# SEMI-ANNUAL MONITORING REPORT
# HYDROCARBON RECOVERY SYSTEM
# UNION PACIFIC RAILROAD YARD
# OAKLAND, CALIFORNIA
# DECEMBER 1996 TO JUNE 1997

1717 Middle Harbor Rd
Oakland 94607
Stid 4020

STID 4020


Prepared for
Union Pacific Railroad
by

Consulting Services
Laidlaw Environmental Services, Inc.
5665 Flatiron Parkway
Boulder, Colorado 80301
Project Number 96199
July 29, 1997

UNION PACIFIC RAILROAD COMPANY

K. R. (KEN) WELCH
Assistant Vice President
Environmental Management

Mailing Address
Room 930
1416 Dodge Street
Omaha, Nebraska 68179
Fax No. (402) 271-4461

G. (GLENN) THOMAS
Director-Environmental Operations-South
S. W. (STEVE) BERKI
Director-Environmental Operations-Central
L. A. (LANNY) SCHMID
Director-Environmental Operations-West
B. A. (BROCK) NELSON
Director-Environmental Operations-East
R. L. (RICK) EADES
Director-Environmental Site Remediation

File: Oakland, Ca.
Environmental

July 30, 1997

Mr. Raymond A. Maxwell
East Bay Municipal Utility District
Source Control Division, Mail Slot 702
375 Eleventh Street
Post Office Box 24055
Oakland, Ca. 94623-1055

Dear Mr. Maxwell:

Semi-Annual Monitoring Report for Groundwater Discharge Permit account number 502-51231, for Union Pacific Railroad's Hydrocarbon Recovery System in Oakland, Ca.

Attached is the Semi-Annual (December 1996 to June 1997) 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

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

CC: Ms. Jennifer Eberle
Alameda County Dept of Environmental Health
1131 Harbor Bay Parkway, Room 250
Alameda, California 94502-6577

Mr. John Prall
Port of Oakland
530 Water Street
Oakland, Ca. 94607

Ms. Jami Matanky
American President Line
1111 Broadway
Oakland, California 94607

Jeff Asay - Law - Los Angeles
Lanny Schmid - Room 930
Denton Mauldin - USPCI

# SEMI-ANNUAL MONITORING REPORT
# HYDROCARBON RECOVERY SYSTEM
# UNION PACIFIC RAILROAD YARD
# OAKLAND, CALIFORNIA
# DECEMBER 1996 TO JUNE 1997

Prepared for
Union Pacific Railroad
by

Consulting Services
Laidlaw Environmental Services, Inc.
5665 Flatiron Parkway
Boulder, Colorado 80301
Project Number 96199
July 29, 1997

# SEMI-ANNUAL MONITORING REPORT
# HYDROCARBON RECOVERY SYSTEM
# UNION PACIFIC RAILROAD YARD
# OAKLAND, CALIFORNIA
# DECEMBER 1996 TO JUNE 1997

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

for submittal to:
Ms. Jennifer Eberle
Alameda County
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502-6577

Prepared by:
Consulting Services
Laidlaw Environmental Services, Inc.
5665 Flatiron Parkway
Boulder, Colorado 80301

Denton Mauldin
Project Engineer


Sam Marquis, R.G. 5110
Project Hydrogeologist

July 29, 1997

# TABLE OF CONTENTS

## FIGURES



## TABLES



## APPENDICES

# 1. INTRODUCTION

This report presents the results from the semi-annual monitoring program conducted at the Union Pacific Railroad (UPRR) at the fueling area of Oakland trailer-on-flat-car (TOFC) railyard at 1717 Middle Harbor Road in Oakland, California for the period of December 1, 1996 to June 30, 1997. The report was prepared by Consulting Services of Laidlaw Environmental Services, Inc. (Laidlaw) for UPRR in accordance with the East Bay Municipal Utility District (EBMUD) permit number 502-51231. The purpose of this report is to provide semi-annual monitoring information pertaining to the hydrocarbon recovery and groundwater treatment system and the groundwater monitoring wells at the fueling area. The objective of the monitoring program is to evaluate the distribution and movement of petroleum hydrocarbons in groundwater and the effectiveness of the hydrocarbon recovery system.

This report also contains quarterly groundwater monitoring information requested in a letter from Alameda County Department of Environmental Health (ACDEH), dated September 21, 1994.

# 2. BACKGROUND INFORMATION

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 (described below) 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 (system) was installed to remove diesel on the groundwater near the fueling area. Operation of the system commenced on May 12, 1992.

The results from prior investigations and environmental engineering activities conducted by Laidlaw have been documented in previous reports. Background information about the site was presented in the report, *Hydrocarbon Investigation and Remediation Design*, dated June 10, 1991. The results of the hydrocarbon investigation and a conceptual design of the system were also presented in this report. 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*, dated July 20, 1992. Process changes to the system were presented in a letter from UPRR dated March 22, 1993 to the EBMUD, which represented the permit renewal application.

On March 14, 1997, Laidlaw submitted the *Additional Remediation Workplan* to ACDEH, which

proposed the recovery of total fluids (water and diesel) from groundwater monitoring well OMW-9 and piezometer OP-4 and treatment at the existing system. On March 21, 1997, ACDEH approved the workplan. On June 24 and 25, 1997, Burns & McDonnell implemented the workplan. The two pumps in OMW-9 and OP-4 were started on June 26, 1997. Additional operational data from the new recovery wells will be included in monitoring report for the third quarter of 1997. A report of field activities will be submitted under a separate cover.

# 3. CURRENT ACTIVITIES

The current activities at the site consist of performing the system and groundwater monitoring activities described in the following sections.

## 3.1 System Monitoring

Samples are collected from the water stream of the system to assess the performance of the system and to compare discharge concentrations with limits established by the EBMUD.

At varying frequencies, water samples are collected from sampling ports located before (influent), between (midfluent), and after (effluent) the two granular activated carbon vessels. On a quarterly basis, samples are collected from the influent and effluent water streams through 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 the influent and midfluent of the water stream through the carbon vessels. The influent samples are analyzed for TPH-D and used for estimating the loading of contaminants on the first vessel. Midfluent water samples are collected and analyzed for BTEX and used to monitor for the breakthrough of organics from the first vessel.

System maintenance consists of changing particulate filters (typically weekly), back-washing 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. In a letter dated March 21, 1997, ACDEH requested that the groundwater monitoring and sampling activities, normally scheduled during the second and fourth quarters of each year, be changed to performing the field activities during the first and third quarters of each year.

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 with diesel. The groundwater elevations in these wells are corrected to account for the diesel overlying the water column in the well. This 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.

During a sampling event, groundwater samples are collected from wells in which diesel is absent. The samples are submitted to a state-certified laboratory and analyzed for BTEX and TPH-D. Diesel is first recovered by hand using disposable bailers from wells containing measurable amounts of diesel.

# 4. SYSTEM MONITORING

The recovery of diesel is accomplished by depressing the groundwater table with total-fluids pumps to recover diesel and water and creating a cone of depression surrounding the recovery wells. The recovery and treatment system consists of five recovery wells, a diesel/water separator, a recovered diesel storage tank, and an activated carbon treatment system. The recovered groundwater is treated and discharged to the EBMUD sanitary sewer. The locations of the five recovery wells (ORW-1, ORW-2, ORW-3, OMW-9, and OP-4) and the water treatment facility are indicated on Figure 2.

## 4.1 System Operation

During the operating period of December 1, 1996 to June 30, 1997, the groundwater recovery and treatment system treated approximately 680,000 gallons of groundwater. Since start-up on May 12, 1992, until June 30, 1997, the system has recovered approximately 5,480,000 gallons of water and 10,400 gallons of diesel (Table 7). With exception of the month of June 1997, recovery well operation was normal throughout this operational period with only minor down time for required periodic maintenance.

On June 2, 1997, the air compressor which supplies pressurized air to the recovery pumps became inoperable. The compressor resumed operation on June 13, 1997, but the controllers for the recovery pumps in OMW-1, OMW-2, and OMW-3 were damaged by the compressor malfunction. The controllers are currently being repaired and will be reinstalled during the month of July. The recovery pumps in OMW-1, OMW-2, and OMW-3 have not been operational since June 2, 1997.

Combined pumping rates for ORW-1, ORW-2, and ORW-3 averaged approximately 2.5 gallons per minute (gpm) for the semi-annual period. The combined pumping rates of OMW-9 and OP-4

averaged approximately 2.7 gpm from June 27 to June 30, 1997. Copies of the field logs for the hydrocarbon recovery system have been included as Appendix A.

## 4.2 Analytical Results

Analytical results of BTEX and TPH-D from the influent to the activated carbon system are presented 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 results from the samples collected between carbon vessels are included as Table 3. Laboratory analytical reports from the system sampling are included in Appendix B.

### 4.2.1 Influent Water Stream To Carbon Units

During the January 14 and April 4, 1997 sampling events for BTEX, analytical results from the influent water stream to the carbon units indicated that benzene ranged from 0.003 to 0.0061 milligrams per liter (mg/l) and xylenes were detected at 0.0039 mg/l in January of 1997. Toluene and ethylbenzene were below the method detection limit (MDL) of 0.0005 mg/l during both events and xylenes were below the MDL of 0.001 mg/l in April of 1997. Influent TPH-D concentrations ranged from 8.5 to 22 mg/l during the months of December 1996 through May 1997.

### 4.2.2 Effluent Water Stream From Carbon Units

Analytical results indicate that all BTEX concentrations in the effluent samples were below the MDLs of 0.0005 mg/l for benzene, toluene, and ethylbenzene and 0.001 mg/l for xylenes during the January 11 and April 4, 1997 sampling events. The effluent TPH-D concentrations were below the MDL of 0.050 mg/l for the two sampling events.

### 4.2.3 Water Stream Between Carbon Units

Analytical results indicate that all BTEX concentrations in the midfluent samples were below the MDLs of 0.0005 mg/l for benzene, toluene, and ethylbenzene and 0.001 mg/l for xylenes during the months of December 1996 through May 1997.

## 4.3 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 "lead" carbon vessel was replaced with fresh activated carbon on December 19, 1996, as noted in the table. Estimates and analytical results (Table 3) indicate that breakthrough occurred in the lead vessel in November 1996. The methodologies for performing calculations, that are represented in Table 4, were originally presented in the *Hydrocarbon Recovery System Quarterly Monitoring Report, Second Quarter, 1992.*

# 5. GROUNDWATER MONITORING

The following sections present information about the fluid levels and sampling results for the November 1996 sampling event. Fluid-level information and an evaluation of changes in the potentiometric surfaces for the January and March 1997 monitoring events were included in the *First Quarter 1997 Monitoring Report*, and submitted to ACDEH on April 30, 1997. Historical fluid levels and groundwater sampling results are presented in Tables 5 and 6, respectively.

