USPCI
A Subsidiary of Union Pacific Corporation

SECOND QUARTER 1994 MONITORING REPORT

UNION PACIFIC RAILROAD

UNION PACIFIC MOTOR FREIGHT FACILITY OAKLAND, CALIFORNIA

USPCI PROJECT NO. 96120-844

PREPARED FOR:

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

Prepared by:

USPCI Consulting Services
5665 Flatiron Parkway
Boulder, Colorado 80301

August 16, 1994

SECOND QUARTER 1994 MONITORING REPORT
UNION PACIFIC RAILROAD
UNION PACIFIC MOTOR FREIGHT FACILITY
OAKLAND, CALIFORNIA
USPCI Project No. 96120-844

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

for submittal to:
Ms. Jennifer Eberle
Department of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, California 94621

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

Denton Mauldin
Engineer III

REGISTERED GEOLOGIST
SAMUEL A. MARQUIS, JR.
NO. 5110
STATE OF CALIFORNIA

Sam Marquis
Project Hydrogeologist
R.G. No. 5110

August 16, 1994

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1. INTRODUCTION

This Quarterly Monitoring Report has been prepared for Union Pacific Railroad (UPRR) by USPCI 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 Union Pacific Motor Freight (UPMF) Ferro Street facility in Oakland, California (Figure 1). The facility was the site of a release of petroleum hydrocarbons from underground storage tanks (USTs).

The quarterly monitoring event involved:

- Measuring the static water levels, purging, and sampling the nine existing monitoring wells;
- Monitoring the performance of the product skimmer in recovery well RW and analyzing a sample of the product for a fuel fingerprint characterization;
- Analyzing groundwater samples from the monitoring wells for total petroleum hydrocarbons as diesel (TPH/D) by EPA Method 8015 Modified, TPH as gasoline (TPH/G) by EPA Method 8015 Modified; benzene, toluene, ethylbenzene and xylenes (BTEX) by EPA Method 8020; and dissolved arsenic and lead by EPA Method 200.7;
- Determining the local hydraulic gradient based on the groundwater level measurements; and
- Preparing a Quarterly Monitoring Report.

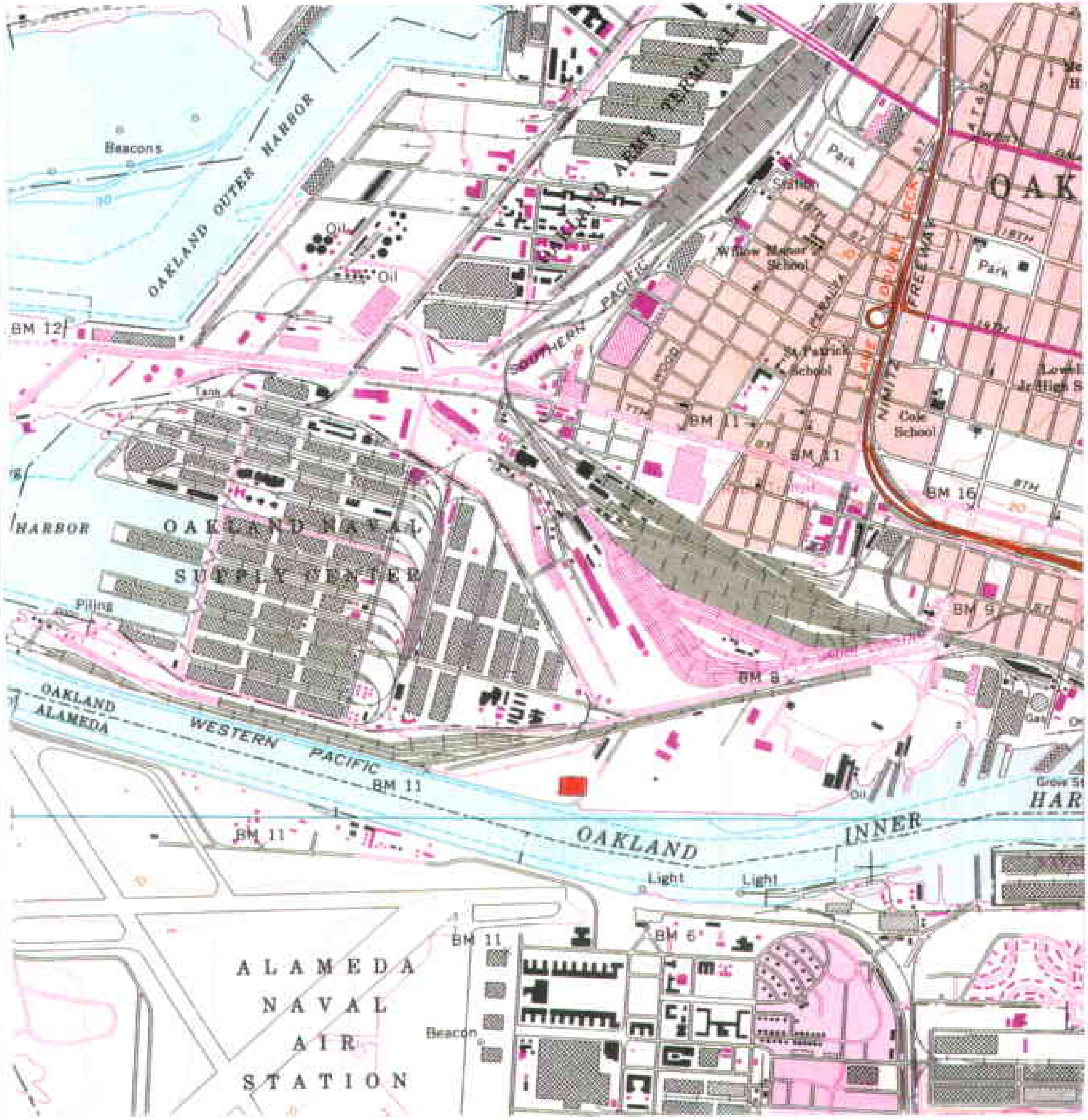
Non-aqueous phase liquid petroleum hydrocarbon (product) was measured in monitoring well OKUS-W6 and recovery well RW during the Second Quarter 1994 Monitoring Event. Groundwater samples were collected from eight of the nine monitoring wells (i.e., all monitoring wells except OKUS-W6, which contained product) at the facility on May 3, 1994.

1.1 Site Background

The following subsections describe the historical activities at the railyard and vicinity as well as the location of and access to the site.

1.1.1 General Description and Previous Activities

The site is located on the southeastern end of the UPRR Oakland trailer-on-flat-car (TOFC) Yard (Figure 2), which is adjacent to the Oakland Inner Harbor or Oakland Estuary. The area surrounding the site is used for heavy to light commerce, with residential areas located inland to the east and west across the Oakland Estuary. Five USTs were removed from the UPMF site from 1987 to 1990. The refueling portion of the TOFC yard, approximately 700 feet northwest of the truck repair shop, is currently undergoing groundwater remediation for recovery of product. The limits of the diesel plume in that portion of the site was defined during previous investigations (USPCI, 1991), and the plume does not extend to the area of impacted groundwater at the truck repair facility in the Oakland TOFC Yard.



Beacons
OAKLAND OUTER HARBOR
BM 12
Oil
OAKLAND ARMY TERMINAL
SOUTHERN PACIFIC
Station
Park
Willow Manor School
St Patrick School
NIMITZ FREEWAY
Park
OAK
Cole School
Lowell Jr High S
BM 11
BM 16
HARBOR
OAKLAND NAVAL SUPPLY CENTER
Piling
Tank
BM 9
BM 8
OAKLAND
ALAMEDA
WESTERN PACIFIC
BM 11
Oil
Gas
HAR
OAKLAND INNER
Light
Light
BM 11
BM 6
ALAMEDA NAVAL AIR STATION
Beacon

- SITE

N

USPCI

Remedial Services

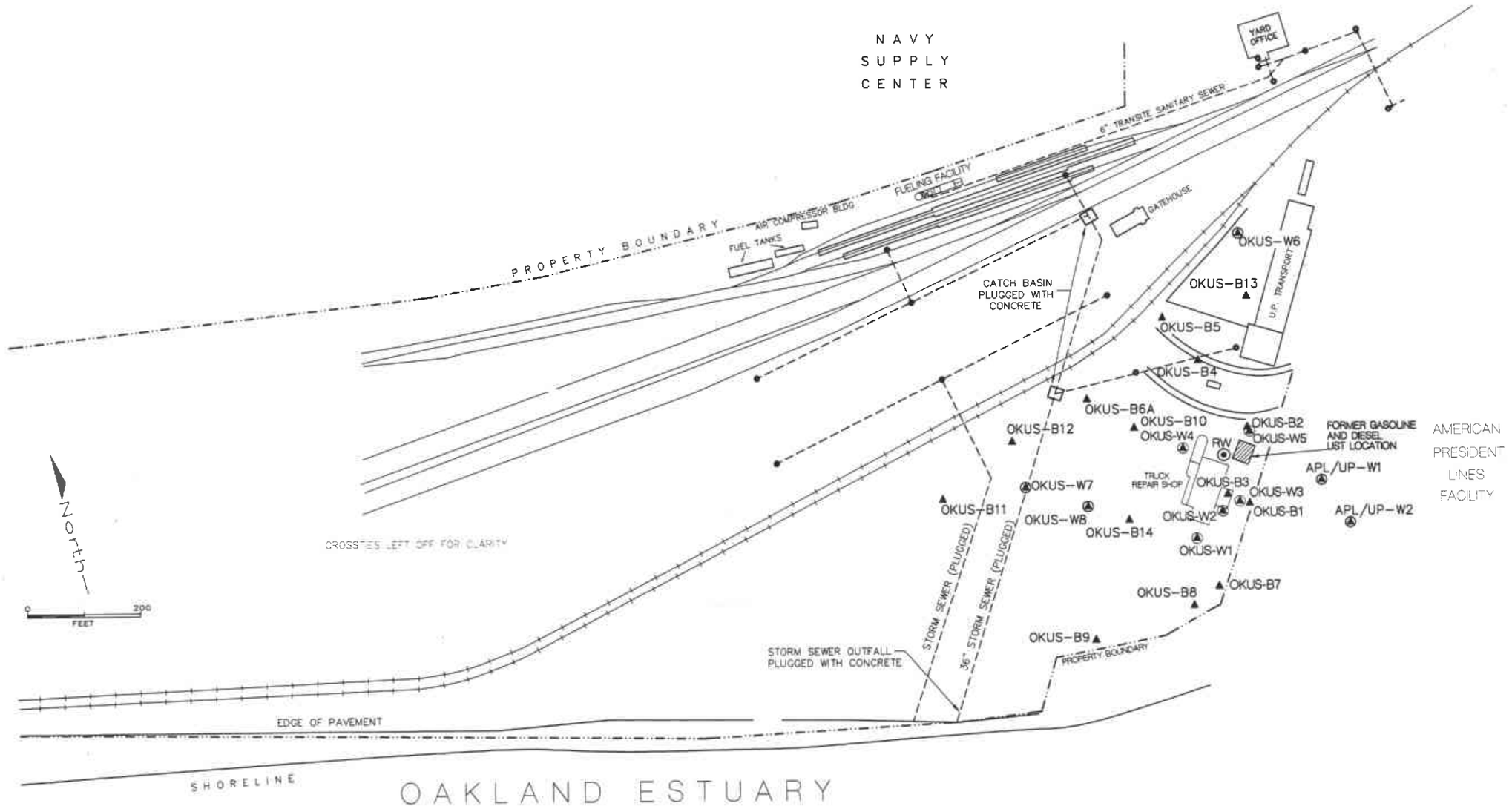
A Subsidiary of Union Pacific Corporation

