PORT OF OAKLAND

May 13, 1999

Mr. Larry Seto
Alameda County
Department of Environmental Health
1131 Harbor Bay Parkway, Second Floor
Alameda, California 94502-6577

SUBJECT: **SEMI-ANNUAL MONITORING REPORT**
UNION PACIFIC MOTOR FREIGHT YARD
PORT OF OAKLAND
OAKLAND, CALIFORNIA

Dear Mr. Seto:

Please find enclosed a copy of the *First Semi-Annual 1999 Groundwater Monitoring Report, Union Pacific Railyard, Motor Freight Railyard, 1750 Ferro Street, Oakland, California*, dated April 29, 1999. Should you have any questions regarding the report please contact me at 272-1373.

627-

Sincerely,

John Prall

John Prall, R.G.
Associate Environmental Scientist

Enclosure

cc: Neil Werner

99 MAY 17 AM 10:08
ENVIRONMENTAL PROTECTION

530 Water Street ■ Jack London Square ■ P.O. Box 2064 ■ Oakland, California 94604-2064
Telephone (510) 272-1100 ■ Fax (510) 272-1172 ■ TDD (510) 763-5703 ■ Cable address, PORTOFOAK, Oakland

CDM Camp Dresser & McKee Inc.

consulting engineering construction operations

One Walnut Creek Center
100 Pringle Avenue, Suite 300
Walnut Creek, California 94596
Tel: 925 933-2900 Fax: 925 933-4174

April 29, 1999

Mr. John Prall
Port of Oakland
Environmental Health and Safety Compliance Department
530 Water Street
Oakland, CA 94607

Subject: *First Semi-Annual 1999 Groundwater Monitoring Report*
Union Pacific Railroad
1750 Ferro Street, Oakland, California

Dear Mr. Prall:

The Camp Dresser & McKee Inc./F.E. Jordan Joint Association (CDM/FEJ) is pleased present the enclosed First Semi-Annual 1999 Groundwater Monitoring Report for the Union Pacific Railroad Motor Freight Railyard located at 1750 Ferro Street in Oakland, California. As required by a written directive from the Alameda County Department of Environmental Health, this report presents the findings of the November 1998 and February 1999 sampling events conducted at the site.

The results of the first semi-annual monitoring showed that the dissolved BTEX and TPH concentrations in the monitored wells were consistent with historic concentration ranges. However, there was an order of magnitude decrease in TPH-D concentrations during the February 1999 monitoring event from the previous monitoring event in most of the wells. The groundwater flow direction was to the southeast during the two monitoring events and consistent with previous groundwater monitoring events.

Please contact the undersign at (925) 933-2900 if you have any questions or comments regarding the report.

Very truly yours,

CAMP DRESSER & McKEE INC.

Hoa Voscott
Task Manager

Michael G. Gray, C.E.G.
Project Manager

Enclosure

First Semi-Annual 1999 Groundwater Monitoring Report

Union Pacific Railroad
Motor Freight Railyard
1750 Ferro Street
Oakland, California

PREPARED FOR:

Port of Oakland
530 Water Street
Oakland, California 94607

APRIL 1999

PREPARED BY:

Camp Dresser & McKee Inc./F.E. Jordan
Joint Association
100 Pringle Avenue, Suite 300
Walnut Creek, California 94596

Executive Summary

This first semi-annual 1999 groundwater monitoring report presents the findings of the November 1998 and February 1999 sampling events conducted at the Union Pacific Railroad Motor Freight (UPMF) railyard at 1750 Ferro Street in Oakland, California. The report was prepared by the Camp Dresser & McKee Inc./F.E. Jordan Joint Association (CDM/FEJ) on behalf of the Port of Oakland (Port). Groundwater monitoring at UPMF railyard is being performed following written directive from the Alameda County Department of Environmental Health, Hazardous Materials Division (ACDEH) to Union Pacific Railroad (UPRR) in 1993.

On December 24, 1998, the Port bought out UPRR's lease and consequently assumed responsibility for the groundwater monitoring at the UPMF and UPRR trailer-on-flat-car (TOFC) railyards. On behalf of the Port, CDM/FEJ has performed the groundwater monitoring at the UPMF railyard since February 1999. Work performed at the UPMF and TOFC railyards was previously performed by Environmental Decision Group, Inc. (formerly Laidlaw Consulting Services) and their subcontractor, Burns & McDonnell, on behalf of UPRR. Groundwater monitoring results for the TOFC railyard will be presented in a separate report.

Presently, 10 groundwater wells monitor the UPMF railyard to determine the lateral extent of petroleum hydrocarbons in the groundwater. Regular quarterly groundwater monitoring, started in January 1993, continues to be performed to monitor the potential migration of the contaminants in the groundwater. On June 1998, ACDEH approved the reporting frequency to be decreased from quarterly to semi-annually (April and October).

On November 30, 1998 and February 17 through 19, 1999, groundwater samples were collected from four quarterly and seven semi-annually monitored wells, respectively. The groundwater samples were analyzed for total petroleum hydrocarbons as diesel (TPH-D) and gasoline (TPH-G) and for purgeable aromatic hydrocarbons. In addition, arsenic was analyzed during the February 1999 monitoring event.

Concentrations of petroleum hydrocarbons, purgeable aromatics, and arsenic in the groundwater samples collected from the monitoring wells were comparable to those obtained from previous sampling events. However in most of the wells, there was an order of magnitude decrease in TPH-D concentrations during the February 1999 monitoring event from the previous monitoring event. Groundwater flow beneath the UPMF railyard is southeast towards Oakland Inner Harbor.

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Section 1
Introduction

This semi-annual report presents the results from the November 1998 and February 1999 groundwater monitoring events conducted at the Union Pacific Railroad Motor Freight (UPMF) railyard at 1750 Ferro Street in Oakland, California (Figure 1). The report was prepared by the Camp Dresser & McKee Inc./F.E. Jordan Joint Association (CDM/FEJ) on behalf of the Port of Oakland (Port).

Groundwater monitoring at UPMF is being performed in response to an April 29, 1993, Alameda County Department of Environmental Health, Hazardous Materials Division (ACDEH) request for Union Pacific Railroad (UPRR) to begin a quarterly monitoring program at the UPMF facility. Previous site activities by UPRR have resulted in groundwater contamination by petroleum and aromatic hydrocarbon compounds. In a letter dated June 1, 1998, the ACDEH approved the reporting frequency to be decreased from quarterly to semi-annually (April and October).

On December 24, 1998, the Port assumed responsibility for the groundwater monitoring at the UPMF and UPRR trailer-on-flat-car (TOFC) railyard and for operation, maintenance, and monitoring (OM&M) of the two groundwater treatment systems at the sites. On behalf of the Port, CDM/FEJ has performed the groundwater monitoring at the UPMF railyard (site) since February 1999. Work performed at the UPMF and TOFC railyards was previously performed by Environmental Decision Group, Inc. (formerly Laidlaw Consulting Services) and their subcontractor, Burns & McDonnell, on behalf of UPRR. Groundwater monitoring results for the TOFC railyard will be presented in a separate report.

This report presents the results of fluid-level measurements and analytical results for groundwater samples collected in November 1998 by Environmental Decision Group and by CDM/FEJ in February 1999. The groundwater monitoring program is directed towards understanding the hydraulic flow direction and the changes in the concentration of dissolved petroleum hydrocarbons at the UPMF railyard. This report includes a discussion of the background information about the site, field and analytical results for the semi-annual period (October 1, 1998 to March 31, 1999), and conclusions.

1.1 Background

The site is located on the southeastern portion of TOFC railyard, which is adjacent to the Oakland Inner Harbor or Oakland Estuary (Figures 1 and 2). The area surrounding the site is used for heavy to light commerce. Residential areas are located approximately one-half mile north of the site and across the Oakland Estuary one-half mile south of the site.

Five underground storage tanks (USTs) were removed from the UPMF railyard between 1987 and 1990. As a result of the tank removal activities, a site assessment was performed in two phases to define the extent of petroleum hydrocarbons in the soil and groundwater (Laidlaw, 1993). For brevity, the light non-aqueous phase of these hydrocarbons is referred to as "product."

Groundwater monitoring has been conducted at the site since 1993. A skimming system that removes product only has operated periodically in recovery well RW since May 2, 1994. Due to the limited volume of product recovered and the amount of time the skimmer was inoperable, a request was made in the First Quarter 1998 Monitoring Report dated April 28, 1998, to decrease the frequency of fluid-level measurements in recovery well RW from monthly to quarterly and to discontinue product skimming. In a letter dated July 21, 1998, the ACDEH approved the request.

The refueling portion of the TOFC railyard, approximately 700 feet northwest and upgradient of the UPMF railyard, is currently undergoing groundwater remediation for recovery of non-aqueous phase liquid as diesel. The extent of contamination at the refueling area was defined during previous investigations (Laidlaw, 1991). On the basis of these investigations and subsequent monitoring, petroleum hydrocarbons from the refueling area do not extend to the UPMF railyard. Therefore, the TOFC railyard is a separate project and will be discussed in a future report, due for presentation to the ACDEH in July 1999. However, the water level data collected from the TOFC railyard in conjunction with the site are used to contour the local groundwater elevations and are depicted in Figures 3 and 4.

Section 2
Completed Activities

Since submission of the Semi-Annual Monitoring Report (April 1 to September 30, 1998), dated October 27, 1998, to the ACDEH by Environmental Decision Group Inc., the major activities completed at the site were groundwater monitoring and resurvey of the monitoring wells. Work performed during the monitoring events followed the standard operating procedures previously approved by the ACDEH (Laidlaw, 1994). The scope of work during this semi-annual monitoring period (October 1, 1998 to April 31, 1999) consisted of the following:

- Measuring fluid-levels in all of the UPMF groundwater monitoring wells quarterly (conducted in November 1998 and February 1999);
- Semi-annual (February 1999) purging and sampling of all groundwater monitoring wells where product is not observed. Monitoring wells OKUS-W2, OKUS-W3, APL/UP-W1 and APL/UP-W2 have additional quarterly sampling in November 1998;
- Analyzing groundwater samples for total petroleum hydrocarbons and volatile aromatic constituents quarterly (conducted in November 1998 and February 1999) and for arsenic annually (February 1999); and
- Determining the local groundwater flow direction and hydraulic gradient based on the potentiometric surface elevations.

2.1 Field Activities and Procedures

November 1998 Monitoring Event

On November 30, 1998, Environmental Decision Group measured fluid levels from the ten monitoring wells (OKUS-W1, OKUS-W2, OKUS-W3, OKUS-W5, OKUS-W6, OKUS-W7, OKUS-W8, APL/UP-W1, APL/UP-W2, and RW) at the site. Two of the wells (OKUS-W5 and OKUS-W6) contained product. In addition, fluid levels were measured from the 17 wells located at the TOFC railyard. Environmental Decision Group's fluid level measurement log is presented in Appendix A.

On November 30, 1998, Environmental Decision Group purged and collected groundwater samples from the four wells (OKUS-W2, OKUS-W3, APL/UP-W1 and APL/UP-W2) that are sampled on a quarterly basis. In addition, a duplicate

sample was collected from well APL/UP-W2 (labeled as ADL/UP-W2). For this monitoring event, no sample collection forms were provided by Environmental Decision Group to CDM/FEJ.

All groundwater samples were submitted under chain-of-custody protocol to Sequoia Analytical, a state-certified analytical laboratory, in Walnut Creek, California. Samples were analyzed for the following:

- Total petroleum hydrocarbons as diesel (TPH-D) by EPA Method 8015 Modified;
- Total petroleum hydrocarbons as gasoline (TPH-G) by EPA Method 8015 Modified; and
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8020.

February 1999 Monitoring Event

On February 16, 1999, CDM/FEJ measured fluid levels in the ten monitoring wells at the site. In addition, fluid levels were measured from the 17 wells located at the TOFC railyard. CDM/FEJ's fluid level measurement log is presented in Appendix A.

From February 17 through 19, 1999, CDM/FEJ purged and collected groundwater samples from seven of the ten wells at the site. In addition, a duplicate sample was collected from well OKUS-W3 (labeled as OKUS-W12). CDM/FEJ's monitoring well purge and sampling forms for the seven wells are presented in Appendix A.

The remaining three wells contained product or sheen and were not sampled during this monitoring event. Specifically, well OKUS-W5 has not been sampled since August 1994, well OKUS-W6 has not been sampled since November 1993, and well RW has never been sampled.

For the seven monitoring wells at the site, CDM/FEJ purged a minimum of three well volumes from each well using a new, disposable bailer. Groundwater samples were collected with the disposable bailer following the removal of three well volumes of water. Samples were contained in the appropriate laboratory supplied bottles. Specifically, samples were contained in three 40-milliliter glass vials preserved with hydrochloric acid (with no headspace), one 1-liter amber glass bottle, and one 1-liter plastic bottle. All samples were transported in a cooler chilled with ice and submitted under chain-of-custody protocol to Curtis & Tompkins, Ltd., a state-certified analytical laboratory, in Berkeley, California.

During this monitoring event, groundwater samples were analyzed for the following:

- TPH-D with silica gel cleanup by EPA Method 8015 Modified;
- TPH-G by EPA Method 8015 Modified;
- BTEX by EPA Method 8020; and
- Arsenic by EPA Method 6000.

Re-Survey of Monitoring Wells

On February 17, 1999, PLS Survey Inc. (PLS) re-surveyed the ten wells at the site and the 17 wells at the TOFC railyard. At each well location, PLS surveyed the horizontal coordinates and the vertical elevations per Port datum (-3.202 Mean Sea Level). These wells were previously surveyed by various surveyors per City of Oakland datum (2.998 Mean Sea Level). In addition to these wells, the northwest and southwest corners of the UPRR transport building were tied into the survey. A copy of the survey results is presented in Appendix B.

2.2 Results of Fluid Level Measurements

During the November 1998 and February 1999 monitoring events, fluid levels were measured from each well at the site. Results of the survey were used in calculating groundwater elevations for the two monitoring events. The cumulative fluid level measurement data is presented in Table 1.

November 1998 Monitoring Event

A groundwater potentiometric surface map, created with measurements collected from groundwater monitoring wells at the site and from the adjacent TOFC railyard on November 30, 1998, is presented as Figure 3. In the region of the UPMF railyard, the potentiometric surface results indicate that groundwater flow generally is to the southeast. Hydraulic gradient was inconsistent across the site but significantly slopes to the southeast approaching well APL/UP-W2. Groundwater depressions are present from pumping in recovery wells on the TOFC railyard (see Figure 3).

Fluid-level measurement data showed that monitoring wells OKUS-W5 and OKUS-W6 continued to contain product. An accurate determination of the product thickness and groundwater level in OKUS-W5 and OKUS-W6 was not possible due to the high viscosity of the product, which prohibited the measurement of product thickness. A product/water interface was not detected in recovery well RW during this sampling event. However, Environmental Decision Group personnel did observe an oil sheen in the well.

February 1999 Monitoring Event

A potentiometric surface map, created with measurements collected from groundwater monitoring wells at the site and from the adjacent TOFC railyard on February 16, 1999, is presented as Figure 4. In the region of the UPMF railyard, the potentiometric surface results indicate that groundwater flow is generally to the southeast. Pumping activity was discontinued on the TOFC railyard (due to system shutdown) during the fluid level measurements, flattening the water table (compare Figure 3 to Figure 4). Groundwater gradient was inconsistent across the site but generally slopes towards well APL/UP-W2.

Fluid-level measurement data showed that monitoring wells OKUS-W5 and OKUS-W6 continued to contain product. For well RW, an oil sheen was observed.

2.3 Results of Groundwater Sampling

During the November 1998 monitoring event, groundwater samples were collected from monitoring wells OKUS-W2, OKUS-W3, APL/UP-W1, and APL/UP-W2. During the February 1999 monitoring event, samples were collected from wells OKUS-W2, OKUS-W3, OKUS-W7, OKUS-W8, APL/UP-W1, and APL/UP-W2. The cumulative groundwater analytical data is presented in Table 2.

November 1998 Monitoring Event

Dissolved TPH-D, representing diesel fuel, was detected in groundwater samples collected from the four monitoring wells sampled during the November 1998 monitoring event. TPH-D concentrations ranged from 400 micrograms/liter (µg/l) in well APL/UP-W2 to 3,400 µg/l in well OKUS-W3. TPH-D concentrations were consistent with concentrations from previous monitoring events.

Dissolved TPH-G, indicative of gasoline, was detected in samples collected from the four monitoring wells. TPH-G concentrations ranged from 65 µg/l in well APL/UP-W2 to 6,600 µg/l in well OKUS-W3. TPH-G concentrations were also consistent with concentrations from previous monitoring events.

For the four wells sampled, benzene concentrations ranged from 2.1 µg/l in well APL/UP-W2 to 240 µg/l in well OKUS-W3. The range for toluene was from less than 0.50 µg/l in wells APL/UP-W1 and APL/UP-W2 to 61 µg/l in well OKUS-W3. Ethylbenzene concentrations ranged from 33 µg/l in well APL/UP-W2 to 6,600 µg/l in well OKUS-W3. Total xylenes concentrations ranged from 3.8 µg/l

in well APL/UP-W2 to 270 µg/l in well OKUS-W3. And the total BTEX concentrations ranged from 38.9 µg/l in well APL/UP-W2 to 7,171 µg/l in well OKUS-W3.

