

**FIRST QUARTER 1996  
MONITORING REPORT**

**UNION PACIFIC MOTOR FREIGHT  
FACILITY  
OAKLAND, CALIFORNIA**

**USPCI/LAIDLAW PROJECT No.  
96120-844**

**PREPARED FOR:**

**UNION PACIFIC RAILROAD  
ENVIRONMENTAL MANAGEMENT  
1416 DODGE STREET, ROOM 930  
OMAHA, NEBRASKA 68179**

**LAIDLAW**  
**ENVIRONMENTAL  
SERVICES**

**Prepared by:**

**USPCI/Laidlaw Consulting Services  
5665 Flatiron Parkway  
Boulder, Colorado 80301**

**April 23, 1996**

ENVIRONMENTAL  
PROTECTION

April 23, 1996  
96 APR 29 PM 2: 56

Mr. Harry Patterson  
Union Pacific Railroad  
1416 Dodge Street, Room 930  
Omaha, Nebraska 68179

Subject: **"First Quarter 1996 Monitoring Report"** Oakland Motor Freight Facility, 1750  
Ferro Street, Oakland, California, USPCI/Laidlaw Project No. 96120-844

Dear Mr. Patterson:

Enclosed is the final copy of the **"First Quarter 1996 Monitoring Report"**, dated  
April 23, 1996, for the Union Pacific Motor Freight Facility at 1750 Ferro Street in Oakland,  
California.

If you have any questions, please call us at (303) 938-5500.

Sincerely,



Denton Mauldin  
Project Manager



Sam Marquis, R.G., P.G.  
Project Hydrogeologist

cc: Jenifer Eberle, ACDEH  
John Amdur, Port of Oakland  
Philip Herden, APL  
Mark McCormick, USPCI/Laidlaw

Enclosure  
DM/tjh

oakmf\qzmf395.ltr, 96120-844, October 31, 1995

**FIRST QUARTER 1996 MONITORING REPORT  
UNION PACIFIC RAILROAD  
UNION PACIFIC MOTOR FREIGHT FACILITY  
OAKLAND, CALIFORNIA  
USPCI/Laidlaw Project No. 96120-844**

Prepared for:  
Union Pacific Railroad  
Environmental Management - Room 930  
1416 Dodge Street  
Omaha, Nebraska 68179

for submittal to:  
Jennifer Eberle  
Alameda County  
Department of Environmental Health  
1131 Harbor Bay Parkway  
Alameda, California 94502

Prepared by:  
USPCI/Laidlaw Consulting Services  
5665 Flatiron Parkway  
Boulder, Colorado 80301



Mark McCormick  
Environmental Assistant



Sam Marquis  
Project Hydrogeologist  
R.G. No. 5110

April 23, 1996

96 APR 29 PH 2:56

ENVIRONMENTAL  
PROTECTION

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## 1. EXECUTIVE SUMMARY

On April 29, 1993, the Alameda County Department of Environmental Health, Hazardous Materials Division (ACDEH) requested that Union Pacific Railroad (UPRR) begin a quarterly monitoring program at the UPMF facility in Oakland, California. The facility was the site of a release of petroleum hydrocarbons from underground storage tanks (USTs). Laidlaw has prepared this report to satisfy the requirements of the ACDEH for the first quarter of 1996. The report summarizes the activities and findings of the first quarter 1996 groundwater monitoring event.

The results from the first quarter monitoring event indicated an increase in groundwater elevations relative to the previous monitoring event (fourth quarter 1995) at the site. Dissolved petroleum hydrocarbons were detected at levels consistent with those observed in the past. Fluid level measurement data indicate that monitoring wells OKUS-W5, OKUS-W6, and recovery well RW contained product. The recovery system in well RW was operational and retrieved approximately 1.5 gallons of hydrocarbon product.

On the basis of the findings revealed by the first quarter 1996 monitoring event, Laidlaw recommends the following:

- The quarterly monitoring program should be continued
- Monitoring and recovery of product near the UPMF facility should be continued

## 2. INTRODUCTION

Laidlaw prepared this document on behalf of Union Pacific Railroad (UPRR) as part of the groundwater monitoring and reporting program at the Union Pacific Motor Freight (UPMF) facility at 1750 Ferro Street in Oakland, California. The report was prepared in response to an April 29, 1993 Alameda County Department of Environmental Health, Hazardous Materials Division (ACDEH) request for UPRR to begin a quarterly monitoring program at the UPMF facility.

The quarterly monitoring program consists of the collection of fluid level measurements in the groundwater monitoring wells and an analysis of dissolved contaminants in groundwater. Field and analytical data are compiled in this report. The monitoring program is directed towards an understanding of the groundwater gradient and the changes in the dissolved petroleum hydrocarbons at the site. This report includes a discussion of the background information about the site, investigation results, and conclusions and recommendations.

## 3. BACKGROUND INFORMATION

The site is located on the southeastern portion of the UPRR Oakland trailer-on-flat-car (TOFC) Yard, 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 site from 1987 to 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). All petroleum hydrocarbons found at the site have been identified as used motor oil and "bunker C." For simplification, these hydrocarbons are referred to as product.

The refueling portion of the TOFC yard, approximately 700 feet northwest (upgradient) of the UPMF site, 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, 1993). On the basis of the investigations, petroleum hydrocarbons do not extend to the UPMF facility.

#### 4. INVESTIGATIVE PROCEDURES

UPRR has subcontracted Burns and McDonnell Waste Consultants, Inc. to perform some of the fieldwork associated with the project. Laidlaw and the UPRR subcontractor followed the standard operating procedures previously supplied to the ACDEH (Laidlaw, 1994). The quarterly monitoring activities consist of the following:

- Measuring fluid levels in all of the groundwater monitoring wells
- Purging and sampling groundwater monitoring wells where product is not observed
- Analyzing groundwater samples for petroleum hydrocarbons and constituents
- Removing product from the recovery well (RW) and monitoring the performance of the product skimmer
- Determining the local hydraulic gradient based on the groundwater level measurements

All samples were analyzed for 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.

Fluid level measurements are collected from groundwater monitoring wells OKUS-W4, OKUS-W5 and OKUS-W6 on a monthly basis. No product has been observed in monitoring well OKUS-W4 since May 12, 1993. Due to the absence of observable product in OKUS-W4, the ACDEH has granted Laidlaw's request to reduce the frequency of fluid level monitoring in the well. Fluid level measurements will be collected from OKUS-W4 on a quarterly rather than a monthly basis.

Fluid level measurements are collected from the recovery well RW on a monthly basis. These measurements are collected to assess the temporal variations in the thickness of product.

## 5. FIELD INVESTIGATION RESULTS

The following subsections present the findings and activities completed during the first quarter monitoring event.

### 5.1 GROUNDWATER GRADIENT

Fluid levels were measured on February 27, 1996 and are compiled into Table 1. The data were used to produce the groundwater elevation map presented as Figure 3. An increase in groundwater elevations relative to the previous monitoring event (fourth quarter 1995) was noted in all of the monitoring wells gauged at the site. Since 1993, groundwater elevations have followed a trend where they are at their highest during the first quarter of each year. These elevations gradually decrease during the second, third, and fourth quarters. The first quarter 1996 increase in water levels may be associated with locally high precipitation levels during the end of 1995 and the beginning of 1996.

The groundwater gradient at the site ranged from approximately 0.010 to 0.012 and the observed groundwater flow direction was to the east. The groundwater gradient and flow direction were consistent with gradients and flow directions observed during previous monitoring events. Fluid level measurements in groundwater monitoring wells do not indicate that product has migrated downgradient.

Monitoring well APL/UP-W1 was not gauged or sampled during the event because stacked trailers were placed directly upon the well head. Laidlaw personnel did not observe any visible damage to the well. Monitoring well OKUS-W4 was not gauged or sampled because of visible damage to the well head. The damage consists of churned asphalt surrounding the well and bent well casing that may possibly be fractured. There is also a pool of standing water immediately over the well.

### 5.2 ANALYTICAL RESULTS

Sample analysis results for all monitoring wells sampled during the first quarter 1996 monitoring event were compiled into Table 2. Dissolved BTEX compounds were detected in the samples collected from groundwater monitoring wells OKUS-W2 and OKUS-W3. The sample collected from monitoring well OKUS-W7 contained dissolved benzene and ethylbenzene. The sample collected from monitoring well OKUS-W8 contained xylenes only. The one downgradient well sampled during this monitoring event, APL/UP-W2, contained BTEX compounds that are consistent with historical BTEX levels for this well. Monitoring well OKUS-W1 did not contain dissolved BTEX concentrations above the method detection limit (MDL) of 0.50 micrograms per liter ( $\mu\text{g/l}$ ). Total



BTEX concentrations ranged from below the MDL of 0.50  $\mu\text{g/l}$  (OKUS-W1) to approximately 7,000  $\mu\text{g/l}$  (OKUS-W3).

Dissolved TPH-G was detected in the samples collected from monitoring wells OKUS-W2, OKUS-W3, OKUS-W8, and APL/UP-W2. Monitoring wells OKUS-W1 and OKUS-W7 did not contain detectable levels of TPH-G contamination. The TPH-G concentrations ranged from below the MDL of 50  $\mu\text{g/l}$  (OKUS-W1) to 7,900  $\mu\text{g/l}$  (OKUS-W3).

Dissolved TPH-D concentrations were detected in the samples collected from all monitoring wells during the first quarter 1996 monitoring event. TPH-D concentrations ranged from 330  $\mu\text{g/l}$  (OKUS-W1) to 4,000  $\mu\text{g/l}$  (OKUS-W3).

Samples were not collected from monitoring wells OKUS-W4, OKUS-W5, OKUS-W6, and APL/UP-W1. Groundwater analytical results for the wells at the site are presented in Table 2. The dissolved BTEX plume in the groundwater is presented in Figure 4. Analytical reports and chain of custody forms are included in Appendix B.

### **5.3 NON-AQUEOUS PHASE LIQUID**

Fluid level measurement data indicated that monitoring wells OKUS-W5, OKUS-W6, and recovery well RW contained product. Groundwater monitoring wells OKUS-W5 and OKUS-W6 continue to contain "bunker C" type product. An accurate determination of product thicknesses in OKUS-W5 and OKUS-W6 was not possible due to the high viscosity of the product.

As mentioned above, monitoring well OKUS-W4 was not gauged during the first quarter 1996 sampling event because of damage to the well head. Nevertheless, Burns and McDonnell personnel did not observe product in the monitoring well during January and February 1996 .

Laidlaw personnel repaired the product recovery system located in recovery well RW on February 2, 1996. The system was operating properly during the first quarter 1996 monitoring event. No product was recovered in January 1996 but Laidlaw personnel estimated that approximately 1.5 gallons of product were removed by the system during February 1996.

