USPCI
A LAIDLAW COMPANY

Consulting Services

July 31, 1995

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

RE: **"Second Quarter 1995 Monitoring Report"** Oakland Motor Freight Facility, 1750 Ferro Street, Oakland, California, USPCI/Laidlaw Project No. 96120-844

Dear Mr. Patterson:

Enclosed is the final copy of the **"Second Quarter 1995 Monitoring Report"**, dated April 26, 1995, for the Union Pacific Motor Freight Facility at 1750 Ferro Street in Oakland, California.

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

Sincerely,

Denton Mauldin
Engineer III

Sam Marquis
Project Hydrogeologist

cc: Jennifer Eberle, ACDEH
John Amdur, Port of Oakland
Philip Herden, APL
Mark McCormick, USPCI/Laidlaw
Ken Fossey, USPCI/Laidlaw (cover letter)

Enclosure
DM/tjh

oakmf\qtrmf295.ltr, 96120-844, July 31, 1995

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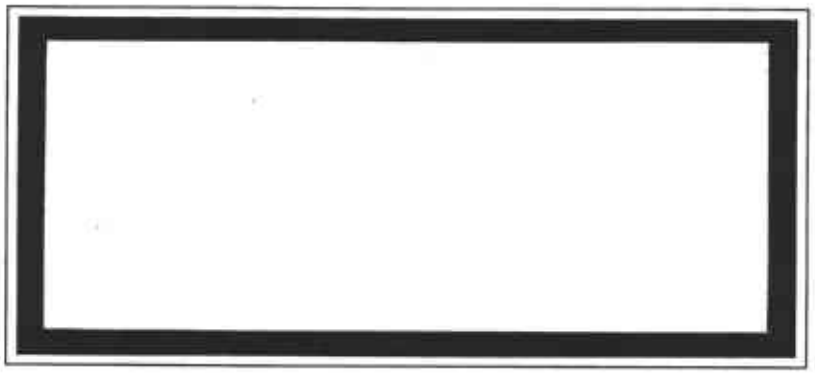
STD 2044



LAIDLAW ENVIRONMENTAL SERVICES

SECOND QUARTER 1995
MONITORING REPORT

UNION PACIFIC RAILROAD

UNION PACIFIC MOTOR FREIGHT
FACILITY
OAKLAND, CALIFORNIA

USPCI/LAIDLAW PROJECT NO.
96120-844

PREPARED FOR:

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

Prepared by:

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5665 Flatiron Parkway
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July 31, 1995

SECOND QUARTER 1995 MONITORING REPORT
UNION PACIFIC RAILROAD
UNION PACIFIC MOTOR FREIGHT FACILITY
OAKLAND, CALIFORNIA
USPCI/Laidlaw Project No. 96120-844

Prepared for:
Union Pacific Railroad
Environmental Management - Room 930
1416 Dodge Street
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for submittal to:
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July 31, 1995

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1. INTRODUCTION

The 1995 Second Quarterly Monitoring Report has been prepared for Union Pacific Railroad (UPRR) by USPCI, a Laidlaw company (Laidlaw) 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 second quarterly monitoring event involved:

- Collecting fluid level measurements from all of the groundwater monitoring wells and purging and sampling eight of the ten existing monitoring wells;
- Monitoring the performance of the product skimmer in recovery well RW;
- Analyzing groundwater samples for petroleum hydrocarbons from the groundwater monitoring wells where non-aqueous phase liquid petroleum hydrocarbon (product) was not measured.
- Determining the local hydraulic gradient based on the groundwater level measurements; and
- Preparation of the Second Quarterly Monitoring Report.

Product was detected in monitoring wells OKUS-W5, OKUS-W6, and recovery well RW during the Second Quarter 1995 Monitoring Event. Groundwater samples were collected from the eight remaining monitoring wells at the facility on June 22, 1995.

1.1 Site Background

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

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 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 were defined during previous

investigations (Laidlaw, 1991), and the plume does not extend to the area of impacted groundwater at the truck repair facility in the Oakland TOFC Yard.

The site is located in the UPRR TOFC Yard at 1750 Ferro Street in the Port of Oakland on the north 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 Laidlaw and subcontractor field activities, including data recording procedures, decontamination methods, groundwater sample collection, and purge water disposal, were completed following Laidlaw's standard operating procedures previously supplied to the ACDEH. The quarterly monitoring event was conducted by Smith/Riedel Environmental Services personnel on June 22, 1995.

2. FIELD INVESTIGATION RESULTS

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. The field investigation presented in this report was completed on June 22, 1995. Groundwater level measurements and samples were collected on the same day. 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; and benzene, toluene, ethylbenzene and xylenes (BTEX) by EPA Method 8020. The following subsections present the findings and activities completed during the second quarter field investigation.

2.1 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.

2.2 Groundwater Gradient

Static water levels measured on June 22, 1995 (Table 1) were used to produce the groundwater elevation map presented as Figure 3. A decrease in groundwater elevations was noted in all of the monitoring wells at the site since the first quarter 1995 sampling event. The groundwater gradient at the site was to the southeast and was consistent with the gradient observed during the previous (fourth quarter 1994 and first quarter 1995) gauging and sampling events. Sample collection logs and sampling reports are presented in Appendix B.

2.3 Analytical Results

Analytical results of the samples collected from the groundwater monitoring wells reveal dissolved concentrations of TPH-D, TPH-G and BTEX in samples from monitoring wells OKUS-W2, OKUS-W3, OKUS-W4, OKUS-W7, OKUS-W8, APL/UP-W1, and APL/UP-W2. Monitoring well OKUS-W1 did not exhibit dissolved BTEX concentrations above the method detection limits (MDL) of 0.50 micrograms per liter (μg/L). Total BTEX concentrations ranged from below the MDL of 0.50 μg/L in the sample collected from monitoring well OKUS-W1 to approximately 5,700 μg/L in the sample collected from monitoring well OKUS-W4 (Table 2). TPH-G concentrations ranged from below the MDL of 50 μg/L in samples collected from OKUS-W1 and OKUS-W7 to 13,000 μg/L in the sample from OKUS-W2. TPH-D concentrations ranged from below the MDL limit in sample OKS-W1 to 3,300 μg/L in the sample from OKUS-W3. The hydrocarbon plume is elongated in the net direction of groundwater flow to the southeast (Figure 4). Only low concentrations of total BTEX (< 100 ppm) have been detected in the furthest downgradient well, APL\UP-W2. Comprehensive groundwater analytical results for the wells at the site are presented in Table 2. Analytical reports and chain of custody forms are included in Appendix A.

2.4 Monitoring and Recovery of Non-Aqueous Phase Liquid

Fluid level measurement data indicates that monitoring wells OKUS-W5, OKUS-W6, and recovery well RW contain product. As indicated in Table 1, monitoring well OKUS-W5 had no measurable product during the June 1995 monitoring event. However, product was observed in the groundwater during well purging procedures and no sample was collected. Monitoring well OKUS-W6 continues to contain "bunker C" type hydrocarbon, as evidenced by the highly viscous nature of the product. An accurate determination of product thickness is not possible due to the high viscosity of the product in OKUS-W6.

A product skimming system was installed in recovery well RW on April 29, 1994 and began operation during the week of May 2, 1994. The skimmer has been out of service for the majority of the second quarter 1995 while repairs to the height adjustment mechanism are being made. Nevertheless, approximately 1.0 gallon of product was retrieved from the recovery well on May 9, 1995 and 0.5 gallons on June 22, 1995 by Smith/Riedel personnel.

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 current 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 in Figure 4. 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 achieved a steady-state where downgradient concentrations are no longer increasing and the areal extent of the plume has remained relatively constant. Monitoring well OKUS-W1 continues to show results below MDLs confirming no areal increase of the plume at elevated concentrations.

Bunker C continues to be observed in monitoring well OKUS-W6.

Product has been retrieved 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 product in recovery well RW should continue to be removed.

