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THIRD 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

October 27, 1994

USPCI
A Subsidiary of
Union Pacific Corporation

Consulting Services

October 27, 1994

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

RE: **"Third Quarter 1994 Monitoring Report"**, UPMF Facility at 1750 Ferro Street, Oakland, California, USPCI Project No. 96120-844

Dear Mr. Patterson:

Enclosed is the final copy of the **"Third Quarter 1994 Monitoring Report"**, dated October 27, 1994 for the Union Pacific Motor Freight (UPMF) Facility at 1750 Ferro Street in Oakland, California.

Based on the information obtained during the most recent monitoring event, the following recommendations are included in the report:

- The quarterly monitoring program should be continued.
- The monitoring of bunker C and product near the Union Pacific Motor Freight facility should be continued.
- The operation and monitoring of the product skimming system in recovery well RW should be continued.

5665 Flatiron Parkway • Boulder, Colorado 80301 • 303/938-5500 • Fax 303/938-5520
24125 Aldine Westfield • Spring, Texas 77373 • 713/350-7240 • Fax 713/350-7246

If you have any questions, please call me at (303) 938-5539.

Sincerely,

Denton Mauldin
Engineer III

cc: Sam Marquis, USPCI
Jennifer Eberle, ACDEH
John Amdur, Port of Oakland
Philip Herden, APL
Ken Fossey, USPCI (cover letter)
Mary Mast, USPCI (cover letter)

Enclosure

DM/tjh

THIRD 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

Sam Marquis
Project Hydrogeologist
R.G. No. 5110

October 27, 1994

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1. INTRODUCTION

The 1994 Third 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 third quarterly monitoring event involved:

- Gauging the static water levels, purging, and sampling the nine existing monitoring wells;
- Monitoring the performance of the product skimmer in recovery well RW;
- Analyzing groundwater samples from the monitoring wells where non-aqueous phase liquid petroleum hydrocarbon (product) was not measured. Samples were analyzed 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
- Preparation of the Third Quarterly Monitoring Report.

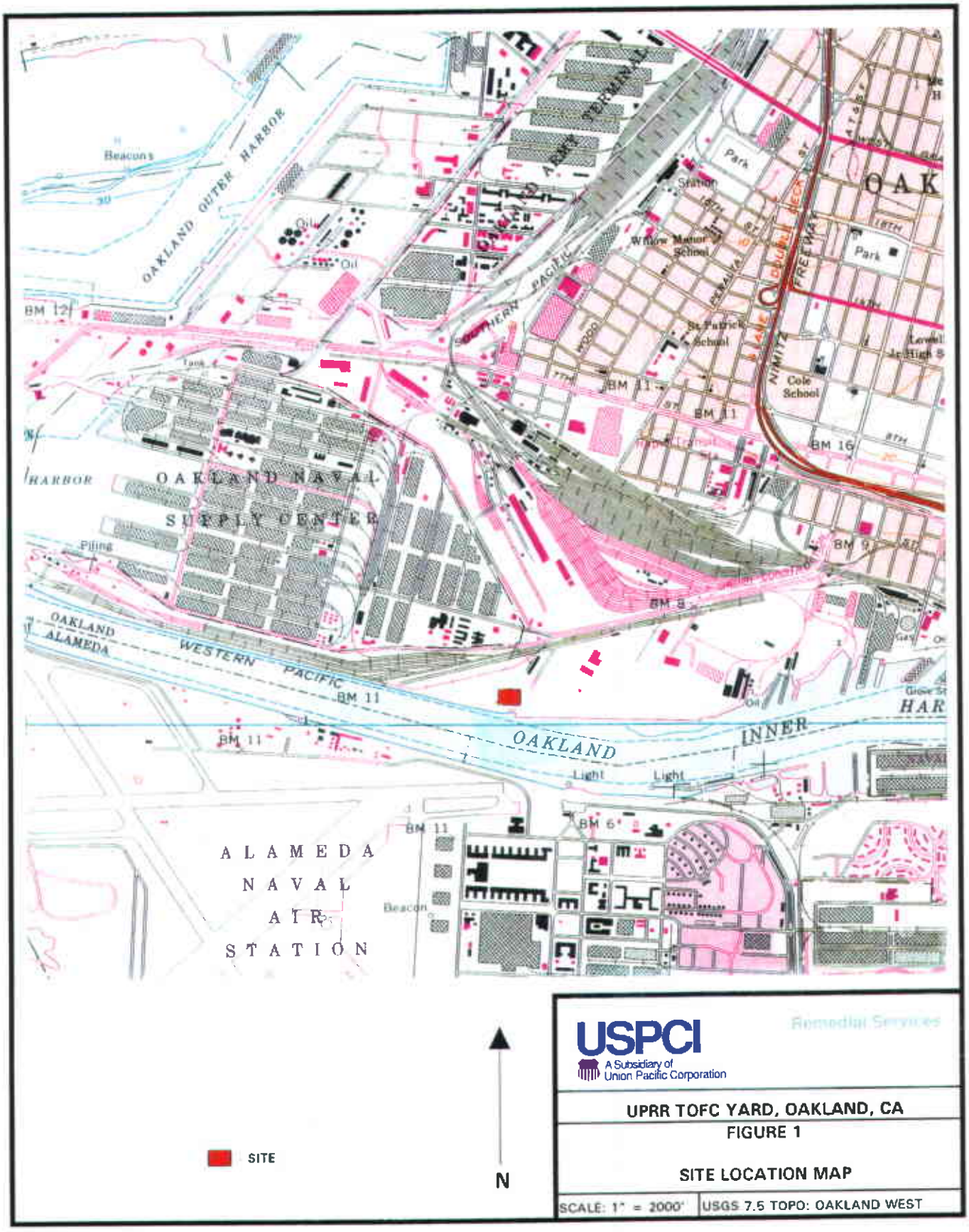
Product was measured in monitoring well OKUS-W6 and recovery well RW during the Third Quarter 1994 Monitoring Event. Groundwater samples were collected from the eight remaining monitoring wells at the facility on August 24, 1994.

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 approximately one half mile away to the north and to the south 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.


