Quarterly Monitoring Report
Hydrocarbon Recovery System
Union Pacific Railroad Yard
Oakland, California
First Quarter, 1994

Prepared for
Union Pacific Railroad
by

USPCI
Remedial Services
5665 Flatiron Parkway
Boulder, Colorado 80301
April 11, 1994

UNION PACIFIC RAILROAD COMPANY

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File: Oakland, Ca.
Environmental

April 14, 1994

Mr. Safa Toma
East Bay Municipal Utility District
Source Control Division, Mail Slot 702
Post Office Box 24055
Oakland, Ca. 94623-1056

Dear Mr. Toma:

QUARTERLY REPORT for Groundwater Discharge Permit account number 502-51231, for Union Pacific Railroad's Hydrocarbon Recovery System in Oakland, Ca.

Attached is the First Quarter 1994 "Quarterly Monitoring Report" for our Hydrocarbon Recovery System in Oakland.

If you have any questions on the report, please call me at (402) 271-4078.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true , accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Yours truly,

Harry P. Patterson, P.E.
Manager Environmental Site Remediation

CC: Ray Balcon
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QUARTERLY MONITORING REPORT
HYDROCARBON RECOVERY SYSTEM
UNION PACIFIC RAILROAD YARD
OAKLAND, CALIFORNIA
FIRST QUARTER, 1994

Prepared for
Union Pacific Railroad
by

USPCI
Remedial Services
5665 Flatiron Parkway
Boulder, Colorado 80301
Project Number 96199
April 11, 1994

CONTENTS

1. INTRODUCTION

In accordance to the East Bay Municipal Utility District (EBMUD) permit number 502-51231, this report was prepared by USPCI to provide quarterly monitoring information pertaining to the hydrocarbon recovery and treatment system, and the groundwater monitoring wells located in the Union Pacific Railroad (UPRR) Oakland Trailer on Flat Car (TOFC) rail yard at 1717 Middle Harbor Road, Oakland, California. Background information about the site was presented in the report, "**Hydrocarbon Investigation and Remedial Design**", dated June 10, 1991. The results of the hydrocarbon investigation and a conceptual design of the hydrocarbon recovery and treatment system were also presented in the report. The system design was outlined in the, "**Preliminary Design Report**", dated September 5, 1991. As-built information for the groundwater recovery and treatment system have been presented in the "**Hydrocarbon Recovery System, As-Built Construction Report**", dated July 20, 1992. Process changes in the hydrocarbon recovery and treatment system were presented in the letter from UPRR dated March 22, 1993, which represented the permit renewal document.

2. GROUNDWATER RECOVERY AND TREATMENT SYSTEM MONITORING

The recovery of floating non aqueous-phase liquid hydrocarbons as diesel (diesel) is accomplished by depressing the groundwater table with total fluids pumps and creating a cone of depression surrounding the recovery wells. The recovered groundwater is treated and discharged to the EBMUD sanitary sewer. The recovery and treatment system consists of three recovery wells, an oil/water separator, a recovered oil storage tank, and an activated carbon treatment system. The location of the three recovery wells and the water treatment facility are indicated on Figure 1.

2.1 SYSTEM OPERATION

During the operating period of December 1, 1993, to February 25, 1994, the groundwater recovery and treatment system recovered approximately 800 gallons of diesel and treated approximately 183,000 gallons of groundwater. Since start-up on May 12, 1992 until February 25, 1994, the system has recovered approximately 4,200 gallons of diesel. Copies of the field log for the operating period for the Hydrocarbon Recovery System have been included as Appendix A. Previous field logs were submitted with previous reports.

2.2 SYSTEM SAMPLING

On December 28, 1993, January 31, and February 25, 1994, water samples were collected from sampling ports located before, between, and after the granular activated carbon vessels. The samples were analyzed for total petroleum hydrocarbons as diesel (TPHd) using EPA method 8015 modified, and EPA method 8020 for benzene, toluene, ethylbenzene, and xylenes (BTEX). The water samples, collected from between the two granular activated carbon vessels, were used to monitor the breakthrough of organics on the first of two vessels. All analytical results are included as Appendix B.

2.3 ANALYTICAL RESULTS

Analytical results of BTEX and TPHd from the influent to the activated carbon system are indicated in Table 1. The EBMUD discharge limits for BTEX, as well as the analytical results from the sampling of the effluent from the water treatment system are listed in Table 2. A summary of the between carbon results has been included as Table 3.

2.3.1 INFLUENT WATER STREAM TO CARBON UNITS

Influent benzene concentrations of the water stream to the carbon units ranged from below method detection limit of 0.0005 mg/L to 0.013 milligrams per liter (mg/L). Influent toluene concentrations ranged from below the detection limit of 0.0005 to 0.0013 mg/L. Ethylbenzene ranged from below the detection limit of 0.0005 to 0.0077 mg/L. Xylenes ranged from below the detection limit of 0.0005 to 0.021 mg/L. Influent TPHd concentrations ranged from 3.3 to 10 mg/L.

