



Industrial Compliance

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**FIRST QUARTER 1995
GROUND WATER MONITORING REPORT**

**Southern Pacific Transportation Company
5th Avenue and 7th Street
Oakland, California**

6-16-95

IC Project No. 05100269

Prepared For:

**Southern Pacific Transportation Company
One Market Plaza
San Francisco, CA 94105**

June 16, 1995





Industrial Compliance

9838 Old Placerville Road Suite 100 Sacramento, CA 95827-3559
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IC Project No. 05100269

Ms. Jennifer Eberle
Alameda County Health Care Services Agency
Department of Environmental Health
Division of Hazardous Materials
1131 Harbor Bay Parkway
Alameda, California 94501

**Re: First Quarter 1995 Ground Water Monitoring Report
Southern Pacific Transportation Company
5th Avenue and 7th Street Property - Oakland, California**

Dear Ms. Eberle:

Industrial Compliance (IC), on behalf of Southern Pacific Transportation Company (SPTCo), has prepared the attached First Quarter 1995 Ground Water Monitoring Report for the SPTCo property located in the East Oakland Yard at 5th Avenue and 7th Street, Oakland, California. This first quarter report was in preparation prior to receipt of your May 31, 1995 letter in which you indicated that future quarterly reports need not include site background information. This simplification in quarterly monitoring reports provided to you will be implemented with the second quarter 1995 report.

If you have any questions regarding this report, please contact either of the undersigned at (510) 238-9540 or (916) 369-8971.

Sincerely,

INDUSTRIAL COMPLIANCE

James B. Ackerman
Project Geologist

Richard L. Bateman, R.G.
Principal Hydrogeologist

JBA/RLB:dao

Attachment

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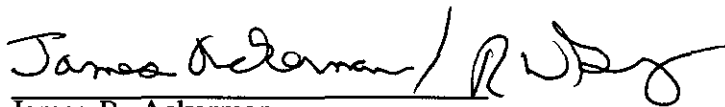
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**FIRST QUARTER 1995
GROUND WATER MONITORING REPORT**

**Southern Pacific Transportation Company
5th Avenue and 7th Street
Oakland, California**

Prepared By:



James B. Ackerman
Project Geologist

Reviewed By:



Richard L. Bateman
Principal Hydrogeologist

TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	BACKGROUND	3
3.0	FIELD INVESTIGATION	6
3.1	Monitoring Well Water Level Data	6
3.2	Monitoring Well Purging	9
3.3	Monitoring Well Sampling	9
3.4	Quality Assurance/Quality Control	11
4.0	ANALYTICAL RESULTS	13
5.0	DISCUSSION	17
6.0	GLOSSARY OF ACRONYMS	21

FIGURES

Figure 1	Site Location Map	2
Figure 2	Site Layout and Location of Soil Borings and Monitoring Wells Installed During Previous Site Investigations	4
Figure 3	Contour Map of Ground Water Elevation, February, 1995	8
Figure 4	Chemical Distribution Map for Constituents in Ground Water Samples, February, 1995	15
Figure 5	Hydrographs of Ground Water Elevation	20

TABLES

Table 1	Ground Water Elevation Data, February, 1995	7
Table 2	Ground Water Purge Characterization Data, February, 1995	10
Table 3	Ground Water Analytical Results, February, 1995	14
Table 4	Ground Water Analytical Results, Historic Summary	18
Table 5	Ground Water Elevation Data, Historic Summary	19

TABLE OF CONTENTS (continued)

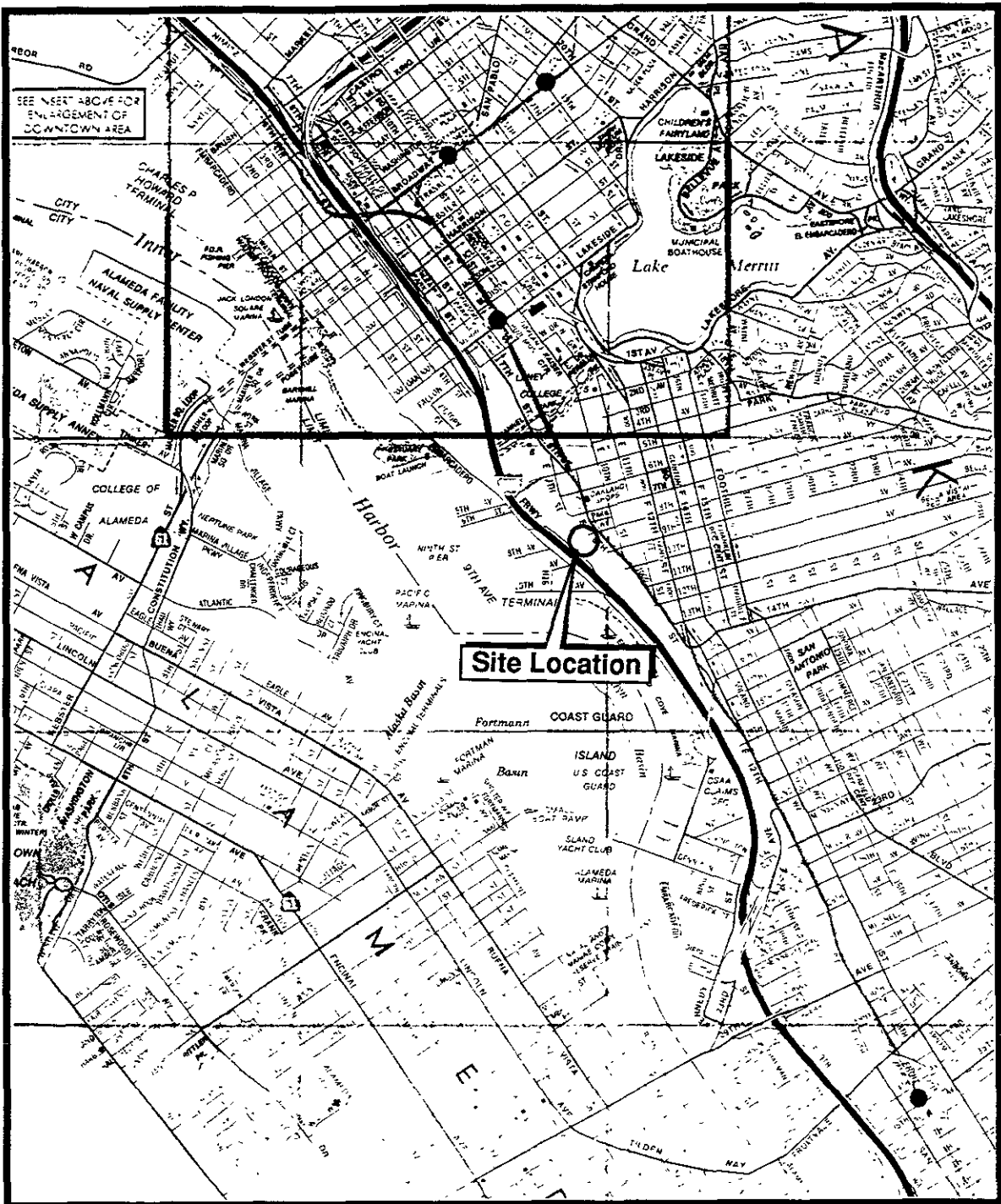
APPENDICES

Appendix A	Ground Water Elevation Measurement and Purge Characterization Field Data Sheets
Appendix B	Chain-of-Custody Document
Appendix C	Analytical Laboratory Reports, Ground Water Samples
Appendix D	Ground Water Elevation Contour Maps, Previous Monitoring Events

1.0 INTRODUCTION

Industrial Compliance (IC), on behalf of Southern Pacific Transportation Company (SPTCo), is conducting quarterly ground water monitoring at the SPTCo property located on a portion of the East Oakland Yard at 5th Avenue and 7th Street in Oakland, California (Figure 1).

This report presents first quarter 1995 ground water monitoring results. First quarter ground water sampling activities occurred on February 16, 1995. First quarter water level measurements used for contouring ground water elevation were taken on February 28, 1995.