4. REFERENCES

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

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

WELL NO.	ELEV.* TOC	DATE	DEPTH TO PRODUCT	PRODUCT ELEVATION	PRODUCT THICKNESS	DEPTH TO WATER	WATER ELEVATION	CORR'D ELEVATION
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
	9.17	11/16/94	N/A	N/A	NP	8.56	0.61	0.61
	9.17	02/22/95	N/A	N/A	NP	7.61	1.56	1.56
	9.17	06/22/95	N/A	N/A	NP	8.00	1.17	1.17
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
	9.71	11/16/94	N/A	N/A	NP	9.74	-0.03	-0.03
	9.71	02/22/95	N/A	N/A	NP	8.49	1.22	1.22
	9.71	06/22/95	N/A	N/A	NP	8.90	0.81	0.81
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
	9.80	11/16/94	N/A	N/A	NP	9.61	0.19	0.19
	9.80	02/22/95	N/A	N/A	NP	8.76	1.04	1.04
	9.80	06/22/95	N/A	N/A	NP	9.15	0.65	0.65
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
	7.35	10/27/94	N/A	N/A	NP	7.05	0.30	0.30
	7.35	11/16/94	N/A	N/A	NP	6.71	0.64	0.64
	7.35	01/25/95	N/A	N/A	NP	5.63	1.72	1.72
	7.35	02/22/95	N/A	N/A	NP	5.71	1.64	1.64
	7.35	06/22/95	N/A	N/A	NP	6.01	1.34	1.34
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	9.91	N/A	0.01	9.92	-0.67	-0.67
	9.25	09/26/94	N/A	N/A	NP	9.92	-0.67	-0.67
	9.25	10/27/94	10.08	-0.83	0.06	10.14	-0.89	-0.89
	9.25	11/16/94	9.59	-0.34	0.22	9.81	-0.56	-0.56
	9.25	01/25/95	N/A	N/A	Trace	8.59	0.66	0.66
	9.25	02/22/95	8.75	0.50	0.16	8.91	0.34	0.34
	9.25	05/09/95	N/A	N/A	Trace	9.00	0.25	0.25
	9.25	06/22/95	N/A	N/A	Trace	9.29	-0.04	-0.04

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

WELL NO.	ELEV.* TOC	DATE	DEPTH TO PRODUCT	PRODUCT ELEVATION	PRODUCT THICKNESS	DEPTH TO WATER	WATER ELEVATION	CORR'D ELEVATION
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	--	--	--
	7.02	09/26/94	6.50	0.52	P	--	--	--
	7.02	10/27/94	6.68	0.34	P	--	--	--
	7.02	11/16/94	5.13	1.89	P	--	--	--
	7.02	01/25/95	3.89	3.13	P	--	--	--
	7.02	02/22/95	4.96	2.06	P	--	--	--
	7.02	05/09/95	5.39	N/A	P	--	--	--
	7.02	06/22/95	5.30	N/A	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
	6.91	11/16/94	N/A	N/A	NP	5.90	1.01	1.01
	6.91	02/22/95	N/A	N/A	NP	4.89	2.02	2.02
	6.91	06/22/95	N/A	N/A	NP	5.26	1.65	1.65
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
	6.75	11/16/94	N/A	N/A	NP	5.75	1.00	1.00
	6.75	02/22/95	N/A	N/A	NP	4.79	1.96	1.96
	6.75	06/22/95	N/A	N/A	NP	5.18	1.57	1.57
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
	8.12	11/15/94	N/A	N/A	NP	10.08	-1.96	-1.96
	8.12	02/22/95	N/A	N/A	NP	9.76	-1.64	-1.64
	8.12	06/22/95	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
	7.31	11/15/94	N/A	N/A	NP	9.40	-2.09	-2.09
	7.31	02/22/95	N/A	N/A	NP	8.85	-1.54	-1.54
	7.31	06/22/95	N/A	N/A	NP	9.42	-2.11	-2.11
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	--	--
	--	10/27/94	9.81	--	0.05	9.86	--	--
	--	11/22/94	--	--	--	--	--	--
	--	12/20/94	--	--	--	--	--	--
	--	01/25/95	8.35	--	0.12	8.47	--	--
	--	02/22/95	8.35	--	0.14	8.49	--	--
	--	05/09/95	8.41	--	0.11	8.52	--	--
	--	06/22/95	8.72	--	0.10	8.82	--	--

* All well casings measured to mean sea level (MSL). N/A Non Applicable
-- Information not available or inaccurate. NP - No Product
P - Product (bunker C) was encountered but the oil/water interface could not be found.