2.3.2 EFFLUENT WATER STREAM FROM CARBON UNITS

Analytical results indicate that BTEX concentrations for the sampling events were below the analytical detection limit of 0.0005 mg/L. All TPHd concentrations were below detection limit of <0.050 mg/L. The effluent was below the discharge limits in all cases. The discharge limits for BTEX are included in Table 2 with a summary of the analytical results.

2.3.3 WATER STREAM BETWEEN CARBON UNITS

BTEX results ranged from below the analytical detection limits of 0.0005 to 0.0017 mg/L for benzene.

2.4 GRANULAR ACTIVATED CARBON USAGE

This section provides an estimate of carbon usage for the first or "lead" vessel. Two 2,000 pound granular activated carbon vessels are connected in series to remove organic compounds dissolved in the recovered groundwater. The second vessel prevents a release of water above the discharge limits once the first carbon vessel is loaded with organics or "breakthrough" occurs.

Table 4 presents the estimated amount of spent carbon (adsorption sites loaded with contaminants) and the expected life of the vessel. The estimate in Table 4 indicates that breakthrough should occur during the middle part of July 1995. As discussed above, future sampling results will confirm the breakthrough of the lead vessel. Sample calculations, that are represented in Table 4, were presented with the "**Hydrocarbon Recovery System Quarterly Monitoring Report, Second Quarter, 1992**".

3. GROUNDWATER MONITORING

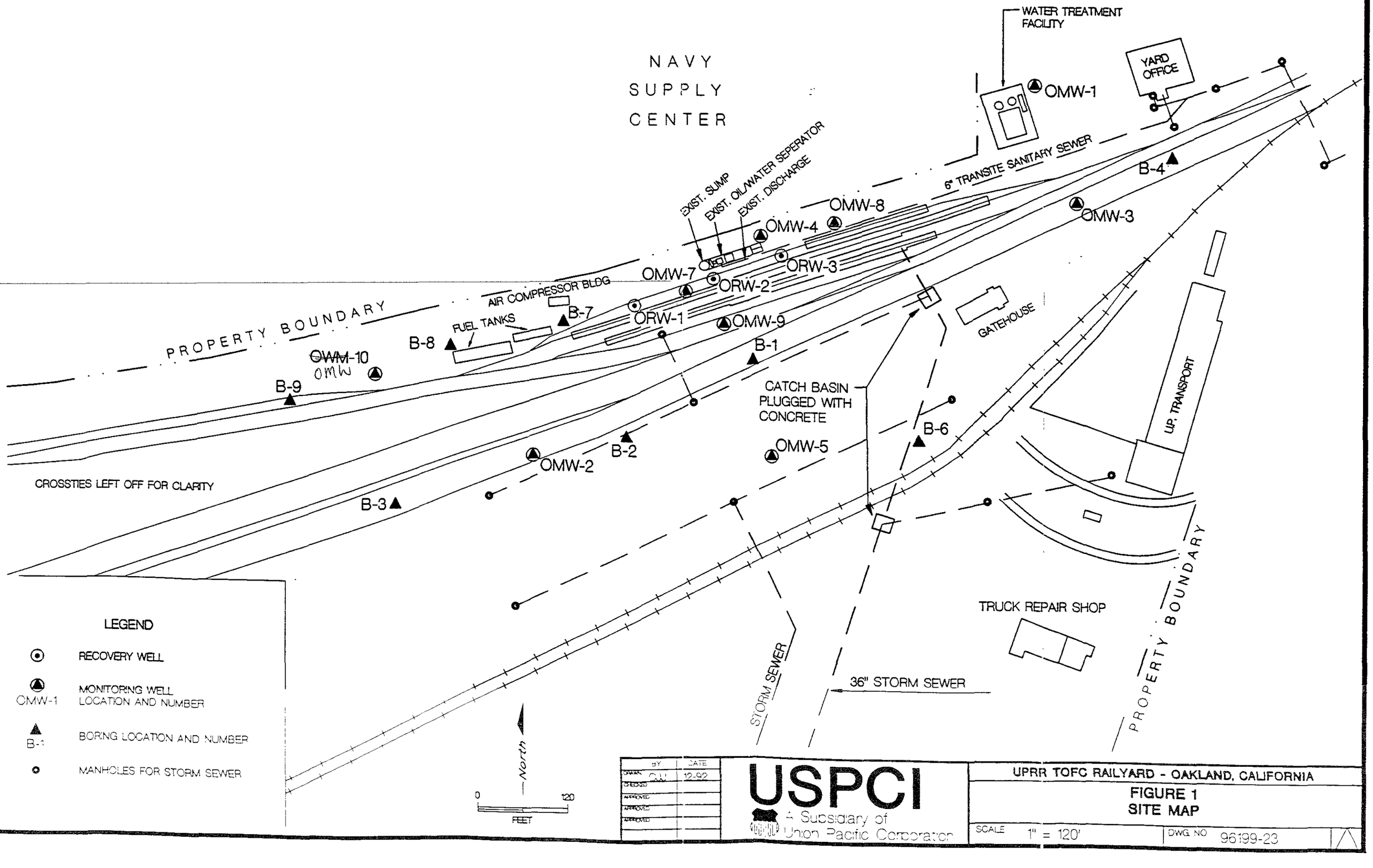
As requested by EBMUD, groundwater monitoring information has been included as part of the quarterly report. The water levels in the monitor wells and recovery wells were measured on January 24, 1994. Results of groundwater elevation measuring activities are presented in Table 5. On november 10, 1993 samples were collected from groundwater monitoring wells at the site. Analytical results are included in Table 6.