Approximate Scale in Feet
 0 2000'

Reference
 Map of Oakland, Berkeley, Alameda
 American Automobile Association



Industrial Compliance

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SITE LOCATION MAP
SOUTHERN PACIFIC TRANSPORTATION COMPANY
5TH AVENUE AND 7TH STREET PROPERTY
OAKLAND, CALIFORNIA

Project No	05100269	Date	12/01/94
Drawn By	Patti Decker	Checked By	James Ackerman

Figure	1
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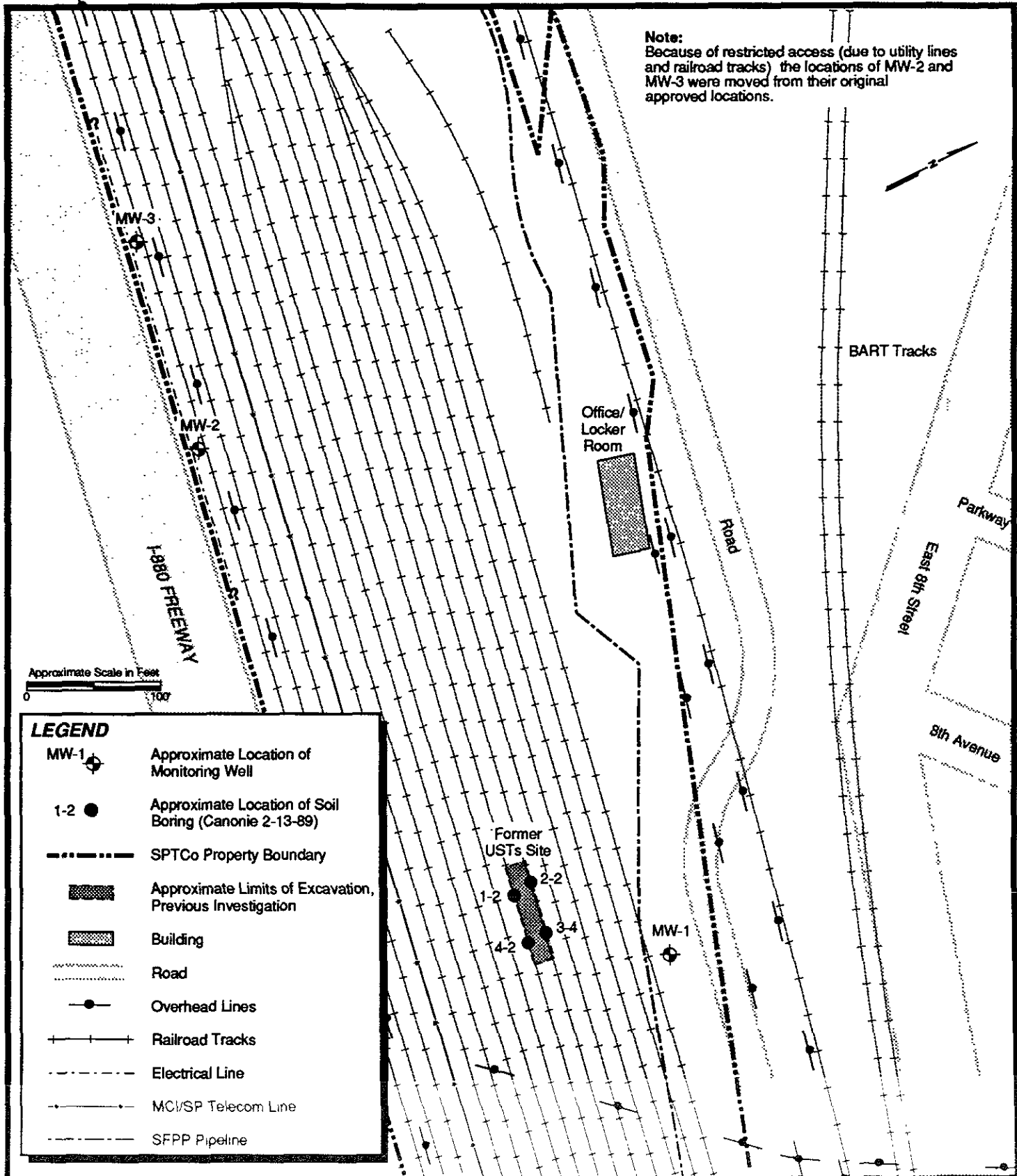
2.0 BACKGROUND

In February, 1989, Canonie Environmental Services Corporation (Canonie) prepared to remove four underground storage tanks (USTs) from the site: two 7,000-gallon diesel USTs (which Canonie referred to as Tanks A and B) and two 7,000-gallon Bunker "C" oil USTs (which Canonie referred to as Tanks C and D). Prior to removal of the USTs, Canonie collected four subsurface soil samples from borings adjacent to the perimeter of the USTs (Figure 2). This preliminary collection of samples was required by Alameda County Health Care Services Agency - Department of Environmental Health, Division of Hazardous Materials (Alameda County) to verify that Canonie's tank removal activities would not further impact the site. Laboratory analyses performed on these soil samples indicated a maximum concentration of total extractable petroleum hydrocarbons (TEPH) of 16,000 parts per million (ppm). The results of these sampling activities were summarized in a Canonie letter report dated February 15, 1989 (letter report entitled: *Soil Sampling Report and Records of Correspondence with Regulatory Agencies, Southern Pacific Transportation Company Railyard, Fifth Avenue and Seventh Street, Oakland, California*).

On February 20, 1989, Canonie began the excavation and removal of the four USTs. Soil was removed from the excavation to a depth of approximately 12 feet below ground surface (bgs). According to the Canonie report, no water entered the excavation in the three days that it remained open. According to the Canonie report, soil in the excavation did not appear impacted (by visual observation). Canonie reported approximately 500 cubic yards (cy) of soil was generated from the UST excavation and was stockpiled onsite on plastic sheeting.

Prior to backfilling the excavation, a total of 12 soil samples were collected from the excavation. Six soil samples were taken from the bottom of the excavation at a depth of 12 feet bgs and six soil samples were taken from 2 feet below the bottom of the excavation (or at 14 feet bgs). Laboratory analyses performed on the soil samples collected at 12 feet bgs

Note:
 Because of restricted access (due to utility lines and railroad tracks) the locations of MW-2 and MW-3 were moved from their original approved locations.



Approximate Scale in Feet
 0 100

LEGEND

- MW-1 Approximate Location of Monitoring Well
- 1-2 Approximate Location of Soil Boring (Canonie 2-13-89)
- SPTCo Property Boundary
- Approximate Limits of Excavation, Previous Investigation
- Building
- Road
- Overhead Lines
- Railroad Tracks
- Electrical Line
- MCI/SP Telecom Line
- SFPP Pipeline

Industrial Compliance A Subsidiary of SP Environmental Systems, Inc.			
Project No	05100269	Date	04/21/95
Drawn By	Patti Decker	Checked By	Richard Bateman

SITE LAYOUT AND LOCATION OF SOIL BORINGS AND MONITORING WELLS INSTALLED DURING PREVIOUS SITE INVESTIGATIONS SOUTHERN PACIFIC TRANSPORTATION COMPANY 5TH AVENUE AND 7TH STREET PROPERTY OAKLAND, CALIFORNIA

Figure
 2
 Page No
 4
 Scale
 as shown

identified maximum concentrations of 12 ppm of TEPH and 43 ppm of total recoverable petroleum hydrocarbons (TRPH). The six samples at 12 feet bgs were composited into two samples and analyzed for polychlorinated biphenyls (PCBs). Laboratory analysis did not detect PCBs at or above the method practical quantitation limit. The excavation was backfilled with clean imported fill material. The procedures and results of this work were presented in a Canonic report dated April 3, 1989 (report entitled: *Completion Report, Underground Storage Tank Removal, Southern Pacific Transportation Company Facility, Oakland, California*).

At the request of Alameda County, IC conducted a preliminary site assessment at the site in April, 1994. A total of three soil borings were drilled at the site, which were then converted to monitoring wells (MW-1, MW-2, and MW-3) (Figure 2). Because of restricted access (due to utility lines and railroad tracks), the locations for two of the monitoring wells (MW-2 and MW-3) were moved in a westerly direction from their previously approved location. After a period of approximately nine days these wells were developed, and subsequently sampled six days thereafter. The procedures and results of this work were presented in an IC report dated September 2, 1994 (report entitled: *Soil and Ground Water Investigation Report, Southern Pacific Transportation Company, 5th Avenue and 7th Street, Oakland, California*).

In August of 1994, IC initiated quarterly ground water monitoring at the site using the monitoring wells installed during the April 1994 field activities. The first quarter 1995 ground water monitoring is the third quarterly monitoring event for the site.

3.0 FIELD INVESTIGATION

This section discusses the procedures and protocol used for the collection of monitoring well water level data and ground water samples for laboratory analyses. On February 16, 1995, the scheduled monitoring date for this quarter, well MW-1 was not accessible due to construction activity at the site. Wells MW-2 and MW-3 were measured and sampled as scheduled. On February 28, 1995, following completion of construction activities, water levels were measured in wells MW-1, MW-2 and MW-3 to provide a consistent set of water level data. A ground water sample was not collected from MW-1 at this time as the analytical results would not be time-consistent with the other two site wells.

3.1 Monitoring Well Water Level Data

On February 16, 1995, prior to purging, the depth to ground water was measured in wells MW-2 and MW-3. On February 28, 1995, depth to water was measured in wells MW-1, MW-2 and MW-3. All measurements were taken from the top of casing (which had been surveyed by a licensed surveyor relative to mean sea level [MSL]) using a water level indicator with an accuracy to 0.01 feet. Ground water elevations this quarter ranged from 1.60 to 4.22 feet above MSL. Ground water elevation data are summarized in Table 1. Ground water elevation data from February 28, 1995 were used to construct a ground water elevation contour map (Figure 3). Ground water flow is in a northeasterly direction. The calculated local hydraulic gradient is 0.006 feet per foot. Ground water elevation measurement logs are included in Appendix A.