## 5.1 Fluid-Level Measurements

Corrected groundwater elevations decreased in thirteen of the fourteen monitoring wells and piezometers between March and May, 1997. The average change in corrected groundwater elevations was a decrease of approximately 0.7 feet. The largest decrease was 1.46 feet in monitoring well OMW-1. Monitoring well OMW-6 exhibited a groundwater elevation increases of 0.38 feet.

Fluid levels measured in May 1997 were used to generate the potentiometric surface map presented in Figure 3. Groundwater depressions created by the recovery wells (ORW-1, ORW-2, and ORW-3 ) are evident on the potentiometric surface map. The contours lines show an increased hydraulic gradient or convergent flow towards each individual recovery well. The increased flow towards the recovery well network indicates that groundwater and diesel within the area of influence of the wells tend to be recovered from the portion of the site where diesel is present. Groundwater flow outside the influence of the recovery wells has historically been to the south towards the Oakland Estuary.

The presence of diesel was observed in monitoring wells OMW-4, OMW-7, and OMW-9, piezometers OP-1, OP-2, OP-3, and OP-4, and recovery wells OMW-1, OMW-2, and OMW-3 during the May 1997 event. Compared to the previous event (March 1997), the measured thicknesses of diesel decreased in OMW-4, OMW-9, OP-3, OP-4, ORW-1, and OMW-2. The largest change in measurable diesel thickness was 3.1 feet in OP-3. Figure 3 illustrates the diesel thickness across the site as measured in monitoring wells and piezometers during the November 1996 sampling event.

### 5.2 GROUNDWATER SAMPLING

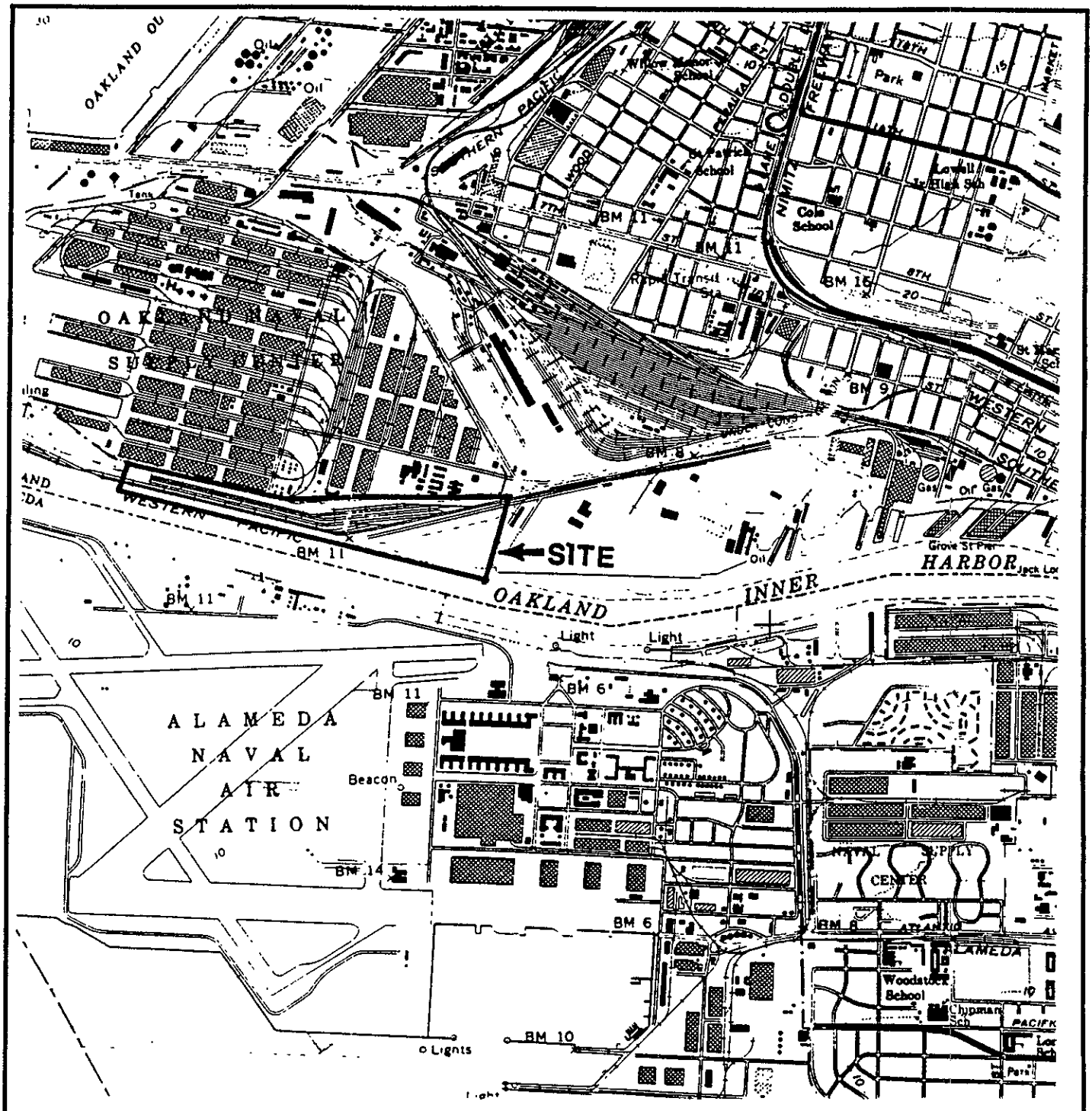
The most recent semi-annual groundwater sampling event was conducted on November 12, 1996. A discussion of the groundwater analytical results from this event was included with the monitoring report that was submitted for the fourth quarter of 1996. The analytical results are included in Table 2. The next sampling event is scheduled for August 1997.

## 6. CONCLUSIONS

The following conclusions are made from the system and groundwater monitoring data collected from December 1, 1996 to June 30, 1997:

- Water discharge from the system did not exceed the EBMUD discharge limits during the monitoring period.
- The potentiometric surface indicates groundwater depression in the locations of the recovery wells.
- The potentiometric surface in the area of the recovery wells is consistent with previous monitoring events.
- Fluid level measurements in the area of the recovery system indicate that drawdown is occurring in the vicinity of each recovery well and that the diesel plume is being controlled.
- The system has removed 10,400 gallons of diesel between the start-up on May 12, 1992 and June 30, 1997.
- The system has removed diesel consistently and effectively over its operational life.

# FIGURES




# USPCI

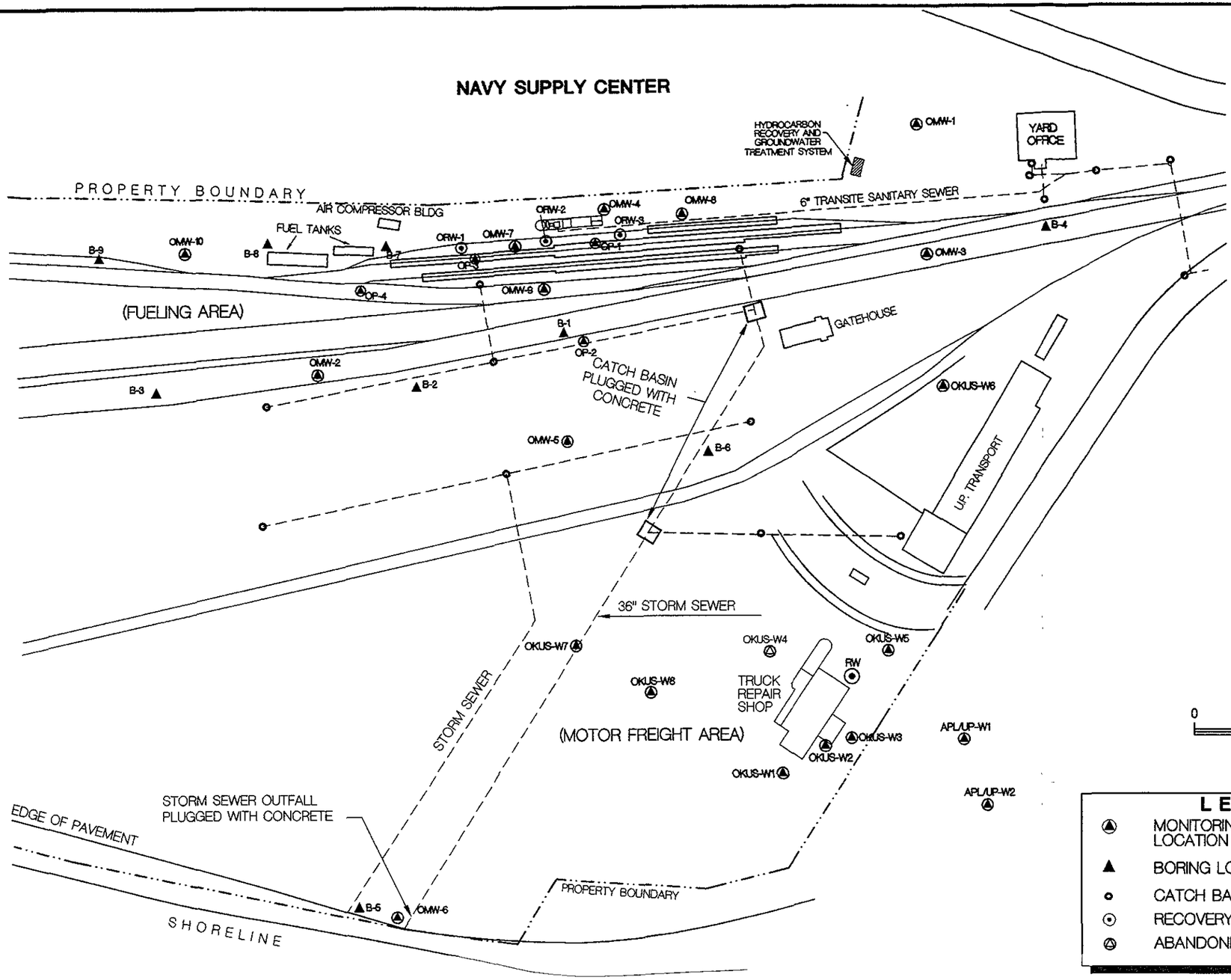
A LAIDLAW COMPANY

UPRR TOFC RAILYARD - OAKLAND, CALIFORNIA

FIGURE 1
SITE LOCATION MAP

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

## NAVY SUPPLY CENTER




**LEGEND**

- MONITORING WELL OR PIEZOMETER LOCATION AND NUMBER
- BORING LOCATION AND NUMBER
- CATCH BASIN FOR STORM SEWER
- RECOVERY WELLS
- ABANDONED WELL