OAKLAND OUTER HARBOR
Beacons
Oil
BM 12
ARMY TERMINAL
SOUTHERN PACIFIC
Park
Station
OAK
Willow Manor School
NIMITZ FREEWAY
Park
St. Patrick School
Cole School
BM 11
BM 16
HARBOR
OAKLAND NAVAL SUPPLY CENTER
Piling
BM 9
OAKLAND ALAMEDA
WESTERN PACIFIC
BM 11
OAKLAND INNER HAR
Light
Light
BM 6
ALAMEDA NAVAL AIR STATION
Beacon
SITE
N
USPCI
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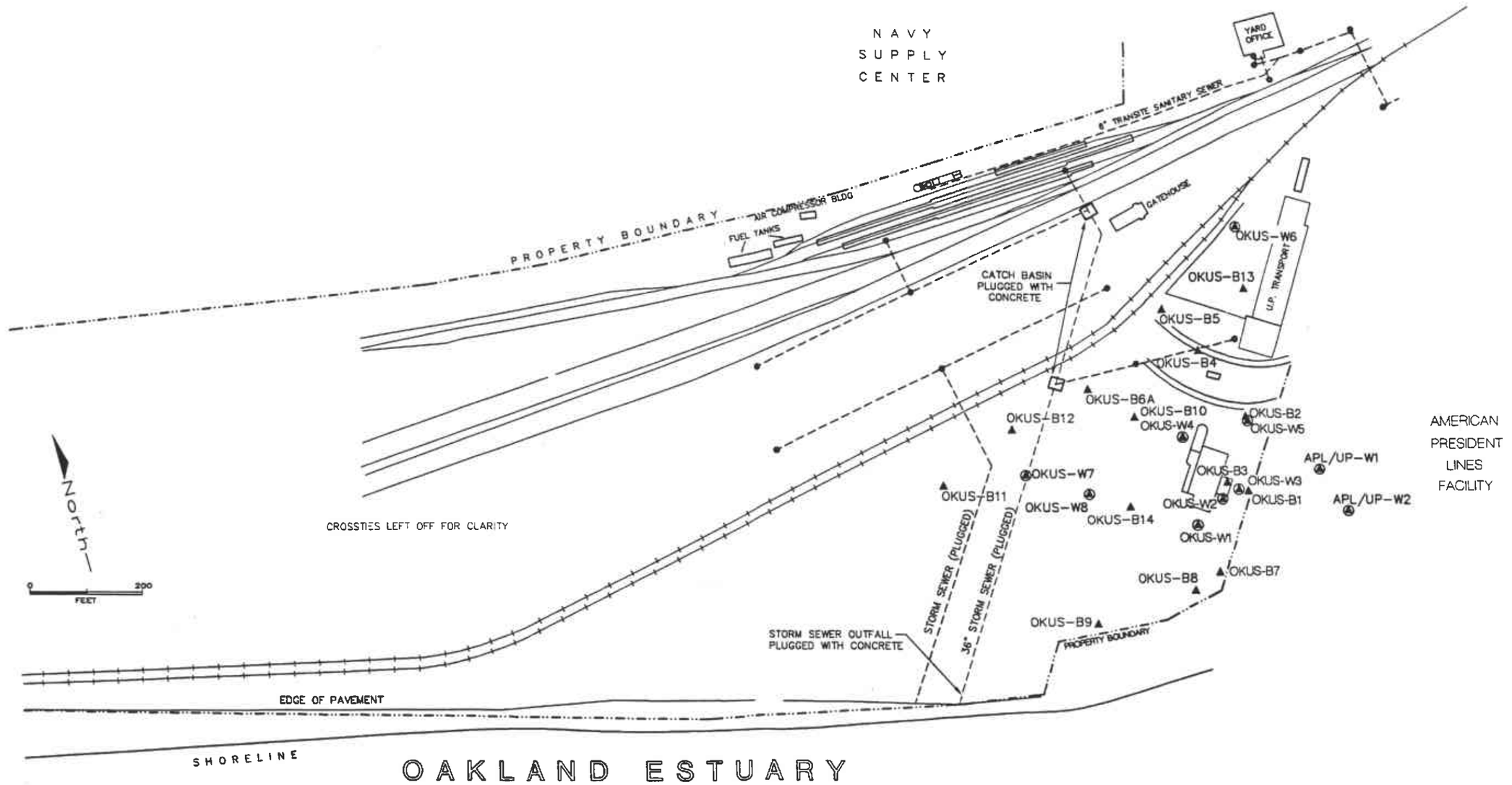
Remedial Services
UPRR TOFC YARD, OAKLAND, CA
FIGURE 1
SITE LOCATION MAP
SCALE: 1" = 2000'
USGS 7.5 TOPO: OAKLAND WEST



LEGEND

⊕ OKUS-W1	MONITORING WELL LOCATION AND NUMBER
▲ OKUS-B1	BORING LOCATION AND NUMBER
•	CATCH BASIN FOR STORM SEWER

BY	DATE
DRAWN BILL	9/93
CHECKED	
APPROVED	
APPROVED	
APPROVED	

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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 operating procedures previously supplied to the ACDEH.

The quarterly monitoring event was conducted by USPCI Remedial Services personnel under the direct supervision of Christopher Byerman.

2. FIELD INVESTIGATION RESULTS

The field investigation presented in this report was completed on three separate occasions during the third quarter. The dates of the field investigation were July 29, August 24, and September 26, 1994. The following subsections present the findings and activities completed during the third quarterly field investigation.

2.1 Groundwater Assessment Determinations

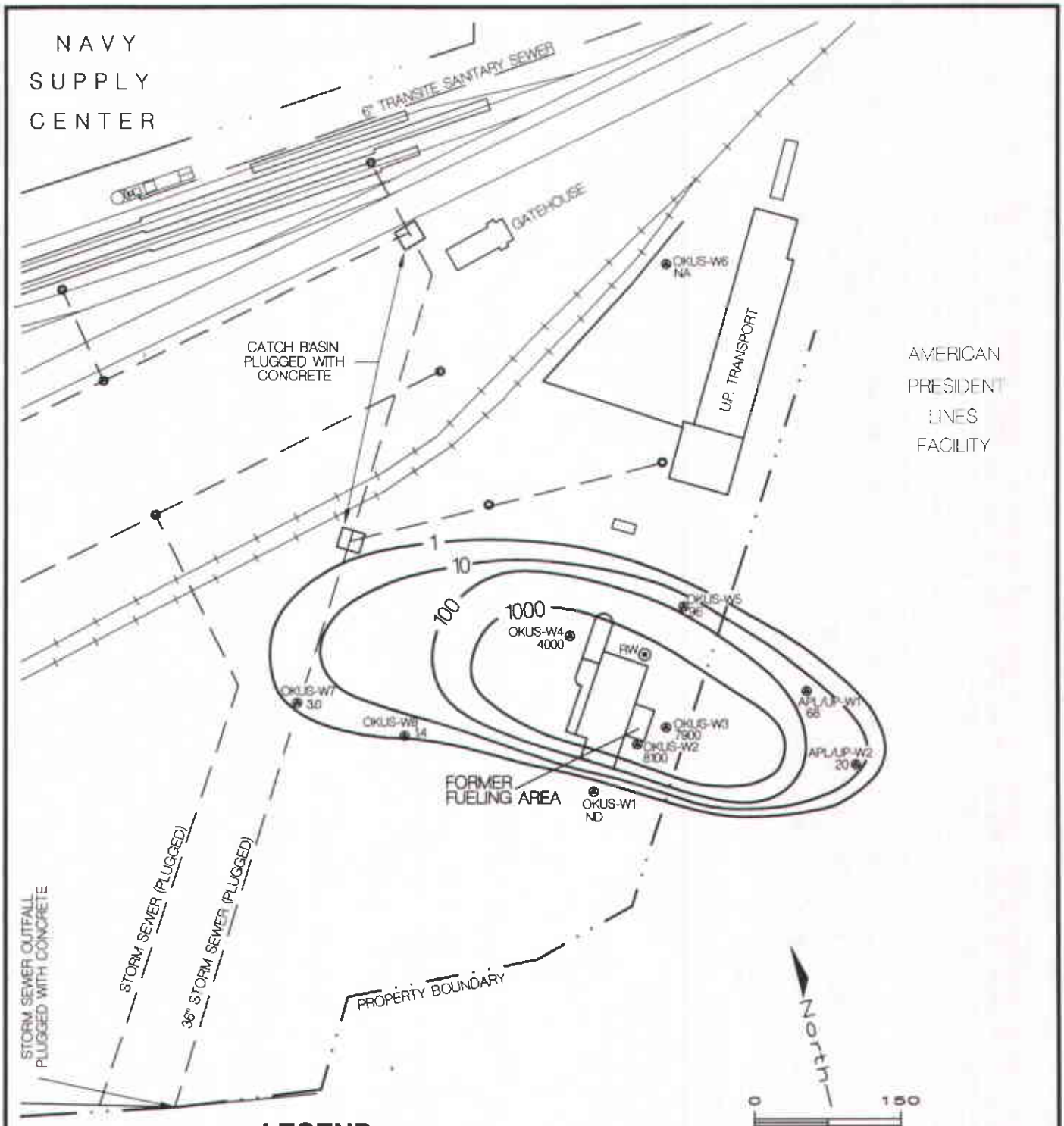
The continued monitoring of wells and the compilation of the field and analytical data is directed towards an understanding of groundwater and petroleum hydrocarbon migration beneath the site.