TABLE 1
GROUND WATER ELEVATION DATA
FEBRUARY, 1995

Monitoring Well ^a	Date Measured	Time Measured	Top of Casing Elevation ^b (feet MSL)	Depth to Ground Water ^c (feet TOC)	Ground Water Elevation ^d (feet MSL)
MW-1	02/16/94 ^e	NM	8.20	NM	NM
	02/28/95 ^f	1259		6.60	1.60
MW-2	02/16/95	0924	6.36	2.04	4.32
	02/28/95 ^f	1312		2.48	3.88
MW-3	02/16/95	0916	6.84	1.14	5.70
	02/28/95 ^f	1316		2.62	4.22

a See Figure 2 for approximate location of monitoring wells.

b Top of casing elevation is a surveyed point marked on the top of the well casing.

c Depth to ground water measured from top of casing.

d Ground water elevation calculated by subtracting the depth to ground water from the top of casing elevation

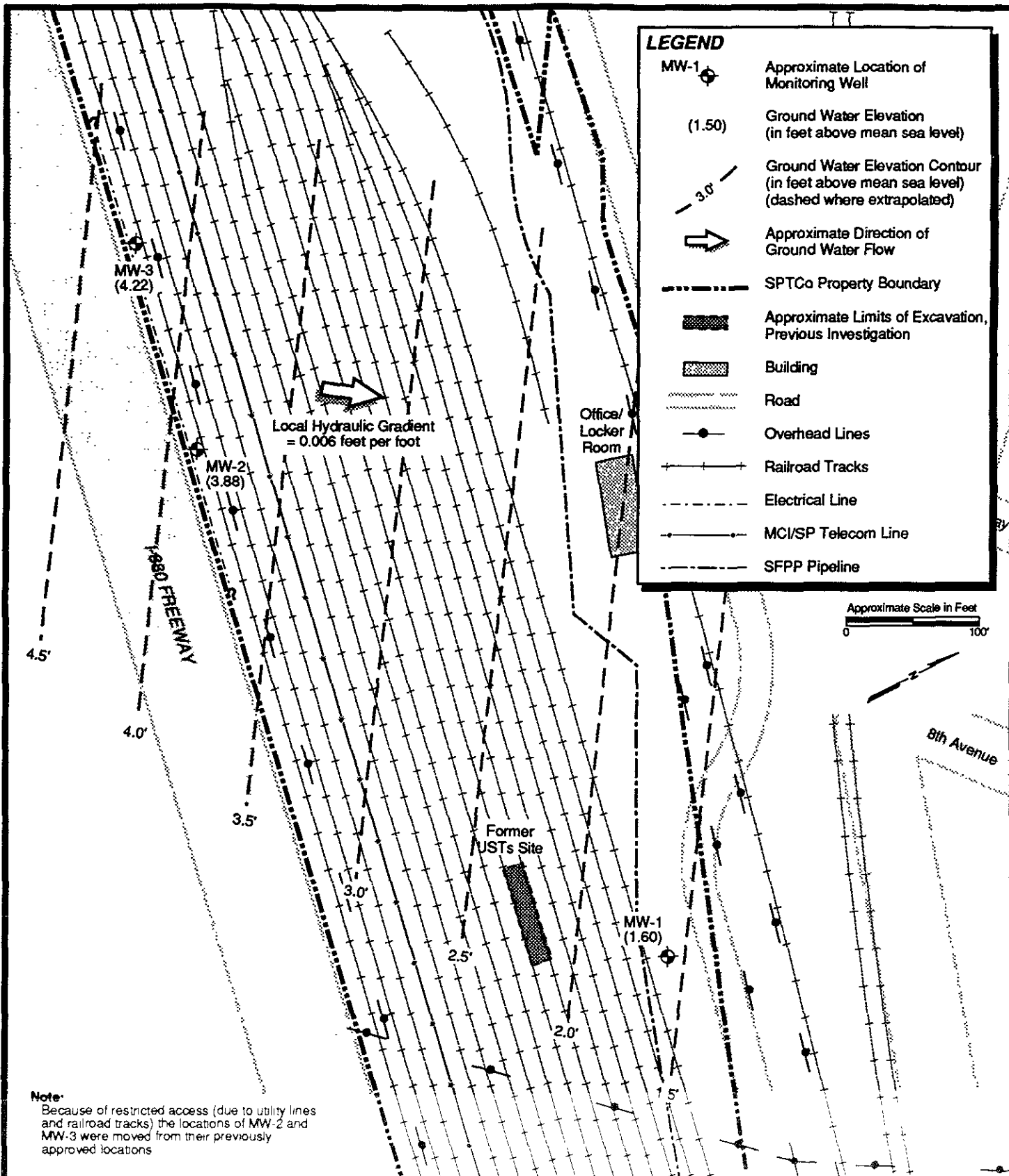
e Depth to water was not measured due to inaccessibility resulting from construction activities

f Depth to water was measured in all wells on February 28, 1995 after MW-1 was accessible.

TOC Top of casing

MSL Mean sea level

NM Not measured



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Project No	05100269	Date	04/21/95
Drawn By	Patti Decker	Checked By	Richard Bateman

CONTOUR MAP OF GROUND WATER ELEVATION
FEBRUARY, 1995
SOUTHERN PACIFIC TRANSPORTATION COMPANY
5TH AVENUE AND 7TH STREET PROPERTY
OAKLAND, CALIFORNIA

Figure	3
Page No	8
Scale	as shown

3.2 Monitoring Well Purging

After measurement of the ground water level in each well, the saturated well volume was calculated by subtracting the depth to ground water from the total depth of the well and multiplying the resultant length by the number of gallons per foot of casing. Prior to sample collection, each well was purged to ensure that the water sample obtained from the well was representative of the formation water. Each well was purged by hand-bailing a minimum of three times the saturated casing volume in the well. Purging equipment was cleaned with Alconox and rinsed with deionized (DI) water prior to each use. Ground water characterization data, consisting of electrical conductivity, temperature and pH, were measured from the initial water removed and at least three times during purging. The ground water in each well was assumed to be representative of the formation when a minimum of three well volumes had been removed and consecutive parameter readings were within 10 percent. After purging was complete, each well was allowed to recover to at least 90 percent of the original water level. Due to the slow recharge rate, well MW-3 was bailed dry and subsequently sampled before recovering to 90 percent of the pre-purge water level. Ground water purge characterization data are summarized in Table 2. Purge characterization field data sheets are included in Appendix A.

3.3 Monitoring Well Sampling

Ground water samples were collected using new, disposable polyethylene bailers. The water samples from the bailers were transferred to laboratory-supplied containers of appropriate volumes and with required preservatives for the intended analyses. Volatile organic analysis (VOA) sample containers were filled to capacity, sealed with Teflon-lined lids, and checked for air bubbles. If air bubbles were detected, the vial was re-opened, additional sample water added, and the vial resealed.

TABLE 2
GROUND WATER PURGE CHARACTERIZATION DATA
FEBRUARY, 1995

Monitoring Well ^a	Date Measured	Purge Volume (gallons)	Electrical Conductivity (μ mhos/cm)	Temperature ($^{\circ}$ F)	Field pH (units)
MW-1 ^b	02/16/95	NM	NM	NM	NM
MW-2	02/16/95	0	4,380	60.2	6.38
		8	5,020	60.0	6.40
		16	1,080	61.6	7.18
		23	1,180	62.0	7.08
MW-3	02/16/95	0	1,860	61.6	6.26
		8	2,020	59.4	6.56
		16	2,220	61.9	6.66
		24	3,090	66.9	6.94

a See Figure 2 for approximate location of monitoring wells.

b Monitoring well MW-1 could not be sampled as it was inaccessible due to construction activities.

μ mhos/cm Micromhos per centimeters

$^{\circ}$ F Degrees Fahrenheit

NM Not measured.

Note: Purge characterization data sheets included in Appendix A.

After sample collection was completed, each sample was labeled with a unique sample number, the site name, date of collection, time of collection, initials of collector, and any other pertinent information. The samples were then placed in a chilled ice chest for transport to Chromalab, Inc. Environmental Services (Chromalab). A chain-of-custody document was completed concurrent with sample collection and accompanied the samples upon transport to the laboratory. The chain-of-custody document is included in Appendix B.

All ground water samples were analyzed for the following constituents:

<u>Constituent</u>	<u>Analytical Method</u>
Total petroleum hydrocarbons as diesel (TPH-D)	EPA Method 8015 Modified
Total petroleum hydrocarbons as motor oil (TPH-MO)	EPA Method 8015 Modified
Benzene, toluene, ethylbenzene, and xylenes (BTEX)	EPA Method 8020
Sodium chloride	Calculation ¹
Total dissolved solids (TDS)	EPA Method 160.1

3.4 Quality Assurance/Quality Control

To evaluate the integrity of the ground water sampling/analysis process, a duplicate ground water sample was collected from MW-2 using the procedures previously described in Section 3.3. The duplicate ground water sample was analyzed for TPH-D, TPH-MO, BTEX, sodium chloride and TDS.