## 6. CONCLUSIONS AND RECOMMENDATIONS

The following subsections present conclusions and recommendations based on the first quarter 1996 monitoring results.

### 6.1 CONCLUSIONS

On the basis of the information in the previous sections, Laidlaw concludes that:

- The groundwater flow to the east with a gradient that ranges from 0.010 to 0.012 is consistent with previous monitoring events
- Total BTEX concentrations in the two groundwater monitoring wells near the source area (OKUS-W2 and OKUS-W3) have increased relative to levels observed in the past
- Product was observed in OKUS-W5, OKUS-W6, and recovery well RW
- Product does not appear to have migrated down gradient
- Approximately 1.5 gallons of product were recovered during the first quarter of 1996

### 6.2 RECOMMENDATIONS

On the basis of the above conclusions, Laidlaw recommends the following:

- Continue the quarterly monitoring program
- Continue product monitoring and removal

## 7. REFERENCES

Laidlaw, 1993. "Phase II Site Assessment Report," Union Pacific Railroad, October, 1993.

Laidlaw, 1994. "Fourth Quarter 1993, Monitoring Event," Union Pacific Railroad, May 1994.

**TABLE 1  
FLUID LEVEL MEASUREMENT DATA  
UNION PACIFIC RAILROAD  
OAKLAND MOTOR FREIGHT FACILITY**

WELL NO.	ELEV.* TOC	DATE	DEPTH TO PRODUCT	PRODUCT THICKNESS	DEPTH TO WATER	WATER ELEV.	CORR'D ELEV.
OKUS-W1	9.17	01/14/93	N/A	NP	8.42	0.75	0.75
	9.17	01/15/93	N/A	NP	8.45	0.72	0.72
	9.17	02/18/93	N/A	NP	7.79	1.38	1.38
	9.17	05/12/93	N/A	NP	8.04	1.13	1.13
	9.17	08/25/93	N/A	NP	8.81	0.56	0.56
	9.17	11/11/93	N/A	NP	9.24	-0.07	-0.07
	9.17	02/08/94	N/A	NP	8.47	0.70	0.70
	9.17	05/03/94	N/A	NP	8.49	0.68	0.68
	9.17	08/24/94	N/A	NP	8.89	0.28	0.28
	9.17	11/16/94	N/A	NP	8.56	0.61	0.61
	9.17	02/22/95	N/A	NP	7.61	1.56	1.56
	9.17	06/22/95	N/A	NP	8.00	1.17	1.17
	9.17	08/09/95	N/A	NP	8.18	0.99	0.99
	9.17	11/29/95	N/A	NP	8.78	0.39	0.39
9.17	02/27/96	N/A	NP	7.58	1.59	1.59	
OKUS-W2	9.71	01/14/93	N/A	NP	9.08	0.63	0.63
	9.71	01/15/93	N/A	NP	9.12	0.59	0.59
	9.71	02/18/93	N/A	NP	8.70	1.01	1.01
	9.71	05/12/93	N/A	NP	9.04	0.67	0.67
	9.71	08/25/93	N/A	NP	9.61	0.10	0.10
	9.71	11/11/93	N/A	NP	10.20	-0.49	-0.49
	9.71	02/08/94	N/A	NP	9.46	0.25	0.25
	9.71	05/03/94	N/A	NP	9.50	0.21	0.21
	9.71	08/24/94	N/A	NP	9.74	-0.03	-0.03
	9.71	11/16/94	N/A	NP	9.74	-0.03	-0.03
	9.71	02/22/95	N/A	NP	8.49	1.22	1.22
	9.71	06/22/95	N/A	NP	8.90	0.81	0.81
	9.71	08/09/95	N/A	NP	9.09	0.62	0.62
	9.71	11/29/95	N/A	NP	9.69	0.02	0.02
9.71	02/27/96	N/A	NP	8.49	1.22	1.22	
OKUS-W3	9.80	01/14/93	N/A	NP	9.39	0.41	0.41
	9.80	01/15/93	N/A	NP	9.33	0.47	0.47
	9.80	02/18/93	N/A	NP	8.85	0.95	0.95
	9.80	05/12/93	N/A	NP	9.23	0.57	0.57
	9.80	08/25/93	N/A	NP	9.82	-0.02	-0.02
	9.80	11/11/93	N/A	NP	10.30	-0.50	-0.50
	9.80	02/08/94	N/A	NP	9.73	0.07	0.07
	9.80	05/03/94	N/A	NP	9.75	0.05	0.05
	9.80	08/24/94	N/A	NP	9.98	-0.18	-0.18
	9.80	11/16/94	N/A	NP	9.61	0.19	0.19
	9.80	02/22/95	N/A	NP	8.76	1.04	1.04
	9.80	06/22/95	N/A	NP	9.15	0.65	0.65
	9.80	08/09/95	N/A	NP	9.41	0.39	0.39
	9.80	11/29/95	N/A	NP	9.97	-0.17	-0.17
9.80	02/27/96	N/A	NP	8.73	1.07	1.07	
OKUS-W4	7.35	01/14/93	N/A	NP	6.43	0.92	0.92
	7.35	01/15/93	N/A	NP	6.44	0.91	0.91
	7.35	02/18/93	N/A	NP	5.77	1.58	1.58
	7.35	05/12/93	6.39	0.01	6.40	0.95	0.95
	7.35	08/25/93	N/A	NP	6.63	0.72	0.72
	7.35	11/11/93	N/A	NP	7.10	0.25	0.25
	7.35	02/07/94	N/A	NP	6.64	0.71	0.71
	7.35	03/07/94	N/A	NP	6.45	0.90	0.90
	7.35	04/18/94	N/A	NP	6.58	0.77	0.77
	7.35	05/03/94	N/A	NP	6.55	0.80	0.80
	7.35	06/07/94	N/A	NP	6.62	0.73	0.73
	7.35	07/29/94	N/A	NP	6.65	0.70	0.70
	7.35	08/24/94	N/A	NP	6.80	0.55	0.55
	7.35	09/01/94	N/A	NP	6.93	0.42	0.42
	7.35	09/26/94	N/A	NP	6.95	0.40	0.40
	7.35	10/27/94	N/A	NP	7.05	0.30	0.30
	7.35	11/16/94	N/A	NP	6.71	0.64	0.64
	7.35	01/25/95	N/A	NP	5.63	1.72	1.72
	7.35	02/22/95	N/A	NP	5.71	1.64	1.64
	7.35	06/22/95	N/A	NP	6.01	1.34	1.34
	7.35	07/31/95	N/A	NP	5.96	1.39	1.39
	7.35	08/09/95	N/A	NP	6.10	1.25	1.25
	7.35	09/07/95	N/A	NP	6.36	0.99	0.99
	7.35	10/18/95	N/A	NP	6.49	0.86	0.86
	7.35	11/10/95	N/A	NP	6.67	0.68	0.68
	7.35	11/29/95	N/A	NP	6.70	0.65	0.65
	7.35	12/15/95	N/A	NP	6.56	0.79	0.79
7.35	01/10/96	N/A	NP	6.28	1.07	1.07	
7.35	02/16/96	N/A	NP	5.09	2.26	2.26	
7.35	02/27/96	N/A	NP	WELL INACCESSABLE			

**TABLE 1 (CONT.)  
FLUID LEVEL MEASUREMENT DATA  
UNION PACIFIC RAILROAD  
OAKLAND MOTOR FREIGHT FACILITY**

WELL NO.	ELEV.* TOC	DATE	DEPTH TO PRODUCT	PRODUCT THICKNESS	DEPTH TO WATER	WATER ELEV.	CORR'D ELEV.
OKUS-W5	9.25	01/14/93	N/A	NP	9.15	0.12	0.12
	9.25	01/15/93	N/A	NP	9.15	0.10	0.10
	9.25	02/18/93	N/A	NP	8.85	0.40	0.40
	9.25	05/12/93	9.18	0.02	9.20	0.05	0.05
	9.25	08/25/93	8.82	0.02	8.84	0.41	0.41
	9.25	11/11/93	N/A	NP	10.15	-0.90	-0.90
	9.25	02/07/94	N/A	NP	9.61	-0.36	-0.36
	9.25	03/07/94	N/A	NP	9.51	-0.26	-0.26
	9.25	04/18/94	N/A	NP	9.78	-0.53	-0.53
	9.25	05/03/94	N/A	NP	9.77	-0.52	-0.52
	9.25	06/07/94	N/A	NP	9.71	-0.46	-0.46
	9.25	07/29/94	N/A	NP	9.83	-0.58	-0.58
	9.25	08/24/94	N/A	NP	9.93	-0.68	-0.68
	9.25	09/01/94	9.91	0.01	9.92	-0.67	-0.67
	9.25	09/26/94	N/A	NP	9.92	-0.67	-0.67
	9.25	10/27/94	10.08	0.06	10.14	-0.89	-0.89
	9.25	11/16/94	9.59	0.22	9.81	-0.56	-0.56
	9.25	01/25/95	N/A	Trace	8.59	0.66	0.66
	9.25	02/22/95	8.75	0.18	8.91	0.34	0.34
	9.25	05/09/95	N/A	Trace	9.00	0.25	0.25
	9.25	06/22/95	N/A	Trace	9.29	-0.04	-0.04
	9.25	07/31/95	N/A	Trace	9.34	-0.09	-0.09
	9.25	08/09/95	N/A	Trace	9.75	-0.50	-0.50
	9.25	09/07/95	N/A	Trace	9.58	-0.31	-0.31
	9.25	10/18/95	9.82	P	---	---	---
9.25	11/10/95	9.97	P	---	---	---	
9.25	11/29/95	10.19	P	---	---	---	
9.25	12/15/95	9.80	P	---	---	---	
9.25	01/10/96	9.58	P	---	---	---	
9.25	02/16/96	9.08	P	---	---	---	
9.25	02/27/96	8.81	P	---	---	---	
OKUS-W6	7.02	07/18/93	N/A	NP	6.20	0.82	0.82
	7.02	08/25/93	N/A	NP	6.52	0.50	0.50
	7.02	11/12/93	N/A	NP	7.22	-0.20	-0.20
	7.02	02/07/94	5.89	P	---	---	---
	7.02	05/03/94	5.90	P	---	---	---
	7.02	08/24/94	6.27	P	---	---	---
	7.02	09/26/94	6.50	P	---	---	---
	7.02	10/27/94	6.88	P	---	---	---
	7.02	11/16/94	5.13	P	---	---	---
	7.02	01/25/95	3.89	P	---	---	---
	7.02	02/22/95	4.98	P	---	---	---
	7.02	05/09/95	5.39	P	---	---	---
	7.02	06/22/95	5.30	P	---	---	---
	7.02	07/31/95	5.60	P	---	---	---
	7.02	08/09/95	5.65	P	---	---	---
	7.02	09/07/95	5.98	P	---	---	---
	7.02	10/18/95	6.38	P	---	---	---
	7.02	11/10/95	6.52	P	---	---	---
7.02	11/29/95	5.75	P	---	---	---	
7.02	12/15/95	5.47	P	---	---	---	
7.02	01/10/96	5.58	P	---	---	---	
7.02	02/16/96	4.70	P	---	---	---	
7.02	02/27/96	4.89	P	---	---	---	
OKUS-W7	8.91	07/18/93	N/A	NP	5.72	1.19	1.19
	8.91	08/25/93	N/A	NP	5.94	0.97	0.97
	8.91	11/12/93	N/A	NP	6.50	0.41	0.41
	8.91	02/07/94	N/A	NP	5.81	1.10	1.10
	8.91	05/03/94	N/A	NP	5.89	1.22	1.22
	8.91	08/24/94	N/A	NP	6.11	0.80	0.80
	8.91	11/16/94	N/A	NP	5.90	1.01	1.01
	8.91	02/22/95	N/A	NP	4.89	2.02	2.02
	8.91	06/22/95	N/A	NP	5.26	1.65	1.65
	8.91	08/09/95	N/A	NP	5.53	1.38	1.38
	8.91	11/29/95	N/A	NP	6.09	0.82	0.82
8.91	02/27/96	N/A	NP	4.98	1.93	1.93	
OKUS-W8	6.75	07/18/93	N/A	NP	5.56	1.19	1.19
	6.75	08/27/93	N/A	NP	5.88	0.87	0.87
	6.75	11/11/93	N/A	NP	6.43	0.32	0.32
	6.75	02/07/94	N/A	NP	5.59	1.16	1.16
	6.75	05/03/94	N/A	NP	5.55	1.20	1.20
	6.75	08/24/94	N/A	NP	5.98	0.77	0.77
	6.75	11/18/94	N/A	NP	5.75	1.00	1.00
	6.75	02/22/95	N/A	NP	4.79	1.96	1.96
	6.75	06/22/95	N/A	NP	5.18	1.57	1.57
	6.75	08/09/95	N/A	NP	5.32	1.43	1.43
	6.75	11/29/95	N/A	NP	5.95	0.80	0.80
	6.75	02/27/96	N/A	NP	4.84	1.91	1.91