| | DATE |
|---|---|
| DRAWN WRB | 6/21/97 |
| CHECKED | |
| APPROVED | |
| APPROVED | |
| APPROVED | |

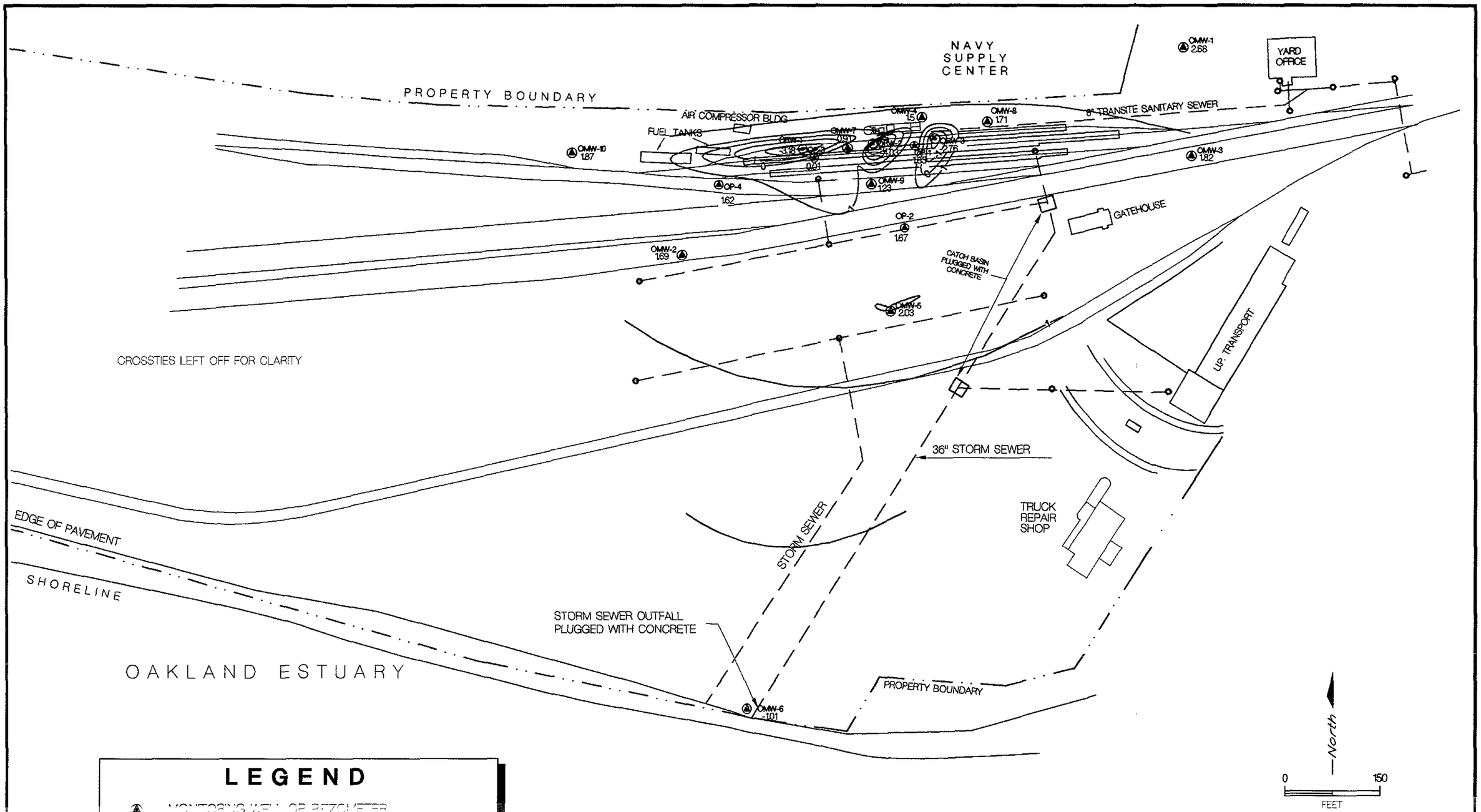
LAIDLAW ENVIRONMENTAL SERVICES

UPRR TOFC RAILYARD - OAKLAND, CALIFORNIA

FIGURE 2
SITE VICINITY MAP

SCALE 1" = 150'

DWG. NO. 96120-940




## LEGEND

- MONITORING WELL OR PIEZOMETER LOCATION AND NUMBER
- CATCH BASIN FOR STORM SEWER
- RECOVERY WELLS
- GROUNDWATER ELEVATION CONTOUR

| BY | DATE |
|---|---|
| DRAWN WRB | 7/15/97 |
| CHECKED | |
| APPROVED | |
| APPROVED | |
| APPROVED | |

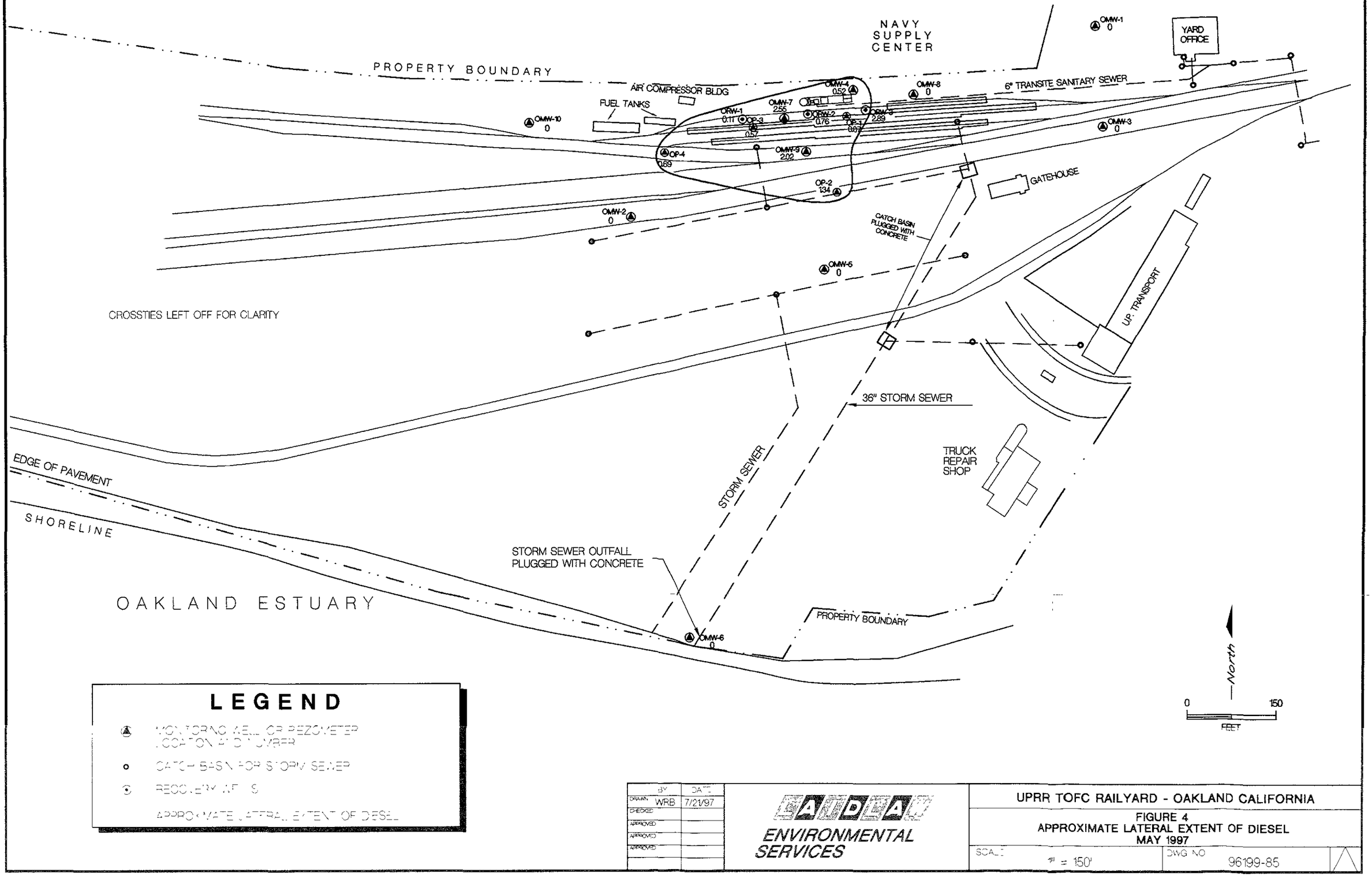
BARGAR ENVIRONMENTAL SERVICES

UPRR TOFC RAILYARD - OAKLAND CALIFORNIA

FIGURE 3
POTENTIOMETRIC SURFACE MAP
MAY 1997

SCALE 1" = 150'

DWG NO 96199-84




| BY | DATE |
|---|---|
| DRAWN WRB | 7/21/97 |
| CHECKED | |
| APPROVED | |
| APPROVED | |
| APPROVED | |

ENVIRONMENTAL SERVICES

UPRR TOFC RAILYARD - OAKLAND CALIFORNIA

FIGURE 4
APPROXIMATE LATERAL EXTENT OF DIESEL
MAY 1997

SCALE 1" = 150'

DWG NO 96199-85

# TABLES

# TABLE 1
## Analytical Results
## Influent Water Stream to Carbon Units
## Hydrocarbon Treatment System
## Oakland Fueling Area

| Date Collected | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | Xylenes (mg/L) | Total Petroleum Hydrocarbons as Diesel (mg/L) |
|---|---|---|---|---|---|
| 01/05/95 | NA | NA | NA | NA | 140 |
| 01/25/95 | <0.03 | <0.03 | <0.03 | <0.03 | 550 |
| 04/12/95 | 0.0015 | <0.0003 | <0.0003 | 0.0023 | 3.7 |
| 05/29/95 | NA | NA | NA | NA | <0.02* |
| 06/30/95 | NA | NA | NA | NA | 25 |
| 07/19/95 | 0.011 | 0.0006 | 0.005 | 0.015 | 13 |
| 08/08/95 | NA | NA | NA | NA | 11 |
| 09/08/95 | NA | NA | NA | NA | 11 |
| 10/13/95 | 0.009 | 0.0006 | 0.010 | 0.020 | 66 |
| 11/22/95 | NA | NA | NA | NA | 38 |
| 12/15/95 | NA | NA | NA | NA | 19 |
| 01/08/96 | 0.013 | <0.0005 | 0.010 | 0.021 | <0.05 |
| 02/12/96 | NA | NA | NA | NA | 56 |
| 03/12/96 | NA | NA | NA | NA | 42 |
| 04/10/96 | 0.0097 | <0.0005 | 0.0067 | 0.010 | 36 |
| 05/13/96 | NA | NA | NA | NA | 14 |
| 06/13/96 | NA | NA | NA | NA | 18 |
| 07/17/96 | <0.0005 | <0.0005 | <0.0005 | <0.002 | 9.7 |
| 08/19/96 | NA | NA | NA | NA | 14 |
| 09/16/96 | NA | NA | NA | NA | 14 |
| 10/17/96 | <0.0005 | <0.0005 | <0.0005 | <0.001 | 11 |
| 11/25/96 | NA | NA | NA | NA | 13 |
| 12/13/96 | NA | NA | NA | NA | 14 |
| 01/14/97 | 0.0061 | <0.0005 | <0.0005 | 0.0039 | 22 |
| 02/11/97 | NA | NA | NA | NA | 13 |
| 03/10/97 | NA | NA | NA | NA | 16 |
| 04/04/97 | 0.003 | <0.0005 | <0.0005 | <0.001 | 8.7 |
| 05/15/97 | NA | NA | NA | NA | 8.5 |

