REMEDIAL SERVICES

Quarterly Monitoring Report
Hydrocarbon Recovery System
Union Pacific Railroad Yard
Oakland, California
Fourth Quarter, 1993

January 10, 1994

CC: Ray Balcon
California Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, Ca. 94612

Jeff Asay - Law - Los Angeles
Joe Beardon - Supt. Stockton, Ca.
Jerry Everett - Room 1200
Avery Grimes - Room 930

File: Oakland, Ca.
Environmental

January 10, 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 Fourth Quarter 1993 "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,

H P Patterson

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

QUARTERLY MONITORING REPORT
HYDROCARBON RECOVERY SYSTEM
UNION PACIFIC RAILROAD YARD
OAKLAND, CALIFORNIA
FOURTH QUARTER, 1993

Prepared for
Union Pacific Railroad
by

USPCI
Remedial Services
5665 Flatiron Parkway
Boulder, Colorado 80301
Project Number 96199
January 10, 1994

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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 in 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 to 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 September 1 to November 30, 1993, the groundwater recovery and treatment system recovered approximately 700 gallons of diesel and treated more than 303,000 gallons of groundwater. Since start-up on May 12, 1992 until November 30, 1993, the system has recovered approximately 3,400 gallons of diesel. Copies of the field log for the Hydrocarbon Recovery System have been included as Appendix A.

Phase

2.2 SYSTEM SAMPLING

On September 30, October 28, and November 30, 1993, 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 laboratory results for the effluent between the two carbon units have 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 0.0092 to 0.011 milligrams per liter (mg/L). Influent toluene concentrations ranged from below the detection limit of 0.0005 to 0.0007 mg/L. Ethylbenzene ranged from 0.0012 to 0.013 mg/L. Xylenes ranged from 0.013 to 0.035 mg/L. Influent TPHd concentrations ranged from 6.1 to 31 mg/L.

2.3.2 EFFLUENT WATER STREAM FROM CARBON UNITS

Analytical results indicate that BTEX concentrations for all sampling events were below the analytical detection limit, which ranged from 0.0003 to 0.0009 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

All BTEX results were below the analytical detection limits (ranged from 0.0003 to 0.0009 mg/L) with the exception of benzene that was detected at 0.0006 mg/L during the November 1993 sampling event. This detection of benzene indicates that the first carbon vessel in series may be loaded with organics. Analytical results from samples collected in December 1993 will confirm this.

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 later part of March 1994. 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

