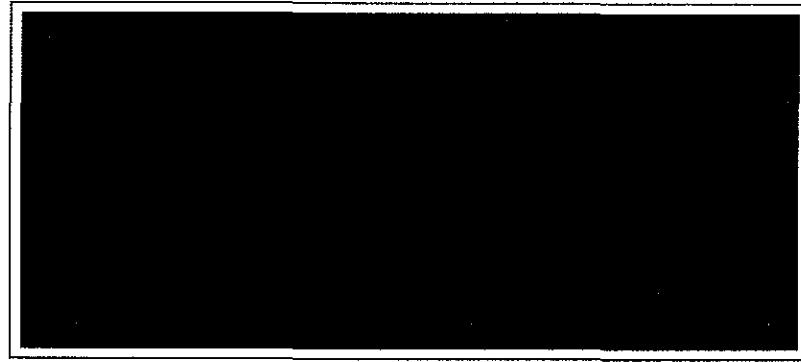


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10-30-96



October 30, 1996

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

RE: "Third Quarter 1996 Monitoring Report", Oakland Fueling Area in the Oakland TOFC
Railyard, Oakland, California

Dear Mr. Patterson:

Enclosed is the final copy of the "Third Quarter 1996 Monitoring Report", dated October 30, 1996, for the Union Pacific Railroad Fueling Area at the trailer-on-flat-car (TOFC) loading facility at 1717 Middle Harbor Road in Oakland, California.

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

Sincerely,

Denton Mauldin
Project Manager

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

cc: Teresa Van, USPCI
Jennifer Eberle, ACDEH
John Prall, Port of Oakland
Philip Herden, APL

Enclosure
DM/tjh

96 NOV - 1 PM 2:40
ENCLOSURE
EX-PROTECTIVE
OAKFA\QTRFA396.LTR, 96199, October 30, 1996

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THIRD QUARTER 1996 MONITORING
REPORT
OAKLAND FUELING AREA
UNION PACIFIC RAILROAD
1717 MIDDLE HARBOR ROAD
OAKLAND, CALIFORNIA
USPCI/Laidlaw Project No. 792930

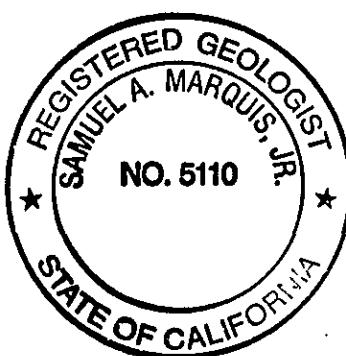
Prepared for:
Union Pacific Railroad
Environmental Management - Room 930
1416 Dodge Street
Omaha, Nebraska 68179

For submittal to:
Jennifer Eberle
Alameda County
Department of Environmental Health
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October 30, 1996

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1. INTRODUCTION

This report was prepared by USPCI, a Laidlaw Company (Laidlaw) for Union Pacific Railroad (UPRR) in accordance with the Alameda County Department of Environmental Health (ACDEH) letter dated September 21, 1994. The purpose of this report is to provide groundwater monitoring information pertaining to the hydrocarbon recovery system located at the fueling area of the UPRR Oakland Trailer on Flat Car (TOFC) railyard at 1717 Middle Harbor Road in Oakland, California. The objective of the groundwater monitoring is to evaluate changes in the distribution of petroleum hydrocarbons in groundwater and to assess the effectiveness of the hydrocarbon recovery system.

In addition to providing information about the fueling area, this report includes monitoring results for the diesel spill area located to the east of the fueling area (Figure 2).

This report presents the results of fluid level measurements collected in July and September 1996. No groundwater sampling was performed, because the next sampling event is not scheduled until November of 1996.

2. BACKGROUND INFORMATION

The following sub-sections present background information regarding the fueling area and the diesel spill area.

2.1 FUELING AREA

The fueling area is located in the northern portion of the UPRR Oakland TOFC Yard, which is adjacent to the Oakland Inner Harbor or Oakland Estuary (Figure 1). The area surrounding the site is used for heavy to light commerce. Residential areas are located approximately one-half mile north of the site and across the Oakland Estuary one-half mile south of the site.

Previous investigations indicated the presence of light non-aqueous phase liquid petroleum hydrocarbons (diesel) floating on the groundwater near the fueling area. A hydrocarbon recovery and groundwater treatment system was installed to remove mobile diesel from near the fueling area. The results from prior investigations and environmental engineering activities conducted by Laidlaw have been documented in previous reports.

The results of the initial site investigation were presented in the *Hydrocarbon Investigation and*

Remediation Design report dated June 10, 1991, which also presented a conceptual design of the system. The system design was outlined in the *Preliminary Design Report*, dated September 5, 1991. As-built information for the system has been presented in the *Hydrocarbon Recovery System, As-Built Construction Report* of July 20, 1992. Process changes to the system were presented in the permit renewal application letter prepared by Laidlaw for UPRR, dated March 22, 1993.

2.2 DIESEL SPILL AREA

On October 1, 1995, approximately 750 gallons of diesel fuel were spilled along a 40 foot section of railroad track east of the UPRR Oakland TOFC Railyard. The diesel fuel spilled from a locomotive fuel tank that was punctured during a minor derailment. Laidlaw submitted an investigation workplan to ACDEH on October 17, 1995. On November 8, 1995, three shallow groundwater monitoring wells (DS-1, DS-2, and DS-3) were installed at the site (Figure 2) in accordance with the workplan. Additional background information was submitted in the report entitled *Environmental Assessment of the Diesel Spill Site*, dated January 8, 1996.

As required by the workplan, fluid level measurements are collected from the three wells on a monthly basis.

3. CURRENT ACTIVITIES

The current activities at the site consist of performing sampling and maintenance on the system and conducting a groundwater monitoring program.

3.1 SYSTEM ACTIVITIES

Water samples are collected from the water stream of the system periodically. Reporting of the system monitoring is conducted on a semiannual frequency with the next report due in January, 1997. The samples are collected to assess the performance of the system and to compare the concentrations of the discharge with limits established by the East Bay Municipal Utility District.

Water samples are collected from sampling ports located before, between, and after the two granular activated carbon vessels at varying frequencies. On a quarterly basis, samples are collected from before and after the carbon vessels. The samples are analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA method 8020 and total petroleum hydrocarbons as diesel (TPH-D) using EPA method 8015 modified. On a monthly basis, water samples are collected from sample ports before and between the carbon vessels and analyzed for TPH-D. The water samples collected from between the two vessels are also analyzed for BTEX.

System maintenance consists of changing particulate filters, backwashing the carbon, and checking the chlorine feed system. Operational readings (cumulative flow, hydrocarbon storage volume, and pressure drop across the particle filters) are collected during each site visit.

3.2 GROUNDWATER MONITORING

Groundwater monitoring activities consist of collecting fluid level measurements in the groundwater monitoring wells on a bi-monthly basis, and collecting groundwater samples on a semi-annual basis.

Fluid level measurements are used to generate potentiometric surface maps. The potentiometric surface maps provide information about the groundwater gradient and the operation of the recovery wells. The data used in these maps include wells in which diesel is found. The groundwater elevations in these wells are corrected to account for the diesel overlying the water column in the well. The correction is performed by multiplying the specific gravity of the diesel by the diesel thickness and adding this value to the water elevation measurement from the well.

Groundwater samples are collected from wells in which diesel is absent. Diesel is recovered by hand from wells which indicate the presence of diesel. The samples are submitted to a laboratory and analyzed for BTEX and TPH-D.

4. SYSTEM OPERATION

The three well recovery system operated properly throughout the third quarter of 1996 with limited downtime required for periodic maintenance. Detailed performance records and monitoring results for the recovery system are included in the semi-annual reports prepared following the second and fourth quarters of each year.

5. GROUNDWATER MONITORING

The following sections provide information about the recent groundwater monitoring.

5.1 FLUID LEVEL MEASUREMENTS

Third-quarter fluid level measurements were obtained from groundwater monitoring wells and piezometers at the fueling area on July 25 and September 16, 1996. Overall, the monitoring wells and piezometers at the site demonstrated decreased water level elevations from the previous quarter. The decrease of groundwater elevations during the third quarter is consistent with past site data. Fluid level measurement results from July of 1996 are presented in Figures 3 and 4. Figures 5 and 6 present fluid level measurement results from September of 1996. Historical fluid levels for each well are provided in Table 1.

The potentiometric surface results for July and September 1996 indicate that groundwater flow outside the influence of the recovery wells is to the south at a hydraulic gradient that ranges from 0.003 to 0.004 feet/foot (16 to 21 feet/mile). A groundwater depression created by the recovery wells (ORW-1, ORW-2, and ORW-3) is evident on the potentiometric surface maps (Figures 3 and 5). The contour lines show an increased hydraulic gradient or convergent flow towards each individual recovery well and towards the entire well network in the portion of the site containing diesel. The hydraulic gradients in the immediate area of the recovery wells range from approximately 0.1 to 0.2 feet/foot (530 to 1,000 feet/mile), which is more than three orders of magnitude greater than the natural gradient outside of the zone of influence of the recovery wells.