A groundwater elevation map was not prepared for this quarter as the groundwater elevation values recovered from the site during the January gauging were deemed not reliable. The elevations appear to have been effected by precipitation infiltration producing elevated values.

4. CONCLUSIONS

Water discharge from the Hydrocarbon Recovery System did not exceed the EBMUD discharge limits during the fourth quarter of 1993.

FIGURE



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USPCI
A Subsidiary of Union Pacific Corporation

UPRR TOFC RAILYARD - OAKLAND, CALIFORNIA

FIGURE 1
SITE MAP

SCALE 1" = 120' | DWG NO 96199-23

TABLES

TABLE 1

Analytical Results
Influent Water Stream to Carbon Units
Hydrocarbon Treatment System
Oakland TOFC

Date Collected	Benzene *(mg/L)*	Toluene *(mg/L)*	Ethylbenzene *(mg/L)*	Xylenes *(mg/L)*	Total Petroleum Hydrocarbons as Diesel *(mg/L)*
05/12/92	0.023	0.022	0.029	0.200	45
05/19/92	<0.002	0.007	0.003	0.064	59
05/27/92	<0.005	<0.005	0.006	0.059	61
06/02/92	<0.005	<0.005	<0.005	0.025	100
07/07/92	<0.005	<0.005	0.005	0.026	200
08/11/92	0.0091	<0.003	0.013	0.051	6.1
09/25/92	0.0085	<0.003	0.0055	0.024	17
11/16/92	<0.050	<0.050	<0.050	<0.050	100
12/04/92	0.0042	<0.001	<0.001	0.009	8.7
02/02/93	0.0083	<0.001	<0.001	0.0012	6.9
03/30/93	0.0095	0.0015	0.0087	0.030	44
04/30/93	0.0007	0.0012	0.001	0.0069	14
05/27/93	0.0054	0.019	0.0092	0.040	120
06/30/93	<0.0003	<0.0003	<0.0003	<0.0009	1.2
07/28/93	0.014	0.0006	0.0054	0.025	2.2
08/31/93	0.012	0.0007	0.0041	0.023	3.2
09/30/93	0.011	0.0007	0.013	0.035	20
10/28/93	0.010	0.0006	0.0098	0.026	6.1
11/30/93	0.0092	<0.0005	0.0012	0.013	31
12/28/93	0.011	<0.0005	0.0041	0.016	10
01/31/94	<0.0005	<0.0005	<0.0005	<0.0005	3.3
02/25/94	0.013	0.0013	0.0077	0.021	9.3

TABLE 2

Analytical Results
Effluent Water Stream from Carbon Units
Hydrocarbon Treatment System
Oakland TOFC

Date Collected	Benzene *(mg/L)*	Toluene *(mg/L)*	Ethylbenzene *(mg/L)*	Xylenes *(mg/L)*	Total Petroleum Hydrocarbons as Diesel *(mg/L)*
EDMUD Discharge Limit	0.005	0.007	0.005	0.008	N/A
05/12/92	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
05/19/92	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
05/27/92	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
06/02/92	<0.0005	<0.0005	<0.0005	<0.0005	0.12
07/07/92	<0.0005	<0.0005	<0.0005	0.0011	18
08/11/92	<0.0005	<0.0005	<0.0005	<0.0005	1.3
09/25/92	<0.001	<0.001	<0.001	0.0014	9.7
11/16/92	<0.0005	<0.0005	<0.0005	<0.0005	0.53
12/04/92	<0.0005	<0.0005	<0.0005	<0.0005	0.24
02/02/93	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
03/30/93	<0.0005	<0.0005	<0.0005	<0.0005	0.074
04/30/93	<0.0003	<0.0003	<0.0003	<0.0009	<0.050
05/27/93	<0.0003	<0.0003	<0.0003	<0.0009	<0.050
06/30/93	<0.0003	<0.0003	<0.0003	<0.0009	<0.050
07/28/93	<0.0003	<0.0003	<0.0003	<0.0009	<0.100
08/31/93	<0.0003	<0.0003	<0.0003	<0.0009	<0.050
09/30/93	<0.0003	<0.0003	<0.0003	<0.0009	<0.050
10/28/93	<0.0003	<0.0003	<0.0003	<0.0009	<0.050
11/30/93	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
12/28/93	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
01/31/94	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
02/25/94	<0.0005	<0.0005	<0.0005	<0.0005	<0.050

N/A – Not Applicable

TABLE 3

Analytical Results
Water Stream Between Carbon Units
Hydrocarbon Treatment System
Oakland TOFC