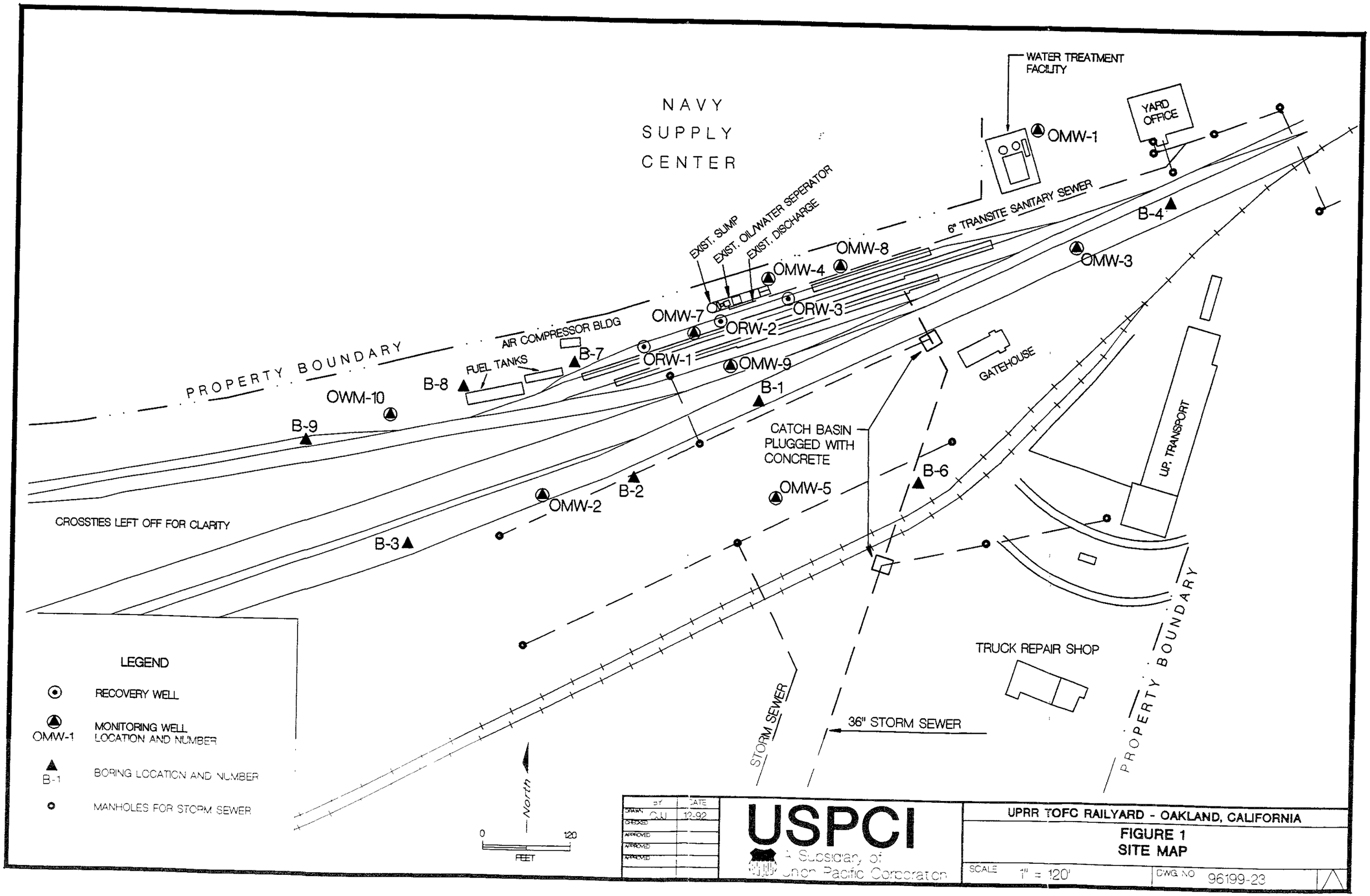
As requested by EBMUD, groundwater monitoring information has been included as part of the quarterly report. The water levels in the monitor wells and recovery wells were measured on September 30 and November 10, 1993. Results of groundwater elevation measuring activities are presented in Table 5. Due to the consistent operation of the groundwater recovery wells, ORW-1, ORW-2, and ORW-3, groundwater elevation measurements are not collected on a regular basis.

On November 10, 1993, groundwater samples were collected from monitoring wells OMW-1, OMW-2, OMW-3, OMW-5, OMW-6, OMW-8, and OMW-10 (see Table 6). Groundwater samples are not collected from wells when diesel is present. The samples were analyzed for TPHd and BTEX. The analytical results are included in Appendix B. The next sampling event is scheduled for May 1994. The location of groundwater monitoring wells are indicated on Figure 1. To provide a detailed view of monitoring wells in the spill area, OMW-6 has been omitted from Figure 1. The location of OMW-6 is indicated on Figure 2 in the "**Hydrocarbon Investigation and Remedial Design**" report, dated June 10, 1993.