NA – Not Analyzed
*Unknown hydrocarbon in the Diesel range reported concentration of 14 mg/L

# TABLE 2
## Analytical Results
## Effluent Water Stream from Carbon Units
## Hydrocarbon Treatment System
## Oakland Fueling Area

| 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 | 0.005 | 0.005 | 0.005 | 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 |
| 03/30/94 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.050 |
| 05/03/94 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.050 |
| 06/01/94 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.050 |
| 07/29/94 | <0.0005 | <0.0005 | <0.0005 | 0.0007 | <0.050 |
| 10/27/94 | <0.0005 | <0.0005 | <0.0005 | 0.0006 | <0.050 |
| 01/25/95 | <0.03 | <0.03 | <0.03 | <0.03 | 470 |
| 04/12/95 | <0.0003 | <0.0003 | <0.0003 | <0.0003 | <0.050 |
| 07/19/95 | <0.0005 | <0.0005 | <0.0005 | <0.002 | 1.5 |
| 10/13/95 | <0.0005 | <0.0005 | <0.0005 | <0.002 | <0.050 |
| 01/08/96 | <0.0005 | <0.0005 | <0.0005 | <0.002 | 36 |
| 04/10/96 | <0.0005 | <0.0005 | <0.0005 | <0.002 | 1.8 |
| 07/17/96 | <0.0005 | <0.0005 | <0.0005 | <0.002 | 0.12 |
| 10/17/96 | <0.0005 | <0.0005 | <0.0005 | <0.001 | <0.050 |
| 01/11/97 | <0.0005 | <0.0005 | <0.0005 | <0.001 | <0.050 |
| 04/04/97 | <0.0005 | <0.0005 | <0.0005 | <0.001 | <0.050 |

* -- Discharge limits updated on July 1, 1996.
N/A – Not Applicable

F:\SHARE\CONSULT\OAKFA\TAB2.WK1

# TABLE 3
## Analytical Results
## Water Stream Between Carbon Units
## Hydrocarbon Treatment System
## Oakland Fueling Area

| Date Collected | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | Xylenes (mg/L) |
|---|---|---|---|---|
| 01/05/95 | 0.0048 | 0.0035 | <0.003 | 0.015 |
| 01/25/95 | <0.03 | <0.03 | <0.03 | <0.03 |
| 04/12/95 | 0.0013 | <0.0003 | <0.0003 | <0.0003 |
| 05/29/95 | 0.0032 | <0.0005 | <0.0005 | <0.0005 |
| 06/30/95 | 0.002 | <0.0005 | <0.0005 | <0.002 |
| 07/19/95 | 0.002 | <0.0005 | <0.0005 | <0.002 |
| 08/08/95 | <0.0005 | <0.0005 | <0.0005 | <0.002 |
| 09/08/95 | <0.0005 | 0.0008 | <0.0005 | <0.002 |
| 11/22/95 | <0.0005 | <0.0005 | <0.0005 | <0.002 |
| 12/15/95 | <0.0005 | <0.0005 | <0.0005 | <0.002 |
| 01/08/96 | 0.0008 | <0.0005 | <0.0005 | <0.002 |
| 02/12/96 | 0.0012 | 0.0005 | <0.0005 | <0.002 |
| 03/12/96 | <0.0005 | <0.0005 | <0.0005 | <0.002 |
| 04/10/96 | 0.0018 | <0.0005 | 0.0005 | <0.002 |
| 05/13/96 | <0.0005 | <0.0005 | <0.0005 | <0.002 |
| 06/13/96 | <0.0005 | <0.0005 | <0.0005 | <0.002 |
| 07/17/96 | <0.0005 | <0.0005 | <0.0005 | <0.002 |
| 08/19/96 | <0.0005 | <0.0005 | <0.0005 | <0.001 |
| 09/16/96 | <0.0005 | <0.0005 | <0.0005 | <0.001 |
| 10/17/96 | <0.0005 | <0.0005 | <0.0005 | <0.001 |
| 11/25/96 | 0.023 | 0.0037 | <0.0005 | 0.031 |
| 12/13/96 | <0.0005 | <0.0005 | <0.0005 | <0.001 |
| 01/14/97 | <0.0005 | <0.0005 | <0.0005 | <0.001 |
| 02/11/97 | <0.0005 | <0.0005 | <0.0005 | <0.001 |
| 03/10/97 | <0.0005 | <0.0005 | <0.0005 | <0.001 |
| 04/04/97 | <0.0005 | <0.0005 | <0.0005 | <0.001 |
| 05/15/97 | <0.0005 | <0.0005 | <0.0005 | <0.001 |

# TABLE 4
## Hydrocarbon Treatment System
## Granular Activated Carbon Usage
## Oakland Fueling Area

| Date | Time | Volume (gallons) | Periodic Flowrate (gpm) | Average Flowrate (gpm) | Inft Conc TPHd (mg/l) | Carbon Used (pounds) | Spent Carbon (pounds) | Remaining Pumpable (gallons) | Remaining Pumpable (days) | Projected Breakthru Date |
|---|---|---|---|---|---|---|---|---|---|---|
| 01/25/95 | 01:30 PM | 2468180 | 2.11 | 1.44 | 35 ** | 812 | 812 | 203706 | 99 | May-95 |
| 04/12/95 | 10:50 AM | 2549270 | 0.73 | 1.20 | 3.7 | 246 | 1059 | 1527342 | 883 | Sep-97 |
| 05/29/95 | 03:30 PM | 2732640 | 2.70 | 1.58 | 0 | 418 | 1476 | 1527342 | 673 | Apr-97 |
| 06/30/95 | 02:00 PM | 2830380 | 2.13 | 1.69 | 25 | 259 | 1736 | 63424 | 26 | Jul-95 |
| 07/19/95 | 02:30 PM | 2882550 | 1.90 | 1.72 | 13 | 134 | 1870 | 59968 | 24 | Aug-95 |
| 07/21/95 | 11:00 AM | 2890500 | 2.98 | 2.98 | 12 * | 0 + | 0 | 1000655 | 233 | Mar-96 |
| 08/08/95 | 04:00 PM | 2986700 | 3.67 | 3.32 | 11 | 184 | 184 | 991051 | 207 | Mar-96 |
| 09/08/95 | 02:00 PM | 3108110 | 2.73 | 3.12 | 11 | 229 | 413 | 865962 | 192 | Mar-96 |
| 10/13/95 | 10:30 AM | 3206500 | 1.96 | 2.83 | 66 | 410 | 823 | 107058 | 26 | Nov-95 |
| 11/22/95 | 03:30 PM | 3318600 | 1.94 | 2.65 | 38 | 515 | 1338 | 104523 | 27 | Dec-95 |
| 12/15/95 | 08:00 AM | 3369800 | 1.57 | 2.47 | 19 | 223 | 1562 | 138533 | 39 | Jan-96 |
| 01/08/96 | 11:45 AM | 3554790 | 5.32 | 2.88 | 0.05 | 691 | 2253 | 255074 | 62 | Mar-96 |
| 02/12/96 | 08:00 AM | 3714500 | 3.18 | 2.92 | 56 | 708 | 2961 | 4150 | 1 | Feb-96 |
| 03/12/96 | 11:00 AM | 3814170 | 2.38 | 2.86 | 42 | 470 | 3432 | 2610 | 1 | Mar-96 |
| 04/10/96 | 08:00 AM | 3927670 | 2.73 | 2.84 | 36 | 550 | 3982 | 3011 | 1 | Apr-96 |
| 05/06/96 | 08:00 AM | 4035290 | 2.87 | 2.87 | 25 * | 0 + | 0 | 480314 | 116 | Aug-96 |
| 05/13/96 | 08:00 AM | 4055530 | 2.69 | 2.78 | 14 | 66 | 66 | 829513 | 207 | Dec-96 |
| 06/13/96 | 07:00 AM | 4172140 | 2.62 | 2.73 | 18 | 369 | 435 | 522088 | 133 | Oct-96 |
| 07/17/96 | 07:50 AM | 4343300 | 3.49 | 2.92 | 9.7 | 475 | 910 | 674587 | 161 | Dec-96 |
| 08/19/96 | 08:00 AM | 4478300 | 2.84 | 2.90 | 14 | 363 | 1273 | 311757 | 75 | Nov-96 |
| 09/16/96 | 10:00 AM | 4556200 | 1.93 | 2.74 | 14 | 205 | 1478 | 223934 | 57 | Nov-96 |
| 10/17/96 | 02:55 PM | 4645700 | 1.99 | 2.63 | 11 | 225 | 1703 | 162148 | 43 | Nov-96 |
| 11/25/96 | 10:25 AM | 4781700 | 2.43 | 2.61 | 13 | 336 | 2039 | -18021 | -5 | Nov-96 |
| 12/13/96 | 09:35 AM | 4829600 | 1.85 | 2.52 | 14 | 118 | 2157 | -67181 | -18 | Nov-96 |
| 12/19/96 | 09:40 AM | 4840900 | 1.31 | 2.40 | 17 * | 0 + | 0 | 706345 | 204 | Jul-97 |
| 01/14/97 | 01:00 PM | 4914200 | 1.95 | 2.36 | 22 | 191 | 191 | 493805 | 145 | Jun-97 |
| 02/11/97 | 02:30 PM | 5072700 | 3.92 | 2.49 | 13 | 406 | 597 | 648010 | 181 | Aug-97 |
| 03/10/97 | 10:00 AM | 5186800 | 2.96 | 2.53 | 16 | 293 | 890 | 416413 | 114 | Jul-97 |
| 04/04/97 | 11:00 AM | 5288500 | 2.82 | 2.55 | 8.7 | 253 | 1144 | 590973 | 161 | Sep-97 |
| 05/15/97 | 07:30 AM | 5435800 | 2.50 | 2.54 | 8.5 | 356 | 1500 | 353139 | 96 | Aug-97 |
| 06/02/97 | 11:00 AM | 5470200 | 1.32 | 2.47 | 8.5 * | 81 | 1581 | 295873 | 83 | Aug-97 |
| 06/26/97 | 01:30 PM | 5470200 | 0.00 | 2.32 | 8.5 * | 0 | 1581 | 295873 | 88 | Sep-97 |
| 06/30/97 | 11:25 AM | 5484800 | 2.59 | 2.34 | 8.5 * | 33 | 1614 | 272647 | 81 | Sep-97 |

* – Concentration estimate ** – Concentration represents the average estimated value from January to the next sampling event.