Date Collected	Benzene *(mg/L)*	Toluene *(mg/L)*	Ethylbenzene *(mg/L)*	Xylenes *(mg/L)*
08/11/92	<0.0005	<0.0005	<0.0005	<0.0005
09/14/92	<0.003	<0.003	<0.003	<0.003
11/06/92	<0.0005	<0.001	<0.0005	<0.0005
12/04/92	<0.003	<0.003	<0.003	<0.003
12/18/92	<0.005	<0.005	<0.005	<0.005
01/20/93	0.0012	0.0005	<0.0005	0.0015
02/02/93	0.00077	<0.0005	<0.0005	<0.0005
02/16/93	0.0043	<0.0005	0.0012	0.0038
03/30/93	<0.0005	<0.0005	<0.0005	<0.0005
04/22/93	<0.0005	<0.0005	<0.0005	<0.0005
04/30/93	<0.0003	<0.0003	<0.0003	<0.0009
05/27/93	<0.003	<0.003	<0.003	<0.009
06/14/93	0.0004	0.0004	0.0004	0.0023
06/30/93	<0.0003	<0.0003	<0.0003	<0.0009
07/13/93	0.0007	0.0004	<0.0003	<0.0009
07/28/93	<0.0003	<0.0003	<0.0003	<0.0009
08/31/93	<0.0003	<0.0003	<0.0003	<0.0009
09/30/93	<0.0003	<0.0003	<0.0003	<0.0009
10/28/93	<0.0003	<0.0003	<0.0003	<0.0009
11/30/93	0.0006	<0.0005	<0.0005	<0.0005
12/28/93	0.0017	<0.0005	<0.0005	0.0007
01/31/94	0.0001	<0.0005	<0.0005	0.0005
02/25/94	<0.0005	<0.0005	<0.0005	<0.0005

TABLE 4

Hydrocarbon Treatment System
Granular Activated Carbon Usage
Oakland TOFC

Date	Time	Volume *(gallons)*	Periodic Flowrate *(gpm)*	Average Flowrate *(gpm)*	Influent Conc–TPH *(mg/l)*	Carbon Used *(pounds)*	Spent Carbon Estimate *(pounds)*	Remaining Pumpable *(gallons)*	Remaining Pumpable *(days)*	Projected Breakthru Date
05/07/92	11:35 PM	2020	1.74	1.74	45.00 *	7.57	7.57	531662.59	212.54	12/05/92
05/12/92	08:30 AM	12980	1.74	1.74	45.00	41.07	48.64	520702.59	207.75	12/05/92
05/19/92	01:30 PM	24990	1.16	1.55	59.00	49.68	98.32	387035.93	173.85	11/08/92
05/27/92	10:50 AM	45350	1.79	1.61	61.00	89.02	187.34	356823.27	154.14	10/28/92
06/02/92	03:00 PM	73150	3.13	1.91	100.00	143.54	330.87	200426.20	72.81	08/13/92
07/07/92	05:35 PM	166500	1.85	1.90	200.00	660.80	991.67	60539.35	22.12	07/29/92
08/11/92	11:56 AM	232370	1.32	1.32	6.10	0.00 +	0.00	1771651.17	935.03	03/04/95
09/25/92	09:55 AM	388390	2.41	1.86	17.00	333.49	333.49	529708.30	197.35	04/10/93
11/16/92	09:55 AM	484380	1.28	1.67	100.00	728.93	1062.42	50662.51	21.07	12/07/92
12/04/92	09:55 AM	518160	1.30	1.58	8.70	205.99	1268.40	454390.86	199.93	06/21/93
02/02/93	02:30 PM	673180	1.79	1.62	6.90	795.82	2064.23	−50297.73	−21.56	01/11/93
03/10/93	03:00 PM	741070	1.31	1.31	30.00 *	0.00 +	0.00	316206.93	167.77	08/24/93
03/30/93	09:00 AM	743950	0.10	1.61	44.00	18.45	18.45	213606.75	92.20	06/30/93
04/30/93	04:00 PM	755900	0.27	1.51	14.00	71.39	89.84	647147.41	297.05	02/21/94
05/27/93	01:40 PM	854610	2.55	1.58	120.00	801.70	891.54	43812.79	19.23	06/15/93
06/30/93	07:30 AM	1007200	3.14	1.68	1.20	1119.23	2010.77	−42559.05	−17.60	06/12/93
07/21/93	07:30 AM	1094630	2.89	2.89	2.20 *	0.00 +	0.00	5785604.28	1389.66	05/10/97
07/28/93	08:30 AM	1125630	3.06	2.97	2.20	143.01	143.01	5371918.68	1254.29	01/02/97
08/31/93	01:55 PM	1256910	2.66	2.87	3.20	564.10	707.10	2571318.13	622.02	05/15/95
09/30/93	04:00 PM	1333050	1.76	2.59	20.00	320.89	1027.99	309301.72	82.86	12/21/93
10/28/93	05:50 PM	1411050	1.93	2.46	6.10	311.80	1339.79	688805.65	194.47	05/10/94
11/30/93	08:00 PM	1475300	1.35	2.27	31.00	260.34	1600.13	82092.50	25.06	12/25/93

TABLE 4 (cont)