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

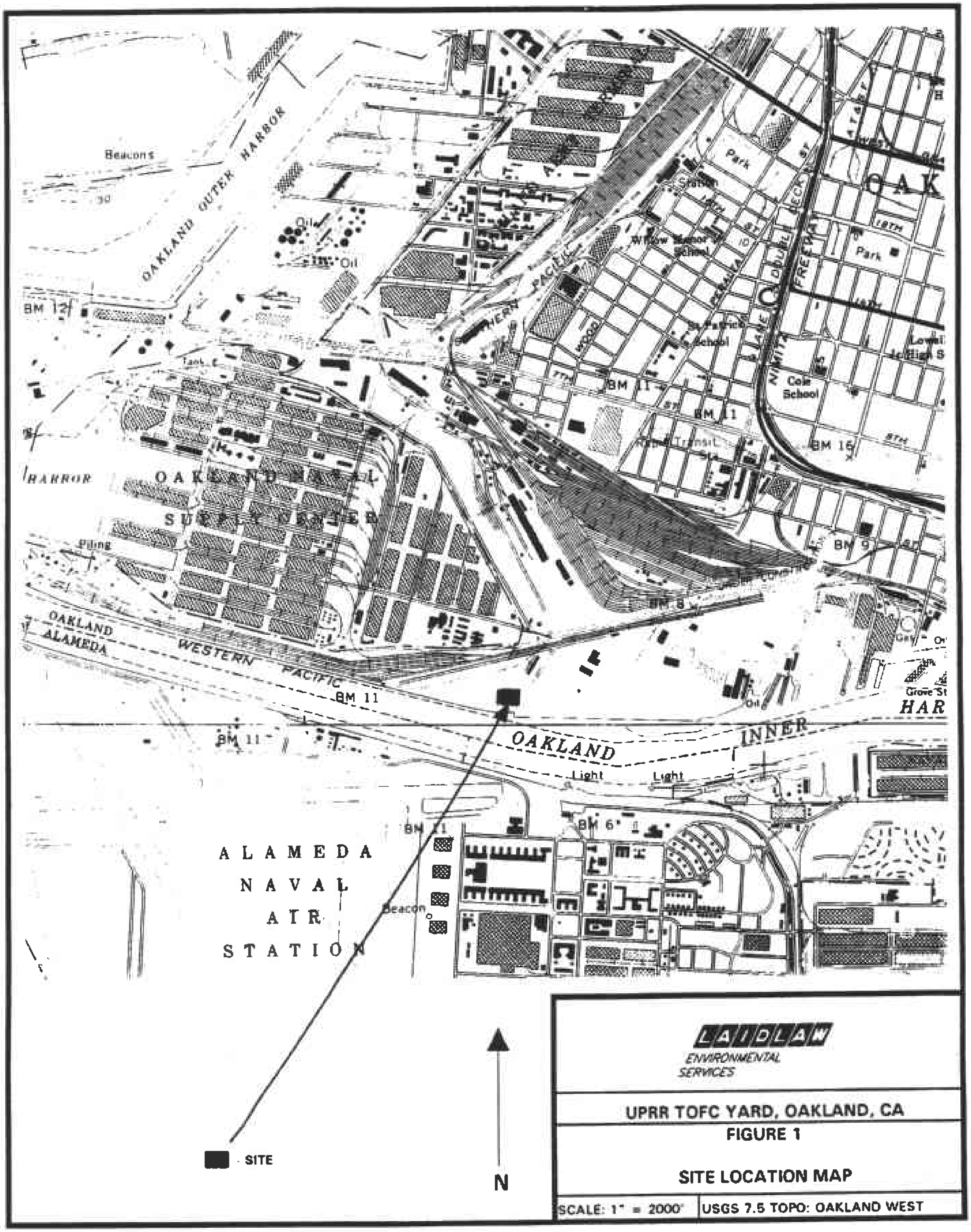
SAMPLE LOCATION	SAMPLE ID	DATE SAMPLED	TPH/IR (mg/l)	TPH/D (ug/l)	TPH/G (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	BTEX (ug/l)	As (mg/l)	Pb (mg/l)
OKUS–W1	OKUS–W1	01/14/93	ND	ND	410	20	4	220	ND	240	ND	ND
"	"	05/12/93	80	120	ND	ND	ND	ND	ND	ND	ND	ND
		08/25/83	ND	100	ND	ND	ND	ND	ND	ND	ND	ND
		11/11/93	ND	160	91	1.1	0.88	21	1.6	24	ND	ND
		02/08/94	NA	92	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.10	<0.02
		05/03/94	NA	61	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.10	<0.02
		08/24/94	NA	86	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.10	NA
		11/16/94	NA	51	<50	<0.50	<0.50	<0.50	<0.50	ND	NA	NA
		02/22/95	NA	120	<50	<0.50	<0.50	<0.50	<0.50	ND	NA	NA
		06/22/95	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	ND	NA	NA
OKUS–W2	OKUS–W2	01/14/93	2.5	5400	14000	480	92	8500	ND	9100	0.036	ND
"	"	05/12/93	ND	2800	8800	220	47	4600	100	5000	0.093	ND
		08/25/93	5.8	6500	22000	420	92	10000	210	11000	0.089	ND
		11/11/93	3.5	7700	24000	540	150	13000	280	14000	ND	ND
		02/08/94	NA	2300	4900	150	29	3000	78	3300	<0.10	<0.02
		05/03/94	NA	2600	17000	300	<0.50	5800	220	6300	<0.10	<0.02
		08/24/94	NA	8200	11000	320	67	7500	250	8100	<0.10	NA
		11/16/94	NA	5500	10000	290	79	130	160	660	NA	NA
		02/22/95	NA	2000	3500	100	18	1600	66	1800	NA	NA
		06/22/95	NA	[illegible]	[illegible]	[illegible]	[illegible]	<0.50	[illegible]	[illegible]	NA	NA
OKUS–W3	OKUS–W3	01/14/93	4.5	4200	4900	230	42	2600	44	2900	NA	ND
"	"	05/12/93	1.7	4400	4600	290	60	3500	72	3900	0.14	ND
		08/25/93	1.5	2700	9400	280	55	4300	41	4700	0.08	ND
		11/11/93	2.3	5000	9500	390	110	5100	130	5700	0.14	ND
		02/08/94	NA	4400	17000	420	78	9800	160	10000	0.12	<0.02
		05/03/94	NA	3000	14000	310	61	6400	210	7000	0.14	<0.02
		08/24/94	NA	4500	10000	350	78	7300	170	7900	<0.10	NA
		11/16/94	NA	4700	9100	260	64	95	<0.50	420	NA	NA
		02/22/95	NA	2400	7400	250	51	4400	150	4900	NA	NA
		06/22/95	NA	[illegible]	[illegible]	250	[illegible]	<0.50	[illegible]	[illegible]	NA	NA
OKUS–W4	OKUS–W4	01/15/93	2.5	5400	8900	300	ND	4500	ND	4800	NA	ND
"	"	05/12/93	1.3	2900	6000	320	110	4600	230	5300	0.16	ND
		08/26/93	ND	2200	6700	350	72	4800	130	5400	0.098	ND
		11/11/93	ND	2400	5500	250	53	4600	140	5000	0.13	ND
		02/07/94	NA	2700	9100	250	<0.50	4900	150	5300	<0.10	<0.02
		05/03/94	NA	2300	6500	240	34	4200	140	4600	0.12	<0.02
		08/24/94	NA	2900	5200	200	41	3600	190	4000	0.11	NA
		11/16/94	NA	2800	5500	320	52	<0.50	120	490	NA	NA
		02/22/95	NA	2000	4300	250	47	2900	160	3400	NA	NA
		06/22/95	NA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NA	NA
OKUS–W5	OKUS–W5	01/15/93	ND	2900	550	53	11	180	20	260	NA	ND
"	"	05/12/93	130	2100	550	81	14	250	37	380	0.56	ND
		08/25/93	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
		11/16/94	PHASE SEPARATED HYDROCARBONS – WELL NOT SAMPLED									
		02/22/95	PHASE SEPARATED HYDROCARBONS – WELL NOT SAMPLED									
		06/22/95	PHASE SEPARATED HYDROCARBONS – WELL NOT SAMPLED									
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									
		08/24/94	PHASE SEPARATED HYDROCARBONS – WELL NOT SAMPLED									
		11/16/94	PHASE SEPARATED HYDROCARBONS – WELL NOT SAMPLED									
		02/22/95	PHASE SEPARATED HYDROCARBONS – WELL NOT SAMPLED									
		06/22/95	PHASE SEPARATED HYDROCARBONS – WELL NOT SAMPLED									

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

SAMPLE LOCATION	SAMPLE ID	DATE SAMPLED	TPH/IR (mg/l)	TPH/D (ug/l)	TPH/G (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	BTEX (ug/l)	As (mg/l)	Pb (mg/l)
OKUS–W7	OKUS–W7	07/16/93	16	ND	ND	2.1	ND	ND	ND	2.1	0.009	ND
"	"	08/25/93	ND	930	56	2.9	ND	1.2	ND	4.1	ND	ND
		11/12/93	ND	1100	ND	ND	ND	ND	ND	ND	ND	ND
		02/07/94	NA	1100	ND	0.7	<0.50	<0.50	<0.50	0.7	<0.10	<0.02
		05/03/94	NA	1300	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.10	<0.02
		08/24/94	NA	910	<50	2.5	0.54	<0.50	<0.50	3.0	<0.10	NA
		11/16/94	NA	820	<50	0.62	<0.50	<0.50	<0.50	0.6	NA	NA
		02/22/95	NA	830	<50	0.54	<0.50	<0.50	<0.50	0.5	NA	NA
		06/22/95	NA	850	<50	0.4	<0.50	0.50	<0.50	0.9	NA	NA
OKUS–W8	OKUS–W8	07/16/93	15	ND	ND	ND	ND	ND	ND	ND	0.012	0.003
"	"	08/27/93	ND	1100	120	1.3	ND	ND	0.85	2.2	ND	0.005
		11/11/93	ND	1300	190	3.5	1.3	46	4.9	55.7	ND	ND
		02/07/94	NA	1000	120	0.9	<0.50	<0.50	<0.50	0.9	<0.10	<0.02
		05/03/94	NA	780	79	0.99	<0.50	<0.50	<0.50	1.0	<0.10	<0.02
		08/24/94	NA	700	100	1.4	<0.50	<0.50	<0.50	1.4	<0.10	NA
		11/16/94	NA	830	110	0.77	<0.50	<0.50	<0.50	0.8	NA	NA
		02/22/95	NA	370	150	0.96	<0.50	<0.50	1.2	2.2	NA	NA
		06/22/95	NA	870	76	0.92	<0.50	<0.50	<0.50	0.9	NA	NA
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
		11/15/94	NA	480	470	36	3.6	9.6	12	61	NA	NA
		02/22/95	NA	510	470	33	2.8	170	9	210	NA	NA
		06/22/95	NA	320	460	12	0.82	3.5	84	100	NA	NA
APL/UP–W2	APL/UP–W2	07/16/93	19	ND	ND	8.0	ND	ND	ND	8	0.016	ND
"	"	08/26/93	ND	240	94	ND	ND	35	2.4	37	0.023	ND
		11/11/93	ND	190	110	5.0	ND	38	2.6	46	ND	ND
		02/07/94	NA	270	120	6.6	<0.50	38	1.8	46	<0.10	<0.02
		05/03/94	NA	100	<50	<0.50	<0.50	<0.50	<0.50	ND	<0.10	<0.02
		08/24/94	NA	330	220	13	0.77	3.5	3.1	20	<0.10	NA
		11/15/94	NA	320	190	11	<0.50	63	5.4	79	NA	NA
		02/22/95	NA	550	320	19	<0.50	100	9.5	130	NA	NA
		06/22/95	NA	290	170	10	0.8	2.2	2.3	15	NA	NA
OKUS–W5	OKUS–W6	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	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
OKUS–W8	OKUS–QC1	08/24/94	NA	950	92	1.8	<0.50	<0.50	<0.50	2	<0.10	NA
APL/UP–W2	OKUS–QC1	11/16/94	NA	310	190	10	<0.50	62	4.7	77	NA	NA
APL/UP–W2	APL–W12	02/22/95	NA	490	360	20	<0.50	110	6.7	140	NA	NA
UPMF	OAK–FB 1	07/16/93	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA
UPMF	OAK–TB 2	07/16/93	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA
UPMF	TB–1	08/27/93	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA
UPMF	TB–2	08/27/93	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA
UPMF	TB–1	11/12/93	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA
UPMF	TB–1	08/24/94	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA
UPMF	TB–1	11/16/94	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
UPMF	TB–1	02/22/95	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA
UPMF	TB–1	06/22/95	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA

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



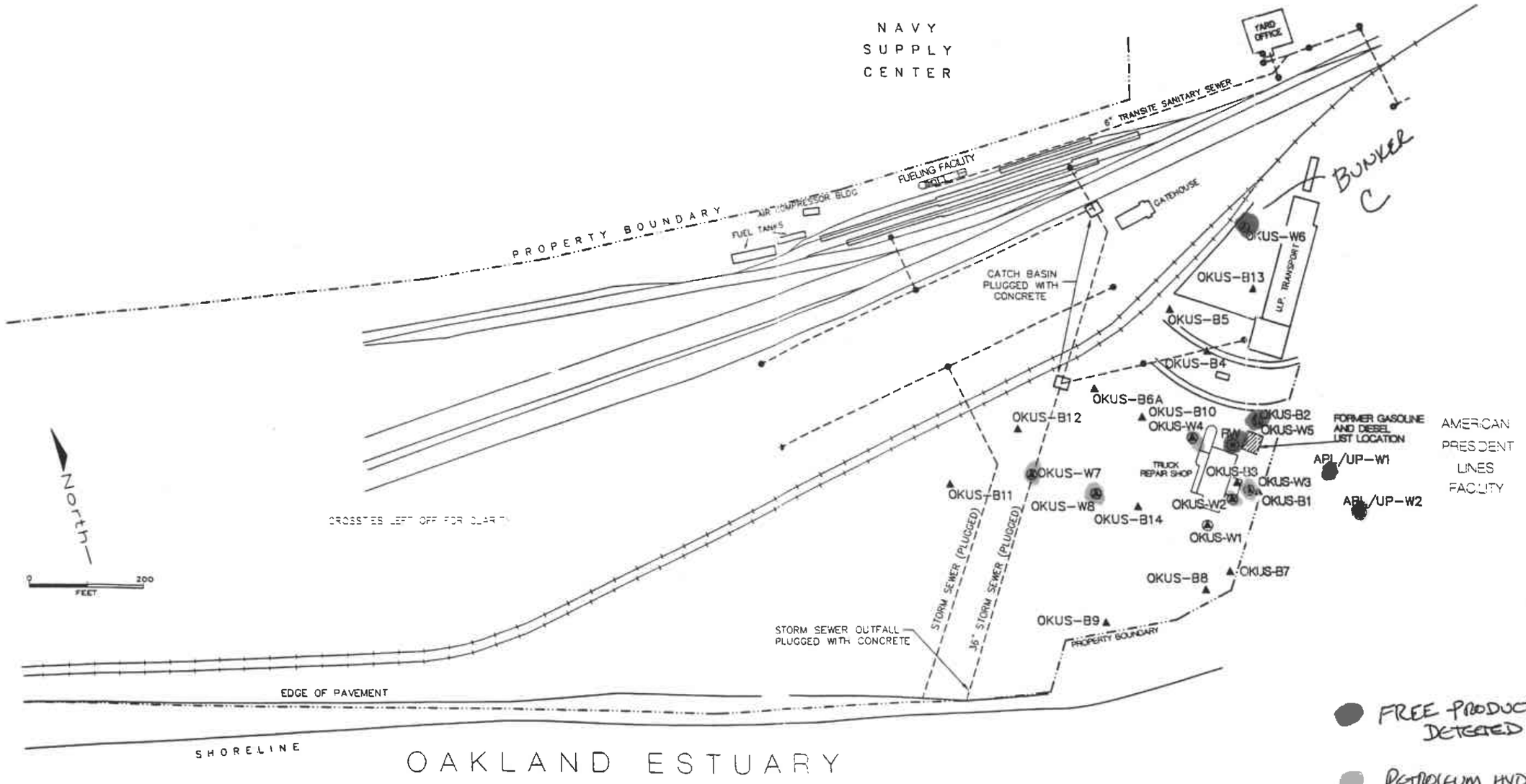
LAIDLAW ENVIRONMENTAL SERVICES

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
◉ RW	RECOVERY WELL

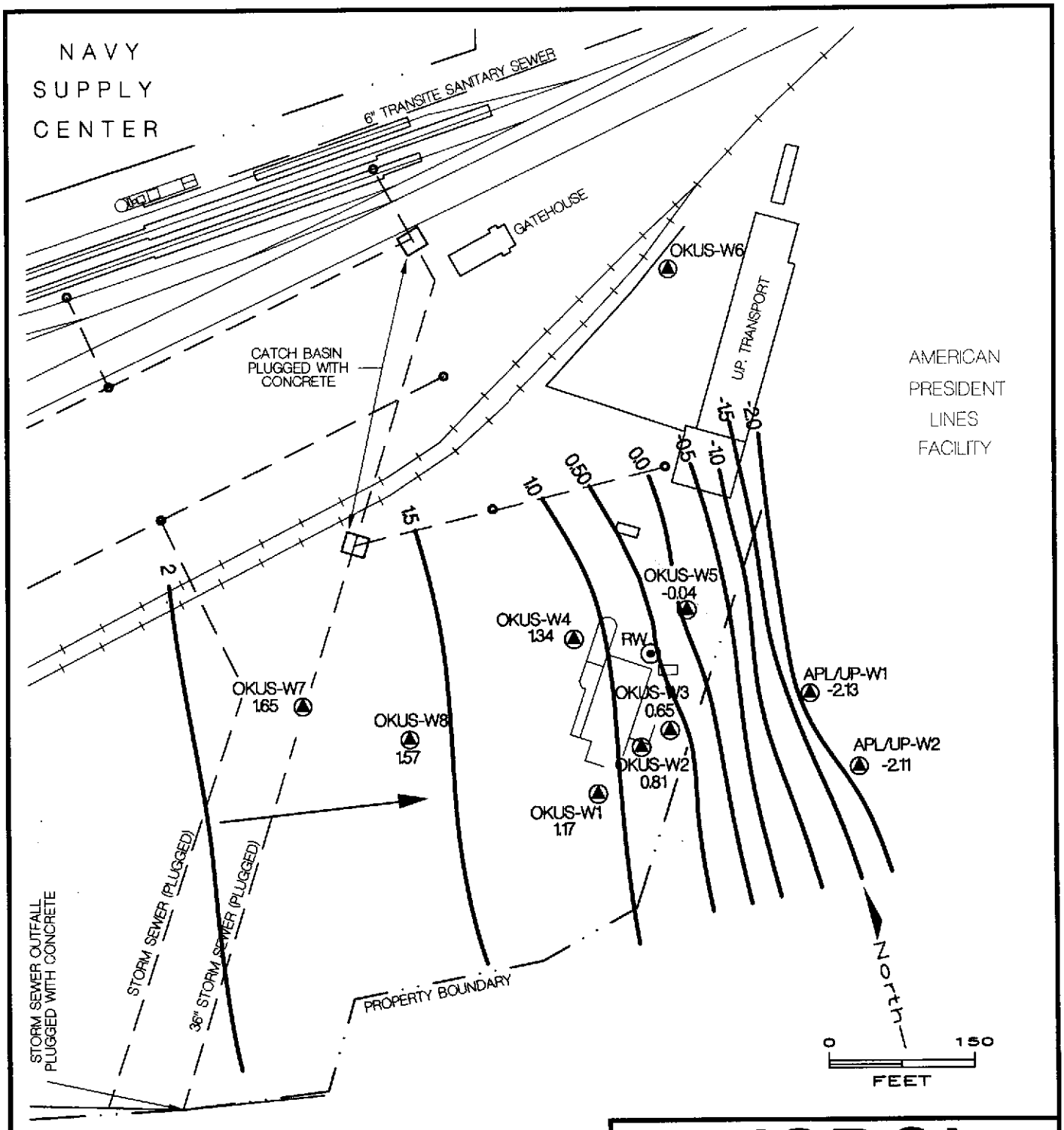
BY	DATE
DRAWN WRB	7/18/95
CHECKED	
APPROVED	
APPROVED	
APPROVED	

