
38	2-Butanone		**6.7**	M	NA		**32**		**22**		5.0	U	15	U	10	U	34	U	**32**		5.0	U	**5.2**		**13**	
39	Benzene	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	1.0	U
40	Bromoform	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	1.0	U
41	Toluene	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	1.0	U
42	Ethylbenzene		**22**		NA		**11**		**5.3**		**1.6**		**11**		**9.7**		**26**		1.0	U	**15**		1.0	U	**4.7**	
43	Styrene	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	1.0	U
44	m,p-Xylene		**18**		NA		**18**		**9.9**		**3.0**		**15**		**18**		**36**		**14**		**35**		**1.2**		**7.3**	
45	o-Xylene		**97**		NA		**45**		**25**		**8.1**		**36**		**49**		**87**		**36**		**84**		**3.0**		**18**	
46	1,3,5-Trimethylbenzene		**80**		NA		**69**		**38**		**16**		**47**		**61**		**94**		**34**		**130**		**5.7**		**24**	
47	1,2,4-Trimethylbenzene		**540**		NA		**330**		**160**		**66**		**250**		**320**		**490**		**200**		**420**		**25**		**110**	
48	Isopropylbenzene		**38**		NA		**23**		**7.3**		**2.2**		**9.1**		**19**		**32**		**13**		**16**		1.0	U	**6.8**	
49	n-Propylbenzene		**60**		NA		**48**		**16**		**5.8**		**20**		**36**		**67**		**28**		**32**		**2.0**		**14**	
50	tert-Butylbenzene	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	1.0	U
51	sec-Butylbenzene		**27**		NA		**24**		**8.2**		**3.9**		**9.3**		**20**		**30**		**15**		1.0	U	**1.4**		**7.5**	
52	4-Isopropyltoluene		**20**		NA		**15**		**7.4**		**3.8**		**8.5**		**17**		**25**		**13**		**22**		**1.5**		**6.6**	
53	n-Butylbenzene		15	U	NA		17	U	**6.5**	M	**3.7**	M	**9.5**		**15**	M	**21**		**12**	M	**18**		**1.2**		5.7	U
54	Naphthalene		**54**		NA		**26**		**10**		5.0	U	**27**		**23**		**60**		**28**		**54**		5.0	U	**11**	
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**		**9.4**		NA		**5.5**		**3.5**		**1.8**		**4.0**		**9.1**		**9.4**		**5.4**		10		**1.5**		**2.8**	
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																										

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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