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). No observable tidal influences have been noted to date at the site; however, 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 though .

2.1.2 Results of Laboratory Analysis of Groundwater Samples

Analytical results demonstrate dissolved concentrations of TPH/D, TPH/G and BTEX in groundwater samples from monitoring wells OKUS-W2 through APL/UP-W2. Only monitoring well OKUS-W1 did not exhibit dissolved concentrations above the detection limits. (Figure 3 and Table 1). Total BTEX concentrations ranged from below the detection limit in the samples collected from monitoring wells OKUS-W1 to approximately 8,100 micrograms per liter (μg/L) in the sample collected from OKUS-W2. TPH/G concentrations ranged from below the method detection limit (MDL) of 50 μg/L in samples collected from OKUS-W1 and OKUS-W7 to 11,000 μg/L in sample OKUS-W2. TPH/D concentrations ranged from 86 μg/L in sample OKUS-W1 to 8200 μg/L in sample OKUS-W2.



LEGEND

OKUS-W8 ▲ 3.0	MONITOR WELL LOCATION AND NUMBER WITH TOTAL DISSOLVED BTEX CONCENTRATION ug/L
●	CATCH BASIN FOR STORM SEWER
100	BTEX CONCENTRATION CONTOUR
ND	NOT DETECTED
NA	NOT ANALYZED

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

96120-619

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OAKLAND, CALIFORNIA

FIGURE 3

DISSOLVED PHASE BTEX DISTRIBUTION MAP
UPMF REPAIR SHOP

SCALE	APPROVED/DATE
1" = 150'	10/20/94

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
		08/24/94	NA	86	<50	<0.50	<0.50	<0.50	<0.5	<2.0	<0.10	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
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
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	4800	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
OKUS–W5	OKUS–W5	01/15/93	ND	2900	550	53	11	180	20	260	NA	ND
"	"	05/12/93	130	2100	550	61	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	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
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	2.8	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									
		08/24/94	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
		08/24/94	NA	910	<50	2.5	0.54	<0.50	<0.50	3	<0.10	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	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
		08/24/94	NA	700	100	1.4	<0.50	<0.50	<0.50	1.4	<0.10	NA

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	660	48	2.9	260	9.8	320	<0.10	<0.02
		08/24/94	NA	420	630	48	4.8	12	3.2	68	<0.10	NA
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	1.6	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
		08/24/94	NA	330	220	13.0	0.77	3.5	3.1	20	<0.10	NA
OKUS–W5	OKUS–W8	01/15/93	ND	2600	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–W8	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	260	84	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
OKUS–W8	OKUS–QC1	08/24/94	NA	950	92	1.6	<0.50	<0.50	<0.50	1.6	<0.10	NA
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

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

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

Groundwater samples were also analyzed for dissolved arsenic. The analytical results indicated dissolved arsenic in samples from two of the ten monitoring wells. Monitoring wells OKUS-W4 and OKUS-W5 exhibited dissolved concentrations of 0.11 and 0.45 milligrams per liter (mg/L), respectively. Analytical results are presented in Table 1. Analytical reports and chain of custody forms are included in Appendix A.

2.1.3 Groundwater Gradient

Static water levels measured on August 24, 1994 (Table 2) were used to produce the groundwater elevation map presented as Figure 4. A decrease in groundwater elevations was noted throughout most of the site since the second quarter 1994 sampling. The groundwater gradient at the site was to the south-southwest and was consistent with the gradient observed during the previous (second quarter 1994) gauging and sampling event. Well stabilization and sampling reports are presented in Appendix B.

2.1.4 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 indicated in Table 2, the product thickness measurement of bunker C in monitoring well OKUS-W6 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, air/oil interface measurement was the only reliable reading obtained.

Monitoring well OKUS-W6 is located in the interpreted cross-gradient direction from the former UST site by approximately 400 feet. The presence of bunker C has not been observed during the drilling 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. During August 1994, the system was shut down due to the breakage of the support cable for the skimming device. The line breakage created a 1-2 gallon spill of product onto the concrete that the system is set on. The spill was contained and removed. Operation of the system was resumed on September 1, 1994. On September 26, 1994, the system had recovered approximately 4.8 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

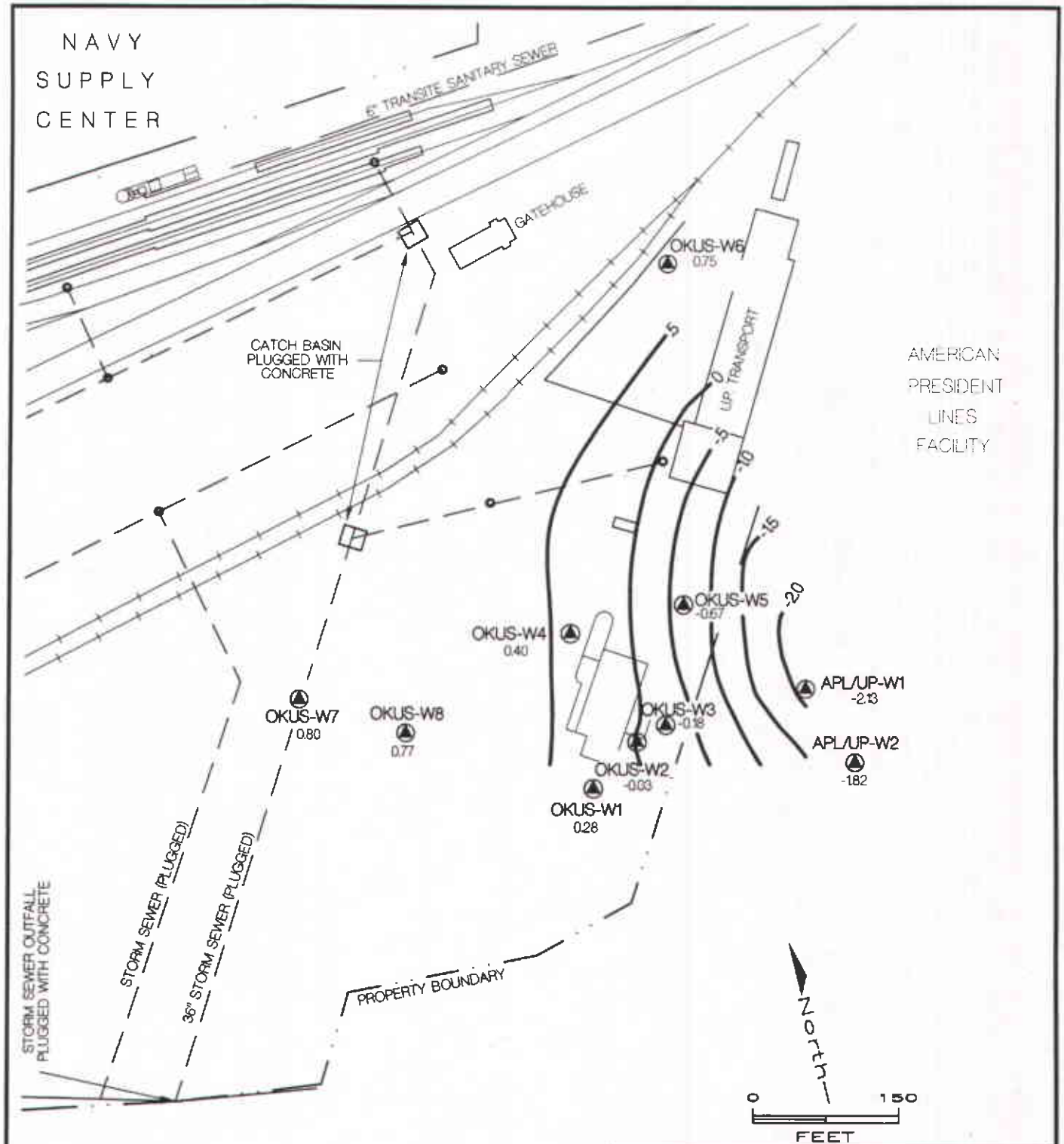
WELL NO.	ELEV.* TOC	DATE	DEPTH TO PRODUCT	PRODUCT ELEVATION	PRODUCT THICKNESS	DEPTH TO WATER	WATER ELEVATION (UNCORR'D)	WATER ELEVATION (CORR'D)
OKUS-W1	9.17	01/14/93	N/A	N/A	NP	8.42	0.75	0.75
	9.17	01/15/93	N/A	N/A	NP	8.45	0.72	0.72
	9.17	02/18/93	N/A	N/A	NP	7.79	1.38	1.38
	9.17	05/12/93	N/A	N/A	NP	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	0.70	0.70
	9.17	05/03/94	N/A	N/A	NP	8.49	0.68	0.68
	9.17	08/24/94	N/A	N/A	NP	8.89	0.28	0.28
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
	9.71	08/24/94	N/A	N/A	NP	9.74	-0.03	-0.03
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	0.57
	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
	9.80	08/24/94	N/A	N/A	NP	9.98	-0.18	-0.18
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	0.95
	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	0.80	0.80
	7.35	06/07/94	N/A	N/A	NP	6.62	0.73	0.73
	7.35	07/29/94	N/A	N/A	NP	6.65	0.70	0.70
	7.35	08/24/94	N/A	N/A	NP	6.80	0.55	0.55
	7.35	09/01/94	N/A	N/A	NP	6.93	0.42	0.42
	7.35	09/26/94	N/A	N/A	NP	6.95	0.40	0.40
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	0.05
	9.25	08/25/93	8.82	0.43	0.02	8.84	0.41	0.41
	9.25	11/11/93	N/A	N/A	NP	10.15	-0.90	-0.90
	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
	9.25	07/29/94	N/A	N/A	NP	9.83	-0.58	-0.58
	9.25	08/24/94	N/A	N/A	NP	9.93	-0.68	-0.68
	9.25	09/01/94	N/A	N/A	NP	9.92	-0.67	-0.67
	9.25	09/26/94	N/A	N/A	NP	9.92	-0.67	-0.67