4. CONCLUSIONS

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

FIGURES



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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

(or 9.2 ppb

(or 31,000 ppb

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

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

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	1.82	6.10	0.00 +	0.00	1968501.30	752.30	09/02/94
09/25/92	09:55 AM	388390	2.41	1.89	17.00	300.14	300.14	600342.76	220.41	05/03/93
11/16/92	09:55 AM	484380	1.28	1.82	100.00	656.04	956.18	62670.37	23.86	12/09/92
12/04/92	09:55 AM	518160	1.30	1.77	8.70	185.39	1141.56	592412.22	232.20	07/24/93
02/02/93	02:30 PM	673180	1.79	1.77	6.90	716.24	1857.80	123729.20	48.46	03/22/93
03/10/93	03:00 PM	741070	1.31	1.73	44.00 *	0.00 +	0.00	272905.86	109.26	06/27/93
03/30/93	09:00 AM	743950	0.10	1.61	44.00	21.11	21.11	270025.86	116.55	07/24/93
04/30/93	04:00 PM	755900	0.27	1.51	14.00	67.67	88.78	819631.28	376.22	05/11/94
05/27/93	01:40 PM	854610	2.55	1.58	120.00	912.47	1001.25	49970.27	21.94	06/17/93
06/30/93	07:30 AM	1007200	3.14	1.68	1.20	1134.53	2135.78	–679320.55	–280.92	09/22/92
07/21/93	07:30 AM	1094630	2.89	1.75	2.20 *	0.00 +	0.00	5458117.25	2165.15	06/25/99
07/28/93	08:30 AM	1125630	3.06	1.82	2.20	11.36	11.36	5427117.25	2067.14	03/26/99
08/31/93	01:55 PM	1256910	2.66	1.87	3.20	55.39	66.75	3627213.11	1348.85	05/10/97
09/30/93	04:00 PM	1333050	1.76	1.86	20.00	87.50	154.26	554085.80	206.66	04/24/94
10/28/93	05:50 PM	1411050	1.93	1.87	6.10	87.56	241.82	1730491.14	644.31	08/03/95
11/30/93	08:00 PM	1475300	1.35	1.84	31.00	115.40	357.21	318166.67	119.97	03/29/94

* – 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
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
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
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

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)
	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
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
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
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
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

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)
	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
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
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
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				

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-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				
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				

* 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 as diesel (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 PRESS. INLET	FILTER PRESS. OUTLET	PUMP CYCLE COUNT ORW-1	PUMP CYCLE COUNT ORW-2	PUMP CYCLE 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]
14-SEP-93	12:22	0(OFF)	126344 : 749600	LOW	0(OFF)	0(OFF)						
10-SEP-93			JOHN L. ON-	SITE :	NOT LOGGED-		SEE MAINT. RECORDS					
09-SEP-93			JOHN L. ON-	SITE :	NOT LOGGED -		SEE MAINT. RECORDS					
03-SEP-93	18:55	0 (OFF)	126287 : 749000	LOW	0(OFF)	0(OFF)						
03-SEP-93			JOHN L. ON	SITE :	NOT LOGGED -		SEE MAINT. RECORDS					
01-SEP-93			RESPOND TO FULL OIL	TANK	CALL							
31-AUG-93	15:30		126194 : 748100	39½	9.0	6.0	331523	209432				
30-AUG-93	13:55	24.1	125691 : 743300	39	9.0	6.0	25664			<0.4 : 0.4		
13-AUG-93	11:00	24.8	119325 : 673195	33	10.0	8.0				≃0.6 : ≃3.0	7.0	
6-AUG-93	10:00	26.5	116387 : 642204	30	9.0	8.2				<0.2 : <0.2		
3-AUG-93	13:30	26.4	115318 : 631419	29	8.0	7.0				>3.0 : >3.0		
28-JUL-93	08:30	20.0	112563 : 603542	27	7.5	5.5				<0.4 : <0.4	7.0	
21-JUL-93	07:30	7.0	109463 : 570315	25	11.5	7.5				<0.4 : <0.4	≃7.0	
19-JUL-93	13:00	9.8	———	—	10.0	11.5						
19-JUL-93	12:30	0.0	108661 : 561300	23½	11.0	7.5				<0.4 : 0.6	≃7.0	
13-JUL-93	14:30	17.2	106165 : 530300	22"	9.5	9.5						