	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 LW2S														
3			LW2S		LW2S		LW2S		LW2D		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S
4			S177G		T176C		U235M		U235E		V224N		W391A		Y336G		Z225A		Z960Q		AH27F		AU22G
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		9/20/99
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**		**0.008**
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	0.005
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	0.002
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	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**		**0.006**	J2	**0.007**		**0.004**		**0.004**		**0.004**	J2	**0.098**		**0.006**		**0.026**		0.005	U	**0.008**
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		NA
74	67	Magnesium (mg/L) (6010)	NA		NA		**5.15**		**5.12**		**2.30**		NA		NA		NA		**2.52**		NA		NA
75	68	Potassium (mg/L) (6010)	NA		NA		**2.8**		**2.8**		**1.6**		NA		NA		NA		**1.9**		NA		NA
76	69	Sodium (mg/L) (6010)	NA		NA		**4.77**		**4.74**		**2.54**		NA		NA		NA		**3.69**		NA		NA
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	NA		NA		**62**		**61**		**52**		NA		NA		NA		**25**		NA		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		NA
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	NA		NA		**62**		**61**		**52**		NA		NA		NA		**25**		NA		NA
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**170**	J2	**130**		**140**		**66**		160		140		220		**76**		**160**		**160**
81	74	Chloride (mg/L) (EPA 325.2)	NA		NA		**15**		**15**		**1.9**		3.9		4.6		26		**1.9**		**1.8**		**3.1**
82	75	N-Nitrate (mg-N/L) (Calculated)	NA		NA		**0.023**		**0.017**		0.010	UJ	NA		NA		NA		**0.040**		NA		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		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		NA
85	78	Sulfate (mg/L) (EPA 375.2)	NA		NA		**5.3**		**5.9**		**6.5**		NA		NA		NA		**9.4**		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	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
1																										
2																										
3			LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S	
4			BC27H		9912050-04A		BH75F		BR64C		CB49I		CK77I		CT55G		DE68C		DM52I		DW48K		ED23E		EM85F	
5			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		6/26/02	
63	**PRIORITY POLLUTANT**																									
64	**METALS (mg/L)**																									
65	Arsenic (7060)		**0.011**		NA		**0.011**		**0.011**		**0.011**		**0.017**		**0.013**		**0.018**		**0.019**		**0.013**		**0.015**		**0.014**	
66	Chromium (6010)	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	0.005	U
67	Copper (6010)	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**		0.002	U
68	Lead (7421)	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	0.001	U
69	Nickel (6010)	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	0.01	U
70	Zinc (6010)		0.009	U	NA		**0.010**		**0.006**		**0.016**		**0.013**		**0.011**		0.006	U	**0.012**		**0.012**		**0.006**		**0.012**	
71																										
72	**MAJOR IONS AND CONVENTIONALS**																									
73	Calcium (mg/L) (6010)		NA		NA		NA		NA		NA		NA		**35.6**		**42.2**		**24.3**		**23.3**		**12.3**		NA	
74	Magnesium (mg/L) (6010)		NA		NA		NA		NA		NA		NA		**9.27**		**10.1**		**7.63**		**7.65**		**3.88**		NA	
75	Potassium (mg/L) (6010)		NA		NA		NA		NA		NA		NA		**2.7**		**3.4**		**3.1**		**2.9**		**2.0**		NA	
76	Sodium (mg/L) (6010)		NA		NA		NA		NA		NA		NA		**5.10**		**5.23**		**5.84**		**5.14**		**3.46**		NA	
77	Alkalinity (mg/L CaCO3) (SM 2320)		NA		NA		NA		NA		NA		NA		**140**		NA		NA		NA		**67**		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	
79	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)		NA		NA		NA		NA		NA		NA		**140**		NA		NA		NA		**67**		NA	
80	Total Dissolved Solids (mg/L) (EPA 160.1)		**170**		NA		**84**		**140**		**180**		**220**		**210**		**300**		**210**		**190**		**120**		**110**	
81	Chloride (mg/L) (EPA 325.2)		**7.5**		NA		**1.8**		**2.5**		**2.8**		**26**		**15**		**38**		**26**		**9.7**		**4.1**		**3.3**	
82	N-Nitrate (mg-N/L) (Calculated)		NA		NA		NA		NA		NA		NA		**0.010**		NA		NA		NA		0.010	U	NA	
83	N-Nitrite (mg-N/L) (EPA 354.1)		NA		NA		NA		NA		NA		NA		0.010	U	NA		NA		NA		**0.026**		NA	
84	Nitrate + Nitrite (NO2+NO3) (mg-N/L) (EPA 353.2)		NA		NA		NA		NA		NA		NA		**0.010**		NA		NA		NA		**0.033**	J	NA	
85	Sulfate (mg/L) (EPA 375.2)		NA		NA		NA		NA		NA		NA		**5.7**		NA		NA		NA		**4.3**		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 LW2S														
3			LW2S		LW2S		LW2S		LW2D		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S
4			S177G		T176C		U235M		U235E		V224N		W391A		Y336G		Z225A		Z960Q		AH27F		AU22G
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		9/20/99
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		6.06
89	82	Temperature (° C) (avg)	10.0		15		15.7		15.7		10.8		12.6		14.4		14.7000		8.6		11.2		16.6
90	83	Conductivity (um/hos)	291		258		168		167		108		244		299		148.0000		57		221		221
91	84	Dissolved oxygen (mg/L) (avg)	NA		NA		NA		NA		NA		2.71		1.43		1.31		1.47		3.08		1.58
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)	**0.0060**
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**		**0.0510**
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	0.0054
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**		0.0054
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**		0.1800
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**		**0.1100**
101	94	Total PeCDF	**0.2400**		**0.120**		**1.300**		NA		**0.2200**		**0.1900**		**0.470**		**0.3000**		**0.4200**		**0.1600**		**0.6700**
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	**0.0130**
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**		**0.0200**
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**		**0.1800**
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	**0.1200**
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**		**0.1600**
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**		**0.0950**
108	101	Total HxCDF	**0.8800**		**0.370**		**14.000**		NA		**0.9700**		**2.0000**	J2	**2.700**		**1.6000**		**14.0000**		**1.5000**		**14.0000**
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**		**0.0620**
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**		**1.2000**
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**		**0.1200**
112	105	Total HxCDD	**0.7900**		**0.350**		**14.000**		NA		**0.9500**		**1.0000**	J2	**2.800**		**1.5000**		**10.0000**		**0.4200**		**2.8000**
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**		**4.8000**
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**		**0.3300**
115	108	Total HpCDF	**6.7000**		**0.640**		**43.000**		NA		**4.8000**		**6.3000**		**4.800**		**13.0000**		**65.0000**		**2.8000**		**5.1000**
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**		**30.0000**
117	110	Total HpCDD	**15.0000**		**5.700**		**82.000**		NA		**15.0000**		**13.0000**		**39.000**	J2	**26.0000**		**84.0000**		**5.6000**		**45.0000**
118	111	OCDF	**8.8000**		**2.600**		**40.000**		NA		**7.0000**		**6.9000**		**20.000**		**12.0000**		**43.0000**		**3.1000**		**29.0000**
119	112	OCDD	**76.0000**		**25.000**		**350.000**		NA		**65.0000**		**58.0000**	J2	**190.000**	J2	**110.0000**		**320.0000**		**25.0000**		**210.0000**
120																							
121		**ETHANOL (mg/L)**	NA		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	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
1																										
2																										
3			LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S	
4			BC27H		9912050-04A		BH75F		BR64C		CB49I		CK77I		CT55G		DE68C		DM52I		DW48K		ED23E		EM85F	
5			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		6/26/02	
87	**FIELD PARAMETERS**																									
88	pH (avg)		6.25		NM		6.42		6.23		6.59		5.58		6.01		6.33		6.54		6.22		4.96		6.39	
89	Temperature (° C) (avg)		12.6		NM		10.8		12.8		15.5		15.3		11.3		12.7		15.5		14.5		11.1		15.2	
90	Conductivity (um/hos)		267		NM		91		267		268		302		305		427		299		321		124		150	
91	Dissolved oxygen (mg/L) (avg)		2.34		NM		0.95		1.22		1.73		0.98		0.59		1.32		3.04		3.76		7.98		3.67	
92																										
93	**DIOXINS AND FURANS (ng/L)**																									
94	**Method 8290**																									
95	2,3,7,8-TCDF	(c)	0.00330	U	NA		0.086	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
96	Total TCDF		**0.0280**		NA		**0.0540**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
97	2,3,7,8-TCDD	U	0.00079	U	NA		0.0047	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
98	Total TCDD	U	0.00079	U	NA		0.0047	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
99	1,2,3,7,8-PeCDF	UE	0.00170	U	NA		2.400	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
100	2,3,4,7,8-PeCDF		**0.0160**	J1	NA		**0.0260**	J1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
101	Total PeCDF		**0.1000**		NA		**0.1200**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
102	1,2,3,7,8-PeCDD		**0.0049**	J1	NA		**0.0068**	J1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
103	Total PeCDD		**0.0074**	J1	NA		**0.0110**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
104	1,2,3,4,7,8-HxCDF		**0.0690**		NA		0.860	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
105	1,2,3,6,7,8-HxCDF		0.720	U	NA		0.0460	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
106	2,3,4,6,7,8-HxCDF		**0.0330**	J1	NA		**0.0420**	J1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
107	1,2,3,7,8,9-HxCDF		0.011	U	NA		0.0100	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
108	Total HxCDF		**2.1000**		NA		**2.9000**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
109	1,2,3,4,7,8-HxCDD		0.020	U	NA		0.012	U	NA		NA		NA		NA		NA		NA		NA		NA		NA	
110	1,2,3,6,7,8-HxCDD		**0.4800**		NA		**0.4400**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
111	1,2,3,7,8,9-HxCDD		**0.0410**	J1	NA		**0.0290**	J1	NA		NA		NA		NA		NA		NA		NA		NA		NA	
112	Total HxCDD		**1.1000**		NA		**1.2000**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
113	1,2,3,4,6,7,8-HpCDF		**2.2000**		NA		**1.7000**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
114	1,2,3,4,7,8,9-HpCDF		**0.1200**		NA		**0.1200**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
115	Total HpCDF		**10.0000**		NA		**9.2000**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
116	1,2,3,4,6,7,8-HpCDD		**14.0000**		NA		**11.0000**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
117	Total HpCDD		**20.0000**		NA		**17.0000**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
118	OCDF		**11.0000**		NA		**9.0000**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
119	OCDD		**100.0000**	N2	NA		**76.0000**		NA		NA		NA		NA		NA		NA		NA		NA		NA	
120																										
121	**ETHANOL (mg/L)**		NA		10	U	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

	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 LW2S														
3			LW2S		LW2S		LW2S		LW2D		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S
4			S177G		T176C		U235M		U235E		V224N		W391A		Y336G		Z225A		Z960Q		AH27F		AU22G
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		9/20/99
123		**PAHs (µg/L)**																					
124		**EPA Method SW8270 SIM**																					
125		Naphthalene	NA		NA		NA		NA		NA		NA		NA		NA		**8.2**		NA		NA
126		2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		**0.41**		NA		NA
127		Acenaphthylene	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA
128		Acenaphthene	NA		NA		NA		NA		NA		NA		NA		NA		**0.11**	M	NA		NA
129		Fluorene	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA
130		Anthracene	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	NA		NA
131		Dibenzofuran	NA		NA		NA		NA		NA		NA		NA		NA		0.10	U	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
1																										
2																										
3			LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S		LW2S	
4			BC27H		9912050-04A		BH75F		BR64C		CB49I		CK77I		CT55G		DE68C		DM52I		DW48K		ED23E		EM85F	
5			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		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	
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
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	
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	**0.86**		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																									

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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

	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	
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
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																									

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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

3			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																										

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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

	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	Z
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	
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		**0.66**		**0.31**		0.25	U	**0.28**		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	UJ	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	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	U
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	U
23	17	Benzoic Acid	10	U	10	U	10	UJ	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	UJ	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	UJ	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	UJ	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	UJ	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	UJ	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	UJ	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	UJ	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	UJ	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	1.3	UJ	1.0	U	NA		NA		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	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	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	0.25	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																									

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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

	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			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	
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	U
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)	**0.003**		**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	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)	**0.008**		**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	U
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	U
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	U
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																									

TABLE F-10
PHASE II REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - SHALLOW WELLS
DETECTED CONSTITUENTS
APRIL 1997 - OCTOBER 2003
TIME OIL - NORTHWEST TERMINAL

			LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S		LW102S	
			S167D		T160E		U235B		V211B		W371B		Z960S		AH76L		BH75B		CT37H		ED16B		EM75B		FF48C	
			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																										

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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

	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			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