To assess the potential for cross-contamination of the ground water samples during transport to the laboratory, one trip blank was prepared by the lab prior to sample collection with DI

¹ Sodium chloride concentration obtained by calculation after analyzing for sodium and chloride separately.

water and accompanied the ground water samples during shipment to the laboratory. The trip blank was submitted to the laboratory for BTEX analysis only.

In addition, one equipment blank was collected by pouring DI water through the sampling equipment into the appropriate sample bottles. The equipment blank was analyzed for TPH-D, TPH-MO, and BTEX.

4.0 ANALYTICAL RESULTS

First quarter 1995 ground water samples were analyzed by Chromalab for the suite of constituents listed in Section 3.3. Analytical results are summarized in Table 3. Figure 4 is a chemical distribution map. Analytical laboratory reports are included as Appendix C. The following is a summary of the first quarter, 1995 analytical results:

- * TPH-D, TPH-MO, and BTEX were not detected in either of the wells sampled at or above their respective reporting limits.
- * Sodium chloride concentrations ranged from 190 milligrams per liter (mg/L) in MW-2 to 650 mg/L in MW-3 (average concentration for both wells = 420 mg/L).
- * TDS ranged from 370 mg/L in MW-2 to 1330 mg/L in MW-3 (average concentration for both wells = 850 mg/L).

The analytical results for the duplicate ground water sample collected from MW-2 were consistent with those of the original ground water sample.

None of the analyzed constituents were detected at or above their respective reporting limits in either the trip blank or the equipment blank.

All laboratory procedures (holding times, methods used, method blanks, documentation, etc.) and subsequent results were monitored throughout the analytical process according to standard quality assurance-quality control (QA/QC) procedures. In addition, all laboratory reports were evaluated as part of QA/QC procedures for ground water monitoring. The

TABLE 3
GROUND WATER ANALYTICAL RESULTS
FEBRUARY, 1995

Sample Location	Date Sampled	Total Extractable Petroleum Hydrocarbons ^a (µg/L)		Volatile Organic Compounds ^b (µg/L)				Sodium Chloride ^c (mg/L)	Total Dissolved Solids ^d (mg/L)
		Diesel	Motor Oil	Benzene	Toluene	Ethylbenzene	Xylenes		
MW 1 ^e	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW 2	02/16/95	<50	<500	<0.5	<0.5	<0.5	<0.5	190	370
MW 3	02/16/95	<50	<500	<0.5	<0.5	<0.5	<0.5	650	1330
MW 2 Duplicate	02/16/95	<50	<500	<0.5	<0.5	<0.5	<0.5	189	360
Equipment Blank	02/16/95	<50	<500	<0.5	<0.5	<0.5	<0.5	NA	NA
Tap Blank	02/16/95	NA	NA	<0.5	<0.5	<0.5	<0.5	NA	NA
Cal DHS MCLs ^f		NE	NE	1	100 ^g	680	1,750	NE	500

a Analyzed by EPA Method 8015 Modified.

b BTEX analyzed by EPA Method 8020.

c Sodium chloride concentrations determined by calculation after analyzing for sodium and chloride separately.

d Total dissolved solids analyzed by EPA Method 160.1

e Monitoring well MW-1 not sampled due to inaccessibility resulting from construction activities.

f California Department of Health Services (DHS) Maximum Contaminant Levels (MCLs) for drinking water (California RWQCB, May, 1993, Compilation of Water Quality Goals).

g California DHS action level for drinking water (California RWQCB, May, 1993, Compilation of Water Quality Goals).

NS Not sampled.

NA Not analyzed.

NE No MCL established.

mg/L Milligrams per liter

µg/L Micrograms per liter

< Indicates the constituent was not detected at a concentration at or above the reporting limit as listed.

Notes:

1. Total petroleum hydrocarbons (TPH) as diesel analyzed by EPA Method 8015 modified.
2. VOCs analyzed by EPA Method 8010/8020.
3. All sample results reported in micrograms per liter (µg/L) or in milligrams per liter (mg/L).
4. < = Indicates constituent not detected at or above method practical quantitation limit as noted.
5. MW-1 was not sampled due to inaccessibility resulting from construction activities.

Date Sampled	TPH (µg/L)		Volatile Organic Compounds (µg/L)				Sodium Chloride (mg/L)	Total Dissolved Solids (mg/L)
	Diesel	Motor Oil	Benzene	Toluene	Ethyl-benzene	Xylenes		
2/16/95	<50	<500	<0.5	<0.5	<0.5	<0.5	850	1330

Date Sampled	TPH (µg/L)		Volatile Organic Compounds (µg/L)				Sodium Chloride (mg/L)	Total Dissolved Solids (mg/L)
	Diesel	Motor Oil	Benzene	Toluene	Ethyl-benzene	Xylenes		
2/16/95	<50	<500	<0.5	<0.5	<0.5	<0.5	190	370

Date Sampled	TPH (µg/L)		Volatile Organic Compounds (µg/L)				Sodium Chloride (mg/L)	Total Dissolved Solids (mg/L)
	Diesel	Motor Oil	Benzene	Toluene	Ethyl-benzene	Xylenes		
NS	NS	NS	NS	NS	NS	NS	NS	NS



LEGEND

- MW-1 Approximate Location of Monitoring Well
- SPTCo Property Boundary
- Approximate Limits of Excavation, Previous Investigation
- Building
- Road
- Overhead Lines
- Railroad Tracks
- Electrical Line
- MCI/SP Telecom Line
- SFPP Pipeline

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Project No: 05100269 Date: 04/21/95

Drawn By: Patti Decker Checked By: Richard Bateman

**CHEMICAL DISTRIBUTION MAP FOR
 CONSTITUENTS IN GROUND WATER SAMPLES
 FEBRUARY, 1995
 SOUTHERN PACIFIC TRANSPORTATION COMPANY
 5TH AVENUE AND 7TH STREET PROPERTY
 OAKLAND, CALIFORNIA**

Figure	4
Page No	15
Scale	as shown

analytical data included in this first quarter, 1995 monitoring report are considered quantitatively valid.

5.0 DISCUSSION

No petroleum hydrocarbons or related volatile organic compounds were detected in ground water samples collected during the first quarter, 1995 ground water monitoring event at the SPTCo 5th Avenue and 7th Street property. This result is generally consistent with analytical results from all previous monitoring events (Table 4). The only historic detection of petroleum hydrocarbons was for TPH-MO at the detection limit in MW-2 during the third quarter of 1994. Third quarter 1994 samples were analyzed by a different analytical laboratory and resulted in detections at this and several other monitoring sites which have not been duplicated in any subsequent monitoring. None of the constituents analyzed this or any preceding quarter has exceeded established California Department of Health Services (DHS) maximum contaminant levels (MCLs) or action levels (ALs) for drinking water.

Ground water elevation contour maps for all previous monitoring events are included in Appendix D. Table 5 lists all ground water elevation data collected to date. A comparison of ground water elevation data collected this quarter (February 28, 1995) with ground water elevations measured during the fourth quarter 1994, indicates a slight decrease in ground water elevations in wells MW-2 and MW-3, and a substantial decrease in ground water elevation in MW-1. Ground water elevations measured during the first quarter 1995, show an average decrease of 2.43 feet over fourth quarter 1994 water levels. The local hydraulic gradient for the first quarter, 1995 was calculated to be 0.006 feet per foot which is slightly lower than the gradient calculated for November, 1994 of 0.013 feet per foot. The ground water flow direction has changed from a southerly direction in November of 1994 to a northeasterly direction this quarter. The observed decrease in ground water elevation is likely due to seasonal variation; however, above-average precipitation occurred during January of 1995 and an increase in shallow ground water levels would have been expected. The change in flow direction may be due to seasonal variation or tidal influence. Figure 5 shows hydrographs of ground water elevations for all monitoring wells.