MAIL COPIES MONTHLY TO: USPCI: 5665 FLATIRON PARKWAY: BOULDER, COLORADO 80301: ATTENTION MR. DENTON MAULDIN

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]
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	0.0	— —	—	—	—	—	—	—	—	—	—
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 / DOWN 14 HRS 08 & 09-NOV-93				—	—
28-OCT-93	1750	5.0	141105 : 924500	25½"	10	9.5	—	—	—	—	—	—
18-OCT-93	13:00	10.6	137490 : 887800	19."	10.5	6.5	175153	372999	000019	<0.4:≃0.4	—	—
06-OCT-93	16:00	20.7	134651: 855300	≯ 19."	9.5	10.0	144864	362859	270999	<0.4:<0.4	OFW-3	RESET TO ≃ CRO
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	<04:≃04		
22-SEP-93	12:00	9.5	129574 : 786748	LOW	11.0	9.0				≃0.6 : >3.0	7.0	

MAIL COPIES MONTHLY TO: USPCI: 5665 FLATIRON PARKWAY: BOULDER, COLORADO 80301: ATTENTION MR. DENTON MAULDIN

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: MIKE SULKA

Project 4117
Reported 10/07/93

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed	Matrix
90145- 1	STATION 'C' INFLUENT	09/30/93	10/07/93	Water
90145- 2	STATION 'D' MIDFLUENT	09/30/93	10/07/93	Water
90145- 3	STATION 'E' EFFLUENT	09/30/93	10/07/93	Water

RESULTS OF ANALYSIS

Laboratory Number:	90145- 1	90145- 2	90145- 3
Benzene:	11	ND<0.3	ND<0.3
Toluene:	0.7	ND<0.3	ND<0.3
Ethyl Benzene:	13	ND<0.3	ND<0.3
Total Xylenes:	35	ND<0.9	ND<0.9
Diesel:	20000	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: 90145

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: 0.3ug/L

ANALYTE	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Benzene:	90/88	2%	75-125
Toluene:	107/89	18%	75-125
Ethyl Benzene:	111/97	13%	75-125
Total Xylenes:	106/90	16%	75-125
Diesel:	101/100	1%	75-125

10/7/93

Senior Chemist

Section I

Chain of Custody and Analysis Request

page 1 of 1

Consultant RIEDEL ENVIRONMENTAL SERVICES
Address 4138 LAKESIDE DRIVE
RICHMOND CA 94806
Phone No. 510 222 7810 Fax No. 510 222 6868
Project Manager M. SULKA
Alternate Contact J. LIECHTI
Project No. 4117 P.O. No. SEE QUOTE 93-00127

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 P.O. #

Laboratory Sample Identification	S = Soil A = Air W = Water Matrix	mod 8015 - Gas	mod ~~8015~~ BTEX 8020	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)
1 STATION 'C' INFLUE	W		X	X											30 SEP	15:20	4	
2																		
3 STATION 'D' MIDFL	W		X												30 SEP	15:20	3	
4																		
5 STATION 'E' EFFLN	W		X	X											30 SEP	15:20	4	
6																		
7																		
8																		
9																		
10																		
11																		
12																		

Please Initial
Samples Stored in ice 10° C
Appropriate Containers Yes
Samples preserved Yes
VOA's without headspace Yes
Comments: OK

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

Relinquished by Mike Sulka	Date/Time 30-SEP-1993 1800	Received by	Date/Time	Lab please initial the following:
Organization RES		Organization		Samples Stored in Ice
Relinquished by	Date/Time	Received by	Date/Time	Appropriate Containers
Organization		Organization		Samples Preserved
Relinquished by	Date/Time	Received by	Date/Time 09/30/93 600 PM	VOAs without Headspace
Organization		Organization		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 11/08/93

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed	Matrix
90423- 1	STATION "C" INFLUENT	10/28/93	11/05/93	Water
90423- 2	STATION "D" MIDFLUENT	10/28/93	11/05/93	Water
90423- 3	STATION "E" EFFFLUENT	10/28/93	11/05/93	Water