+ – Changed carbon vessel on this date.

# TABLE 5
## 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 | | 8.79 | | | | | |
| | 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 |
| | 11/12/96 | | | 7.51 | 1.28 | | 1.28 |
| | 01/20/97 | | | 4.26 | 4.53 | | 4.53 |
| | 03/06/97 | | | 4.65 | 4.14 | | 4.14 |
| | 05/20/97 | | | 6.11 | 2.68 | | 2.68 |
| OMW-2 | | 5.88 | | | | | |
| | 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 |
| | 11/12/96 | | | 4.93 | 0.95 | | 0.95 |
| | 01/20/97 | | | 2.44 | 3.44 | | 3.44 |
| | 03/06/97 | | | 2.95 | 2.93 | | 2.93 |
| | 05/20/97 | | | 4.19 | 1.69 | | 1.69 |
| OMW-3 | | 7.16 | | | | | |
| | 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 |
| | 11/12/96 | | | 6.22 | 0.94 | | 0.94 |
| | 01/20/97 | | | 3.79 | 3.37 | | 3.37 |
| | 03/06/97 | | | 4.02 | 3.14 | | 3.14 |
| | 05/20/97 | | | 5.34 | 1.82 | | 1.82 |
| OMW-4 | | 7.41 | | | | | |
| | 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 |

# TABLE 5 (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-4 | 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 |
| | 11/12/96 | | 6.58 | 8.12 | -0.71 | 1.54 | 0.58 |
| | 01/20/97 | | 4.75 | 6.45 | 0.96 | 1.70 | 2.39 |
| | 03/06/97 | | 5.25 | 6.24 | 1.17 | 0.99 | 2.00 |
| | 05/20/97 | | 5.83 | 6.35 | 1.06 | 0.52 | 1.50 |
| OMW-5 | | 7.62 | | | | | |
| | 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 |
| | 11/12/96 | | TRACE | 6.59 | 1.03 | | 1.03 |
| | 01/20/97 | | | 3.73 | 3.89 | | 3.89 |
| | 03/06/97 | | | 5.34 | 2.28 | | 2.28 |
| | 05/20/97 | | | 5.59 | 2.03 | | 2.03 |
| OMW-6 | | 5.78 | | | | | |
| | 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 |
| | 11/12/96 | | | 5.65 | 0.13 | | 0.13 |
| | 01/20/97 | | | 5.52 | 0.26 | | 0.26 |
| | 03/06/97 | | | 7.17 | -1.39 | | -1.39 |
| | 05/20/97 | | | 6.79 | -1.01 | | -1.01 |
| OMW-7 | | 7.03 | | | | | |
| | 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 |
| | 11/12/96 | | 6.50 | 8.79 | -1.76 | 2.29 | 0.16 |
| | 01/20/97 | | 4.95 | 10.76 | -3.73 | 5.81 | 1.15 |
| | 03/06/97 | | 5.26 | 7.70 | -0.67 | 2.44 | 1.38 |
| | 05/20/97 | | 5.71 | 8.26 | -1.23 | 2.55 | 0.91 |

# TABLE 5 (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-8 | | 7.52 | | | | | |
| | 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 |
| | 11/12/96 | | | 6.69 | 0.83 | | 0.83 |
| | 01/20/97 | | | 4.84 | 2.68 | | 2.68 |
| | 03/06/97 | | | 5.15 | 2.37 | | 2.37 |
| | 05/20/97 | | | 5.81 | 1.71 | | 1.71 |
| OMW-9 | | 6.64 | | | | | |
| | 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 |
| | 11/12/96 | | 5.84 | 8.37 | -1.73 | 2.53 | 0.40 |
| | 01/20/97 | | 4.10 | 9.42 | -2.78 | 5.32 | 1.69 |
| | 03/06/97 | | 4.55 | 7.95 | -1.31 | 3.40 | 1.55 |
| | 05/20/97 | | 5.09 | 7.11 | -0.47 | 2.02 | 1.23 |
| OMW-10 | | 7.56 | | | | | |
| | 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 | | 2.81 |
| | 07/25/96 | | | 5.79 | 1.77 | | 1.77 |
| | 09/16/96 | | | 6.33 | 1.23 | | 1.23 |
| | 11/12/96 | | TRACE | 6.50 | 1.06 | | 1.06 |
| | 01/20/97 | | | 4.33 | 3.23 | | 3.23 |
| | 03/06/97 | | | 5.05 | 2.51 | | 2.51 |
| | 05/20/97 | | | 5.69 | 1.87 | | 1.87 |
| ORW-1 | | 6.59 | | | | | |
| | 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 |

# TABLE 5 (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 | 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 |
| | 11/12/96 | | | 9.60 | -3.01 | | -3.01 |
| | 01/20/97 | | NOT GAUGED | | | | |
| | 03/06/97 | | 9.55 | 9.75 | -3.16 | 0.20 | -2.99 |
| | 05/20/97 | | 9.75 | 9.86 | -3.27 | 0.11 | -3.18 |
| ORW-2 | | 6.79 | | | | | |
| | 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 |
| | 11/12/96 | | 9.63 | 10.87 | -4.08 | 1.24 | -3.04 |
| | 01/20/97 | | 9.61 | 11.00 | -4.21 | 1.39 | -3.04 |
| | 03/06/97 | | 10.05 | 11.09 | -4.30 | 1.04 | -3.43 |
| | 05/20/97 | | 10.70 | 11.46 | -4.67 | 0.76 | -4.03 |
| ORW-3 | | 6.30 | | | | | |
| | 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 |
| | 11/12/96 | | 11.63 | 11.87 | -5.57 | 0.24 | -5.37 |
| | 01/20/97 | | NOT GAUGED | | | | |
| | 03/06/97 | | 11.20 | 11.50 | -5.20 | 0.30 | -4.95 |
| | 05/20/97 | | 8.60 | 11.49 | -5.19 | 2.89 | -2.76 |
| 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 |
| | 11/12/96 | | TRACE | 2.90 | 3.81 | | 3.81 |
| | 01/20/97 | | TRACE | 3.90 | 2.81 | | 2.81 |
| | 03/06/97 | | TRACE | 4.19 | 2.52 | | 2.52 |
| | 05/20/97 | | 4.87 | 4.94 | 1.77 | 0.07 | 1.83 |
| 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 |

# TABLE 5 (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-2 | 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 |
| | 11/12/96 | | 6.66 | 8.79 | -0.99 | 2.13 | 0.80 |
| | 01/20/97 | | 4.74 | 6.35 | 1.45 | 1.61 | 2.80 |
| | 03/06/97 | | 5.38 | 6.40 | 1.40 | 1.02 | 2.26 |
| | 05/20/97 | | 5.92 | 7.26 | 0.54 | 1.34 | 1.67 |
| 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 | 0.81 |
| | 07/25/96 | | TRACE | 5.61 | 0.87 | | 0.87 |
| | 09/16/96 | | 5.75 | 9.29 | -2.81 | 3.54 | 0.16 |
| | 11/12/96 | | 6.14 | 8.89 | -2.41 | 2.75 | -0.10 |
| | 01/20/97 | | 4.96 | 8.20 | -1.72 | 3.24 | 1.00 |
| | 03/06/97 | | 4.75 | 8.42 | -1.94 | 3.67 | 1.14 |
| | 05/20/97 | | 6.38 | 6.95 | -0.47 | 0.57 | 0.01 |
| 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 |
| | 11/12/96 | | 5.10 | 8.56 | -2.24 | 3.46 | 0.67 |
| | 01/20/97 | | 3.30 | 6.49 | -0.17 | 3.19 | 2.51 |
| | 03/06/97 | | 3.80 | 4.99 | 1.33 | 1.19 | 2.33 |
| | 05/20/97 | | 4.59 | 5.28 | 1.04 | 0.69 | 1.62 |

* Corrected water level elevation assumes product density of 0.84 g/cm3
Data collected prior to 1995 was submitted in previous reports.
M.S.L. = Mean Sea Level

Data collected prior to 1995 was submitted in previous reports.

# TABLE 6
## 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 |
| | 11/12/96 | <0.050 | <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 |
| | 11/12/96 | 3.4 | <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 | 1.8 | <0.0003 | 0.0005 | <0.0003 | <0.0009 |
| | 05/02/94 | 1.8 | <0.0005 | 0.0023 | <0.0005 | 0.00089 |
| | 11/15/94 | 1.2 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| | 05/17/95 | 0.46 | <0.0005 | 0.0013 | <0.0005 | <0.0005 |
| | 11/30/95 | 2.4 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| | 05/29/96 | 2.3 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| | 11/12/96 | 3.1 | <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 |
| | 11/12/96 | ****** NOT SAMPLED – Well Contained Product ********** | | | | |

# TABLE 6
## 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 |
| | 11/12/96 | 1.9 | <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 |
| | 11/12/96 | 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 ********** | | | | |
| | 11/12/96 | ****** 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.