During July 1996, diesel was observed in three groundwater monitoring wells (ORW-2, OMW-7, and OMW-9) and two piezometers (OP-2 and OP-4). In addition, traces of diesel were detected in wells ORW-1 and OMW-4 and piezometer OP-3. During the September 1996 fluid level measurement event, diesel was observed in five groundwater monitoring wells (ORW-2, ORW-3, OMW-4, OMW-7, and OMW-9) and three piezometers (OP-2, OP-3 and OP-4). Figures 4 and 6 illustrate the diesel thicknesses as measured in the monitoring wells and piezometers during the July and September 1996 monitoring events, respectively. As indicated by the differences between groundwater elevations in wells OMW-2, OMW-5, OP-4, and OP-2, the location of the diesel plume appeared to be within the area that has a hydraulic gradient towards the recovery wells.

Monthly fluid-level measurement results from the diesel spill wells (DS-1, DS-2, and DS-3) indicate that diesel has not been observed since installation in November of 1996.

5.2 GROUNDWATER SAMPLING

The most recent semi-annual groundwater sampling event was conducted on May 26, 1996. A discussion of the groundwater analytical results from this event was included with the monitoring report that was submitted for the second quarter of 1996. The analytical results are included as Table 2. Analytical reports from the May 1996 sampling event were included in the previous monitoring report (second quarter of 1996). The next sampling event is scheduled for November of 1996.

6. CONCLUSIONS AND RECOMMENDATIONS

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

6.1 CONCLUSIONS

On the basis of the third quarter 1996 monitoring event, the following conclusions have been drawn:

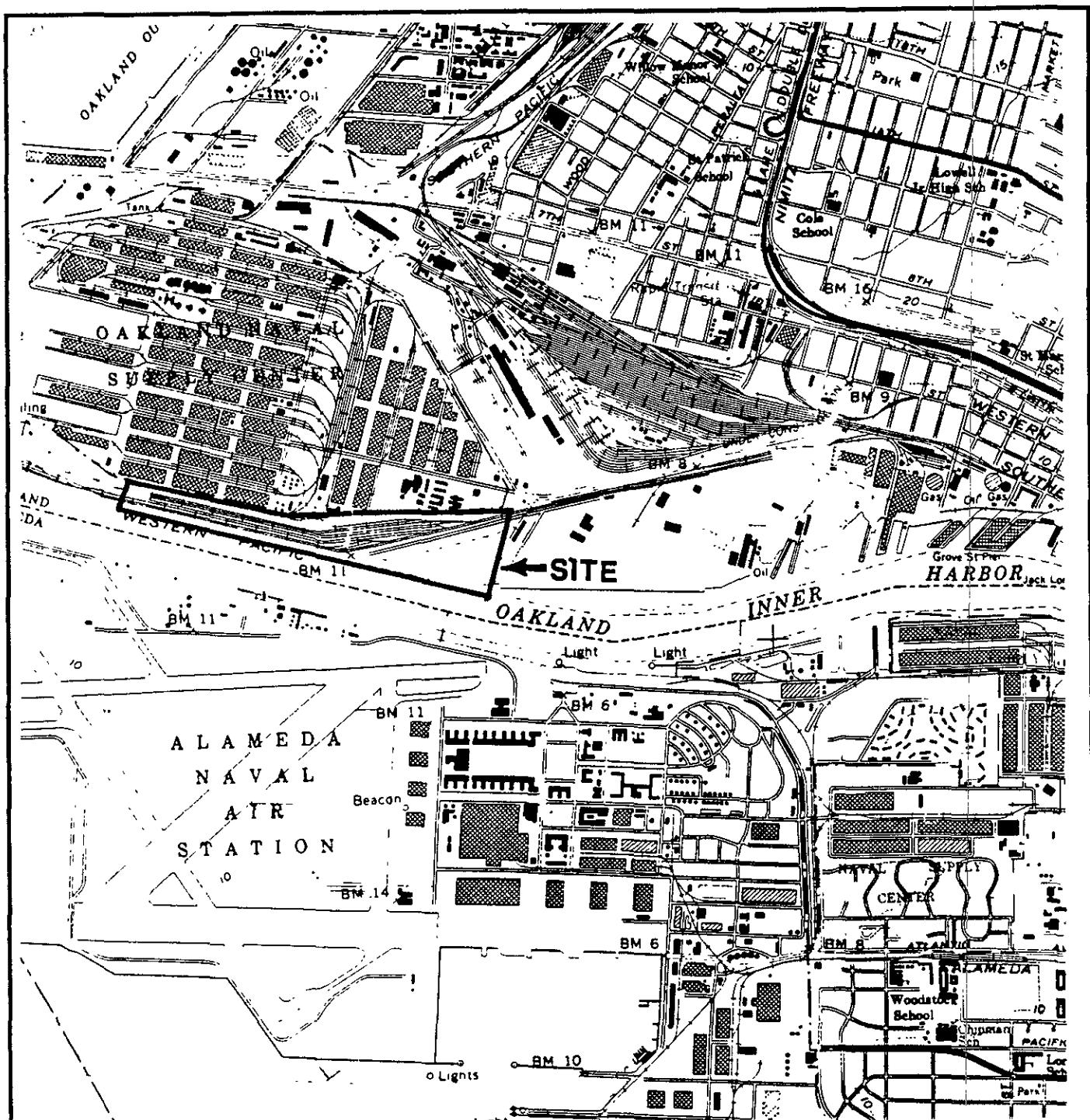
- A steep hydraulic gradient has been developed towards the recovery wells such that diesel is contained within and controlled by the hydraulic gradient created by the recovery wells.
- The groundwater gradient, fluid-level elevations, and field observations of diesel are consistent with previous monitoring events.
- The detection of TPH-D decreased overall since the November 1995 sampling event but continues to remain above historical levels.

6.2 RECOMMENDATIONS

On the basis of the site information, Laidlaw recommends the following:

- Continue to evaluate the increase in dissolved TPH.
- Continue the operation of the system.

FIGURES



USPCI
A LAIDLAH COMPANY

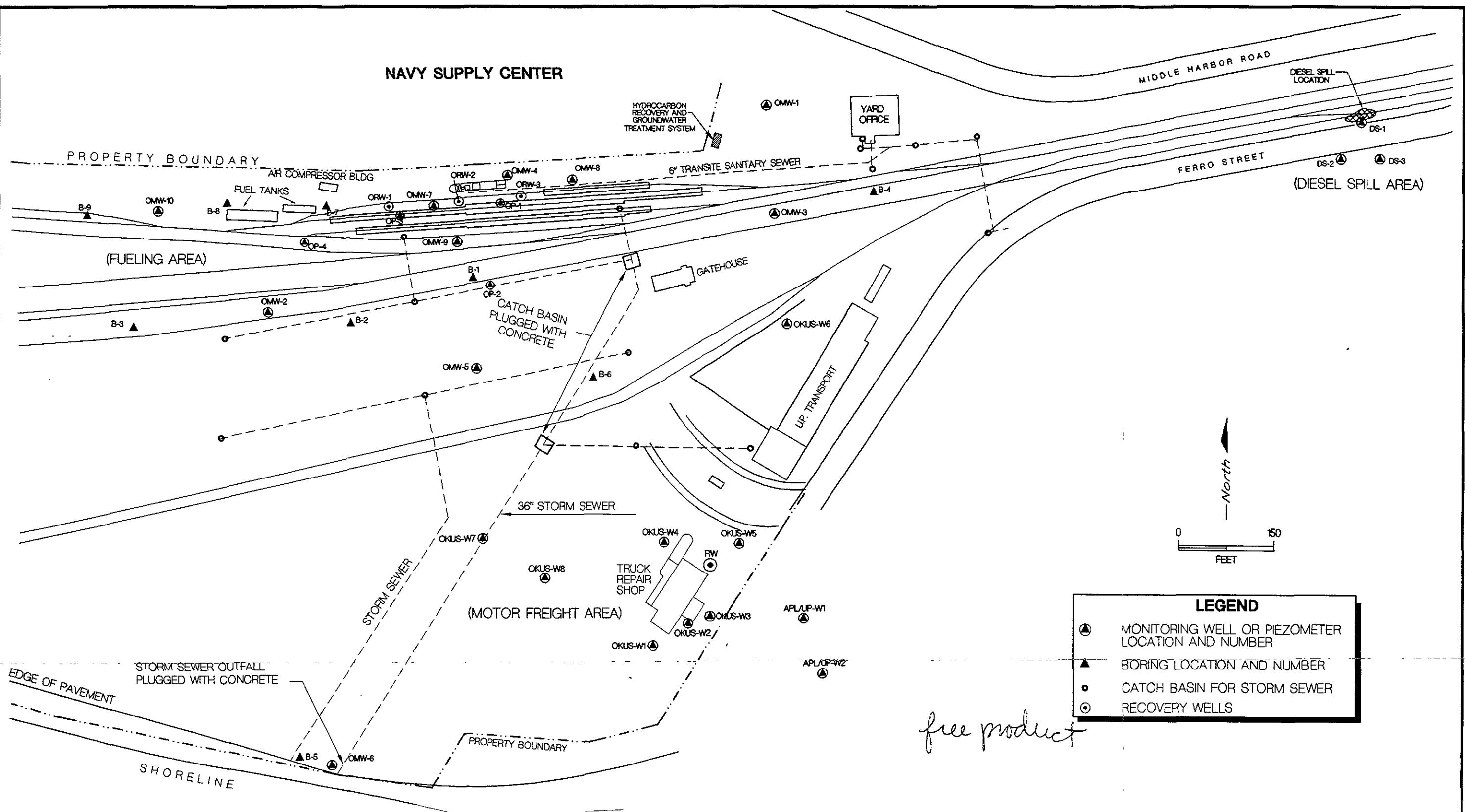
UPRR TOFC RAILYARD - OAKLAND, CALIFORNIA