Hydrocarbon Treatment System
Granular Activated Carbon Usage
Oakland TOFC

Date	Time	Volume *(gallons)*	Periodic Flowrate *(gpm)*	Average Flowrate *(gpm)*	Influent Conc–TPH *(mg/l)*	Carbon Used *(pounds)*	Spent Carbon Estimate *(pounds)*	Remaining Pumpable *(gallons)*	Remaining Pumpable *(days)*	Projected Breakthru Date
12/28/93	12:00 PM	1526880	1.29	2.13	10.00	201.47	1801.60	126264.94	41.08	02/07/94
01/31/94	03:00 PM	1584340	1.17	2.01	3.30	213.63	2015.23	−29369.09	−10.13	01/20/94
02/07/94	12:00 PM	1595300	1.11	1.11	8.00 *	0.00 +	0.00	1500982.24	941.54	09/05/96
02/25/94	04:00 PM	1658010	2.04	1.58	9.30	231.46	231.46	1141742.40	503.41	07/13/95

* – Concentration estimate

+ – Changed carbon vessel on this date.

TABLE 5

Well Gauging Data
Union Pacific Railyard
Oakland TOFC

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
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
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

TABLE 5

Well Gauging Data
Union Pacific Railyard
Oakland TOFC

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-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 available
	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		3.82	5.73	1.68	1.91	3.28
	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
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			NA	7.62		7.62
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

TABLE 5

Well Gauging Data
Union Pacific Railyard
Oakland TOFC

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
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
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

TABLE 5

Well Gauging Data
Union Pacific Railyard
Oakland TOFC

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-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
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				
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				

TABLE 5

Well Gauging Data
Union Pacific Railyard
Oakland TOFC

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				

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

** Guaging data for these may have been switched.

M.S.L. = Mean Sea Level

TABLE 6

Analytical Results for Oakland TOFC

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
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
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
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
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
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
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

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.

APPENDIX A

FIELD LOGS
GROUNDWATER RECOVERY
AND TREATMENT SYSTEM

PROJECT # 96199

RES JOB # 4117

GROUNDWATER TREATMENT SYSTEM FIELD LOG

UNION PACIFIC RAILROAD - OAKLAND TOFC
1717 MIDDLE HARBOR ROAD

DATE	TIME	FLOW RATE	TOTALIZER SIGNET : NEPTUNE	PRODUCT LEVEL	FILTER INLET	PRESS. OUTLET	PUMP ORW-1	CYCLE ORW-2	COUNT ORW-3	CHLORINE FREE:TOTAL	pH	HARDNESS as $CaCO_3$
[D-M-Y]	[24:00]	[GPM]	[GALLONS:GALLONS]	[INCHES]	[PSIG]	[PSIG]	[CYCLES]	[CYCLES]	[CYCLES]	[PPM]:[PPM]	[pH]	[PPM]
01-MAR94	1300	13.7	166337:1335000	?	4	5				0.5 : 3.0		
25-FEB-94	16:30	OFF	16580/: 1326500	?						>/> 3.0		
22-FEB94	1200	14.6	163997 1303900	42 F	4	5				≥0.4 : ≥0.4		
17-FEB-94	1200	10.3			8	4,5				<0,4 | 0.5		
17-FEB-94	0900	OFF	163084 1290700	31.5	OFF	OFF						

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PROJECT # 96199

RES JOB # 4117

GROUNDWATER TREATMENT SYSTEM FIELD LOG

UNION PACIFIC RAILROAD - OAKLAND TOFC
1717 MIDDLE HARBOR ROAD

OFFICE COPY

DATE	TIME	FLOW RATE	TOTALIZER SIGNET : NEPTUNE	PRODUCT LEVEL	FILTER INLET	PRESS. OUTLET	PUMP ORW-1	CYCLE ORW-2	COUNT ORW-3	CHLORINE FREE:TOTAL	pH	HARDNESS as $CaCO_3$
[D-M-Y]	[24:00]	[GPM]	[GALLONS:GALLONS]	[INCHES]	[PSIG]	[PSIG]	[CYCLES]	[CYCLES]	[CYCLES]	[PPM]:[PPM]	[pH]	[PPM]
08-FEB-94	09:46	15.5	159522 : 1247400	28.5	4.0	5.0				0.4 : 0.6		
07-FEB-94	NEW	CARBON		28.5	DOWN	FOR	NEW	CARBON				
04-FEB-94	16:31	20.3	158911 : 1241000	27.5	9.0	10.0				<0.4 ≈ 0.4		
31-JAN-94	1500	19.3	158434 : 1235100	25.	9.0	8.5				0.8 : ≈3.0		
28-JAN-94	11:30	13.2	158331 : 1233900	24.	9.5	10.5				<0.4 : ≈0.4		
24-JAN-94	10:00	19.7	157227 : 1218600	21.5	10.0	11.0						
21-JAN-94	1800	21.0	156857 : 1213700	20.5	10.0	11.0				DARK		
17-JAN-94	1400	21.1	155576 : 1196800	18.0	10.	10.5				0.5 : 0.8		
13-JAN-94	1400	22.9	154737 : 1185700	17.0	10.0	10.5						
11-JAN-94	10:10	21.8	154416 : 1182100	16.0	10	9.5						
07-JAN-94	17:20	22.5	153769 : 1175600	14.5	9	10				0.5 : >3.!!		
06-JAN-94	13:30	11.8	153327 : 1169700	14.0	10	6				≈0.4		
05 JAN 94	1400	20.1	153225 : 1166800	14	10	10						
04 JAN 94	09:15	9.6	153210 : 1166600	13.5	10	10						
03 JAN 94	08:45	20	153058 1163300	13.5	10	10						
31 DEC 93	18:15	21.7	152894 : 1161200	13.	9.5	10.0						