**TABLE 1 (CONT.)  
FLUID LEVEL MEASUREMENT DATA  
UNION PACIFIC RAILROAD  
OAKLAND MOTOR FREIGHT FACILITY**

WELL NO.	ELEV.* TOC	DATE	DEPTH TO PRODUCT	PRODUCT THICKNESS	DEPTH TO WATER	WATER ELEV.	CORR'D ELEV.
APL/UP-W1	8.12	07/16/93	N/A	NP	10.02	-1.90	-1.90
	8.12	08/26/93	N/A	NP	9.93	-1.81	-1.81
	8.12	11/11/93	N/A	NP	10.25	-2.13	-2.13
	8.12	02/07/94	N/A	NP	9.71	-1.59	-1.59
	8.12	05/03/94	N/A	NP	10.10	-1.98	-1.98
	8.12	08/24/94	N/A	NP	10.25	-2.13	-2.13
	8.12	11/15/94	N/A	NP	10.08	-1.96	-1.96
	8.12	02/22/95	N/A	NP	9.76	-1.64	-1.64
	8.12	06/22/95	N/A	NP	10.25	-2.13	-2.13
	8.12	08/09/95	N/A	NP	10.01	-1.89	-1.89
	8.12	11/29/95	N/A	NP	10.29	-2.17	-2.17
	8.12	02/27/96	N/A	NP	WELL INACCESSABLE		
APL/UP-W2	7.31	07/16/93	N/A	NP	9.98	-2.07	-2.07
	7.31	08/26/93	N/A	NP	9.20	-1.89	-1.89
	7.31	11/11/93	N/A	NP	9.85	-2.34	-2.34
	7.31	02/07/94	N/A	NP	8.85	-1.54	-1.54
	7.31	05/03/94	N/A	NP	10.02	-2.71	-2.71
	7.31	08/24/94	N/A	NP	9.13	-1.82	-1.82
	7.31	11/15/94	N/A	NP	9.40	-2.09	-2.09
	7.31	02/22/95	N/A	NP	8.85	-1.54	-1.54
	7.31	06/22/95	N/A	NP	9.42	-2.11	-2.11
	7.31	08/09/95	N/A	NP	9.42	-2.11	-2.11
	7.31	11/29/95	N/A	NP	9.41	-2.10	-2.10
	7.31	02/27/96	N/A	NP	8.89	-1.58	-1.58
RW	--	01/31/94	10.31	0.10	10.41	--	--
	--	02/07/94	10.26	0.10	10.36	--	--
	--	02/17/94	10.11	0.07	10.18	--	--
	--	02/23/94	10.01	0.09	10.10	--	--
	--	03/01/94	9.96	0.03	9.99	--	--
	--	03/07/94	9.92	0.04	9.96	--	--
	--	03/16/94	9.92	0.07	9.99	--	--
	--	03/23/94	9.93	0.06	9.99	--	--
	--	03/30/94	10.00	0.05	10.05	--	--
	--	04/05/94	10.02	0.01	10.03	--	--
	--	04/11/94	10.02	0.01	10.03	--	--
	--	04/18/94	10.07	0.02	10.09	--	--
	--	04/26/94	10.07	0.07	10.14	--	--
	--	06/07/94	9.94	0.03	9.97	--	--
	--	07/29/94	10.19	0.01	10.20	--	--
	--	09/01/94	9.71	0.09	9.80	--	--
	--	09/26/94	9.76	0.06	9.84	--	--
	--	10/27/94	9.81	0.05	9.86	--	--
	--	11/22/94	--	--	--	--	--
	--	12/20/94	--	--	--	--	--
	--	01/25/95	8.95	0.12	8.47	--	--
	--	02/22/95	8.35	0.14	8.49	--	--
	--	05/09/95	8.41	0.11	8.52	--	--
	--	06/22/95	8.72	0.10	8.82	--	--
	--	07/31/95	8.94	0.04	8.98	--	--
	--	08/09/95	9.07	0.03	9.10	--	--
	--	09/07/95	9.18	0.01	9.19	--	--
	--	10/18/95	9.41	0.02	9.43	--	--
	--	11/10/95	9.58	--	N/A	--	--
	--	11/29/95	9.63	0.09	9.72	--	--
--	12/15/95	9.46	0.12	9.58	--	--	
--	01/10/96	9.24	0.04	9.28	--	--	
--	02/16/96	8.73	--	N/A	--	--	
--	02/27/96	9.22	0.12	9.31	--	--	

\* All well casings measured to mean sea level (MSL).

N/A Non Applicable

-- Information not available or inaccurate.

NP - No Product

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



**TABLE 2  
ANALYTICAL RESULTS - GROUNDWATER MONITORING WELLS  
UNION PACIFIC RAILROAD  
OAKLAND MOTOR FREIGHT FACILITY**

SAMPLE LOCATION	SAMPLE ID	DATE SAMPLED	TPH/IR (mg/l)	TPH/D (ug/l)	TPH/G (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	BTEX (ug/l)	As (mg/l)	Pb (mg/l)
OKUS-W1	OKUS-W1	01/14/93	ND	ND	410	20	4	220	ND	240	ND	ND
		05/12/93	80	120	ND	ND	ND	ND	ND	ND	ND	ND
		08/25/93	ND	100	ND	ND	ND	ND	ND	ND	ND	ND
		11/11/93	ND	160	91	1.1	0.88	21	1.6	24	ND	ND
		02/08/94	NA	92	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.10	<0.02
		05/03/94	NA	61	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.10	<0.02
		08/24/94	NA	86	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.10	NA
		11/16/94	NA	51	<50	<0.50	<0.50	<0.50	<0.50	ND	NA	NA
		02/22/95	NA	120	<50	<0.50	<0.50	<0.50	<0.50	ND	NA	NA
		06/22/95	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	ND	NA	NA
OKUS-W2	OKUS-W2	01/14/93	2.5	5400	14000	480	92	8500	ND	9100	0.036	ND
		05/12/93	ND	2800	8800	220	47	4600	100	5000	0.093	ND
		08/25/93	5.8	6500	22000	420	92	10000	210	11000	0.089	ND
		11/11/93	3.5	7700	24000	540	150	13000	280	14000	ND	ND
		02/08/94	NA	2300	4900	150	29	3000	78	3300	<0.10	<0.02
		05/03/94	NA	2600	17000	300	<0.50	5800	220	6300	<0.10	<0.02
		08/24/94	NA	8200	11000	320	67	7500	250	8100	<0.10	NA
		11/16/94	NA	5500	10000	290	79	130	160	660	NA	NA
		02/22/95	NA	2000	3500	100	18	1600	66	1800	NA	NA
		06/22/95	NA	3200	13000	260	62	<0.50	110	430	NA	NA
OKUS-W3	OKUS-W3	01/14/93	4.5	4200	4900	230	42	2600	44	2900	NA	ND
		05/12/93	1.7	4400	4600	290	60	3500	72	3900	0.14	ND
		08/25/93	1.5	2700	9400	280	55	4300	41	4700	0.08	ND
		11/11/93	2.3	5000	9500	390	110	5100	130	5700	0.14	ND
		02/08/94	NA	4400	17000	420	78	9800	160	10000	0.12	<0.02
		05/03/94	NA	3000	14000	310	61	6400	210	7000	0.14	<0.02
		08/24/94	NA	4500	10000	350	78	7300	170	7900	<0.10	NA
		11/16/94	NA	4700	9100	260	64	95	<0.50	420	NA	NA
		02/22/95	NA	2400	7400	250	51	4400	150	4900	NA	NA
		06/22/95	NA	3300	8100	250	53	<0.50	76	380	NA	NA
OKUS-W4	OKUS-W4	01/15/93	2.5	5400	8900	300	ND	4500	ND	4800	NA	ND
		05/12/93	1.3	2900	6000	320	110	4600	230	5300	0.16	ND
		08/26/93	ND	2200	6700	350	72	4800	130	5400	0.098	ND
		11/11/93	ND	2400	5500	250	53	4600	140	5000	0.13	ND
		02/07/94	NA	2700	9100	250	<0.50	4900	150	5300	<0.10	<0.02
		05/03/94	NA	2300	6500	240	34	4200	140	4600	0.12	<0.02
		08/24/94	NA	2900	5200	200	41	3600	190	4000	0.11	NA
		11/16/94	NA	2800	5500	320	52	<0.50	120	490	NA	NA
		02/22/95	NA	2000	4300	250	47	2900	160	3400	NA	NA
		06/22/95	NA	2700	4900	280	38	5200	140	5700	NA	NA
OKUS-W5	OKUS-W5	01/15/93	ND	2900	550	53	11	180	20	260	NA	ND
		05/12/93	130	2100	550	81	14	250	37	380	0.56	ND
		08/25/93	PRODUCT IN WELL - NOT SAMPLED									
		11/11/93	2.7	1600	590	14	3.1	54	6.2	77	0.53	ND
		02/07/94	NA	1900	760	54	9.4	220	24	310	0.55	<0.02
		05/03/94	NA	2000	820	57	9.5	240	27	330	0.38	<0.02
		08/24/94	NA	1700	910	55	14	8.5	18	96	0.45	NA
		02/27/96	WELL INACCESSIBLE - NOT SAMPLED									
		PRODUCT IN WELL - THE WELL HAS NOT BEEN SAMPLED SINCE 3RD QUARTER 1994										