# TABLE 7
## Diesel Recovery
## Union Pacific Railroad
## Oakland Fueling Area

| DATE | TOTAL VOLUME RECOVERED (gallons) | RECOVERY RATE (gal/day) | NOTES |
|---|---|---|---|
| 03/02/93 | 1500 | -- | VOLUME ESTIMATED FROM GAUGE |
| 05/11/93 | 1700 | 2.9 | TANK EMPTIED |
| 06/10/93 | 1900 | 6.7 | VOLUME ESTIMATED FROM GAUGE |
| 09/03/93 | 2700 | 9.4 | TANK EMPTIED |
| 11/30/93 | 3400 | 8.0 | VOLUME ESTIMATED FROM GAUGE |
| 02/25/94 | 4200 | 9.2 | VOLUME ESTIMATED FROM GAUGE |
| 06/01/94 | 4800 | 6.3 | VOLUME ESTIMATED FROM GAUGE |
| 06/27/94 | 4900 | 3.8 | TANK EMPTIED |
| 09/23/94 | 5500 | 6.8 | TANK EMPTIED |
| 12/27/94 | 6000 | 5.3 | TANK EMPTIED |
| 03/17/95 | 6300 | 3.8 | TANK EMPTIED |
| 07/14/95 | 6900 | 5.0 | TANK EMPTIED |
| 10/18/95 | 7500 | 6.3 | TANK EMPTIED |
| 01/30/96 | 8200 | 6.7 | TANK EMPTIED |
| 07/08/96 | 9000 | 5.0 | TANK EMPTIED |
| 01/02/97 | 9800 | 4.5 | TANK EMPTIED |
| 05/27/97 | 10400 | 4.1 | VOLUME ESTIMATED FROM GAUGE |

# APPENDIX A

## FIELD LOGS
## GROUNDWATER RECOVERY
## AND TREATMENT SYSTEM

# GROUNDWATER TREATMENT SYSTEM FIELD LOG
## OAKLAND FUELING AREA
## UNION PACIFIC RAILROAD

| Date | Time | Volume | | Flow Rate Thru Carbon (gal/min) | Filter Pressure | | Oil Level In Tank (inches) | Comments (Maintenance, Adjustments, and Observations) |
|---|---|---|---|---|---|---|---|---|
| | | Signet (gallons) | Neptune (gallons) | | Inlet (psig) | Outlet (psig) | | |
| 12/2/96 | 1330 | 1597460 | 4803600 | 22.9 | 10 | 9 | 29" | |
| 12/4/96 | 1545 | 1601520 | 4807900 | 20.8 | 10 | 9 | 29" | |
| 12/13/96 | 0915 | 1621500 | 4829600 | 14.2 | 10 | 10 | 33" | Gauged wells & Diesel Spill, Motor Freight |
| 12/17/96 | 0800 | — | — | — | — | — | — | Serviced/replaced pump in ORW-3. |
| 12/19/96 | 0940 | 1632030 | 4840900 | 15.9 | 11 | 10 | 35" | Carbon swap out ("1 unit only) |
| 12/20/96 | 0900 | 1637760 | 4846500 | 23.6 | 8.5 | 8.5 | 35" | System restart after carbon soak. |
| 12/27/96 | 1430 | 1665790 | 4878700 | 8.4 | 10 | 5 | 36" | Serious wellhead flooding due to rain. |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

# GROUNDWATER TREATMENT SYSTEM FIELD LOG
## OAKLAND FUELING AREA
## UNION PACIFIC RAILROAD

| Date | Time | Volume | | Flow Rate | Filter Pressure | | Oil Level | Comments |
|---|---|---|---|---|---|---|---|---|
| | | Signet (gallons) | Neptune (gallons) | Thru Carbon (gal/min) | Inlet (psig) | Outlet (psig) | In Tank (inches) | (Maintenance, Adjustments, and Observations) |
| 1/2/97 | 1515 | 1683720 | 4899100 | NA | NA | NA | 42" | RT tank full |
| 1/6/97 | 0700 | 1684060 | 4899400 | 20.1 | 10 | 10 | 0 | Evergreen pumped out product tank |
| 1/9/97 | 1500 | 1695980 | 4913700 | 20.0 | 10 | 8 | 0 | ORW-1 pump repair/maintenance. Sampled S |
| 1/14/97 | 1300 | 1696340 | 4914200 | 12.8 | 10 | 9 | 0 | Installed pump in ORW-1 after maint. |
| 1/16/97 | 1445 | 1703270 | 4922400 | 21.2 | 10 | 9.5 | 0 | |
| 1/20/97 | 0800 | 1721000 | 4942800 | 18.6 | 10 | 8.5 | 0 | Gauged all wells |
| 1/23/97 | 0730 | 1735920 | 4960000 | 17.5 | 10 | 10 | 0 | |
| 1/27/97 | 0800 | 1754630 | 4987200 | 20.4 | 9.5 | 9.5 | <13" | Alert #3 (corrected). |
| 1/30/97 | 1000 | 1770470 | 5006000 | 20.5 | 9 | 8.5 | 13" | New chlorine pump. |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

# GROUNDWATER TREATMENT SYSTEM FIELD LOG
## OAKLAND FUELING AREA
## UNION PACIFIC RAILROAD

| Date | Time | Volume | | Flow Rate | Filter Pressure | | Oil Level | Comments |
|---|---|---|---|---|---|---|---|---|
| | | Signet (gallons) | Neptune (gallons) | Thru Carbon (gal/min) | Inlet (psig) | Outlet (psig) | In Tank (inches) | (Maintenance, Adjustments, and Observations) |
| 2/3/97 | 0715 | 1789320 | 5028500 | 21.0 | 10 | 10 | 14" | |
| 2/6/97 | 1450 | 1804620 | 5046900 | 24.6 | 10 | 10 | 14" | |
| 2/11/97 | 1430 | 1824980 | 5072700 | 7.3 | 12 | 10.5 | 15" | UP Air supply shut down. Alert # 4. |
| 2/14/97 | 1340 | 1837340 | 5087500 | 8.4 | 9.5 | 9.0 | >15" | Blockage. Backflushed both C-units. |
| 2/18/97 | 1500 | 1853020 | 5104700 | 23.6 | 9 | 8.5 | 16" | |
| 2/21/97 | 1330 | 1864470 | 5116400 | 22.5 | 9 | 9 | 17" | Possible slow transfer pump in surge tank. |
| 2/24/97 | 1500 | 1876580 | 5130100 | 17.5 | 9 | 8 | 18" | Backflush $H_2O$ gray (not usu. orange/brown) |
| 2/27/97 | 1515 | 1888420 | 5143100 | 20.5 | 9 | 8 | 19" | |

AIL COPIES MONTHLY TO: USPCI/LAIDLAW, 5665 FLATIRON PARKWAY, BOULDER, COLORADO 80301, ATTENTION: DENTON MAULDIN

# GROUNDWATER TREATMENT SYSTEM FIELD LOG
## OAKLAND FUELING AREA
## UNION PACIFIC RAILROAD

| Date | Time | Volume | | Flow Rate Thru Carbon (gal/min) | Filter Pressure | | Oil Level In Tank (inches) | Comments (Maintenance, Adjustments, and Observations) |
|---|---|---|---|---|---|---|---|---|
| | | Signet (gallons) | Neptune (gallons) | | Inlet (psig) | Outlet (psig) | | |
| 3/3/97 | 1015 | 1902880 | 5158700 | 18.4 | 10 | 7.5 | 21" | Began product bailing program Gauged wells. |
| 3/6/97 | 0845 | 1914480 | 5171400 | 17.2 | 11 | 11 | 22" | |
| 3/10/97 | 1000 | 1928850 | 5186800 | 24.2 | 9 | 9 | 26" | Sampled influent/midfluent |
| 3/14/97 | 0730 | 1941480 | 5200700 | 17.2 | 10 | 8 | 26" | |
| 3/18/97 | 0900 | 1956480 | 5218400 | 12.2 | 10 | 8 | 27" | |
| 3/24/97 | 1000 | 1978420 | 5244300 | 21.6 | 10 | 10 | 29" | |
| 3/20/97 | 1030 | 1992580 | 5260700 | 20.7 | 10 | 10 | 30" | |
| 3/31/97 | 0800 | 2002530 | 5273000 | 7.2 | 11 | 8 | 30" | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

# GROUNDWATER TREATMENT SYSTEM FIELD LOG
## OAKLAND FUELING AREA
## UNION PACIFIC RAILROAD

| Date | Time | Volume | | Flow Rate Thru Carbon | Filter Pressure | | Oil Level In Tank | Comments |
|---|---|---|---|---|---|---|---|---|
| | | Signet (gallons) | Neptune (gallons) | (gal/min) | Inlet (psig) | Outlet (psig) | (inches) | (Maintenance, Adjustments, and Observations) |
| 4/4/97 | 1100 | 2016250 | 5288850 | 12.1 | 11 | 10.5 | 31" | Sampled inf./mid./eff. |
| 4/9/97 | 1200 | 2030770 | 5305200 | 13.9 | 11 | 11 | 32" | |
| 4/11/97 | 1100 | 2037360 | 5313100 | 7.0 | 10 | 9 | 32" | |
| 4/15/97 | 1100 | 2050850 | 5329000 | 5.2 | 10 | 9 | 33" | |
| 4/18/97 | 1045 | 2060740 | 5340100 | 8.8 | 10 | 10 | 33" | |
| 4/22/97 | 0920 | 2073160 | 5355400 | 10.3 | 10 | 10 | 34" | |
| 4/25/97 | 1315 | 2082730 | 5366700 | 11.8 | 10 | 9 | 35' | |
| 4/29/97 | 1035 | 2093840 | 5380600 | 4.5 | 10 | 8 | >35" | Gauged Wells |

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

# GROUNDWATER TREATMENT SYSTEM FIELD LOG
## OAKLAND FUELING AREA
## UNION PACIFIC RAILROAD

| Date | Time | Volume | | Flow Rate | Filter Pressure | | Oil Level | Comments |
|---|---|---|---|---|---|---|---|---|
| | | Signet (gallons) | Neptune (gallons) | Thru Carbon (gal/min) | Inlet (psig) | Outlet (psig) | In Tank (inches) | (Maintenance, Adjustments, and Observations) |
| 5/5/97 | 1045 | 2113450 | 5403000 | 11.2 | 10 | 10 | 36" | |
| 5/8/97 | 0930 | 212 3030 | 5414000 | 16.3 | 10 | 10 | 36" | |
| 5/12/97 | 1155 | 2131700 | 5427800 | 12.0 | 10.5 | 9 | 37" | |
| 5/15/97 | 0730 | 2138180 | 5435800 | 14.6 | 10 | 10 | 37" | Sampled inf. (TPHd) eff. (BTEX) |
| 5/19/97 | 1040 | 215162-0 | 5451800 | 8.1 | 10 | 10 | 38" | |
| 5/23/97 | 1115 | 2161650 | 5463800 | 7.0 | 10 | 8.5 | 38" | |
| 5/27/97 | 1100 | 2165310 | 5468700 | 16.0 | 10 | 8.5 | 38" | Gauged all wells |

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

# GROUNDWATER TREATMENT SYSTEM FIELD LOG
## OAKLAND FUELING AREA
## UNION PACIFIC RAILROAD

| Date | Time | Volume | | Flow Rate | Filter Pressure | | Oil Level | Comments |
|---|---|---|---|---|---|---|---|---|
| | | Signet (gallons) | Neptune (gallons) | Thru Carbon (gal/min) | Inlet (psig) | Outlet (psig) | In Tank (inches) | (Maintenance, Adjustments, and Observations) |
| 6/3/97 | 0730 | — | — | — | — | — | — | Alert #3, Alert #4 (rec'd 6/2) |
| 6/5/97 | 1040 | 2167220 | 5470200 | 23.0 | 10 | 10 | 39 | Compressor still down |
| 6/10/97 | 1030 | — | — | — | — | — | — | Compressor still down |
| 6/13/97 | 1000 | — | — | — | — | — | — | Compressor OK, but controllers malfunctioning |
| 6/19/97 | 0900 | — | — | — | — | — | — | Three controllers removed for repair |
| 6/24/97 | 0630 | — | — | — | — | — | — | Begin new pump installation |
| 6/27/97 | 1230 | — | 5473200 | NA | 10 | 9 | 39 | Flowmeter and autodialer malfunctioning |
| 6/30/97 | 1125 | — | 5484800 | NA | 9 | 4 | 39 | New pumps operating OK |