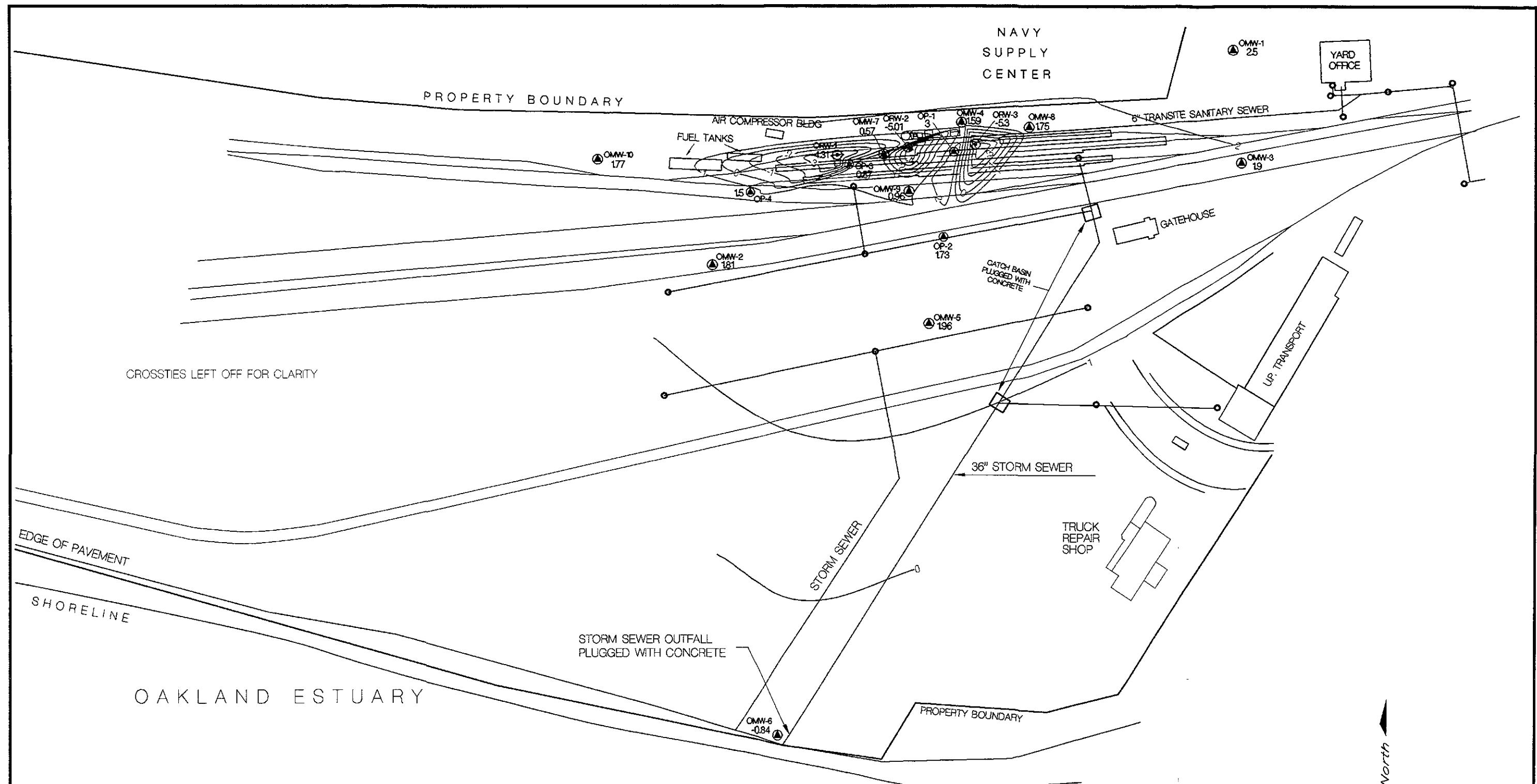
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FIGURE 1
SITE LOCATION MAP