Overall, well OKUS-W3 contained the highest dissolved concentrations of TPH-D, TPH-G, and BTEX. The dissolved TPH-D, TPH-G, and BTEX concentrations detected during the November 1998 monitoring events are presented as Figure 5. Analytical reports and chain of custody forms are included in Appendix C.

February 1999 Monitoring Event

Dissolved TPH-D was detected in groundwater samples collected from the three of the seven monitoring wells sampled during the February 1999 monitoring event. TPH-D concentrations ranged from below 50 µg/l in wells OKUS-W1, OKUS-W7, APL/UP-W1, and APL/UP-W2 to 1,200 µg/l in well OKUS-W2. TPH-D concentrations exhibited an order of magnitude decrease in all of the wells, except for well OKUS-W2, from the previous (November 1998) monitoring event.

Dissolved TPH-G was detected in samples collected from five of the seven monitoring wells. TPH-G concentrations ranged from less than 50 µg/l in wells OKUS-W1 and OKUS-W7 to 9,800 µg/l in well OKUS-W3. TPH-G concentrations were also consistent with concentrations from previous monitoring events.

For the seven wells sampled, benzene concentrations ranged from less than 0.5 µg/l in wells OKUS-W1 and OKUS-W8 to 200 µg/l in OKUS-W3. For toluene, only well OKUS-W2 had a detectable concentration (52 µg/l). Ethylbenzene concentrations ranged from below 0.5 µg/l in wells OKUS-W1, OKUS-W7, and OKUS-W8 to 5,300 µg/l in OKUS-W2. For total xylenes, only well OKUS-W2 had a detectable concentration (128 µg/l). Total BTEX concentrations ranged from below detection limits in wells OKUS-W1 and OKUS-W8 to 5,700 µg/l in well OKUS-W2.

Overall, well OKUS-W2 contained the highest dissolved concentrations of TPH-D and BTEX. Well OKUS-W3 contained the highest dissolved concentrations of TPH-G. The dissolved TPH-D, TPH-G, and BTEX concentrations detected during February 1999 monitoring events are presented as Figure 6. Analytical reports and chain of custody forms are included in Appendix C.

For the seven wells sampled, arsenic was detected in four of the monitored wells. Arsenic concentrations ranged from less than 5 µg/l in wells OKUS-W1, OKUS-W7, and OKUS-W8 to 99 µg/l in well OKUS-W-3.

2.4 Field and Laboratory QA/QC

A duplicate groundwater sample (OKUS-W12) was collected at well OKUS-W3 and analyzed for TPH-G, TPH-D, BTEX, and arsenic to measure groundwater data reproductively. The duplicate sample showed good correlation with its partner sample, particularly for BTEX and arsenic. In addition, a trip blank sample was collected during each day of field activities and analyzed for TPH-G and BTEX. Laboratory results for the three trip blank samples, collected from February 17 through 19, 1999, were all below laboratory detection limits. This indicates that sample handing procedures were adequate.

The maximum holding time for TPH-G, TPH-D, and BTEX in water is 14 days from the time of sample collection to time of analysis. Arsenic has a maximum holding time of 180 days. According to the analytical reports, all samples were analyzed within the analytes' respective holding times. Based on the analytical reports' case narratives, no analytical problems were encountered during laboratory Quality Assurance/Quality Control (QA/QC) procedures.

Section 3
Summary and Conclusions

Based upon the results of the previous and most recent monitoring events in November 1998 and February 1999, presented below are the summary of findings and CDM/FEJ's conclusions:

- The groundwater flow direction was to the southeast during the two monitoring events. This flow direction is consistent with previous groundwater monitoring events. Groundwater flow and gradient are clearly influenced by groundwater remedial pumping activities on the TOFC railyard.

- The dissolved BTEX and TPH concentrations in all wells were consistent with historic concentration ranges. However, there was an order of magnitude decrease in TPH-D concentrations during the February 1999 monitoring event from the previous monitoring event in most of the wells.

- Historic monitoring results show that residual petroleum contamination in the source area has decreased over time, which suggests that a continued source of volatile aromatic hydrocarbon contamination is not present.

Section 4
References

Laidlaw, 1991 — *Hydrocarbon Investigation and Remediation Design.* Laidlaw Environmental Services, June 10, 1991.

Laidlaw, 1993 — *Phase II Site Assessment Report.* Laidlaw Environmental Services, October 1993.

Laidlaw, 1994 — *Fourth Quarter 1993 Monitoring Event.* Laidlaw Environmental Services, October 1993.

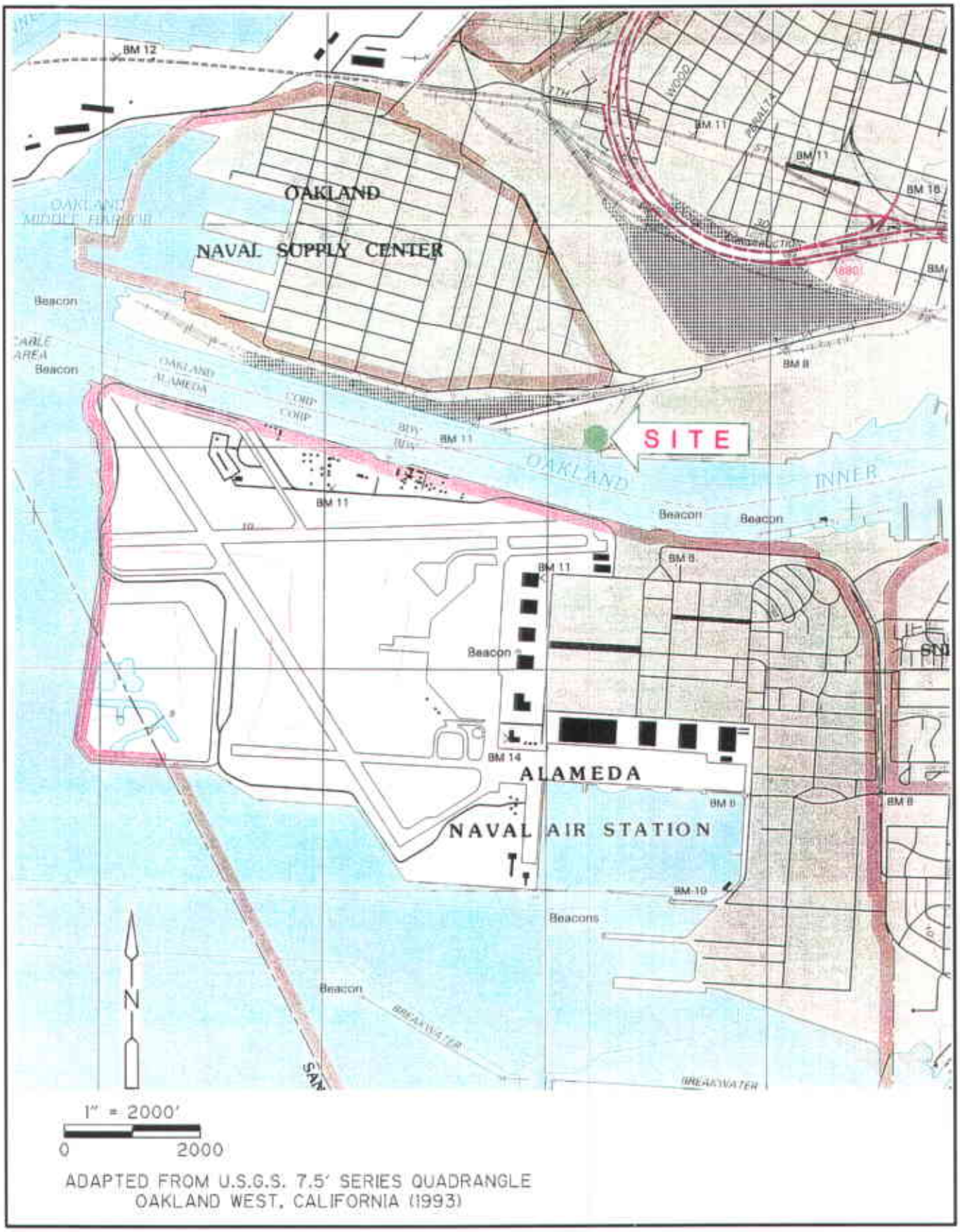

Figure No. 1
UPRR TOFC AND MF RAILYARD
SITE LOCATION MAP

CDM Camp Dresser & McKee

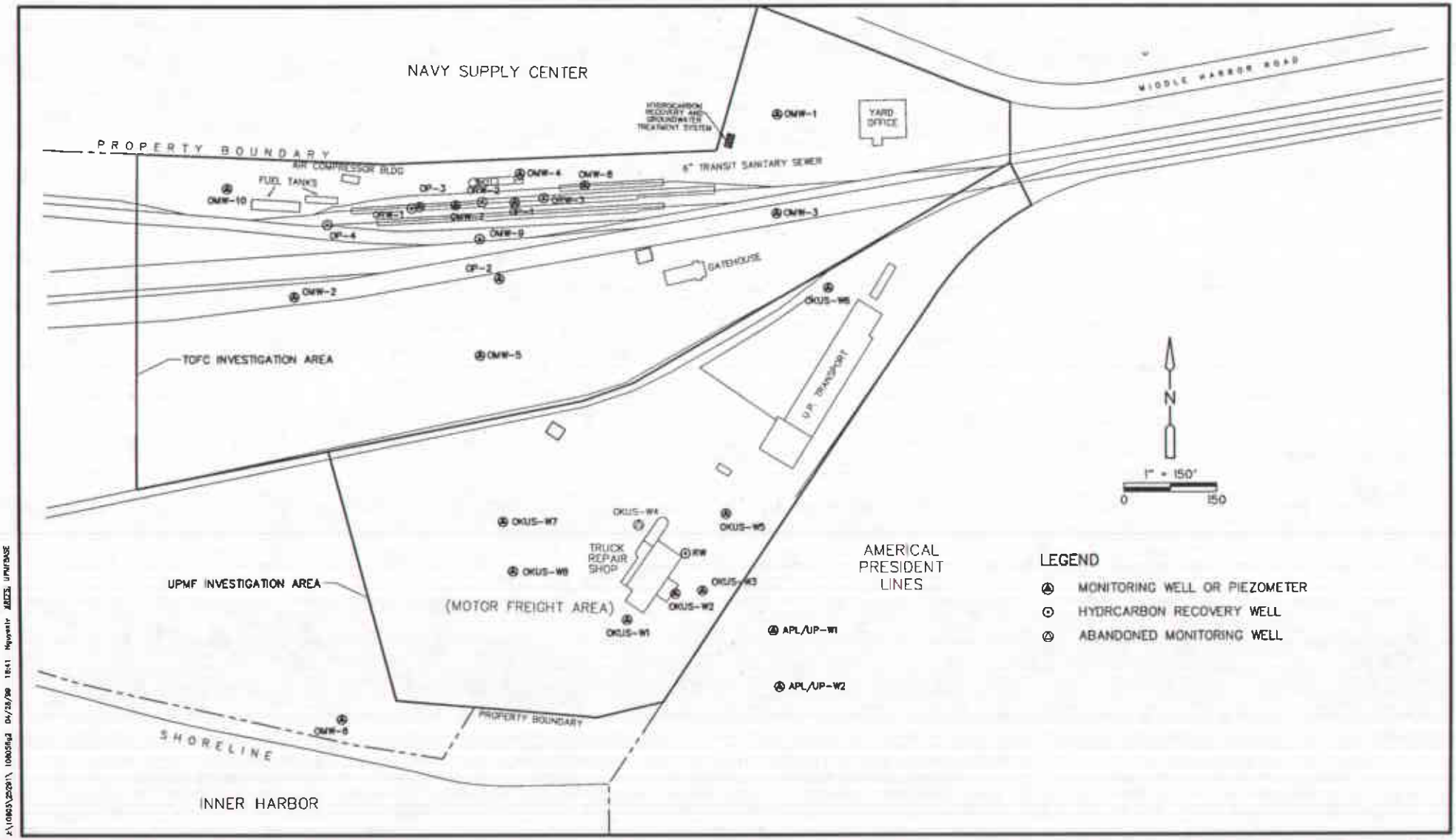

Figure No. 2
UPRR TOFC AND MF RAILYARD
SITE VICINITY MAP

CDM Camp Dresser & McKee

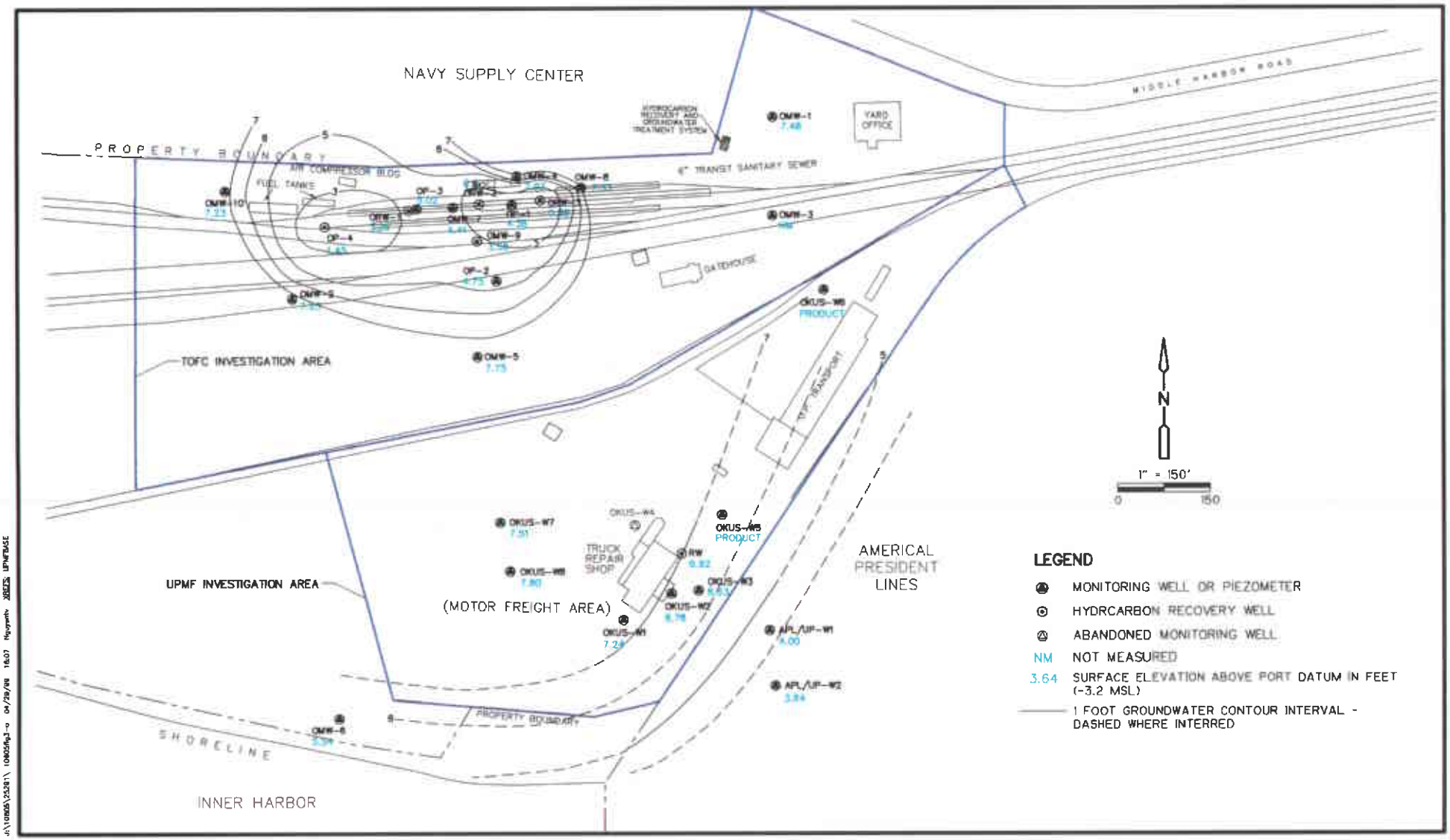

Figure No. 3
UPRR TOFC AND MF RAILYARD - Oakland, California
GROUNDWATER POTENTIOMETRIC SURFACE MAP - NOVEMBER 1998