**TABLE 2 (CONT.)  
ANALYTICAL RESULTS - GROUNDWATER MONITORING WELLS  
UNION PACIFIC RAILROAD  
OAKLAND MOTOR FREIGHT FACILITY**

SAMPLE LOCATION	SAMPLE ID	DATE SAMPLED	TPH/IR (mg/l)	TPH/D (ug/l)	TPH/G (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	BTEX (ug/l)	As (mg/l)	Pb (mg/l)
OKUS-W6	OKUS-W6	07/16/93	BRK	BRK	ND	2.5	ND	ND	ND	2.5	0.004	ND
"	"	08/25/93	ND	590	ND	2.6	ND	4.9	1.3	8.8	0.013	ND
"	"	11/12/93	ND	610	ND	3.6	ND	3.7	1.3	8.6	ND	ND
"	"	02/27/96	PRODUCT IN WELL - THE WELL HAS NOT BEEN SAMPLED SINCE 4TH QUARTER 1993									
OKUS-W7	OKUS-W7	07/16/93	16	ND	ND	2.1	ND	ND	ND	2.1	0.009	ND
"	"	08/25/93	ND	930	56	2.9	ND	1.2	ND	4.1	ND	ND
"	"	11/12/93	ND	1100	ND	ND	ND	ND	ND	ND	ND	ND
"	"	02/07/94	NA	1100	ND	0.7	<0.50	<0.50	<0.50	0.7	<0.10	<0.02
"	"	05/03/94	NA	1300	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.10	<0.02
"	"	08/24/94	NA	910	<50	2.5	0.54	<0.50	<0.50	3.0	<0.10	NA
"	"	11/16/94	NA	820	<50	0.62	<0.50	<0.50	<0.50	0.6	NA	NA
"	"	02/22/95	NA	830	<50	0.54	<0.50	<0.50	<0.50	0.5	NA	NA
"	"	06/22/95	NA	850	<50	2.4	<0.50	0.52	<0.50	2.9	NA	NA
"	"	08/09/95	NA	640	71	4.2	<0.50	1.2	1.2	6.6	0.074	<0.050
"	"	11/29/95	NA	1300	64	4.3	<0.50	1.3	0.51	6.1	0.0095	NA
"	"	02/27/96	NA	2600	<50	1.5	<0.50	0.54	<0.50	2.0	NA	NA
OKUS-W8	OKUS-W8	07/16/93	15	ND	ND	ND	ND	ND	ND	ND	0.012	0.003
"	"	08/27/93	ND	1100	120	1.3	ND	ND	0.85	2.2	ND	0.005
"	"	11/11/93	ND	1300	190	3.5	1.3	46	4.9	55.7	ND	ND
"	"	02/07/94	NA	1000	120	0.9	<0.50	<0.50	<0.50	0.9	<0.10	<0.02
"	"	05/03/94	NA	780	79	0.99	<0.50	<0.50	<0.50	1.0	<0.10	<0.02
"	"	08/24/94	NA	700	100	1.4	<0.50	<0.50	<0.50	1.4	<0.10	NA
"	"	11/16/94	NA	830	110	0.77	<0.50	<0.50	<0.50	0.8	NA	NA
"	"	02/22/95	NA	370	150	0.96	<0.50	<0.50	1.2	2.2	NA	NA
"	"	06/22/95	NA	870	76	0.92	<0.50	<0.50	<0.50	0.9	NA	NA
"	"	08/09/95	NA	1100	90	1.1	<0.50	<0.50	1.3	2.4	0.078	<0.050
"	"	11/29/95	NA	2400	100	0.73	<0.50	<0.50	0.91	1.6	<0.0050	NA
"	"	02/27/96	NA	1900	80	<0.50	<0.50	<0.50	1.3	1.3	NA	NA
APL/UP-W1	APL/UP-W1	07/16/93	11	700	300	25.4	1.7	ND	3.0	30	0.011	ND
"	<i>offsite</i>	08/26/93	ND	810	720	47	1.3	360	14.0	420	0.013	ND
"	"	11/11/93	ND	530	560	26	ND	220	11.0	260	ND	ND
"	"	02/07/94	NA	660	620	25	<0.50	180	10	220	<0.10	<0.02
"	"	05/03/94	NA	590	680	48	2.9	260	9.8	320	<0.10	<0.02
"	"	08/24/94	NA	420	830	48	4.8	12	3.2	68	<0.10	NA
"	"	11/15/94	NA	480	470	36	3.6	9.6	12	61	NA	NA
"	"	02/22/95	NA	510	470	33	2.8	170	9	210	NA	NA
"	"	06/22/95	NA	320	160	12	0.82	3.5	2.4	19	NA	NA
"	"	08/09/95	NA	160	69	4.2	<0.50	<0.50	2.3	6.5	<0.0050	<0.050
"	"	11/29/95	NA	920	170	7.4	0.58	66	3.5	78	0.018	NA
"	"	02/27/96	WELL INACCESSIBLE - NOT SAMPLED									
APL/UP-W2	APL/UP-W2	07/16/93	19	ND	ND	8.0	ND	ND	ND	8	0.016	ND
"	<i>offsite</i>	08/26/93	ND	240	94	ND	ND	35	2.4	37	0.023	ND
"	"	11/11/93	ND	190	110	5.0	ND	38	2.6	46	ND	ND
"	"	02/07/94	NA	270	120	6.6	<0.50	38	1.8	46	<0.10	<0.02
"	"	05/03/94	NA	100	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.10	<0.02
"	"	08/24/94	NA	330	220	13.0	0.77	3.5	3.1	20	<0.10	NA
"	"	11/15/94	NA	320	190	11.0	<0.50	63.0	5.4	79	NA	NA
"	"	02/22/95	NA	550	320	19.0	<0.50	100	9.5	130	NA	NA
"	"	06/22/95	NA	300	170	10.0	0.62	2.2	2.3	76	NA	NA
"	"	08/09/95	NA	180	62	3.5	<0.50	<0.50	2.3	5.8	0.220	<0.050
"	"	11/29/95	NA	690	110	7.2	<0.50	49	2.3	59	0.019	NA
"	"	02/27/96	NA	480	100	5.3	<0.50	33	2.9	41	NA	NA

**TABLE 2 (CONT.)  
ANALYTICAL RESULTS - GROUNDWATER MONITORING WELLS  
UNION PACIFIC RAILROAD  
OAKLAND MOTOR FREIGHT FACILITY**

SAMPLE LOCATION	SAMPLE ID	DATE SAMPLED	TPH/IR (mg/l)	TPH/D (ug/l)	TPH/G (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	BTEX (ug/l)	As (mg/l)	Pb (mg/l)
<b>DUPLICATES</b>												
OKUS-W5	OKUS-W6	01/15/93	ND	2800	510	50	10	170	19	250	NA	NA
OKUS-W1	OKUS-W6	05/12/93	ND	140	ND	ND	ND	ND	ND	ND	ND	ND
APL/UP-W1	QA/QC-1	07/16/93	12	ND	0.21	22.4	ND	ND	2.4	25	0.012	ND
OKUS-W4	OKUS-W9	08/26/93	ND	2700	6200	340	78	4500	100	5000	0.100	ND
OKUS-W8	OKUS-W9	11/11/93	ND	1300	120	1.3	ND	4	1.4	7	2.400	ND
OKUS-W3	QA/QC-1	02/08/94	NA	2900	15000	280	64	5800	<0.50	6100	0.120	0.12
OKUS-W4	OKUS-QC1	05/03/94	NA	2500	5400	300	41	5200	130	5700	0.120	<0.02
OKUS-W8	OKUS-QC1	08/24/94	NA	950	92	1.6	<0.50	<0.50	<0.50	2	<0.10	NA
APL/UP-W2	OKUS-QC1	11/16/94	NA	310	190	10	<0.50	62	4.7	77	NA	NA
APL/UP-W2	APL-W12	02/22/95	NA	490	360	20	<0.50	110	6.7	140	NA	NA
APL/UP-W2	APL-W12	08/09/95	NA	160	71	3.4	<0.50	<0.50	2.2	5.6	0.200	<0.050
APL/UP-W1	APL-W11	11/29/95	NA	1100	170	7.5	0.57	66	4.4	79	0.021	NA
OKUS-W1	OKUS-W11	02/27/96	NA	330	<50	<0.50	<0.50	<0.50	<0.50	ND	NA	NA
<b>TRIP BLANKS</b>												
UPMF	OAK-FB 1	07/16/93	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA
UPMF	OAK-TB 2	07/16/93	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA
UPMF	TB-1	08/27/93	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA
UPMF	TB-2	08/27/93	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA
UPMF	TB-1	11/12/93	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA
UPMF	TB-1	08/24/94	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA
UPMF	TB-1	11/16/94	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
UPMF	TB-1	02/22/95	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA
UPMF	TB-1	06/22/95	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA
UPMF	TB-1	08/09/95	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA
UPMF	TRIP BLANK	11/29/95	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA
UPMF	TRIP BLANK	02/27/96	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA

ND - Not Detected

NA - Not Analyzed

BRK - Bottle broken during shipment

TPH - Total Petroleum Hydrocarbons

mg/L - milligram per liter

ug/L - microgram per liter

TPH/IR - analyzed using EPA Method 418.1

TPH/D - analyzed using EPA Method 8015 Mod.