SCALE: 1" = 2000' DATE: 10/29/96

NAVY SUPPLY CENTER





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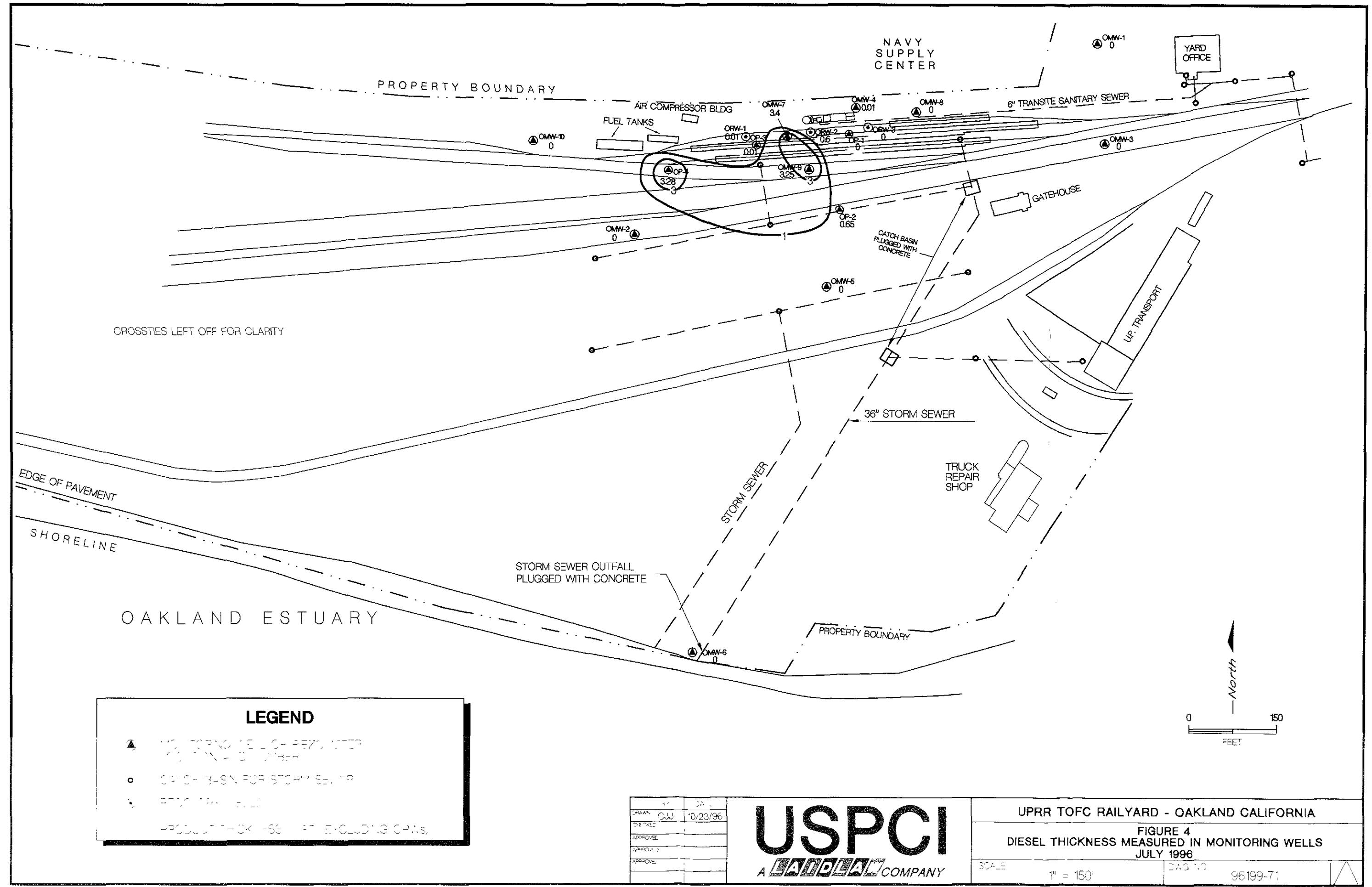
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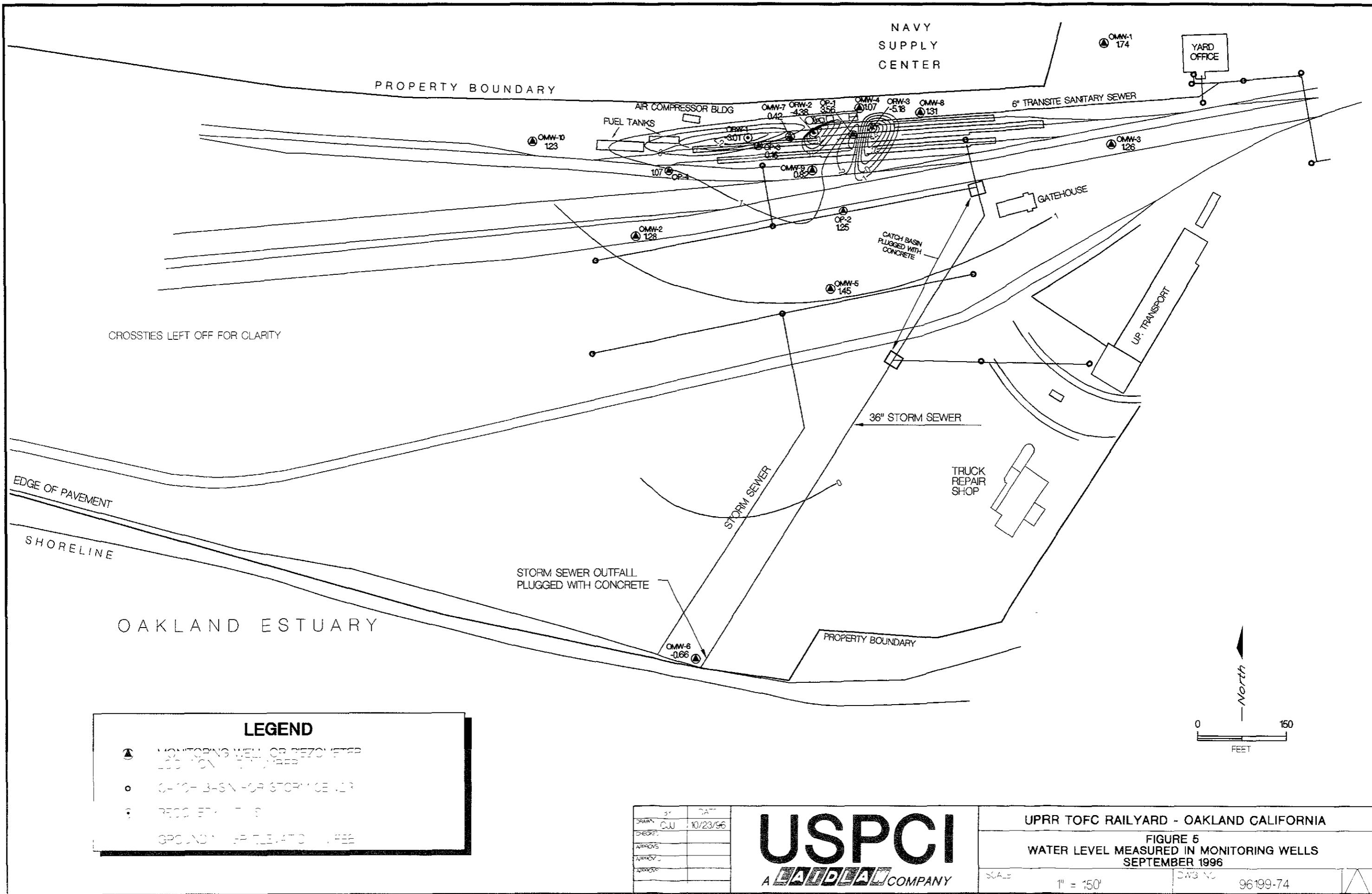
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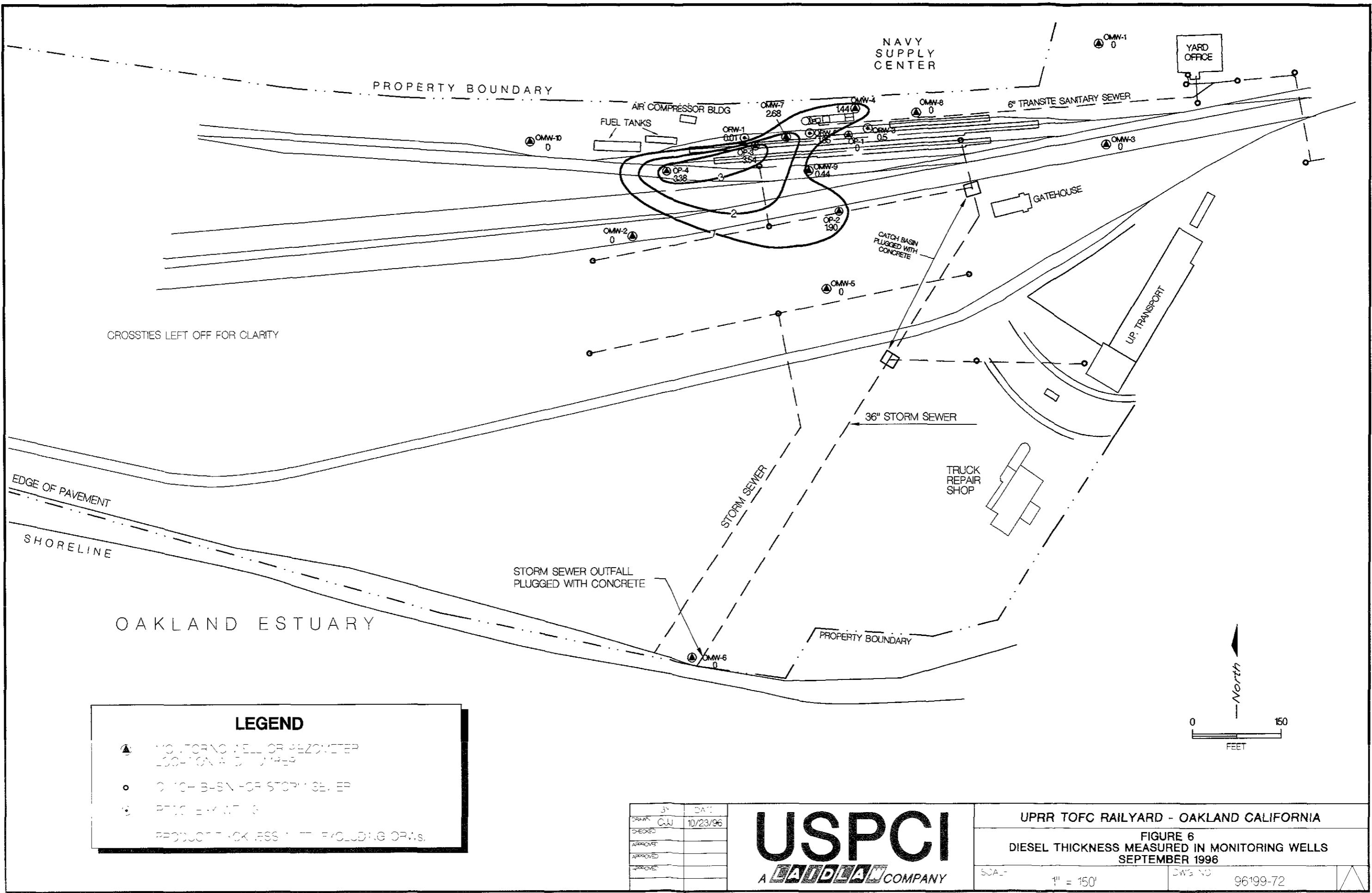
UPRR TOFC RAILYARD - OAKLAND CALIFORNIA