CDM Camp Dresser & McKee

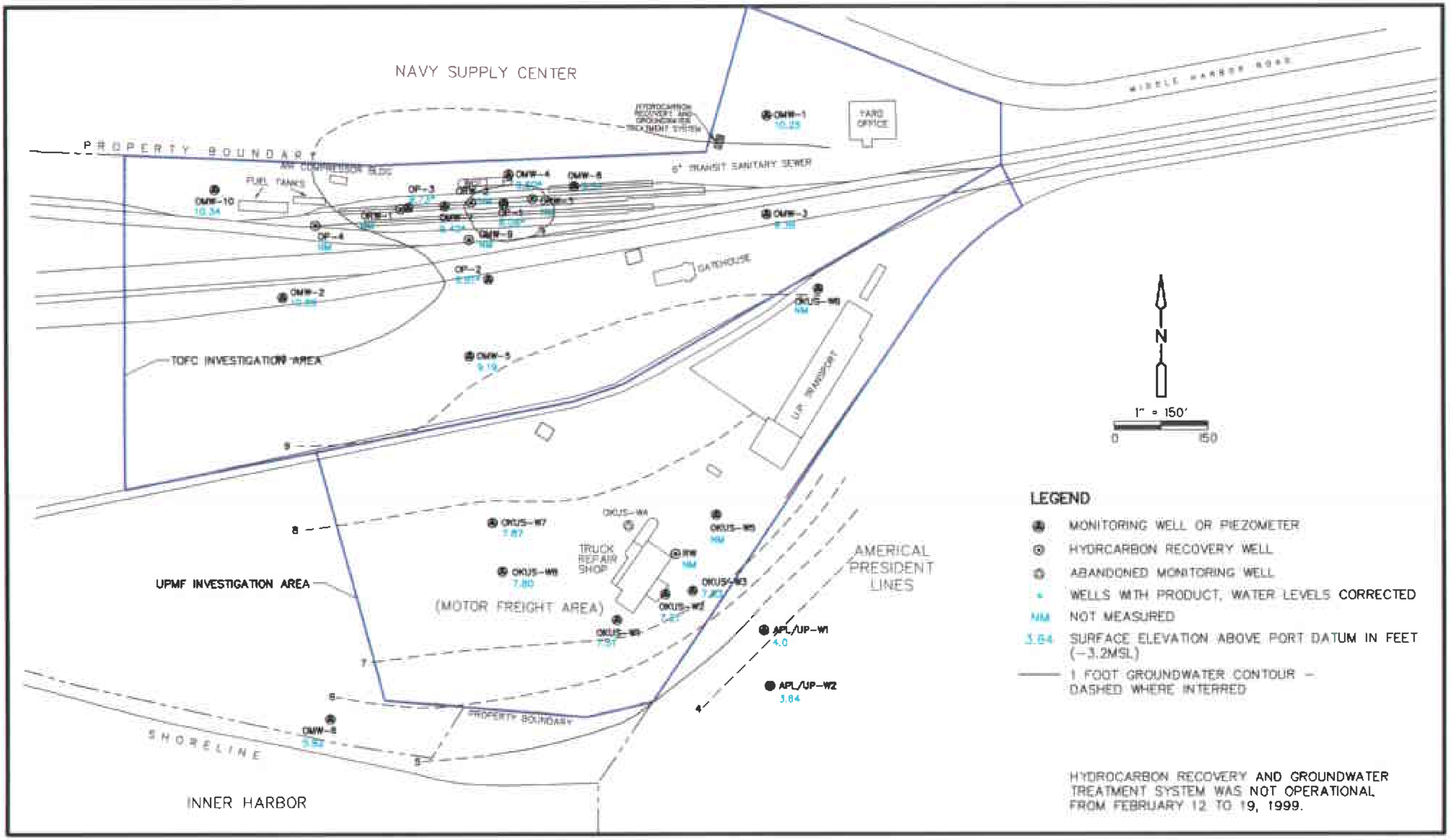

Figure No. 4
UPRR TOFC AND MF RAILYARD - Oakland, California
GROUNDWATER POTENTIOMETRIC SURFACE MAP - FEBRUARY 16, 1999

CDM Camp Dresser & McKee

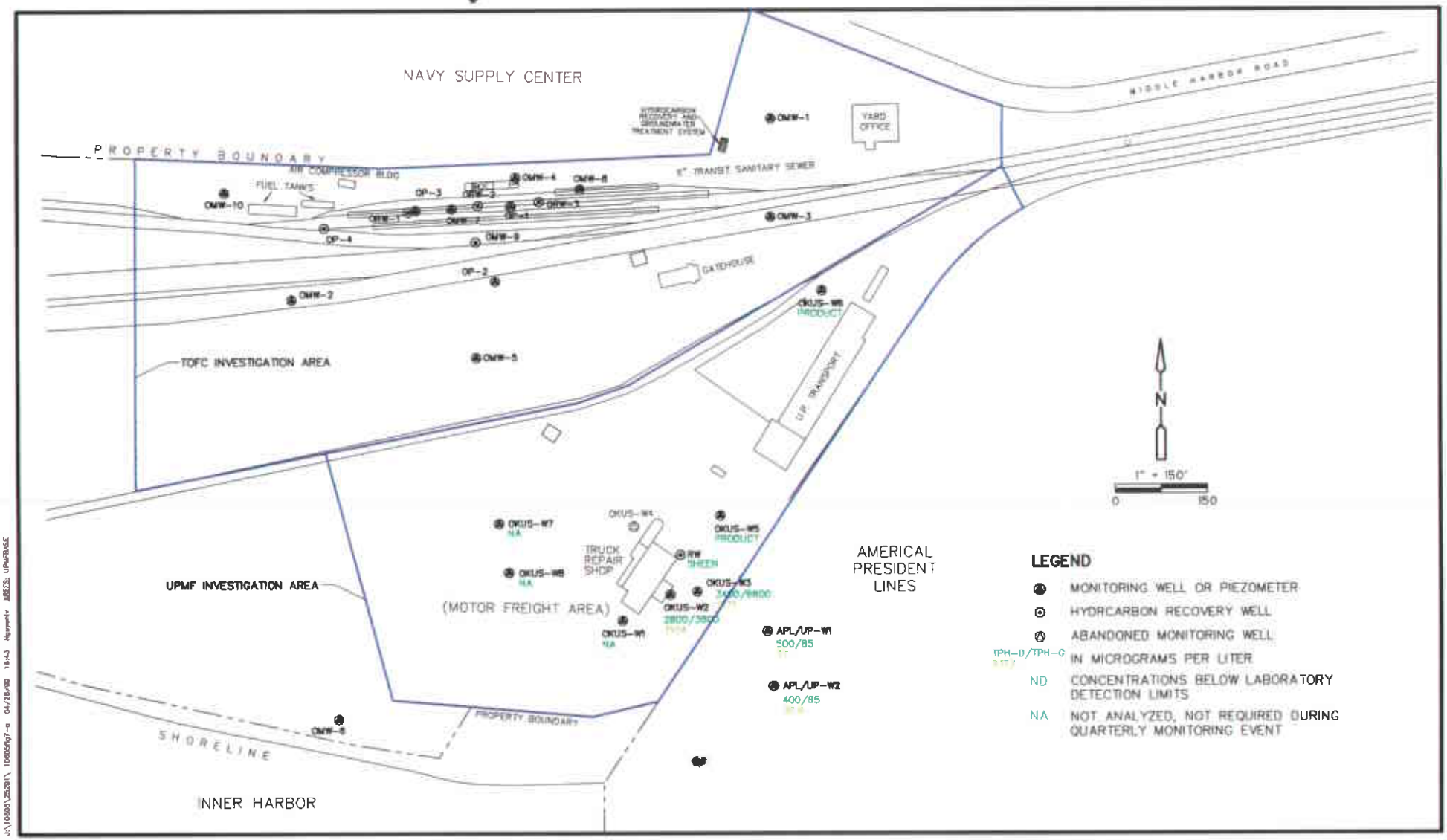

Figure No. 5
UPRR TOFC AND MF RAILYARD - Oakland, California
HYDROCARBON CONCENTRATIONS
NOVEMBER 30, 1998

CDM Camp Dresser & McKee

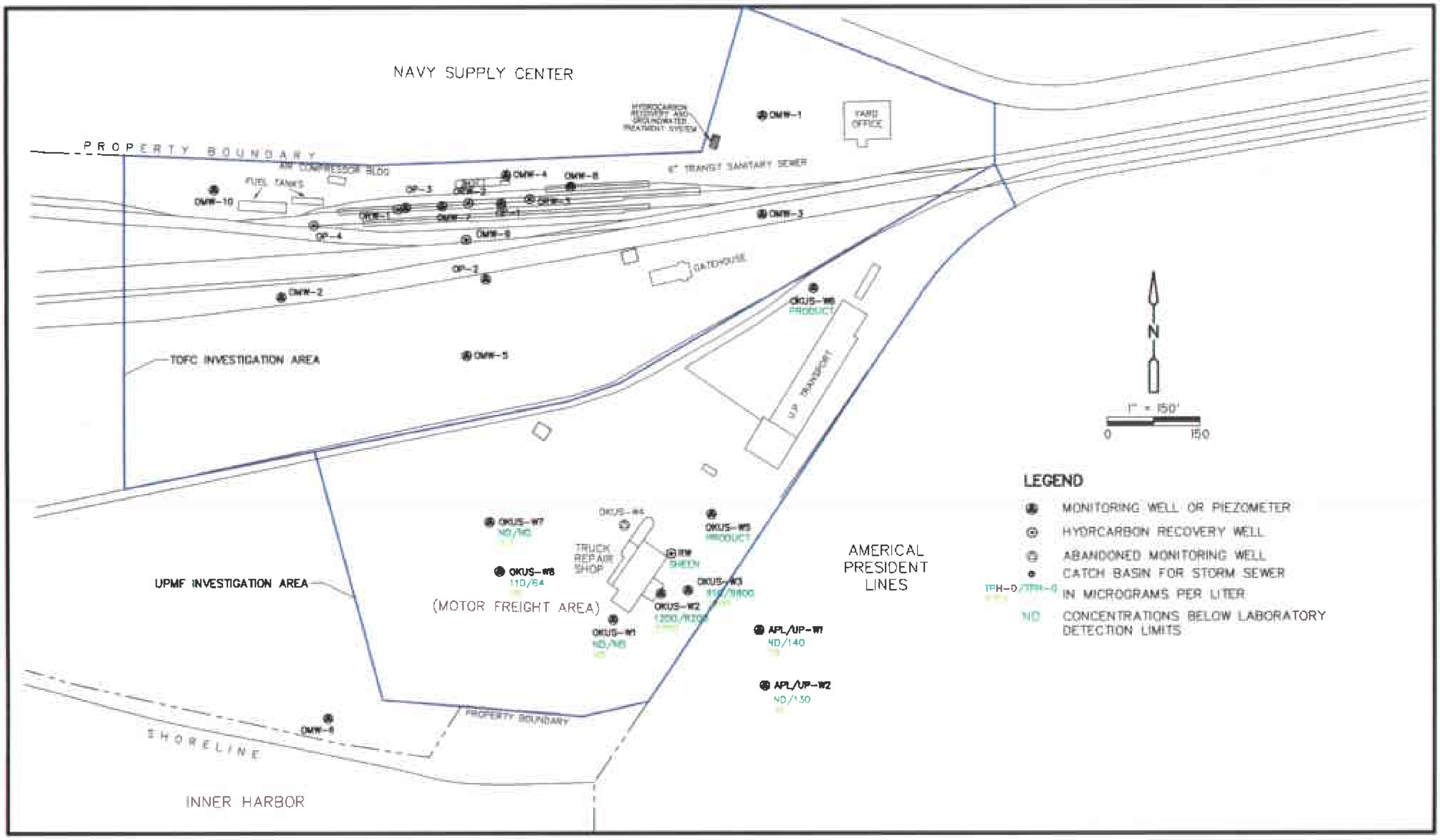

Figure No. 6
UPRR TOFC AND MF RAILYARD - Oakland, California
HYDROCARBON CONCENTRATIONS
FEBRUARY 16 through 19, 1999

CDM Camp Dresser & McKee

TABLE 1
CUMULATIVE SUMMARY OF FLUID LEVEL MEASUREMENT DATA
UNION PACIFIC RAILROAD
MOTOR FREIGHT RAILYARD

WELL NO.	ELEV. TOC *	DATE	DEPTH TO PRODUCT	PRODUCT THICKNESS	DEPTH TO WATER	GROUNDWATER ELEV. *
OKUS-W1	9.17	05/29/96 S	N/A	NP	7.80	1.37
	9.17	08/27/96 S	N/A	NP	8.34	0.83
	9.17	11/13/96 S	N/A	NP	8.71	0.46
	9.17	02/17/97 S	N/A	NP	7.58	1.59
	9.17	05/21/97 S	N/A	NP	8.24	0.93
	9.17	08/27/97 S	N/A	NP	8.37	0.80
	9.17	11/19/97 S	N/A	NP	8.28	0.89
	9.17	02/04/98 S	N/A	NP	6.95	2.22
	9.17	05/21/98 S	N/A	NP	7.48	1.69
	9.17	08/12/98 S	N/A	NP	7.95	1.22
	15.24	11/30/98 S	N/A	NP	8.00	7.24
	15.24	02/16/99 C	N/A	NP	7.73	7.51
OKUS-W2	9.71	05/29/96 S	N/A	NP	8.72	0.99
	9.71	07/25/96 B	N/A	NP	9.03	0.68
	9.71	08/27/96 S	N/A	NP	9.24	0.47
	9.71	09/16/96 B	N/A	NP	9.35	0.36
	9.71	11/13/96 S	N/A	NP	9.62	0.09
	9.71	11/25/96 B	N/A	NP	9.36	0.35
	9.71	01/20/97 B	N/A	NP	8.48	1.23
	9.71	02/17/97 S	N/A	NP	8.41	1.30
	9.71	03/6/97 S	N/A	NP	8.67	1.04
	9.71	05/21/97 S	N/A	NP	9.13	0.58
	9.71	05/27/97 S	N/A	NP	9.10	0.61
	9.71	07/15/97 B	N/A	NP	9.24	0.47
	9.71	08/27/97 S	N/A	NP	9.29	0.42
	9.71	09/15/97 B	N/A	NP	9.42	0.29
	9.71	11/19/97 S	N/A	NP	9.21	0.50
	9.71	02/04/98 S	N/A	NP	7.50	2.21
	9.71	05/21/98 S	N/A	NP	8.33	1.38
	9.71	08/12/98 S	N/A	NP	8.80	0.91
	15.73	11/30/98 S	N/A	NP	8.97	6.76
	15.73	01/27/99 B	N/A	NP	8.97	6.76
	15.73	02/16/99 C	N/A	NP	8.52	7.21
OKUS-W3	9.80	05/29/96 S	N/A	NP	8.94	0.86
	9.80	07/25/96 B	N/A	NP	9.32	0.48
	9.80	08/27/96 S	N/A	NP	9.52	0.28
	9.80	09/16/96 B	N/A	NP	9.63	0.17
	9.80	11/13/96 S	N/A	NP	9.90	-0.10
	9.80	11/25/96 B	N/A	NP	9.65	0.15
	9.80	01/20/97 B	N/A	NP	8.74	1.06
	9.80	02/17/97 S	N/A	NP	8.67	1.13

TABLE 1
CUMULATIVE SUMMARY OF FLUID LEVEL MEASUREMENT DATA
UNION PACIFIC RAILROAD
MOTOR FREIGHT RAILYARD

WELL NO.	ELEV. TOC *	DATE	DEPTH TO PRODUCT	PRODUCT THICKNESS	DEPTH TO WATER	GROUNDWATER ELEV. *
OKUS-W3	9.80	03/6/97 B	N/A	NP	8.92	0.88
	9.80	05/21/97 S	N/A	NP	9.44	0.36
	9.80	05/27/97 B	N/A	NP	9.40	0.40
	9.80	07/15/97 B	N/A	NP	9.53	0.27
	9.80	08/27/97 S	N/A	NP	WELL INACCESSABLE	
	9.80	11/19/97 S	N/A	NP	9.45	0.35
	9.80	02/5/98 B	N/A	NP	7.65	2.15
	9.80	05/21/98 S	N/A	NP	8.63	1.17
	9.80	08/12/98 S	N/A	NP	9.13	0.67
	15.85	11/30/98 S	N/A	NP	9.22	6.63
	15.85	01/27/99 B	N/A	NP	9.25	6.60
	15.85	02/16/99 C	N/A	NP	8.02	7.83
OKUS-W4	7.35	08/9/95 B	N/A	NP	6.10	1.25
	7.35	11/29/95 B	N/A	NP	6.70	0.65
		05/13/97 B	WELL DECOMMISSIONED			
OKUS-W5	9.25	05/29/96 S	9.06	P	--	--
	9.25	06/13/96 B	9.11	P	--	--
	9.25	07/25/96 B	9.11	P	--	--
	9.25	8/9/96 B	9.22	P	--	--
	9.25	08/27/96 S	9.44	P	--	--
	9.25	09/16/96 B	N/A	--	--	--
	9.25	10/17/96 B	9.65	P	--	--
	9.25	11/13/96 S	9.87	P	--	--
	9.25	12/16/96 B	N/A	--	--	--
	9.25	01/20/97 B	N/A	--	--	--
	9.25	02/17/97 S	9.09	P	--	--
	9.25	05/21/97 S	9.29	P	--	--
	9.25	08/27/97 S	9.42	P	--	--
	9.25	11/19/97 S	9.87	P	--	--
	9.25	02/5/98 B	7.13	P	--	--
	9.25	05/22/98 S	8.65	P	--	--
	9.25	08/13/98 S	9.03	P	--	--
	15.32	11/30/99 S	9.27	P	--	--
	15.32	02/16/99 C	8.00	0.33	--	--
OKUS-W6	7.02	08/9/95 B	5.65	P	--	--
	7.02	09/7/95 B	5.98	P	--	--
	7.02	10/18/95 B	6.38	P	--	--
	7.02	11/10/95 B	6.52	P	--	--
	7.02	12/15/95 B	5.47	P	--	--
	7.02	01/10/96 B	5.58	P	--	--