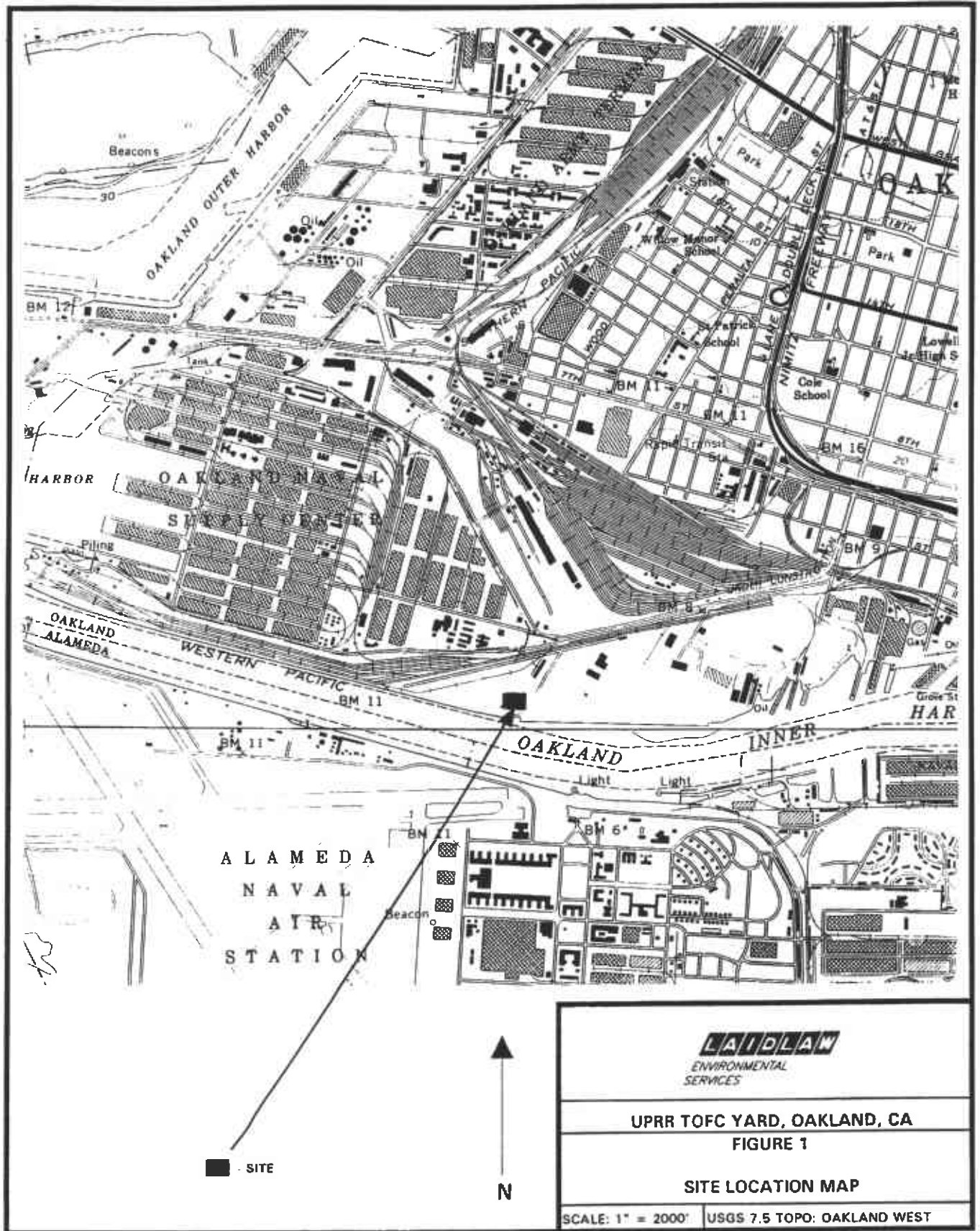
TPH/G - analyzed using EPA Method 8015 Mod.

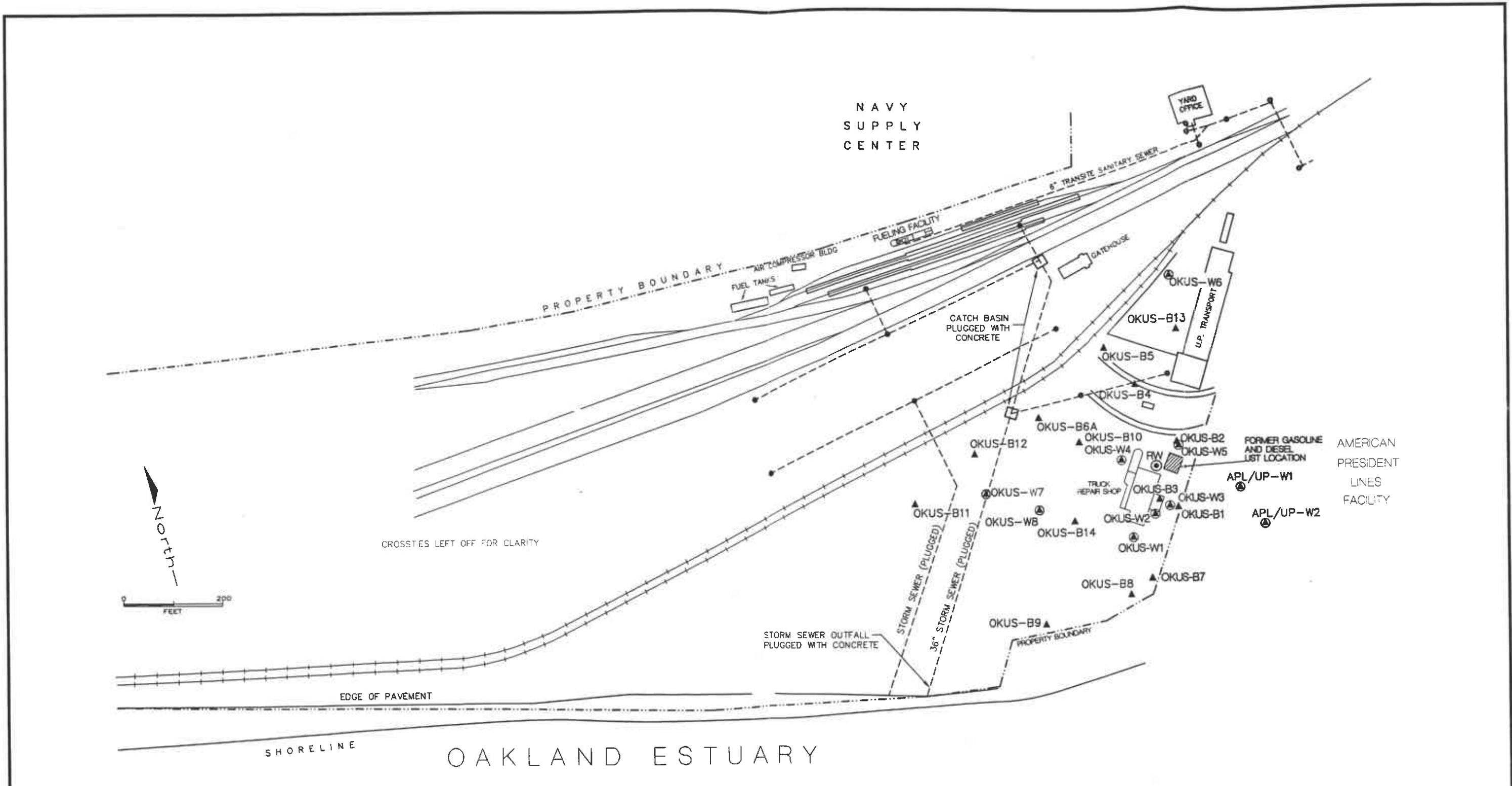
BTEX - analyzed using EPA Method 8020

As - analyzed using EPA Method 7060

Pb - analyzed using EPA Method 7421







**LEGEND**

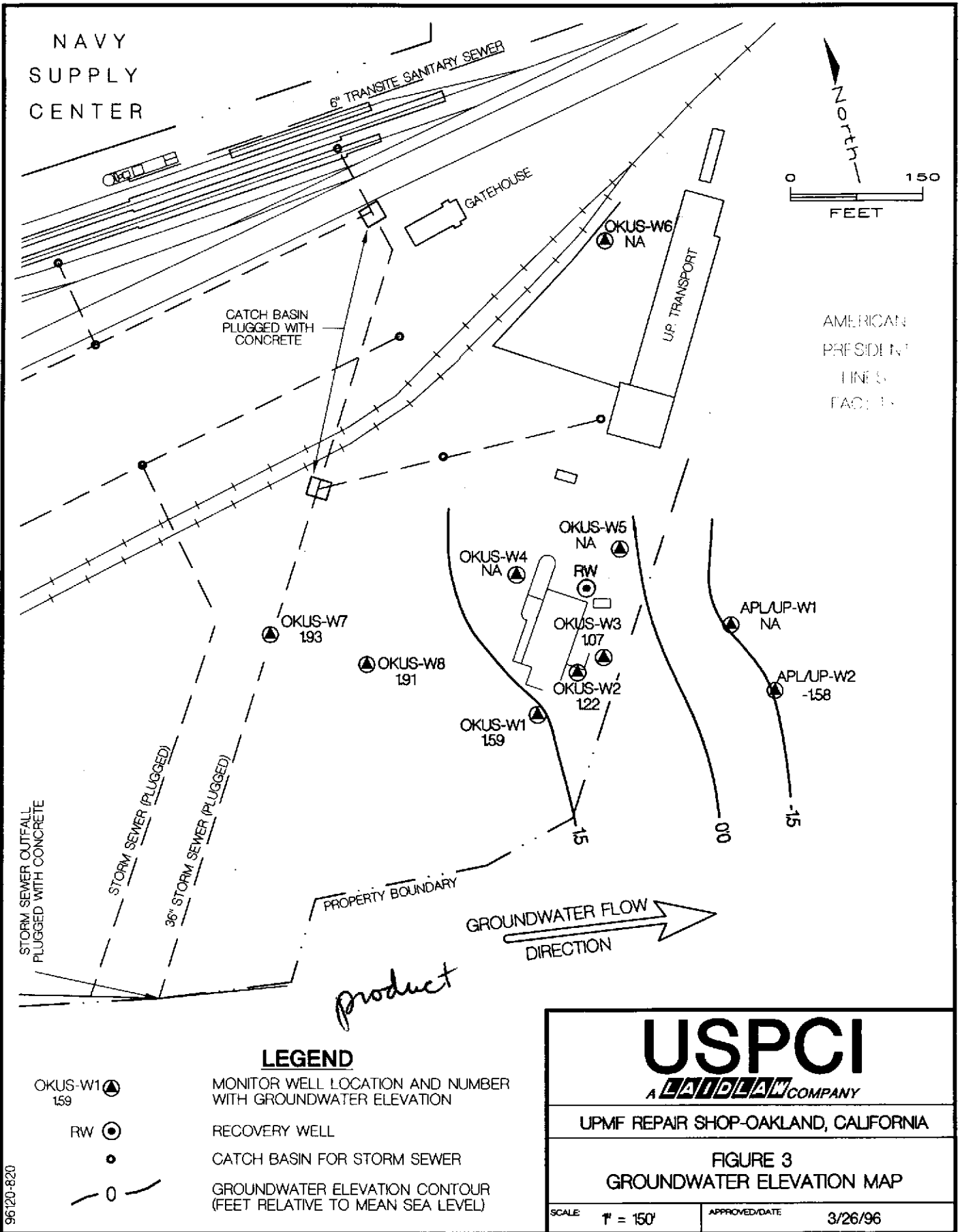
- ▲ OKUS-W1 MONITORING WELL LOCATION AND NUMBER
- ▲ OKUS-B1 BORING LOCATION AND NUMBER
- CATCH BASIN FOR STORM SEWER
- ◎ RW RECOVERY WELL