FIGURE 3
WATER LEVEL MEASURED IN MONITORING WELLS
JULY 1996

1" = 150' Dwg No. 96199-73







TABLES

TABLE 1
Fluid Level Measurements
Union Pacific Railroad
Oakland Fueling Area

Well No.	Date	Well Elev. Above M.S.L. (FT)	Depth to Product (FT)	Depth to Water (FT)	Water Level Elevation (FT)	Product Thickness (FT)	Corr Water Level Elevation* (FT)
OMW-1	04/09/91	8.79		5.54	3.25		3.25
	06/19/91			6.89	1.90		1.90
	05/11/92			6.34	2.45		2.45
	06/09/92			6.91	1.88		1.88
	07/07/92			7.21	1.58		1.58
	08/11/92			7.55	1.24		1.24
	09/04/92			7.82	0.97		0.97
	10/13/92			7.96	0.83		0.83
	11/12/92			7.64	1.15		1.15
	12/17/92			6.64	2.15		2.15
	03/18/93			5.98	2.81		2.81
	05/14/93			6.39	2.40		2.40
	07/13/93			7.12	1.67		1.67
	09/30/93			7.84	0.95		0.95
	11/10/93			8.08	0.71		0.71
	01/24/94			7.54	1.25		1.25
	03/23/94			6.69	2.10		2.10
	05/02/94			6.61	2.18		2.18
	07/29/94			7.32	1.47		1.47
	09/26/94			7.67	1.12		1.12
	11/15/94			3.67	5.12		5.12
	01/25/95			2.52	6.27		6.27
	05/09/95			5.55	3.24		3.24
	05/17/95			4.43	4.36		4.36
	07/31/95			6.43	2.36		2.36
	09/07/95			6.86	1.93		1.93
	11/30/95			7.69	1.10		1.10
	01/10/96			6.48	2.31		2.31
	03/25/96			5.00	3.79		3.79
	05/17/96			2.98	5.81		5.81
	07/25/96			6.29	2.50		2.50
	09/16/96			7.05	1.74		1.74
OMW-2	04/09/91	5.88		2.10	3.78		3.78
	06/19/91			3.59	2.29		2.29
	05/11/92			3.22	2.66		2.66
	06/09/92			3.97	1.91		1.91
	07/07/92			4.21	1.67		1.67
	08/11/92			4.46	1.42		1.42
	09/04/92			4.77	1.11		1.11
	10/13/92			4.96	0.92		0.92
	11/12/92			4.08	1.80		1.80
	12/17/92			1.70	4.18		4.18
	03/18/93			1.94	3.94		3.94
	05/14/93			3.29	2.59		2.59
	07/13/93			4.28	1.60		1.60
	09/30/93			4.99	0.89		0.89
	11/10/93			5.23	0.65		0.65
	01/24/94			3.30	2.58		2.58
	03/23/94			3.55	2.33		2.33
	05/02/94			4.95	0.93		0.93
	07/29/94			4.49	1.39		1.39
	09/26/94			4.92	0.96		0.96
	11/16/94			1.03	4.85		4.85
	01/25/95			3.35	2.53		2.53
	05/09/95	NOT GAUGED					
	05/17/95			2.44	3.44		3.44
	07/31/95	NOT GAUGED					
	09/07/95			4.35	1.53		1.53
	11/30/95			5.12	0.76		0.76
	01/10/96			2.60	3.28		3.28
	03/25/96			2.35	3.53		3.53
	05/17/96			1.73	4.15		4.15
	07/25/96			4.07	1.81		1.81
	09/16/96			4.60	1.28		1.28

TABLE 1 (cont.)
Fluid Level Measurements
Union Pacific Railroad
Oakland Fueling Area

Well No.	Date	Well Elev. Above M.S.L. (FT)	Depth to Product (FT)	Depth to Water (FT)	Water Level Elevation (FT)	Product Thickness (FT)	Corr Water Level Elevation* (FT)
OMW-3	04/09/91	7.16		3.93	3.23		3.23
	06/19/91			5.33	1.83		1.83
	05/11/92			5.92	1.24		1.24
	06/09/92			5.48	1.68		1.68
	07/07/92			5.78	1.38		1.38
	08/11/92			6.09	1.07		1.07
	09/04/92			6.33	0.83		0.83
	10/13/92			6.55	0.61		0.61
	11/12/92			6.16	1.00		1.00
	12/17/92			5.15	2.01		2.01
	03/18/93			2.58	4.58		4.58
	05/14/93			4.91	2.25		2.25
	07/13/93			5.70	1.46		1.46
	09/30/93			6.43	0.73		0.73
	11/10/93			6.92	0.24		0.24
	01/24/94			3.50	3.66		3.66
	03/23/94			5.90	1.26		1.26
	05/02/94			5.84	1.32		1.32
	07/29/94			5.98	1.18		1.18
	09/26/94			6.32	0.84		0.84
	11/15/94			2.36	4.80		4.80
	01/25/95		NOT GAUGED - WELL UNDER WATER				
	05/09/95			4.37	2.79		2.79
	05/17/95			4.46	2.70		2.70
	07/31/95			5.22	1.94		1.94
	09/07/95			5.64	1.52		1.52
	11/30/95			6.36	0.80		0.80
	01/10/96			5.13	2.03		2.03
	03/25/96			4.08	3.08		3.08
	05/17/96			2.61	4.55		4.55
	07/25/96			5.26	1.90		1.90
	09/16/96			5.90	1.26		1.26
OMW-4	04/09/91	7.41	3.79	6.23	1.18	2.44	3.23
	06/19/91		4.44	8.68	-1.27	4.24	2.29
	05/11/92		NOT GAUGED				
	06/09/92		5.88	9.81	-2.40	3.93	0.90
	07/07/92		6.00	9.88	-2.47	3.88	0.79
	08/11/92		6.13	8.23	-0.82	2.10	0.94
	09/04/92		6.78	8.37	-0.96	1.59	0.38
	10/13/92**			6.58	0.83		0.83
	11/12/92		5.74	7.33	0.08	1.59	1.42
	12/17/92		5.77	7.28	0.13	1.51	1.40
	03/18/93		3.62	5.73	1.68	1.91	3.26
	05/14/93		5.76	8.45	-1.04	2.69	1.22
	07/13/93		5.94	7.78	-0.37	1.84	1.18
	09/30/93		6.85	8.17	-0.76	1.32	0.35
	11/10/93		7.03	7.59	-0.18	0.56	0.29
	01/24/94		6.15	6.76	0.65	0.61	1.16
	03/23/94		6.09	6.80	0.61	0.71	1.21
	05/02/94		5.25	5.54	1.87	0.29	2.11
	07/29/94		6.40	7.15	0.26	0.75	0.89
	09/26/94		6.31	6.93	0.48	0.62	1.00
	11/16/94		4.30	5.05	2.36	0.75	2.99
	01/25/95		6.23	7.12	0.29	0.89	1.04
	05/09/95		4.99	6.38	1.03	1.39	2.20
	05/17/95		5.19	6.58	0.83	1.39	2.00
	07/31/95		5.78	6.99	0.42	1.21	1.44
	09/07/95		6.01	6.92	0.49	0.91	1.25
	11/30/95		6.60	7.06	0.35	0.46	0.74
	01/10/96		5.73	6.48	0.93	0.75	1.56
	03/25/96		5.22	6.19	1.22	0.97	2.03
	05/17/96		5.23	6.26	1.15	1.03	2.02
	07/25/96		TRACE	5.82	1.59		1.59
	09/16/96		6.11	7.55	-0.14	1.44	1.07

TABLE 1 (cont.)
Fluid Level Measurements
Union Pacific Railroad
Oakland Fueling Area