RESULTS OF ANALYSIS

Laboratory Number:	90423- 1	90423- 2	90423- 3
Benzene:	10	ND<0.3	ND<0.3
Toluene:	0.6	ND<0.3	ND<0.3
Ethyl Benzene:	9.8	ND<0.3	ND<0.3
Total Xylenes:	26	ND<0.9	ND<0.9
Diesel:	6100	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: 90423

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: 0.3ug/L

ANALYTE	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Benzene:	81/85	5%	75-125
Toluene:	88/90	2%	75-125
Ethyl Benzene:	92/95	3%	75-125
Total Xylenes:	96/99	3%	75-125
Diesel:	119/118	1%	75-125

Afsaneh Salimpour
Senior Chemist

90-123

Section I

Chain of Custody and Analysis Request

page 1 of 1

Consultant RIEDER ENVIRONMENTAL
Address 4138 LAKESIDE DR
RICHMOND CA
Phone No. 5102227810 Fax No. 5102226868
Project Manager SCILKA OK TO INFORM RMS
Alternate Contact LIECHTI - MAULDIN (USR1)
Project No. 4117 P.O. No. QUOTE 93001227

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 LEICHTI
Regulatory Agency: N-A

Section II: Analysis Request

Laboratory Sample Identification	S = Soil A = Air W = Water Matrix	mod 8015 - Gas	mod 8015 - 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' INFLUENT	W		X	X											28-OCT	1740	4	YES	3/4
2																			
3 STATION 'D' MIDFLUENT	W		X												28 OCT	1740	3	YES	3/3
4																			
5 STATION 'E' EFFLUENT	W		X	X											28 OCT	1740	4	YES	3/4
6																			
7																			
8																			
9																			
10																			
11																			
12																			

Please initial:
Samples Stored in ice yes
Appropriate containers 4
Samples preserved
VOA's without headspace
Comments

Relinquished by MIKE SULKS	Date/Time 28-OCT-93 11:00 pm	Received by	Date/Time
Organization RES		Organization	
Relinquished by	Date/Time	Received by	Date/Time
Organization		Organization	
Relinquished by	Date/Time	Received by RAMOS	Date/Time

Lab please initial the following:
Samples Stored in Ice
Appropriate Containers
Samples Preserved
VOAs without Headspace
Comments

Superior Precision Analytical, Inc.
1555 Burke, Unit I • San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

U.S. POLLUTION CONTROL, INC.
Attn: DENTON MAULDIN

Project 96199
Reported 17-November-1993

PURGEABLE AROMATIC HYDROCARBONS - by EPA SW-846 Methods 5030/8020.

Chronology

Laboratory Number 57300

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
MW-1	11/10/93	11/10/93	/ /	11/15/93		1
MW-6	11/10/93	11/10/93	/ /	11/16/93		2
MW-5	11/10/93	11/10/93	/ /	11/16/93		3
MW-3	11/10/93	11/10/93	/ /	11/16/93		4
MW-2	11/10/93	11/10/93	/ /	11/15/93		5
MW-8	11/10/93	11/10/93	/ /	11/16/93		6
MW-10	11/10/93	11/10/93	/ /	11/16/93		7
TRIPBLNK	11/10/93	11/10/93	/ /	11/14/93		8

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U.S. POLLUTION CONTROL, INC.
Attn: DENTON MAULDIN

Project 96199
Reported 17-November-1993

PURGEABLE AROMATIC HYDROCARBONS - by EPA SW-846 Methods 5030/8020.

Laboratory Number	Sample Identification	Matrix
57300- 1	MW-1	Water
57300- 2	MW-6	Water
57300- 3	MW-5	Water
57300- 4	MW-3	Water
57300- 5	MW-2	Water
57300- 6	MW-8	Water
57300- 7	MW-10	Water
57300- 8	TRIPBLNK	Water