USPCI
A LAIDLAW COMPANY

UPRR TOFC RAILYARD
UPMF REPAIR SHOP, OAKLAND, CALIFORNIA

FIGURE 2
SITE VICINITY MAP

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



LEGEND

- OKUS-W1 0.80 — MONITOR WELL LOCATION AND NUMBER WITH GROUNDWATER ELEVATION
- RW — RECOVERY WELL
- CATCH BASIN FOR STORM SEWER
- 0 — GROUNDWATER ELEVATION CONTOUR (FEET RELATIVE TO MEAN SEA LEVEL)
- GROUNDWATER FLOW DIRECTION

96120-767

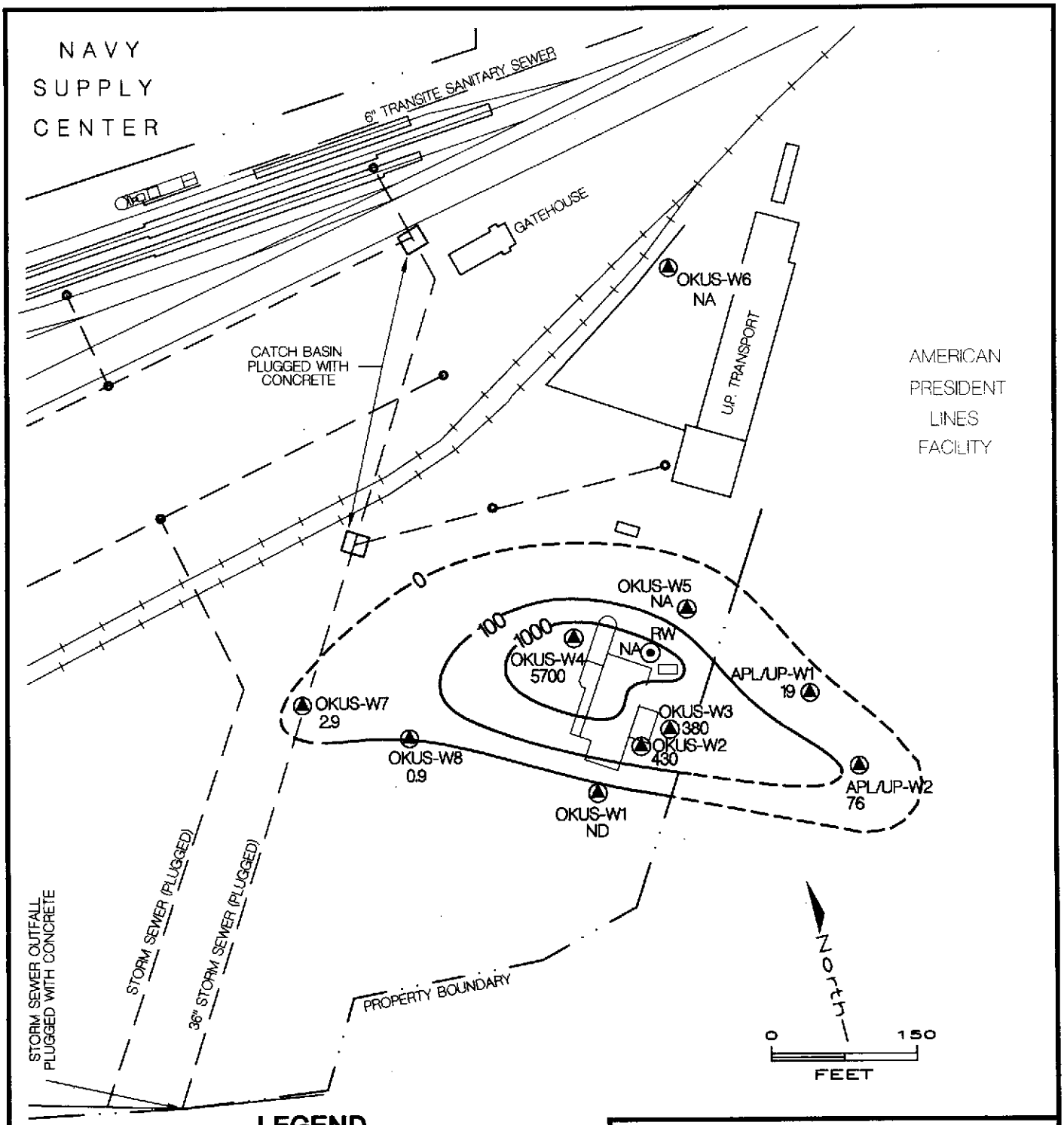
USPCI

A LAIDLAW COMPANY

OAKLAND, CALIFORNIA

FIGURE 3
GROUNDWATER ELEVATION MAP (6/95)

SCALE:	1" = 150'	APPROVED/DATE:	7/25/95



LEGEND

OKUS-W8 ▲ 3.0	MONITOR WELL LOCATION AND NUMBER WITH TOTAL DISSOLVED BTEX CONCENTRATION ug/L
⊙ RW	RECOVERY WELL
•	CATCH BASIN FOR STORM SEWER
—100—	TOTAL BTEX DISTRIBUTION CONTOUR; DASHED WHERE INFERRED
ND	NOT DETECTED
NA	NOT ANALYZED

NOTE: ALL ANALYTICAL RESULTS IN µg/L

96120-766

USPCI

A LAIDLAW COMPANY

OAKLAND, CALIFORNIA

FIGURE 4
DISSOLVED PHASE BTEX DISTRIBUTION (6/95)
UPMF REPAIR SHOP

SCALE	APPROVED/DATE
1" = 150'	7/25/95

APPENDIX A

ANALYTICAL REPORTS

Sequoia Analytical

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

Riedel Environmental Services, Inc.	Client Project ID:	UPRR., #4117	Sampled: Jun 22, 1995
4138 Lakeside Drive	Sample Matrix:	Water	Received: Jun 23, 1995
Richmond, CA 94806	Analysis Method:	EPA 5030/8015 Mod./8020	Reported: Jul 13, 1995
Attention: Chris Merritt	First Sample #:	506-1830	

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 506-1830 OKUS-W1	Sample I.D. 506-1831 OKUS-W2	Sample I.D. 506-1832 OKUS-W3	Sample I.D. 506-1833 OKUS-W4	Sample I.D. 506-1834 OKUS-W7	Sample I.D. 506-1835 OKUS-W8
QC Batch Number:		GC062995 802004B	GC062995 802005A	GC062995 802005A	GC063095 802002B	GC070295 802004A	GC070295 802004A
Purgeable Hydrocarbons	50	N.D.	13,000	8,100	4,900	N.D.	76
Benzene	0.50	N.D.	260	250	280	2.4	0.92
Toluene	0.50	N.D.	62	53	38	N.D.	N.D.
Ethyl Benzene	0.50	N.D.	N.D.	N.D.	5,200	0.52	N.D.
Total Xylenes	0.50	N.D.	110	76	140	N.D.	N.D.
Chromatogram Pattern:		--	Gasoline	Gasoline	Gasoline	--	Unidentified Hydrocarbons >C10

Quality Control Data

Report Limit Multiplication Factor:	1.0	100	100	40	1.0	1.0
Date Analyzed:	6/29/95	6/29/95	6/29/95	6/30/95	7/2/95	7/2/95
Instrument Identification:	HP-4	HP-5	HP-5	HP-2	HP-4	HP-4
Surrogate Recovery, %: (QC Limits = 70-130%)	90	91	91	105	99	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