TABLE 1
CUMULATIVE SUMMARY OF FLUID LEVEL MEASUREMENT DATA
UNION PACIFIC RAILROAD
MOTOR FREIGHT RAILYARD

WELL NO.	ELEV. TOC *	DATE	DEPTH TO PRODUCT	PRODUCT THICKNESS	DEPTH TO WATER	GROUNDWATER ELEV. *
OKUS-W6	7.02	02/16/96 B	4.70	P	--	--
	7.02	03/25/96 B	4.72	P	--	--
	7.02	05/29/96 S	5.02	P	--	--
	7.02	06/13/96 B	4.99	P	--	--
	7.02	07/25/96 B	5.23	P	--	--
	7.02	08/9/96 B	5.66	P	--	--
	7.02	08/27/96 S	5.82	P	--	--
	7.02	09/16/96 B	N/A	--	--	--
	7.02	10/17/96 B	6.50	P	--	--
	7.02	11/13/96 S	6.27	P	--	--
	7.02	12/16/96 B	N/A	--	--	--
	7.02	01/20/97 C	N/A	--	--	--
	7.02	02/17/97 S	4.71	P	--	--
	7.02	05/21/97 S	6.03	P	--	--
	7.02	08/27/97 S	6.00	P	--	--
	7.02	11/19/97 S	5.54	P	--	--
	7.02	02/5/98 B	3.30	P	--	--
	7.02	05/22/98 S	4.48	P	--	--
	7.02	08/13/98 S	5.81	P	--	--
	13.10	11/30/98 S	5.96	P	--	--
	13.10	02/16/99 C	6.00	P	--	--
OKUS-W7	6.91	05/29/96 S	N/A	NP	5.08	1.83
	6.91	08/27/96 S	N/A	NP	5.68	1.23
	6.91	11/13/96 S	N/A	NP	6.00	0.91
	6.91	02/17/97 S	N/A	NP	4.85	2.06
	6.91	05/21/97 S	N/A	NP	5.53	1.38
	6.91	08/27/97 S	N/A	NP	5.76	1.15
	6.91	11/19/97 S	N/A	NP	5.65	1.26
	6.91	02/04/98 S	N/A	NP	4.45	2.46
	6.91	05/21/98 S	N/A	NP	4.69	2.22
	6.91	08/12/98 S	N/A	NP	5.28	1.63
	12.98	11/30/98 S	N/A	NP	5.47	7.51
	12.98	02/19/99 C	N/A	NP	5.11	7.87
OKUS-W8	6.75	05/29/96 S	N/A	NP	4.93	1.82
	6.75	08/27/96 S	N/A	NP	5.52	1.23
	6.75	11/13/96 S	N/A	NP	5.90	0.85
	6.75	02/17/97 S	N/A	NP	4.69	2.06
	6.75	05/21/97 S	N/A	NP	5.36	1.39
	6.75	08/27/97 S	N/A	NP	5.59	1.16
	6.75	11/19/97 S	N/A	NP	5.45	1.30
	6.75	02/04/98 S	N/A	NP	4.36	2.39

TABLE 1
CUMULATIVE SUMMARY OF FLUID LEVEL MEASUREMENT DATA
UNION PACIFIC RAILROAD
MOTOR FREIGHT RAILYARD

WELL NO.	ELEV. TOC *	DATE	DEPTH TO PRODUCT	PRODUCT THICKNESS	DEPTH TO WATER	GROUNDWATER ELEV. *
OKUS-W8	6.75	05/21/98 S	N/A	NP	4.45	2.30
	6.75	08/12/98 S	N/A	NP	5.05	1.70
	12.80	11/30/98 S	N/A	NP	5.20	7.60
	12.80	02/16/99 C	N/A	NP	5.00	7.80
APL/UP-W1	8.12	05/29/96 S	N/A	NP	WELL INACCESSABLE	
	8.12	08/27/96 S	N/A	NP	WELL INACCESSABLE	
	8.12	11/12/96 B	N/A	NP	WELL INACCESSABLE	
	8.12	02/17/97 S	N/A	NP	10.02	-1.90
	8.12	05/21/97 S	N/A	NP	10.14	-2.02
	8.12	08/27/97 S	N/A	NP	9.91	-1.79
	8.12	11/18/97 B	N/A	NP	9.32	-1.20
	8.12	02/04/98 S	N/A	NP	9.80	-1.68
	8.12	05/21/98 S	N/A	NP	10.21	-2.09
	8.12	08/12/98 S	N/A	NP	9.76	-1.64
	14.19	11/30/98 S	N/A	NP	9.77	4.42
	14.19	02/18/99 C	N/A	NP	10.19	4.00
APL/UP-W2	7.31	05/29/96 S	N/A	NP	9.68	-2.37
	7.31	08/27/96 S	N/A	NP	9.53	-2.22
	7.31	11/13/96 S	N/A	NP	9.57	-2.26
	7.31	02/17/97 S	N/A	NP	9.07	-1.76
	7.31	05/21/97 S	N/A	NP	9.42	-2.11
	7.31	08/27/97 S	N/A	NP	9.17	-1.86
	7.31	11/18/97 B	N/A	NP	8.59	-1.28
	7.31	02/04/98 S	N/A	NP	8.80	-1.49
	7.31	05/21/98 S	N/A	NP	9.58	-2.27
	7.31	08/12/98 S	N/A	NP	8.99	-1.68
	13.19	11/30/98 S	N/A	NP	8.76	4.43
	13.19	02/18/99 C	N/A	NP	9.55	3.64
RW	--	05/29/96 S	N/A	NP	8.68	--
	--	06/13/96 B	N/A	NP	8.68	--
	--	07/25/96 B	N/A	NP	9.09	--
	--	08/9/96 B	N/A	NP	9.16	--
	--	08/27/96 S	N/A	NP	9.18	--
	--	09/16/96 B	N/A	NP	9.33	--
	--	10/17/97 B	N/A	NP	9.50	--
	--	11/12/96 B	N/A	SHEEN	9.59	--
	--	11/25/96 B	9.43	0.02	9.45	--
	--	12/16/96 B	9.12	0.10	9.22	--
	--	01/20/97 B	N/A	SHEEN	8.50	--
		02/11/97 B	N/A	NP	8.33	--

TABLE 1
CUMULATIVE SUMMARY OF FLUID LEVEL MEASUREMENT DATA
UNION PACIFIC RAILROAD
MOTOR FREIGHT RAILYARD

WELL NO.	ELEV. TOC *	DATE	DEPTH TO PRODUCT	PRODUCT THICKNESS	DEPTH TO WATER	GROUNDWATER ELEV. *
RW	--	02/17/97 S	8.39	0.01	8.40	--
	--	03/6/97 B	N/A	NP	8.70	--
	--	04/29/97 B	N/A	SHEEN	9.03	--
	--	05/21/97 S	9.10	0.02	9.12	--
	--	05/27/97 B	9.09	0.03	9.12	--
	--	07/15/97 B	N/A	NP	9.22	--
	--	08/15/97 B	N/A	NP	9.17	--
	--	08/27/97 S	N/A	SHEEN	9.29	--
	--	11/19/97 S	N/A	SHEEN	9.29	--
	--	02/6/98 B	N/A	SHEEN	7.24	--
	--	05/22/98 S	N/A	SHEEN	8.21	--
	--	08/13/98 S	8.74	0.08	8.82	--
	15.84	11/30/98 S	N/A	SHEEN	8.92	6.92
	15.84	01/27/99 B	8.95	0.05	9.00	6.84
	15.84	02/16/99 C	N/A	SHEEN	NM	--

-- Depth to water was not measured due to the presence of product in well.

N/A Non Applicable

NP - No Product

P - Product (bunker C) was encountered but the oil/water interface could not be found.

* Elevation of top of casing, all well casings and groundwater elevations measured to City of Oakland Datum (2.998 Mean Sea Level) from May 1996 through August 1998. In February 1999, the well casings were resurveyed to Port Datum (-3.202 Mean sea Level) by PLS Survey Inc.

S = Measurement collected by Safety-Kleen personnel during quarterly sampling.

B = Measurements collected by Burns & McDonnell Waste Consultant personnel.

C = Measurements collected by Camp Dresser & McKee Inc. personnel during quarterly sampling.

TABLE 2
CUMULATIVE SUMMARY OF ANALYTICAL DATA
UNION PACIFIC RAILROAD
MOTOR FREIGHT RAILYARD

SAMPLE LOCATION	SAMPLE ID	DATE SAMPLED	TPH/D µg/l	TPH/G µg/l	B µg/l	T µg/l	E µg/l	X µg/l	Total BTEX µg/l	As (mg/l)
OKUS-W1	OKUS-W1	01/14/93	ND	410	20	4	220	ND	240	ND
		05/12/93	120	ND	ND	ND	ND	ND	ND	ND
		08/25/83	100	ND	ND	ND	ND	ND	ND	ND
		11/11/93	160	91	1.1	0.88	21	1.6	24.58	ND
		02/08/94	92	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.10
		05/03/94	61	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.10
		08/24/94	86	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.10
		11/16/94	51	<50	<0.50	<0.50	<0.50	<0.50	ND	NA
		02/22/95	120	<50	<0.50	<0.50	<0.50	<0.50	ND	NA
		06/22/95	<50	<50	<0.50	<0.50	<0.50	<0.50	ND	NA
		08/09/95	<50	<50	<0.50	<0.50	<0.50	<0.50	ND	0.04
		11/29/95	480	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.0050
		02/27/96	330	<50	<0.50	<0.50	<0.50	<0.50	ND	NA
		05/30/96	320	<50	<0.50	<0.50	<0.50	<0.50	ND	NA
		08/27/96	440	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.10
		11/13/96	180	<50	<0.50	<0.50	<0.50	<0.50	ND	NA
		02/18/97	400	<50	<0.50	<0.50	<0.50	<0.50	ND	NA
		05/21/97	190	<50	<0.50	<0.50	<0.50	<0.50	ND	NA
		08/27/97	140	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.0050
		11/19/97	260	<50	<0.50	<0.50	<0.50	<0.50	ND	NA
		02/05/98	WELL NOT SAMPLED							NA
		08/12/98	230	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.0050
		02/18/99	<50	<50	<0.5	<0.5	<0.5	<0.5	ND	<0.005
OKUS-W2	OKUS-W2	01/14/93	5400	14000	480	92	8500	ND	9100	0.036
		05/12/93	2800	8800	220	47	4600	100	5000	0.093
		08/25/93	6500	22000	420	92	10000	210	11000	0.089
		11/11/93	7700	24000	540	150	13000	280	14000	ND
		02/08/94	2300	4900	150	29	3000	78	3300	<0.10
		05/03/94	2600	17000	300	<0.50	5800	220	6300	<0.10
		08/24/94	6200	11000	320	67	7500	250	8100	<0.10
		11/16/94	5500	10000	290	79	130	160	660	NA
		02/22/95	2000	3500	100	18	1600	66	1800	NA
		06/22/95	3200	13000	260	62	<0.50	110	430	NA
		08/09/95	2900	4800	160	28	<0.50	200	390	0.92
		11/29/95	5600	7100	240	34	<0.50	58	330	0.049
		02/27/96	2400	5300	200	42	3400	160	3800	NA
		05/30/96	1900	7000	210	<0.50	<0.50	180	390	NA
		08/27/96	3100	6700	240	65	170	180	660	0.17
		11/12/96	2900	6000	160	34	130	64	390	NA
		02/18/97	3000	7800	190	44	4000	150	4390	NA
		05/21/97	2500	3300	120	23	11	31	185	NA
		08/27/97	1800	4600	140	34	76	48	300	0.052
		11/19/97	2200	3300	120	23	2400	67	2600	NA
		02/06/98	1600	1100	72	11	<0.50	18	100	NA
		05/22/98	1700	5400	170	41	45	51	310	NA

TABLE 2
CUMULATIVE SUMMARY OF ANALYTICAL DATA
UNION PACIFIC RAILROAD
MOTOR FREIGHT RAILYARD

SAMPLE LOCATION	SAMPLE ID	DATE SAMPLED	TPH/D µg/l	TPH/G µg/l	B µg/l	T µg/l	E µg/l	X µg/l	Total BTEX µg/l	As (mg/l)
OKUS-W2	OKUS-W2	08/12/98	2400	2800	190	39	2600	150	3000	0.12
		11/30/98	2800	3800	120	24	2800	160	3104	NA
		02/18/99	1200 YLZ	6200 YL	220	52	5300	128	5700	0.071
OKUS-W3	OKUS-W3	01/14/93	4200	4900	230	42	2600	44	2900	NA
		05/12/93	4400	4600	290	60	3500	72	3900	0.14
		08/25/93	2700	9400	280	55	4300	41	4700	0.08
		11/11/93	5000	9500	390	110	5100	130	5700	0.14
		02/08/94	4400	17000	420	78	9800	160	10000	0.12
		05/03/94	3000	14000	310	61	6400	210	7000	0.14
		08/24/94	4500	10000	350	78	7300	170	7900	<0.10
		11/16/94	4700	9100	260	64	95	<0.50	420	NA
		02/22/95	2400	7400	250	51	4400	150	4900	NA
		06/22/95	3300	8100	250	53	<0.50	76	380	NA
		08/09/95	3100	5200	200	39	<0.50	140	380	1.6
		11/29/95	4500	5300	220	42	<0.50	44	310	0.18
		02/27/96	4000	7900	330	75	6400	240	7000	NA
		05/30/96	2300	8900	200	<0.50	<0.50	61	260	NA
		08/27/96	2700	3100	170	37	64	36	310	0.20
		11/12/96	4700	7400	220	60	<0.50	<0.50	280	NA
		02/18/97	4600	9300	260	62	5800	85	6210	NA
		05/21/97	2400	6100	190	43	120	41	394	NA
		08/27/97	WELL INACCESSABLE - NOT SAMPLED							NA
		11/19/97	2800	6800	260	67	5600	280	6200	NA
		02/06/98	3400	6000	210	<0.50	<0.50	<0.50	210	NA
		05/22/98	3200	7000	280	67	25	47	420	NA
		08/12/98	2600	6900	230	58	5400	170	5900	0.093
		11/30/98	3400	6600	240	61	6600	270	7171	NA
		02/17/99	610 YLZ	9800 YL	200	<50	2700	<50	2900	0.099
OKUS-W4	OKUS-W4	01/15/93	5400	8900	300	ND	4500	ND	4800	NA
		05/12/93	2900	6000	320	110	4600	230	5300	0.16
		08/26/93	2200	6700	350	72	4800	130	5400	0.098
		11/11/93	2400	5500	250	53	4600	140	5000	0.13
		02/07/94	2700	9100	250	<0.50	4900	150	5300	<0.10
		05/03/94	2300	6500	240	34	4200	140	4600	0.12
		08/24/94	2900	5200	200	41	3600	190	4000	0.11
		11/16/94	2800	5500	320	52	<0.50	120	490	NA
		02/22/95	2000	4900	250	47	2900	160	3400	NA
		06/22/95	2700	4900	280	38	5200	140	5700	NA
		08/09/95	2900	5300	270	54	<0.50	210	530	1.3
		11/29/95	3100	4500	200	41	<0.50	46	290	0.14
		05/13/97	WELL DECOMMISSIONED							
OKUS-W5	OKUS-W5	01/15/93	2900	550	53	11	180	20	260	NA
		05/12/93	2100	550	81	14	250	37	380	0.56

TABLE 2
CUMULATIVE SUMMARY OF ANALYTICAL DATA
UNION PACIFIC RAILROAD
MOTOR FREIGHT RAILYARD

SAMPLE LOCATION	SAMPLE ID	DATE SAMPLED	TPH/D µg/l	TPH/G µg/l	B µg/l	T µg/l	E µg/l	X µg/l	Total BTEX µg/l	As (mg/l)
		02/27/96	1900	80	<0.50	<0.50	<0.50	1.3	1.3	NA
		05/30/96	2200	210	<0.50	<0.50	<0.50	0.7	0.7	NA
OKUS-W8	OKUS-W8	08/27/96	2100	150	0.64	<0.50	<0.50	<0.50	0.64	<0.10
		11/12/96	1600	170	<0.50	<0.50	<0.50	1.1	1.1	NA
		02/18/97	1900	140	<0.50	<0.50	<0.50	1.3	1.3	NA
		05/21/97	1600	100	1.3	<0.50	<0.50	1.1	2.4	NA
		08/27/97	1100	100	1.5	<0.50	1.1	3.2	5.8	<0.0050
		11/19/97	1500	94	<0.50	<0.50	<0.50	0.69	0.69	NA
		02/05/98	1400	56	<0.50	<0.50	<0.50	<0.50	ND	NA
		08/12/98	2000	79	<0.50	<0.50	<0.50	<0.50	ND	<0.0050
		02/18/99	110 Y	64 Y	<0.5	<0.5	<0.5	<0.5	ND	<0.005
APL/UP-W1	APL/UP-W1	07/16/93	700	600	25.4	1.7	ND	3.0	30	0.011
		08/26/93	810	720	47	1.3	360	14	420	0.013
		11/11/93	530	560	26	ND	220	11	260	ND
		02/07/94	660	620	25	<0.50	180	10	220	<0.10
		05/03/94	590	680	48	2.9	260	9.8	320	<0.10
		08/24/94	420	830	48	4.8	12	3.2	68	<0.10
		11/15/94	480	470	36	3.6	9.6	12	61	NA
		02/22/95	510	470	33	2.8	170	9	210	NA
		06/22/95	320	150	12	0.62	3.5	2.4	19	NA
		08/09/95	160	69	4.2	<0.50	<0.50	2.3	7	<0.0050
		11/29/95	920	170	7.4	0.58	66	3.5	78	0.018
		02/27/96	WELL INACCESSABLE - NOT SAMPLED							
		05/30/96	WELL INACCESSABLE - NOT SAMPLED							
		08/27/96	WELL INACCESSABLE - NOT SAMPLED							
		11/12/96	WELL INACCESSABLE - NOT SAMPLED							
		02/18/97	1800	620	43	3.3	130	20	196	NA
		05/21/97	850	260	22	<0.50	13	2.5	38	NA
		08/27/97	930	310	31	1.2	9.7	8.5	50	0.026
		11/18/97	1400	740	53	<0.50	370	28	450	NA
		02/05/98	1000	640	55	<0.50	<0.50	22	77	NA
		05/22/98	490	270	20	<0.50	5.2	5.4	31	NA
		08/12/98	500	160	17	0.72	130	11	160	0.027
		11/30/98	500	85	3.8	<0.50	47	5.8	57	NA
		02/18/99	<50	140 YL	9.3	<0.5	70	<0.5	79	0.015
APL/UP-W2	APL/UP-W2	07/16/93	ND	ND	8.0	ND	ND	ND	8	0.016
		08/26/93	240	94	ND	ND	35	2.4	37	0.023
		11/11/93	190	110	5.0	ND	38	2.6	46	ND
		02/07/94	270	120	6.6	<0.50	38	1.8	46	<0.10
		05/03/94	100	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.10
		08/24/94	330	220	13	0.77	3.5	3.1	20	<0.10
		11/15/94	320	190	11	<0.50	63	5.4	79	NA
		02/22/95	550	320	19	<0.50	100	9.5	130	NA
		06/22/95	300	170	10	62	2.2	2.3	76	NA