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

# APPENDIX B

## ANALYTICAL RESULTS

## TEH-Tot Ext Hydrocarbons

Client: Burns & McDonnell
Project#: 96-071-1

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: EPA 3520

| Sample # | Client ID | Batch # | Sampled | Extracted | Analyzed | Moisture |
|---|---|---|---|---|---|---|
| 127751-001 | INFLUENT | 31438 | 12/13/96 | 12/16/96 | 12/26/96 | |

Matrix: Water

| Analyte<br>Diln Fac: | Units | 127751-001<br>1 |
|---|---|---|
| Diesel C12-C22 | ug/L | 14000 |
| Surrogate | | |
| Hexacosane | %REC | 102 |

# BTXE

Client: Burns & McDonnell
Project#: 96-071-1

Analysis Method: EPA 8020
Prep Method: EPA 5030

| Sample # | Client ID | Batch # | Sampled | Extracted | Analyzed | Moisture |
|---|---|---|---|---|---|---|
| 127751-002 | MIDFLUENT | 31460 | 12/13/96 | 12/18/96 | 12/18/96 | |

Matrix: Water

| Analyte | Units | 127751-002 |
|---|---|---|
| Diln Fac: | | 1 |
| Benzene | ug/L | <0.5 |
| Toluene | ug/L | <0.5 |
| Ethylbenzene | ug/L | <0.5 |
| m,p-Xylenes | ug/L | <0.5 |
| o-Xylene | ug/L | <0.5 |
| Surrogate | | |
| Trifluorotoluene | %REC | 100 |
| Bromobenzene | %REC | 95 |

12773

# Request for Chemical Analysis and Chain of Custody Record

Burns & McDonnell Waste Consultants, Inc.
9400 Ward Parkway
Kansas City, Missouri 64114
Phone: (816) 333-8787 Fax: (816) 822-3463

Laboratory: Curtis & Tompkins
Address: 2323 5th Street
City/State/Zip: Berkeley CA 94710
Telephone: 510 - 486 - 0900

Document Control No.: 121396
Lab. Reference No. or Episode No.:

Attention: Rita Proctor
Project Number: ~~96-118-4-11~~ M-9607-1
Project Name: ~~UALSFO~~ UNPAC
Site, Group, or SWMU Name: Union Pacific

| Sample Number | | Sample Event | | Sample Depth (in feet) | | Sample Collected | | Sample Type: Matrix | | | | | Number of Containers | Analysis: TEH-D | Analysis: BTEX | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Point | Sample Designator | Round | Year | From | To | Date | Time | Liquid | Solid | Gas | Composite | Grab | | | | | | | | |
| Influent | GW | | | | | 12-13-96 | 0935 | X | | | | | 1 | X | | | | | | |
| Midfluent | GW | | | | | 12-13-96 | 0940 | X | | | | | 2 | | X | | | | | |
| | | | | | | | | | | | | | | | | | | | | Standard Turnaround |

Sampler (signature): Jamison Cook
Sampler (signature):

Special Instructions:

| Relinquished By: (signature) | Date/Time | Relinquished By: (signature) | Date/Time |
|---|---|---|---|
| Jamison Cook | 12/13/96 1310 | | |
| Relinquished By: 2. (signature) | Date/Time | Relinquished By: Received (signature) | Date/Time |

Condition of Shipping Container: Good ☐ Fair ☐ Poor ☐
Ice Present in Container: Yes ☐ No ☐
Comments:

061996 Form WCI-OP1

# BTXE

Client: Burns & McDonnell
Project#: 96-071-1
Location: UP/OAKLAND

Analysis Method: EPA 8020
Prep Method: EPA 5030

| Sample # | Client ID | Batch # | Sampled | Extracted | Analyzed | Moisture |
|---|---|---|---|---|---|---|
| 127979-001 | EFFLUENT | 31846 | 01/14/97 | 01/16/97 | 01/16/97 | |
| 127979-002 | MIDFLUENT | 31846 | 01/14/97 | 01/16/97 | 01/16/97 | |
| 127979-003 | INFLUENT | 31988 | 01/14/97 | 01/23/97 | 01/23/97 | |

Matrix: Water

| Analyte | Units | 127979-001 | 127979-002 | 127979-003 |
|---|---|---|---|---|
| Diln Fac: | | 1 | 1 | 1 |
| Benzene | ug/L | <0.5 | <0.5 | 6.1 |
| Toluene | ug/L | <0.5 | <0.5 | <0.5 |
| Ethylbenzene | ug/L | <0.5 | <0.5 | <0.5 |
| m,p-Xylenes | ug/L | <0.5 | <0.5 | 3.3 |
| o-Xylene | ug/L | <0.5 | <0.5 | 0.6 |
| Surrogate | | | | |
| Trifluorotoluene | %REC | 97 | 98 | 96 |
| Bromobenzene | %REC | 96 | 98 | 97 |

## TEH-Tot Ext Hydrocarbons

Client: Burns & McDonnell
Project#: 96-071-1
Location: UP/OAKLAND

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: EPA 3520

| Sample # | Client ID | Batch # | Sampled | Extracted | Analyzed | Moisture |
|---|---|---|---|---|---|---|
| 127979-001 | EFFLUENT | 31859 | 01/14/97 | 01/15/97 | 01/17/97 | |
| 127979-003 | INFLUENT | 31859 | 01/14/97 | 01/15/97 | 01/17/97 | |

Matrix: Water

| Analyte | Units | 127979-001 | 127979-003 |
|---|---|---|---|
| Diln Fac: | | 1 | 1 |
| Diesel C12-C22 | ug/L | <50 | 22000 |
| Surrogate | | | |
| Hexacosane | %REC | 100 | 94 |

# Request for Chemical Analysis and Chain of Custody Record

Burns & McDonnell Waste Consultants, Inc.
9400 Ward Parkway
Kansas City, Missouri 64114 SFIA
Phone: (816) 333-8787 Fax: (816) 822-3463

Attention: SCOTT KELLSTEDT

Laboratory CURTIS & TOMPKINS
Address 2323 FIFTH ST.
City/State/Zip BERKELEY, CA 94710
Telephone (510) 486-0900

Document Control No.:

Lab. Reference No. or Episode No.:

Project Number: 96-071-1
Project Name: VP/OAKLAND
Site, Group, or SWMU Name:

| Sample Number | | Sample Event | | Sample Depth (in feet) | | Sample Collected | | Sample Type: Matrix | | | | | Number of Containers | Analysis: TPH by 8015 M | Analysis: BTEX by 8020 | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Point | Sample Designator | Round | Year | From | To | Date | Time | Liquid | Solid | Gas | Composite | Grab | | | | | | | | |
| EFFLUENT | | | 97 | | | 11/14/97 | 11:10 | X | | X | | X | 3 | X | X | | | | | |
| MIDFLUENT | | | 97 | | | " | 11:20 | X | | X | | X | 2 | | X | | | | | |
| INFLUENT | | | 97 | | | " | 11:30 | X | | | | X | 3 | X | X | | | | | |

Fax results to Scott Kellstedt @ San Francisco office

Sampler (signature): X. [signature]

Sampler (signature).

Special Instructions:

| Relinquished By: 1. Received (signature): | Date/Time 11/14/97 | Relinquished By: (signature): | Date/Time | Condition of Shipping Container: Good ☑ Fair ☐ Poor ☐ | Ice Present in Container: Yes ☐ No ☐ |
|---|---|---|---|---|---|
| Relinquished By: 2. (signature) | Date/Time 15:00 | Relinquished By: (signature): | Date/Time | Comments: | |

061996 Form WCI-OP1

## TEH-Tot Ext Hydrocarbons

Client: Burns & McDonnell
Project#: M-96071-1
Location: UNPAC

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: EPA 3520

| Sample # | Client ID | Batch # | Sampled | Extracted | Analyzed | Moisture |
|---|---|---|---|---|---|---|
| 128317-001 | INFLUENT | 32596 | 02/11/97 | 02/24/97 | 03/02/97 | |

Matrix: Water

| Analyte | Units | 128317-001 |
|---|---|---|
| Diln Fac: | | 1 |
| Diesel C12-C22 | ug/L | 13000 YH |
| Surrogate | | |
| Hexacosane | %REC | 120 |

Y: Sample exhibits fuel pattern which does not resemble standard
H: Heavier hydrocarbons than indicated standard

# BTXE

Client: Burns & McDonnell
Project#: M-96071-1
Location: UNPAC

Analysis Method: EPA 8020
Prep Method: EPA 5030

| Sample # | Client ID | Batch # | Sampled | Extracted | Analyzed | Moisture |
|---|---|---|---|---|---|---|
| 128317-002 | MIDFLUENT | 32509 | 02/11/97 | 02/20/97 | 02/20/97 | |

Matrix: Water

| Analyte | Units | 128317-002 |
|---|---|---|
| Diln Fac: | | 1 |
| Benzene | ug/L | <0.5 |
| Toluene | ug/L | <0.5 |
| Ethylbenzene | ug/L | <0.5 |
| m,p-Xylenes | ug/L | <0.5 |
| o-Xylene | ug/L | <0.5 |
| **Surrogate** | | |
| Trifluorotoluene | %REC | 102 |
| Bromobenzene | %REC | 131 |

128317

# Request for Chemical Analysis and Chain of Custody Record


Burns & McDonnell Waste Consultants, Inc.
9400 Ward Parkway
Kansas City, Missouri 64114
Phone: (816) 333-8787 Fax: (816) 822-3463


Laboratory: Curtis + Tompkins
Address: 2323 5th Street
City/State/Zip: Berkeley CA 94710
Telephone: 510-486-0900

Document Control No.: 021197
Lab. Reference No. or Episode No.:

Attention: Scott Kellstedt
Project Number: M-96071-1 Project Name: UNPAC
Site, Group, or SWMU Name: Union Pacific

| Sample Number | | Sample Event | | Sample Depth (in feet) | | Sample Collected | | Sample Type: Matrix | | | | | Number of Containers | Analysis: TEH-d | Analysis: BTEX | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Point | Sample Designator | Round | Year | From | To | Date | Time | Liquid | Solid | Gas | Composite | Grab | | | | |
| EastAlluvial | GW | | | | | 2-11-97 | 1445 | X | | | | | 1 | X | | |
| MidAlluvial | GW | | | | | 2-11-97 | 1450 | X | | | | | 2 | | X | |

2 week (standard) turnaround

Sampler (signature):
Sampler (signature):

Special Instructions:

| Relinquished By: | Date/Time | Relinquished By: | Date/Time |
|---|---|---|---|
| 1. (signature): | 2-11-97 1445 | (signature): | |
| 2. (signature): | | (signature): | 2/12/97 |

Condition of Shipping Container: Good ✓ Fair ☐ Poor ☐
Ice Present in Container: Yes ☐ No ☐
Comments:

061996 Form WCI-OP1

## TEH-Tot Ext Hydrocarbons

Client: Burns & McDonnell

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: EPA 3520

| Sample # | Client ID | Batch # | Sampled | Extracted | Analyzed | Moisture |
|---|---|---|---|---|---|---|
| 128568-001 | INFLUENT | 32844 | 03/10/97 | 03/12/97 | 03/15/97 | |

Matrix: Water

| Analyte<br>Diln Fac: | Units | 128568-001<br>1 |
|---|---|---|
| Diesel C12-C22 | ug/L | 16000 |
| Surrogate | | |
| Hexacosane | %REC | 105 |

Curtis & Tompkins, Ltd.