UPRR TOFC YARD, OAKLAND, CA

FIGURE 1

SITE LOCATION MAP

SCALE: 1" = 2000'	USGS 7.5 TOPO: OAKLAND WEST



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	BILL	9/93
CHECKED	DM	9/99
APPROVED	TM	8/7/99
APPROVED		
APPROVED		

USPCI
A Subsidiary of Union Pacific Corporation

UPRR TOFC RAILYARD
UPMF REPAIR SHOP, OAKLAND, CALIFORNIA

FIGURE 2
SITE VICINITY MAP

SCALE	DATE	DWG NO
1"=200'	9/93	96120-556

1.1.2 Location and Access

The site is located in the UPRR TOFC Yard at 1750 Ferro Street in the Port of Oakland on the east side of the Inner Harbor, Oakland, California. Access to the site is from the intersection of Middle Harbor Road and Ferro Street.

1.2 Investigative Procedures

All USPCI field activities, including data recording procedures, decontamination methods, groundwater sample collection, and purge water disposal, were completed following USPCI's standard procedures previously supplied to the ACDEH.

The quarterly monitoring event was conducted by USPCI Remedial Services personnel under the direct supervision of Christopher Byerman and Richard Pollard (California Registered Geologist #4659).

2. FIELD INVESTIGATION RESULTS

The field investigation presented in this report was completed on three separate occasions during the quarter. The dates of the field investigation were April 18, May 3 and June 7, 1994. The following subsections present the findings of and activities completed during the field investigation.

2.1 Groundwater Assessment Determinations

The continued monitoring of wells and the compilation of the field and analytical data is directed towards an understanding of groundwater and petroleum hydrocarbon movement beneath the site.

2.1.1 Groundwater Characteristics

The UPRR Oakland UPMF Facility is adjacent to the Oakland Estuary, which is located in the eastern portion of the San Francisco Bay (Figure 2). The close proximity of the estuary to the site suggests that a direct hydrologic connection may exist between the estuary and the groundwater beneath the site. Tidal influences from the estuary may influence water levels in the monitoring wells at the site; however, previous studies in the San Francisco Bay Area indicate that tidal influences are generally minimal (i.e., the maximum measured tidal amplitude was approximately 0.02 feet) and are only detectable in monitoring wells in very close proximity to the Bay (usually within 200 feet; USPCI, 1991). The actual degree of influence is dependent on individual site characteristics.

2.1.2 Results of Laboratory Analysis of Groundwater Samples

Analytical results indicate elevated TPH/D, TPH/G and BTEX concentrations in groundwater at the site (Figure 3 and Table 1). Total BTEX concentrations ranged from below the method detection limit (MDL) of 2.0 micrograms per liter (μg/L) in the samples collected from monitoring wells OKUS-W1, OKUS-W7 and APL/UP-W2 to approximately 7,000 μg/L in the sample collected from OKUS-W3. TPH/G concentrations ranged from below the MDL of 50 μg/L in samples collected from OKUS-W1, OKUS-W7 and APL/UP-W2 to 17,000 μg/L in sample OKUS-W2. TPH/D concentrations ranged from 61 μg/L in sample OKUS-W1 to 3,000 μg/L in sample OKUS-W3.

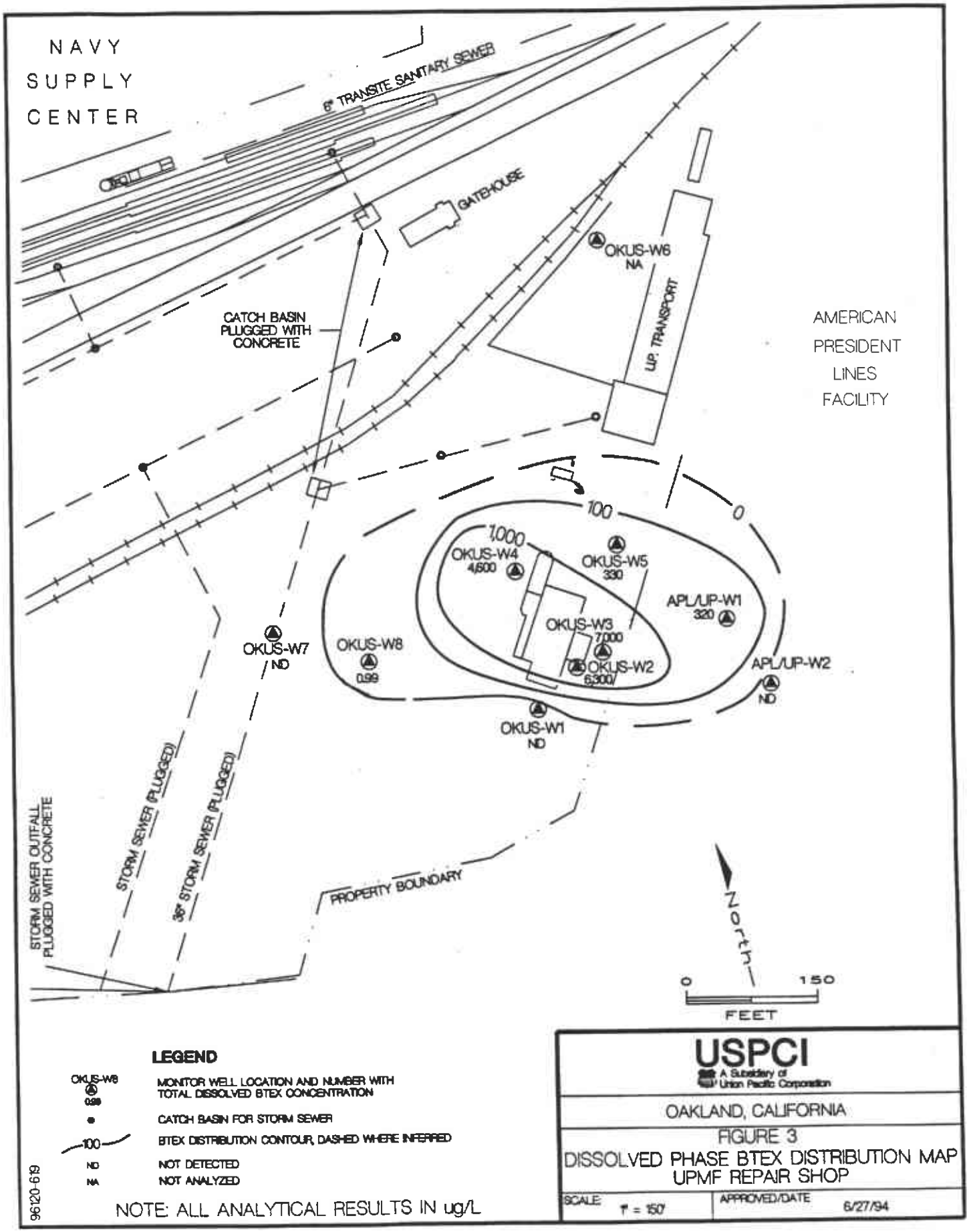

NAVY
SUPPLY
CENTER
6" TRANSITE SANITARY SEWER
GATEHOUSE
CATCH BASIN PLUGGED WITH CONCRETE
OKUS-W6
NA
UP TRANSPORT
AMERICAN PRESIDENT LINES FACILITY
100
0
1,000
OKUS-W4
4,600
OKUS-W5
330
APL/UP-W1
320
OKUS-W3
7,000
OKUS-W2
6,300
APL/UP-W2
ND
OKUS-W7
ND
OKUS-W8
0.99
OKUS-W1
ND
STORM SEWER (PLUGGED)
36" STORM SEWER (PLUGGED)
STORM SEWER OUTFALL PLUGGED WITH CONCRETE
PROPERTY BOUNDARY
North
0
150
FEET
LEGEND
OKUS-W8 0.99 MONITOR WELL LOCATION AND NUMBER WITH TOTAL DISSOLVED BTEX CONCENTRATION
CATCH BASIN FOR STORM SEWER
100 BTEX DISTRIBUTION CONTOUR, DASHED WHERE INFERRED
ND NOT DETECTED
NA NOT ANALYZED
NOTE: ALL ANALYTICAL RESULTS IN ug/L
96120-619
USPCI
A Subsidiary of Union Pacific Corporation
OAKLAND, CALIFORNIA
FIGURE 3
DISSOLVED PHASE BTEX DISTRIBUTION MAP
UPMF REPAIR SHOP
SCALE: 1" = 150'
APPROVED/DATE: 6/27/94

TABLE 1: CUMULATIVE ANALYTICAL RESULTS OF GROUNDWATER SAMPLES AT THE UNION PACIFIC MOTOR FREIGHT FACILITY, OAKLAND, CALIFORNIA – USPCI PROJECT NO. 96120–844

SAMPLE LOCATION	SAMPLE ID	DATE SAMPLED	TPH/IR mg/L	TPH/D ug/L	TPH/G ug/L	BENZENE ug/L	TOLUENE ug/L	ETHYL–BENZENE ug/L	TOTAL XYLENES ug/L	TOTAL 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	<2.0	<0.10	<0.02
		05/03/94	NA	61	<50	<0.50	<0.50	<0.50	<0.5	<2.0	<0.10	<0.02
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
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
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
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	PHASE SEPARATED HYDROCARBONS – 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	780	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
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
		02/07/94	PHASE SEPARATED HYDROCARBONS – WELL NOT SAMPLED									
		05/03/94	PHASE SEPARATED HYDROCARBONS – WELL NOT SAMPLED									
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	0.70	<0.10	<0.02
		05/03/94	NA	1300	<50	<0.50	<0.50	<0.50	<0.50	<2.0	<0.10	<0.02
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	56	ND	ND
		02/07/94	NA	1000	120	0.9	<0.50	<0.50	<0.50	0.90	<0.10	<0.02
		05/03/94	NA	780	79	0.99	<0.50	<0.50	<0.50	0.99	<0.10	<0.02

f:\share\consult\mars\dm\okmft1.wk1

TABLE 1: CUMULATIVE ANALYTICAL RESULTS OF GROUNDWATER SAMPLES AT THE UNION PACIFIC MOTOR FREIGHT FACILITY, OAKLAND, CALIFORNIA – USPCI PROJECT NO. 96120-844

SAMPLE LOCATION	SAMPLE ID	DATE SAMPLED	TPH/IR mg/L	TPH/D ug/L	TPH/G ug/L	BENZENE ug/L	TOLUENE ug/L	ETHYL-BENZENE ug/L	TOTAL XYLENES ug/L	TOTAL BTEX ug/L	As mg/L	Pb mg/L
APL/UP-W1	APL/UP-W1	07/16/93	11	700	300	25.4	1.7	ND	3.0	30	0.011	ND
		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
APL/UP-W2	APL/UP-W2	07/16/93	19	ND	ND	8.0	ND	ND	ND	8.0	0.016	ND
		08/26/93	ND	240	94	ND	ND	35	2.4	37.0	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	<2.0	<0.10	<0.02
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	0.1	ND
OKUS-W6	OKUS-W9	11/11/93	ND	1300	120	1.3	ND	4	1.4	6.7	2.4	ND
OKUS-W3	QA/QC-1	02/08/94	NA	2900	15000	280	64	5800	<0.50	6100	0.12	0.12
OKUS-W4	OKUS-QC1	05/03/94	NA	2500	5400	300	41	5200	130	5700	0.12	<0.02
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

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 – anaytzed using EPA Method 8015 Mod.
TPH/G – anaytzed using EPA Method 8015 Mod.
BTEX – analyzed using EPA Method 8020
As – analyzed using EPA Method 7060
Pb – analyzed using EPA Method 7421

f:\share\consult\mrs\dm\okmft1.wk1

Groundwater samples were also analyzed for dissolved arsenic and lead. The analytical results indicated dissolved arsenic in samples from three of the ten monitoring wells. The detected concentrations of dissolved arsenic in groundwater samples were 0.14, 0.12, and 0.38 milligrams per liter (mg/L) in OKUS-W3, OKUS-W4, and OKUS-W5, respectively. Dissolved lead was not detected above the MDL of 0.02 mg/L in any of the wells. All of the above described analytical results are presented in Table 1. Analytical reports and chain of custody forms are included in Appendix A.

2.1.3 Analytical Results of Non-Aqueous Phase Liquid

On June 7, 1994, a sample of product was collected from recovery well RW and analyzed for a fingerprint characterization. The results indicate the sample could be motor oil mixed with diesel fuel. The analytical report and chain of custody is included in Appendix A.

2.1.4 Groundwater Gradient

Static water levels measured on May 3, 1994 (Table 2) were used to produce the groundwater elevation map presented as Figure 4. The hydraulic gradient beneath the site during the single-time groundwater level measurements collected on May 3, 1994, sloped toward the Oakland Estuary at approximately 0.67 percent. The computed gradient is consistent with past single-time groundwater level measurements. Well stabilization and sampling reports are located in Appendix B.

2.1.5 Monitoring and Recovery of Non-Aqueous Phase Liquid

As requested by the ACDEH, product thicknesses in monitoring wells OKUS-W4, and OKUS-W5, and recovery well RW have been monitored at the site since January 31, 1994, on a monthly basis at a minimum. Water level information has been collected at monitoring well OKUS-W6 on a quarterly basis. The monitoring data indicates that monitoring well OKUS-W6 and recovery well RW have had measurable amounts of product (Table 2). As discussed in the "First Quarter 1994 Monitoring Report", a sample of product was collected from monitoring well OKUS-W6 and analyzed for a fuel fingerprint characterization. The results indicated that the product could be weathered crude oil or bunker C (Fuel Oil No. 6 or 7).

As indicated in Table 2, the product thickness measurement of bunker C is difficult to perform accurately, due to the high viscosity of the liquid. Typically, the water interface probe becomes coated with bunker C as the measurement of the oil/water interface is performed. This creates a barrier between the probe and the water. Therefore, the only reliable reading is the air/oil interface.

Monitoring well OKUS-W6 is located in the interpreted cross- and up-gradient directions from the site by approximately 400 feet. The presence of bunker C has not been observed during the installation of soil borings and has not been observed in any of the monitoring wells at the UPMF site. It appears that the presence of bunker C in OKUS-W6 is not related to the UPMF site.

A product skimming system was installed in recovery well RW on April 29, 1994 and began operation during the week of May 2, 1994. Since start-up, the skimming system has recovered approximately 6 gallons of total fluids. The corresponding recovery rate is approximately equal to the one gallon of product recovery per week by the previous hand bailing activities that was observed prior to installation of the skimming system.

TABLE 2
CUMULATIVE FLUID LEVEL MEASUREMENT DATA
UNION PACIFIC RAILROAD MOTOR FREIGHT FACILITY
OAKLAND, CALIFORNIA
USPCI PROJECT NO. 96120-844

WELL NO.	ELEV.* TOC	DATE	DEPTH TO PRODUCT	PRODUCT ELEVATION	PRODUCT THICKNESS	DEPTH TO WATER	WATER ELEVATION (UNCORR'D)	WATER ELEVATION (CORR'D)
OKUS-W1	9.17	01/14/93	N/A	N/A	NP	8.42	0.75	0.75
	9.17	01/15/93	N/A	N/A	NP	8.45	0.72	0.72
	9.17	02/18/93	N/A	N/A	NP	7.79	1.38	1.38
	9.17	05/12/93	N/A	N/A	NP	8.04	1.13	1.13
	9.17	08/25/93	N/A	N/A	NP	8.61	0.56	0.56
	9.17	11/11/93	N/A	N/A	NP	9.24	-0.07	-0.07
	9.17	02/08/94	N/A	N/A	NP	8.47	0.40	0.40
	9.17	05/03/94	N/A	N/A	NP	8.49	0.38	0.38
OKUS-W2	9.71	01/14/93	N/A	N/A	NP	9.08	0.63	0.63
	9.71	01/15/93	N/A	N/A	NP	9.12	0.59	0.59
	9.71	02/18/93	N/A	N/A	NP	8.70	1.01	1.01
	9.71	05/12/93	N/A	N/A	NP	9.04	0.67	0.67
	9.71	08/25/93	N/A	N/A	NP	9.61	0.10	0.10
	9.71	11/11/93	N/A	N/A	NP	10.20	-0.49	-0.49
	9.71	02/08/94	N/A	N/A	NP	9.46	0.25	0.25
	9.71	05/03/94	N/A	N/A	NP	9.50	0.21	0.21
OKUS-W3	9.80	01/14/93	N/A	N/A	NP	9.39	0.41	0.41
	9.80	01/15/93	N/A	N/A	NP	9.33	0.47	0.47
	9.80	02/18/93	N/A	N/A	NP	8.85	0.95	0.95
	9.80	05/12/93	N/A	N/A	NP	9.23	0.57	0.54
	9.80	08/25/93	N/A	N/A	NP	9.82	-0.02	-0.02
	9.80	11/11/93	N/A	N/A	NP	10.30	-0.50	-0.50
	9.80	02/08/94	N/A	N/A	NP	9.73	0.07	0.07
	9.80	05/03/94	N/A	N/A	NP	9.75	0.05	0.05
OKUS-W4	7.35	01/14/93	N/A	N/A	NP	6.43	0.92	0.92
	7.35	01/15/93	N/A	N/A	NP	6.44	0.91	0.91
	7.35	02/18/93	N/A	N/A	NP	5.77	1.58	1.58
	7.35	05/12/93	6.39	0.96	0.01	6.40	0.95	0.96
	7.35	08/25/93	N/A	N/A	NP	6.63	0.72	0.72
	7.35	11/11/93	N/A	N/A	NP	7.10	0.25	0.25
	7.35	02/07/94	N/A	N/A	NP	6.64	0.71	0.71
	7.35	03/07/94	N/A	N/A	NP	6.45	0.90	0.90
	7.35	04/18/94	N/A	N/A	NP	6.58	0.77	0.77
	7.35	05/03/94	N/A	N/A	NP	6.55	0.82	0.82
	7.35	06/07/94	N/A	N/A	NP	6.62	0.73	0.73
OKUS-W5	9.25	01/14/93	N/A	N/A	NP	9.13	0.12	0.12
	9.25	01/15/93	N/A	N/A	NP	9.15	0.10	0.10
	9.25	02/18/93	N/A	N/A	NP	8.85	0.40	0.40
	9.25	05/12/93	9.18	0.07	0.02	9.20	0.05	0.07
	9.25	08/25/93	8.82	0.43	0.02	8.84	0.41	0.16
	9.25	11/11/93	N/A	N/A	NP	10.15	-0.80	-0.80
	9.25	02/07/94	N/A	N/A	NP	9.61	-0.36	-0.36
	9.25	03/07/94	N/A	N/A	NP	9.51	-0.26	-0.26
	9.25	04/18/94	N/A	N/A	NP	9.78	-0.53	-0.53
	9.25	05/03/94	N/A	N/A	NP	9.77	-0.52	-0.52
	9.25	06/07/94	N/A	N/A	NP	9.71	-0.46	-0.46

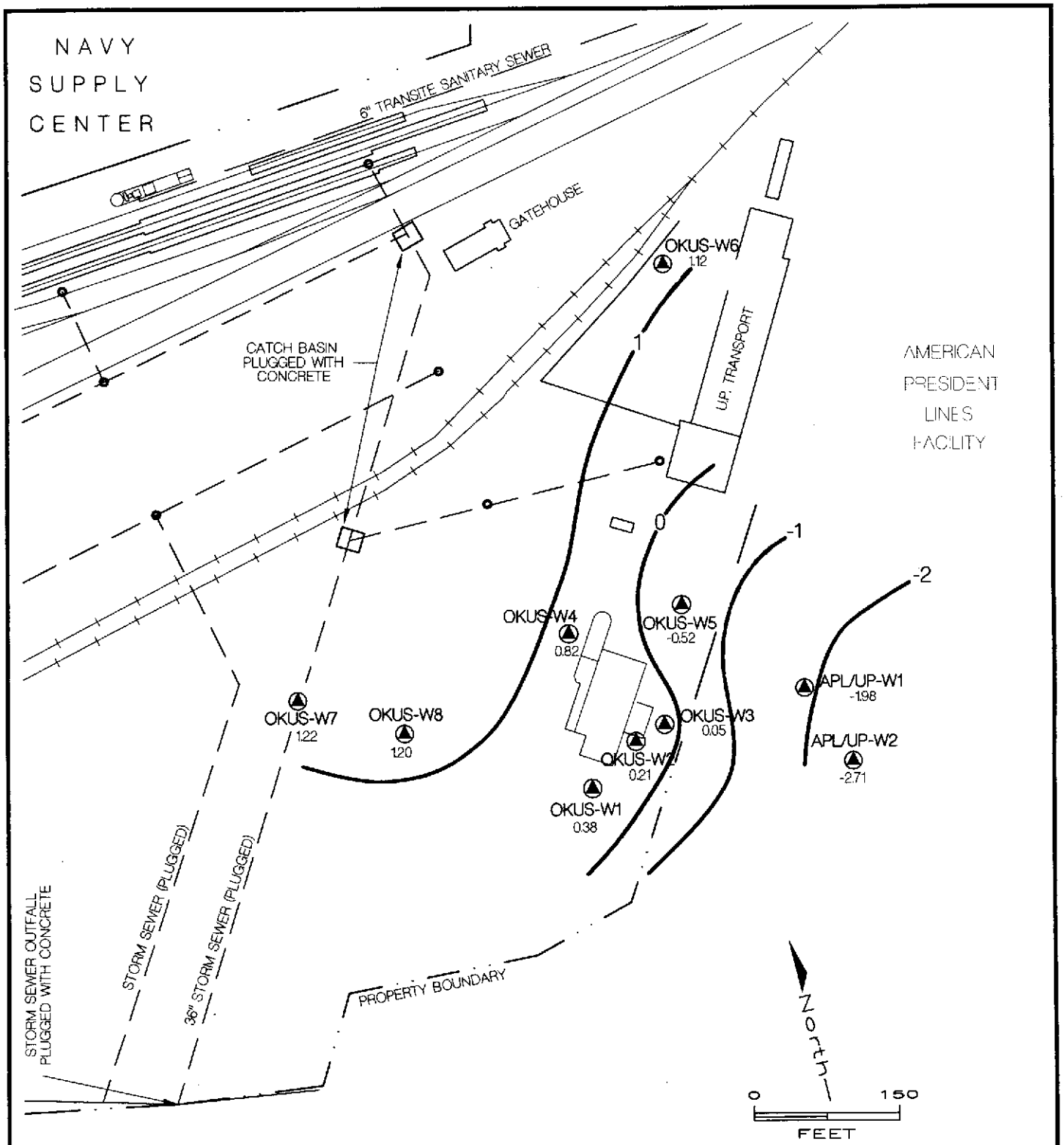
f:\share\consult\mars\dm\okmft2.wk1

TABLE 2
CUMULATIVE FLUID LEVEL MEASUREMENT DATA
UNION PACIFIC RAILROAD MOTOR FREIGHT FACILITY
OAKLAND, CALIFORNIA
USPCI PROJECT NO. 96120-844

WELL NO.	ELEV.* TOC	DATE	DEPTH TO PRODUCT	PRODUCT ELEVATION	PRODUCT THICKNESS	DEPTH TO WATER	WATER ELEVATION (UNCORR'D)	WATER ELEVATION (CORR'D)
OKUS-W6	7.02	07/16/93	N/A	N/A	NP	6.20	0.82	0.82
	7.02	08/25/93	N/A	N/A	NP	6.52	0.50	0.50
	7.02	11/12/93	N/A	N/A	NP	7.22	-0.20	-0.20
	7.02	02/07/94	5.89	1.13	P	--	--	--
	7.02	05/03/94	5.90	1.12	P	--	--	--
OKUS-W7	6.91	07/16/93	N/A	N/A	NP	5.72	1.19	1.19
	6.91	08/25/93	N/A	N/A	NP	5.94	0.97	0.97
	6.91	11/12/93	N/A	N/A	NP	6.50	0.39	0.39
	6.91	02/07/94	N/A	N/A	NP	5.81	1.10	1.10
	6.91	05/03/94	N/A	N/A	NP	5.69	1.22	1.22
OKUS-W8	6.75	07/16/93	N/A	N/A	NP	5.56	1.19	1.19
	6.75	08/27/93	N/A	N/A	NP	5.88	0.87	0.87
	6.75	11/11/93	N/A	N/A	NP	6.43	0.33	0.33
	6.75	02/07/94	N/A	N/A	NP	5.59	1.16	1.16
	6.75	05/03/94	N/A	N/A	NP	5.55	1.20	1.20
APL/UP-W1	8.12	07/16/93	N/A	N/A	NP	10.02	-1.90	-1.90
	8.12	08/26/93	N/A	N/A	NP	9.93	-1.81	-1.81
	8.12	11/11/93	N/A	N/A	NP	10.25	-2.13	-2.13
	8.12	02/07/94	N/A	N/A	NP	9.71	-1.59	-1.59
	8.12	05/03/94	N/A	N/A	NP	10.10	-1.98	-1.98
APL/UP-W2	7.31	07/16/93	N/A	N/A	NP	9.38	-2.07	-2.07
	7.31	08/26/93	N/A	N/A	NP	9.20	-1.89	-1.89
	7.31	11/11/93	N/A	N/A	NP	9.65	-2.34	-2.34
	7.31	02/07/94	N/A	N/A	NP	8.85	-1.54	-1.54
	7.31	05/03/94	N/A	N/A	NP	10.02	-2.71	-2.71
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	--	--

* 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 seperator interface could not be found.

f:\share\consult\mars\dm\okmft2.wk1



LEGEND

OKUS-W1 0.88 — MONITOR WELL LOCATION AND NUMBER WITH GROUNDWATER ELEVATION

CATCH BASIN FOR STORM SEWER

1 — GROUNDWATER ELEVATION CONTOUR (FEET RELATIVE TO SEA LEVEL)

96120-616

USPCI
A Subsidiary of Union Pacific Corporation

OAKLAND, CALIFORNIA

FIGURE 4
GROUNDWATER ELEVATION MAP

SCALE:	APPROVED/DATE
1" = 150'	6-27-94

3. CONCLUSIONS AND RECOMMENDATIONS

The following subsections present conclusions and recommendations based on the field and analytical results from the subject site.

3.1 CONCLUSIONS

The analytical results from the 1993 site assessments and groundwater monitoring program indicate a dissolved plume of BTEX and TPH which is not limited to the immediate area surrounding the UPMF facility. An estimate of the lateral extent of the dissolved contaminant plume is presented on Figure 3. Based on the most recent sampling results, the downgradient edge of the plume appears to be between monitoring wells APL/UP-W1 and APL/UP-W2. It appears that the dissolved BTEX plume has not migrated or increased in areal extent.

The concentrations of dissolved arsenic exceeded the MDL of 0.050 mg/L in groundwater samples from three of ten wells. In the past, arsenic and lead concentrations have remained at or near the MDLs. Based on the consistently low historical dissolved arsenic and lead concentrations a less frequent sampling schedule or the elimination of these analytes from the sampling program is warranted.

Bunker C has been observed in monitoring well OKUS-W6 and it appears that this occurrence is not related to the UPMF site.

The product skimming system has continued to remove product from recovery well RW at a rate equal to that observed from bailing activities.

3.2 RECOMMENDATIONS

Based on the above conclusions, the following recommendations are made:

- To monitor the status of the dissolved petroleum hydrocarbon plume in the groundwater at the site, the quarterly monitoring program should be continued.
- The collection and analysis of arsenic and lead groundwater samples should be discontinued.
- The monitoring of bunker C and product near the UPMF facility should be continued.
- The operation and monitoring of the product skimming system in recovery well RW should be continued.

APPENDIX A

ANALYTICAL REPORTS

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

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

Client Project ID: #96120-844/UPMF Oakland
Sample Matrix: Water
Analysis Method: EPA 5030/8015/8020
First Sample #: 405-0062

Sampled: May 3, 1994
Received: May 4, 1994
Reported: May 18, 1994

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 405-0062 OKUS-W1	Sample I.D. 405-0063 OKUS-W2	Sample I.D. 405-0064 OKUS-W3	Sample I.D. 405-0065 OKUS-W4	Sample I.D. 405-0066 OKUS-W5	Sample I.D. 405-0067 OKUS-W7
Purgeable Hydrocarbons	50	N.D.	17,000	14,000	6,500	820	N.D.
Benzene	0.5	N.D.	300	310	240	57	N.D.
Toluene	0.5	N.D.	N.D.	61	34	9.5	N.D.
Ethyl Benzene	0.5	N.D.	5,800	6,400	4,200	240	N.D.
Total Xylenes	0.5	N.D.	220	210	140	27	N.D.
Chromatogram Pattern:		--	Gasoline	Gasoline	Gasoline	Gasoline	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	100	100	50	5.0	1.0
Date Analyzed:	5/11/94	5/11/94	5/11/94	5/12/94	5/12/94	5/12/94
Instrument Identification:	HP4	HP4	HP4	HP4	HP4	HP4
Surrogate Recovery, %: (QC Limits = 70-130%)	98	101	98	93	92	91

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

Karen L. Enstrom
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

U.S.P.C.I.	Client Project ID:	#96120-844/UPMF Oakland	Sampled: May 3, 1994
5665 Flatiron Parkway	Sample Matrix:	Water	Received: May 4, 1994
Boulder, CO 80301	Analysis Method:	EPA 5030/8015/8020	Reported: May 18, 1994
Attention: Denton Mauldin	First Sample #:	405-0068	

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 405-0068 OKUS-W8	Sample I.D. 405-0069 APL-W1	Sample I.D. 405-0070 APL-W2	Sample I.D. 405-0071 OKUS-QC1
Purgeable Hydrocarbons	50	79	680	N.D.	5,400
Benzene	0.5	0.99	48	N.D.	300
Toluene	0.5	N.D.	2.9	N.D.	41
Ethyl Benzene	0.5	N.D.	260	N.D.	5,200
Total Xylenes	0.5	N.D.	9.8	N.D.	130
Chromatogram Pattern:		Unidentified Hydrocarbons >C10	Gasoline	--	Gasoline

Quality Control Data

Report Limit Multiplication Factor:	1.0	2.0	1.0	20
Date Analyzed:	5/16/94	5/16/94	5/16/94	5/16/94
Instrument Identification:	HP2	HP4	HP4	HP2
Surrogate Recovery, %: (QC Limits = 70-130%)	103	99	86	98

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

Karen L. Enstrom
Project Manager

Please Note:
REVISED REPORT 7/6/94

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

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

Client Project ID: #96120-844/UPMF Oakland
Sample Matrix: Water
Analysis Method: EPA 3510/3520/8015
First Sample #: 405-0062

Sampled: May 3, 1994
Received: May 4, 1994
Reported: May 18, 1994

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 405-0062 OKUS-W1	Sample I.D. 405-0063 OKUS-W2	Sample I.D. 405-0064 OKUS-W3	Sample I.D. 405-0065 OKUS-W4	Sample I.D. 405-0066 OKUS-W5	Sample I.D. 405-0067 OKUS-W7
Extractable Hydrocarbons	50	61	2,600	3,000	2,300	2,000	1,300
Chromatogram Pattern:		Diesel & Unidentified Hydrocarbons >C20	Diesel & Unidentified Hydrocarbons <C14; >C20	Diesel & Unidentified Hydrocarbons <C14; >C20	Diesel & Unidentified Hydrocarbons <C14; >C20	Diesel & Unidentified Hydrocarbons <C14; >C20	Diesel & Unidentified Hydrocarbons >C20

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0	1.0
Date Extracted:	5/10/94	5/10/94	5/10/94	5/10/94	5/10/94	5/10/94
Date Analyzed:	5/13/94	5/13/94	5/13/94	5/13/94	5/13/94	5/13/94
Instrument Identification:	HP3A	HP3A	HP3A	HP3A	HP3A	HP3A

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

Karen L. Enstrom
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

U.S.P.C.I.	Client Project ID:	#96120-844/UPMF Oakland	Sampled: May 3, 1994
5665 Flatiron Parkway	Sample Matrix:	Water	Received: May 4, 1994
Boulder, CO 80301	Analysis Method:	EPA 3510/3520/8015	Reported: May 18, 1994
Attention: Denton Mauldin	First Sample #:	405-0068	

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 405-0068 OKUS-W8	Sample I.D. 405-0069 APL-W1	Sample I.D. 405-0070 APL-W2	Sample I.D. 405-0071 OKUS-QC1
Extractable Hydrocarbons	50	780	590	100	2,500
Chromatogram Pattern:		Diesel & Unidentified Hydrocarbons >C20	Diesel & Unidentified Hydrocarbons >C14; >C20	Diesel	Diesel & Unidentified Hydrocarbons <C14; >C20

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0
Date Extracted:	5/10/94	5/10/94	5/10/94	5/10/94
Date Analyzed:	5/13/94	5/13/94	5/13/94	5/13/94
Instrument Identification:	HP3B	HP3B	HP3B	HP3B

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

Karen L. Enstrom
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

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

Client Project ID: #96120-844/UPMF Oakland
Sample Descript: Water
Analysis for: Dissolved Arsenic
First Sample #: 405-0062

Sampled: May 3, 1994
Received: May 4, 1994
Extracted: May 5, 1994
Analyzed: May 5, 1994
Reported: May 18, 1994

LABORATORY ANALYSIS FOR: Dissolved Arsenic

Sample Number	Sample Description	Detection Limit mg/L	Sample Result mg/L
405-0062	OKUS-W1	0.10	N.D.
405-0063	OKUS-W2	0.10	N.D.
405-0064	OKUS-W3	0.10	0.14
405-0065	OKUS-W4	0.10	0.12
405-0066	OKUS-W5	0.10	0.38
405-0067	OKUS-W7	0.10	N.D.
405-0068	OKUS-W8	0.10	N.D.
405-0069	APL-W1	0.10	N.D.
405-0070	APL-W2	0.10	N.D.
405-0071	OKUS-QC1	0.10	0.12

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL, #1271

Karen L. Enstrom
Project Manager

Please Note:
*Samples filtered in field

4050062.USP <5>

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

U.S.P.C.I.	Client Project ID:	#96120-844/UPMF Oakland	Sampled: May 3, 1994
5665 Flatiron Parkway	Sample Descript:	Water	Received: May 4, 1994
Boulder, CO 80301	Analysis for:	Dissolved Lead	Extracted: May 5, 1994
Attention: Denton Mauldin	First Sample #:	405-0062	Analyzed: May 6, 1994
			Reported: May 18, 1994

LABORATORY ANALYSIS FOR: Dissolved Lead

Sample Number	Sample Description	Detection Limit mg/L	Sample Result mg/L
405-0062	OKUS-W1	0.020	N.D.
405-0063	OKUS-W2	0.020	N.D.
405-0064	OKUS-W3	0.020	N.D.
405-0065	OKUS-W4	0.020	N.D.
405-0066	OKUS-W5	0.020	N.D.
405-0067	OKUS-W7	0.020	N.D.
405-0068	OKUS-W8	0.020	N.D.
405-0069	APL-W1	0.020	N.D.
405-0070	APL-W2	0.020	N.D.
405-0071	OKUS-QC1	0.020	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL, #1271

Karen L. Enstrom
Project Manager

Please Note:
*Samples Filtered in field

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

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

Client Project ID: #96120-844/UPMF Oakland
Matrix: Liquid

QC Sample Group: 4050062-71

Reported: May 18, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes	Diesel
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015 Mod
Analyst:	J.Fontecha	J.Fontecha	J.Fontecha	J.Fontecha	K.Wimer
MS/MSD Batch#:	4050401	4050401	4050401	4050401	Blk050994
Date Prepared:	5/11/94	5/11/94	5/11/94	5/11/94	5/9/94
Date Analyzed:	5/11/94	5/11/94	5/11/94	5/11/94	5/10/94
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4	HP3A
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L	300 µg/L
Matrix Spike % Recovery:	70	90	95	95	88
Matrix Spike Duplicate % Recovery:	70	85	90	95	91
Relative % Difference:	0.0	5.7	5.4	2.1	3.7

LCS Batch#:	21CS051194	21CS051194	21CS051194	21CS051194	BLK050994
Date Prepared:	5/11/94	5/11/94	5/11/94	5/11/94	5/9/94
Date Analyzed:	5/11/94	5/11/94	5/11/94	5/11/94	5/10/94
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4	HP3A
LCS % Recovery:	71	88	93	95	88
% Recovery Control Limits:	71-133	72-128	72-130	71-120	28-122

SEQUOIA ANALYTICAL, #1271

Karen L. Enstrom
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.

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

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

Client Project ID: #96120-844/UPMF Oakland
Matrix: Liquid
QC Sample Group: 4050062-71
Reported: May 18, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Lead	Arsenic	Benzene	Toluene	Ethyl	Xylenes
Method:	EPA 200.7	EPA 200.7	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	J. Dinsay	J. Dinsay	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha
MS/MSD Batch#:	4050057	4050057	4050379	4050379	4050379	4050379
Date Prepared:	5/5/94	5/5/94	5/16/94	5/16/94	5/16/94	5/16/94
Date Analyzed:	5/6/94	5/6/94	5/16/94	5/16/94	5/16/94	5/16/94
Instrument I.D.#:	Liberty-100	Liberty-100	HP-4	HP-4	HP-4	HP-4
Conc. Spiked:	1.0 mg/L	1.0 mg/L	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Matrix Spike % Recovery:	85	98	90	95	90	93
Matrix Spike Duplicate % Recovery:	85	104	90	90	90	92
Relative % Difference:	0.0	5.9	0.0	5.4	0.0	1.1
LCS Batch#:	BLK050594 ms	BLK050594 ms	2LCS051694	2LCS051694	2LCS051694	2LCS051694
Date Prepared:	5/5/94	5/5/94	5/16/94	5/16/94	5/16/94	5/16/94
Date Analyzed:	5/6/94	5/6/94	5/16/94	5/16/94	5/16/94	5/16/94
Instrument I.D.#:	Liberty-100	Liberty-100	HP-4	HP-4	HP-4	HP-4
LCS % Recovery:	81	93	92	92	92	94
% Recovery Control Limits:	75-125	75-125	71-133	72-128	72-130	71-120

SEQUOIA ANALYTICAL

Karen L. Enstrom
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.

[redacted]

USPCI
A Subsidiary of Union Pacific Corporation

Ship To: USPCI Analytical Services
4322 South 49th West Avenue
Tulsa, OK 74107
(918) 446-1162

REPORT TO
COMPANY: USPCI
ADDRESS: 5615 Flatiron Pkwy
CITY: Boulder ST.: CO ZIP: 80301
PHONE: 303-938-5534 FAX: 303-938-5520

BILL TO
COMPANY:
ADDRESS:
CITY: ST.: ZIP:
PHONE: PO #:

CHAIN OF CUSTODY RECORD

PROJ. NO.: 96120-844
PROJECT NAME: UPMF Oakland
SAMPLERS (SIGNATURE): [signature]

STANDARD TURNAROUND: ✓
RUSH TURNAROUND (specify required date):

1 of 4

CUSTOMER SAMPLE I.D.	DATE	TIME	MATRIX	# CONTAINERS	BTEX 8020	TPH-G 8015	TPH-D 8015	Dissolved Metals As, Pb	LABORATORY SAMPLE I.D.	REMARKS
OKUS-W1	5-3-94	1430	H_2O	1	✓				4050062A-D	
OKUS-W1	↓	↓	↓	1		✓			↓	
OKUS-W1				1			✓			
OKUS-W1				1				✓		Metals filtered in field
OKUS-W2		1500		1	✓				0063A-D	
OKUS-W2		↓		1		✓				
OKUS-W2				1			✓			
OKUS-W2				1				✓		
OKUS-W3		1505		1	✓				0064 A-D	
OKUS-W3		↓		1		✓				
OKUS-W3				1			✓			
OKUS-W3	↓	↓	↓	1				✓		

RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	COURIER
[signature]	5-4-94 950	Melissa Crousore	5/4/94 9:30am	
RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	AIRBILL NO.

WHITE COPY — LABORATORY YELLOW COPY — LABORATORY PINK COPY — SAMPLER

USPCT
A Subsidiary of Union Pacific Corporation

Ship To: USPCT Analytical Services
4322 South 49th West Avenue
Tulsa, OK 74107
(918) 446-1162

REPORT TO
COMPANY USPCT
ADDRESS 5665 Flatiron Pkwy
CITY Boulder ST. CO ZIP 80301
PHONE 303 938 3331 FAX 303-938-3520

BILL TO
COMPANY
ADDRESS
CITY ST. ZIP
PHONE PO #

CHAIN OF CUSTODY RECORD

PROJ. NO. 96120-894
PROJECT NAME UPRR OAKLAND
SAMPLERS (SIGNATURE)

STANDARD TURNAROUND X
RUSH TURNAROUND (specify required date)

2 of 4

CUSTOMER SAMPLE I.D.	DATE	TIME	MATRIX	# CONTAINERS	BTEX 8020	TPH-G 8015	TPH-D 8015	Dissolved Metals As, Pb	LABORATORY SAMPLE I.D.	REMARKS
OKUT-W 9	5-3-94	1125	H_2O	1	X				405006 5A-D	
OKUT-W 4				1		X				
OKUT-W 4				1			X			
OKUT-W 4				1	X			X		Metals filtered in Field
OKUT-W 5		1150		1	X	X			0066AD	
OKUT-W 5				1			X			
OKUT-W 5				1				X		
OKUT-W 5				1		X				
OKUT-W6				1	X					OKUT-W6 WAS NOT SAMPLED DUE TO PSH IN WELL. CB
OKUT-W6				1	X					
OKUT-W6				1						
OKUT-W6				1				X		

RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	COURIER
RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	AIRBILL NO.
	5-4-94 0930	Melissa Chavez	5/4/94 9:30am	

WHITE COPY — LABORATORY YELLOW COPY — LABORATORY PINK COPY — SAMPLER

USPCI
A Subsidiary of Union Pacific Corporation

Ship To: USPCI Remedial Services
24125 Aldine Westfield
Spring, TX 77373
(713) 350-7240

REPORT TO
CONTACT [redacted]
COMPANY USPCI
ADDRESS 5665 Flatiron Pkwy
CITY Boulder ST. CO ZIP 80301
PHONE 303-938-3559 FAX 303-938-5520

BILL TO
CONTACT [redacted]
COMPANY
ADDRESS
CITY ST. ZIP
PHONE PO #

CHAIN OF CUSTODY RECORD

PROJ. NO. 96120-844
PROJECT NAME UPRR Oakland
SAMPLERS (SIGNATURE)

STANDARD TURNAROUND X
RUSH TURNAROUND (specify required date)
3 of 4

CUSTOMER SAMPLE I.D.	DATE	TIME	MATRIX	# CONTAINERS	BTEX 8020	TPH-G 8015	TPH-D 8015	Dissolved Metals As, Pb	LABORATORY SAMPLE I.D.	REMARKS
OKU5-W7	5-3-94	1325	H2O	1	X				405006 7AD	
OKU5-W7				1		X				
OKU5-W7				1			X			
OKU5-W7				1				X		metals filtered in field
OKU5-W8		1345		1	X				00168AD	
OKU5-W8				1		X				
OKU5-W8				1			X			
OKU5-W8				1				X		

RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	COURIER
	5-9-94 0930	Melissa Crenshaw	5/4/94 9:30am	
RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	AIRBILL NO.

[redacted]

USPCI
A Subsidiary of Union Pacific Corporation

Ship To: USPCI Analytical Services
4322 South 49th West Avenue
Tulsa, OK 74107
(918) 446-1162

REPORT TO
COMPANY: USPCI
ADDRESS: 5665 Flatiron Pkwy
CITY: Boulder ST.: CO ZIP: 80301
PHONE: 303-938-5537 FAX: 303-938-5520

BILL TO
COMPANY: ↓
ADDRESS:
CITY: ST.: ZIP:
PHONE: PO #:

CHAIN OF CUSTODY RECORD

PROJ. NO.: 96120-844
PROJECT NAME: UPMF OAKLAND
SAMPLERS (SIGNATURE): [signature]

STANDARD TURNAROUND: ✓
RUSH TURNAROUND (specify required date):

4 of 4

CUSTOMER SAMPLE I.D.	DATE	TIME	MATRIX	# CONTAINERS	BTEX 8020	TPH-G 8015	TPH-D 8015	Dissolved Metals Cd, Pb	LABORATORY SAMPLE I.D.	REMARKS
APL-W1	5-3-94	1735	H_2O	1	X				4050069AD	
APL-W1	↓	↓	↓	1		✓			↓	
APL-W1				1			✓			
APL-W1		↓		1				✓		metals filtered in field
APL-W2		1725		1	✓				0070AD	
APL-W2		↓		1		✓				
APL-W2				1			✓			
APL-W2		↓		1				✓		
OKUS-QC1		1200		1	✓				0071AD	
OKUS-QC1		↓		1		✓				
OKUS-QC1				1			✓			
OKUS-QC1	↓	↓	↓	1				✓		

RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	COURIER
[signature]	5-4-94 0930	Melissa Crumley	5/4/94 9:30am	
RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	AIRBILL NO.

WHITE COPY — LABORATORY YELLOW COPY — LABORATORY PINK COPY — SAMPLER

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: June 14, 1994
Date Received: June 13, 1994
Project: UPRR UPMF
Date Samples Extracted: June 13, 1994

RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FINGERPRINT CHARACTERIZATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)

Sample ID	GC Characterization
RES 4117	The GC trace using the flame ionization detector (FID) showed the presence of medium and high boiling compounds. The patterns displayed by these peaks are indicative of diesel fuel and motor oil. The medium boiling compounds appeared as a regular pattern of peaks eluting from *n*-C_{10} to *n*-C_{22} showing a maximum near *n*-C_{17}. A regular pattern of the *n*-alkanes is seen for the medium boiling product. The high boiling compounds appeared as a pattern of peaks eluting from *n*-C_{23} to *n*-C_{34} showing a maximum near *n*-C_{28}. The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis.

06-AMG-A
06/13/94
9:35

FRIEDMAN & BRUYA, INC.
3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282

SAMPLE CHAIN OF CUSTODY

Send Report To:
Company Riedel Environmental Services Contact M. Sulka
Address 4138 Lakeside Dr.
City, State, Zip Richmond, 94806
Phone # (510) 222-7810 Date 6/13/94

SITE NO.	PROJECT NAME	PURCHASE ORDER #
	UPRR UPmF	

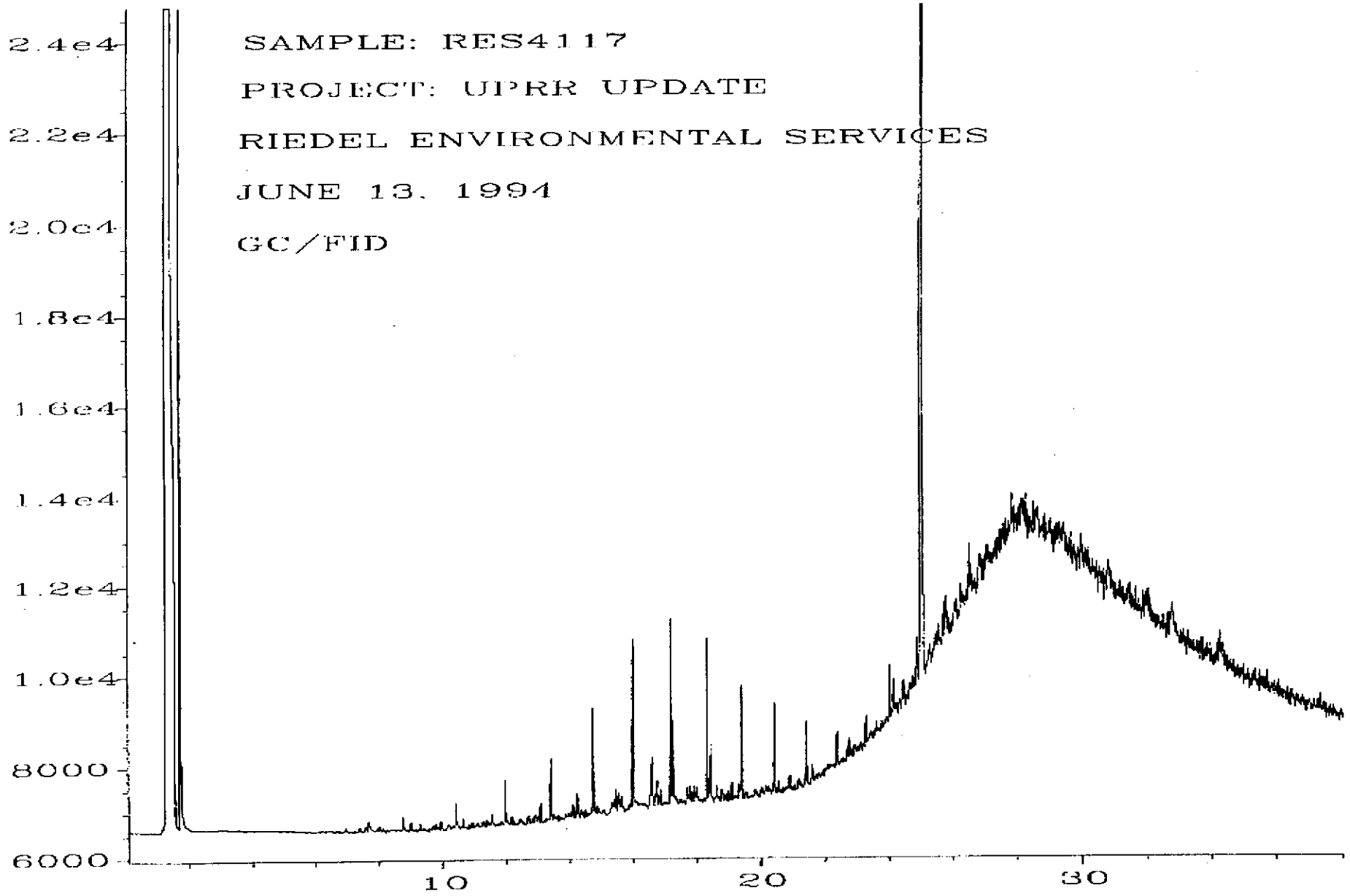
SAMPLERS *(signature)*	PROJECT LOCATION

REMARKS
No COC, initiated by lab, 6/13/94 KM

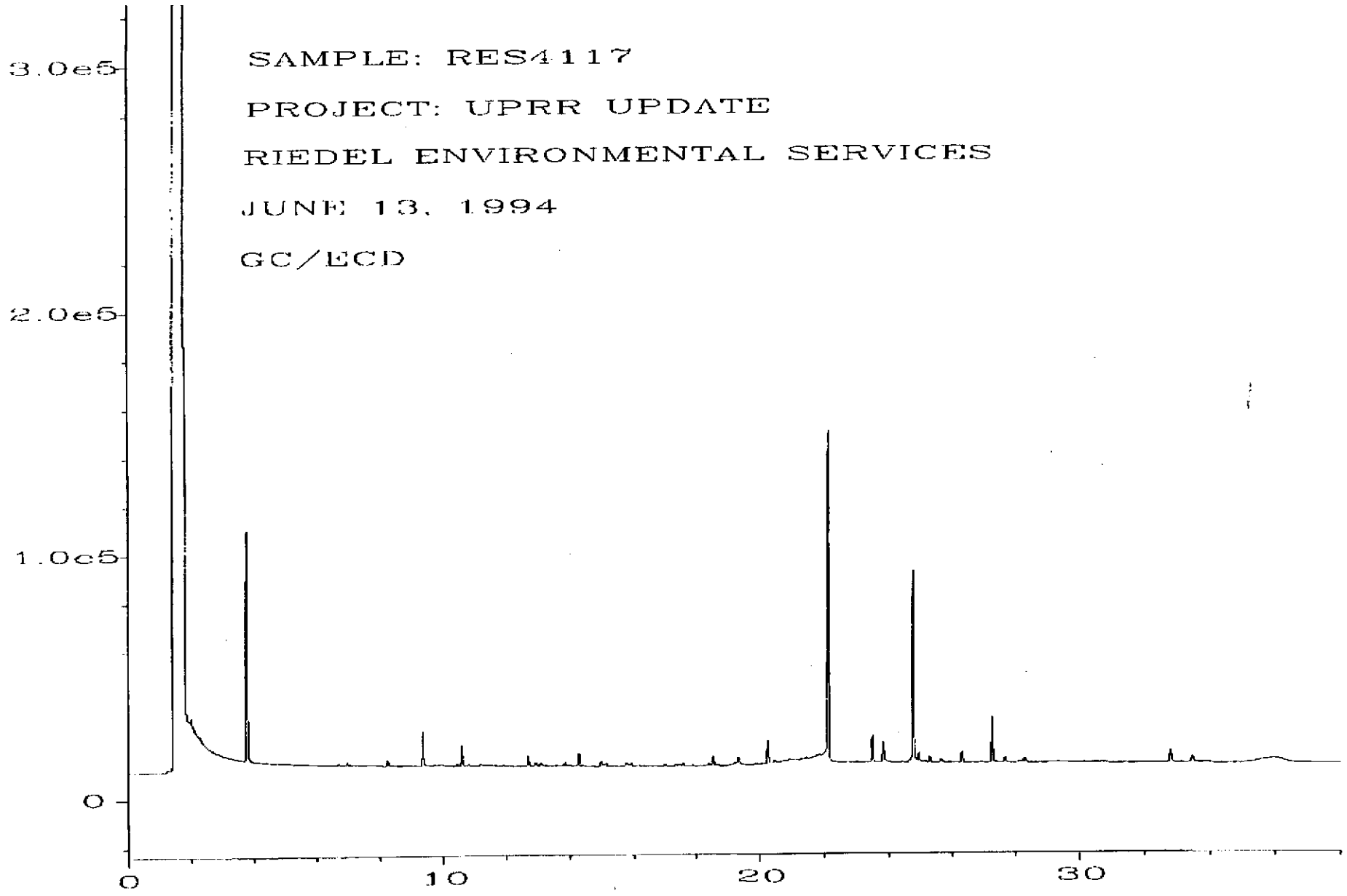
SAMPLE DISPOSAL INFORMATION
- ☐ Dispose after 30 days
- ☐ Return Samples
- ☐ Call for Instructions

Sample #	Date/Time Sampled	Type of Sample	# of Jars	Lab Sample #	Analyses Requested
RES 4/17	6/7/94/14:00	Product	1	50271	Fuel Fingerprint

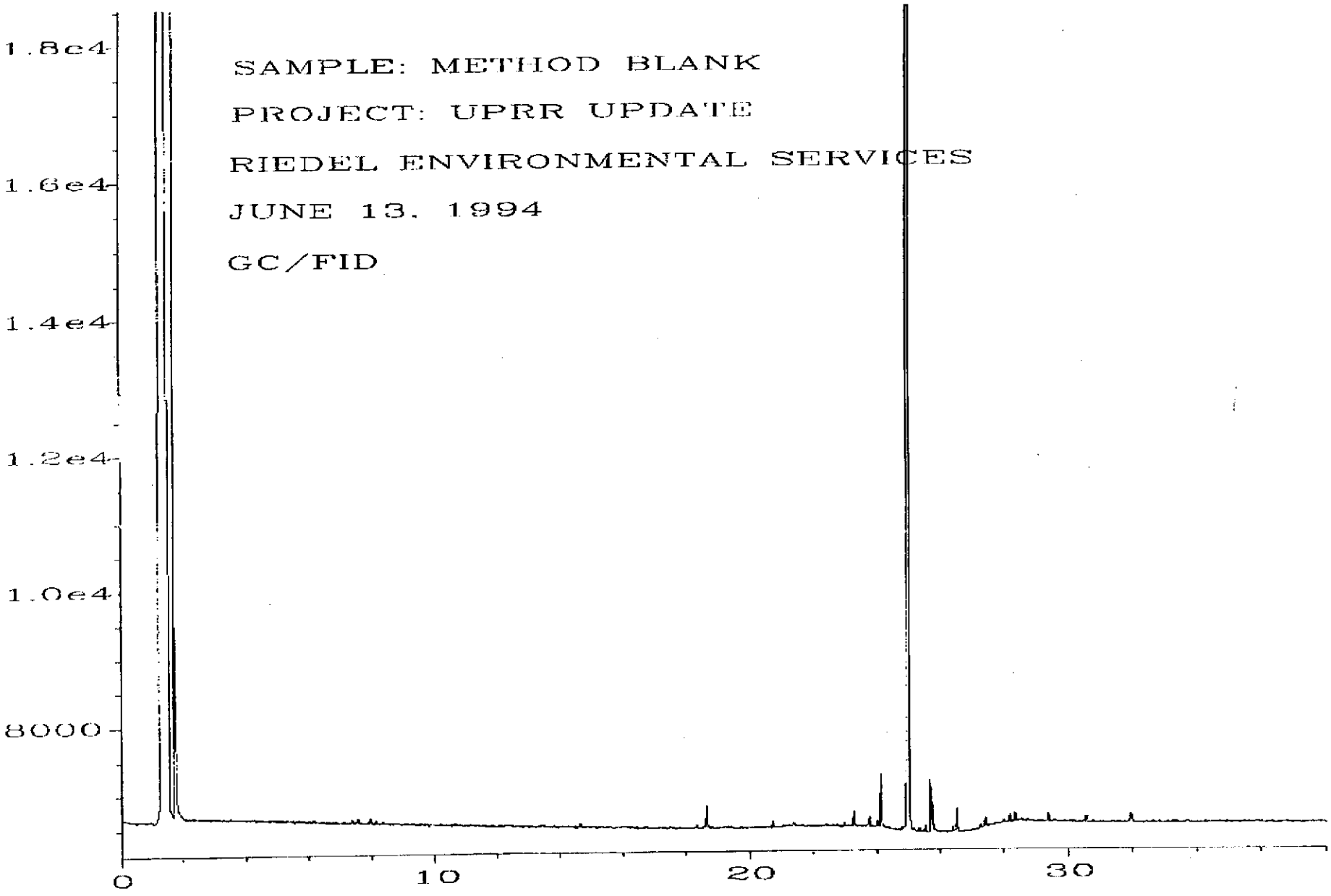
SIGNATURE	PRINT NAME	COMPANY	Date	Time
Relinquished by: mike sulka 20-JUN-94 FED EX	MIKE SULKA	RIEDEL		
Received by: Kathy Miller	Kathy Miller	FBI	6/13/94	9:35
Relinquished by:				
Received by:				



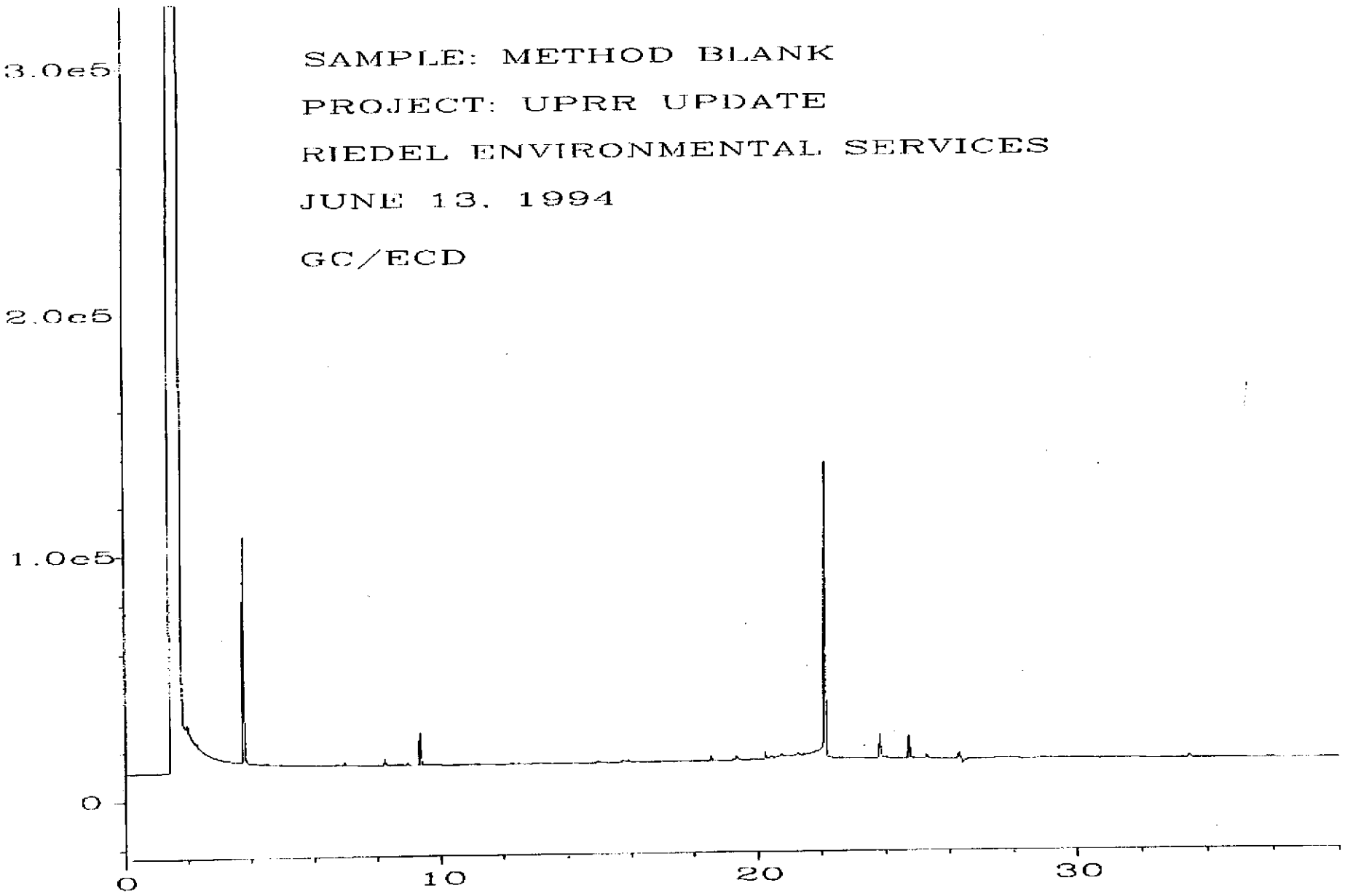
Sig. 1 in C:\HPCHEM\4\DATA\06-13-94\012F0501.D



Sig. 2 in C:\HPCHEM\4\DATA\06-13-94\012R0501.D



Sig. 1 in C:\HPCHEM\4\DATA\06-13-94\011F0501.D



Sig. 2 in C:\HPCHEM\4\DATA\06-13-94\011R0501.D

APPENDIX B

WELL STABILIZATION AND SAMPLING REPORTS

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: **UPMF Oakland Facility Quarterly Monitoring** USPCI Project Number: **96120-544**

Measuring Point (MP) Location **Top of Casing**

Well No. OKUS-W1

Well Depth: (Below MP): **22.05**

Casing diameter: **2** Inches — Sampling Date: **5/3/94**

Depth To Ground Water (Below MP): **8.49** Feet — Sample ID No. **OKUS-W1**

Method Of Well Development: — Time: **14:05**

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

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

Sampling Collection Method: — Sample Appearance: **slight turbidity**

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample — Odor: **no odor**

■ 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:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests — Samples Collected: BTEX,TPH/G,TPH/D,As,Pb