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PROJECT # 96199

RES JOB # 4117

GROUNDWATER TREATMENT SYSTEM FIELD LOG

UNION PACIFIC RAILROAD - OAKLAND TOFC
1717 MIDDLE HARBOR ROAD

DATE	TIME	FLOW RATE	TOTALIZER SIGNET : NEPTUNE	PRODUCT LEVEL	FILTER INLET	PRESS. OUTLET	PUMP ORW-1	CYCLE ORW-2	COUNT ORW-3	CHLORINE FREE:TOTAL	pH	HARDNESS as $CaCO_3$
[D-M-Y]	[24:00]	[GPM]	[GALLONS:GALLONS]	[INCHES]	[PSIG]	[PSIG]	[CYCLES]	[CYCLES]	[CYCLES]	[PPM]:[PPM]	[pH]	[PPM]
28-DEC	14130	3.0	152688 : 1154100	12.0	10.5	5.5	CDE	---		0.4 : —	—	—
27-DEC-93	17:17	6.2	152361 ; 1149900	12.0	~~10~~ 10.5	~~10~~ 7.5	BW	—	—			
16-DEC-93	16:15	6.4	151684 ; 1116100	0.	10.5	8.5						
14-DEC-93	11:00	7.0	— —	53½	~10	~~8~~						
11-DEC-93	~12:00	0.0	— —	50	~10	~~8~~						
30-NOV-93	20:00	13.7	147530 : 1050400	42	10.5	4.5						
30-NOV-93	16:15	0.0	147494 ; 1050300	42	10	9	BACKWASH	+ NEW	BAGS			
13-NOV-93	18:05	00	— —	—	—	—	—	—	—	—	—	—
12-NOV-93	06:30	0.0	145130 ; 984500	39.5	0	0	—	—	—	—	—	—
09-NOV-93	06:30	23.3	143937 : 971500	27½"	9.5	8.5	BACKWASH	CARBON	V / DOWN 08 & 09	14 HRS -NOV-93	—	—
28-OCT-93	1750	5.0	141105 : 929500	25½"	10	9.5	—	—	—	—	—	—
18-OCT-93	15:00	10.6	137490 : 887800	19."	10.5	6.5	175153	472999	000019	<0.4 : ≥0.4	—	—
06-OCT-93	1600	20.7	134651 ; 855300	19."	9.5	10.0	144864	32859	270999	<0.4 : <0.4	ORW3	RESET 10
30-SEP-93	16:00	11.2	NEW FILTERS —		WILL	BACK	WASH	CARBON	NEXT	VISIT.		
30-SEP-93	15:16	6.0	133305 ; 829700	LOW	10.0	10.0	129647	327997	270998	<0.4 : ≥0.4		
22-SEP-93	12:00	9.5	129574 : 786748	LOW	11.0	9.0				≥0.6 ; >3.0	7.0	

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APPENDIX B

ANALYTICAL RESULTS

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

Riedel Environmental Services, Inc.
Attn: JOHN LIECHTI

Project 4117
Reported 01/05/94

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed	Matrix
90858- 1	STATION C INFLUENT	12/28/93	01/03/94	Water
90858- 2	STATION D MIDFLUENT	12/28/93	01/03/94	Water
90858- 3	STATION E EFFLUENT	12/28/93	01/03/94	Water

RESULTS OF ANALYSIS

Laboratory Number:	90858- 1	90858- 2	90858- 3
Benzene:	11	1.7	ND<0.5
Toluene:	ND<0.5	ND<0.5	ND<0.5
Ethyl Benzene:	4.1	ND<0.5	ND<0.5
Total Xylenes:	16	0.7	ND<0.5
Diesel:	10000	NA	ND<50
Concentration:	ug/L	ug/L	ug/L

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

CERTIFICATE OF ANALYSIS

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS

QA/QC INFORMATION
SET: 90858

NA = ANALYSIS NOT REQUESTED
ND = ANALYSIS NOT DETECTED ABOVE QUANTITATION LIMIT
ug/L = parts per billion (ppb)

Modified EPA SW-846 Method 8015 for Extractable Hydrocarbons:
Minimum Quantitation Limit for Diesel in Water: 50ug/L

EPA SW-846 Method 8020/BTXE
Minimum Quantitation Limit in Water: 0.5ug/L

ANALYTE	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Benzene:	78/73	7%	70-130
Toluene:	81/78	4%	70-130
Ethyl Benzene:	92/89	3%	70-130
Total Xylenes:	101/98	3%	70-130
Diesel:	90/108	18%	70-130