Well No.	Date	Well Elev. Above M.S.L. (FT)	Depth to Product (FT)	Depth to Water (FT)	Water Level Elevation (FT)	Product Thickness (FT)	Corr Water Level Elevation* (FT)
OMW-5	04/09/91	7.62		4.64	2.98		2.98
	06/19/91			5.35	2.27		2.27
	05/11/92			5.18	2.44		2.44
	06/09/92			5.85	1.77		1.77
	07/07/92			6.02	1.60		1.60
	08/11/92			6.18	1.44		1.44
	09/04/92			6.59	1.03		1.03
	10/13/92			6.54	1.08		1.08
	11/12/92			6.23	1.39		1.39
	12/17/92			5.23	2.39		2.39
	03/18/93			3.33	4.29		4.29
	05/14/93			5.06	2.56		2.56
	07/13/93			5.96	1.66		1.66
	09/30/93			6.70	0.92		0.92
	11/10/93			5.92	1.70		1.70
	01/24/94	NOT GAUGED					
	03/23/94			5.74	1.88		1.88
	05/02/94			5.71	1.91		1.91
	07/29/94			6.27	1.35		1.35
	09/26/94			6.56	1.06		1.06
	11/16/94			5.31	2.31		2.31
	01/25/95	NOT GAUGED					
	05/09/95	NOT GAUGED					
	05/18/95			4.84	2.78		2.78
	07/31/95	NOT GAUGED					
	09/07/95			5.85	1.77		1.77
	11/30/95			6.55	1.07		1.07
	01/10/96			5.46	2.16		2.16
	03/25/96			4.63	2.99		2.99
	05/17/96			4.83	2.79		2.79
	07/25/96			5.66	1.96		1.96
	09/16/96			6.17	1.45		1.45
OMW-6	04/09/91	5.78	7.60	-1.82			-1.82
	06/19/91		6.98	-1.20			-1.20
	05/11/92		7.41	-1.63			-1.63
	06/09/92		7.18	-1.40			-1.40
	07/07/92		6.61	-0.83			-0.83
	08/11/92		7.14	-1.36			-1.36
	09/04/92		6.58	-0.80			-0.80
	10/13/92**		6.16	-0.38			-0.38
	11/12/92		6.91	-1.13			-1.13
	12/17/92		6.16	-0.38			-0.38
	03/18/93		7.31	-1.53			-1.53
	05/14/93		6.59	-0.81			-0.81
	07/13/93		6.58	-0.80			-0.80
	09/30/93		5.49	0.29			0.29
	11/10/93		5.08	0.70			0.70
	01/24/94		5.40	0.38			0.38
	03/23/94		6.90	-1.12			-1.12
	05/02/94		7.44	-1.66			-1.66
	07/29/94		5.65	0.13			0.13
	09/26/94		6.88	-1.10			-1.10
	11/16/94		5.35	0.43			0.43
	01/25/95		6.91	-1.13			-1.13
	05/09/95		7.19	-1.41			-1.41
	05/17/95		6.84	-1.06			-1.06
	07/31/95		5.65	0.13			0.13
	09/07/95		5.51	0.27			0.27
	11/30/95		6.71	-0.93			-0.93
	01/10/96		6.72	-0.94			-0.94
	03/25/96		6.73	-0.95			-0.95
	05/17/96		6.50	-0.72			-0.72
	07/25/96		6.62	-0.84			-0.84
	09/16/96		6.44	-0.66			-0.66

TABLE 1 (cont.)
Fluid Level Measurements
Union Pacific Railroad
Oakland Fueling Area

Well No.	Date	Well Elev. Above M.S.L. (FT)	Depth to Product (FT)	Depth to Water (FT)	Water Level Elevation (FT)	Product Thickness (FT)	Corr Water Level Elevation* (FT)
OMW-7	04/09/91	7.03	3.26	7.48	-0.45	4.22	3.09
	06/19/91		4.13	7.66	-0.63	3.53	2.34
	05/11/92		3.70	7.32	-0.29	3.62	2.75
	06/09/92		5.79	7.78	-0.75	1.99	0.92
	07/07/92		5.98	7.88	-0.85	1.90	0.75
	08/11/92		6.01	9.22	-2.19	3.21	0.51
	09/04/92		6.53	8.92	-1.89	2.39	0.12
	10/13/92		5.97	8.00	-0.97	2.03	0.74
	11/12/92		5.29	8.69	-1.66	3.40	1.20
	12/17/92		5.60	8.66	-1.63	3.06	0.94
	03/18/93		3.93	7.97	-0.94	4.04	2.45
	05/14/93		5.34	8.21	-1.18	2.87	1.23
	07/13/93		5.95	7.49	-0.46	1.54	0.83
	09/30/93		6.65	9.75	-2.72	3.10	-0.12
	11/10/93		6.75	9.12	-2.09	2.37	-0.10
	01/24/94		6.00	7.87	-0.84	1.87	0.73
	03/23/94		5.79	8.56	-1.53	2.77	0.80
	05/02/94		4.79	6.64	0.39	1.85	1.94
	07/29/94		6.15	8.46	-1.43	2.31	0.51
	09/26/94		6.14	7.11	-0.08	0.97	0.73
	11/16/94		4.23	4.63	2.40	0.40	2.74
	01/25/95		3.31	9.53	-2.50	6.22	2.72
	05/09/95		5.22	9.25	-2.22	4.03	1.17
	05/17/95		5.41	8.38	-1.35	2.97	1.14
	07/31/95		5.61	8.83	-1.80	3.22	0.90
	09/07/95		5.80	7.97	-0.94	2.17	0.88
	11/30/95		6.49	7.54	-0.51	1.05	0.37
	01/10/96		5.40	8.33	-1.30	2.93	1.16
	03/25/96		5.46	9.60	-2.57	4.14	0.91
	05/17/96		5.40	8.79	-1.76	3.39	1.09
	07/25/96		5.92	9.32	-2.29	3.40	0.57
	09/16/96		6.18	8.86	-1.83	2.68	0.42
OMW-8	04/09/91	7.52		4.25	3.27		3.27
	06/19/91			5.27	2.25		2.25
	05/11/92			5.05	2.47		2.47
	06/09/92			6.25	1.27		1.27
	07/07/92			6.33	1.19		1.19
	08/11/92			6.48	1.04		1.04
	09/04/92			7.00	0.52		0.52
	10/13/92			6.23	1.29		1.29
	11/12/92			6.34	1.18		1.18
	12/17/92			6.10	1.42		1.42
	03/18/93			4.51	3.01		3.01
	05/14/93			5.78	1.74		1.74
	07/13/93			6.26	1.26		1.26
	09/30/93			7.06	0.46		0.46
	11/10/93			7.12	0.40		0.40
	01/24/94			6.58	0.94		0.94
	03/23/94			6.15	1.37		1.37
	05/02/94			6.06	1.46		1.46
	07/29/94			6.47	1.05		1.05
	09/26/94			6.50	1.02		1.02
	11/15/94			4.74	2.78		2.78
	01/25/95	TRACE		3.55	3.97		3.97
	05/09/95			5.00	2.52		2.52
	05/17/95			5.16	2.36		2.36
	07/31/95			5.70	1.82		1.82
	09/07/95			5.99	1.53		1.53
	11/30/95			6.53	0.99		0.99
	01/10/96			5.87	1.65		1.65
	03/25/96			5.01	2.51		2.51
	05/17/96			5.18	2.34		2.34
	07/25/96			5.77	1.75		1.75
	09/16/96			6.21	1.31		1.31

TABLE 1 (cont.)
Fluid Level Measurements
Union Pacific Railroad
Oakland Fueling Area

Well No.	Date	Well Elev. Above M.S.L. (FT)	Depth to Product (FT)	Depth to Water (FT)	Water Level Elevation (FT)	Product Thickness (FT)	Corr Water Level Elevation* (FT)
OMW-9	05/11/92	6.64	3.41	7.65	-1.01	4.24	2.55
	06/09/92		5.09	8.17	-1.53	3.08	1.06
	07/07/92		5.28	8.42	-1.78	3.14	0.86
	08/11/92		5.29	9.45	-2.81	4.16	0.68
	09/04/92		5.70	9.56	-2.92	3.86	0.32
	10/13/92		5.70	6.88	-0.24	1.18	0.75
	11/12/92		5.23	6.44	0.20	1.21	1.22
	12/17/92		5.08	6.40	0.24	1.32	1.35
	03/18/93		3.01	6.69	-0.05	3.68	3.04
	05/14/93		4.38	10.37	-3.73	5.99	1.30
	07/13/93		5.57	6.79	-0.15	1.22	0.87
	09/30/93		5.86	9.81	-3.17	3.95	0.15
	11/10/93		6.06	9.61	-2.97	3.55	0.01
	01/24/94		5.41	7.71	-1.07	2.30	0.86
	03/23/94		4.91	9.10	-2.46	4.19	1.06
	05/02/94		4.52	4.54	2.10	0.02	2.12
	07/29/94		5.46	8.40	-1.76	2.94	0.71
	09/26/94		5.74	6.39	0.25	0.65	0.80
	11/16/94		4.91	4.95	1.69	0.04	1.72
	01/25/95		3.83	6.25	0.39	2.42	2.42
	05/09/95		4.94	9.02	-2.38	4.08	1.05
	05/17/95		4.18	8.95	-2.31	4.77	1.70
	07/31/95		6.07	8.46	-1.82	2.39	0.19
	09/07/95		5.23	6.89	-0.25	1.66	1.14
	11/30/95		5.76	7.25	-0.61	1.49	0.64
	01/10/96		4.45	9.00	-2.36	4.55	1.46
	03/25/96		4.19	8.96	-2.32	4.77	1.69
	05/17/96		5.41	7.40	-0.76	1.99	0.91
	07/25/96		5.16	8.41	-1.77	3.25	0.96
	09/16/96		5.75	6.19	0.45	0.44	0.82
OMW-10	05/11/92	7.56	4.76	2.80			2.80
	06/09/92		5.42	2.14			2.14
	07/07/92		5.58	1.98			1.98
	08/11/92		5.83	1.73			1.73
	09/04/92		6.18	1.38			1.38
	10/13/92**		5.30	2.26			2.26
	11/12/92		5.41	2.15			2.15
	12/17/92		4.20	3.36			3.36
	03/18/93		3.93	4.00	3.56	0.07	3.62
	05/14/93		4.83	4.92	2.64	0.09	2.72
	07/13/93		5.64	5.67	1.89	0.03	1.92
	09/30/93		6.36	6.38	1.18	0.02	1.20
	11/10/93		6.55	1.01			1.01
	01/24/94		5.55	2.01			2.01
	03/23/94		4.81	2.75			2.75
	05/02/94		5.06	2.50			2.50
	07/29/94		6.94	0.62			0.62
	09/26/94		6.36	1.20			1.20
	11/15/94		4.01	3.55	0.1		3.55
	01/25/95		NOT GAUGED - WELL COVERED				
	05/09/95		NOT GAUGED - WELL COVERED				
	05/17/95		TRACE	4.64	2.92		2.92
	07/31/95		NOT GAUGED - WELL COVERED				
	09/07/95			6.02	1.54		1.54
	11/30/95		TRACE	7.78	-0.22		-0.22
	01/10/96		TRACE	4.68	2.88		2.88
	03/25/96			4.58	2.98		2.98
	05/17/96			4.75	2.81	0.1	2.81
	07/25/96			5.79	1.77		1.77
	09/16/96			6.33	1.23		1.23