**TABLE 4
GROUND WATER ANALYTICAL RESULTS
HISTORIC SUMMARY**

Sample Location	Date Sampled	Total Extractable Petroleum Hydrocarbons (µg/L)		Volatile Organic Compounds ^c (µg/L)				Sodium Chloride ^d (mg/L)	Total Dissolved Solids ^e (mg/L)
		Diesel ^a	Motor Oil ^b	Benzene	Toluene	Ethylbenzene	Xylenes		
MW-1	04/28/94	<50	<200	<0.5	<0.5	<0.5	<0.5	61	530
	08/16/94	<120	<750	<0.3	<0.3	<0.5	<0.5	86	600
	11/09/94	<50	<500	<0.5	<0.5	<0.5	<0.5	25	470
	02/16/95 ^f	NS	NS	NS	NS	NS	NS	NS	NS
MW-2	04/28/94	<50	<200	<0.5	<0.5	<0.5	<0.5	77	460
	08/16/94	<120	750	<0.3	<0.3	<0.5	<0.5	170	690
	11/10/94	<50	<500	<0.5	<0.5	<0.5	<0.5	35	370
	02/16/95	<50	<500	<0.5	<0.5	<0.5	<0.5	190	370
MW-3	04/28/94	<50	<200	<0.5	<0.5	<0.5	<0.5	300	680
	08/16/94	<120	<750	<0.3	<0.3	<0.5	<0.5	1200	3700
	11/10/94	<50	<500	<0.5	<0.5	<0.5	<0.5	140	620
	02/16/95	<50	<500	<0.5	<0.5	<0.5	<0.5	630	1330
Cal DHS MCLs ^g		NE	NE	1	100 ^h	680	1,750	NE	500

a Analyzed by EPA Method 8015 (April 1994 samples analyzed by EPA Method 8260).

b Analyzed by EPA Method 8015 (April 1994 samples analyzed by EPA Method 8270).

c Analyzed by EPA Method 8020 (April 1994 samples analyzed by EPA Method 8270).

d Sodium chloride concentrations determined by calculation, after analyzing for sodium and chloride separately.

e Total dissolved solids analyzed by EPA Method 160.1.

f MW-1 was not sampled on February 16, 1995 due to inaccessibility resulting from construction activities.

g California Department of Health Services (DHS) Maximum Contaminant Levels (MCLs) for drinking water (California RWQCB, May, 1993, Compilation of Water Quality Goals).

h California DHS action level for drinking water (California RWQCB, May, 1993, Compilation of Water Quality Goals).

NS Not sampled

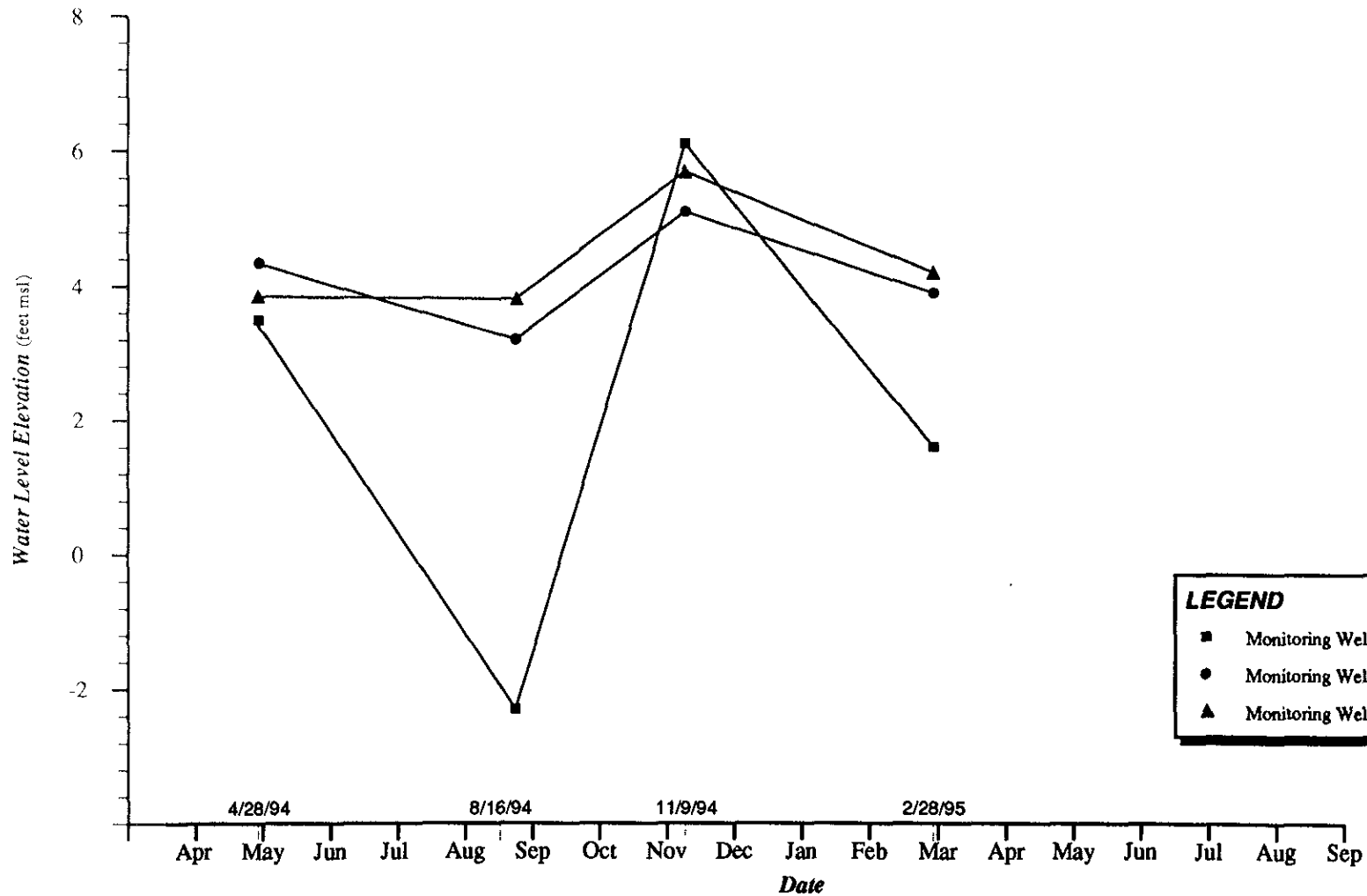
NA Not analyzed.

NE No MCL established.

mg/L Milligrams per liter

µg/L Micrograms per liter

< Indicates the constituent was not detected at a concentration at or above the reporting or method detection limit as listed.



LEGEND

- Monitoring Well MW-1
- Monitoring Well MW-2
- ▲ Monitoring Well MW-3

Project No.: 05100269	Date: 04/21/95
Drawn By: Patti Decker	Checked By: Richard Bateman

**HYDROGRAPHS OF GROUND WATER ELEVATION
SOUTHERN PACIFIC TRANSPORTATION COMPANY
5TH AVENUE AND 7TH STREET PROPERTY
OAKLAND, CALIFORNIA**

Figure: 5
Page No.: 20
Scale: as shown

Oak-269/OA94GW/E-07 #300

6.0 GLOSSARY OF ACRONYMS

ALs	Action levels
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene and xylenes
cy	Cubic yards
DHS	California Department of Health Services
DI	Deionized
IC	Industrial Compliance
MCLs	Maximum contaminant levels
mg/L	Milligrams per liter
MSL	Mean sea level
PCBs	Polychlorinated biphenyls
ppm	Parts per million
QA/QC	Quality Assurance/Quality Control
SPTCo	Southern Pacific Transportation Company
TDS	Total dissolved solids
TEPH	Total extractable petroleum hydrocarbons
TPH-D	Total petroleum hydrocarbons as diesel
TPH-MO	Total petroleum hydrocarbons as motor oil
TRPH	Total recoverable petroleum hydrocarbons
USTs	Underground storage tanks
VOA	Volatile organic analysis



APPENDIX A

**GROUND WATER ELEVATION MEASUREMENT AND
PURGE CHARACTERIZATION FIELD DATA SHEETS**

GROUND WATER ELEVATION MEASUREMENT LOG

Sheet 1 of 1

Project Name: EAST BAYLAND Project No. 05100269 Task/Phase: 01 / 98000
 Date: 2-16-95 Equipment: WATER LEVEL METER Weather: OVERCAST

Well Number	Reference Elevation (feet-MSL)	Time (military)	Depth to Water (feet)	Depth to Product (feet)	Total Depth (feet)	PT (feet)	PT x 0.8 (feet)	Adjusted DTW ¹ (feet)	Ground Water Elevation ² (feet-MSL)
MW-1									
MW-2	6.36	924	2.04	—	13.64	—	—	2.04	4.32
MW-3	6.84	916	1.14	—	13.60	—	—	1.14	5.70
Comments: <u>NOT SAMPLED TO MW#1 DUE TO ACCESSIBLE</u>									

- 1 Adjusted depth to water = DTW - (PT x 0.8)
- 2 Ground water elevation = Reference elevation - Adjusted DTW
- MSL Mean sea level
- DTW Depth to water (to 0.01 foot)
- PT Product thickness (0.01 foot)

Signature Duke Endrey

GROUND WATER ELEVATION MEASUREMENT LOG

Sheet 6 of 1

Project Name: EAST OAKLAND
Date: 2-28-95

Project No. 05100269
Equipment: WATER LEVEL INDICATOR

Task/Phase: 01 / 98000
Weather: RAINY

Well Number	Reference Elevation (feet-MSL)	Time (military)	Depth to Water (feet)	Depth to Product (feet)	Total Depth (feet)	PT (feet)	PT x 0.8 (feet)	Adjusted DTW (feet)	Ground Water Elevation (feet-MSL)
MW-1	8.20	1259	6.60	—	13.68	—	—	6.60	1.60
MW-2	6.36	1312	2.48	—	13.64	—	—	2.48	3.88
MW-3	6.84	1316	2.62	—	13.60	—	—	2.62	4.22
Comments:									