1/6/94

Senior Chemist

Chain of Custody and Analysis Request

90858

page__of__

Section I

Consultant RIEDEL ENVIRONMENTAL
Address 4138 LAKESIDE DR.
RICHMOND CA 94806
Phone No. 222 7810 Fax No. 222 6868
Project Manager SULKA
Alternate Contact LIECHTI
Project No. 4117 P.O. No. 24255

Turn Around Time (circle one)
Same Day 72 Hrs
24 Hrs 48 Hrs
Normal 5 Day

Superior Precision Analytical, Inc.
P.O. Box 1545
Martinez, California 94553
Martinez 1 (510) 229-1512 Martinez 2 (510) 229-0166
SanFrancisco (415) 647-2081

Sampler: MIKE SULKA
Regulatory Agency: NONE

Section II: Analysis Request

Laboratory Sample Identification	S = Soil A = Air W = Water Matrix	mod 8015 - Gas	mod 8020 - BTEX	mod 8015 - Diesel	8010	8240	CAM17	TCLP Metals:	Metals:	418.1 - TPH by IR	O & G	PCBs			Date Sampled	Time Sampled	Number of Containers	Preservative (yes or no)	Sampling Remarks
1 STATION 'C'	W		X	X											28 DEC		3	X	HCl
2 INFLUENT															1993		1	NO	
3																			
4 STATION 'D'	W		X												28 DEC		3	X	HCl
5 MIDFLUENT															1993				
6																			
7 STATION 'E'	W		X	X											28 DEC		3	X	HCl
8 EFFLUENT															1993		1	NO	
9																			
10																			
11																			
12																			

Sampling Remarks
- ☐ Bio-remediation
- ☒ Underground storage tank
- ☐ Monitoring
- ☐ Recent Contamination
- ☐ Unknown Compounds

Relinquished by MIKE SULKA	Date/Time 19 DEC 1993 12:30	Received by	Date/Time	Lab please initial the following:
Organization RIEDEL ENVIRONMENTAL		Organization		Samples Stored in Ice yes 40°
Relinquished by	Date/Time	Received by	Date/Time	Appropriate Containers yes
Organization		Organization		Samples Preserved yes
Relinquished by	Date/Time	Received by	Date/Time 12-19 1230	VOAs without Headspace yes
Organization		Organization SUPER		Comments

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

Riedel Environmental Services, Inc.
Attn: MIKE SULKA

Project 4117
Reported 02/07/94

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed	Matrix
91039- 1	STATION 'C' INFLUENT	01/31/94	02/02/94	Water
91039- 2	STATION 'D' MIDFLUENT	01/31/94	02/02/94	Water
91039- 3	STATION 'E' EFFLUENT	01/31/94	02/02/94	Water

RESULTS OF ANALYSIS

Laboratory Number:	91039- 1	91039- 2	91039- 3
Benzene:	ND<0.5	1	ND<0.5
Toluene:	ND<0.5	ND<0.5	ND<0.5
Ethyl Benzene:	ND<0.5	ND<0.5	ND<0.5
Total Xylenes:	ND<0.5	0.5	ND<0.5
Diesel:	3300	NA	ND<50
Concentration:	ug/L	ug/L	ug/L

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825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

C E R T I F I C A T E O F A N A L Y S I S

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS

QA/QC INFORMATION
SET: 91039

NA = ANALYSIS NOT REQUESTED
ND = ANALYSIS NOT DETECTED ABOVE QUANTITATION LIMIT
ug/L = parts per billion (ppb)

Modified EPA SW-846 Method 8015 for Extractable Hydrocarbons:
Minimum Quantitation Limit for Diesel in Water: 50ug/L

EPA SW-846 Method 8020/BTXE
Minimum Quantitation Limit in Water: 0.5ug/L

ANALYTE	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Benzene:	91/111	20%	70-130
Toluene:	90/84	7%	70-130
Ethyl Benzene:	74/76	3%	70-130
Total Xylenes:	88/90	2%	70-130
Diesel:	86/65	28%	64-142

Afsaneh Salimpour
Senior Chemist

9103;1

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: SUPERIOR PRECISION
Contact: RICH
Phone: ~~222~~ 229 1512
Date: 31-JAN-94
Page: 1 Of: 1

PROJECT INFORMATION

Project Manager: SULKA
Fax Results to: SULKA At: 222 6868
Also to: MAULDIN At: 303 938 5520
Send Report to: SULKA
Sample Team (print): MIKE SULKA
(signatures): Mike Sulka

Project Name: ~~4117~~ UPRR TOFC
Project #: 4117
P.O.#: 24260

Turn Around Time: 10 Day (5 Day) 48 Hr. 24 Hr. Other NORM

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
STATION 'C' INFLUENT		31-JAN 1994	1500	W	HCl / NONE		X		X													4
STATION 'D' MIDFLUENT		31-JAN 1994	1500	W	HCl				X													3
STATION 'E' EFFLUENT		31-JAN 1994	1500	W	HCl / NONE		X		X													4