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TABLE 1 (cont.)
Fluid Level Measurements
Union Pacific Railroad
Oakland Fueling Area

Well No.	Date	Well Elev. Above M.S.L. (FT)	Depth to Product (FT)	Depth to Water (FT)	Water Level Elevation (FT)	Product Thickness (FT)	Corr Water Level Elevation* (FT)
ORW-1	06/19/91	6.59	3.91	9.36	-2.77	5.45	1.81
	05/11/92			NOT GAUGED			
	06/09/92			NOT GAUGED			
	07/07/92			NOT GAUGED			
	08/11/92			8.39	-1.80		-1.80
	09/04/92			8.35	-1.76		-1.76
	10/13/92		6.95	8.15	-1.56	1.20	-0.55
	11/12/92			NOT GAUGED			
	12/17/92		8.30	8.35	-1.76	0.05	-1.72
	03/18/93		3.60	7.39	-0.80	3.79	2.38
	05/14/93			8.63	-2.04		-2.04
	07/13/93			8.60	-2.01		-2.01
	09/30/93			NOT GAUGED			
	11/10/93			NOT GAUGED			
	01/24/94			NOT GAUGED			
	03/23/94			NOT GAUGED			
	05/02/94			NOT GAUGED			
	07/29/94			NOT GAUGED			
	09/26/94			NOT GAUGED			
	11/15/94			NOT GAUGED			
	01/25/95			NOT GAUGED			
	05/09/95			NOT GAUGED			
	05/18/95		8.77	9.76	-3.17	0.99	-2.34
	07/31/95		8.35	10.55	-3.96	2.20	-2.11
	09/07/95		8.55	11.03	-4.44	2.48	-2.36
	11/30/95		5.92	5.98	0.61	0.06	0.66
	01/10/96		TRACE	11.20	-4.61		-4.61
	03/25/96			11.20	-4.61		-4.61
	05/17/96			11.40	-4.81		-4.81
	07/25/96		TRACE	10.90	-4.31		-4.31
	09/16/96			9.60	-3.01		-3.01
ORW-2	06/19/91	6.79	4.36	4.38	2.41	0.02	2.43
	05/11/92		3.55	6.34	0.45	2.79	2.79
	06/09/92			NOT GAUGED			
	07/07/92			NOT GAUGED			
	08/11/92			9.30	-2.51		-2.51
	09/04/92			9.31	-2.52		-2.52
	10/13/92		8.20	9.20	-2.41	1.00	-1.57
	11/12/92			NOT GAUGED			
	12/17/92			9.45	-2.66		-2.66
	03/18/93		2.94	7.48	-0.69	4.54	3.12
	05/14/93			8.21	-1.42		-1.42
	07/13/93		9.30	9.41	-2.62	0.11	-2.53
	09/30/93			NOT GAUGED			
	11/10/93			NOT GAUGED			
	01/24/94			NOT GAUGED			
	03/23/94			NOT GAUGED			
	05/02/94			NOT GAUGED			
	07/29/94			NOT GAUGED			
	09/26/94			NOT GAUGED			
	11/15/94			NOT GAUGED			
	01/25/95			NOT GAUGED			
	05/09/95			NOT GAUGED			
	05/18/95		9.55	9.56	-2.77	0.01	-2.76
	07/31/95		9.30	9.45	-2.66	0.15	-2.53
	09/07/95		9.45	9.50	-2.71	0.05	-2.67
	11/30/95		9.66	9.68	-2.89	0.02	-2.87
	01/10/96		9.55	9.60	-2.81	0.05	-2.77
	03/25/96		10.75	11.85	-5.06	1.10	-4.14
	05/17/96		10.60	11.60	-4.81	1.00	-3.97
	07/25/96		11.70	12.30	-5.51	0.60	-5.01
	09/16/96		10.95	12.30	-5.51	1.35	-4.38

TABLE 1 (cont.)
Fluid Level Measurements
Union Pacific Railroad
Oakland Fueling Area

Well No.	Date	Well Elev. Above M.S.L. (FT)	Depth to Product (FT)	Depth to Water (FT)	Water Level Elevation (FT)	Product Thickness (FT)	Corr Water Level Elevation* (FT)
ORW-3	06/19/91	6.30	4.07	4.10	2.20	0.03	2.23
	05/11/92		3.24	5.31	0.99	2.07	2.73
	06/09/92	NOT GAUGED					
	07/07/92	NOT GAUGED					
	08/11/92		8.90	-2.60			-2.60
	09/04/92		8.75	-2.45			-2.45
	10/13/92		8.59	-2.29			-2.29
	11/12/92	NOT GAUGED					
	12/17/92		8.35	-2.05			-2.05
	03/18/93	2.90	5.71	0.59	2.81		2.95
	05/14/93		8.16	-1.86			-1.86
	07/13/93	9.08	9.46	-3.16	0.38		-2.84
	09/30/93	NOT GAUGED					
	11/10/93	NOT GAUGED					
	01/24/94	NOT GAUGED					
	03/23/94	NOT GAUGED					
	05/02/94	NOT GAUGED					
	07/29/94	NOT GAUGED					
	09/26/94	NOT GAUGED					
	11/15/94	NOT GAUGED					
	01/25/95	NOT GAUGED					
	05/09/95	NOT GAUGED					
	05/18/95		9.45	9.48	-3.18	0.03	-3.15
	07/31/95		TRACE	9.68	-3.38		-3.38
	09/07/95		9.57	9.60	-3.30	0.03	-3.27
	11/30/95		TRACE	9.67	-3.37		-3.37
	01/10/96		TRACE	9.55	-3.25		-3.25
	03/25/96		11.55	12.05	-5.75	0.50	-5.33
	05/17/96		11.60	12.10	-5.80	0.50	-5.38
	07/25/96			11.60	-5.30		-5.30
	09/16/96		11.40	11.90	-5.60	0.50	-5.18
OP-1	05/18/95	6.71	3.84	5.05	1.66	1.21	2.68
	07/31/95		5.23	5.35	1.36	0.12	1.46
	09/07/95		5.55	6.13	0.58	0.58	1.07
	11/30/95		5.81	9.36	-2.65	3.55	0.33
	01/10/96		TRACE	4.41	2.30		2.30
	03/25/96			3.78	2.93		2.93
	05/17/96			2.18	4.53		4.53
	07/25/96			3.71	3.00		3.00
	09/16/96			3.15	3.56		3.56
OP-2	05/18/95	7.80	5.15	6.97	0.83	1.82	2.36
	07/31/95		NOT GAUGED				
	09/07/95		6.04	7.85	-0.05	1.81	1.47
	11/30/95		6.85	7.26	0.54	0.41	0.88
	01/10/96		5.70	6.25	1.55	0.55	2.01
	03/25/96		5.00	6.67	1.13	1.67	2.53
	05/17/96		5.30	6.45	1.35	1.15	2.32
	07/25/96		5.97	6.62	1.18	0.65	1.73
	09/16/96		6.25	8.15	-0.35	1.90	1.25
OP-3	05/18/95	6.48	4.88	9.86	-3.38	4.98	0.80
	07/31/95		5.32	8.46	-1.98	3.14	0.66
	09/07/95		5.16	8.22	-1.74	3.06	0.83
	11/30/95		5.75	6.52	-0.04	0.77	0.61
	01/10/96		4.84	10.20	-3.72	5.36	0.78
	03/25/96		5.12	9.84	-3.36	4.72	0.60
	05/17/96		5.03	10.29	-3.81	5.26	0.61
	07/25/96		TRACE	5.61	0.87		0.87
	09/16/96		5.75	9.29	-2.81	3.54	0.16