- 1 Adjusted depth to water = DTW - (PT x 0.8)
- 2 Ground water elevation = Reference elevation - Adjusted DTW
- MSL Mean sea level
- DTW Depth to water (to 0.01 foot)
- PT Product thickness (0.01 foot)

Signature Mike Endicott



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PURGE CHARACTERIZATION AND SAMPLE LOG

Project Number: 05100269 Project Name: EAST OAKLAND YARD Date: 2-16-95
 Well Number: 100-1 Sampler: MIKE ENDICOTT Weather: OVERCAST

Military Time										
Gallons Purged	0									Depth to bottom (DB):
Purge Rate	---	---	---	---						Depth to water (DW):
pH										Height of water column (H) = DB - DW:
Conductivity										One casing volume (CV) = H x multiplier:
Temperature (C)										Three casing volumes (3CV):
Salinity (0/00)	---	---	---	---						Multipliers = 2" well = 0.16 gallons/foot
Turbidity										4" well = 0.65 gallons/foot
Color										6" well = 1.47 gallons/foot
Water Level Casing										8" well = 2.61 gallons/foot
Calibration	pH:									S.C.:

Sample #	Quantity	Volume	Type	Preserv.	Analysis	Lab	Sample Equip.	Purge Equip.	Field Comments
100-2	2	40AL	COA	HCL	BTEX	CH2M	DIS-BALLER	TEL-BALLER	
	1	1 LT	ANION	NONE	PAH-0				
	1	1 LT	ANION	NONE	PAH-10				
	1	1 LT	POLY	NONE	TD/MSD				
TRIP	2	40MG	COA	HCL	BTEX	CH2M			
Cleaning:	BALLER WASHED WITH ALCOHOL / RINSED WITH DI WATER								
Comments:	WELL NOT ACCESSIBLE DUE TO CONSTRUCTION ACTIVITY								

Sampler's Signature: Mike Endicott



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PURGE CHARACTERIZATION AND SAMPLE LOG

Project Number: 05100269 Project Name: EAST OAKLAND YARD Date: 2-16-95

Well Number: MW-2 Sampler: MIKE ENDICOTT Weather: OVERCAST

Military Time	1002	1009	1030	1035	1100		
Gallons Purged	0	8	16	23			Depth to bottom (DB): <u>13.64</u>
Purge Rate	—	—	—	—	S		Depth to water (DW): <u>2.04</u>
pH	6.38	6.40	7.18	7.08	A		Height of water column (H) = DB - DW: <u>11.60</u>
Conductivity	4.38 ^{x1000}	5.08 ^{x1000}	1.00 ^{x1000}	1.18 ^{x1000}	M		One casing volume (CV) = H x multiplier: <u>7.5</u>
Temperature (°F)	60.2	60.0	61.6	62.0	P		Three casing volumes (3CV): <u>22.6</u>
Salinity (0/00)	—	—	—	—	L		Multipliers = 2" well = 0.16 gallons/foot
Turbidity	CLOUDY	CLOUDY	CLOUDY	CLOUDY	E		4" well = 0.65 gallons/foot
Color	GRAY	GRAY	GRAY	GRAY			6" well = 1.47 gallons/foot
Water Level Casing							8" well = 2.61 gallons/foot
Calibration	pH:						S.C.:

Sample #	Quantity	Volume	Type	Preserv.	Analysis	Lab	Sample Equip.	Purge Equip.	Field Comments
MW-2	2	40 ML	VOA	HCL	BTEX	CHROM	DIS BAILER	TEL BAILER	
	1	1 LT.	AMBER	NONE	TPH-D	↓	↓	↓	
	1	1 LT	AMBER	NONE	TPH-MO	↓	↓	↓	
	1	1 LT	POLY	NONE	TDS/NACL	↓	↓	↓	
MW-2.D	2	40 ML	VOA	HCL	BTEX	CHROM	DIS BAILER	TEL BAILER	
	1	1 LT	AMBER	NONE	TPH-D	↓	↓	↓	
	1	1 LT	AMBER	NONE	TPH-MO	↓	↓	↓	
	1	1 LT	POLY	NONE	TDS/NACL	↓	↓	↓	
Cleaning:	BAILER WASHED WITH ALCOHOL / RINSED WITH DI WATER								
Comments:									

Sampler's Signature: Mike Endicott



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PURGE CHARACTERIZATION AND SAMPLE LOG

Project Number: 05100269 Project Name: EAST OAKLAND YARD Date: 2-16-95

Well Number: MW-3 Sampler: MIKE ENDICOTT Weather: OVERCAST

Military Time	930	939	958	1110	1400					
Gallons Purged	0	8	16	24				Depth to bottom (DB):	13.60	
Purge Rate						S		Depth to water (DW):	1.14	
pH	6.26	6.56	6.66	6.94		A		Height of water column (H) = DB - DW:	12.46	
Conductivity	1.86 ^{x1000}	2.02 ^{x1000}	2.22 ^{x1000}	3.05 ^{x1000}		M		One casing volume (CV) = H x multiplier:	8.0	
Temperature (°F)	61.6	59.4	61.9	66.9		D		Three casing volumes (3CV):	24.0	
Salinity (0/00)						L		Multipliers = 2" well = 0.16 gallons/foot		
Turbidity	CLEAR	CLOUDY	CLOUDY			E		4" well = 0.65 gallons/foot		
Color	CLEAR	LT BRN	LT BRN					6" well = 1.47 gallons/foot		
Water Level Casing								8" well = 2.61 gallons/foot		
Calibration	pH:							S.C.:		

Sample #	Quantity	Volume	Type	Preserv.	Analysis	Lab	Sample Equip.	Purge Equip.	Field Comments
MW-3	2	40ML	VOA	HCL	BTEX	CHEM	DIS BAILEY	TEL BAILEY	
	1	1 LT	AMBER	NONE	TPH-D	↓	↓	↓	
	1	1 LT	AMBER	NONE	TPH-MO	↓	↓	↓	
	1	1 LT	POLY	NONE	TDS/TOTAL	↓	↓	↓	
EQUIP	2	40ML	VOA	HCL	BTEX	CHEM	---	TEL BAILEY	
	1	1 LT	AMBER	NONE	TPH-D	↓		↓	
	1	1 LT	AMBER	NONE	TPH-MO	↓		↓	
Cleaning:	BAILEY WASHED WITH ALCOHOL / RINSED WITH DI WATER								
Comments:	SLOW RECOVERY								

Sampler's Signature: Mike Endicott

APPENDIX B
CHAIN-OF-CUSTODY DOCUMENT

217778027-78031
20546

CHAIN-OF-CUSTODY RECORD

No. 20485

INDUSTRIAL COMPLIANCE • 9838 OLD PLACERVILLE ROAD, SUITE 100 • SACRAMENTO, CA 95827-3559 • Phone 916-369-8971 • FAX 916-369-8370

PROJECT NAME EAST OAKLAND YARD		PROJECT LOCATION OAKLAND, CA	
PROJ NO 05100289	PROJECT CONTACT MIKE ERDICOTT	PROJECT TELEPHONE NO. (510) 238 9540	
CLIENT'S REPRESENTATIVE		PROJECT MANAGER/SUPERVISOR	

ANALYSIS DESIRED
(INDICATE SEPARATE CONTAINERS)
 BTEX BOLSM
 TPH - DIESEL BOLSM
 TPB - MOTOR OIL BOLSM
 TDS / TRACE

LAB # 20546
 CLIENT: INDUSTRIAL COMPLIANCE
 REF: 05100289
 REF # 20546

ITEM NO	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE LOCATION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	ANALYSIS DESIRED	REMARKS
1	MW-1	2/16				SAMPLE MONITORING WELL MW-1 (WATER)	5	X X X X	WELL NOT INACCESSIBLE DUE TO CONSTRUCTION ACTIVITY
2	MW-2		1100			SAMPLE MONITORING WELL MW-2 (WATER)	5	X X X X	
3	MW-3		1400			SAMPLE MONITORING WELL MW-3 (WATER)	5	X X X X	
4	MW-2D		1100			SAMPLE MONITORING WELL MW-2 (DUPLICATE SAMPLE WATER)	5	X X X X	
5	EQUIP		1100			EQUIPMENT BLANK (BALLER) (WATER)	4	X X X	EQUIP. BLANK
6	TRIP		1100			TRIP BLANK (WATER)	2	X	TRIP BLANK
7									
8									
9									
10									

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	6	<i>Mike Erdicott</i>	<i>[Signature]</i>	2/16	1526	5 DAY TURNAROUND
2						
3						P.O # 00905
4						SAMPLER'S NAME: MIKE ERDICOTT SAMPLER'S SIGNATURE: <i>Mike Erdicott</i>

APPENDIX C
ANALYTICAL LABORATORY REPORTS
GROUND WATER SAMPLES

CHROMALAB, INC.