TABLE 2
CUMULATIVE SUMMARY OF ANALYTICAL DATA
UNION PACIFIC RAILROAD
MOTOR FREIGHT RAILYARD

SAMPLE LOCATION	SAMPLE ID	DATE SAMPLED	TPH/D µg/l	TPH/G µg/l	B µg/l	T µg/l	E µg/l	X µg/l	Total BTEX µg/l	As (mg/l)
		08/09/95	180	62	3.5	<0.50	<0.50	2.3	5.8	0.22
		11/29/95	690	110	7.2	<0.50	49	2.3	59	0.019
		02/27/96	480	100	5.3	<0.50	33	2.9	41	NA
APL/UP-W2	APL/UP-W2	05/30/96	280	<50	1.9	<0.50	<0.50	1.2	3.1	NA
		08/27/96	320	<50	1.1	<0.50	1.0	<0.50	2.1	<0.10
		11/12/96	470	85	3.2	<0.50	1.7	0.62	5.5	NA
		02/18/97	770	170	12	0.77	81	9.4	103	NA
		05/21/97	430	92	4.8	<0.50	1.1	<0.50	5.9	NA
		08/27/97	450	130	6.4	<0.50	3.8	1.9	12.0	0.017
		11/18/97	640	300	17	<0.50	120	15	150	NA
		02/05/98	730	180	15	<0.50	<0.50	4.9	20	NA
		05/22/98	250	88	4	<0.50	1.7	<0.50	5.7	NA
		08/12/98	360	58	3	<0.50	35	3.2	42	0.012
		11/30/98	400	65	2.1	<0.50	33	3.8	38.9	NA
		02/18/99	<50	130 YL	4	<0.5	37	<0.5	41	0.027
DUPLICATES										
OKUS-W6	OKUS-W6	01/15/93	2800	510	50	10	170	19	250	NA
OKUS-W1	OKUS-W6	05/12/93	140	ND	ND	ND	ND	ND	ND	ND
APL/UP-W1	QA/QC-1	07/16/93	ND	0.21	22.4	ND	ND	2.4	25	0.012
OKUS-W4	OKUS-W9	08/26/93	2700	6200	340	78	4500	100	5000	0.10
OKUS-W8	OKUS-W9	11/11/93	1300	120	1.3	ND	4	1.4	7	2.40
OKUS-W3	QA/QC-1	02/08/94	2900	15000	280	64	5800	<0.50	6100	0.12
OKUS-W4	OKUS-QC1	05/03/94	2500	5400	300	41	5200	130	5700	0.12
OKUS-W8	OKUS-QC1	08/24/94	950	92	1.6	<0.50	<0.50	<0.50	2	<0.10
APL/UP-W2	OKUS-QC1	11/16/94	310	190	10	<0.50	62	4.7	77	NA
APL/UP-W2	APL-W12	02/22/95	490	360	20	<0.50	110	6.7	140	NA
APL/UP-W2	APL-W12	08/09/95	160	71	3.4	<0.50	<0.50	2.2	6	0.20
APL/UP-W1	APL-W11	11/29/95	1100	170	7.5	0.57	66	4.4	79	0.02
OKUS-W1	OKUS-W11	02/27/96	330	<50	<0.50	<0.50	<0.50	<0.50	ND	NA
OKUS-W1	OKUS-W11	05/30/96	570	<50	<0.50	<0.50	<0.50	<0.50	ND	NA
OKUS-W1	OKUS-W11	08/27/96	330	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.10
OKUS-W2	OKUS-W12	11/12/96	3000	11000	210	55	26	89	380	NA
APL/UP-W1	APL/UP-W11	02/18/97	1800	370	42	1.4	140	18	201	NA
OKUS-W1	OKUS-W11	05/21/97	220	<50	<0.50	<0.50	<0.50	<0.50	ND	NA
OKUS-W2	OKUS-W12	08/27/97	1500	4800	140	29	70	23	260	0.068
OKUS-W7	OKUS-W17	11/19/97	1400	<50	2.1	<0.50	0.66	<0.50	2.8	NA
OKUS-W2	OKUS-100	05/22/98	1400	<50	<0.50	<0.50	<0.50	<0.50	ND	NA
OKUS-W2	OKUS-W200	08/12/98	2100	<50	<0.50	<0.50	<0.50	<0.50	ND	0.10
APL/UP-W2	ADL/UP-W2	11/30/98	510	54	1.9	<0.50	31	4	37	NA
OKUS-W3	OKUS-W12	02/17/99	460 YLZ	6700 Y	190	45	2600	<25	2835	0.097
TRIP BLANKS										
UPMF	OAK-FB 1	07/16/93	NA	NA	ND	ND	ND	ND	ND	NA
UPMF	OAK-TB 2	07/16/93	NA	NA	ND	ND	ND	ND	ND	NA
UPMF	TB-1	08/27/93	NA	NA	ND	ND	ND	ND	ND	NA
UPMF	TB-2	08/27/93	NA	NA	ND	ND	ND	ND	ND	NA
UPMF	TB-1	11/12/93	NA	NA	ND	ND	ND	ND	ND	NA

TABLE 2
CUMULATIVE SUMMARY OF ANALYTICAL DATA
UNION PACIFIC RAILROAD
MOTOR FREIGHT RAILYARD

SAMPLE LOCATION	SAMPLE ID	DATE SAMPLED	TPH/D µg/l	TPH/G µg/l	B µg/l	T µg/l	E µg/l	X µg/l	Total BTEX µg/l	As (mg/l)
UPMF	TB-1	08/24/94	NA	NA	ND	ND	ND	ND	ND	NA
UPMF	TB-1	11/16/94	NA	NA	NA	NA	NA	NA	NA	NA
UPMF	TB-1	02/22/95	NA	ND	ND	ND	ND	ND	ND	NA
UPMF	TB-1	06/22/95	NA	ND	ND	ND		ND	ND	NA
UPMF	TB-1	08/09/95	NA	ND	ND	ND	ND	ND	ND	NA
UPMF	TRIP BLANK	11/29/95	NA	ND	ND	ND	ND	ND	ND	NA
UPMF	TRIP BLANK	02/27/96	NA	ND	ND	ND	ND	ND	ND	NA
UPMF	TRIP BLANK	05/29/96	NA	ND	ND	ND	ND	ND	ND	NA
UPMF	TRIP BLANK	08/27/96	NA	ND	ND	ND	ND	ND	ND	NA
UPMF	TRIP BLANK	11/12/96	NA	ND	ND	ND	ND	ND	ND	NA
UPMF	TRIP BLANK	02/18/97	NA	ND	ND	ND	ND	ND	ND	NA
UPMF	TRIP BLANK	05/21/97	NA	ND	ND	ND	ND	ND	ND	NA
UPMF	TRIP BLANK	08/27/97	NA	ND	ND	ND	ND	ND	ND	NA
UPMF	TRIP BLANK	11/19/97	NA	ND	ND	ND	ND	ND	ND	NA
UPMF	TRIP BLANK	02/02/98	NA	NA	ND	ND	ND	ND	ND	NA
UPMF	TRIP BLANK	08/14/98	NA	NA	ND	ND	ND	ND	ND	NA
UPMF	TRIP BLANK	11/30/98	NA	<50	<0.5	<0.5	<0.5	<0.5	ND	NA
UPMF	TRIP BLANK	02/17/99	NA	<50	<0.5	<0.5	<0.5	<0.5	ND	NA
UPMF	TB2	02/18/99	NA	<50	<0.5	<0.5	<0.5	<0.5	ND	NA
UPMF	TB3	02/19/99	NA	<50	<0.5	<0.5	<0.5	<0.5	ND	NA

TPH/D - Total Petroleum Hydrocarbons as Diesel anaylzed using EPA Method 8015 Mod. with Silicia Gel Cleanup (since 2/99)
TPH/G - Total Petroleum Hydrocarbons as Gasoline anaylzed using EPA Method 8015 Mod.
BTEX -Benzene, toluene, ethylbenzene, and xylenes analyzed using EPA Method 8020.
As - Arsenic analyzed using EPA Method 7060.
Samples were analyzed at Curtis & Tompkins Ltd., a state certified analytical laboratory in Berkeley, California (since 2/99).
µg/l - microgram per liter
mg/L - milligram per liter
ND - Not Detected
NA - Not Analyzed
BRK - Bottle broken during shipment
Y - Sample exhibits fuel pattern which does not resemble standard, per Curtis & Tompkins, Ltd.
H - Heavier hydrocarbons than indicated standard, per Curtis & Tompkins, Ltd.
L - Lighter hydrocarbons than indicated standard, per Curtis & Tompkins, Ltd.

Appendix A

Monitoring Well Fluid Level Logs and Purge Forms

Appendix A-1

Environmental Decision Group
November 1998

Date collected 11/30/98 529 | 9818 [illegible] 35

sealed

sealed

filtered

Arrived on-site @ 0945

Well	Time	DTW	Product
OMW-1	0910	7.40	
OMW-2	0918	9.82	
OMW-3	0928		
OMW-4	1039	6.31	
OMW-5	0948	6.01	
OMW-6	1012	6.282	
OMW-7	10.19	8.76	
OMW-8	1029	6.29	
OMW-9	1055	8.76	
OMW-10	11.00	6.48	
ORW-1	1046	10.03	
ORW-2	1038	12.52	
ORW-3	11 38	11.87	
OP-1	1140	8.59	
OP-2	1115	9.20	
OP-3	12.00	7.59	
OP-4	1308	10.77	
OKUS-W1	1301	8.00	
OKUS-W2	1237	8.97	
OKUS-W3	1232	9.22	
OKUS-W5	1215	NM	Product Present 9.27
OKUS-W6	1200	[illegible]	Product Present 5%
OKUS-W7	1318	5.47	
OKUS-W8	1326	5.20	
APL/UP-W1	0839	9.77	
APL/UP-W2	0850	8.76	
RW	0800	8.52	

Appendix A-2

CDM/FEJ
January 1999

Analytical Sampling Schedule for the Port of Oakland
February 16 - 18, 1999

(Matrix = Water)

Sheet 1 of 2

Specific Analyses Requested							TPH-gasoline and BTEX Methods 8015M and 8020	VOCs Method 8260	TPH-diesel/ motor oil/ hydraulic oil Method 8015M	PAHs Method 8270	Dissolved Metals Method 6010	Arsenic Method 6000
Preservatives					DTP+DTW meas taken 2/17 unless otherwise noted		HCl to pH<2; cool to 4°C	HCl to pH<2; cool to 4°C	Cool to 4°C	Cool to 4°C	Filter- 0.45 µm; HNO_3 to pH<2; cool to 4°C	Filter- 0.45 µm; HNO_3 to pH<2; cool to 4°C
Analytical Holding Time							14 days	14 days	7 days	7 days	6 months	6 months
Number of Containers (Total number of containers per analysis)					steady tone on the way up		3x40-mL glass vials (vials)	3x40-mL glass vials (vials)	1x1-liter amber bottles (bottles)	1x1-liter amber bottles (bottles)	1x250-mL poly bottle (bottles)	1x250-mL poly bottle (bottles)
Well	Location	Sample	Head-space OVM	Breathing Space OVM	steady tone Depth to Product	intermit tone then Depth to Water	Samples					
Wells With Free Product					3.87 ← reading taken on 2/18/99 →							
OP-2	TOFC				4.14	5.57						
OMW-7	TOFC				3.06	7.4						
OP-3	TOFC				2.75	3.55						
OP-1	TOFC				none heard	4.79						
OMW-4*	TOFC				2.59	4.75						
OKUS-W5	UPMF				~8	do not place equip.						
OKUS-W6	UPMF				~6	– report states	OKUS-W6 has same material as OKUS-W5					
Wells Without Free Product												
OMW-10	TOFC	✓				n.t.	X		X			
OMW-10 dup	TOFC	✓				—	X		X			
OMW-5	TOFC	✓					X		X			
OKUS-W3	UPMF	✓				8.02	X		X			X
OKUS-W3 dup	UPMF	✓				—	X		X			X
OMW-3	TOFC	✓				3.61	X		X			
OMW-2	TOFC	✓				1.76	X		X			
OMW-8	TOFC	✓				4.05	X		X			
OKUS-W2*	UPMF	✓				8.52	X		X			X

*There is a <10% difference in measured diesel concentration or free product thickness between this well and the well listed above it.

2/15/99

5.0

4.14

Analytical Sampling Schedule for the Port of Oakland
February 16 - 18, 1999

(Matrix = Water)

Sheet 2 of 2

Specific Analyses Requested							TPH-gasoline and BTEX Methods 8015M and 8020	VOCs Method 8260	TPH-diesel/ motor oil/ hydraulic oil Method 8015M	PAHs Method 8270	Dissolved Metals Method 6010	Arsenic Method 6000
Preservatives							HCl to pH < 2; cool to 4°C	HCl to pH < 2; cool to 4°C	Cool to 4°C	Cool to 4°C	Filter- 0.45 µm; HNO_3 to pH < 2; cool to 4°C	Filter- 0.45 µm; HNO_3 to pH < 2; cool to 4°C
Analytical Holding Time							14 days	14 days	7 days	7 days	6 months	6 months
Number of Containers (Total number of containers per analysis)							3x40-mL glass vials (9 vials)	3x40-mL glass vials (2 vials)	1x1-liter amber bottles (3 bottles)	1x1-liter amber bottles (7 bottles)	1x250-mL poly bottle (7 bottles)	1x250-mL poly bottle (8 bottles)
Well	Location	Sample	Head-space OVM	Breathing Space OVM	~~Depth to Product~~	Depth to Water	Samples					
OKUS-W7	UPMF	✓				MACC.	X		X			X
OMW-6*	TOFC	✓				NP	X		X			
OKUS-W8*	UPMF	✓				5.00	X		X			X
APL/UP-W1	UPMF	✓					X		X			X
APL/UP-W2	UPMF	✓					X		X			X
OKUS-W1	UPMF	✓				7.73	X		X			X
PORT-MW05	UPIR					9.30	X	X	X	X	X	
PORT-MW05 dup	UPIR					—	X	X	X	X	X	
OMW-1*	TOFC	✓				4.63	X		X			
PORT-MW01	UPIR	✓				5.32	X	X	X	X	X	
PORT-MW02*	UPIR	✓				4.88	X	X	X	X	X	
PORT-MW03*	UPIR					7.06	X	X	X	X	X	
PORT-MW04*	UPIR	✓				8.06	X	X	X	X	X	
PORT-MW06*	UPIR					3.10	X	X	X	X	X	
Total Samples							23	7	23	7	7	8

ALSO NEED: 3 TRIP BLANKS FOR VOLATILES

MACC, truck on top

cleanest

69
21
90

*There is a < 10% difference in measured diesel concentration or free product thickness between this well and the well listed above it.