RESULTS OF ANALYSIS

Laboratory Number:	57300- 1	57300- 2	57300- 3	57300- 4	57300- 5
Benzene:	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.3
Toluene:	ND<0.3	ND<0.3	0.6	0.5	ND<0.3
Ethyl Benzene:	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.3
Total Xylenes:	ND<0.9	ND<0.9	ND<0.9	ND<0.9	ND<0.9
Concentration:	ug/L	ug/L	ug/L	ug/L	ug/L
-- Surrogate % Recoveries --					
Trifluorotoluene (SS):	104	104	118	113	104

Laboratory Number:	57300- 6	57300- 7	57300- 8
Benzene:	ND<0.3	4.3	ND<0.3
Toluene:	ND<0.3	1.1	ND<0.3
Ethyl Benzene:	ND<0.3	ND<0.3	ND<0.3
Total Xylenes:	ND<0.9	1.2	ND<0.9
Concentration:	ug/L	ug/L	ug/L
-- Surrogate % Recoveries --			
Trifluorotoluene (SS):	113	103	102

Superior Precision Analytical, Inc.
1555 Burke, Unit I • San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

PURGEABLE AROMATIC HYDROCARBONS - by EPA SW-846 Methods 5030/8020.
Quality Assurance and Control Data - Water

Laboratory Number 57300

Compound	Method Blank (ug/L)	RL (ug/L)	Spike Recovery (%)	Limits (%)	RPD (%)
Benzene:	ND<0.3	0.3	91/90	75-125	1%
Toluene:	ND<0.3	0.3	92/91	75-125	1%
Ethyl Benzene:	ND<0.3	0.3	93/92	75-125	1%
Total Xylenes:	ND<0.9	0.9	95/93	75-125	2%
Trifluorotoluene (SS):	101			70-130	

Definitions:
ND = Not Detected
RPD = Relative Percent Difference
RL = Reporting Limit
ug/L = Parts per billion (ppb)
QC File No. 57300

Senior Chemist
Account Manager

Superior Precision Analytical, Inc.
1555 Burke, Unit I • San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

U.S. POLLUTION CONTROL, INC.
Attn: DENTON MAULDIN

Project 96199
Reported 17-November-1993

TOTAL PETROLEUM HYDROCARBONS AS DIESEL
BY EPA METHOD 8015M

Chronology

Laboratory Number 57300

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
MW-1	11/10/93	11/10/93	11/13/93	11/16/93		1
MW-6	11/10/93	11/10/93	11/13/93	11/17/93		2
MW-5	11/10/93	11/10/93	11/13/93	11/17/93		3
MW-3	11/10/93	11/10/93	11/13/93	11/17/93		4
MW-2	11/10/93	11/10/93	11/13/93	11/17/93		5
MW-8	11/10/93	11/10/93	11/13/93	11/17/93		6
MW-10	11/10/93	11/10/93	11/13/93	11/17/93		7

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U.S. POLLUTION CONTROL, INC.
Attn: DENTON MAULDIN

Project 96199
Reported 17-November-1993

TOTAL PETROLEUM HYDROCARBONS AS DIESEL

Laboratory Number	Sample Identification	Matrix
57300- 1	MW-1	Water
57300- 2	MW-6	Water
57300- 3	MW-5	Water
57300- 4	MW-3	Water
57300- 5	MW-2	Water
57300- 6	MW-8	Water
57300- 7	MW-10	Water

RESULTS OF ANALYSIS

Laboratory Number:	57300- 1	57300- 2	57300- 3	57300- 4	57300- 5
Diesel:	ND<50	ND<50	ND<50	1800	ND<50
Concentration:	ug/L	ug/L	ug/L	ug/L	ug/L

Laboratory Number:	57300- 6	57300- 7
Diesel:	ND<50	2600
Concentration:	ug/L	ug/L

Superior Precision Analytical, Inc.
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TOTAL PETROLEUM HYDROCARBONS AS DIESEL
Quality Assurance and Control Data - Water

Laboratory Number 57300

Compound	Method Blank (ug/L)	RL (ug/L)	Spike Recovery (%)	Limits (%)	RPD (%)
Diesel:	ND<50	50	101/98	50-149	3%