TABLE 1 (cont.)
Fluid Level Measurements
Union Pacific Railroad
Oakland Fueling Area

Well No.	Date	Well Elev. Above M.S.L. (FT)	Depth to Product (FT)	Depth to Water (FT)	Water Level Elevation (FT)	Product Thickness (FT)	Corr Water Level Elevation* (FT)
OP-4	05/18/95	6.32	3.28	7.15	-0.83	3.87	2.42
	07/31/95		NOT GAUGED				
	09/07/95		4.64	6.17	0.15	1.53	1.44
	11/30/95		5.56	5.75	0.57	0.19	0.73
	01/10/96		3.43	6.45	-0.13	3.02	2.41
	03/25/96		3.11	6.89	-0.57	3.78	2.61
	05/17/96		3.30	6.43	-0.11	3.13	2.52
	07/25/96		4.30	7.58	-1.26	3.28	1.50
	09/16/96		4.71	8.09	-1.77	3.38	1.07
DS-1	11/09/95	6.95		6.17	0.78		0.78
	12/15/95			5.98	0.97		0.97
	01/10/96			4.90	2.05		2.05
	02/16/96			3.69	3.26		3.26
	03/25/96			4.11	2.84		2.84
	05/15/96			4.79	2.16		2.16
	06/13/96			5.06	1.89		1.89
	07/25/96			5.53	1.42		1.42
	08/09/96			5.62	1.33		1.33
	09/16/96			6.00	0.95		0.95
DS-2	11/09/95	8.24		7.98	0.26		0.26
	12/15/95			7.59	0.65		0.65
	01/10/96			8.53	-0.29		-0.29
	02/16/96			6.85	1.39		1.39
	03/25/96			9.51	-1.27		-1.27
	05/15/96			9.47	-1.23		-1.23
	06/13/96			9.29	-1.05		-1.05
	07/25/96			8.63	-0.39		-0.39
	08/09/96			8.72	-0.48		-0.48
	09/16/96			9.13	-0.89		-0.89
DS-3	11/09/95	8.33		8.37	-0.04		-0.04
	12/15/95			7.85	0.48		0.48
	01/10/96			8.75	-0.42		-0.42
	02/16/96			8.75	-0.42		-0.42
	03/25/96			8.66	-0.33		-0.33
	05/15/96			9.10	-0.77		-0.77
	06/13/96			9.03	-0.70		-0.70
	07/25/96			9.62	-1.29		-1.29
	08/09/96			9.81	-1.48		-1.48
	09/16/96			9.13	-0.80		-0.80

* Corrected water level elevation assumes product density of 0.84 g/cm³

** Gauging data for these may have been switched.

M.S.L. = Mean Sea Level

TABLE 2
Analytical Results
Groundwater Monitoring Wells
Union Pacific Railroad
Oakland Fueling Area

Well Number	Date Sampled	Total Petroleum Hydrocarbons (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
OMW-1	05/11/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	08/11/92	0.060	<0.0005	<0.0005	<0.0005	<0.0005
	11/13/92	0.067	<0.0005	0.00061*	<0.0005	<0.0005
	05/14/93	<0.050	<0.0003	<0.0003	<0.0003	<0.0009
	11/10/93	<0.050	<0.0003	<0.0003	<0.0003	<0.0009
	05/02/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	11/15/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	05/17/95	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	11/30/95	0.240	<0.0005	<0.0005	<0.0005	<0.0005
	05/29/96	0.056	<0.0005	<0.0005	<0.0005	<0.0005
OMW-2	05/11/92	4.5	<0.0005	<0.0005	<0.0005	<0.0005
	08/11/92	2.7	<0.0005	<0.0005	<0.0005	<0.0005
	11/13/92	3.4	<0.0005	0.00057*	0.0011	0.0033
	05/14/93	<0.050	<0.0003	<0.0003	<0.0003	<0.0009
	11/10/93	<0.050	<0.0003	<0.0003	<0.0003	<0.0009
	05/02/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	11/16/94	0.26	<0.0005	<0.0005	<0.0005	<0.0005
	05/17/95	0.082	<0.0005	<0.0005	<0.0005	<0.0005
	11/30/95	4.0	<0.0005	<0.0005	<0.0005	<0.0005
	05/29/96	0.58	<0.0005	<0.0005	<0.0005	<0.0005
OMW-3	05/11/92	2.3	.0003J	0.0013	.0003J	0.0034
	08/11/92	5.8	<0.0005	0.00071	<0.0005	.0017
	11/13/92	110	<0.0005	0.00089*	0.0015	.0084
	05/14/93	0.180	<0.0003	0.036	<0.0003	.0027
	11/10/93	1.80	<0.0003	0.0005	<0.0003	<0.0009
	05/02/94	1.80	<0.0005	0.0023	<0.0005	0.00089
	11/15/94	1.20	<0.0005	<0.0005	<0.0005	<0.0005
	05/17/95	0.46	<0.0005	0.0013	<0.0005	<0.0005
	11/30/95	2.40	<0.0005	<0.0005	<0.0005	<0.0005
	05/29/96	2.30	<0.0005	<0.0005	<0.0005	<0.0005
OMW-5	05/11/92	2.1	<0.0005	.0004J	<0.0005	0.0003
	08/11/92	2.1	<0.0005	<0.0005	<0.0005	<0.0005
	11/13/92	4.4	<0.0005	0.00078*	<0.0005	<0.0005
	05/14/93	11	<0.0003	0.0018	<0.0003	<0.0009
	11/10/93	<0.050	<0.0003	0.0006	<0.0003	<0.0009
	05/02/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	11/16/94	0.52	<0.0005	0.0012	0.0014	0.0077
	05/18/95	2.4	<0.0005	<0.0005	<0.0005	0.0017
	11/30/95	13	<0.0005	<0.0005	<0.0005	<0.0005
	05/29/96	5.8	<0.0005	<0.0005	<0.0005	<0.0005

TABLE 2 (cont.)
Analytical Results
Groundwater Monitoring Wells
Union Pacific Railroad
Oakland Fueling Area

Well Number	Date Sampled	Total Petroleum Hydrocarbons (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
OMW-6	05/11/92	0.52	<0.0005	<0.0005	<0.0005	0.0016
	08/11/92	0.55	<0.0005	<0.0005	<0.0005	<0.0005
	11/13/92	6.0	<0.0005	0.00077*	<0.0005	<0.0005
	05/14/93	0.18	<0.0003	<0.0003	<0.0003	<0.0009
	11/10/93	<0.050	<0.0003	<0.0003	<0.0003	<0.0009
	05/02/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	11/16/94	0.46	<0.0005	<0.0005	<0.0005	<0.0005
	05/17/95	1.1	<0.0005	<0.0005	<0.0005	<0.0005
	11/30/95	2.5	<0.0005	<0.0005	<0.0005	<0.0005
	05/29/96	2.3	<0.0005	<0.0005	<0.0005	<0.0005
OMW-8	05/11/92	0.24	<0.0005	<0.0005	<0.0005	<0.0005
	08/11/92	0.22	<0.0005	<0.0005	<0.0005	<0.0005
	11/13/92	0.26	<0.0005	0.00058*	<0.0005	<0.0005
	05/14/93	<0.050	<0.0003	<0.0003	<0.0003	<0.0009
	11/10/93	<0.050	<0.0003	<0.0003	<0.0003	<0.0009
	05/02/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	11/15/94	0.26	<0.0005	<0.0005	<0.0005	<0.0005
	05/17/95	0.26	<0.0005	<0.0005	<0.0005	<0.0005
	11/30/95	1.7	<0.0005	<0.0005	<0.0005	<0.0005
	05/29/96	1.3	<0.0005	<0.0005	<0.0005	<0.0005
OMW-10	05/11/92	2.1	0.033	<0.0005	<0.0005	0.0027
	08/11/92	1.3	0.0096	<0.0005	<0.0005	.00062
	11/13/92	2.8	0.0066	0.00084*	<0.0005	.00062
	05/14/93	***** NOT SAMPLED – Well Contained Product *****				
	11/10/93	2.6	0.0043	0.0011	<0.0003	.00012
	05/02/94	2.6	0.00052	<0.0005	<0.0005	<0.0005
	11/16/94	***** NOT SAMPLED – Well Contained Product *****				
	05/17/95	***** NOT SAMPLED – Well Contained Product *****				
	11/30/95	***** NOT SAMPLED – Well Contained Product *****				
	05/29/96	***** NOT SAMPLED – Well Contained Product *****				

NOTES

J = Estimated value below reporting limit.

Due to the presence of product, recovery wells ORW-1, ORW-2, ORW-3, and monitoring wells OMW-4, OMW-7, and OMW-9, are not sampled.

* 0.00062 mg/L was detected in the Trip Blank.