BY	DATE
DRAWN WRB	7/18/95
CHECKED	
APPROVED	
APPROVED	
APPROVED	

USPCI

A LAIDLAW COMPANY

UPRR TOFC RAILYARD UPMF REPAIR SHOP, OAKLAND, CALIFORNIA		
<b>FIGURE 2 SITE VICINITY MAP</b>		
SCALE 1"=200'	DATE 9/93	DWG. NO. 96120-556



NAVY  
SUPPLY  
CENTER

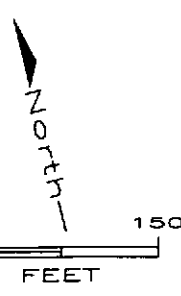
6" TRANSITE SANITARY SEWER

GATEHOUSE

CATCH BASIN  
PLUGGED WITH  
CONCRETE

OKUS-W6  
NA

UP. TRANSPORT



AMERICAN  
PRESIDENT  
LINES  
FACILITY

OKUS-W7  
193

OKUS-W8  
191

OKUS-W5  
NA

OKUS-W4  
NA

RW

OKUS-W3  
107

OKUS-W2  
122

OKUS-W1  
159

APLUP-W1  
NA

APLUP-W2  
-158

STORM SEWER OUTFALL  
PLUGGED WITH CONCRETE

STORM SEWER (PLUGGED)

36" STORM SEWER (PLUGGED)

PROPERTY BOUNDARY



*product*

**LEGEND**

- OKUS-W1 159 MONITOR WELL LOCATION AND NUMBER WITH GROUNDWATER ELEVATION
- RW RECOVERY WELL
- CATCH BASIN FOR STORM SEWER
- GROUNDWATER ELEVATION CONTOUR (FEET RELATIVE TO MEAN SEA LEVEL)

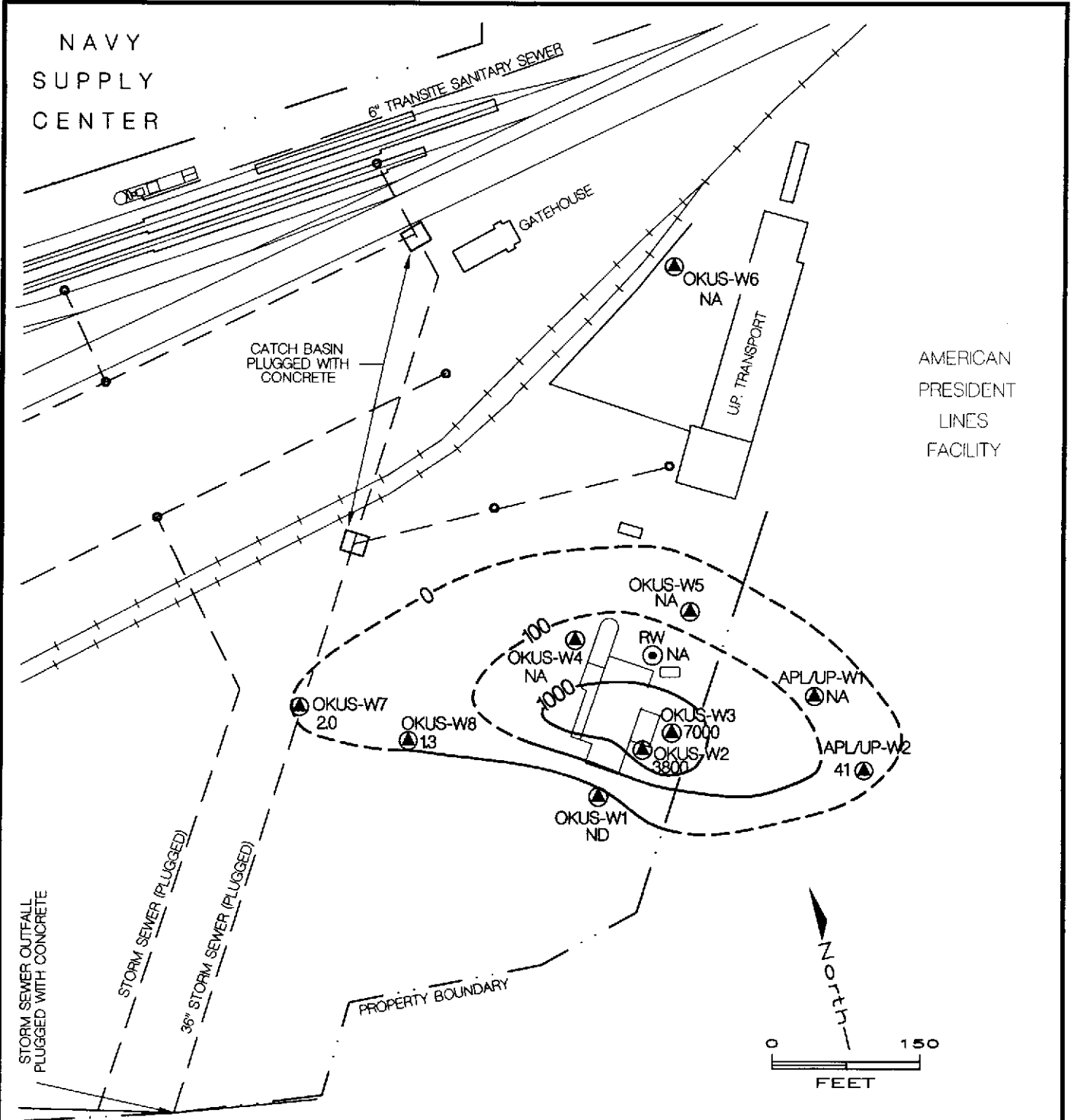
**USPCI**  
A LAIDLAW COMPANY

UPMF REPAIR SHOP-OAKLAND, CALIFORNIA

**FIGURE 3**  
**GROUNDWATER ELEVATION MAP**

SCALE 1" = 150' APPROVED/DATE 3/26/96

96120-820



**LEGEND**

- OKUS-W8  
▲ 40  
MONITOR WELL LOCATION AND NUMBER WITH TOTAL DISSOLVED BTEX CONCENTRATION ug/L
- RW ●  
RECOVERY WELL
- CATCH BASIN FOR STORM SEWER
- 100-  
TOTAL BTEX DISTRIBUTION CONTOUR; DASHED WHERE INFERRED
- ND  
NOT DETECTED
- NA  
NOT ANALYZED

NOTE: ALL ANALYTICAL RESULTS IN  $\mu\text{g/L}$

USPCI

A LAIDLAW COMPANY

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UPMF REPAIR SHOP-OAKLAND, CALIFORNIA

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FIGURE 4  
DISSOLVED PHASE BTEX DISTRIBUTION (2/96)

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SCALE: 1" = 150'	APPROVED/DATE: 3/26/96
------------------	------------------------

96120-821

**APPENDIX A**

**FLUID LEVEL MEASUREMENTS AND  
SAMPLE COLLECTION LOGS**

**USPCI SAMPLING AND WELL STABILIZATION FORM**

USPCI Project Name: <b>UPMF Oakland</b>			USPCI Project Number: <b>96120-844</b>			
Measuring Point (MP) Location <b>Top of casing</b>			<b>Well No. APL-W1</b>			
Well Depth: (Below MP): <b>21.87 Feet</b>						
Casing diameter: <b>2 Inches</b>			Sampling Date: <b>02/27/96</b>			
Depth To Ground Water (Below MP): <b>Not measured (See comments below)</b>			Sample ID No. <b>N/A</b>			
<b>Method Of Well Development:</b>			Time: <b>12:58</b>			
<input type="checkbox"/> Tap <input type="checkbox"/> Submersible Pump <input type="checkbox"/> Bladder Pump			Riser Elevation (MP): <b>7.11 Feet</b>			
<input type="checkbox"/> Bailer <input type="checkbox"/> Centrifugal Pump <input type="checkbox"/> Other			Top of Screen Elevation: <b>2.11 Feet</b>			
<b>Sampling Collection Method:</b>			Sample Appearance: <b>N/A</b>			
<input type="checkbox"/> Tap <input type="checkbox"/> Submersible Pump <input type="checkbox"/> Bladder Pump			Sample Odor: <b>N/A</b>			
<input type="checkbox"/> Bailer Type: <input type="radio"/> Teflon <input type="radio"/> Stainless Steel			Sampling Problems (if any): <b>Well inaccessible</b>			
<input type="radio"/> ABS Plastic <input type="radio"/> PVC <input type="radio"/> HDPE disposable						
Pump Intake Or Bailer Set At _____ Feet Below MP			Decontamination Performed:			
Tubing Type (if Used):						
Tubing Used for: <input type="checkbox"/> Sample Collection <input type="checkbox"/> Well Development/Field Tests			Samples Collected: <b>None</b>			
Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
WELL NOT	SAMPLED					

At Least Well Bore Volumes Were Evacuated Before Sampling      Discharge Rate =      GPM x 0.00223 =      cfs

Comments: **The well was inaccessible because of stacked trailers resting on the well head. The sampler was unable to gauge or sample the well.**

[Comments may continue on back]

Form Completed By: **Mark McCormick**      Witnessed By: \_\_\_\_\_

**USPCI SAMPLING AND WELL STABILIZATION FORM**

USPCI Project Name: **UPMF Oakland** USPCI Project Number: **96120-844**

Measuring Point (MP) Location **Top of casing** **Well No. APL-W2**

Well Depth: (Below MP): **11.10 Feet**

Casing diameter: **2 Inches** Sampling Date: **02/27/96**

Depth To Ground Water (Below MP): **8.89 Feet** Sample ID No. **APL-W2**

**Method Of Well Development:** Time: **12:51**

Tap  Submersible Pump  Bladder Pump Riser Elevation (MP): **7.62 Feet**

Bailer  Centrifugal Pump  Other Top of Screen Elevation: **2.62 Feet**

**Sampling Collection Method:** Sample Appearance: **Clear**

Tap  Submersible Pump  Bladder Pump Sample Odor: **None**

Bailer Type:  Teflon  Stainless Steel Sampling Problems (if any):