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	--	--	--
	7.02	08/24/94	6.27	0.75	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	0.41	0.41
	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
	6.91	08/24/94	N/A	N/A	NP	6.11	0.80	0.80
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	0.32	0.32
	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
	6.75	08/24/94	N/A	N/A	NP	5.98	0.77	0.77
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
	8.12	08/24/94	N/A	N/A	NP	10.25	-2.13	-2.13
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
	7.31	08/24/94	N/A	N/A	NP	9.13	-1.82	-1.82
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	9.78	--	0.06	9.84	--	--

* 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 0.80 — MONITOR WELL LOCATION AND NUMBER WITH GROUNDWATER ELEVATION

CATCH BASIN FOR STORM SEWER

0 — 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'	10-20-94

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 recent sampling results, the downgradient edge of the plume appears to be near monitoring well APL/UP-W2. Comparison of historical data to the most recent sampling results suggests 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 two of ten wells. These results are consistent with results from previous sampling events.

Bunker C continues to be 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.

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 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 Flat Iron Pkwy.
Boulder, CO 80301
Attention: Denton Mauldin

Client Project ID: UPMF Oakland/#96120-844
Sample Matrix: Water
Analysis Method: EPA 5030/8015/8020
First Sample #: 408-1458

Sampled: Aug 24, 1994
Received: Aug 25, 1994
Reported: Sep 8, 1994

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 408-1458 OKUS-W5	Sample I.D. 408-1459 OKUS-W8	Sample I.D. 408-1460 OKUS-W7	Sample I.D. 408-1461 APL-W1	Sample I.D. 408-1462 APL-W2
Purgeable Hydrocarbons	50	910	100	N.D.	830	220
Benzene	0.50	55	1.4	2.5	48	13
Toluene	0.50	14	N.D.	0.54	4.8	0.77
Ethyl Benzene	0.50	8.5	N.D.	N.D.	12	3.5
Total Xylenes	0.50	18	N.D.	N.D.	3.2	3.1
Chromatogram Pattern:		Gasoline	Gasoline	--	Gasoline	Gasoline

Quality Control Data

Report Limit Multiplication Factor:	5.0	1.0	1.0	4.0	2.0
Date Analyzed:	8/29/94	8/30/94	8/29/94	8/29/94	8/29/94
Instrument Identification:	HP-5	HP-4	HP-5	HP-5	HP-5
Surrogate Recovery, %: (QC Limits = 70-130%)	92	91	105	99	93

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

4081458.USP <1>

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:	UPMF Oakland/#96120-844	Sampled:	Aug 24, 1994
5665 Flat Iron Pkwy.	Sample Matrix:	Water	Received:	Aug 25, 1994
Boulder, CO 80301	Analysis Method:	EPA 3510/3520/8015	Reported:	Sep 8, 1994
Attention: Denton Mauldin	First Sample #:	408-1458		

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 408-1458 OKUS-W5	Sample I.D. 408-1459 OKUS-W8	Sample I.D. 408-1460 OKUS-W7	Sample I.D. 408-1461 APL-W1	Sample I.D. 408-1462 APL-W2
Extractable Hydrocarbons	50	1,700	700	910	420	330
Chromatogram Pattern:		Unidentified Hydrocarbons C10-C24	Diesel and Unidentified Hydrocarbons >C20	Unidentified Hydrocarbons >C14	Unidentified Hydrocarbons C10-C24	Unidentified Hydrocarbons C10-C24

Quality Control Data

Report Limit Multiplication Factor:	20	1.0	1.0	1.0	1.0
Date Extracted:	8/26/94	8/26/94	8/26/94	8/26/94	8/26/94
Date Analyzed:	9/2/94	9/2/94	9/2/94	9/2/94	9/2/94
Instrument Identification:	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

Karen L. Enstrom
Project Manager

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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:	UPMF Oakland/#96120-844	Sampled:	Aug 24, 1994
5665 Flat Iron Pkwy.	Sample Descript:	Water	Received:	Aug 25, 1994
Boulder, CO 80301	Analysis for:	Dissolved Arsenic	Extracted:	Aug 31, 1994
Attention: Denton Mauldin	First Sample #:	408-1458	Analyzed:	Sep 6, 1994
			Reported:	Sep 8, 1994

LABORATORY ANALYSIS FOR: Dissolved Arsenic

Sample Number	Sample Description	Detection Limit mg/L	Sample Result mg/L
408-1458	OKUS-W5	0.10	0.45
408-1459	OKUS-W8	0.10	N.D.
408-1460	OKUS-W7	0.10	N.D.
408-1461	APL-W1	0.10	N.D.
408-1462	APL-W2	0.10	N.D.