2/15/99

Well No.: OKUS-W1	Site: UP Motor Freight Facility	Date: 2/18/99
Client: Port of Oakland	Project No.:	
Well Casing Diameter: (2") 4" 6" Other:	Well Casing Material: PVC SS Other:	
Well Headspace:	PID (ppm):	FID (ppm):
Sampler: C O'Neill C Chan		

Total Depth of Well (feet): (10.5 + .3) 14.8 (measured 2/18/99) Reference Point: _____ Datum: _____

Depth to Water (feet): 7.73

Water Column Height (feet): 11.07 (X) (2" - 0.16) 4" - 0.65 6" - 1.47 Gal/feet = 1.77 (X) 3 = 5.3 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump ☐ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☒ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: _____ Purge Equipment Decon'd? Y ☐ N ☐

Depth of Pump Intake (feet): _____ Purge/Decon Water Containerized? Y ☐ N ☐ Container Type/ Volume? _____

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
1432	0	59.5		59000				pH + conductivity on Hydac not functioning
1435	2	63.4						
1436	3	64.2						
1437	4	64.8						
1438	5	65.3						
1439	5.5	65.3						

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate: _____
Bailer: ☒ Type: _____
Other: ☐ Desc.: _____

Sample ID: OKUS-W1
Dup. ID (if appl.): _____
Sample Time: 1445

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8015M 8020	3-40mL VOAs	HCl
8015M	1 1L amber	—
6000	1 1L poly	—

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OKUSW2	Site: UP Motor Freight Facility	Date: 2/18/99
Client: Port of Oakland	Project No.:	
Well Casing Diameter: (2") 4" 6" Other:	Well Casing Material: PVC SS Other:	
Well Headspace:	PID (ppm):	FID (ppm):
Sampler: C O'Neill C Chan		

Total Depth of Well (feet): 22.33 Reference Point: ______ Datum: ______

Depth to Water (feet): 8.52

Water Column Height (feet): 13.81 (X) (2" - 0.16) / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 2.21 (X) 3 = 6.6 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump ☐ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☒ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: ______ Purge Equipment Decon'd? Y ☐ N ☐

Depth of Pump Intake (feet): ______ Purge/Decon Water Containerized? Y ☐ N ☐ Container Type/Volume? ______

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
1358	0	62.7						odor
1400	2	63.8						conductivity on
1402	3	64.5						Hydac > 9999!
1404	4	65.3						called Equipco for
1407	6	63.6						new one
1409	7	64.6						

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate: ______
Bailer: ☒ Type: ______
Other: ☐ Desc.: ______

Sample ID: ______
Dup. ID (if appl.): ______
Sample Time: 1417

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8015M 8020	3 40mL VOAs	HCl
8015M	1 1L Amber	—
6000	1 1L poly	—

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OKUS-W3	Site: UP Motor Freight Facility	Date: 2/17/99
Client: Port of Oakland	Project No.:	
Well Casing Diameter: (2") 4" 6" Other:	Well Casing Material: PVC SS Other:	
Well Headspace: PID (ppm):	FID (ppm):	
Sampler: C. O'Neill C. Chan		

Total Depth of Well (feet): 22.09 Reference Point: ______ Datum: ______

Depth to Water (feet): 8.02

Water Column Height (feet): 14.07 (X) (2" - 0.16) 4" - 0.65 6" - 1.47 ___" - ___ Gal/feet = 2.25 (X) 3 = 6.8 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump ☐ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☒ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: ______ Purge Equipment Decon'd? Y ☐ N ☐

Depth of Pump Intake (feet): ______ Purge/Decon Water Containerized? Y ☐ N ☐ Container Type/Volume? ______

Time	Gallons	Temp. (C / F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
1558	0	63	6.68	1838				odor
1559	1	63.7	6.66	1859				
1600	2.5	63.9	6.66	2100				
1602	4	64.0	6.65	2140				
1603	5	64.4	6.68	2310				
1604	5.5	64.3	6.88	2380				
1605	6	64.1	6.94	2270				
1606	7	64.1	6.96	2370				

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate: ______
Bailer: ☒ Type: ______
Other: ☐ Desc.: ______

Sample ID: OKUS-W3
Dup. ID (if appl.): OKUS-W12 (1615)
Sample Time: 1625

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8015M 8020	3 40mL VOAs	HCl
8015M	1 1L amber	—
6000	1 1L poly	—

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OKUS-W7	Site: UP Motor Freight Facility	Date: 2/19/99
Client: Port of Oakland	Project No.:	
Well Casing Diameter: (2") 4" 6" Other:	Well Casing Material: PVC SS Other:	
Well Headspace:	PID (ppm):	FID (ppm):
Sampler: C O'Neill C Chan		

Total Depth of Well (feet): 19.84 Reference Point: _____ Datum: _____

Depth to Water (feet): 5.11

Water Column Height (feet): 14.73 (X) (2" - 0.16, 4" - 0.65, 6" - 1.47) Gal/feet = 2.36 (X) 3 = 7.1 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump ☐ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☒, Teflon ☐, SS ☐, Disposable ☐

Pump Make/Model: _____ Purge Equipment Decon'd? Y ☐ N ☐

Depth of Pump Intake (feet): _____ Purge/Decon Water Containerized? Y ☐ N ☐ Container Type/ Volume? _____

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
857	0	58.5						
859	1	60.9						
900	2	62.7						
901	3	62.8						
902	4	63.0						
904	5	64.0						
905	6	63.0						
907	7	63.0						

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate: _____
Bailer: ☒ Type: _____
Other: ☐ Desc.: _____

Sample ID: OKUS-W7
Dup. ID (if appl.): _____
Sample Time: 910

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8015M, 8020	3-40mL VOAs	HCl
8015M	1-1L amber	—
6000	1-500mL poly	—

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OKUS-W8	Site: UP Motor Freight Facility	Date: 2/18/99
Client: Port of Oakland	Project No.:	
Well Casing Diameter: (2") 4" 6" Other:	Well Casing Material: PVC SS Other:	
Well Headspace:	PID (ppm):	FID (ppm):
Sampler: C O'Neill C Chan		

Total Depth of Well (feet): 14.8 Reference Point: ____ Datum: ____

Depth to Water (feet): 5.00

Water Column Height (feet): 9.80 (X) (2" - 0.16) 4" - 0.65 6" - 1.47 Gal/feet = 1.57 (X) 3 = 4.7 Minimum Purge Volume (Gallons)

__" - ____

PURGE METHOD:

Submersible Pump ☐ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☒ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: ____ Purge Equipment Decon'd? Y ☐ N ☐

Depth of Pump Intake (feet): ____ Purge/Decon Water Containerized? Y ☐ N ☐ Container Type/Volume? ____

Time	Gallons	Temp. (C / F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
1540	0	59.5						
1541	1	62.1						
1543	2	63.0						
1545	3	63.0						
1546	4	64.7						
1547	5	64.8						

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate: ____

Bailer: ☒ Type: ____

Other: ☐ Desc.: ____

Sample ID: OKUS-W8

Dup. ID (if appl.): ____

Sample Time: 1555

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8015M, 8020	3 40mL VOAs	HCl
8015M	1 1L amber	—
6000	1 1L poly	—

CDM
environmental engineers, scientists, planners, & management consultants

MONITORING WELL PURGE AND SAMPLING FORM

Well No.: APL/UP-W1	Site: APL	Date: 2/18/99
Client: Port of Oakland	Project No.:	
Well Casing Diameter: (2") 4" 6" Other:	Well Casing Material: PVC SS Other:	
Well Headspace:	PID (ppm):	FID (ppm):
Sampler: C O'Neill C Chan		

Total Depth of Well (feet): 21.85 Reference Point: _____ Datum: _____

Depth to Water (feet): 10.19

Water Column Height (feet): 11.66 (X) (2" - 0.16, 4" - 0.65, 6" - 1.47) Gal/feet = 1.87 (X) 3 = 5.6 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump ☐ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: _____ Purge Equipment Decon'd? Y ☐ N ☐

Depth of Pump Intake (feet): _____ Purge/Decon Water Containerized? Y ☐ N ☐ Container Type/ Volume? _____

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
915	0							Hydac meter having difficulty stabilizing pH
916	5	59.1						
919	3	58.1	8.1	1764				
924	6	60.1		1973				

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate: _____
Bailer: ☐ Type: _____
Other: ☐ Desc.: _____

Sample ID: APL/UP-W1
Dup. ID (if appl.): _____
Sample Time: 935

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8015M, 8020	3 40 mL VOAs	HCl
8015M	1 1L amber	—
6000	1 250mL poly	—

CDM environmental engineers, scientists, planners, & management consultants

MONITORING WELL PURGE AND SAMPLING FORM

Well No.: APL/UP-W2	Site: APL	Date: 2/18/99
Client: Port of Oakland	Project No.:	
Well Casing Diameter: (2") 4" 6" Other:	Well Casing Material: PVC SS Other:	
Well Headspace: PID (ppm):	FID (ppm):	
Sampler: C O'Neill C. Chan		

Total Depth of Well (feet): 16.98
Depth to Water (feet): 9.55
Reference Point: ______ Datum: ______

Water Column Height (feet): 7.43 (X) (2" - 0.16) 4" - 0.65 6" - 1.47 ___" - ___ Gal/feet = 1.19 (X) 3 = 3.6 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump ☐ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: ______ Purge Equipment Decon'd? Y ☐ N ☐

Depth of Pump Intake (feet): ______ Purge/Decon Water Containerized? Y ☐ N ☐ Container Type/Volume? ______

Time	Gallons	Temp. (C / F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
945	0	61.4		1690				cap of well broken
948	2.5	61.9	8.6+	1807				(allows infiltration
950	4							from top)

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate: ______
Bailer: ☒ Type: ______
Other: ☐ Desc.: ______

Sample ID: APL/UP-W2
Dup. ID (if appl.): ______
Sample Time: 1005

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8015M 8020	3 40mL VOAs	HCl
8015M	1 1L Amber	—
6000	1 250mL poly	—

CDM
environmental engineers, scientists, planners, & management consultants

MONITORING WELL PURGE AND SAMPLING FORM

Appendix B

PLS Survey Inc.
Survey Data

CADD PT NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION	WELL	
23	2117653.81	6040234.35	15.18	OMW-1 VAULT		
24	2117653.86	6040234.31	14.88	QMW-1.CASING	OMW-1	
25	2117492.96	6040233.47	12.99	OMW-3.CASE	OMW-3	
26	2117558.40	6039815.75	13.75	OMW-4.VAULT		
27	2117558.14	6039815.61	13.38	OMW-4.CASING	OMW-4	
28	2117538.80	6039921.11	13.85	OMW-8.VAULT		
29	2117538.85	6039920.90	13.62	OMW-8.CASING	OMW-8	
33	2117502.35	6039638.96	12.48	ORW-1 VAULT		
34	2117502.10	6039639.84	13.29	1.8X2.9LID.ORW-1	ORW-1	
35	2117504.62	6039652.43	12.61	OP-3.CASING	OP-3	
36	2117504.55	6039652.58	13.28	OP-3.VAULT		
37	2117506.93	6039711.41	13.17	OMW-7.CASING	OMW-7	
38	2117506.92	6039711.53	13.41	OMW-7.VAULT		
39	2117512.28	6039754.43	12.92	ORW-2.CASE	ORW-2	
40	2117511.85	6039755.53	13.40	1.8X2.9 ORW-2		
41	2117510.82	6039807.59	13.20	OP-1.VAULT		
42	2117510.91	6039807.50	12.87	OP-1.CASING	OP-1	
43	2117518.33	6039854.09	12.46	ORW-3.CASING	ORW-3	
44	2117517.77	6039853.53	13.43	1.8X2.9.VLT ORW-3		
45	2117452.97	6039750.98	12.91	OMW-9.VAULT		
46	2117451.96	6039750.69	12.31	OMW-9.CASING	OMW-9	
47	2117475.55	6039502.57	12.22	OP-4 CASING	OP-4	
48	2117475.91	6039501.91	12.78	1.8X2.9.OP-4.VLT		
52	2117358.31	6039449.13	12.07	OMW-2.CASING	OMW-2	
53	2117358.20	6039449.19	12.26	OMW-2.VAULT		
54	2117387.34	6039782.31	13.95	OP-2.CASING	OP-2	
55	2117387.31	6039782.38	14.15	OP-2.VAULT		
56	2117262.38	6039751.24	13.76	OMW-5.CASING	OMW-5	
57	2117261.22	6039750.74	14.24	G OMW-5		
58	2117371.85	6040317.26	13.10	OKUSW-6.CASING	OKUS-W6	
59	2117371.74	6040316.99	13.37	OKUSW-6.VAULT		
60	2117347.32	6040362.93	27.94	BC.NO.ELEV	NW Building	
61	2117110.39	6040204.83	14.02	BC	SW Building	
62	2117004.05	6040150.06	15.32	OKUSW-5.CASING	OKUS-W5	
63	2117003.88	6040150.14	15.49	OKUSW-5.VAULT		
64	2116939.90	6040084.02	15.84	RW.CASING	RW	
65	2116939.38	6040083.67	16.56	RW.VAULT		
67	2116879.17	6040111.32	15.85	OKUSW-3.CASING	OKUS-W3	
68	2116879.54	6040111.13	16.06	OKUSW-3.VAULT		
69	2116874.16	6040067.12	15.73	OKUSW-2.CASING	OKUS-W2	
70	2116874.10	6040067.03	15.93	OKUSW-2.VAULT		
71	2116831.70	6039988.43	15.24	OKUSW-1.CASING	OKUS-W1	
72	2116831.61	6039988.56	15.56	OKUSW-1.VAULT		
73	2116723.65	6040236.66	13.19	APLUP-W2.CASING	APL/UP-W2	
74	2116723.84	6040236.95	13.48	APLUP-W2.VAULT		
75	2116814.40	6040227.07	14.19	APLUP-W1.CASING	APL/UP-W1	
76	2116814.73	6040226.98	14.55	APLUP-W1.VAULT		
77	2116910.85	6039803.09	12.80	OKUSW-8.CASING	OKUS-W8	
78	2116911.13	6039802.74	13.09	OKUSW-8.VAULT		
79	2116991.20	6039787.28	12.98	OKUSW-7.CASING	OKUS-W7	

CADD PT NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION	WELL	
80	2116991.62	6039787.17	13.45	OKUSW-7.VAULT		
83	2116670.11	6039523.74	11.67	OMW-6.CASING	OMW-6	
84	2116670.00	6039523.83	11.88	OMW-6.VAULT		
85	2117534.24	6039339.72	13.71	OMW-10.CASING	OMW-10	
86	2117534.11	6039339.74	14.00	OMW-10.VAULT		
CONTROL: COORDINATE VALUES ARE BASED ON THE CALIFORNIA COORDINATE						
	SYSTEM, NAD '83 ZONE III. HORIZONTAL CONTROL IS BASED ON					
	POINT "CHAN", HAVING THE FOLLOWING VALUES:					
	NORTHING-2115374.50, EASTING-6040926.93. ELEVATION IS					
	BASED ON BENCHMARK "VENT", EL=17.20, PORT OF OAKLAND DATUM.					

Appendix C

Analytical Reports and Chain-of Custody

Appendix C-1

Environmental Decision Group
APL/UP-W1, APL/UP-W2A, OKUS-W2, OKUS-W3, ADL/UP-W2

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (925) 988-9600, FAX (925) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100
1455 McDowell Blvd. North, Ste. D, Petaluma, CA 94954, (707) 792-1865, FAX (707) 792-0342

Environmental Decision Group
5665 Flatiron Pkwy.
Boulder, CO. 80301
Attention: Lisa Hennesey

Client Project ID: Port of Oakland
Sample Matrix: Water
Analysis Method: EPA 5030/8015 Mod./8020
First Sample #: 812-0167

Sampled: Nov 30, 1998
Received: Dec 1, 1998
Reported: Dec 11, 1998

QC Batch Number:	GC120798 802002A	GC120798 802002A	GC120898 802002A	GC120898 802002A	GC120798 802002A	GC120798 802002A

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 812-0167 APL/UP-W-1	Sample I.D. 812-0168 APL/UP-W-2A	Sample I.D. 812-0169 OKUS-W2	Sample I.D. 812-0170 OKUS-W3	Sample I.D. 812-0171 Trip Blank	Sample I.D. 812-0172 ADL/UP-W2
Purgeable Hydrocarbons	50	85	65	3,800	8,400	N.D.	54
Benzene	0.50	3.8	2.1	120	240	N.D.	1.9
Toluene	0.50	N.D.	N.D.	24	61	N.D.	N.D.
Ethyl Benzene	0.50	47	33	2,800	6,600	N.D.	31
Total Xylenes	0.50	5.8	3.8	160	270	N.D.	4.0
Chromatogram Pattern:		Unidentified Hydrocarbons C6 - C12	Unidentified Hydrocarbons C6 - C12	Gasoline	Gasoline	--	Unidentified Hydrocarbons C6 - C12

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	40	100	1.0	1.0
Date Analyzed:	12/7/98	12/7/98	12/8/98	12/8/98	12/7/98	12/7/98
Instrument Identification:	HP-2	HP-2	HP-2	HP-2	HP-2	HP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	102	102	101	101	105	100

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL, #1271

Julianne Fegley
Project Manager

8120167.EEE <1>

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (925) 988-9600, FAX (925) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100
1455 McDowell Blvd. North, Ste. D, Petaluma, CA 94954, (707) 792-1865, FAX (707) 792-0342

Environmental Decision Group	Client Project ID:	Port of Oakland	Sampled: Nov 30, 1998
5665 Flatiron Pkwy.	Sample Matrix:	Water	Received: Dec 1, 1998
Boulder, CO. 80301	Analysis Method:	EPA 3510/8015 Mod.	Reported: Dec 11, 1998
Attention: Lisa Hennesey	First Sample #:	812-0167	