Kevin Van Slambrook
Project Manager

5061830.RRR <1>

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Riedel Environmental Services, Inc.	Client Project ID:	UPRR., #4117	Sampled: Jun 22, 1995
4138 Lakeside Drive	Sample Matrix:	Water	Received: Jun 23, 1995
Richmond, CA 94806	Analysis Method:	EPA 5030/8015 Mod./8020	Reported: Jul 13, 1995
Attention: Chris Merritt	First Sample #:	506-1836	

QC Batch Number: GC062995 GC062995 GC062995
802005A 802005A 802005A

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 506-1836 APL/W1	Sample I.D. 506-1837 APL/W2	Sample I.D. 506-1838 TB
Purgeable Hydrocarbons	50	160	170	N.D.
Benzene	0.50	12	10	N.D.
Toluene	0.50	0.82	62	N.D.
Ethyl Benzene	0.50	3.5	2.2	N.D.
Total Xylenes	0.50	2.4	2.3	N.D.
Chromatogram Pattern:		Gasoline	Gasoline	-

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0
Date Analyzed:	6/29/95	6/29/95	6/29/95
Instrument Identification:	HP-5	HP-5	HP-5
Surrogate Recovery, %: (QC Limits = 70-130%)	95	82	85

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

SEQUOIA ANALYTICAL, #1271

Kevin Van Slambrook
Project Manager

Sequoia Analytical

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

Riedel Environmental Services, Inc.	Client Project ID:	UPRR., #4117	Sampled: Jun 22, 1995
4138 Lakeside Drive	Sample Matrix:	Water	Received: Jun 23, 1995
Richmond, CA 94806	Analysis Method:	EPA 3510/8015 Mod.	Reported: Jul 13, 1995
Attention: Chris Merritt	First Sample #:	506-1830	

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 506-1830 OKUS-W1	Sample I.D. 506-1831 OKUS-W2	Sample I.D. 506-1832 OKUS-W3	Sample I.D. 506-1833 OKUS-W4	Sample I.D. 506-1834 OKUS-W7	Sample I.D. 506-1835 OKUS-W8
QC Batch Number:		SP062995 8015EXA	SP062995 8015EXA	SP062995 8015EXA	SP062995 8015EXA	SP062995 8015EXA	SP062995 8015EXA
Extractable Hydrocarbons	50	N.D.	3200	3300	2700	850	870
Chromatogram Pattern:		--	Diesel & Unidentified Hydrocarbons <C15	Diesel & Unidentified Hydrocarbons <C15	Diesel & Unidentified Hydrocarbons <C15	Diesel	Diesel

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0	1.0
Date Extracted:	6/29/95	6/29/95	6/29/95	6/29/95	6/29/95	6/29/95
Date Analyzed:	6/30/95	6/30/95	6/30/95	6/30/95	6/30/95	6/30/95
Instrument Identification:	HP-3A	HP-3A	HP-3B	HP-3B	HP-3B	HP-3B

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

SEQUOIA ANALYTICAL, #1271

Kevin Van Slambrook
Project Manager

Sequoia Analytical

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

Riedel Environmental Services, Inc.	Client Project ID:	UPRR., #4117	Sampled: Jun 22, 1995
4138 Lakeside Drive	Sample Matrix:	Water	Received: Jun 23, 1995
Richmond, CA 94806	Analysis Method:	EPA 3510/8015 Mod.	Reported: Jul 13, 1995
Attention: Chris Merritt	First Sample #:	506-1836	

QC Batch Number: SP062995 8015EXA | SP062995 8015EXA

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 506-1836 APL/W1	Sample I.D. 506-1837 APL/W2
Extractable Hydrocarbons	50	320	300
Chromatogram Pattern:		Diesel & Unidentified Hydrocarbons <C15	Diesel & Unidentified Hydrocarbons <C15

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0
Date Extracted:	6/29/95	6/29/95
Date Analyzed:	6/30/95	6/30/95
Instrument Identification:	HP-3B	HP-3B

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

SEQUOIA ANALYTICAL, #1271

Kevin Van Slambrook
Project Manager

Sequoia Analytical

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

Riedel Environmental Services, Inc.
4138 Lakeside Drive
Richmond, CA 94806
Attention: Chris Merritt

Client Project ID: UPRR., #4117
Matrix: Liquid
QC Sample Group 5061830

Reported: Jul 13, 1995

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes	Diesel	Diesel
QC Batch#:	GC062995	GC062995	GC062995	GC062995	SP062995	SP062995
	802004B	802004B	802004B	802004B	8015EXA	8015EXA
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015	EPA 8015
Prep. Method:	-	-	-	-	EPA 3510	EPA 3510
Analyst:	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha	J. Dinsay	J. Dinsay
MS/MSD #:	5062031	5062031	5062031	5062031	BLK062995	BLK062995
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Prepared Date:	6/29/95	6/29/95	6/29/95	6/29/95	6/29/95	6/29/95
Analyzed Date:	6/29/95	6/29/95	6/29/95	6/29/95	6/30/95	6/30/95
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4	GCHP-3B	GCHP-3A
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L	300 µg/L	300 µg/L
Result:	21	22	22	65	200	190
MS % Recovery:	105	110	110	108	67	63
Dup. Result:	20	21	21	64	200	190
MSD % Recov.:	100	105	105	107	67	63
RPD:	4.9	4.7	4.7	0.93	0.0	0.0
RPD Limit:	0-20	0-20	0-20	0-20	0-20	0-20

LCS #:	2LCS062995	2LCS062995	2LCS062995	2LCS062995	BLK062995	BLK062995
Prepared Date:	6/29/95	6/29/95	6/29/95	6/29/95	6/29/95	6/29/95
Analyzed Date:	6/29/95	6/29/95	6/29/95	6/29/95	6/30/95	6/30/95
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4	GCHP-3B	GCHP-3A
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L	300 µg/L	300 µg/L
LCS Result:	19	20	21	62	200	190
LCS % Recov.:	96	101	103	103	67	63

MS/MSD LCS Control Limits	71-133	72-128	72-130	71-120	38-122	38-122

SEQUOIA ANALYTICAL, #1271

Kevin Van Slambrook
Project Manager

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

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

Sequoia Analytical

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Riedel Environmental Services, Inc.
4138 Lakeside Drive
Richmond, CA 94806
Attention: Chris Merritt

Client Project ID: UPRR., #4117
Matrix: Liquid
QC Sample Group 5061830-38

Reported: Jul 13, 1995

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC062995	GC062995	GC062995	GC062995
	802005A	802005A	802005A	802005A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	-	-	-	-
Analyst:	A. Tuzon	A. Tuzon	A. Tuzon	A. Tuzon
MS/MSD #:	5062000	5062000	5062000	5062000
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	6/29/95	6/29/95	6/29/95	6/29/95
Analyzed Date:	6/29/95	6/29/95	6/29/95	6/29/95
Instrument I.D.#:	HP-5	HP-5	HP-5	HP-5
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Result:	22	22	22	67
MS % Recovery:	110	110	110	112
Dup. Result:	20	19	19	58
MSD % Recov.:	100	95	95	97
RPD:	9.5	15	15	14
RPD Limit:	0-20	0-20	0-20	0-20

LCS #:	3LCS062995	3LCS062995	3LCS062995	3LCS062995
Prepared Date:	6/29/95	6/29/95	6/29/95	6/29/95
Analyzed Date:	6/29/95	6/29/95	6/29/95	6/29/95
Instrument I.D.#:	HP-5	HP-5	HP-5	HP-5
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
LCS Result:	19	19	19	58
LCS % Recov.:	97	96	94	97

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

SEQUOIA ANALYTICAL, #1271

Kevin Van Slambrook
Project Manager

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Riedel Environmental Services, Inc.
4138 Lakeside Drive
Richmond, CA 94806
Attention: Chris Merritt