Case initial: SS
Samples Stored in ice
Appropriate containers
Samples preserved
VOA's without headspace
Comments:
VOC

SPECIAL INSTRUCTIONS:

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

COMMENTS:

RELINQUISHED BY (Sampler): Mike Sulka (Signature) 18:45 (Time)
MIKE SULKA (Printed Name) 31-JAN-94 (Date)
RIEDEL ENVIRONMENTAL (Company)

RECEIVED BY:
(Signature) (Time)
(Printed Name) (Date)
(Company)

RELINQUISHED BY:
(Signature) (Time)
(Printed Name) (Date)
(Company)

RECEIVED BY:
(Signature) (Time)
(Printed Name) (Date)
(Company)

RELINQUISHED BY:
(Signature) (Time)
(Printed Name) (Date)
(Company)

RECEIVED BY (Laboratory): Seyedsyed (Signature) 18 (Time)
SAJ'ID (Printed Name) 1/31/94 (Date)
SPA PIR (Company)

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

Riedel Environmental Services, Inc.
Attn: MIKE SULKA

Project 4117
Reported 03/07/94

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed	Matrix
91196- 1	STATION 'C' INFLUENT	02/25/94	03/03/94	Water
91196- 2	STATION 'D' MIDFLUENT	02/25/94	03/03/94	Water
91196- 3	STATION 'E' EFFLUENT	02/25/94	03/03/94	Water

RESULTS OF ANALYSIS

Laboratory Number:	91196- 1	91196- 2	91196- 3
Benzene:	13	ND<0.5	ND<0.5
Toluene:	1.3	ND<0.5	ND<0.5
Ethyl Benzene:	7.7	ND<0.5	ND<0.5
Total Xylenes:	21	ND<0.5	ND<0.5
Diesel:	9300	NA	ND<50
Concentration:	ug/L	ug/L	ug/L

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

C E R T I F I C A T E O F A N A L Y S I S

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS

QA/QC INFORMATION
SET: 91196

NA = ANALYSIS NOT REQUESTED
ND = ANALYSIS NOT DETECTED ABOVE QUANTITATION LIMIT
ug/L = parts per billion (ppb)

OIL AND GREASE ANALYSIS By Standard Methods Method 5520F:
Minimum Detection Limit in Water: 5000ug/L

Modified EPA SW-846 Method 8015 for Extractable Hydrocarbons:
Minimum Quantitation Limit for Diesel in Water: 50ug/L

EPA SW-846 Method 8015/5030 Total Purgable Petroleum Hydrocarbons:
Minimum Quantitation Limit for Gasoline in Water: 50ug/L

EPA SW-846 Method 8020/BTXE
Minimum Quantitation Limit in Water: 0.5ug/L

ANALYTE	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Benzene:	82/95	15%	75-125
Toluene:	90/103	13%	75-125
Ethyl Benzene:	70/90	25%	75-125
Total Xylenes:	90/95	5%	75-125
Diesel:	113/108	5%	70-130

3/7/94

Senior Chemist

9119

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: SUPERIOR Date: 25-FEB-94
Contact: AFSANEH Page: 1
Phone: 229 1512 Of: 1

PROJECT INFORMATION

Project Manager: SULKA
~~Fax Results to: SULKA At: 2226868~~
Also to: ~~SULKA~~ NO At: FAX
Send Report to: SULKA
Sample Team (print): MIKE SULKA
(signatures): Mike Sulka
Turn Around Time: 10 Day (5 Day) 48 Hr. 24 Hr. Other NORM

Project Name: UPAR TOFC
Project # 4117
P.O # 24264

ANALYSES

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)			CONTAINERS: Number of Containers
STATION 'C' INFLUENT		25-FEB 1994	16:20	W	HCl		X		X													4
STATION 'D' MIDFLUENT		25-FEB 1994	16:16	W	HCl				X													3
STATION 'E' EFFLUENT		25-FEB 1994	16:12	W	HCl		X		X													4

Please Initial:
Samples Stored in ice. yes
Appropriate containers
Samples preserved
VOA's without headspace
Comments: 11 unless

SPECIAL INSTRUCTIONS:

NO FAX NECESSARY

SAMPLE RECEIPT

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

COMMENTS:

RELINQUISHED BY (Sampler):

Mike Sulka 1815
(Signature) (Time)
MIKE SULKA 25-FEB-94
(Printed Name) (Date)
RIEDEL ENVIRONMENTAL
(Company)

RECEIVED BY:

(Signature) (Time)
(Printed Name) (Date)
(Company)

RELINQUISHED BY:

(Signature) (Time)
(Printed Name) (Date)
(Company)

RECEIVED BY:

(Signature) (Time)
(Printed Name) (Date)
(Company)

RELINQUISHED BY:

(Signature) (Time)
(Printed Name) (Date)
(Company)

RECEIVED BY (Laboratory):

6:15 pm
(Signature) (Time)
R Venega S 2-25-94
(Printed Name) (Date)
Super
(Company)

log in as recieved
mm - 28-'94