QC Batch Number: SP120298 (5 samples) / 8015EXA (5 samples)

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 812-0167 APL/UP-W-1	Sample I.D. 812-0168 APL/UP-W-2A	Sample I.D. 812-0169 OKUS-W2	Sample I.D. 812-0170 OKUS-W3	Sample I.D. 812-0172 ADL/UP-W2
Extractable Hydrocarbons	50	500	400	2,800	3,400	510
Chromatogram Pattern:		Diesel	Diesel	Discrete Peaks & Unidentified Hydrocarbons C9 - C24	Discrete Peaks & Unidentified Hydrocarbons C9 - C24	Diesel

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0
Date Extracted:	12/2/98	12/2/98	12/2/98	12/2/98	12/2/98
Date Analyzed:	12/2/98	12/2/98	12/3/98	12/3/98	12/3/98
Instrument Identification:	HP-3B	HP-3B	HP-3B	HP-3A	HP-3A

Extractable Hydrocarbons are quantitated against a fresh diesel standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL, #1271

Julianne Fegley
Project Manager

8120167.EEE <2>

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (925) 988-9600, FAX (925) 988-9673
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1455 McDowell Blvd. North, Ste. D, Petaluma, CA 94954, (707) 792-1865, FAX (707) 792-0342

Environmental Decision Group
5665 Flatiron Pkwy.
Boulder, CO. 80301
Attention: Lisa Hennesey

Client Project ID: Port of Oakland
Matrix: Liquid

QC Sample Group: 8120167-172

Reported: Dec 11, 1998

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes	Diesel
QC Batch#:	GC120798	GC120798	GC120798	GC120798	SP120298
Analy. Method:	802002A EPA 8020	802002A EPA 8020	802002A EPA 8020	802002A EPA 8020	8015EXA EPA 8015
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030	EPA 3510
Analyst:	D. Newcomb	D. Newcomb	D. Newcomb	D. Newcomb	K. Grubb
MS/MSD #:	8120525	8120525	8120525	8120525	BLK120298
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Prepared Date:	12/7/98	12/7/98	12/7/98	12/7/98	12/2/98
Analyzed Date:	12/7/98	12/7/98	12/7/98	12/7/98	12/3/98
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2	HP-3A
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L	500 µg/L
Result:	18	18	19	60	490
MS % Recovery:	90	90	95	100	98
Dup. Result:	19	19	19	62	470
MSD % Recov.:	95	95	95	103	94
RPD:	5.4	5.4	0.0	3.3	4.2
RPD Limit:	0-20	0-20	0-20	0-20	0-50

LCS #:	2LCS120798	2LCS120798	2LCS120798	2LCS120798	LCS120298
Prepared Date:	12/7/98	12/7/98	12/7/98	12/7/98	12/2/98
Analyzed Date:	12/7/98	12/7/98	12/7/98	12/7/98	12/3/98
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2	HP-3A
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L	500 µg/L
LCS Result:	18	17	19	59	460
LCS % Recov.:	90	85	95	98	92
MS/MSD LCS Control Limits	70-130	70-130	70-130	70-130	60-140

SEQUOIA ANALYTICAL, #1271

Julianne Fegley
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
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1455 McDowell Blvd. North, Ste. D, Petaluma, CA 94954, (707) 792-1865, FAX (707) 792-0342

Environmental Decision Group
5665 Flatiron Pkwy.
Boulder, CO. 80301
Attention: Lisa Hennesey

Client Project ID: Port of Oakland
Matrix: Liquid

QC Sample Group: 8120167-172

Reported: Dec 11, 1998

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC120898	GC120898	GC120898	GC120898
	802002A	802002A	802002A	802002A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	C. Westwater	C. Westwater	C. Westwater	C. Westwater
MS/MSD #:	8120213	8120213	8120213	8120213
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	12/8/98	12/8/98	12/8/98	12/8/98
Analyzed Date:	12/8/98	12/8/98	12/8/98	12/8/98
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Result:	19	18	28	63
MS % Recovery:	95	90	140	105
Dup. Result:	18	18	19	60
MSD % Recov.:	90	90	95	100
RPD:	5.4	0.0	38	4.9
RPD Limit:	0-20	0-20	0-20	0-20
LCS #:	2LCS120898	2LCS120898	2LCS120898	2LCS120898
Prepared Date:	12/8/98	12/8/98	12/8/98	12/8/98
Analyzed Date:	12/8/98	12/8/98	12/8/98	12/8/98
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
LCS Result:	18	18	19	61
LCS % Recov.:	90	90	95	102
MS/MSD LCS Control Limits	70-130	70-130	70-130	70-130

SEQUOIA ANALYTICAL, #1271

Julianne Fegley

Julianne Fegley
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

SEQUOIA ANALYTICAL
CHAIN OF CUSTODY

☐ 680 Chesapeake Drive • Redwood City, CA 94063 • (650) 364-9600 FAX (650) 364-9233
☐ 819 Striker Ave., Suite 8 • Sacramento, CA 95834 • (916) 921-9600 FAX (916) 921-0100
☒ 1404 N. Wiget Lane • Walnut Creek, CA 94598 • (925) 988-9600 FAX (925) 988-9673
☐ 1455 McDowell Blvd. North, Suite D • Petaluma, CA 94954 • (707) 792-1865 FAX (707) 792-0342

Company Name: Environmental Decision Group	Project Name: Port of Oakland
Mailing Address: 5665 Flatiron Pkwy	Billing Address (if different): 5665 Flatiron Pkwy
City: Boulder State: CO Zip Code: 80301	Boulder, CO 80301 9812037
Telephone: 510 337-8659 FAX #: 510 337-3974	P.O. #:
Report To: Lisa Hennessey Sampler: Steven Carson	QC Data: ☒ Level D (Standard) ☐ Level C ☐ Level B ☐ Level A

Turnaround Time: ☒ 10 Working Days ☐ 3 Working Days ☐ 2 - 8 Hours ☐ 7 Working Days ☐ 2 Working Days ☐ 5 Working Days ☐ 24 Hours

☐ Drinking Water ☐ Waste Water ☐ Other

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Sequoia's Sample #	TPH-G	TPH-D	BTEX	Comments
1. APL/UP-W1	11/30/98, 1150	H_2O	1	A	8120167		X		
2. APL/UP-W1	↓	↓	2	VOA	↓ A-C	X		X	
3. APL/UP-W2A	1100		1	A	8120168		X		
4. APL/UP-W2A	↓	↓	2	VOA	↓ A-C	X		X	
5. OKUS-W2	1600		1	A	8120169		X		
6. OKUS-W2	↓	↓	2	VOA	↓ A-C	X		X	
7. OKUS-W3	1520		1	A	8120170		X		
8. OKUS-W3	↓	↓	2	VOA	↓ A-C	X		X	
9. Trip Blank	11/30/98 0800	H_2O	1	VOA	8120171	X		X	
10.									

Relinquished By:	Date: 12/1/98	Time: 0800	Received By: Courier	Date: 12/01/98	Time: 0800
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab:	Date: 12/1/98	Time: 1305

SEQUOIA ANALYTICAL
CHAIN OF CUSTODY

☐ 680 Chesapeake Drive • Redwood City, CA 94063 • (650) 364-9600 FAX (650) 364-9233
☐ 819 Striker Ave., Suite 8 • Sacramento, CA 95834 • (916) 921-9600 FAX (916) 921-0100
☒ 1404 N. Wiget Lane • Walnut Creek, CA 94598 • (925) 988-9600 FAX (925) 988-9673
☐ 1455 McDowell Blvd. North, Suite D • Petaluma, CA 94954 • (707) 792-1865 FAX (707) 792-0342

Company Name: Environmental Decision Group	Project Name: Port of Oakland
Mailing Address: 5665 Flatiron Pkwy	Billing Address (if different):
City: Boulder State: CO Zip Code: 80301	9812037
Telephone: 510 337-8659 FAX #: 510 337-3994	P.O. #:
Report To: Lisa Hennessey Sampler: Steve Carson	QC Data: ☒ Level D (Standard) ☐ Level C ☐ Level B ☐ Level A

Turnaround Time: ☒ 10 Working Days ☐ 3 Working Days ☐ 2 - 8 Hours ☐ 7 Working Days ☐ 2 Working Days ☐ 5 Working Days ☐ 24 Hours

☐ Drinking Water ☐ Waste Water ☐ Other

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Sequoia's Sample #	TPH-6	TPH-D	BTEX	Comments
1. ADL/VP-W2	11/30/98 1110	H2O	1	A	8120172	X			
2. ↓	↓ ↓	↓	2	VOA	↓A-C	X	X		
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									

Relinquished By: [signature]	Date: 12/1/98	Time: 0800	Received By: Courier	Date: 12/01/98	Time: 0800
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab: [signature]	Date: 12/1/98	Time: 305

Appendix C-2

CDM/FEJ
OKUS-W3, OKUS-W12

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900, Fax (510) 486-0532

A N A L Y T I C A L R E P O R T

Prepared for:

Camp, Dresser & McKee
1 Walnut Creek Center
100 Pringle Ave, Suite 300
Walnut Creek, CA 94596

Date: 03-MAR-99
Lab Job Number: 138022
Project ID: 10605-25291
Location: Port Of Oakland,U.P.GW

Reviewed by: _____

Reviewed by: _____

Curtis & Tompkins, Ltd.

Laboratory Number: **138022**
Client: **Camp, Dresser & McKee**
Location: **Port of Oakland, U.P. GW**
Project: **10605-25291**

Receipt Date: **2/17/99**

CASE NARRATIVE

This hardcopy data package contains sample and QC results for eleven water samples that were received on February 17, 1999. All samples were received cold and intact.

Total Volatile Hydrocarbons/BTXE: No analytical problems were encountered.

Total Extractable Hydrocarbons: All extracts were treated with silica gel prior to analysis. No analytical problems were encountered.

Volatile Organics by EPA Method 8260: No analytical problems were encountered.

Polynuclear Aromatic Hydrocarbons by EPA Method 8270B: The extracts for all samples did not require GPC clean-up. No analytical problems were encountered.

Metals & Arsenic by EPA Method 6010A: All samples were preserved and filtered prior to analysis. Because there was no metal elements detected, with the exception of Barium, the %RPD is 'Not Calculable' for the Sample Duplicate. No analytical problems were encountered.

CHAIN OF CUSTODY FORM

Page 1 of 1

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900 Phone
(510) 486-0532 Fax

4°C

C&T LOGIN # 13902

Sampler: Charlie ONeill, Clara Chan

Project No: 10605-25291-GW.UPIR GW. UPMF, GW.UPTOFC

Report To: Hoa Voscott

Project Name: Port of Oakland, UP gw sampling

Company: Camp Dresser & McKee

Project P.O.:

Telephone: 925 933 2900

Turnaround Time: 5 days

Fax: 925 933 4174

Lab Number	Sample ID.	Sampling Date Time	Matrix: Soil	Water	Waste	# of Containers	Preservative: HCl	H_2SO_4	HNO_3	ICE	Directions Field Notes	TPH-gas 8015M	BTEX 8020	VOCs 8260	TPH-diesel, motor oil, hydr. oil 8015M with silica gel cleanup	PAHs 8270 with gel permeation column cleanup	Dissolved (Cam 17) metals 6010	Arsenic 6000	TPH-diesel 8015M with silica gel cleanup
	PORT-MW01	2/17/99 948		X		9	X*			X	Please filter and preserve	X	X	X	X	X	X		
	PORT-MW02	1038				9					Metals (6010) samples	X	X	X	X	X	X		
	PORT-MW04	1127				9					IMMEDIATELY	X	X	X	X	X	X		
	OMW-10	1217				4							X						X
	OMW-12	1317				4							X						X
	OMW-1	1440				4							X						X
	OMW-8	1515				4							X						X
	OMW-3	1540				4							X						X
	OKUS-W3	1625				5					Please filter and preserve	X	X					X	X
	OKUS-W12	1615				5					Arsenic (6000) samples IMMEDIATELY	X	X					X	X
							*HCl for TPH-gas/BTEX + VOCs vials only													
	Trip Blank 2/18/99											X	X	X					

Notes: note cleanups for TPH-diesel + TPH-diesel, motor + hydr oil
filter + preserve Metals (6010) + Arsenic (6000) samples ASAP

RELINQUISHED BY:	RECEIVED BY:
Clara Chan 2/17/99 1700 DATE/TIME	2/17/99 1700 DATE/TIME
DATE/TIME	DATE/TIME
DATE/TIME	DATE/TIME

Signature on this form constitutes a firm Purchase Order for the services requested above.

Curtis & Tompkins, Ltd.

TVH-Total Volatile Hydrocarbons

Client: Camp, Dresser & McKee
Project#: 10605-25291
Location: Port Of Oakland,U.P.GW

Analysis Method: EPA 8015M
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138022-001	PORT-MW01	46364	02/17/99	02/19/99	02/19/99	
138022-002	PORT-MW02	46364	02/17/99	02/19/99	02/19/99	
138022-003	PORT-MW04	46364	02/17/99	02/19/99	02/19/99	
138022-009	OKUS-W3	46364	02/17/99	02/20/99	02/20/99	

Matrix: Water

Analyte Diln Fac:	Units	138022-001 1	138022-002 1	138022-003 1	138022-009 25	
Gasoline C7-C12	ug/L	<50	<50	<50	9800	YL
Surrogate						
Trifluorotoluene	%REC	102	102	104	106	
Bromofluorobenzene	%REC	101	102	102	103	

Y: Sample exhibits fuel pattern which does not resemble standard
L: Lighter hydrocarbons than indicated standard

TVH-Total Volatile Hydrocarbons

Client: Camp, Dresser & McKee
Project#: 10605-25291
Location: Port Of Oakland,U.P.GW

Analysis Method: EPA 8015M
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138022-010	OKUS-W12	46386	02/17/99	02/23/99	02/23/99	
138022-011	TRIP BLANK	46364	02/17/99	02/19/99	02/19/99	

Matrix: Water

Analyte	Units	138022-010		138022-011
Diln Fac:		50		1
Gasoline C7-C12	ug/L	6700	Y	<50
Surrogate				
Trifluorotoluene	%REC	100		99
Bromofluorobenzene	%REC	100		95

Y: Sample exhibits fuel pattern which does not resemble standard

BTXE

Client: Camp, Dresser & McKee
Project#: 10605-25291
Location: Port Of Oakland,U.P.GW

Analysis Method: EPA 8021B
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138022-009	OKUS-W3	46386	02/17/99	02/23/99	02/23/99	
138022-010	OKUS-W12	46386	02/17/99	02/23/99	02/23/99	
138022-011	TRIP BLANK	46364	02/17/99	02/19/99	02/19/99	

Matrix: Water

Analyte	Units	138022-009	138022-010	138022-011
Diln Fac:		100	50	1
Benzene	ug/L	200	190	<0.5
Toluene	ug/L	<50	45	<0.5
Ethylbenzene	ug/L	2700	2600	<0.5
m,p-Xylenes	ug/L	<50	<25	<0.5
o-Xylene	ug/L	<50	<25	<0.5
Surrogate				
Trifluorotoluene	%REC	91	95	93
Bromofluorobenzene	%REC	93	97	92

TEH-Tot Ext Hydrocarbons

Client: Camp, Dresser & McKee
Project#: 10605-25291
Location: Port Of Oakland,U.P.GW

Analysis Method: EPA 8015M
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138022-009	OKUS-W3	46362	02/17/99	02/18/99	02/24/99	
138022-010	OKUS-W12	46362	02/17/99	02/18/99	02/24/99	

Matrix: Water

Analyte	Units	138022-009		138022-010	
Diln Fac:		1		1	
Diesel C10-C24	ug/L	610	YLZ	460	YLZ
Motor Oil C24-C36	ug/L	<300		<300	
Hydraulic Fluid,C24-36	ug/L	<300		<300	
Surrogate					
Hexacosane	%REC	67		74	

Y: Sample exhibits fuel pattern which does not resemble standard
Z: Sample exhibits unknown single peak or peaks
L: Lighter hydrocarbons than indicated standard

CLIENT: Camp, Dresser & McKee
PROJECT ID: 10605-25291
LOCATION: Port Of Oakland,U.P.GW
MATRIX: Filtrate

DATE REPORTED: 03/02/99

Metals Analytical Report

Arsenic

Sample ID	Lab ID	Sample Date	Receive Date	Result (ug/L)	Reporting Limit (ug/L)	IDF	QC Batch	Method	Analysis Date
OKUS-W3	138022-009	02/17/99	02/17/99	99	5.0	1	46373	EPA 6010A	02/23/99
OKUS-W12	138022-010	02/17/99	02/17/99	97	5.0	1	46373	EPA 6010A	02/23/99

Curtis & Tompkins, Ltd.

Appendix C-3

CDM/FEJ
APL/UP-W1, APL/UP-W2, OKUS-W2, OKUS-W1, OKUS-W8,

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900, Fax (510) 486-0532

A N A L Y T I C A L R E P O R T

Prepared for:

Camp, Dresser & McKee
1 Walnut Creek Center
100 Pringle Ave, Suite 300
Walnut Creek, CA 94596

Date: 03-MAR-99
Lab Job Number: 138050
Project ID: 10605-25291
Location: Port Of Oakland,U.P.GW

Reviewed by: _____

Reviewed by: _____

Curtis & Tompkins, Ltd.