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

SEQUOIA ANALYTICAL, #1271

Karen L. Enstrom
Project Manager

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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 Flat Iron Pkwy.
Boulder, CO 80301
Attention: Denton Mauldin

Client Project ID: UPMF Oakland/#96120-844
Matrix: Liquid
QC Sample Group: 4081458-462

Reported: Sep 12, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha
MS/MSD Batch#:	4081532	4081532	4081532	4081532
Date Prepared:	8/30/94	8/30/94	8/30/94	8/30/94
Date Analyzed:	8/30/94	8/30/94	8/30/94	8/30/94
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Matrix Spike % Recovery:	80	95	100	102
Matrix Spike Duplicate % Recovery:	80	95	100	100
Relative % Difference:	0.0	0.0	0.0	1.9
LCS Batch#:	2LCS083094	2LCS083094	2LCS083094	2LCS083094
Date Prepared:	8/30/94	8/30/94	8/30/94	8/30/94
Date Analyzed:	8/30/94	8/30/94	8/30/94	8/30/94
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4
LCS % Recovery:	78	89	92	94
% Recovery Control Limits:	71-133	72-128	72-130	71-120

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.

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U.S.P.C.I.
5665 Flat Iron Pkwy.
Boulder, CO 80301
Attention: Denton Mauldin

Client Project ID: UPMF Oakland/#96120-844
Matrix: Liquid
QC Sample Group: 4081458-462

Reported: Sep 12, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes	Diesel	Arsenic
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015 Mod	EPA 200.7
Analyst:	A. Tuzon	A. Tuzon	A. Tuzon	A. Tuzon	K.V.S.	K. Anderson
MS/MSD Batch#:	4081492	4081492	4081492	4081492	BLK082694	4081463
Date Prepared:	8/29/94	8/29/94	8/29/94	8/29/94	8/26/94	8/31/94
Date Analyzed:	8/29/94	8/29/94	8/29/94	8/29/94	8/26/94	9/6/94
Instrument I.D.#:	HP-5	HP-5	HP-5	HP-5	HP-3B	Liberty-100
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L	300 µg/L	1.0 mg/L
Matrix Spike % Recovery:	90	100	100	100	99	97
Matrix Spike Duplicate % Recovery:	110	120	115	113	88	91
Relative % Difference:	20	18	14	12	12	6.4
LCS Batch#:	3LCS082994	3LCS082994	3LCS082994	3LCS082994	BLK082694	BLK083194
Date Prepared:	8/29/94	8/29/94	8/29/94	8/29/94	8/26/94	8/31/94
Date Analyzed:	8/29/94	8/29/94	8/29/94	8/29/94	8/26/94	9/6/94
Instrument I.D.#:	HP-5	HP-5	HP-5	HP-5	HP-3B	Liberty-100
LCS % Recovery:	107	119	121	117	99	89
% Recovery Control Limits:	71-133	72-128	72-130	71-120	28-122	75-125

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.

USPCI
A Subsidiary of Union Pacific Corporation
Ship To: USPCI Remedial Services
24125 Aldine Westfield
Spring, TX 77373
(713) 350-7240

REPORT TO
CONTACT Denton Mclean
COMPANY USOCI
ADDRESS 5665 Flatiron Pkwy
CITY Boulder ST. Co ZIP 80301
PHONE 303-938-5539 FAX 303-938-5328

BILL TO
CONTACT Same ←
COMPANY
ADDRESS
CITY ST. ZIP
PHONE PO #

№ 001299

CHAIN OF CUSTODY RECORD

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

STANDARD TURNAROUND X
RUSH TURNAROUND (specify required date)

CUSTOMER SAMPLE I.D.	DATE	TIME	MATRIX	# CONTAINERS	BTEX EPA	T-H-O	TPH-D	Dissolved As	LABORATORY SAMPLE I.D.	REMARKS
OKUS-W5	8-24-94	1630	H_2O	2	X	X			4081458 AD	Dissolved As
OKUS-W5		1630		1			X			needs to be
OKUS-W5		1630		1				X		filtered @ lab
OKUS W8		1400		2	X	X			4081459 AD	
OKUS-W8		1400		1			X			
OKUS-W8		1400		1				X		
OKUS-W7		1450		2	X	X			4081460 AD	
OKUS-W7		1450		1			X			
OKUS-W7		1450		1				X		
APL-W1		1830		2	X	X			4081461 AD	
APL-W1		1830		1			X			
APL-W1		1830		1				X		

RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	COURIER
RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	AIRBILL NO
	8-25-94 0951	Melissa Creasure	8/25/94 0951	

USPCI
A Subsidiary of Union Pacific Corporation
Ship To: USPCI Analytical Services
4322 South 49th West Avenue
Tulsa, OK 74107
(918) 446-1162

003397

REPORT TO
CONTACT [redacted]
COMPANY USPCI
ADDRESS 5665 Flatiron Pkwy
CITY Boulder ST. CO ZIP 8031
PHONE 303-938-6559 FAX 303-938-5520

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

CHAIN OF CUSTODY RECORD

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

STANDARD TURNAROUND X
RUSH TURNAROUND
(specify required date)

CUSTOMER SAMPLE I.D.	DATE	TIME	MATRIX	# CONTAINERS	BTEX	TPH-G	TPH-D	Dissolved As								LABORATORY SAMPLE I.D.	REMARKS
APL-W2	8-24-94	1800	H_2O	2	X	X										4081462 A-D	Dissolved As needs to be filtered and pres. in lab
APL-W2	↓	1800	↓	1			X										
APL-W2	↓	1800	↓	1				X									

RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	COURIER
[signature]	8-25-94 0951	Melissa Cressere	8/25/94 0951	
RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	AIRBILL NO.

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

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
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U.S.P.C.I.
5665 Flat Iron Pkwy.
Boulder, CO 80301
Attention: Denton Mauldin

Client Project ID: UPMF Oakland/#96120-844
Sample Matrix: Water
Analysis Method: EPA 5030/8015/8020
First Sample #: 408-1463

Sampled: Aug 24, 1994
Received: Aug 25, 1994
Reported: Sep 8, 1994

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 408-1463 OKUS-W1	Sample I.D. 408-1464 OKUS-W2	Sample I.D. 408-1465 OKUS-W3	Sample I.D. 408-1466 OKUS-W4	Sample I.D. 408-1467 OKUS-QC1	Sample I.D. 408-1468 TB-0824
Purgeable Hydrocarbons	50	N.D.	11,000	10,000	5,200	92	N.D.
Benzene	0.50	N.D.	320	350	200	1.6	N.D.
Toluene	0.50	N.D.	67	78	41	N.D.	N.D.
Ethyl Benzene	0.50	N.D.	7,500	7,300	3,600	N.D.	N.D.
Total Xylenes	0.50	N.D.	250	170	190	N.D.	N.D.
Chromatogram Pattern:		--	Gasoline	Gasoline	Gasoline	Unidentified Hydrocarbons >C9	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	20	20	20	1.0	1.0
Date Analyzed:	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94
Instrument Identification:	HP-4	HP-4	HP-4	HP-4	HP-4	HP-4
Surrogate Recovery, %: (QC Limits = 70-130%)	96	112	98	92	94	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

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:	UPMF Oakland/#96120-844	Sampled: Aug 24, 1994
5665 Flat Iron Pkwy.	Sample Matrix:	Water	Received: Aug 25, 1994
Boulder, CO 80301	Analysis Method:	EPA 3510/3520/8015	Reported: Sep 8, 1994
Attention: Denton Mauldin	First Sample #:	408-1463	

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 408-1463 OKUS-W1	Sample I.D. 408-1464 OKUS-W2	Sample I.D. 408-1465 OKUS-W3	Sample I.D. 408-1466 OKUS-W4	Sample I.D. 408-1467 OKUS-QC1
Extractable Hydrocarbons	50	86	8,200	4,500	2,900	950
Chromatogram Pattern:		Unidentified Hydrocarbons >C20	Unidentified Hydrocarbons <C14	Unidentified Hydrocarbons <C14	Unidentified Hydrocarbons <C14	Unidentified Hydrocarbons C10-C24