ABS Plastic  PVC  HDPE disposable

Pump Intake Or Bailer Set At \_\_\_\_\_ Feet Below MP Decontamination Performed: **Probe**

Tubing Type (if Used):

Tubing Used for:  Sample Collection  Well Development/Field Tests Samples Collected: **TPH-Gasoline, TPH-Diesel, 8020 BTEX**

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
12:30	Begin well					
12:41	7	1800	17.0		0.50	
12:43	7	1800	17.1		0.75	
12:46	7	1800	17.0		1.25	
12:51	Sample well					

At Least 3 Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments: **The sampler measured a new total depth of the well. The new TD equals 11.10 Feet.**

**(11.10 - 8.89) \* 0.16 = 0.354 or 0.35 gallons per volume**

**The pH was measured with Whatman™ pH paper.**

*[Comments may continue on back]*

Form Completed By: **Mark McCormick** Witnessed By:

**USPCI SAMPLING AND WELL STABILIZATION FORM**

USPCI Project Name: **UPMF Oakland** USPCI Project Number: **96120-844**

Measuring Point (MP) Location **Top of casing** **Well No. OKUS-W1**  
 Well Depth: (Below MP): **18.70 Feet**

Casing diameter: **2 Inches** Sampling Date: **02/28/96**

Depth To Ground Water (Below MP): **7.58 Feet** Sample ID No. **OKUS-W1**

**Method Of Well Development:** Time: **10:50**

Tap  Submersible Pump  Bladder Pump Riser Elevation (MP): **9.17 Feet**

Bailer  Centrifugal Pump  Other Top of Screen Elevation: **6.85 Feet**

**Sampling Collection Method:** Sample Appearance: **Clear**

Tap  Submersible Pump  Bladder Pump Sample Odor: **Very slight**

Bailer Type:  Teflon  Stainless Steel Sampling Problems (if any):

ABS Plastic  PVC  HDPE plastic disposable

Pump Intake Or Bailer Set At \_\_\_\_\_ Feet Below MP Decontamination Performed: **Probe**

Tubing Type (if Used):  
 Tubing Used for:  Sample Collection  Well Development/Field Tests Samples Collected: **TPH-Gasoline, TPH-Diesel, 8020 BTEX**

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
10:26	Begin well					
10:33	7	1000	15.7		1.75	
10:37	7	1100	15.7		3.75	
10:40	7	1100	15.9		5.50	
10:50	Sample well					
11:00	Duplicate	sample =	OKUS-W11			

At Least 3 Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments: **(18.70 - 7.58) \* 0.16 = 1.779 or from 1.75 to 2.0 gallons per volume**

**Duplicate sample, OKUS-W11, was taken at 11:00.**

**The pH was measured with Whatman™ pH paper.**

[Comments may continue on back]

Form Completed By: **Mark McCormick** Witnessed By:



**USPCI SAMPLING AND WELL STABILIZATION FORM**

USPCI Project Name: **UPMF Oakland** USPCI Project Number: **96120-844**

Measuring Point (MP) Location **Top of casing** **Well No. OKUS-W2**  
 Well Depth: (Below MP): **22.00 Feet**

Casing diameter: **2 Inches** Sampling Date: **02/28/96**

Depth To Ground Water (Below MP): **8.49 Feet** Sample ID No. **OKUS-W2**

**Method Of Well Development:** Time: **11:27**

Tap  Submersible Pump  Bladder Pump Riser Elevation (MP): **9.71 Feet**

Bailer  Centrifugal Pump  Other Top of Screen Elevation: **7.05 Feet**

**Sampling Collection Method:** Sample Appearance: **Very slightly turbid, very light yellow color**

Tap  Submersible Pump  Bladder Pump Sample Odor: **Moderate**

Bailer Type:  Teflon  Stainless Steel Sampling Problems (if any):

ABS Plastic  PVC  HDPE plastic disposable

Pump Intake Or Bailer Set At \_\_\_\_\_ Feet Below MP Decontamination Performed: **Probe**

Tubing Type (if Used):

Tubing Used for:  Sample Collection  Well Development/Field Tests Samples Collected: **TPH-Gasoline, TPH-Diesel, 8020 BTEX**

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
11:03	Begin well					
11:08	7	3000	17.2		2.25	
11:13	7	3300	17.6		4.50	
11:17	7	3200	17.8		6.75	
11:27	Sample well					

At Least 3 Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments: **(22.00 - 8.49) \* 0.16 = 2.162 or 2.25 gallons per volume**

**The pH was measured with Whatman™ pH paper.**

[Comments may continue on back]

Form Completed By: **Mark McCormick** Witnessed By:

**USPCI SAMPLING AND WELL STABILIZATION FORM**

USPCI Project Name: **UPMF Oakland** USPCI Project Number: **96120-844**

Measuring Point (MP) Location **Top of casing** **Well No. OKUS-W3**

Well Depth: (Below MP): **21.5 Feet**

Casing diameter: **2 Inches** Sampling Date: **02/28/96**

Depth To Ground Water (Below MP): **8.73 Feet** Sample ID No. **OKUS-W3**

**Method Of Well Development:** Time: **11:55**

Tap  Submersible Pump  Bladder Pump Riser Elevation (MP): **9.80 Feet**

Bailer  Centrifugal Pump  Other Top of Screen Elevation: **6.55 Feet**

**Sampling Collection Method:** Sample Appearance: **Clear, light yellow color**

Tap  Submersible Pump  Bladder Pump Sample Odor: **Moderate**

Bailer Type:  Teflon  Stainless Steel Sampling Problems (if any): **Water is reactive**

ABS Plastic  PVC  HDPE plastic disposable

Pump Intake Or Bailer Set At \_\_\_\_\_ Feet Below MP Decontamination Performed: **Probe**

Tubing Type (if Used):

Tubing Used for:  Sample Collection  Well Development/Field Tests Samples Collected: **TPH-Gasoline, TPH-Diesel, 8020 BTEX**

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
11:30	Begin well					
11:38	7	2900	17.3		2.25	
11:42	7	2900	17.6		4.50	
11:46	7	2900	17.8		6.75	
11:55	Sample well					

At Least 3 Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments: **(21.50 - 8.73) \* 0.16 = 2.043 or from 2.00 to 2.25 gallons per volume**

**The pH was measured with Whatman™ pH paper.**

[Comments may continue on back]

Form Completed By: **Mark McCormick** Witnessed By:

**USPCI SAMPLING AND WELL STABILIZATION FORM**

USPCI Project Name: UPMF Oakland			USPCI Project Number: 96120-844			
Measuring Point (MP) Location Top of casing			<b>Well No. OKUS-W4</b>			
Well Depth: (Below MP): 20.69 Feet						
Casing diameter: 2 Inches			Sampling Date: 02/27/96			
Depth To Ground Water (Below MP): Not measured (see comments below)			Sample ID No. N/A			
<b>Method Of Well Development:</b>			Time: 14:00			
<input type="checkbox"/> Tap <input type="checkbox"/> Submersible Pump <input type="checkbox"/> Bladder Pump			Riser Elevation (MP): 7.11 Feet			
<input type="checkbox"/> Bailer <input type="checkbox"/> Centrifugal Pump <input type="checkbox"/> Other			Top of Screen Elevation: 2.11 Feet			
<b>Sampling Collection Method:</b>			Sample Appearance: N/A			
<input type="checkbox"/> Tap <input type="checkbox"/> Submersible Pump <input type="checkbox"/> Bladder Pump			Sample Odor: N/A			
<input type="checkbox"/> Bailer Type: <input type="radio"/> Teflon <input type="radio"/> Stainless Steel			Sampling Problems (if any): Well inaccessible			
<input type="radio"/> ABS Plastic <input type="radio"/> PVC <input type="radio"/> HDPE disposable						
Pump Intake Or Bailer Set At _____ Feet Below MP			Decontamination Performed:			
Tubing Type (if Used):						
Tubing Used for: <input type="checkbox"/> Sample Collection <input type="checkbox"/> Well Development/Field Tests			Samples Collected: None			

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
WELL NOT	SAMPLED					

At Least Well Bore Volumes Were Evacuated Before Sampling    Discharge Rate =    GPM x 0.00223 =    cfs

Comments: The well head is badly damaged by UPMF heavy equipment. The casing is bent and possibly broken. Approximately 100 gals. of surface water had accumulated over the entire well head area.

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[Comments may continue on back]

Form Completed By: Mark McCormick    Witnessed By: \_\_\_\_\_





**USPCI SAMPLING AND WELL STABLIZATION FORM**

USPCI Project Name: <b>UPMF Oakland</b>			USPCI Project Number: <b>96120-844</b>			
Measuring Point (MP) Location: <b>Top of casing</b>			<b>Well No. OKUS-W8</b>			
Well Depth: (Below MP): <b>14.87 Feet</b>						
Casing diameter: <b>2 Inches</b>			Sampling Date: <b>02/28/96</b>			
Depth To Ground Water (Below MP): <b>4.84 Feet</b>			Sample ID No. <b>OKUS-W8</b>			
<b>Method Of Well Development:</b>			Time: <b>12:25</b>			
<input type="checkbox"/> Tap <input type="checkbox"/> Submersible Pump <input type="checkbox"/> Bladder Pump			Riser Elevation (MP): <b>7.11 Feet</b>			
<input checked="" type="checkbox"/> Bailer <input type="checkbox"/> Centrifugal Pump <input type="checkbox"/> Other			Top of Screen Elevation: <b>2.11 Feet</b>			
<b>Sampling Collection Method:</b>			Sample Appearance: <b>Slightly turbid, yellow color</b>			
<input type="checkbox"/> Tap <input type="checkbox"/> Submersible Pump <input type="checkbox"/> Bladder Pump			Sample Odor: <b>Slight</b>			
<b>Bailer Type:</b> <input type="radio"/> Teflon <input type="radio"/> Stainless Steel			Sampling Problems (if any):			
<input type="radio"/> ABS Plastic <input type="radio"/> PVC <input checked="" type="radio"/> HDPE plastic disposable						
Pump Intake Or Bailer Set At _____ Feet Below MP			Decontamination Performed: <b>Probe</b>			
Tubing Type (if Used):						
Tubing Used for: <input type="checkbox"/> Sample Collection <input type="checkbox"/> Well Development/Field Tests			Samples Collected: <b>TPH-Gasoline, TPH-Diesel, 8020 BTEX</b>			

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
12:02	Begin well					
12:08	7	3600	17.4		1.75	
12:11	7	3700	17.5		3.50	
12:14	7	3700	17.7		5.00	
12:25	Sample well					

At Least 3 Well Bore Volumes Were Evacuated Before Sampling      Discharge Rate =      GPM x 0.00223 =      cfs

Comments: (14.87 - 4.84) \* 0.16 = 1.605 or from 1.50 to 1.75 gallons per volume

**The samples were doubled for MS/MSD for TPH and BTEX**

**The pH was measured with Whatman™ pH paper.**

[Comments may continue on back]

Form Completed By: **Mark McCormick**      Witnessed By: \_\_\_\_\_

HYDRODATA

Date: 1/10/95

PROJECT: 4117

EVENT: JAN H<sub>2</sub>O LEVELS

SAMPLER: CM/IM

No.	Well of Location	Date	Time		Measurement		Comments
			Hr.	Min.	DTP	DTW	
1	OKVS-4	1/10/95				6.28'	WELL GETTING SEVERE DAMAGE FROM SUGGY PACKERS
2	OKVS-5				9.58'	<del>9.58'</del>	DEPTH TO THICK VISCOUS PRODUCT (WELL BAIL THIS OF OF 5+6 IN FUTURE)
3	OKVS-6				5.58'	5.58'	DEPTH TO THICK VISCOUS PRODUCT
4	RW-1				9.24	9.24	.04' PRODUCT

All levels are depth from inner casing - describe any other reference points in comments column; when in doubt, describe reference point.  
 Note in comments column if well is not: properly labeled, locked, or able to be locked. Describe corrective action.  
 Note flooding of vault box, odor, access problems.