Laboratory Number: **138050**
Client: **Camp, Dresser & McKee**
Location: **Port of Oakland, U.P. GW**
Project: **10605-25291**

Receipt Date: **2/18/99**

CASE NARRATIVE

This hardcopy data package contains sample and QC results for nine water samples that were received on February 18, 1999. All samples were received cold and intact.

Total Volatile Hydrocarbons/BTXE: No analytical problems were encountered.

Total Extractable Hydrocarbons: All extracts were treated with silica gel prior to analysis. No analytical problems were encountered.

Volatile Organics by EPA Method 8260: No analytical problems were encountered.

Arsenic by EPA Method 6010A: No analytical problems were encountered.

CHAIN OF CUSTODY FORM

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900 Phone
(510) 486-0532 Fax

C&T LOGIN # 13805 6

Sampler: C O'Neill C Chan

Project No:

Project Name: Port of Oakland, UP

Project P.O.: 10605-25291-GW-UPMFGW UPTOFC

Turnaround Time: 5days

Report To: Hoa Voscott

Company: Camp Dresser & McKee

Telephone: 925 9332900

Fax: 925 933 4174

Lab Number	Sample ID.	Sampling Date Time	Matrix: Soil	Water	Waste	# of Containers	Preservative: HCl*	H_2SO_4	HNO_3	ICE	Directions Field Notes	Analyses: TPH diesel 8015M w/silica gel cleanup	BTEX 8020	TPHgas 8015M	Arsenic 6000	VOCs 8260
1	APL/UP-W1	2/18/99 935		X		5	X				Pls filter+preserve	X	X	X	X	
2	APL/UP-W2	1005				5					arsenic (6000) samples ASAP	X	X	X	X	
3	OMW-5	1125				4						X	X			
4	OMW-2	1205				4						X	X			
5	OKUS-W2	1417				5					Pls filter+preserve	X	X	X	X	
6	OKUS-W1	1445				5					arsenic (6000) samples ASAP	X	X	X	X	
7	OMW-6	1515				4						X	X			
8	OKUS-W8	1555				5					Pls filter+preserve arsenic sample ASAP	X	X	X	X	
9	TB2					1							X	X		X
10																
11																
12																

* HCl in VOAs only (TPH gas, BTEX samples)

Notes:
Filter+preserve arsenic (6000) samples immediately
4.0 JQW

RELINQUISHED BY:	RECEIVED BY:
C O'Neill 2/18/99 1635 DATE/TIME	2/18/99 1635 DATE/TIME
DATE/TIME	DATE/TIME
DATE/TIME	DATE/TIME

Signature on this form constitutes a firm Purchase Order for the services requested above.

TVH-Total Volatile Hydrocarbons

Client: Camp, Dresser & McKee
Project#: 10605-25291
Location: Port Of Oakland,U.P.GW

Analysis Method: EPA 8015M
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138050-001	APL/UP-W1	46386	02/18/99	02/22/99	02/22/99	
138050-002	APL/UP-W2	46386	02/18/99	02/23/99	02/23/99	
138050-005	OKUS-W2	46434	02/18/99	02/24/99	02/24/99	
138050-006	OKUS-W1	46386	02/18/99	02/23/99	02/23/99	

Matrix: Water

Analyte	Units	138050-001	138050-002	138050-005	138050-006
Diln Fac:		1	1	10	1
Gasoline C7-C12	ug/L	140 YL	130 YL	6200 YL	<50
Surrogate					
Trifluorotoluene	%REC	102	103	107	100
Bromofluorobenzene	%REC	105	108	101	100

Y: Sample exhibits fuel pattern which does not resemble standard
L: Lighter hydrocarbons than indicated standard

TVH-Total Volatile Hydrocarbons

Client: Camp, Dresser & McKee
Project#: 10605-25291
Location: Port Of Oakland,U.P.GW

Analysis Method: EPA 8015M
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138050-008	OKUS-W8	46386	02/18/99	02/23/99	02/23/99	
138050-009	TB2	46386	02/18/99	02/23/99	02/23/99	

Matrix: Water

Analyte	Units	138050-008	138050-009
Diln Fac:		1	1
Gasoline C7-C12	ug/L	64 Y	<50
Surrogate			
Trifluorotoluene	%REC	103	101
Bromofluorobenzene	%REC	103	99

Y: Sample exhibits fuel pattern which does not resemble standard

Curtis & Tompkins Ltd.

BTXE

Client: Camp, Dresser & McKee
Project#: 10605-25291
Location: Port Of Oakland,U.P.GW

Analysis Method: EPA 8021B
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138050-001	APL/UP-W1	46386	02/18/99	02/22/99	02/22/99	
138050-002	APL/UP-W2	46386	02/18/99	02/23/99	02/23/99	
138050-003	OMW-5	46386	02/18/99	02/23/99	02/23/99	
138050-004	OMW-2	46386	02/18/99	02/23/99	02/23/99	

Matrix: Water

Analyte	Units	138050-001	138050-002	138050-003	138050-004
Diln Fac:		1	1	1	1
Benzene	ug/L	9.3	4	<0.5	<0.5
Toluene	ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	ug/L	70	37	<0.5	1.9
m,p-Xylenes	ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	ug/L	<0.5	<0.5	<0.5	<0.5
Surrogate					
Trifluorotoluene	%REC	98	99	95	79
Bromofluorobenzene	%REC	102	103	96	82

BTXE

Client: Camp, Dresser & McKee
Project#: 10605-25291
Location: Port Of Oakland,U.P.GW

Analysis Method: EPA 8021B
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138050-005	OKUS-W2	46434	02/18/99	02/24/99	02/24/99	
138050-006	OKUS-W1	46386	02/18/99	02/23/99	02/23/99	
138050-007	OMW-6	46386	02/18/99	02/23/99	02/23/99	
138050-008	OKUS-W8	46386	02/18/99	02/23/99	02/23/99	

Matrix: Water

Analyte Diln Fac:	Units	138050-005 40	138050-006 1	138050-007 1	138050-008 1
Benzene	ug/L	220	<0.5	<0.5	<0.5
Toluene	ug/L	52	<0.5	<0.5	<0.5
Ethylbenzene	ug/L	5300	<0.5	<0.5	<0.5
m,p-Xylenes	ug/L	77	<0.5	<0.5	<0.5
o-Xylene	ug/L	51	<0.5	<0.5	<0.5
Surrogate					
Trifluorotoluene	%REC	97	95	95	97
Bromofluorobenzene	%REC	99	97	96	98

Curtis & Tompkins Ltd.

BTXE

Client: Camp, Dresser & McKee
Project#: 10605-25291
Location: Port Of Oakland,U.P.GW

Analysis Method: EPA 8021B
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138050-009	TB2	46386	02/18/99	02/23/99	02/23/99	

Matrix: Water

Analyte	Units	138050-009
Diln Fac:		1
Benzene	ug/L	<0.5
Toluene	ug/L	<0.5
Ethylbenzene	ug/L	<0.5
m,p-Xylenes	ug/L	<0.5
o-Xylene	ug/L	<0.5
Surrogate		
Trifluorotoluene	%REC	95
Bromofluorobenzene	%REC	97

Curtis & Tompkins, Ltd.

TEH-Tot Ext Hydrocarbons

Client: Camp, Dresser & McKee
Project#: 10605-25291
Location: Port Of Oakland,U.P.GW

Analysis Method: EPA 8015M
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138050-001	APL/UP-W1	46409	02/18/99	02/22/99	02/25/99	
138050-002	APL/UP-W2	46409	02/18/99	02/22/99	02/25/99	
138050-003	OMW-5	46409	02/18/99	02/22/99	02/27/99	
138050-004	OMW-2	46409	02/18/99	02/22/99	02/25/99	

Matrix: Water

Analyte	Units	138050-001	138050-002	138050-003	138050-004
Diln Fac:		1	1	1	1
Diesel C10-C24	ug/L	<50	<50	370 YH	<50
Motor Oil C24-C36	ug/L	<300	<300	1900 YH	<300
Surrogate					
Hexacosane	%REC	92	96	92	101

Y: Sample exhibits fuel pattern which does not resemble standard
H: Heavier hydrocarbons than indicated standard

Curtis & Tompkins Ltd.

TEH-Tot Ext Hydrocarbons

Client: Camp, Dresser & McKee
Project#: 10605-25291
Location: Port Of Oakland,U.P.GW

Analysis Method: EPA 8015M
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138050-005	OKUS-W2	46409	02/18/99	02/22/99	02/27/99	
138050-006	OKUS-W1	46409	02/18/99	02/22/99	02/25/99	
138050-007	OMW-6	46409	02/18/99	02/22/99	02/25/99	
138050-008	OKUS-W8	46409	02/18/99	02/22/99	02/25/99	

Matrix: Water

Analyte	Units	138050-005	138050-006	138050-007	138050-008
Diln Fac:		1	1	1	1
Diesel C10-C24	ug/L	1200 YLZ	<50	550 Y	110 Y
Motor Oil C24-C36	ug/L	<300	<300	<300	<300
Surrogate					
Hexacosane	%REC	91	100	99	105

Y: Sample exhibits fuel pattern which does not resemble standard
Z: Sample exhibits unknown single peak or peaks
L: Lighter hydrocarbons than indicated standard

CLIENT: Camp, Dresser & McKee
PROJECT ID: 10605-25291
LOCATION: Port Of Oakland,U.P.GW
MATRIX: Filtrate

DATE REPORTED: 03/02/99

Metals Analytical Report

Arsenic

Sample ID	Lab ID	Sample Date	Receive Date	Result (ug/L)	Reporting Limit (ug/L)	IDF	QC Batch	Method	Analysis Date
APL/UP-W1	138050-001	02/18/99	02/18/99	15	5.0	1	46427	EPA 6010A	02/24/99
APL/UP-W2	138050-002	02/18/99	02/18/99	27	5.0	1	46427	EPA 6010A	02/24/99
OKUS-W2	138050-005	02/18/99	02/18/99	71	5.0	1	46427	EPA 6010A	02/24/99
OKUS-W1	138050-006	02/18/99	02/18/99	ND	5.0	1	46427	EPA 6010A	02/24/99
OKUS-W8	138050-008	02/18/99	02/18/99	ND	5.0	1	46427	EPA 6010A	02/24/99

ND = Not detected at or above reporting limit

Curtis & Tompkins, Ltd.

Appendix C-4

CDM/FEJ
OKUS-W7

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900, Fax (510) 486-0532

A N A L Y T I C A L R E P O R T

Prepared for:

Camp, Dresser & McKee
1 Walnut Creek Center
100 Pringle Ave, Suite 300
Walnut Creek, CA 94596

Date: 03-MAR-99
Lab Job Number: 138059
Project ID: 10605-25291
Location: Port Of Oakland,U.P.GW

Reviewed by: _____

Reviewed by: _____

Curtis & Tompkins, Ltd.

Laboratory Number: **138059**
Client: **Camp, Dresser & McKee**
Location: **Port of Oakland, U.P. GW**
Project: **10605-25291**

Receipt Date: **2/19/99**

CASE NARRATIVE

This hardcopy data package contains sample and QC results for six water samples that were received on February 19, 1999. All samples were received cold and intact.

Total Volatile Hydrocarbons/BTXE: No analytical problems were encountered.

Total Extractable Hydrocarbons: All extracts were treated with silica gel prior to analysis. No analytical problems were encountered.

Volatile Organics by EPA Method 8260: No analytical problems were encountered.

Polynuclear Aromatic Hydrocarbons by EPA Method 8270B: The extracts for all samples did not require GPC clean-up. No analytical problems were encountered.

Metals & Arsenic by EPA Method 6010A: All samples were preserved and filtered prior to analysis. Because there was no metal elements detected, with the exception of Barium, the %RPD is 'Not Calculable' for the Sample Duplicate. No analytical problems were encountered.

CHAIN OF CUSTODY FORM

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900 Phone
(510) 486-0532 Fax

C&T LOGIN # 138039

Sampler: C O'Neill C Chan

Project No: 10605-25291-GW.UPIR -GW.UPMF

Report To: Hoa Voscott

Project Name: Port of Oakland, UP

Company: Camp Dresser & McKee

Project P.O.:

Telephone: 925 933 2900

Turnaround Time: 5 days

Fax: 925 933 4174

Analyses: (1) TPH gas 8015M; (2) TPH diesel/motor oil/hydr. oil 8015M w/silica gel cleanup; (3) BTEX 8020; (4) PAHs 8270 w/gel permeation col. cleanup; (5) VOCs 8260; (6) CAM17 Metals 6010; (7) Arsenic 6000; (8) TPH diesel 8015M w/silica gel cleanup

Lab Number	Sample ID.	Sampling Date Time	Soil	Water	Waste	# of Containers	HCl *	H2SO4	HNO3	ICE	DIRECTIONS ~~Field Notes~~	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)			
	OKUS-W7	2/19/99 910		X		5	X				Please filter +	X		X				X	X			
	PORT-MW05	1020		↓		9	↓				preserve 6010+6000	X	X	X	X	X	X					
	PORT-MW12	1050				9					samples ASAP	X	X	X	X	X	X					
	PORT-MW06	1120				9						X	X	X	X	X	X					
	PORT-MW03	1220				9						X	X	X	X	X	X					
	TB3	↓		↓		1						X		X		X						
							* HCl in VOAs only															

Notes:

TEMP RECEIVED 4.5°C; 4.0°C; C
RECEIVED BY JN

RELINQUISHED BY:	RECEIVED BY:
Clara Chan 2/19/99 1315 DATE/TIME	[signature] 2/19/99 1315 DATE/TIME
DATE/TIME	DATE/TIME
DATE/TIME	DATE/TIME

Signature on this form constitutes a firm Purchase Order for the services requested above.

Curtis & Tompkins Ltd.

TVH-Total Volatile Hydrocarbons

Client: Camp, Dresser & McKee
Project#: 10605-25291
Location: Port Of Oakland,U.P.GW

Analysis Method: EPA 8015M
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138059-001	OKUS-W7	46434	02/19/99	02/24/99	02/24/99	
138059-002	PORT-MW05	46434	02/19/99	02/24/99	02/24/99	
138059-003	PORT-MW12	46434	02/19/99	02/24/99	02/24/99	
138059-004	PORT-MW06	46434	02/19/99	02/24/99	02/24/99	

Matrix: Water

Analyte Diln Fac:	Units	138059-001 1	138059-002 1	138059-003 1	138059-004 1
Gasoline C7-C12	ug/L	<50	<50	<50	<50
Surrogate					
Trifluorotoluene	%REC	100	102	103	100
Bromofluorobenzene	%REC	101	103	104	103

BTXE

Client: Camp, Dresser & McKee
Project#: 10605-25291
Location: Port Of Oakland,U.P.GW

Analysis Method: EPA 8021B
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138059-001	OKUS-W7	46434	02/19/99	02/24/99	02/24/99	
138059-002	PORT-MW05	46434	02/19/99	02/24/99	02/24/99	
138059-003	PORT-MW12	46434	02/19/99	02/24/99	02/24/99	
138059-004	PORT-MW06	46434	02/19/99	02/24/99	02/24/99	

Matrix: Water

Analyte Diln Fac:	Units	138059-001 1	138059-002 1	138059-003 1	138059-004 1
Benzene	ug/L	0.73	<0.5	<0.5	<0.5
Toluene	ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	ug/L	<0.5	<0.5	<0.5	<0.5
Surrogate					
Trifluorotoluene	%REC	99	101	101	99
Bromofluorobenzene	%REC	101	105	105	102

Curtis & Tompkins Ltd.

TEH-Tot Ext Hydrocarbons

Client: Camp, Dresser & McKee
Project#: 10605-25291
Location: Port Of Oakland,U.P.GW

Analysis Method: EPA 8015M
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138059-001	OKUS-W7	46409	02/19/99	02/22/99	02/25/99	
138059-002	PORT-MW05	46409	02/19/99	02/22/99	02/27/99	
138059-003	PORT-MW12	46409	02/19/99	02/22/99	02/27/99	
138059-004	PORT-MW06	46409	02/19/99	02/22/99	02/25/99	

Matrix: Water

Analyte	Units	138059-001	138059-002	138059-003	138059-004
Diln Fac:		1	1	1	1
Diesel C10-C24	ug/L	<50	470 YH	520 YH	<50
Motor Oil C24-C36	ug/L	<300	550 H	650 H	<300
Hydraulic Fluid,C24-36	ug/L	<300	470 L	560 L	<300
Surrogate					
Hexacosane	%REC	98	83	76	93

Y: Sample exhibits fuel pattern which does not resemble standard
H: Heavier hydrocarbons than indicated standard
L: Lighter hydrocarbons than indicated standard

Curtis & Tompkins, Ltd.

SAMPLE ID: OKUS-W7
LAB ID: 138059-001
CLIENT: Camp, Dresser & McKee
PROJECT ID: 10605-25291
LOCATION: Port Of Oakland,U.P.GW
MATRIX: Filtrate

DATE SAMPLED: 02/19/99
DATE RECEIVED: 02/19/99
DATE REPORTED: 03/02/99

Metals Analytical Report

Compound	Result (ug/L)	Reporting Limit (ug/L)	IDF	QC Batch	Method	Analysis Date
Arsenic	ND	5.0	1	46427	EPA 6010A	02/24/99

ND = Not detected at or above reporting limit