Client Project ID: UPRR., #4117
Matrix: Liquid

QC Sample Group 5061830-38

Reported: Jul 13, 1995

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC063095	GC063095	GC063095	GC063095
	802002B	802002B	802002B	802002B
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	-	-	-	-
Analyst:	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha
MS/MSD #:	5062051	5062051	5062051	5062051
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	6/30/95	6/30/95	6/30/95	6/30/95
Analyzed Date:	6/30/95	6/30/95	6/30/95	6/30/95
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Result:	22	22	23	69
MS % Recovery:	110	110	115	115
Dup. Result:	23	22	23	60
MSD % Recov.:	115	110	115	100
RPD:	4.4	0.0	0.0	14
RPD Limit:	0-20	0-20	0-20	0-20

LCS #:	1LCS063095	1LCS063095	1LCS063095	1LCS063095
Prepared Date:	6/30/95	6/30/95	6/30/95	6/30/95
Analyzed Date:	6/30/95	6/30/95	6/30/95	6/30/95
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
LCS Result:	23	23	24	72
LCS % Recov.:	116	115	120	120

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

SEQUOIA ANALYTICAL, #1271

Kevin Van Slambrook
Project Manager

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Riedel Environmental Services, Inc.
4138 Lakeside Drive
Richmond, CA 94806
Attention: Chris Merritt

Client Project ID: UPRR., #4117
Matrix: Liquid
QC Sample Group 5061830-38

Reported: Jul 13, 1995

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC070295	GC070295	GC070295	GC070295
	802004A	802004A	802004A	802004A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	-	-	-	-
Analyst:	A. Tuzon	A. Tuzon	A. Tuzon	A. Tuzon
MS/MSD #:	5061985	5061985	5061985	5061985
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	7/2/95	7/2/95	7/2/95	7/2/95
Analyzed Date:	7/2/95	7/2/95	7/2/95	7/2/95
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
Result:	20	21	22	67
MS % Recovery:	100	105	110	112
Dup. Result:	20	22	23	69
MSD % Recov.:	100	110	115	115
RPD:	0.0	4.7	4.4	2.6
RPD Limit:	0-20	0-20	0-20	0-20

LCS #:	2LCS070295	2LCS070295	2LCS070295	2LCS070295
Prepared Date:	7/2/95	7/2/95	7/2/95	7/2/95
Analyzed Date:	7/2/95	7/2/95	7/2/95	7/2/95
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
LCS Result:	20	21	21	64
LCS % Recov.:	100	105	107	107

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

SEQUOIA ANALYTICAL, #1271

Kevin Van Slambrook
Project Manager

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RIEDEL ENVIRONMENTAL SERVICES, INC
4138 Lakeside Drive, Richmond, California 94806
Phone: (510) 222-7810 Fax: (510) 222-6868

Chain of Custody Request for Analysis

Laboratory: SEQUOIA Date: 6/22/95
Contact: KEVIN Page: 1
Phone: 988-9600 Of: 1

PROJECT INFORMATION

Project Manager: CHRIS MERRITT
Fax Results to: SAME At: 748-3812
Also to: _____ At: _____
Send Report to: CHRIS MERRITT
Sample Team (print): CHRIS MERRITT
(signatures): CHRIS MERRITT
Turn Around Time: (10 Day) 5 Day 48 Hr. 24 Hr. Other _____

Project Name: UPRR MOTOR FREIGHT/TOFC
Project #: 4117
P.O.#: 32024
RICK PEBLEY (cm for) RICK PEBLEY

Sample ID	Lab ID	Date	Time	Matrix	Preserv.	TPH – Gasoline (EPA 5030, 8015)	TPH – Diesel (EPA 3510/3550, 8015)	TEPH – Kerosene, Diesel, Motor Oil (EPA 3510/3550, 8015)	Purgeable Aromatics BTEX (EPA 602, 8020)	Purgeable Halocarbons (EPA 601, 8010)	Volatile Organics (EPA 624, 8240, 524.2)	SemiVolatile Organics (EPA 625/627, 8270, 525)	Total Oil & Grease (EPA 5520, B+F, E+F)	Total Recoverable Petroleum Hydrocarbons (EPA 418.1)		Metals: Cd, Cr, Pb, Zn, Ni Total or Soluble	CAM Metals (17) Total or Soluble	Lead (Pb) Total, Soluble, or Organic	Extraction TCLP or STLC (Wet)			Number of Containers
OKUS-W1	5061830	RTC 6/22/95		WATER	HCL	X	X		X													4
OKUS-W2	5061831					X	X		X													4
OKUS-W3	5061832					X	X		X													4
OKUS-W4	5061833					X	X		X													4
OKUS-W7	5061834					X	X		X													4
OKUS W8	5061835					X	X		X													4
APL/W1	5061836					X	X		X													4
APL/W2	5061837					X	X		X													4
TB	5061838	AB				X			X													1

SPECIAL INSTRUCTIONS:

COMMENTS:

SAMPLE RECEIPT
Total No. Containers: ____
Head Space: Y N
Rec'd Good Cond/Cold: Y N
Conforms to Record: Y N

RELINQUISHED BY (Sampler):
CHRIS MERRITT 11:54 AM
(Signature) (Time)
CHRIS MERRITT 6/23/95
(Printed Name) (Date)
RES/SMITH
(Company)

RECEIVED BY:
11:54
(Signature) (Time)
(Printed Name) 6/23/95 (Date)
RES/SMITH
(Company)

RELINQUISHED BY:
2000
(Signature) (Time)
(Printed Name) 6/23/95 (Date)
RES/SMITH
(Company)

RECEIVED BY:
8:00
(Signature) (Time)
GARY TADLOCK 6/23/95
(Printed Name) (Date)
SEQUOIA
(Company)

RELINQUISHED BY
5:45
(Signature) (Time)
(Printed Name) 6/23
(Date)
SEQUOIA
(Company)

RECEIVED BY (Laboratory):
1800
(Signature) (Time)
RG Kelley 6/23/95
(Printed Name) (Date)
Sequoia Analytical
(Company)

APPENDIX B

HYDRODATA AND SAMPLE COLLECTION LOGS

HYDRODATA

Date: 5/9/95

PROJECT: 417 EVENT: WATER LEVELS SAMPLER: CHRISM, RICK P.

No.	Well or Location	Date	Time Hr.	Time Min.	Measurement DTP	Measurement DTW	Comments
1	RW-1	5/9/95			8.41	8.52	
2	OKUS-W4						COVERED
3	OKUS-W5				9.00	9.00	TRACE OIL
4	OKUS-W6				5.39	5.40	APPROXIMATE THICKNESS, THICK STICKY OIL.
5	OMW-1				5.55	5.55	
6	OMW-2						DION'T GET
7	OMW-3				4.37'	4.37'	
8	OMW-4				4.99	6.38	
9	OMW-5						PAVED
10	OMW-6				7.19'	7.19'	
11	OMW-7				5.22	9.25	
12	OMW-8				5.00	5.00	
13	OMW-9				4.94'	9.02'	
14	OMW-10						UNABLE TO LOCATE
15							
16							
17							
18							
19							
20							

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

IF DTP = DTW · THEN NO PRODUCT

HYDRODATA

Date: 6/22/95

PROJECT: 4117 EVENT: QUARTERLY SAMPLER: CHRIS MERRITT RICK PEBLEY

No.	Well or Location	Date	Time Hr.	Time Min.	Measurement	Comments
✓1	OKUS-W1	6/22/95	11	58	8.00'	NO APPARENT PRODUCT, BIOLOGICAL GROWTH CAME OUT ON PROBE.
✓2	OKUS-W2	6/22/95	12	04	8.90'	NO APPARENT PRODUCT.
✓3	OKUS-W3	6/22/95	12	10	9.15'	
4	OKUS-W4	6/22/95	11	40	6.01'	NO APPARENT PRODUCT REPLACED CAP WITH SPARE I HAD.
5	OKUS-W5	6/22/95	11	35	9.29'	PRODUCT BLEBS-HEAVY OIL NO SAMPLE
6	OKUS-W6	6/22/95	12	19	5.30'	APPROXIMATE, CONTAINS BUNKER AT THIS DEPTH NO SAMP.
7	OKUS-W7	6/22/95	11	52	5.26'	NO APPARENT PRODUCT
✓8	OKUS-W8	6/22/95	11	50	5.18	NO APPARENT PRODUCT, CAP BROKEN.
✓9	APL/W1	6/22/95	12	46	10.25'	NO APPARENT PRODUCT.
✓10	APL/W2	6/22/95	12	52	9.42'	NO APPARENT PRODUCT
11	RW	6/22/95	19 ~~DE~~	02	8.72 OIP / 8.92 OTW	NO IN WELL
12						
13						
14						
15						
16						
17						
18						
19						
20						

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

JUL 17 '95 14:56

RIEDEL ENVIRONMENTAL SERVICES, INC.