	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																									Dup of LW103S			
2			LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW13D		LW103S	
3			S167B		T160C		U235D		V211A		W371D		Z960U		AH76N		BH75C		CT37K		ED16D		EM75D		EM75I		FF48E	
4			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		2/10/03	
5																												
6	1	**CHLORINATED PHENOLS (µg/L)**																										
7	2	**EPA Method SW8040**																										
8	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	0.25	U
9	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		NA	
10	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		NA	
11	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		NA	
12	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		NA	
13	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		NA	
14	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		NA	
15	10																											
16	11	**SEMIVOLATILES (µg/L)**																										
17	12	**EPA Method SW8270**																										
18	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		2	U
19	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		1	U
20	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		1	U
21	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		3	U
22	17	Benzoic Acid	10	U	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	50	U	NA		NA		50	U
23	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		1	U
24	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		1	U
25	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		5	U
26	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		5	U
27	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		1	U
28	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		1	U
29	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		1	U
30	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		5	U
31	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		1	U
32	27																											
33	28	**VOLATILES (µg/L)**																										
34	29	**EPA Method SW8260**																										
35	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		5	U
36	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		1	U
37	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		5	U
38	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		1	U
39	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		1	U
40	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		1	U
41	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		1	U
42	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		1	U
43	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		1	U
44	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		1	U
45	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		1	U
46	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		1	U
47	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		1	U
48	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		1	U
49	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		1	U
50	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		1	U
51	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		1	U
52	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		1	U
53	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		5	U
54	48.5	Methyl tert-butyl ether	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
55	49																											
56	50	**TOTAL PETROLEUM HYDROCARBONS (mg/L)**																										
57	51	**Method OR-DEQ**																										
58	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		0.25	U
59	53	**TPH-D Motor Oil**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
60	54	**TPH-Gasoline**	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
61	55																											

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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

	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 LW103S			
3			LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW13D		LW103S	
4			S167B		T160C		U235D		V211A		W371D		Z960U		AH76N		BH75C		CT37K		ED16D		EM75D		EM75I		FF48E	
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		2/10/03	
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		**0.008**	
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		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	**0.007**		0.002	U	**0.003**		NA		NA		0.002	U
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		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		NA		0.01	U
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		0.006	U
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		**15.4**	
74	67	Magnesium (mg/L) (6010)	**5.02**		**6.95**		**5.65**		**5.89**		NA		NA		NA		NA		NA		**6.51**		NA		NA		**5.89**	
75	68	Potassium (mg/L) (6010)	**1.8**		**2.0**		**2.0**		**1.3**		NA		NA		NA		NA		NA		**1.7**		NA		NA		**1.4**	
76	69	Sodium (mg/L) (6010)	**4.93**		**5.35**		**5.11**		**5.99**		NA		NA		NA		NA		NA		**5.57**		NA		NA		**6.7**	
77	70	Alkalinity (mg/L CaCO3) (SM 2320)	**95**		**84**		**71**		**84**		NA		NA		NA		NA		NA		**83**		NA		NA		**100**	
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		1	U
79	72	Bicarbonate (Alkalinity) (mg/L CaCO3) (SM 2320)	**95**		**84**		**71**		**84**		NA		NA		NA		NA		NA		**83**		NA		NA		**100**	
80	73	Total Dissolved Solids (mg/L) (EPA 160.1)	NT		**130**		**100**		**110**		NA		NA		**110**		**97**		**130**		**110**		NA		NA		**110**	
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		**2.8**	
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		**0.2**	
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		0.01	U
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		**0.2**	
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		**8.6**	
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

	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 LW103S			
3			LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW13D		LW103S	
4			S167B		T160C		U235D		V211A		W371D		Z960U		AH76N		BH75C		CT37K		ED16D		EM75D		EM75I		FF48E	
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		2/10/03	
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		7.12	
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		12.2	
90	83	Conductivity (um/hos)	157		222		180		198		214		128		174		135		160		170		187		188		184	
91	84	Dissolved oxygen (mg/L) (avg)									1.47		2.98		2.79		2.56		3.55		5.73		5.70		5.74		1.79	
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		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																												

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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

	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 LW103S			
3			LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW103S		LW13D		LW103S	
4			S167B		T160C		U235D		V211A		W371D		Z960U		AH76N		BH75C		CT37K		ED16D		EM75D		EM75I		FF48E	
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		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		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

	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	
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	**0.77**		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																									

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	
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**	
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																									

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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

	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

	A	B	C
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	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

Third Quarter 2004 Groundwater Monitoring and Groundwater Interim Action Status Report Time Oil Northwest Terminal Portland, Oregon

February 15, 2005

Prepared for

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1.0 INTRODUCTION

This report provides the results of the third quarter 2004 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 post-injection monitoring results for the first full scale *in situ* chemical oxidation (ISCO) event for treatment of upper zone groundwater and soil, and 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. Starting with the fourth quarter 2003 event, groundwater monitoring data were also collected from wells installed as part of the Phase III RI within the Main Terminal tank farm and Bell Terminal tank farm areas and other areas of the terminal not covered under previous investigations. Groundwater monitoring was initiated at the wells installed to monitor the ISCO activities as part of the third quarter 2003 groundwater monitoring event conducted in August 2003. 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 activities is provided in the draft Phase III RI report (Landau Associates 2004a).

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. Quarterly groundwater monitoring of the Phase II wells has been ongoing at the terminal since April 1997. 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 Remedial Investigation (RI) Work Plan (Landau Associates 2001). The groundwater monitoring locations at the terminal are shown on Figure 2.

The third quarter 2004 groundwater monitoring event was conducted from August 2 through August 10, 2004. This report summarizes groundwater elevation and groundwater quality data for the third quarter 2004, transmits analytical laboratory data packages and the associated data validation report, presents an evaluation of data collected during the third quarter 2004 (July 1 through September 30, 2004) for the groundwater interim action in the upper and lower water-bearing zones relative to compliance with defined performance criteria, and provides a summary of the initial full-scale *in situ* chemical oxidation (ISCO) injection event completed in July 2004.

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 third quarter 2004 event and for the previous RI quarterly events since March 1997 are

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provided in Appendix A, Table A-2. Groundwater quality data for the third quarter 2004 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-6. A summary of the third quarter 2004 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. As-built sketches of the lateral injection wells are provided in Appendix E. Groundwater elevation and chlorinated phenol concentration vs. Time graphs are presented in Appendix F. PCP mass removal calculations are presented in Appendix G. The data validation report for the third quarter 2004 data is provided in Appendix H. Laboratory data packages for these data are provided in Appendix I.

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 either electronically or on computer diskette. These tables will continue to be updated following each quarterly event.

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2.0 THIRD QUARTER 2004 GROUNDWATER MONITORING EVENT

The third quarter 2004 groundwater monitoring event was conducted from August 2 through August 10, 2004. The quarterly event included measurement of water levels at all groundwater monitoring wells, well points, and recovery wells and 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 third quarter 2004 event included the sampling of the routine Phase II monitoring wells; selected monitoring wells associated with the Phase II ISCO activities (OX-1S 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-14D, LW-17D, and LW-18D); and monitoring wells from the Phase III RI. Because the Phase II and Phase III wells were installed to monitor groundwater quality in different areas of the terminal, 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, all site monitoring wells, well points, recovery wells, and monitoring points are grouped as follows:

- Phase II: B1, B2, D, G1A, H, J1, J2, L, LW-3D, -4S/D, -5S, -6D, -7S, -8S, -9S/D, -10S/D, -11S/D, -13S, -14D, -15D, -16D, -17D, -18D, OX-1S through OX-7S, OX-8S/D, OX-9S, PZ-1 through PZ-4, RW-1, RW-2, HRW-1, SDM-1, and river outfall.