**APPENDIX B**  
**ANALYTICAL REPORTS**



# Sequoia Analytical

680 Chesapeake Drive Redwood City, CA 94063 (415) 364-9600 FAX (415) 364-9233  
 404 N. Wiget Lane Walnut Creek, CA 94598 (510) 988-9600 FAX (510) 988-9673  
 819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100

U.S.P.C.I. / Laidlaw Client Project ID: UP Moter Freight Sampled: Feb 27 & 28, 1996  
 5665 Flatiron Pkwy Sample Matrix: Water Received: Feb 28, 1996  
 Boulder, CO 80301 Analysis Method: EPA 5030/8015 Mod./8020 Reported: Mar 18, 1996  
 Attention: Denton Mauldin First Sample #: 602-2017

QC Batch Number: GC030696 GC030696 GC030696 GC030896 GC030896 GC030896  
 802002A 802002A 802002A 802002A 802002A 802002A

## TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 602-2017 APL-W2	Sample I.D. 602-2018 OKUS-W1	Sample I.D. 602-2019 OKUS - W11	Sample I.D. 602-2020 OKUS - W2	Sample I.D. 602-2021 OKUS - W3	Sample I.D. 602-2022 OKUS - W8
Purgeable Hydrocarbons	50	100	N.D.	N.D.	5,300	7,900	80
Benzene	0.50	5.3	N.D.	N.D.	200	330	N.D.
Toluene	0.50	N.D.	N.D.	N.D.	42	75	N.D.
Ethyl Benzene	0.50	33	N.D.	N.D.	3,400	6,400	N.D.
Total Xylenes	0.50	2.9	N.D.	N.D.	160	240	1.3
Chromatogram Pattern:		Gasoline	--	--	Gasoline	Gasoline	Unidentified Hydrocarbons > C8

### Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	10	20	1.0
Date Analyzed:	3/6/96	3/6/96	3/6/96	3/8/96	3/8/96	3/8/96
Instrument Identification:	HP-2	HP-2	HP-2	HP-2	HP-2	HP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	108	108	105	97	98	116

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

*Kevin Van Slambrook*  
 Kevin Van Slambrook  
 Project Manager





U.S.P.C.I. / Laidlaw 5665 Flatiron Pkwy Boulder, CO 80301 Attention: Denton Mauldin	Client Project ID: UP Moter Freight Sample Matrix: Water Analysis Method: EPA 5030/8015 Mod./8020 First Sample #: 602-2023	Sampled: Feb 28, 1996 Received: Feb 28, 1996 Reported: Mar 18, 1996
--	---	---

QC Batch Number:	GC030696 802002A	GC030896 802002A
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**TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION**

Analyte	Reporting Limit µg/L	Sample I.D. 602-2023 OKUS - W7	Sample I.D. 602-2024 Trip Blank
Purgeable Hydrocarbons	50	N.D.	N.D.
Benzene	0.50	1.5	N.D.
Toluene	0.50	N.D.	N.D.
Ethyl Benzene	0.50	0.54	N.D.
Total Xylenes	0.50	N.D.	N.D.
Chromatogram Pattern:		--	--

**Quality Control Data**

Report Limit Multiplication Factor:	1.0	1.0
Date Analyzed:	3/6/96	3/8/96
Instrument Identification:	HP-2	HP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	107	105

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

*Kevin Van Slambrook*  
Kevin Van Slambrook  
Project Manager





# Sequoia Analytical

680 Chesapeake Drive Redwood City, CA 94063 (415) 364-9600 FAX (415) 364-9233  
 404 N. Wiget Lane Walnut Creek, CA 94598 (510) 988-9600 FAX (510) 988-9673  
 819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100

U.S.P.C.I. / Laidlaw Client Project ID: UP Moter Freight Sampled: Feb 27 & 28, 1996  
 5665 Flatiron Pkwy Sample Matrix: Water Received: Feb 28, 1996  
 Boulder, CO 80301 Analysis Method: EPA 3510/8015 Mod. Reported: Mar 18, 1996  
 Attention: Denton Mauldin First Sample #: 602-2017

QC Batch Number: SP030496 SP030496 SP030496 SP030496 SP030496 SP030496  
 8015EXA 8015EXA 8015EXA 8015EXA 8015EXA 8015EXA

## TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 602-2017 APL - W2	Sample I.D. 602-2018 OKUS - W1	Sample I.D. 602-2019 OKUS - W11	Sample I.D. 602-2020 OKUS - W2	Sample I.D. 602-2021 OKUS - W3	Sample I.D. 602-2022 OKUS - W8
Extractable Hydrocarbons	50	480	330	320	2400	4000	1900
Chromatogram Pattern:		Diesel & Unidentified Hydrocarbons <C15 and >C16	Unidentified Hydrocarbons >C15	Unidentified Hydrocarbons >C15	Diesel & Unidentified Hydrocarbons <C15 and >C16	Diesel & Unidentified Hydrocarbons <C15 and >C16	Diesel & Unidentified Hydrocarbons >C16

### Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0	1.0
Date Extracted:	3/4/96	3/4/96	3/4/96	3/4/96	3/4/96	3/4/96
Date Analyzed:	3/5/96	3/5/96	3/5/96	3/5/96	3/5/96	3/5/96
Instrument Identification:	HP-3A	HP-3A	HP-3A	HP-3A	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

Kevin Van Slambrook  
 Project Manager





U.S.P.C.I. / Laidlaw  
5665 Flatiron Pkwy  
Boulder, CO 80301  
Attention: Denton Mauldin

Client Project ID: UP Moter Freight  
Sample Matrix: Water  
Analysis Method: EPA 3510/8015 Mod.  
First Sample #: 602-2023

Sampled: Feb 28, 1996  
Received: Feb 28, 1996  
Reported: Mar 18, 1996

QC Batch Number: SP030496  
8015EXA

**TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS**

Analyte	Reporting Limit µg/L	Sample I.D. 602-2023 OKUS-W7
Extractable Hydrocarbons	50	2600
Chromatogram Pattern:		Diesel & Unidentified Hydrocarbons >C16

**Quality Control Data**

Report Limit Multiplication Factor: 1.0  
Date Extracted: 3/4/96  
Date Analyzed: 3/5/96  
Instrument Identification: 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

*Kevin Van Slambrook*  
Kevin Van Slambrook  
Project Manager





# Sequoia Analytical

680 Chesapeake Drive Redwood City, CA 94063 (415) 364-9600 FAX (415) 364-9233  
 404 N. Wiget Lane Walnut Creek, CA 94598 (510) 988-9600 FAX (510) 988-9673  
 819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100

U.S.P.C.I. / Laidlaw  
 5665 Flatiron Pkwy  
 Boulder, CO 80301  
 Attention: Denton Mauldin

Client Project ID: UP Moter Freight  
 Matrix: Liquid

QC Sample Group: 6022017-024

Reported: Mar 18, 1996

## QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes	Diesel
QC Batch#:	GC030696 802002A	GC030696 802002A	GC030696 802002A	GC030696 802002A	SP030496 8015EXA
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030	EPA 3510
Analyst:	L. Huang	L. Huang	L. Huang	L. Huang	J. Dinsay
MS/MSD #:	MS030696	MS030696	MS030696	MS030696	BLK030496
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Prepared Date:	3/6/96	3/6/96	3/6/96	3/6/96	3/4/96
Analyzed Date:	3/6/96	3/6/96	3/6/96	3/6/96	3/4/96
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	300 µg/L
Result:	24	22	23	69	310
MS % Recovery:	120	110	115	115	103
Dup. Result:	23	22	23	69	300
MSD % Recov.:	115	110	115	115	100
RPD:	4.3	0.0	0.0	0.0	3.3
RPD Limit:	0-50	0-50	0-50	0-50	0-20

LCS #:	1LCS030696	1LCS030696	1LCS030696	1LCS030696	LCS030496
Prepared Date:	3/6/96	3/6/96	3/6/96	3/6/96	3/4/96
Analyzed Date:	3/6/96	3/6/96	3/6/96	3/6/96	3/4/96
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	300 µg/L
LCS Result:	22	20	22	64	310
LCS % Recov.:	110	100	110	107	103

MS/MSD LCS Control Limits	71-133	72-128	72-130	71-120	50-150
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**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, #1271

*Kevin Van Slambrook*  
 Kevin Van Slambrook  
 Project Manager





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**QUALITY CONTROL DATA REPORT**

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC030896 802002A	GC030896 802002A	GC030896 802002A	GC030896 802002A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	M. Creusere	M. Creusere	M. Creusere	M. Creusere
MS/MSD #:	6022022	6022022	6022022	6022022
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	3/8/96	3/8/96	3/8/96	3/8/96
Analyzed Date:	3/8/96	3/8/96	3/8/96	3/8/96
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:	23	23	23	68
MS % Recovery:	115	115	115	111
Dup. Result:	24	23	24	70
MSD % Recov.:	120	115	120	115
RPD:	4.3	0.0	4.3	3.0
RPD Limit:	0-50	0-50	0-50	0-50

LCS #:	1LCS030896	1LCS030896	1LCS030896	1LCS030896
Prepared Date:	3/8/96	3/8/96	3/8/96	3/8/96
Analyzed Date:	3/8/96	3/8/96	3/8/96	3/8/96
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:	20	19	20	60
LCS % Recov.:	100	95	100	100

MS/MSD LCS Control Limits	71-133	72-128	72-130	71-120
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**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.

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