Definitions:
ND = Not Detected
RPD = Relative Percent Difference
RL = Reporting Limit
ug/L = Parts per billion (ppb)
QC File No. 57300

Senior Chemist
Account Manager

47300

№ 000164

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

REPORT TO
CONTACT Denton Mauldin
COMPANY USPCI
ADDRESS 5665 Flatiron Pkwy
CITY Boulder ST. CO ZIP 80301
PHONE (303) 938-5539 FAX (303) 938-5520

BILL TO
CONTACT same as report
COMPANY refer to PO# 96199
ADDRESS
CITY ST. ZIP
PHONE PO #

CHAIN OF CUSTODY RECORD

PROJ. NO. 96199
PROJECT NAME Oakland TOFC
SAMPLERS (SIGNATURE) [signature]

STANDARD TURNAROUND ✓
RUSH TURNAROUND (specify required date)

CUSTOMER SAMPLE I.D.	DATE	TIME	MATRIX	# CONTAINERS	TPHd 8015M	BTEX-8020	LABORATORY SAMPLE I.D.	REMARKS
MW-1	11/10/93	9:08	GW	4	✓	✓		
MW-6	↓	10:10	↓	5	✓	✓		
MW-5	↓	10:30	↓	5	✓	✓		
MW-3	↓	11:20	↓	5	✓	✓		
MW-2	↓	12:20	↓	5	✓	✓		
MW-8	↓	12:40	↓	5	✓	✓		
MW-10	↓	1:00	↓	5	✓	✓		
Trip Blank	→			3		✓		

Please initial: RB
Samples Stored in ice ✓ 2°
Appropriate containers ✓
Samples preserved ✓
VOA's without headspace ✓
Comments:

RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	COURIER
[signature]	11/10/93			

RELINQUISHED BY	DATE / TIME	RECEIVED BY	DATE / TIME	AIRBILL NO
		Omm A Nwosu	11/10/93	

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1517 / fax (510) 229-1526

Riedel Environmental Services, Inc.

Attn: MIKE BULKA

Project 4117
Reported 12/08/93

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed	Matrix
90672- 1	STATION 'C' INF	11/30/93	12/07/93	Water
90672- 2	STATION 'D' MID	11/30/93	12/07/93	Water
90672- 3	STATION 'E' EFF	11/30/93	12/06/93	Water

RESULTS OF ANALYSIS

Laboratory Number:	90672- 1	90672- 2	90672- 3
Benzene:	9.2	0.6	ND<0.5
Toluene:	ND<0.5	ND<0.5	ND<0.5
Ethyl Benzene:	1.2	ND<0.5	ND<0.5
Total Xylenes:	13	ND<0.5	ND<0.5
Diesel:	31000	NA	ND<50
Concentration:	ug/L	ug/L	ug/L

90672

DEC 28 '93 11:01

510 222 6868 PAGE.003

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: 30-NOV-93
Contact: _____ Page: 1
Phone: 229 1512 Of: 1

PROJECT INFORMATION

Project Manager: SULKA
Fax Results to: SULKA At: 2226868
Also to: _____ At: _____
Send Report to: SULKA
Sample Team (print): SULKA
(signatures): Sulka
Turn Around Time: 10 Day (5 Day) 48 Hr. 24 Hr. Other _____

Project Name: UPRR TOFC
Project #: 4117
P.O.#: 25857

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)			Number of Containers
STATION 'C' INFLUENT		30-NOV 93	1920	W	HCl/NO		X		X													4
STATION 'D' MIDEFLUENT		30-NOV 93	1920	W	HCL/NO				X													3
STATION 'E' EFFLUENT		30-NOV 93	1920	W	HCl/NO		X		X													4

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):
Mike Sulka 09 50
(Signature) (Time)
MIKE SULKA 01-DEC-93
(Printed Name) (Date)
RIEDEL ENVIRONMENTAL
(Company)

RECEIVED BY:
Rodger Ames
(Signature) (Time)
Rodger Ames
(Printed Name) (Date)
SPA MTZ 12/1/93
(Company) 9:50 AM

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