DATE	0	6	2	2	9	5
TIME	12	55				
PAGE	1	OF	1			
PAGE						
PROJECT NO.	4117					

SAMPLE COLLECTION LOG

PROJECT NAME: UPRR - MOTOR FREIGHT / TOFC

SAMPLE NO.: APL/W1

SAMPLE LOCATION: AMERICAN PRESIDENT LINES LOT

SAMPLE TYPE: WATER

COMPOSITE: _____ YES X NO

COMPOSITE TYPE: _____

DEPTH OF SAMPLE: _____

WEATHER: CLEAR, WARM, SUNNY

CONTAINERS USED	AMOUNT COLLECTED
3 40ml VOA	120ml
1 L AMBER	1 L

COMMENTS:

DTW - 10.25
OOC - 22.30

CALCULATED PURGE 7.86 GALLONS.
(ACTUAL 8.0)

PREPARED BY: _____

RIEDEL ENVIRONMENTAL SERVICES, INC.

DATE	0	6	2	2	9	5
TIME	1	3	1	7		
PAGE	1	OF	1			
PAGE						
PROJECT NO.						

SAMPLE COLLECTION LOG

PROJECT NAME UPRR - MOTORFREIGHT/TOFC

SAMPLE NO. APL/W2

SAMPLE LOCATION AMERICAN PRESIDENT LINES

SAMPLE TYPE WATER

COMPOSITE _____ YES X NO

COMPOSITE TYPE _____

DEPTH OF SAMPLE _____

WEATHER CLEAR, WARM, SUNNY

CONTAINERS USED	AMOUNT COLLECTED
3 40ml VOA	120ml
1 L AMBER	1 L

COMMENTS: $14.4 - 9.42 \times 2^2 \times 4 \times .0408$ 3.25 gAL TO PURGE (ACTUAL 3.6)

OTW - 9.42

OOC 14.4'

PREPARED BY: _____

RIEDEL ENVIRONMENTAL SERVICES, INC.

DATE	0	6	2	2	9	5
TIME						
PAGE	1	OF	1			
PAGE						
PROJECT NO.						

SAMPLE COLLECTION LOG

PROJECT NAME: UPRR MOTOR FREIGHT / TOFC

SAMPLE NO.: OKUS-~~MW~~1

SAMPLE LOCATION: UP MOTOR FREIGHT SHOP AREA

SAMPLE TYPE: WATER

COMPOSITE: ____ YES X NO

COMPOSITE TYPE: NA

DEPTH OF SAMPLE: NA

WEATHER: CLEAR, SUNNY

CONTAINERS USED	AMOUNT COLLECTED
3 40 ml VOA	120 ml
1 L AMBER	1 L

COMMENTS: PURGE VOLUME = 9.13 GALLONS (ACTUAL 9.5)

WATER CLEAR W/ SLIGHT GREENISH TINGE.

PREPARED BY: _____

RIEDEL ENVIRONMENTAL SERVICES, INC.

DATE	0	6	2	2	9	5
TIME	15	17				
PAGE	1	OF	1			
PAGE						
PROJECT NO.	4117					

SAMPLE COLLECTION LOG

PROJECT NAME: UPRR MOTOR FREIGHT / TOFC

SAMPLE NO.: OKUS-WZ

SAMPLE LOCATION: MOTOR FREIGHT SHOP AREA

SAMPLE TYPE: WATER

COMPOSITE: ____ YES X NO

COMPOSITE TYPE: NA

DEPTH OF SAMPLE: NA

WEATHER: CLEAR, SUNNY

CONTAINERS USED	AMOUNT COLLECTED
3 40 ml VOA	120 ml
1 l AMBER	1 l

COMMENTS: 8.87 GALLONS CALCULATED PURGE VOLUME (ACTUAL 9.0)
1303-939-4927 MARK McCORMICK USPCI → CALLED TO ASCERTAIN OKUS-W8/7 LOCATION.
WATER CLEAR W/ SLIGHT GREEN TINT

PREPARED BY: _____

RIEDEL ENVIRONMENTAL SERVICES, INC.

DATE	0	6	2	2	9	5
TIME	1	6	1	3		
PAGE	1	OF	1			
PAGE						
PROJECT NO.						

SAMPLE COLLECTION LOG

PROJECT NAME: UPRR MOTOR FREIGHT/TOFC

SAMPLE NO.: OKUS-W3

SAMPLE LOCATION: MOTOR FREIGHT YARD

SAMPLE TYPE: WATER

COMPOSITE: ____ YES X NO

COMPOSITE TYPE: NA

DEPTH OF SAMPLE: NA

WEATHER: CLEAR, SUNNY

CONTAINERS USED	AMOUNT COLLECTED
3 40ml VOA	120 ml
1 L AMBER	1 L

COMMENTS: PURGE VOLUME 8.64 GALLONS (ACTUAL 9.0)

PREPARED BY: _____

RIEDEL ENVIRONMENTAL SERVICES, INC.

DATE	0	6	2	2	9	5
TIME	1	6	4	4		
PAGE	1	OF	1			
PAGE						
PROJECT NO.	4	1	1	7		

SAMPLE COLLECTION LOG

PROJECT NAME: UPRR MOTOR FREIGHT / TOFC

SAMPLE NO.: OKJS-W4

SAMPLE LOCATION: MOTOR FREIGHT SHOP AREA

SAMPLE TYPE: WATER

COMPOSITE: ____ YES X NO

COMPOSITE TYPE: NA

DEPTH OF SAMPLE: NA

WEATHER: CLEAR, SUNNY

CONTAINERS USED	AMOUNT COLLECTED
3 40ml VOA	120 ml
1 L AMBER	1 L

COMMENTS: PURGE VOLUME 9.72 GALLONS (ACTUAL 10.0)

SAMPLED 1540

PREPARED BY: _____

RIEDEL ENVIRONMENTAL SERVICES, INC.

DATE	0 6	2 2	9 5		
TIME	1 7	1 9			
PAGE	1 OF 1				
PAGE					
PROJECT NO.					

SAMPLE COLLECTION LOG

PROJECT NAME UPRR MOTOR FREIGHT/TOFC

SAMPLE NO. OKUS-W8

SAMPLE LOCATION TOFC LOT

SAMPLE TYPE WATER

COMPOSITE ____ YES X NO

COMPOSITE TYPE NA

DEPTH OF SAMPLE NA

WEATHER CLEAR, SUNNY

CONTAINERS USED	AMOUNT COLLECTED
340 ml VOA	120 ml
1 L AMBER	1 L

COMMENTS: PURGE CALCULATION 6.6 GALLONS (ACTUAL 7.0)

SAMPLE OBTAINED 17:49

PREPARED BY: _____

RIEDEL ENVIRONMENTAL SERVICES, INC.

DATE	0	6	2	2	9	5
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PROJECT NO.	4117					

SAMPLE COLLECTION LOG

PROJECT NAME: UPRR MOTOR FREIGHT/TOFC

SAMPLE NO.: OKUS-W7

SAMPLE LOCATION: TOFC LOT

SAMPLE TYPE: WATER

COMPOSITE: ____ YES X NO

COMPOSITE TYPE: NA

DEPTH OF SAMPLE: NA

WEATHER: CLEAR, SUNNY

CONTAINERS USED	AMOUNT COLLECTED
~~3~~ 3 40ml VOA	120 ml
1 L AMBER	1 L

COMMENTS: PURGE VOLUME CALCULATED @ 9.75 (ACTUAL 10)

SAMPLED 18:15

PREPARED BY: _____