- Phase III: K, N, P, Q, O, R, LW-1S/D, LW-19S, -20S/D, -21S, -22D, -23D, -24D, -25D, -26D, -27S/D, -28S, -29S/D, -30S/D, -31S, -32S/D, -33S, -34S, and -35D.

A summary of the analyses conducted at each sample location scheduled for the third quarter 2004 event is provided in Table A-1. As shown in Table A-1, only select Phase II monitoring wells were sampled during the third quarter of 2004 per the recommendations to DEQ for reduction of sample frequency for Phase II monitoring wells (Landau Associates 2004b). 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 all 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. Section 4.0 presents information related to the ISCO interim remedial action program.

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2.1 GROUNDWATER LEVEL AND PRODUCT MEASUREMENTS

Groundwater levels were measured at each well for the third quarter 2004 event on August 10, 2004. 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 third quarter 2004 event, a trace amount of product was noted in well P. Measurable product was observed at wells LW-21S and LW-27S, located within the Main Terminal tank farm area at thicknesses of 0.17 ft and 0.12 ft, respectively. Measurable product was first noted at wells LW-21S and LW-27S during the first quarter 2004 sampling event following installation of these monitoring wells in September 2003. Keck passive product recovery bailers were installed at LW-21S and LW-27S in March 2004. To date, approximately 3 gallons of product have been removed from LW-21S. 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 product bailer was reinstalled at LW-27S during the third quarter 2004 sampling event to continue the product recovery efforts. The recovered product is temporarily contained in a 55-gal drum onsite pending appropriate offsite disposal. All 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 shallow wells were used to estimate groundwater flow conditions in the upper water-bearing zone (upper zone). Groundwater elevation contours for the upper zone are presented on Figure 3. Groundwater elevations measured during the third quarter 2004 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

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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, during the summer and fall months, 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 the wetter winter and spring months, groundwater is observed within the upper zone along this boundary. In the Bell Terminal tank farm area, well LW-28S, which is located where the confining unit is thin and likely discontinuous, was dry during the summer third quarter sampling event. 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.

2.1.3 Lower Water-Bearing Zone

Groundwater elevations measured in the deep wells were used to estimate groundwater flow conditions in the lower water-bearing zone (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, as demonstrated by the slight mounding of groundwater between the riverbank wells and the confining unit boundary, and 2) the residual influence of high river stage on groundwater elevations in wells inward of the riverbank wells due to lagtime effects following the shift in flow direction toward the river in response to falling river stage. Groundwater recovery well RW-2 pumped continuously during the third quarter 2004 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, such that hydraulic capture is achieved to the west near well LW-18D and to the south to well LW-10D. 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 predominantly include PCP and associated carrier compounds. Phase II wells are currently being sampled on a semiannual basis, as

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described earlier. For the third quarter 2004 event, groundwater from 18 upper zone Phase II wells and 14 lower zone Phase II wells were sampled and analyzed. Monitoring wells LW-9S and LW-10S were dry and not sampled as part of this event. Monitoring location LW-4D was not sampled during this event due to the damage sustained to the bentonite seal during the ISCO injection event conducted in July 2004. For this monitoring event, analytical results for groundwater collected from select Phase II wells were used to evaluate the performance of the groundwater interim action, to document water quality conditions following the first 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. Except as needed to assess the groundwater interim action and ISCO activities, discussions of the results from the Phase III wells and groundwater interim action are discussed in Sections 2.3 and 3.0, respectively.

Groundwater samples were analyzed for the following constituents 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 well LW-7S, 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). PCP analyses using EPA Method 8270 SIM were also conducted on samples containing nondetect concentrations of PCP using EPA Method 8270 and for monitoring of ISCO conditions. The laboratory analyses were conducted by Specialty Analytical, Inc., in Tualatin, Oregon, except as follows: the ferrous iron (EPA Method SM3500) analysis performed for samples collected at the ISCO monitoring locations, was performed by Analytical Resources Inc., in Seattle, Washington. Dioxin and furan analysis was performed on groundwater from wells OX-2S, OX-6S, and RW-1 (EPA Method SW8290) by Columbia Analytical, Inc. in Houston, Texas.

Analytical results for the third quarter 2004 event are provided in Tables A-3a through A-3g for the upper zone wells and in Tables A-4a through A-4f for the lower zone wells. A summary of the Phase II results are provided in the following sections. Data qualifier definitions are included in Table A-6.

2.2.1 Upper Water-Bearing Zone

The third quarter 2004 analytical results for the Phase II upper zone wells indicate that samples from nine wells contained concentrations of PCP greater than the laboratory reporting limits (Figure 5). The highest concentrations were detected in the samples from wells OX-2S, OX-6S and LW-11S [1,500, 604, and 604 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-4S, OX-7S,

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OX-8S, LW-4S, and RW-1 contained PCP concentrations ranging from 8.52 (LW-4S) to 160 (RW-1) µg/L. During the previous quarterly event, the highest detections of PCP were in samples from wells OX-2S (5,030 µg/L) and OX-6S (3,280 µg/L). Decreases in PCP concentrations within and downgradient of the former PCP mixing area appear to result from implementation of the ISCO interim remedial action. A further discussion of the reduction of PCP concentrations related to ISCO is discussed in Section 4.0.

In addition to PCP, other SVOCs were detected at low concentrations; however, none were greater than 42.8 µg/L (2-chloronaphthalene at RW-1). The highest concentrations of VOCs (ethylbenzene, isopropylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, n-propylbenzene, sec-butylbenzene, naphthalene, and xylenes) were detected in samples collected from 14 Phase II well locations (B1, D, J1, LW-7S, -8S, -11S, OX-1S through OX-4S, OX-6S through OX-8S, and RW-1). The highest concentrations of diesel-range TPH and gasoline-range TPH were observed at well RW-1 [6.12 milligrams per liter (mg/L) and 5.48 mg/L, respectively]. The highest individual concentrations of metals (arsenic and lead) were detected in samples collected at wells J1, OX-1S, OX-3S, OX-4S, and OX-8S. Arsenic concentrations from the upper zone Phase II wells ranged from nondetect at well LW-4S to 23.3 µg/L at well OX-8S. Lead concentrations ranged from nondetect (B1, D, LW-4S, LW-8S, LW-11S, OX-5S through OX-9S) to 1.07 µg/L at well OX-4S.

Dioxin and furan analysis was performed at well locations OX-2S, OX-6S and RW-1, which are located within and downgradient of the former PCP mixing area. Results from this sampling indicated that concentrations, as total equivalency quotient (TEQ), ranged from 0.001402 nanograms per liter (ng/L) at RW-1 to 0.02922 ng/L at OX-2S.

2.2.2 Lower Water-Bearing Zone

During this quarter, PCP was detected in lower zone wells G1A (5.22 µg/L) and RW-2 (13.5 µg/L) as shown on Figure 6. Other SVOCs, 2-methylnapthalene (6.18 µg/L) and naphthalene (1.87 µg/L), were detected at only 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 118 µg/L (iso-propylbenzene at G1A). The highest detected concentration of diesel-range TPH was 3.25 mg/L at well G1A and the highest detected concentration of gasoline-range TPH was 1.8 mg/L at RW-2. The highest concentrations of metals (arsenic and lead) were detected in samples collected from wells G1A, RW-2, LW-9D, LW-10D, LW-D and OX-8D. Arsenic concentrations from the lower zone Phase II wells ranged from 3.63 µg/L at well B2 to 30.7 µg/L at well LW-9D. Lead concentrations in the same wells ranged from nondetect at well B2 and RW-2 to 2.74 µg/L at well LW-11D.

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2.2.3 WATER LEVEL AND CONTAMINANT TRENDS

In addition to sampling associated with the groundwater interim action and ISCO activities, the third quarter data from the Phase II wells were 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 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 7 and 8. Plots of groundwater elevations and PCP concentrations for upper zone wells LW-4S and LW-11S are shown on Figures 9 and 10. Figure 11 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 third quarter 2004 event for the upper and lower water-bearing zones are plotted on Figures 5 and 6.

As shown on Figure 7, the PCP concentrations in the selected upper zone wells show variable concentration trends over time. The PCP concentration at RW-1 (160 µg/L) decreased compared to the two previous quarterly events, but is still above the historic low observed during November 2001 (17 µg/L). PCP concentrations in well LW-11S also decreased compared to the previous quarterly events (from 2,130 to 604 µg/L). Historically, PCP concentrations detected at well LW-11S appear to reflect a response to seasonal groundwater fluctuations, as shown on Figure 10. The PCP concentration at LW-13S has been reported at or near the detection limit since the fourth quarter 2001 event, except during the summer and fall 2003 sampling events when the detected concentration increased to slightly greater than 1 µg/L. At well LW-4S, concentrations increased to 8.52 µg/L after not being detected during the first quarter of this year. PCP concentrations at well LW-4S appear to reflect seasonal changes in groundwater elevation and resulting changes in PCP concentrations upgradient followed by downgradient migration of PCP (Figure 9). Overall reductions of PCP concentrations within monitoring wells within and downgradient of the former PCP mixing area appear to be a result of the July 2004 ISCO injection event. Further discussion on the impact of the ISCO injection event on the PCP plume is provided in Section 4.0.

As shown on Figure 8, the PCP concentrations in the lower zone at RW-2 have generally decreased since June 2002, but are greater than the historic low PCP concentration recorded at this well in June 2001 (0.68 µg/L). The PCP concentration at RW-2 for this quarter (13.5 µg/L) is lower than the

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concentration observed during last quarter (47.3 µg/L). Historically, sporadic detections of PCP have been observed in both LW-11D and G1A. During this quarterly event, PCP was not detected in well LW-11D and was detected at G1A at a concentration of 5.22 µg/L.

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 2000 and 2002. Trends in PCP concentrations can be correlated with groundwater elevations at some locations. Figure 9 shows that there appears to be a correlation between the water levels and PCP concentrations in the upper zone at well LW-4S and since the first quarter of 2002, as discussed earlier. Figure 10 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 similar trends with seasonal fluctuations in the Willamette River, as shown by the plot of groundwater elevations at LW-11D with river stage on Figure 11. 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 5 and 6, respectively) indicate that the overall extent of the PCP plume has narrowed and PCP concentrations are significantly lower than in previous quarters at all well locations, except for wells LW-4S and OX-2S. This reduction appears to be due to effects from the ISCO injection event, as discussed in Section 4.0. Monitoring well OX-2S, downgradient of the former PCP mixing area, contained the highest concentration of PCP (1,500 µg/L) for the upper zone wells for this quarter. For the lower zone wells, RW-2 and G1A were the only locations where PCP was detected, as noted earlier.

Contaminant and groundwater level trends will continue to be evaluated and discussed for 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., BTEX), polycyclic aromatic hydrocarbons (PAHs), and other associated petroleum-related compounds. For the third quarter 2004 event, groundwater from 12 upper zone Phase III wells and 11 lower zone Phase III wells was sampled and analyzed. These wells are indicated in Table A-1. Monitoring wells N, P, and Q were added to the Phase III sampling program this quarter to further

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define upper zone water quality within the Main Terminal Tank farm area. Monitoring well LW-28S was dry and not sampled as part of this event. Monitoring wells LW-21S, LW-27S and P were not sampled due to the presence of product at these well locations. The third quarter 2004 sampling event is the fourth consecutive quarterly monitoring event for the Phase III wells that were installed in September 2003.

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 (PAH, EPA 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). Monitoring wells K and LW-1S were analyzed for BTEX and TPH (gasoline range) only. The Phase III laboratory analyses were conducted by Specialty Analytical, Inc.

Analytical results for the third quarter 2004 event are provided in Tables A-3a through A-3g for the upper zone wells and Tables A-4a through A-4f for the lower zone wells. A summary of the Phase III results are provided in the following sections. Data qualifier definitions are included in Table A-6.

2.3.1 Upper Water-Bearing Zone

The third quarter 2004 results for the Phase III monitoring wells installed in the upper zone indicate the following:

- Gasoline-range TPH and diesel-range TPH were detected at the five upper zone Phase III well locations (LW-19S, -20S, -27S, N, and Q) within the Main Terminal tank farm area. Within the Bell Terminal tank farm area, four wells (LW-29S, -30S, -31S, and -32S) contained detected concentrations of diesel-range TPH and two wells (LW-30S and LW-32S) contained gasoline-range. The highest diesel-range TPH concentration was detected at well LW-20S (9.21 mg/L) and the highest gasoline-range TPH concentration was detected at well N (12 mg/L). Diesel-range TPH and gasoline-range TPH concentrations at the upper zone monitoring locations are shown on Figures 12 and 13, respectively.

- VOCs (isopropylbenzene; n-butylbenzene; n-propylbenzene; sec-butylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene) were detected in seven of the ten wells sampled for these constituents. The detected VOC concentrations ranged from about 2 µg/L (n-butylbenzene) at well LW-19S to 518 µg/L (1,2,4-trimethylbenzene) at well N. The highest benzene and toluene concentrations were observed at well location Q (1,030 and 21.2 µg/L, respectively), the highest concentrations of ethylbenzene and total xylenes were observed at well location N (744 µg/L and 904 µg/L, respectively). MTBE was nondetect in all upper zone wells where analyzed. Benzene and ethylbenzene concentrations at the upper zone monitoring locations are shown on Figures 14 and 15, respectively.

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- PAH detections were observed in a majority of the monitoring wells, with the highest detections noted at wells LW-20S, N, and Q. PAH concentrations ranged from nondetect to 54.5 µg/L (napthalene at well N).

- Other SVOC detections were limited to di-n-butyl phthalate at LW-20S (2.17 µg/L), 2,4-dimethylphenol at well N (4.48 µg/L) and dibenzofuran at well Q (3.70 µg/L).

- The highest detected metals concentrations occurred at wells LW-19S (arsenic 40.6 µg/L), well N (arsenic 37.3 µg/L and lead 7.33 µg/L), and well Q (arsenic 34 µg/L and lead 7.35 µg/L).

2.3.2 LOWER WATER-BEARING ZONE

The third quarter 2004 results for the Phase III monitoring wells installed in the lower zone indicate the following:

- Diesel-range TPH was detected in all lower zone Phase III wells sampled during this event. Gasoline-range TPH was detected in seven of the same monitoring wells. The highest TPH (diesel range) concentration was observed in lower zone Phase III monitoring well LW-24D (6.57 mg/L). Monitoring well LW-25D contained the highest gasoline-range TPH concentration (0.98 mg/L). Diesel-range TPH and gasoline-range TPH concentrations at the lower zone monitoring locations are shown on Figures 16 and 17, respectively.

- The highest concentrations of VOCs (benzene, isopropylbenzene, n-propylbenzene, and sec-butylbenzene) ranged from 1.6 µg/L (sec-butylbenzene; LW-23D) to 26.1 µg/L (benzene; LW-23D). MTBE was detected in Phase III lower zone well LW-23D (3.17 µg/L) and well LW-26D (2.38 µg/L), which are located within the Main Terminal tank farm area. Benzene and ethylbenzene concentrations at the lower zone monitoring locations are shown on Figures 18 and 19, respectively.

- PAHs were detected in nine Phase III lower zone wells with individual concentrations ranging from 0.0584 µg/L (acenaphthlyene at well LW-35D) to 2.65 µg/L (fluorene at well LW-24D).

- Other SVOC detections were limited to bis(2-ethylhexyl)phthalate detected at seven Phase III lower zone wells. Concentrations ranged from 1.37 µg/L at well LW-29D to 3.77 µg/L at LW-26D.

- Arsenic was detected in 10 of the 11 Phase III lower zone wells at concentrations ranging from 6.94 µg/L at well LW-29D to 43.5 µg/L at well LW-23D. Five or more priority pollutant metals (arsenic, chromium, copper, lead, nickel and zinc) were detected at lower zone well LW-20D, LW-23D, LW-24D, LW-25D, LW-26D, and LW-27D.

2.3.3 WATER LEVEL AND CONTAMINANT TRENDS

The four quarters of data collected from the Phase III wells were used to evaluate contaminant trends within areas of the terminal used historically for petroleum operations. The analytes detected in

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the Phase III wells during the third quarter 2004 and previous quarters are predominantly constituents commonly associated with petroleum products. This contaminant trend discussion focuses on petroleum hydrocarbons (gasoline- and diesel-range) and VOCs (benzene and ethylbenzene) because these constituents are related to former petroleum operations at the terminal and will likely drive cleanup activities; however, other constituents were detected, as described in the previous section. The diesel-range and gasoline-range petroleum hydrocarbons, benzene, and ethylbenzene concentrations for the upper and lower water-bearing zones for the third quarter 2004 are plotted on Figures 12 through 19. The groundwater concentration contours contained in the draft Phase III RI report (Landau Associates 2004a) include data from monitoring wells sampled during the fourth quarter 2003 event, as well as data collected from single event direct-push locations. The contours shown in subsequent quarterly reports only contain data from permanent monitoring wells.

Since the primary pathway of concern at the terminal is from groundwater to surface water, the groundwater analytical results were contoured using preliminary screening levels (Figures 12 through 19), as presented in the draft Phase III RI report (Landau Associates 2004a). 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 2004a); and DEQ generic risk-based concentrations for petroleum constituents (DEQ 2003). Screening values for TPH are not risk-based and are presented here for demonstrative purposes only.

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- and gasoline-range TPH concentrations for selected upper zone and lower zone wells in the Main Terminal tank farm area are shown on Figures 20 through 23. These same constituents for upper zone wells in the Bell Terminal are shown on Figures 24 and 25. 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 are provided on Figures 26 through 29 (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 (LW-30S/D) are shown on Figures 30 and 31.

Concentrations of diesel- and gasoline-range TPH for the upper and lower zone Phase III wells were generally similar to those detected during the previous quarters, with the exception of upper zone

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well LW-27S located within the Main Terminal tank farm area. During this quarter and the first quarter 2004 sampling event, measurable product was observed at this location. In addition to the third quarter 2004 event, product has been observed at monitoring well LW-21S during each of the three prior quarterly events since installation of this well. Based on information collected for the Phase III RI, the potential sources of this 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. The two separate diesel-range TPH plumes visible in the upper and lower zones (Figures 12 and 16) and the separate ethylbenzene plumes in the upper zone (Figure 15) 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 oils used with the PCP formula during wood treatment formulation activities within the former PCP mixing area. This interpretation is supported by the product sample results collected from well LW-11S in November 2000, which contained 3.2 percent PCP in addition to other petroleum constituents, versus the product sample results collected from wells LW-21S and LW-27S in April 2004 (Landau Associates 2004d), which contained only petroleum constituents (e.g., gasoline-, diesel-, and motor oil-range TPH). The area including LW-8S is included in the plumes associated with the former petroleum operations in the Main Terminal tank farm area for the TPH compounds and ethylbenzene because upper zone groundwater flow in this area appears to be more to the south-southwest (Figure 3) and contaminant migration of constituents originating in the former PCP mixing area (e.g., PCP) have not been observed at this location.

Benzene and ethylbenzene concentrations are presented on Figures 14 and 15 for the upper zone and Figures 18 and 19 for the lower zone. In general, the overall distribution of these compounds remain generally unchanged during the previous four quarters where data are available, with one exception: monitoring wells N and Q were sampled for the first time during the third quarter 2004 event since initially installed in 1994 because these wells typically contained product. Benzene and ethylbenzene concentrations in wells N and P are elevated over those observed in other parts of the terminal with benzene concentrations at 424 and 1,030 µg/L and ethylbenzene concentrations at 744 and 12.1 µg/L, respectively. Also, benzene concentrations at monitoring location LW-23D within the Main Terminal tank farm area nearest the river decreased significantly to 26.1 µg/L from the high detected during the previous sampling event (132 µg/L). Of the lower zone well locations sampled, the only detections of

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benzene were observed at LW-23D and RW-2 (26.1 µg/L and 3.88 µg/L, respectively), and the only detection of ethylbenzene (6.19 µg/L) was observed at RW-2.

Contaminant trend data indicate that diesel-range TPH concentrations in the upper zone within the Main Terminal tank farm area have ranged between about 3 to 12 mg/L, with the highest concentrations occurring at well LW-20S during three of the four quarters when data are available (Figure 20). Gasoline-range TPH concentrations in the upper zone within the Main Tank Farm area are consistently greatest at well LW-8S over time with concentrations at this well ranging from greater than 4 to 15 mg/L since this well was first sampled in May 1999 (Figures 21 and 26). Concentrations of diesel-range TPH in the lower zone within the Main Terminal tank farm area tend to be significantly greater than gasoline-range TPH at the same locations over time (Figures 22 and 23), but less overall than the upper zone concentrations for these constituents (Figures 20 and 21). Also, TPH concentrations in groundwater from lower zone wells located beyond the extent of the confining unit tend to be greater than those farther to the east where the confining unit is present, likely as a result of the higher TPH concentrations in upper zone groundwater mixing with lower zone groundwater downgradient of the confining unit boundary. The highest concentration of diesel-range TPH since quarterly monitoring began at these wells occurred at well LW-25D in February 2004 (about 6.7 mg/L); however, the concentration this quarter was 3.17 mg/L. Diesel-range concentrations at the other lower zone wells in the Main Terminal tank farm area decreased slightly this quarter with the exception of monitoring locations LW-6D, LW-20D, and LW-25D (Figure 22). Gasoline-range concentrations for lower zone wells in the Main Terminal tank farm area showed similar overall trends to the diesel-range concentrations, except at wells LW-27D and LW-35D where slight increases of gasoline-range TPH were observed (Figure 22).

In the Bell Terminal, diesel-range TPH concentrations in the upper zone are slightly greater than gasoline-range concentrations, with the highest concentrations for both constituents typically occurring at LW-32S (4.24 mg/L for diesel-range TPH in August 2004 and 1.8 mg/L for gasoline-range TPH in October 2003; Figures 24 and 25). Slight increases for both of these constituents were generally observed in the other upper zone wells between the second and third quarters of 2004, except at LW-30S. (Note that well LW-33S was dry during the October 2003 event and LW-28S was dry during the October 2003 and August 2004 events.) Lower zone groundwater concentrations in the Bell Terminal for these constituents are much less than the upper zone concentrations, as shown on Figures 16 and 17. Also, diesel- and gasoline-range TPH concentrations are much less in upper zone groundwater in the Bell Terminal than in the Main Terminal tank farm area (Figures 12 and 13).

Comparison of the diesel- and gasoline-range TPH, benzene, and ethylbenzene concentrations with groundwater level elevations at selected well locations in the Main Terminal tank farm area indicate that groundwater concentrations in upper zone wells are likely influenced by seasonal fluctuations in

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groundwater levels, as demonstrated by the long-term data in well LW-8S (Figure 26). At well LW-8S, long-term diesel-range concentrations appear to be progressively increasing over time, benzene concentrations are progressively decreasing, and gasoline-range TPH and ethylbenzene concentrations have stayed relatively constant since about February 2002. At lower zone wells LW-23D and LW-25D (Figures 27 and 28), groundwater level elevations correlate with river stage fluctuations, as expected; however, any trends in groundwater concentrations in response to groundwater level fluctuations or river stage fluctuations is not apparent based on the available data. Diesel-range TPH concentrations at upper/lower zone well pair LW-20S/-20D in the Main Terminal tank farm area indicate that upper and lower zone concentrations for this constituent are relatively similar at this location, and are all less than 1.0 mg/L (Figure 30). 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, concentrations of diesel- and gasoline-range TPH, benzene, and ethylbenzene in upper zone well LW-32S have remained relatively constant over time and no correlation between groundwater concentrations and groundwater levels is apparent based on the available data (Figure 29). Similarly, 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 appears to be a slight correlation at the upper zone well LW-30S (Figure 31). Diesel-range TPH concentrations have been slightly greater in the upper zone than the lower zone at this well pair, except for this quarter.

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 third quarter of 2004 (July 1 through September 30, 2004). 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 implemented in a storm drain (SDM-1) at the site.

Specific operational information for the third quarter 2004, 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 August 10, 2004. The groundwater elevation data are summarized in Table A-2 and presented on Figure 3.

- During the third quarter 2004, groundwater was extracted from the upper zone recovery well, HRW-1, when sufficient water was present in the extraction well. A total of approximately 2,419 gallons of groundwater was recorded as being recovered from HRW-1 during the third quarter of 2004 at an estimated rate of 0.03 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 subsequently discharged to the sanitary sewer under a permit with the City of Portland. Groundwater collected from HRW-1 contained a PCP concentration of 16.6 µg/L on August 5, 2004. A summary of groundwater recovery 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 July 1 through September 30, 2004 by operating the groundwater recovery pump in RW-2. A total of approximately 839,329 gallons of groundwater was recorded as being recovered from RW-2 during the third quarter of 2004 at an estimated average rate of 8.6 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 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 August 10, 2004. 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 August 2 through August 10, 2004. 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 6, respectively, based on data collected during the August 2004 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 diminished in comparison to previous quarterly events. The third 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 July 1 and September 30, 2004, 151,961 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 1.7 gpm. Groundwater collected from the storm drain contained a PCP concentration of 158 µg/L on August 5, 2004 (Appendix B, Table B-1). During the third quarter 2004 sampling event, the Willamette River level was below the elevation of the outfall of the storm drain line; therefore a water quality sample was collected for PCP analysis to assess whether the capture of PCP-containing water was occurring. A sample was collected at the outfall on August 5, 2004 and results indicated that PCP was not detected.

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 third quarter 2004 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 ranged from nondetect to 37.5 µg/L and pH ranged from 7.0 to 8.0 during the third

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quarter 2004. 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 two times per week. On July 7, 2004, a discharge sample was also collected for analysis of BTEX. Analytical results 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).

This third quarter 2004 groundwater monitoring event collected information used to document baseline (pre-injection) site conditions. Section 4.0 presents information related to this baseline (pre-injection) groundwater sampling event, a description of the method used for ISCO injection, a post-injection groundwater sampling event, and an evaluation of the data compiled with respect to performance of the ISCO technique.

4.1 BASELINE GROUNDWATER MONITORING EVENT

In preparation for the ISCO interim remedial action, and as a follow up to the soil removal activities completed in 2002, four monitoring wells (OX-5S through OX-8S) were installed in the vicinity of the former PCP warehouse and mixing area in September 2003. In addition, as requested by DEQ (DEQ 2004c), one monitoring well (OX-9S) was installed on July 14, 2004 to define the eastern extent of the PCP plume. Soil sample results and the boring log for OX-9S will be provided in the final Phase III RI report, currently in preparation. These five monitoring wells, and the six additional monitoring wells (RW-1, LW-11S, and OX-1S through OX-4S) previously used to monitor results of the pilot test, were sampled on June 9 and 10, 2004 to document baseline conditions prior to the injection of chemical oxidation reagents into the groundwater and to evaluate the effect of the ISCO program on PCP, selenium, and iron concentrations between the injection events. Samples from three of the monitoring wells (OX-2S, OX-6S, and RW-1) were also analyzed for dioxin/furan compounds.

Subsequent to the completion of the baseline water sampling at RW-1, LW-11S, and OX-1S through OX-8S, Landau Associates agreed to comply with a DEQ May 24, 2004 letter request to include three additional wells (LW-13S, LW-4D, and LW-11D) and the groundwater intercept system located at SDM-1 in the baseline and post-injection monitoring program (DEQ 2004c). During the ISCO injection event conducted in July 2004, the well seal of LW-4D was damaged so this well will not be included as a monitoring point to be evaluated in the future. However, a replacement well for LW-4D (LW-4DR) was

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installed in November 2004, and will be used as a future monitoring point. Prior to the ISCO injection event, LW-13S and LW-11D were most recently sampled in February 2004 and SDM-1 was most recently sampled on May 6, 2004, therefore these data will be considered baseline conditions for the July 2004 ISCO injection event. Sampling and analysis activities were performed in accordance with the SAP included in the ISCO work plan (Landau Associates 2004c).

4.2 DESCRIPTION OF INJECTION METHOD

On July 12 through 16, 2004, Time Oil's contractor (ISOTEC) injected ISCO reagents (17 percent hydrogen peroxide, complexed iron catalyst, and tap water) at 40 (IP-1-A through IP-21-A, and IP-23-A through IP-41-A) direct-push injection points 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 ISCO work plan proposed the use of 30 direct push injection points, but 11 additional points were installed in the former PCP source area to increase the potential for the reagents to spread out in the saturated zone. The approximate locations of the direct-push ISCO injection points and lateral injection wells are shown on Figure 32.

4.2.1 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 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:

- Approximately 25 gallons of hydrogen peroxide, 25 gallons of iron catalyst, and 25 gallons of tap water were injected at injection points IP-27-A and IP-30-A. The lower volume of reagents were used at these points because the points were located near monitoring wells and the injection of ISCO reagents at IP-29-A, which was similarly located close to monitoring well LW-4D, caused damage to the well seal of LW-4D.

- Injection was not completed at injection point IP-22-A because high backpressure was experienced during the initial injection of tap water into the injection point. The high back pressure is indicative of less permeable soils in the injection area, therefore ISCO reagents would not be expected to migrate outward into the saturated zone formation.

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A total of approximately 7,650 gallons of 17 percent hydrogen peroxide, 7,650 gallons of iron catalyst, and 2,330 gallons of tap water were injected into the subsurface using the direct-push points.

4.2.2 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 well. A total of approximately 1,200 gallons of 17 percent hydrogen peroxide, 1,200 gallons of iron catalyst, and 720 gallons of water were pumped into the subsurface using the lateral injection wells. As-built sketches of the lateral injection wells are provided in Appendix E.

4.3 POST GROUNDWATER INJECTION MONITORING

The third quarter 2004 groundwater monitoring event was conducted on August 2 through 10, 2004. 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:

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

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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-2S, and OX-6S were also analyzed for dioxin/furan compounds by Columbia Analytical Services of Houston, Texas using EPA Method 8290.

4.4 DATA EVALUATION

Based on the data collected prior to, during, 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 4.3. 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 and we will not include an evaluation of analytical results from well LW-4D because the well seal was damaged during the ISCO injection events. A discussion of each of the evaluation criteria is provided in the following sections. The data analysis was performed to assess the effectiveness of the ISCO program for reducing PCP concentrations in upper zone groundwater, to determine if the ISCO injection causes detrimental impacts to groundwater, and to determine if modifications need to be made prior to future ISCO injection events.

4.3.1 EFFECTS ON PCP CONCENTRATION IN UPPER ZONE GROUNDWATER

Prior to the July 2004 ISCO injection event, groundwater samples were collected on June 9 and 10, 2004 by Landau Associates from monitoring wells RW-1, LW-11S, and OX-2S through OX-8S to establish baseline conditions for chlorinated phenols (including PCP; 2,4,6-trichhlorophenol (TCP); 2,4,5-TCP; 2,4-dichlorophenol (DCP); and 2-chlorophenol) using EPA Method 8270. Baseline groundwater

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samples were collected from wells LW-13S, LW-4D, and LW-11D in February 2004. A baseline water sample from SDM-1 (analyzed for PCP only) was collected on May 6, 2004. Following the ISCO injection event, Landau Associates collected water samples from RW-1, LW-11S, LW-13S, OX-1S through OX-4S, OX-6S, OX-7S, OX-8S, and LW-11D for chlorinated phenol analysis and SDM-1 for PCP analysis on August 4 through 6 2004. Appendix G Figures G-1 through G-12 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, 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, LW-13S and OX-1S through 4S, OX-6S, OX-7S, and OX-8S) was reduced by 63 percent (OX-8S) to 92 percent (OX-3S). The PCP concentration in the deep groundwater monitoring well (LW-11D) was reduced from 1.5 µg/L to less than 0.5 µg/L. The PCP concentration in the water collected from SDM-1 was reduced from 1,000 µg/L to 158 µg/L.

Comparison of the PCP plumes in the upper zone using the June 2004 (Figure 33) and August 2004 (Figure 34) data, shows an apparent reduction in the estimated lateral extent of the plume in the east-west direction. However, the north-south extent of the plume remains relatively unchanged, although PCP concentrations were significantly reduced. The extent of the PCP plume in the lower zone groundwater is negligible, as presented on Figure 6, therefore comparison of baseline and post-injection conditions are not presented in this report.

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 as reported; however, we lack sufficient data to prepare concentration graphs at this time. Tetrachlorophenol compounds, an additional chlorinated phenol, are not reported because the laboratory did not quantify this compound in the standard EPA Method 8270 analysis. The laboratory has reported that a qualitative analysis of the data indicates that tetrachlorophenol was not present in the baseline or post-injection groundwater samples. 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 July 2004 introduced a total of approximately 20,750 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 9 percent.

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4.4.2 MASS REMOVAL OF PCP IN GROUNDWATER

The mass of PCP in the upper zone groundwater prior to the ISCO injection in July 2004 was estimated to be approximately 1.01 pounds, based on the groundwater samples collected in June 2004. The mass of PCP in the upper zone groundwater following the ISCO injection in July 2004 was estimated to be approximately 0.32 pounds, based on the groundwater samples collected in August 2004. The PCP mass calculations are provided in Appendix G. Based on the mass calculations, it appears that the ISCO injection in July 2004 may have effected a mass reduction of PCP of approximately 0.69 pounds, or 68 percent. If a direct correlation could be assumed from the dosage of 17 percent hydrogen peroxide and complexed iron catalyst (8,850 gallons of each reagent) utilized during the July 2004 ISCO injection event to achieve the 68 percent reduction in the mass of PCP in the upper zone groundwater, then a dosage of approximately 11,700 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.

4.4.3 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 ISCO event in reducing PCP concentrations in the upper zone groundwater, a ROI of approximately 25 ft appears to be accurate.

4.4.4. EFFECTS ON DIOXIN/FURANS IN GROUNDWATER

Prior to the July 2004 ISCO injection event, groundwater samples were collected on July 12, 2004 by Landau Associates from monitoring wells RW-1, OX-2S, and OX-6S to establish baseline conditions for dioxin/furan compounds. Following the ISCO injection event, Landau Associates collected groundwater samples from RW-1, OX-2S, and OX-6S on August 4, 2004 to establish post-injection conditions for dioxin/furan compounds. After calculating the TEQ for dioxin/furans in the groundwater samples (Table A-3g), the change in concentrations of dioxin/furan compounds in the three monitoring wells were as follows:

- The TEQ in RW-1 increased from 0.00016272 ng/L to 0.001402 ng/L.
- The TEQ in OX-2S decreased from 0.11 ng/L to 0.02922 ng/L.
- The TEQ in OX-6S increased from 0.003588 ng/L to 0.300869 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

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monitored in these three wells in the future to determine if there are concentration trends change that can be attributed to future ISCO injection events.

4.4.5 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.

4.4.6 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 the ISCO injection event, water samples were collected on June 9 and 10, 2004, by Landau Associates from monitoring wells RW-1, LW-11S, and OX-2S through OX-8S to establish baseline conditions for ferrous iron and selenium using Standard Method 3500-Fe and EPA Method 6010, respectively. Baseline concentrations of ferrous iron and selenium were not established for LW-13S or LW-11D prior to the July 2004 ISCO injection event, therefore we have not included these wells in an evaluation for these metals. Following the ISCO injection event, Landau Associates collected water samples from RW-1, LW-11S, and OX-2S through OX-8S for ferrous iron and selenium analysis.

Based on the analytical data presented in Table A-3e the ferrous iron concentration in the upper zone groundwater increased in wells OX-2S, OX-4S, OX-7S, OX-8S and decreased in monitoring wells OX-1S, OX-3S, OX-6S, 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-4S (49.9 mg/L). The lower zone groundwater was not analyzed for ferrous iron before the injection event, but the sample from OX-8D contained a ferrous iron concentration of 15.2 mg/L in the post-injection sample, as presented in Table 4e.

The analytical data presented in Tables A-3e and A-4e indicates that selenium was not present prior to or after the ISCO injection event in the upper or lower zone groundwater samples collected.

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5.0 FUTURE GROUNDWATER TASKS

5.1 GROUNDWATER MONITORING

The fourth quarter 2004 groundwater sampling event was conducted during the first half of November 2004 following the installation of the additional Phase III monitoring wells. The groundwater monitoring and analytical program for the fourth quarter 2004 event includes the following: 1) monitoring at Phase II quarterly well locations per the approved modifications from February 2004 discussed in Section 1.0; 2) monitoring of ISCO injection monitoring wells as per the ISCO work plan (Landau Associates 2004c); 3) monitoring of the Phase III RI monitoring wells installed in September 2003; and 4) the monitoring of the 12 additional wells installed during October and November 2004. The results for the Phase II and Phase III fourth quarter 2004 groundwater monitoring event and the fourth quarter groundwater interim action status will be provided in the *Fourth Quarter 2004 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 fourth quarter of 2004. 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.

Alternatives will be evaluated to address the petroleum free product and elevated concentrations of VOCs in the former Main Tank farm area. Preliminary alternatives being considered include using recovery wells to route free product and impacted groundwater through the existing remediation system, installing an air sparge and soil vapor extraction system, or utilizing ISCO technology.

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 mid to late winter as groundwater elevations rise. The higher elevation of the groundwater table should allow for better distribution of ISCO reagents into the upper zone groundwater.

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The next ISCO injection event is anticipated to occur in January and February of 2005. The number and proposed locations for the injection points will be identified following a review of the fourth quarter 2004 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.

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