Lab #: 128568

BATCH QC REPORT



| BTXE | |
|---|---|
| Client: Burns & McDonnell | Analysis Method: EPA 8020<br>Prep Method: EPA 5030 |

METHOD BLANK

| | | | |
|---|---|---|---|
| Matrix: | Water | Prep Date: | 03/12/97 |
| Batch#: | 32834 | Analysis Date: | 03/12/97 |
| Units: | ug/L | | |
| Diln Fac: | 1 | | |

MB Lab ID: QC41778

| Analyte | Result |
|---|---|
| Benzene | <0.5 |
| Toluene | <0.5 |
| Ethylbenzene | <0.5 |
| m,p-Xylenes | <0.5 |
| o-Xylene | <0.5 |

| Surrogate | %Rec | Recovery Limits |
|---|---|---|
| Trifluorotoluene | 79 | 58-130 |
| Bromobenzene | 84 | 62-131 |

# Request for Chemical Analysis and Chain of Custody Record

Burns & McDonnell Waste Consultants, Inc.
9400 Ward Parkway
Kansas City, Missouri 64114
Phone: (816) 333-8787 Fax: (816) 822-3463

Laboratory: Curtis & Tompkins
Address: 2323 5th Street
City/State/Zip: Berkeley CA 94710
Attention: ~~Rita~~ Scott Kellstedt
Telephone: 510-486-0900

Document Control No.: 031097
Lab. Reference No. or Episode No.:

Project Number:
Project Name: UNPAC
Site, Group, or SWMU Name: Union Pacific

| Sample Number | | Sample Event | | Sample Depth (in feet) | | Sample Collected | | Sample Type: Matrix | | | | | Number of Containers | Analysis: TPH-diesel | Analysis: BTEX | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Point | Sample Designator | Round | Year | From | To | Date | Time | Liquid | Solid | Gas | Composite | Grab | | | | |
| Enfluent | GW | | | | | 3-10-97 | 1315 | X | | | | | 1 | X | | |
| Midfluent | GW | | | | | 3-10-97 | 1420 | X | | | | | 2 | X | | |

Standard Turnaround

Sampler (signature): Jennifer Cook
Sampler (signature):

Relinquished By: Jennifer Cook (signature) — Date/Time: 3-10-97 1430
Relinquished By: (signature) — Date/Time: 3/10/97 14:36
Relinquished By: 2. (signature) — Date/Time:
Relinquished By: (signature) — Date/Time:

Special Instructions:

Condition of Shipping Container: Good ☑ Fair ☐ Poor ☐
Ice Present in Container: Yes ☑ No ☐
Comments:

061996 Form WCI-OP1

## TEH-Tot Ext Hydrocarbons

Client: Burns & McDonnell
Project#: 96-071-1
Location: UNPAC

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: EPA 3520

| Sample # | Client ID | Batch # | Sampled | Extracted | Analyzed | Moisture |
|---|---|---|---|---|---|---|
| 128867-001 | INFLUENT | 33329 | 04/04/97 | 04/07/97 | 04/10/97 | |
| 128867-003 | EFFLUENT | 33329 | 04/04/97 | 04/07/97 | 04/10/97 | |

Matrix: Water

| Analyte | Units | 128867-001 | 128867-003 |
|---|---|---|---|
| Diln Fac: | | 1 | 1 |
| Diesel C12-C22 | ug/L | 8700 | <50 |
| Surrogate | | | |
| Hexacosane | %REC | 76 | 102 |

# BTXE

Client: Burns & McDonnell
Project#: 96-071-1
Location: UNPAC

Analysis Method: EPA 8020
Prep Method: EPA 5030

| Sample # | Client ID | Batch # | Sampled | Extracted | Analyzed | Moisture |
|---|---|---|---|---|---|---|
| 128867-001 | INFLUENT | 33313 | 04/04/97 | 04/06/97 | 04/06/97 | |
| 128867-002 | MIDFLUENT | 33313 | 04/04/97 | 04/06/97 | 04/06/97 | |
| 128867-003 | EFFLUENT | 33313 | 04/04/97 | 04/06/97 | 04/06/97 | |

Matrix: Water

| Analyte | Units | 128867-001 | 128867-002 | 128867-003 |
|---|---|---|---|---|
| Diln Fac: | | 1 | 1 | 1 |
| Benzene | ug/L | 3 | <0.5 | <0.5 |
| Toluene | ug/L | <0.5 | <0.5 | <0.5 |
| Ethylbenzene | ug/L | <0.5 | <0.5 | <0.5 |
| m,p-Xylenes | ug/L | <0.5 | <0.5 | <0.5 |
| o-Xylene | ug/L | <0.5 | <0.5 | <0.5 |
| Surrogate | | | | |
| Trifluorotoluene | %REC | 76 | 75 | 74 |
| Bromobenzene | %REC | 79 | 78 | 77 |

128867

# Request for Chemical Analysis and Chain of Custody Record

Burns & McDonnell Waste Consultants, Inc.
9400 Ward Parkway
Kansas City, Missouri 64114
Phone: (816) 333-8787 Fax: (816) 822-3463

Laboratory: Curtis & Tompkins
Address: 2323 5th St
City/State/Zip: Berkeley CA 94710
Telephone: 510-486-0900

Document Control No.: 040497
Lab. Reference No. or Episode No.:

Attention: Scott Kellstet
Project Number: M-96-071-1
Project Name: UNPAC
Site, Group, or SWMU Name: Union Pacific - Oakland

| Sample Number | | Sample Event | | Sample Depth (in feet) | | Sample Collected | | Sample Type: Matrix | | | | | Number of Containers | Analysis: TPH-d | Analysis: BTEX | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Point | Sample Designator | Round | Year | From | To | Date | Time | Liquid | Solid | Gas | Composite | Grab | | | | | | | | |
| Influent | GW | | | | | 4-4-97 | 1110 | X | | | | | 3 | X | X | | | | | |
| Midfluent | GW | | | | | | 1115 | X | | | | | 2 | | X | | | | | |
| Effluent | GW | | | | | ↓ | 1120 | X | | | | | 3 | X | X | | | | | |
| | | | | | | | | | | | | | | | | | | | | Standard Turnaround |

Sampler (signature): Jamison Cross
Sampler (signature):

Special Instructions:

Relinquished By: 1. Jamison Cross (signature) — Date/Time 4/4/97 1250
Relinquished By: 2. (signature) — Date/Time
Relinquished By: (signature) — Date/Time 4/4/97 15:26
Relinquished By: (signature) — Date/Time

Condition of Shipping Container: Good [✓] Fair [ ] Poor [ ]
Ice Present in Container: Yes [✓] No [ ]
Comments:

061996 Form WCI-OP1

## TEH-Tot Ext Hydrocarbons

Client: Burns & McDonnell
Project#: 95-071-1
Location: UNPAC

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: EPA 3520

| Sample # | Client ID | Batch # | Sampled | Extracted | Analyzed | Moisture |
|---|---|---|---|---|---|---|
| 129284-001 | INF | 34034 | 05/15/97 | 05/19/97 | 05/21/97 | |

Matrix: Water

| Analyte | Units | 129284-001 |
|---|---|---|
| Diln Fac: | | 1 |
| Diesel C12-C22 | ug/L | 8500 H |
| Surrogate | | |
| Hexacosane | %REC | 99 |

H: Heavier hydrocarbons than indicated standard

# BTXE

Client: Burns & McDonnell
Project#: 95-071-1
Location: UNPAC

Analysis Method: EPA 8020
Prep Method: EPA 5030

| Sample # | Client ID | Batch # | Sampled | Extracted | Analyzed | Moisture |
|---|---|---|---|---|---|---|
| 129284-002 | MID | 34058 | 05/15/97 | 05/21/97 | 05/21/97 | |

Matrix: Water

| Analyte | Units | 129284-002 |
|---|---|---|
| Diln Fac: | | 1 |
| MTBE | ug/L | <2 |
| Benzene | ug/L | <0.5 |
| Toluene | ug/L | <0.5 |
| Ethylbenzene | ug/L | <0.5 |
| m,p-Xylenes | ug/L | <0.5 |
| o-Xylene | ug/L | <0.5 |
| **Surrogate** | | |
| Trifluorotoluene | %REC | 87 |
| Bromobenzene | %REC | 100 |

# Request for Chemical Analysis and Chain of Custody Record

Burns & McDonnell Waste Consultants, Inc.
9400 Ward Parkway
Kansas City, Missouri 64114
Phone: (816) 333-8787 Fax: (816) 822-3463

Laboratory: CURTIS & TOMPKINS
Address: 5TH ST.
City/State/Zip: BERKELEY, CA
Telephone: 486-0900

Document Control No.:
Lab. Reference No. or Episode No.:

Attention: SCOTT KELLSTEDT

Project Number: 95-071-1
Project Name: UNPAC

Site, Group, or SWMU Name: OAKLAND TOFC

| Sample Number | | Sample Event | | Sample Depth (in feet) | | Sample Collected | | Sample Type: Matrix | | | | | Number of Containers | Analysis: TPH-d (8015 M) | Analysis: BTEX (8020) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Point | Sample Designator | Round | Year | From | To | Date | Time | Liquid | Solid | Gas | Composite | Grab | | | | |
| INF | | | | | | 5/15 | 0810 | X | | | | X | 1 | X | | |
| MID | | | | | | 5/15 | 0758 | X | | | | X | 2 | | X | |

No preservative except 4°C

Sampler (signature): X. [illegible]

Sampler (signature).

Special Instructions:

| Relinquished By: | Date/Time | Relinquished By: | Date/Time |
|---|---|---|---|
| 1. X. [illegible] (signature). | 5/15/97 | (signature): | |
| Relinquished By: | Date/Time | ~~Relinquished By:~~ | Date/Time |
| 2. (signature): | | ~~(signature):~~ [illegible] | 5/15/97 |

Condition of Shipping Container: Good [✓] Fair [ ] Poor [ ]
Ice Present in Container: Yes [ ] No [ ]

Comments:

061996 Form WCI-OP1