Environmental Services (SDB)

February 23, 1995

Submission #: 9502217

INDUSTRIAL COMPLIANCE-OAKLAND

Atten: Mike Endicott

Project: EAST OAKLAND YARD ✓
Received: February 16, 1995

Project#: 05100269

re: 5 samples for BTEX analysis.

Sampled: February 16, 1995 ✓ Matrix: WATER
Method: EPA 602/8020 Run#: 5466 Analyzed: February 22, 1995

Spl #	CLIENT SMPL ID	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
78027	MW-2	N.D. ✓	N.D. ✓	N.D. ✓	N.D. ✓
78028	MW-3	N.D. ✓	N.D. ✓	N.D. ✓	N.D. ✓
78029	MW-2D	N.D.	N.D.	N.D.	N.D.
78030	EQUIP	N.D.	N.D.	N.D.	N.D.
78031	TRIP	N.D.	N.D.	N.D.	N.D.
Reporting Limits		0.5	0.5	0.5	0.5
Blank Result		N.D.	N.D.	N.D.	N.D.
Blank Spike Result (%)		102	108	111	119

Jack Kelly
Chemist

Ali Kharrazi
Organic Manager

CHROMALAB, INC.

Environmental Services (SDB)

February 24, 1995

Submission #: 9502217

INDUSTRIAL COMPLIANCE-OAKLAND

Atten: Mike Endicott

Project: EAST OAKLAND YARD
Received: February 16, 1995

Project#: 05100269

re: Four samples for TEPH analysis

Matrix: WATER
Sampled: February 16, 1995
Method: 3510/8015 ✓

Extracted: February 21, 1995
Analyzed: February 22&24, 1995

Sample #	Client Sample ID	Kerosene ($\mu\text{g/L}$)	Diesel ($\mu\text{g/L}$)	Motor Oil ($\mu\text{g/L}$)
78027	MW-2	N.D. ✓	N.D. ✓	N.D. ✓
78028	MW-3	N.D. ✓	N.D. ✓	N.D. ✓
78029	MW-2D	N.D.	N.D.	N.D.
78030	EQUIP	N.D.	N.D.	N.D.
Blank		N.D.	N.D.	N.D.
Spike Recovery		----	87%	----
Dup Spike Recovery		----	88%	----
Reporting Limit		50	50	500

ChromaLab, Inc.

Sirirat Chullakorn

Sirirat Chullakorn
Analytical Chemist

Ali Kharrazi
Ali Kharrazi
Organic Manager

cc



GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue
Modesto, CA 95351

Phone (209) 572-0900
FAX (209) 572-0916

CERTIFICATE OF ANALYSIS

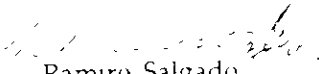
Report # G048-04
ChromaLab
1220 Quarry Lane
Pleasanton CA 94566 - 4756

Date of Report: 02/21/95
Date Received: 02/17/95
Date Started: 02/17/95
Date Completed: 02/20/95

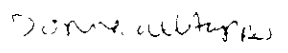
Project Name: INDCOMP

Project # 9502217

Sample ID	Lab ID	Detection Limit	Method	Analyte	Results	Units mg/L
MW-2	G30842	1	6010/300	Sodium Chloride	190	
MW-3	G30843	1	6010/300	Sodium Chloride	650	
MW-2D	G30844	1	6010/300	Sodium Chloride	189	


Ramiro Salgado
Chemist

Certification # 1157


Donna Allsup
Laboratory Director



GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue
Modesto, CA 95351

Phone (209) 572-0900
FAX (209) 572-0916

CERTIFICATE OF ANALYSIS

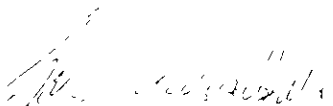
Report # G048-04
ChromaLab
1220 Quarry Lane
Pleasanton CA 94566 - 4756

Date of Report: 02/21/95
Date Received: 02/17/95
Date Started: 02/17/95
Date Completed: 02/20/95

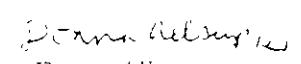
Project Name: INDCOMP

Project # 9502217

Sample ID	Lab ID	Detection Limit	Method	Analyte	Results	Units mg/L
MW-2	G30842	10	160.1	Total Dissolved Solids	370	✓
MW-3	G30843	10	160.1	Total Dissolved Solids	1330	✓
MW-2D	G30844	10	160.1	Total Dissolved Solids	360	

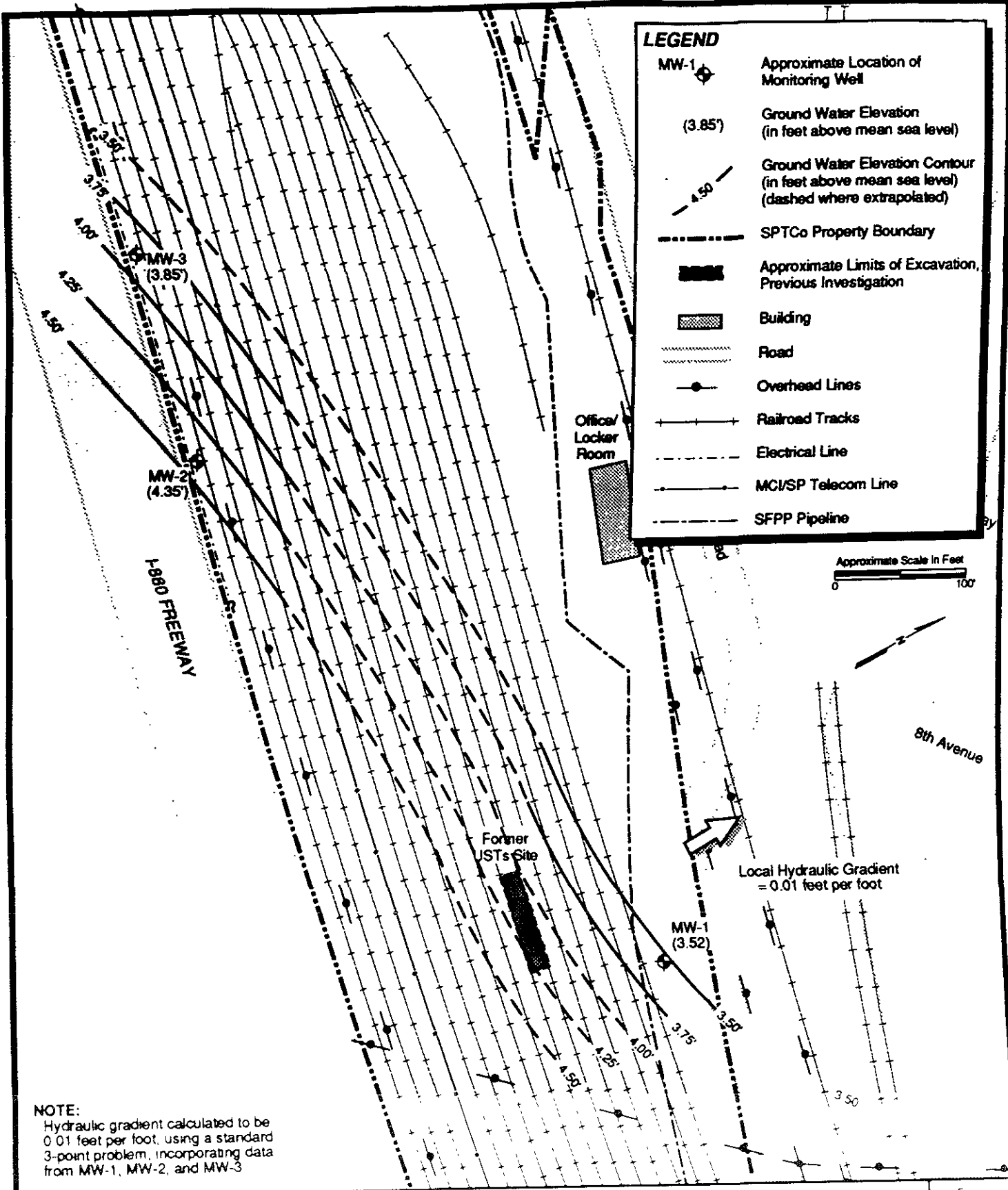

Ramiro Salgado
Chemist

Certification # 1157


Donna Allsup
Laboratory Director

APPENDIX D

**GROUND WATER ELEVATION CONTOUR MAPS
PREVIOUS MONITORING EVENTS**

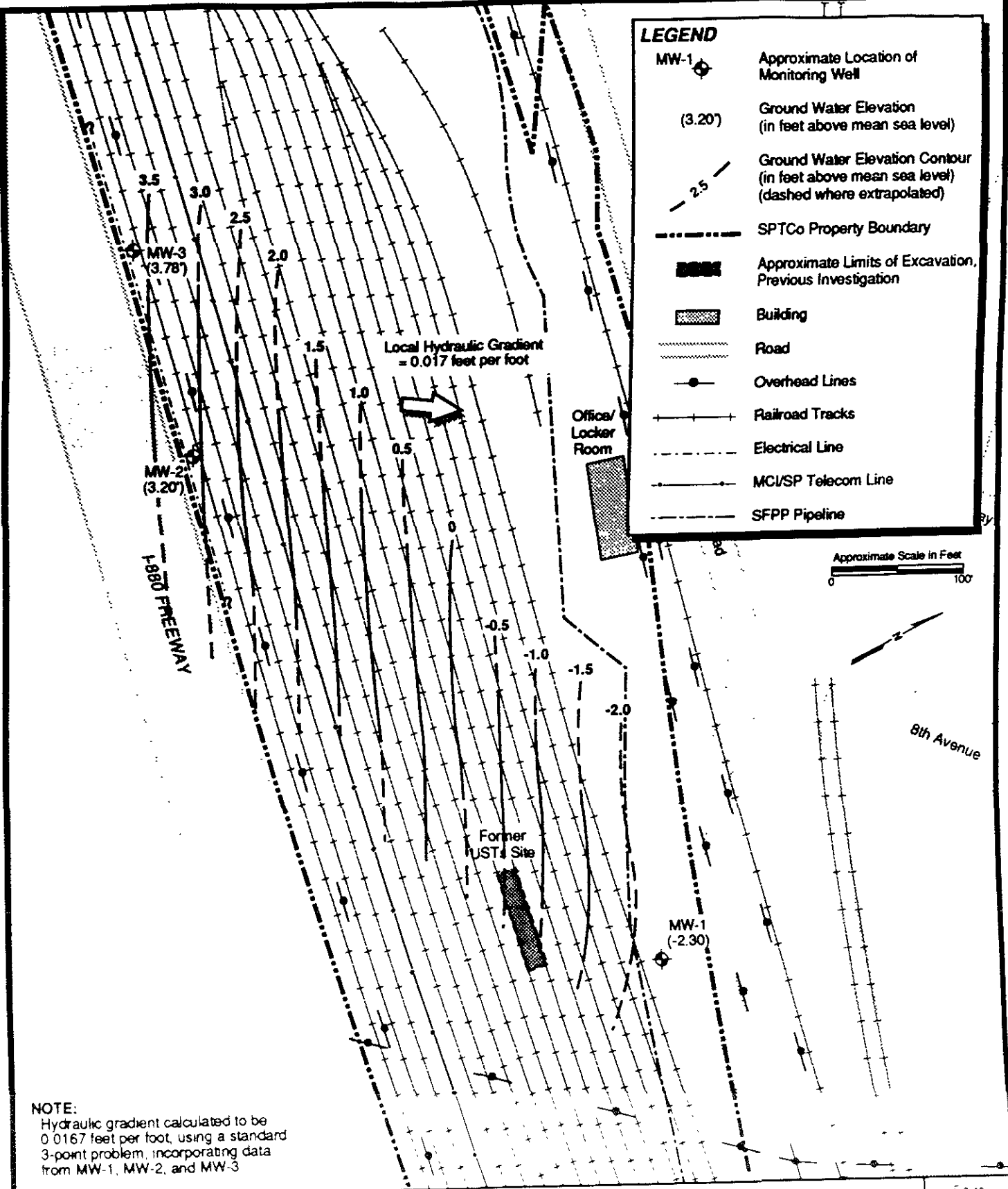


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**CONTOUR MAP OF GROUND WATER ELEVATIONS WITH HYDRAULIC GRADIENT, APRIL, 1994
 SOUTHERN PACIFIC TRANSPORTATION COMPANY
 5TH AVENUE AND 7TH STREET PROPERTY
 OAKLAND, CALIFORNIA**

Figure	8
Page No	
Scale	as shown

Project No.	05100269	Date	08/01/94
Drawn By	Patti Decker	Checked By	James G. Jensen



NOTE:
 Hydraulic gradient calculated to be 0.0167 feet per foot, using a standard 3-point problem, incorporating data from MW-1, MW-2, and MW-3



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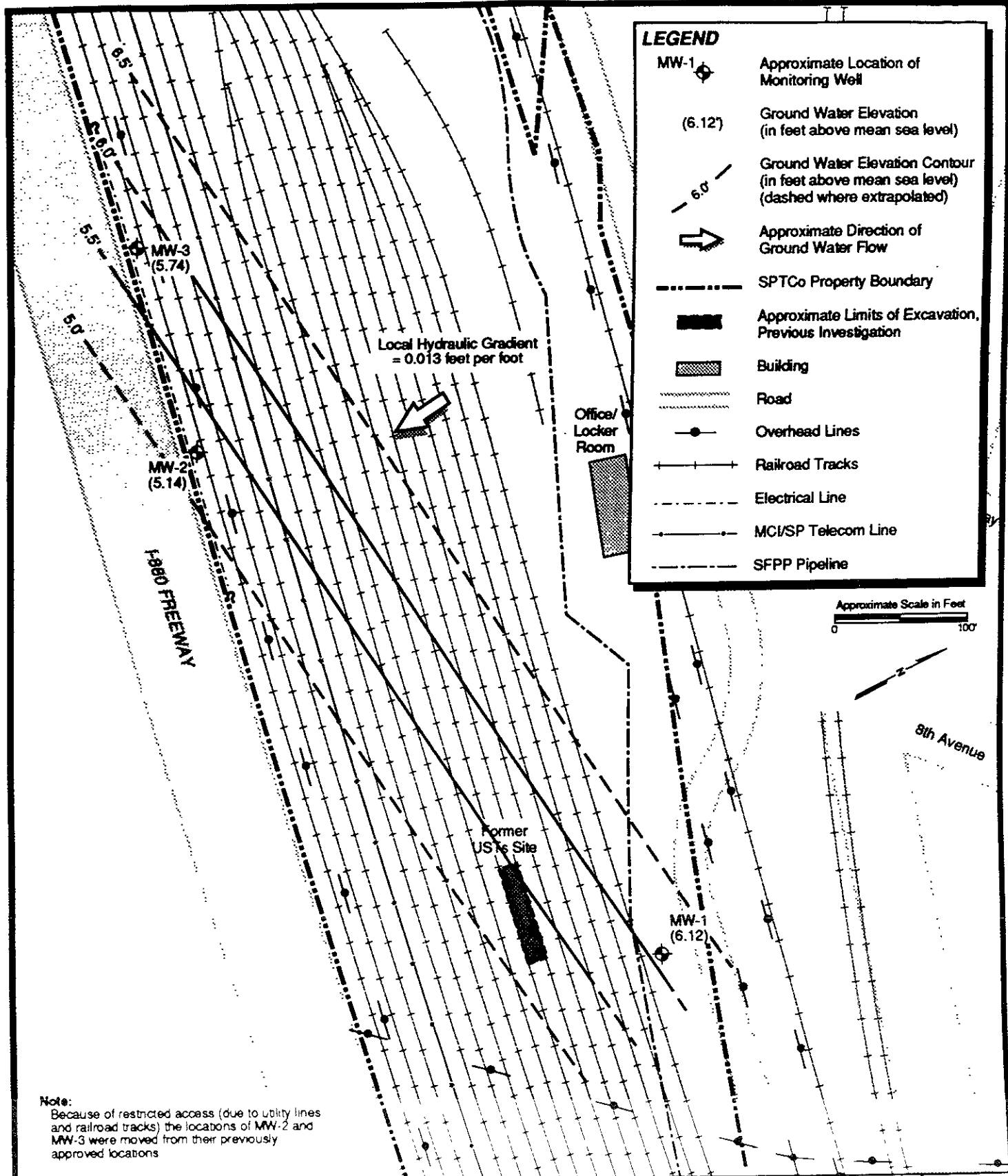
A Subsidiary of SP Environmental Systems, Inc.



**CONTOUR MAP OF GROUND WATER ELEVATIONS
 AUGUST, 1994
 SOUTHERN PACIFIC TRANSPORTATION COMPANY
 5TH AVENUE AND 7TH STREET PROPERTY
 OAKLAND, CALIFORNIA**

Project No.	05100269	Date	12/01/94
Drawn By	Patti Decker	Checked By	James Ackerman

Figure	4
Page No	
Scale	as shown



Note:
 Because of restricted access (due to utility lines and railroad tracks) the locations of MW-2 and MW-3 were moved from their previously approved locations



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**CONTOUR MAP OF GROUND WATER ELEVATION
 NOVEMBER, 1994
 SOUTHERN PACIFIC TRANSPORTATION COMPANY
 5TH AVENUE AND 7TH STREET PROPERTY
 OAKLAND, CALIFORNIA**

Project No.	05100269	Date	02/13/95
Drawn By	Patti Decker	Checked By	Richard Bateman

Figure
4

Page No
9

Scale
as shown