Quality Control Data

Report Limit Multiplication Factor:	1.0	20	10	10	10
Date Extracted:	8/26/94	8/26/94	8/26/94	8/26/94	8/26/94
Date Analyzed:	9/2/94	9/2/94	9/2/94	9/2/94	9/2/94
Instrument Identification:	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

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:	UPMF Oakland/#96120-844	Sampled:	Aug 24, 1994
5665 Flat Iron Pkwy.	Sample Descript:	Water	Received:	Aug 25, 1994
Boulder, CO 80301	Analysis for:	Dissolved Arsenic	Extracted:	Aug 31, 1994
Attention: Denton Mauldin	First Sample #:	408-1463	Analyzed:	Sep 6, 1994
			Reported:	Sep 8, 1994

LABORATORY ANALYSIS FOR: Dissolved Arsenic

Sample Number	Sample Description	Detection Limit mg/L	Sample Result mg/L
408-1463	OKUS-W1	0.10	N.D.
408-1464	OKUS-W2	0.10	N.D.
408-1465	OKUS-W3	0.10	N.D.
408-1466	OKUS-W4	0.10	0.11
408-1467	OKUS-QC1	0.10	N.D.

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

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 Flat Iron Pkwy.
Boulder, CO 80301
Attention: Denton Mauldin

Client Project ID: UPMF Oakland/#96120-844
Matrix: Liquid
QC Sample Group: 4081463-468

Reported: Sep 12, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes	Diesel	Arsenic
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015 Mod	EPA 200.7
Analyst:	A. Tuzon	A. Tuzon	A. Tuzon	A. Tuzon	K.V.S.	K. Anderson
MS/MSD Batch#:	4081491	4081491	4081491	4081491	BLK082694	4081463
Date Prepared:	8/29/94	8/29/94	8/29/94	8/29/94	8/26/94	8/31/94
Date Analyzed:	8/29/94	8/29/94	8/29/94	8/29/94	8/26/94	9/6/94
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4	HP-3B	Liberty-100
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L	300 µg/L	1.0 mg/L
Matrix Spike % Recovery:	80	90	95	98	99	97
Matrix Spike Duplicate % Recovery:	75	90	90	95	88	91
Relative % Difference:	6.5	0.0	5.4	3.1	12	6.4
LCS Batch#:	2LCS082994	2LCS082994	2LCS082994	2LCS082994	82694	BLK083194
Date Prepared:	8/29/94	8/29/94	8/29/94	8/29/94	8/26/94	8/31/94
Date Analyzed:	8/29/94	8/29/94	8/29/94	8/29/94	8/26/94	9/6/94
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4	HP-3B	Liberty-100
LCS % Recovery:	90	95	100	102	99	89
% Recovery Control Limits:	71-133	72-128	72-130	71-120	28-122	75-125

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.

USPCI
A Subsidiary of Union Pacific Corporation
Ship To: USPCI Remedial Services
24125 Aldine Westfield
Spring, TX 77373
(713) 350-7240

№ 001297

REPORT TO
CONTACT Denton Malcolm
COMPANY USPCI
ADDRESS 5665 Flatiron Pkwy
CITY Boulder ST. CO ZIP 80301
PHONE 303-938-3579 FAX 303-938-3520

BILL TO
CONTACT same
COMPANY
ADDRESS
CITY ST. ZIP
PHONE PO #

CHAIN OF CUSTODY RECORD

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

STANDARD TURNAROUND X
RUSH TURNAROUND (specify required date)

CUSTOMER SAMPLE I.D.	DATE	TIME	MATRIX	# CONTAINERS	BTEX 8020	TPH-G	TPH-D	Dissolved As	LABORATORY SAMPLE I.D.	REMARKS
OKUS-W1	8-24-94	1310	H_2O	2	X	X			4081463 AD	Dissolved As
OKUS-W1		1310		1			X			samples need
OKUS-W1		1310		1				X		to be filtered
OKUS-W2		1725		2	X	X			4081464 AD	and preserved
OKUS-W2		1725		1			X			in the lab
OKUS-W2		1725		1				X		
OKUS-W3		1700		2	X	X			4081465 AD	
OKUS-W3		1700		1			X			
OKUS-W3		1700		1				X		
OKUS-W4		1550		2	X	X			4081466 AD	
OKUS-W4		1550		1			X			
OKUS-W4		1550		1				X		

RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	COURIER
	8-25-94 0951	Melissa Crimmins	8/25/94 0951	
RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	AIRBILL NO

USPCI
A Subsidiary of Union Pacific Corporation
Ship To: USPCI Remedial Services
24125 Aldine Westfield
Spring, TX 77373
(713) 350-7240

REPORT TO
CONTACT Denton Malvin
COMPANY USPCI
ADDRESS ~~24~~ 5665 Flat Iron Pkwy
CITY Boulder ST. CO ZIP 80301
PHONE 303-938-5535 FAX 303-938-5520

BILL TO
CONTACT SAME
COMPANY
ADDRESS
CITY ST. ZIP
PHONE PO #

№ 001298

CHAIN OF CUSTODY RECORD

PROJ. NO. UCMF OAKLAND
PROJECT NAME 96120-844
SAMPLERS (SIGNATURE)

STANDARD TURNAROUND X
RUSH TURNAROUND (specify required date)

CUSTOMER SAMPLE I.D.	DATE	TIME	MATRIX	# CONTAINERS	BTEX 8020	TPH-G	TPH-D	Dissolved As								LABORATORY SAMPLE I.D.	REMARKS
OKUS-QC1	8-24-94	1200	H_2O	2	X	X										408146 7AB	Dissolved As needs to be filtered and preserved in lab
OKUS-QC1	↓	1200	↓	1			X										
OKUS-QC1	↓	1200	↓	1				X									
~~QC~~																	
TB-0824	8-22-94	—	H_2O	2	X	X										408146 8AB	

RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	COURIER
	8-25-94 0931	Melissa Creasure	08/25/94 0951	
RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	AIRBILL NO.

APPENDIX B

WELL STABILIZATION AND SAMPLING REPORTS

USPCI Project Name:	UPMF Oakland Facility Quarterly Monitoring			USPCI Project Number:	96120-844
Measuring Point (MP)	Top of casing			Well No.	OKUS-W1
Well Depth: (Below MP):	21.75	Feet			
Casing diameter:	2	Inches		Sampling Date:	8/24/94
Depth To Ground Water (Below MP):	8.89	Feet		Sample ID No.	OKUS-W1
Method Of Well Development				Time:	1235
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump		Riser Elevation (MP):	9.17
[X] Bailer	[ ] Centrifugal Pump	[ ] Other	Top of Screen Elevation:	6.85	Feet
Sampling Collection Method:			Sample Appearance:	slightly turbid	
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump:	Odor:	no odor	
[X] Bailer	Type: [ ] Teflon	[ ] Stainless Steel	Sampling Problems (if any):		
	[X] HDPE Plastic	[ ] PVC	[X] Disposable		
Pump Intake Or Bailer Set At:		Feet Below MP	Decontamination Performed:		
Tubing Type (if Used):					
Tubing Used for:	]]SampleCollection	[ ] Well Development/Field Tests	Samples Collected:	BTEX,TPH/G, TPH/D, Diss. As	

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)
Begin purge @ 1240						
1250	7.3	1200	19.0		2.5	
1258	7.2	1200	20.0		5.0	
1306	7.2	1100	20.0		7.5	
Samples collected at 1310						