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)
14:15	7.5	1150	16		2.5	
14:18	7.6	1100	16		5.0	
14:29	7.7	1300	16		7.5	
samples	collected at	14:30				

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

Comments:

[Comments may continue on back]

Form Completed By: **Tracey Haskell** — Witnessed By: **Denton Mauldin**

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: **UPMF Oakland Facility Quarterly Monitoring** | USPCI Project Number: **96120-844**

Measuring Point (MP) Location **Top of Casing** | **Well No. OKUS-W2**

Well Depth: (Below MP): **22.50**

Casing diameter: **2** Inches | Sampling Date: **5/3/94**

Depth To Ground Water (Below MP): **9.50** Feet | Sample ID No. **OKUS-W2**

Method Of Well Development: | Time: **14:25**

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

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

Sampling Collection Method: | Sample Appearance: **slightly turbid**

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample | Odor: **strong petroleum odor**

■ 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:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests | Samples Collected: **BTEX,TPH/G,TPH/D,As,Pb**

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)
14:35	7.7	3300	16		2.5	
14:45	7.6	3600	16		5.0	
14:52	7.6	3600	16		7.5	
sample	collected at	15:00				

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

Comments:

[Comments may continue on back]

Form Completed By: **Tracey Haskell** Witnessed By: **Denton Mauldin**

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: **UPMF Oakland Facility Quarterly Monitoring** USPCI Project Number: **96120-844**

Measuring Point (MP) Location **Top of Casing**

Well No. OKUS-W3

Well Depth: (Below MP): **22.38 Feet**

Casing diameter: **2** Inches

Sampling Date: **5/3/94**

Depth To Ground Water (Below MP): **9.75 Feet**

Sample ID No. **OKUS-W3**

Method Of Well Development;

Time: **14:38**

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP): **9.80**

■ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation: **6.55 Feet**

Sampling Collection Method:

Sample Appearance: **Slight turbidity**

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: **strong petroleum odor**

■ 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:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: **BTEX,TPH/G,TPH/D,As,Pb**

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)
14:41	7.6	3300	17		2.0	
14:50	7.6	3600	17		4.0	
14:55	7.6	3800	17		6.0	
sample	collected at	15:05				

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

Comments:

[Comments may continue on back]

Form Completed By: **Tracey Haskell** Witnessed By: **Denton Mauldin**

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: **UPMF Oakland Facility Quarterly Monitoring** | USPCI Project Number: **96120-844**

Measuring Point (MP) Location **Top of Casing**

Well No. OKUS-W4

Well Depth: (Below MP): **20.92 Feet**

Casing diameter: **2** Inches | Sampling Date: **5/3/94**

Depth To Ground Water (Below MP): **6.55** Feet | Sample ID No. **OKUS-W4/OKUS-QC1**

Method Of Well Development: | Time: **10:57**

☐ Tap ☐ Submersible Pump ☐ Bladder Pump | Riser Elevation (MP): 7.35

■ Bailer ☐ Centrifugal Pump ☐ Other | Top of Screen Elevation: 6.08 Feet

Sampling Collection Method: | Sample Appearance: **slight turbidity**

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample | Odor: **strong petroleum odor**

■ 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:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests | Samples Collected: **BTEX,TPH/D,TPH/G,As,Pb**

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)
11:01	8.1	3100	15.0		2.5	
11:12	8.2	3200	16.0		5.0	
11:22	8.2	3200	16.5		7.5	
samples	collected at	11:25				

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

Comments:

[Comments may continue on back]

Form Completed By: **Tracey Haskell** | Witnessed By: **Denton Mauldin**

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: **UPMF Oakland Facility Quarterly Monitoring** USPCI Project Number: **96120-844**

Measuring Point (MP) Location **Top of Casing**

Well No. OKUS-W5

Well Depth: (Below MP): **20.68 Feet**

Casing diameter: **2** Inches — Sampling Date: **5/3/94**

Depth To Ground Water (Below MP): **9.77 Feet** — Sample ID No. **OKUS-W5**

Method Of Well Development: — Time: **10:31** ■AM, ☐PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump — Riser Elevation (MP): 9.25

■ Bailer ☐ Centrifugal Pump ☐ Other — Top of Screen Elevation: 5.95

Sampling Collection Method: — Sample Appearance: **slight turbidity**

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample — Odor: **strong petroluem odor**

■ 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:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests — Samples Collected: **BTEX,TPH/G,TPH/D,As,Pb**

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)
10:35	7.6	3900	16		2.0	
10:39	7.7	3700	16		4.0	
10:45	7.7	3600	16		6.0	
samples	collected at	11:50				

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

Comments:

[Comments may continue on back]

Form Completed By: **Tracey Haskell** — Witnessed By: **Denton Mauldin**

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: **UPMF Oakland Facility Quarterly Sampling** USPCI Project Number: **96120-844**

Measuring Point (MP) Location **Top of Casing**

Well No. OKUS-W6

Well Depth: (Below MP): **16.30 Feet**

Casing diameter: **2** Inches Sampling Date: **5/3/94**

Depth To Ground Water (Below MP): **5.91** Feet Sample ID No. **OKUS-W6**

Method Of Well Development: Time: **17:25**

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Riser Elevation (MP): 7.29

◯ Bailer ☐ Centrifugal Pump ☐ Other Top of Screen Elevation: 2.29 Feet

Sampling Collection Method: Sample Appearance:

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample Odor: **mo odor**

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

◯ ABS Plastic ◯ PVC

Pump Intake Or Bailer Set At _____ Feet Below MP Decontamination Performed:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests Samples Collected:

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)
Free product						

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

Comments: **A [redacted] petroleum product noted on the top and sides of the bailer when it was removed from the well. The water/oil interphase probe did not pick up the petroleum product when the water level was measured.**

[Comments may continue on back]

Form Completed By: **Tracey Haskell** Witnessed By: **Denton Mauldin**

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: **UPMF Oakland Facility Quarterly Monitoring** USPCI Project Number: **96120-844**

Measuring Point (MP) Location **Top of Casing**

Well No. OKUS-W7

Well Depth: (Below MP): **20.50 Feet**

Casing diameter: **2** Inches — Sampling Date: **5/3/94**

Depth To Ground Water (Below MP): **5.69 Feet** — Sample ID No. **OKUS-W7**

Method Of Well Development: — Time: **13:00**

☐ Tap ☐ Submersible Pump ☐ Bladder Pump — Riser Elevation (MP): 7.4

■ Bailer ☐ Centrifugal Pump ☐ Other — Top of Screen Elevation: 2.4 Feet

Sampling Collection Method: — Sample Appearance: **slight turbidity**

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample — Odor: **no odor**

■ 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:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests — Samples Collected: **BTEX,TPH/D,TPH/G,As, Pb**

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)
13:06	8.1	2600	16		3.0	
13:12	8.1	2700	16		6.0	
13:19	8.1	2600	16		9.0	
samples	collected at	13:25				

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

Comments:

[Comments may continue on back]

Form Completed By: **Tracey Haskell** — Witnessed By: **Denton Mauldin**

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: **UPMF Oakland Facility Quarterly Monitoring** USPCI Project Number: **96120-844**

Measuring Point (MP) Location **Top of casing**

Well No. OKUS-W8

Well Depth: (Below MP): **15.30 Feet**

Casing diameter: **2** Inches

Sampling Date: **5/3/94**

Depth To Ground Water (Below MP): **5.55** Feet

Sample ID No. **OKUS-W8**

Method Of Well Development:

Time: **13:32**

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

Riser Elevation (MP): 7.11

■ Bailer ☐ Centrifugal Pump ☐ Other

Top of Screen Elevation: 2.11 Feet

Sampling Collection Method:

Sample Appearance: **slightly turbid**

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

Odor: **no odor**

■ 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:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: **BTEX,TPH/D,TPH/G,As,Pb**

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)
13:37	7.6	3700	17		2.0	
13:40	7.5	3800	17		4.0	
13:43	7.6	3900	17		6.0	
samples	collected at	13:45				

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

Comments:

[Comments may continue on back]

Form Completed By: **Tracey Haskell** Witnessed By: **Denton Mauldin**

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: **UPMF Oakland Facility Quarterly Monitoring** USPCI Project Number: **96120-844**

Measuring Point (MP) Location **Top of casing**

Well No. APL/UP-W1

Well Depth: (Below MP): **22.00 Feet**

Casing diameter: **2** Inches Sampling Date: **5/3/94**

Depth To Ground Water (Below MP): **10.10** Feet Sample ID No. **APL-W1**

Method Of Well Development: Time: **17:06**

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Riser Elevation (MP): 7.11

■ Bailer ☐ Centrifugal Pump ☐ Other Top of Screen Elevation: 2.11 Feet

Sampling Collection Method: Sample Appearance: **clear**

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample Odor: **no odor**

■ 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:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests Samples Collected: **BTEX,TPH/D,TPH/G,As,Pb**

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)
17:10	8.1	1600	16.0		2.0	
17:12	8.2	1600	16.0		4.0	
17:13	8.2	1600	16.0		6.0	
sample	collected at	17:35				

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

Comments:

[Comments may continue on back]

Form Completed By: **Tracey Haskell** Witnessed By: **Denton Mauldin**

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: **UPMF Oakland Facility Quarterly Monitoring** | USPCI Project Number: **96120-844**

Measuring Point (MP) Location **Top of Casing** | **Well No. APL/UP-W2**

Well Depth: (Below MP): **17.30 Feet**

Casing diameter: **2** Inches | Sampling Date: **5/3/94**

Depth To Ground Water (Below MP): **10.02** Feet | Sample ID No. **APL-W2**

Method Of Well Development: | Time: **17:06**

☐ Tap ☐ Submersible Pump ☐ Bladder Pump | Riser Elevation (MP): 7.62

■ Bailer ☐ Centrifugal Pump ☐ Other | Top of Screen Elevation: 2.62 Feet

Sampling Collection Method: | Sample Appearance: **slightly turbid**

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample | Odor: **no odor**

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

○ ABS Plastic ○ PVC ■ HDPE Plastic ■ Disposal

Pump Intake Or Bailer Set At _____ Feet Below MP | Decontamination Performed:

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests | Samples Collected: **BTEX,TPH/G,TPH/D,As,Pb**

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)
17:09	8.1	1700	17		1.5	
17:14	8.0	1900	16		3.0	
17:19	8.0	1900	17		4.5	
samples	collected at	17:25				

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

Comments:

[Comments may continue on back]

Form Completed By: **Tracey Haskell** Witnessed By: **Denton Mauldin**