At Least 3 Well Bore Volumes Were Purged Before Sampl Discharge Rate = GPM x 0.00223 = cfs

Comments: Groundwater photo sensitive, moderate bacteria level

Form Completed By: C. Byerman Witnessed By:

USPCI Project Name:	UPMF Oakland Facility Quarterly Monitoring		USPCI Project Number: 96120-844
Measuring Point (MP)	Top of casing		Well No. OKUS-W2
Well Depth: (Below MP):	22.00	Feet	
Casing diameter:	2	Inches	Sampling Date: 8/24/94
Depth To Ground Water (Below MP):	9.74	Feet	Sample ID No. OKUS-W2
Depth To Product (Below MP):	N/A		

Method Of Well Development			Time: 1702	
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump	Riser Elevation (MP):	9.71
[X] Bailer	[ ] Centrifugal Pump	[ ] Other	Top of Screen Elevation: 7.05	Feet
Sampling Collection Method:			Sample Appearance: Clear	
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump:	Odor: modorate petroleum odor	
[X] Bailer	Type: [ ] Teflon	[ ] Stainless Steel	Sampling Problems (if any):	
	[X] HDPE Plastic	[ ] PVC	[X] Disposable	
Pump Intake Or Bailer Set At:		Feet Below MP	Decontamination Performed:	
Tubing Type (if Used):				
Tubing Used for:	[ ]SampleCollection	[ ] Well Development/Field Tests	Samples Collected:	BTEX,TPH/G, TPH/D, As

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)
Begin purge at 1705						
1710	6.9	4000	19.0		2.0	
1715	6.9	4100	19.0		4.0	
1720	6.9	4100	18.0		6.0	
Samples collected at 1725						

At Least 3 Well Bore Volumes Were Purged Before Sampl Discharge Rate = GPM x 0.00223 = cfs

Comments: Ground water is photo sensitive

Form Completed By: C. Byerman Witnessed By:

USPCI Project Name:	UPMF Oakland Facility Quarterly Monitoring		USPCI Project Number: 96120-844
Measuring Point (MP)	Top of casing		Well No. OKUS-W3
Well Depth: (Below MP):	21.50	Feet	
Casing diameter:	2	Inches	Sampling Date: 8/24/94
Depth To Ground Water (Below	9.98	Feet	Sample ID No. OKUS-W3
Depth To Product (Below MP): N/A			
Method Of Well Development			Time: 1640
[ ] Tap [ ] Submersible Pump		[ ] Inertia Pump	Riser Elevation (MP): 9.80
[X] Bailer [ ] Centrifugal Pump		[ ] Other	Top of Screen Elevation: 6.55 Feet
Sampling Collection Method:			Sample Appearance: Slightly turbid
[ ] Tap [ ] Submersible Pump		[ ] Inertia Pump:	Odor: modorate petroleum odor
[X] Bailer Type:	[ ] Teflon	[ ] Stainless Steel	Sampling Problems (if any):
[X] HDPE Plastic		[ ] PVC	[X] Disposable
Pump Intake Or Bailer Set At:		Feet Below MP	Decontamination Performed:
Tubing Type (if Used):			
Tubing Used for:	[ ]SampleCollection	[ ] Well Development/Field Tests	Samples Collected: BTEX,TPH/G, TPH/D, Diss. As

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)
Begin purge at 1643						
1647	6.9	3400	19.0		2.0	
1652	7.0	3400	19.0		4.0	
1656	7.1	3600	19.0		6.0	
Samples collected at 1700						

At Least 3 Well Bore Volumes Were Purged Before Sampl Discharge Rate = GPM x 0.00223 = cfs

Comments:

Form Completed By: C. Byerman Witnessed By: W. Freeman

USPCI Project Name:	UPMF Oakland Facility Quarterly Monitoring			USPCI Project Number:	96120-844
Measuring Point (MP)	Top of casing			Well No.	OKUS-W4
Well Depth: (Below MP):	21.00	Feet			
Casing diameter:	2	Inches		Sampling Date:	8/24/94
Depth To Ground Water (Below MP):	6.80	Feet		Sample ID No.	OKUS-W4
Depth To Product (Below MP):	N/A				
Method Of Well Development				Time:	1515
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump		Riser Elevation (MP):	7.35
[X] Bailer	[ ] Centrifugal Pump	[ ] Other	Top of Screen Elevation:	6.08	Feet
Sampling Collection Method:			Sample Appearance:	slightly turbid	
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump:	Odor:	moderate odor	
[X] Bailer	Type: [ ] Teflon	[ ] Stainless Steel	Sampling Problems (if any):		
	[X] HDPE Plastic	[ ] PVC	[X] Disposable		
Pump Intake Or Bailer Set At:		Feet Below MP	Decontamination Performed:		
Tubing Type (if Used):					
Tubing Used for:	[ ]SampleCollection	[ ] Well Development/Field Tests	Samples Collected:	BTEX,TPH/G, TPH/D, Diss. As	

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)
Begin purge at 1519						
1526	7.5	3400	20.0		2.5	
1535	7.3	3300	19.0		5.0	
1543	7.2	3300	19.0		7.5	
Samples collected at 1550						

At Least 3 Well Bore Volumes Were Purged Before Sampl Discharge Rate = GPM x 0.00223 = cfs

Comments:

Form Completed By: C. Byerman Witnessed By:

USPCI Project Name:	UPMF Oakland Facility Quarterly Monitoring			USPCI Project Number:	96120-844
Measuring Point (MP)	Top of casing			Well No.	OKUS-W5
Well Depth: (Below MP):	21.00	Feet			
Casing diameter:	2	Inches		Sampling Date:	6/24/94
Depth To Ground Water (Below	9.93	Feet		Sample ID No.	OKUS-W5
Depth To Product (Below MP): N/A					
Method Of Well Development				Time: 1600	
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump		Riser Elevation (MP):	9.25
[X] Bailer	[ ] Centrifugal Pump	[ ] Other	Top of Screen Elevation:	5.95	Feet
Sampling Collection Method:			Sample Appearance:	slightly turbid	
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump:	Odor:	slight	
[X] Bailer	Type: [ ] Teflon	[ ] Stainless Steel	Sampling Problems (if any):		
	[X] HDPE Plastic	[ ] PVC	[X] Disposable		
Pump Intake Or Bailer Set At:		Feet Below MP	Decontamination Performed:		
Tubing Type (if Used):					
Tubing Used for:	[ ]SampleCollection	[ ] Well Development/Field Tests	Samples Collected:	BTEX,TPH/G, TPH/D, Diss. As	

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)
Begin purge at 1610						
1615	7.2	3600	19.0		2.0	
1620	7.1	3500	18.0		4.0	
1625	7.1	3500	18.0		6.0	
Samples collected at 1630						

At Least	3	Well Bore Volumes Were Purged Before Sampl	Discharge Rate =	GPM x 0.00223 =	cfs

Comments: **Small amount of floating product on bailer**

Form Completed By: **C. Byerman** Witnessed By:

USPCI Project Name:	**UPMF Oakland Facility Quarterly Monitoring**		USPCI Project Number:	**96120-844**
Measuring Point (MP)	**Top of casing**		**Well No.**	**OKUS-W6**
Well Depth: (Below MP):	**16.30**	Feet		
Casing diameter:	**2**	Inches	Sampling Date:	**8/24/94**
Depth To Ground Water (Below MP):	**6.29**	Feet	Sample ID No.	**N/A**
Depth To Product (Below MP):	**6.27**			
Method Of Well Development			Time:	**1507**
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump	Riser Elevation (MP):	**7.29**
[X] Bailer	[ ] Centrifugal Pump	[ ] Other	Top of Screen Elevation:	**2.29** Feet
Sampling Collection Method:			Sample Appearance:	
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump:	Odor:	
[ ] Bailer	Type: [ ] Teflon	[ ] Stainless Steel	Sampling Problems (if any):	
	[ ] HDPE Plastic	[ ] PVC	[ ] Disposable	
Pump Intake Or Bailer Set At:		Feet Below MP	Decontamination Performed:	
Tubing Type (if Used):				
Tubing Used for:	[ ]SampleCollection	[ ] 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 IN WELL						

At Least **3** Well Bore Volumes Were Purged Before Sampl Discharge Rate = GPM x 0.00223 = cfs

Comments: **Well contained 0.02 feet of free product (noted in the field as a Bunker C oil material)**

Form Completed By: **C. Byerman** Witnessed By:

USPCI Project Name:	UPMF Oakland Facility Quarterly Monitoring			USPCI Project Number:	96120-844
Measuring Point (MP)	Top of casing			Well No.	OKUS-W7
Well Depth: (Below MP):	20.50	Feet			
Casing diameter:	2	Inches		Sampling Date:	8/24/94
Depth To Ground Water (Below MP):	6.11	Feet		Sample ID No.	OKUS-W7
Depth To Product (Below MP):	N/A				
Method Of Well Development				Time:	1420
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump		Riser Elevation (MP):	7.4
[X] Bailer	[ ] Centrifugal Pump	[ ] Other	Top of Screen Elevation:	2.4	Feet
Sampling Collection Method:			Sample Appearance:	clear	
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump:	Odor:	no odor	
[X] Bailer	Type:	[ ] Teflon	[ ] Stainless Steel	Sampling Problems (if any):	
	[X] HDPE Plastic	[ ] PVC	[X] Disposable		
Pump Intake Or Bailer Set At:		Feet Below MP	Decontamination Performed:		
Tubing Type (if Used):					
Tubing Used for:	[ ]SampleCollection	[X] Well Development/Field Tests		Samples Collected:	BTEX,TPH/G, TPH/D,

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)
Begin purge at 1425						
1431	7.0	2800	19.0		2.5	
1439	7.1	3000	19.0		5.0	
1445	7.2	2900	20.0		7.5	
samples collected at 1450						

At Least 3 Well Bore Volumes Were Purged Before Sampl Discharge Rate = GPM x 0.00223 = cfs

Comments:

Form Completed By: C. Byerman Witnessed By:

USPCI Project Name:	UPMF Oakland Facility			USPCI Project Number:	96120-844
Measuring Point (MP)	Top of casing			Well No.	OKUS-W8
Well Depth: (Below MP):	15.30	Feet			
Casing diameter:	2	Inches		Sampling Date:	8/24/94
Depth To Ground Water (Below MP): 5.98		Feet		Sample ID No.	OKUS-W8
Depth To Product (Below MP): N/A					Dup OKUS-QC1
Method Of Well Development				Time: 1325	
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump		Riser Elevation (MP):	7.11
[X] Bailer	[ ] Centrifugal Pump	[ ] Other	Top of Screen Elevation:	2.11	Feet
Sampling Collection Method:			Sample Appearance:	slightly turbid	
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump:	Odor:	none	
[X] Bailer	Type: [ ] Teflon	[ ] Stainless Steel	Sampling Problems (if any):		
	[X] HDPE Plastic	[ ] PVC	[X] Disposable		
Pump Intake Or Bailer Set At:		Feet Below MP	Decontamination Performed:		
Tubing Type (if Used):					
Tubing Used for:	[ ]SampleCollection	[X] Well Development/Field Tests	Samples Collected:	BTEX,TPH/G, TPH/D, Diss. As	

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)
Begin purge at 1332						
1337	7.1	4300	20.0		2.0	
1345	7.0	4500	20.0		4.0	
1350	7.1	4500	20.0		6.0	
samples collected at 1400						

At Least 3 Well Bore Volumes Were Purged Before Sampl Discharge Rate = GPM x 0.00223 = cfs

Comments: DUPLICATE SAMPLE COLLECTED AT THIS WELL, LABELED OKUS-QC1

Form Completed By: C. Byerman Witnessed By:

USPCI Project Name:	UPMF Oakland Facility Quarterly Monitoring			USPCI Project Number:	96120-844
Measuring Point (MP)	Top of casing			Well No.	APL-W1
Well Depth: (Below MP):	22.00	Feet			
Casing diameter:	2	Inches		Sampling Date:	8/24/94
Depth To Ground Water (Below MP):	10.25	Feet		Sample ID No.	APL-W1
Depth To Product (Below MP):	N/A				
Method Of Well Development				Time:	1740
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump		Riser Elevation (MP):	7.11
[X] Bailer	[ ] Centrifugal Pump	[ ] Other	Top of Screen Elevation:	2.11	Feet
Sampling Collection Method:			Sample Appearance:	clear	
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump:	Odor:	very slight petroleum odor	
[X] Bailer	Type: [ ] Teflon	[ ] Stainless Steel	Sampling Problems (if any):		
	[X] HDPE Plastic	[ ] PVC	[X] Disposable		
Pump Intake Or Bailer Set At:		Feet Below MP	Decontamination Performed:		
Tubing Type (if Used):					
Tubing Used for:	[ ]SampleCollection	[X] Well Development/Field Tests		Samples Collected:	BTEX,TPH/G, TPH/D, As, and 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)
1751	7.1	2500	15.0		1.5	
1756	7.0	2400	15.0		3.0	
1805	7.0	2400	16.0		4.5	
samples collected at 1825						

At Least 3 Well Bore Volumes Were Purged Before Sampl Discharge Rate = GPM x 0.00223 = cfs

Comments:

Form Completed By: C. Byerman Witnessed By:

USPCI Project Name:	UPMF Oakland Facility Quarterly Monitoring		USPCI Project Number: 96120-844
Measuring Point (MP)	Top of casing		Well No. APL-W2
Well Depth: (Below MP):	11.17	Feet	
Casing diameter:	2	Inches	Sampling Date: 8/24/94
Depth To Ground Water (Below MP):	9.13	Feet	Sample ID No. APL-W2

Method Of Well Development			Time: 1738	
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump	Riser Elevation (MP):	7.62
[X] Bailer	[ ] Centrifugal Pump	[ ] Other	Top of Screen Elevation: 2.62	Feet
Sampling Collection Method:			Sample Appearance:	very slightly turbid
[ ] Tap	[ ] Submersible Pump	[ ] Inertia Pump:	Odor:	none
[X] Bailer	Type: [ ] Teflon	[ ] Stainless Steel	Sampling Problems (if any):	
	[X] HDPE Plastic	[ ] PVC	[X] Disposable	
Pump Intake Or Bailer Set At:		Feet Below MP	Decontamination Performed:	
Tubing Type (if Used):				
Tubing Used for:	[ ]SampleCollection	[X] Well Development/Field Tests	Samples Collected:	BTEX,TPH/G, TPH/D, Diss. As

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)
Begin purge at 1741						
1745	7.1	2700	18.0		1.5	
1750	7.1	2500	17.0		3.0	
1754	7.0	2500	17.0		4.5	
Samples collected at 1800						

At Least 3 Well Bore Volumes Were Purged Before Sampl Discharge Rate = GPM x 0.00223 = cfs

Comments: TD only 11.17 feet, seems to be a bailer or some other type of obstacle in the bottom of well

Form Completed By: C. Byerman Witnessed By: