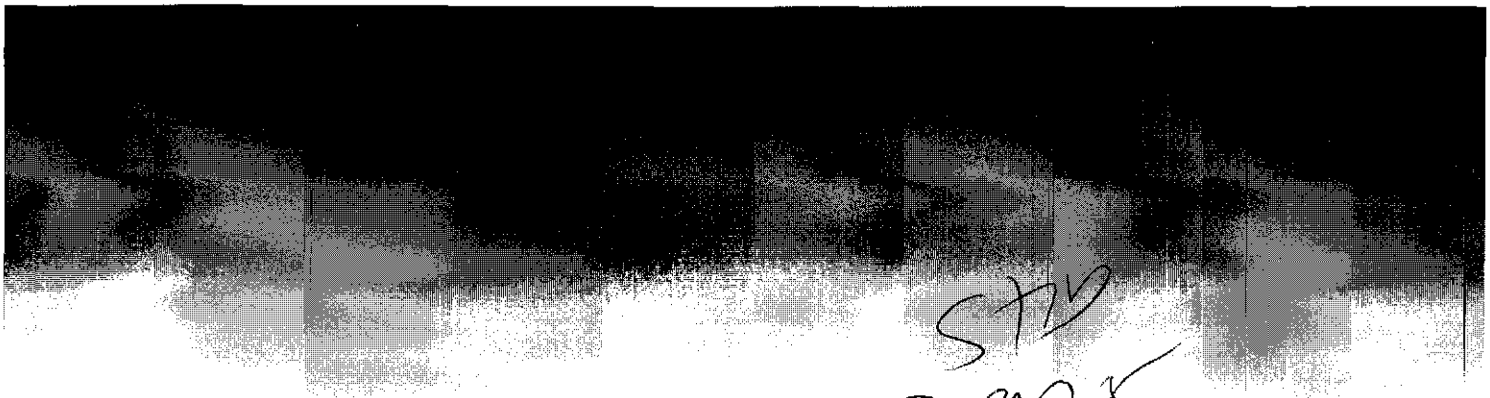


QUARTERLY GROUNDWATER MONITORING AND SAMPLING REPORT

at

SEKHON GAS STATION
6600 Foothill Boulevard
Oakland, California

APR 24 2002

Prepared for:

Mr. Ravi S. Sekhon
6600 Foothill Boulevard
Oakland, California

April 20, 2002

ADVANCED ASSESSMENT AND REMEDIATION SERVICES

2380 Salvio Street, Suite 202
Concord, CA 94520
Phone: (925) 363-1999
Fax: (925) 363-1998
e-mail: aars@earthlink.net

ADVANCED ASSESSMENT AND REMEDIATION SERVICES (AARS)

2380 SALVIO STREET, SUITE 202
CONCORD, CALIFORNIA 94520-2137
TEL: (925) 363-1999 FAX: (925) 363-1998
e-mail: aars@ccnet.com

April 20, 2002

Mr. Amir Gholami
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502

Subject: **Quarterly Groundwater Monitoring and Sampling Report for SEKHON GAS STATION, 6600 Foothill Boulevard, Oakland, California**

Dear Mr. Gholami:

The enclosed report presents the results and findings of the March 2002, quarterly groundwater monitoring and sampling for the above-referenced facility.

Should you have any questions regarding the report please contact Tridib Guha at (925) 363-1999.

Sincerely,

Advanced Assessment and Remediation Services

Tridib K. Guha, R.G., R.E.A.
Principal

cc: Mr. Ravi S. Sekhon, Oakland, CA

TG/SEKHONQ1RPT

TABLE OF CONTENTS

QUARTERLY GROUNDWATER MONITORING AND SAMPLING REPORT

For

SEKHON GAS STATION
6600 Foothill Boulevard
Oakland, California

1.0 INTRODUCTION

This report presents the results and findings of the March 2002, quarterly groundwater monitoring and sampling performed at 6600 Foothill Boulevard, Oakland, California. This report is intended to fulfill quarterly self-monitoring requirements and to establish a groundwater monitoring history for the site. A site vicinity map is shown in Figure 1.

2.0 GROUNDWATER MONITORING WELLS

This section presents the water level monitoring, field observations, sampling and analysis procedures, as well as the analytical results. The location of the monitoring wells is presented in Figure 2. The work and related field sampling activities were conducted in accordance with the guidelines and requirements of the Alameda County Department of Environmental Health (ACDEH) and the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB).

2.1 Groundwater Level Monitoring and Surveying

Groundwater levels in each well were measured to the nearest 0.01 foot from the top of the PVC casing, using an electronic sounder tape. A groundwater surface elevation map based on interpretation of groundwater level measurements taken on March 21, 2002, and survey data is presented in Figure 3. The survey data and water level measurements are presented in Table 1.

2.2 Field Observations

The purged water from the monitoring wells, MW-1, and MW-2 were clear. The purged water from MW-3 was clear with some brownish suspended gel. However, water samples collected at the time of sampling were clear. Floating product was not observed in the groundwater samples. Sheen was observed in groundwater samples from monitoring well, MW-2. In addition, petroleum odor was noticed in the groundwater samples from all three monitoring wells except.

2.3 Sampling and Analytical Procedures

Groundwater samples were collected on March 21, 2002, following water level measurements. Samples were analyzed by North State Environmental Laboratory of South San Francisco, California which is certified by the California Department of Health Services (DHS) to perform the specified analyses.

Before purging, water levels were measured in all wells with an electronic sounder tape. Purging preceded sampling in order to ensure collection of non-stagnant water. A minimum of three casing volumes were removed before sampling the wells. The purged water was monitored for temperature, pH, and conductivity. Purging was considered complete when these parameters had stabilized. The wells were sampled after 92 percent recovery or greater. The groundwater monitoring well purge/sampling worksheets are presented Appendix A.

To prevent potential cross-contamination, all measuring, purging and sampling equipment was washed in an Alconox detergent solution, rinsed with tap water, and finally with distilled water between wells.

The sampling procedure for each monitoring well involved extracting well water with a clean PVC bailer on a clean nylon cord. Groundwater collected for analysis of Total Petroleum Hydrocarbon as gasoline (TPHg) and Benzene, Toluene, Ethylbenzene and total Xylenes (BTEX), Methyl Tertiary Butyl Ether (MTBE), was decanted into two 40-milliliter volatile organic analysis vials with Teflon-lined septa. Samples to be analyzed for TPHg/BTEX/MTBE were preserved using hydrochloric acid to a pH of 2.0. All samples were labeled and placed in an iced cooler, along with the chain-of-custody document (Appendix B). Samples transported to the laboratory were analyzed within the specified holding time.

Groundwater produced during purging and sampling was contained in 55-gallon steel drums. The drummed water was labeled with the source (i.e. well number) and date.

2.4 Analytical Methods

Samples were analyzed for TPHg/BTEX/MTBE by using EPA Methods SW8020F. A summary of the analytical results of groundwater samples from the monitoring wells is presented in Table 2. The certified analytical reports for this sampling events are included in Appendix B.

3.0 INTERPRETATION OF RESULTS

The results of water level measurements and groundwater sampling are discussed in the following sections.

3.1 Groundwater Elevations and Gradients

A relative groundwater elevation contours for March 21, 2002, is presented in Figure 3. The flow direction, based on groundwater level data, was toward the southeast with an average hydraulic gradient of 0.024 foot per foot for this monitoring period. The average depth to stabilized groundwater in these wells was approximately 8 feet below ground surface.

3.2 Analytical Results

The analytical results for groundwater samples from monitoring wells were found to contain TPHg ranging from 95 to 452 parts per billion (ppb); benzene concentrations ranging from non-detect to 3.4 ppb; toluene concentrations were non-detect; ethylbenzene concentrations ranging from non-detect to 1.6 ppb; and xylenes concentrations ranging from non-detect to 2.5 ppb. MTBE were detected in groundwater samples, concentrations ranging from 72.5 to 71,900 ppb. TPHg and MTBE concentrations in groundwater are presented in Figure 4 and 5, respectively.

4.0 SELF-MONITORING PROJECT SCHEDULE AND RECOMMENDATIONS

The next quarterly groundwater monitoring event scheduled for the site is in June 2002. In this sampling event, TPHg was detected in groundwater samples from all three monitoring wells. The analytical results for this sampling event detected highest concentrations of TPHg and MTBE in the furthest downgradient monitoring well, MW-2. Therefore, the site is subject to further site characterization with the possible off-site migration. A work plan for additional site investigation was submitted to ACDEH and is approved.

5.0 CERTIFICATION

The information provided in this report is based on the groundwater sampling activities conducted at the site. All data presented in this report is believed to be factual and accurate, unless proven otherwise. Any conclusions or recommendations provided within are based on our expertise and experience conducting work for a similar nature.

Advanced Assessment and Remediation Services

Tridib K. Guha, R.G. 5836

TABLE 1: SURVEY AND WATER LEVEL MONITORING DATA
SEKHON GAS STATION
6600 Foothill Blvd.
Oakland, California

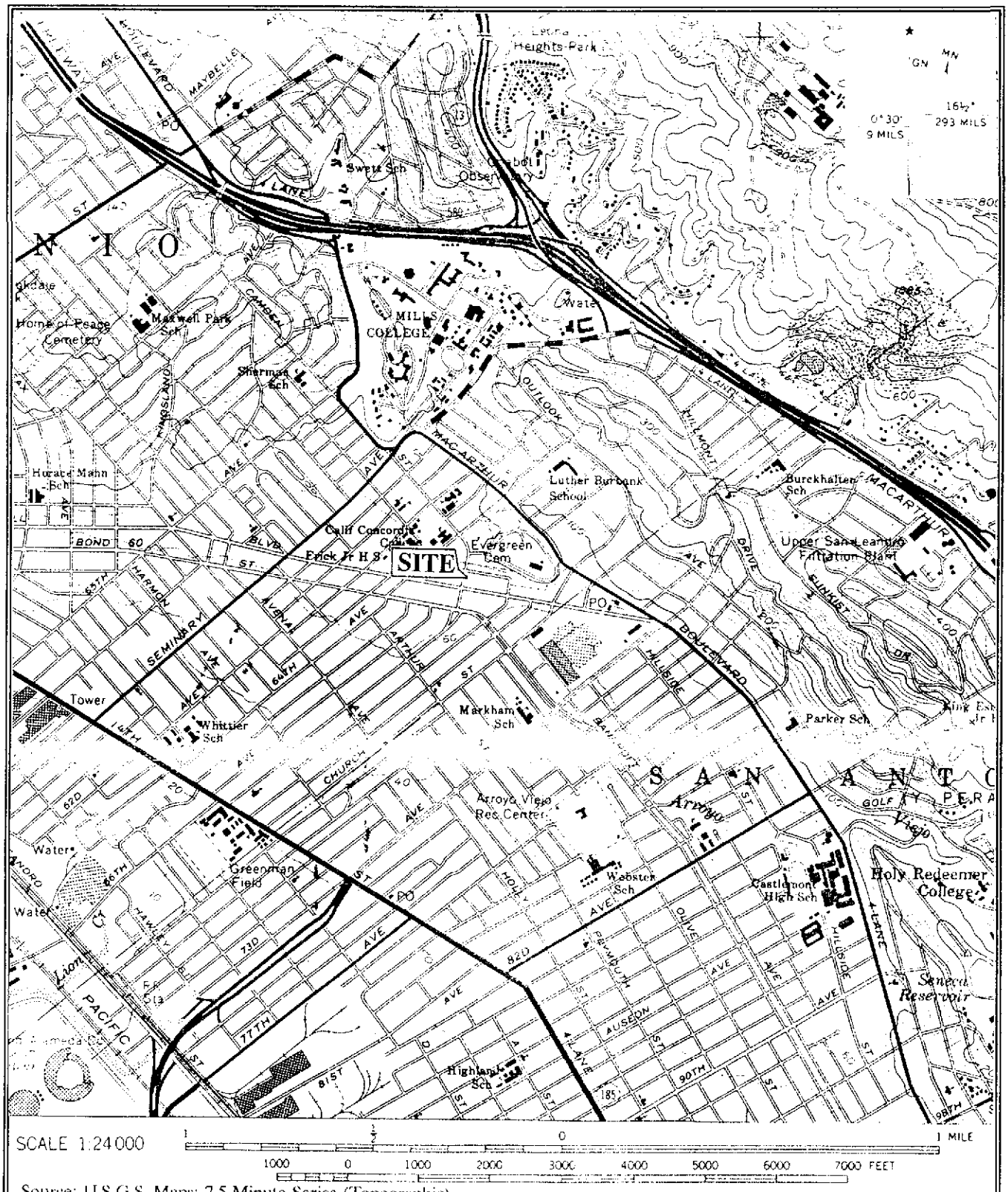
Well No.	Date of Measurement	Casing Elevation (Feet - Relative)	*Depth to Groundwater* (Feet - Relative)	Product Thickness (Feet)	Groundwater Elevation (Feet - Relative)
MW-1	06-13-01	100.00	9.36	0.00	90.64
MW-1	03-21-02	100.00	7.96	0.00	92.04
MW-2	06-13-01	98.71	10.44	0.00	88.57
MW-2	03-21-02	98.71	8.18	0.00	9.53
MW-3	06-13-01	99.90	9.69	0.00	90.21
MW-3	03-21-02	99.90	8.80	0.00	91.10

Note: A bench mark was established at forty feet south of the southeast corner of the Store Building. The top of well casing elevations were surveyed on June 13, 2001, in reference to MW-1 as the common datum with an assumed elevation of 100.00 feet above mean sea level (MSL). All elevations are relative to this.

TABLE 2: SUMMARY OF ANALYTICAL RESULTS OF GROUNDWATER SAMPLING
SEKHON GAS STATION
6600 Foothill Blvd.
Oakland, California

Sample ID	Date of Sampling	TPHg (µg/L)	MTBE (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	
MW-1/GW	06/13/01	ND	130	ND	ND	ND	ND	
MW-1/GW	03/21/02	95	72.5	ND	ND	ND	ND	
MW-2/GW	06/13/01	5800	94000*	160	210	290	980	
MW-2/GW	03/21/02	452	79100*	3.4	ND	1.6	2.1	
MW-3/GW	06/13/01	300	450	1	ND	0.07	2	
MW-3/GW	03/21/02	274	7520	1.1	ND	1	2.5	
RL	03/26/02	50	0.5	0.5	0.5	0.5	1.0	

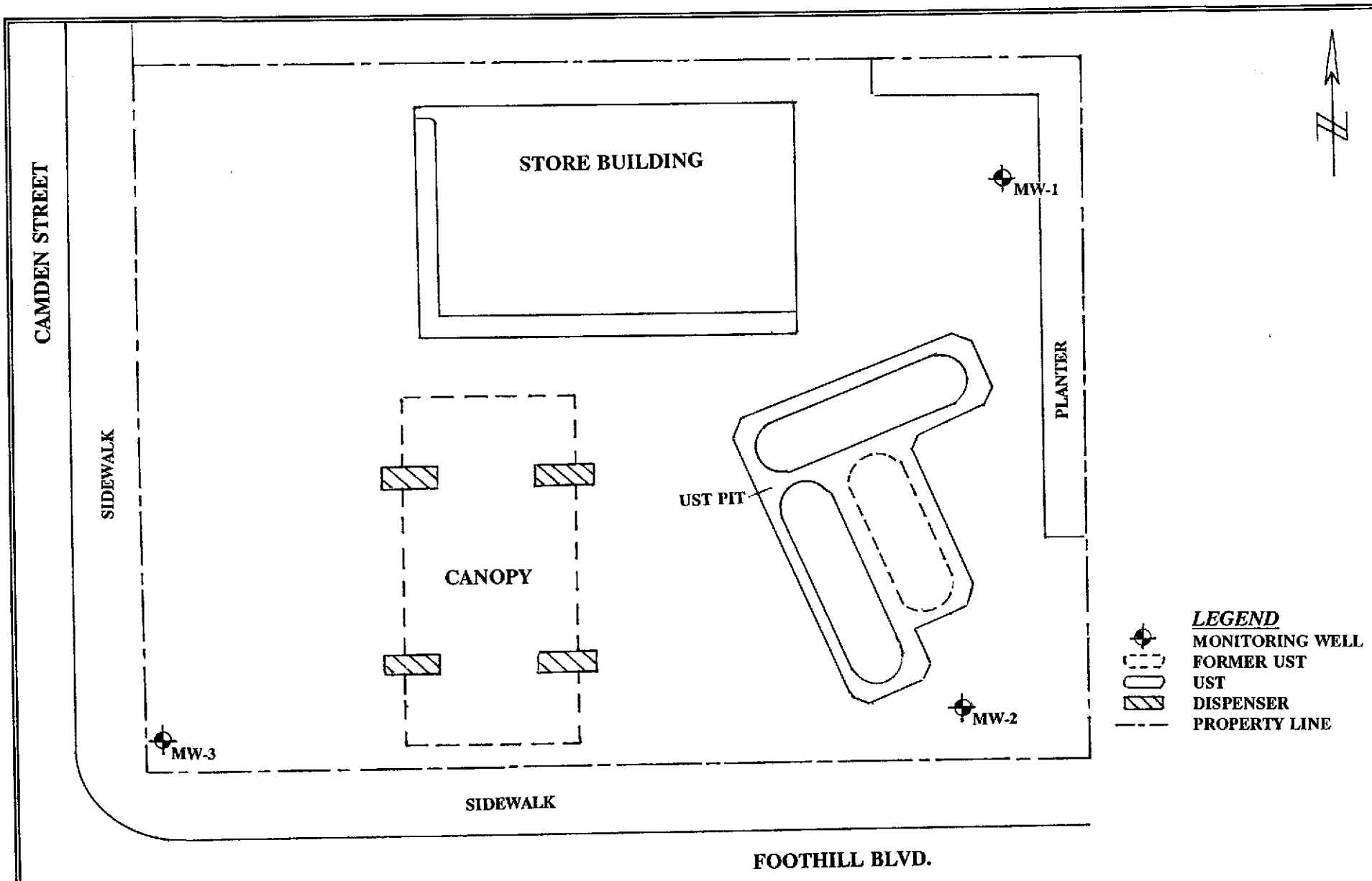
Notes:
ND- Not Detected RL- Reporting Limit NA- Not Analyzed
µg/L- Microgram per liter (parts per billion)
TPHg- Total petroleum hydrocarbon as gasoline (EPA method modified 8015)
MTBE- Methyl Tertiary Butyl Ether (EPA method 8020)
Benzene, toluene, ethylbenzene, and total xylenes (EPA method 8020)
* Confirmed by GC/MS method 8260



Source: U.S.G.S. Maps; 7.5 Minute Series (Topographic)
Oakland East Quadrangle, CA
Aerial Photograph taken 1959 Photorevised 1980

FIGURE 1: SITE VICINITY MAP
SEKHON GAS STATION
6600 Foothill Blvd.
Oakland, California

ADVANCED ASSESSMENT AND REMEDIATION SERVICES
2380 Salvio Street, Suite 202
Concord, California

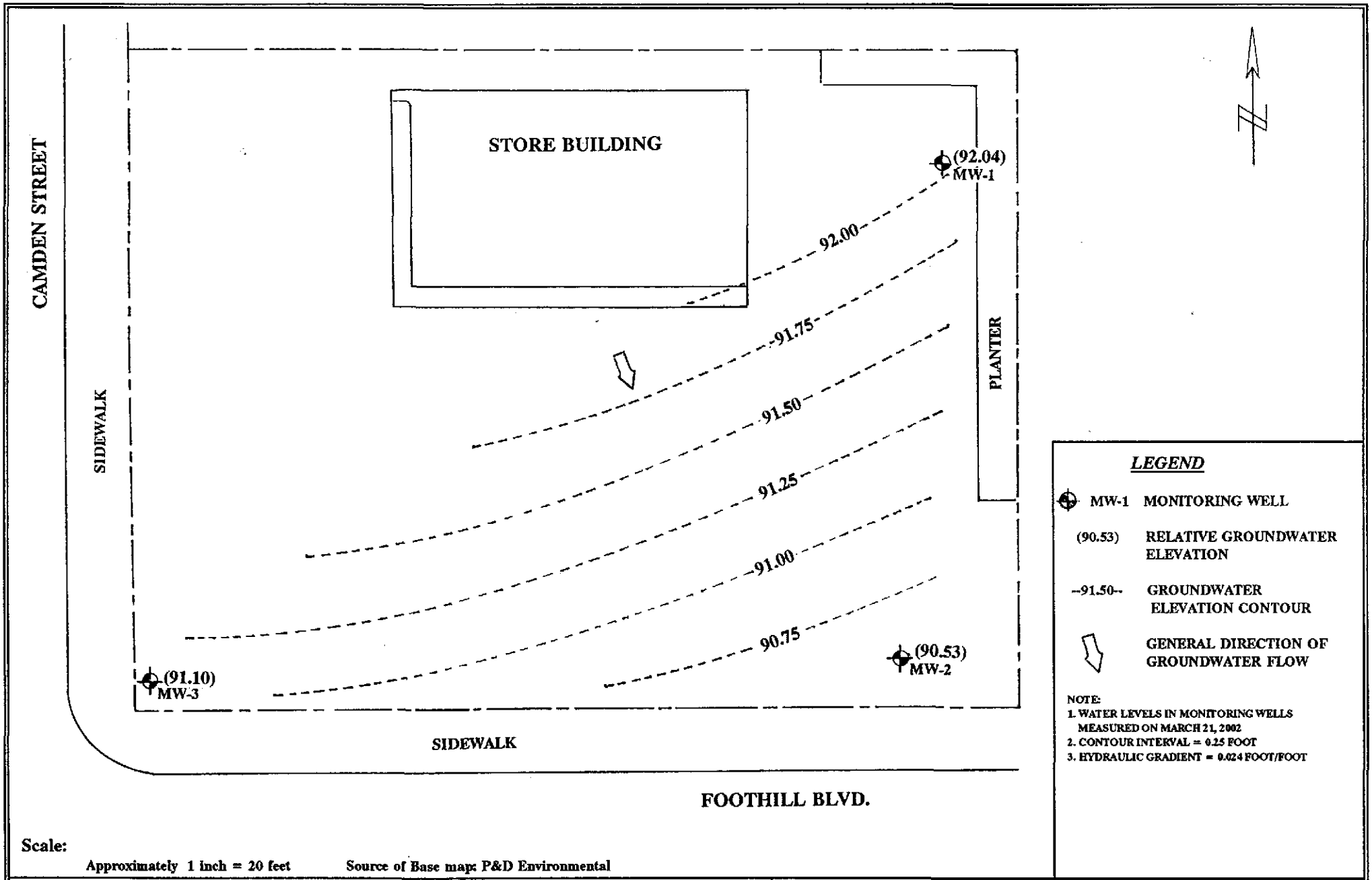


Scale: 1 inch = 20 feet approximately

Source of base map: P&D Environmental

FIGURE 2: SITE PLAN
SEKHON GAS STATION
6600 Foothill Blvd.
Oakland, California

ADVANCED ASSESSMENT AND REMEDIATION SERVICES
2380 Salvio Street, Suite 202
Concord, CA 94520



Scale:

Approximately 1 inch = 20 feet Source of Base map: P&D Environmental

FIGURE 3: GROUNDWATER SURFACE ELEVATIONS (03/21/02)
SEKHON GAS STATION
6600 Foothill Boulevard
Oakland, California

ADVANCED ASSESSMENT AND REMEDIATION SERVICES
2380 Salvio Street, Suite 202
Concord, California 94520

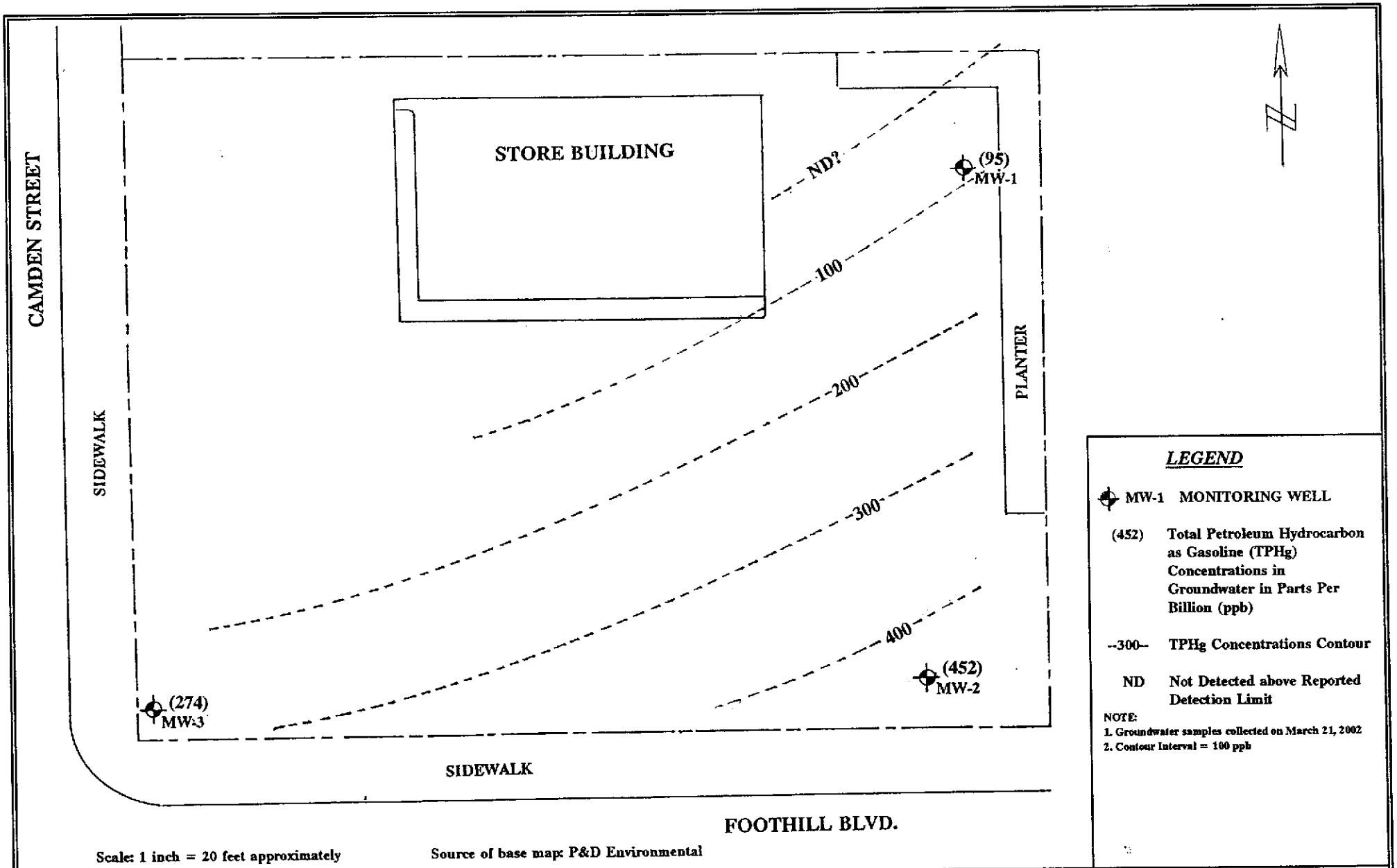


FIGURE 4: TPHg CONCENTRATIONS IN GROUNDWATER
SEKHON GAS STATION
6600 Foothill Blvd.
Oakland, California

ADVANCED ASSESSMENT AND REMEDIATION SERVICES
2380 Salvio Street, Suite 202
Concord, California 94520

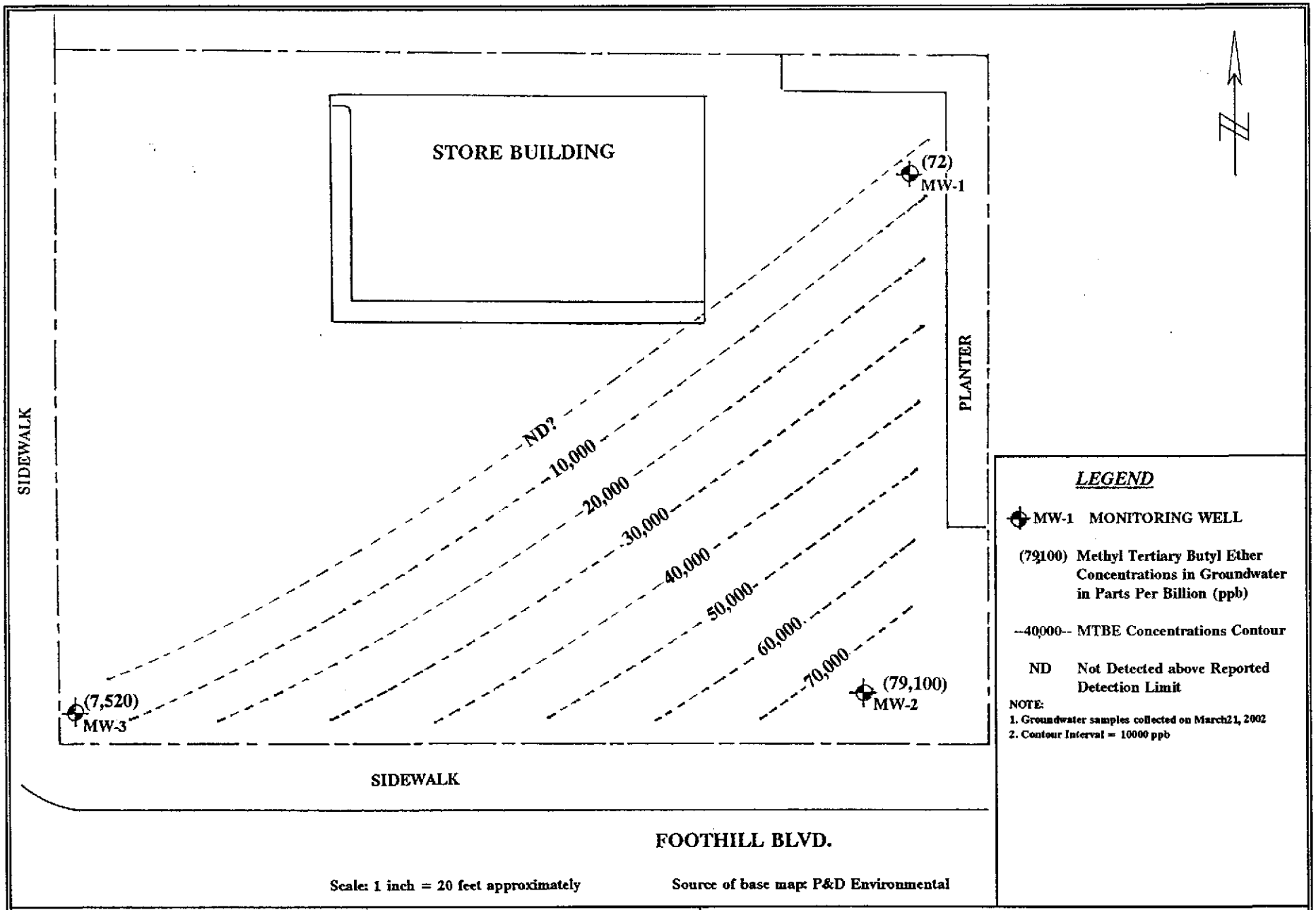


FIGURE 5: MTBE CONCENTRATIONS IN GROUNDWATER
SEKHON GAS STATION
6600 Foothill Blvd.
Oakland, California

ADVANCED ASSESSMENT AND REMEDIATION SERVICES
2380 Salvio Street, Suite 202
Concord, California 94520

APPENDIX A

Monitoring Well Purge/Sample Worksheet

GROUNDWATER MONITORING WELL PURGE/SAMPLING WORKSHEET

PROJECT NAME: Sekhon Gas Station PROJECT NUMBER: 00015

SITE ADDRESS: 6600 Foothill Blvd., Oakland, CA

WELL NUMBER: MW-1 WELL CASING DIA.: 2" DATE: 3-21-02

Stagnant Volume Calculation

Total Well Depth (ft)	-	Initial Depth to Water	=	Water Column Height (ft)	-	Time: 8:07
25		7.96		17.04		

Water column Height (ft)	x	Gallons/Linear Foot	=	Stagnant Volume (Gallons)
17.04		0.17		2.9

(Gallons/Linear Foot: 2" dia. = 0.17; 4" dia. = 0.66; 6" dia. = 1.5)

Groundwater Inspection

Floating Product (ft. or in.): NONE Sheen/Iridescence: NONE Odor: YES

Time	Volume Purged (gal)	Temperature (degrees F)	pH	Conductivity µS	Color/Turbidity/Other
9:40	0	66.7	6.30	714	CLEAR
9:50	3	66.4	6.24	730	CLEAR WITH GREENISH PARTICLES (MOSS)
10:00	6	67.1	6.28	794	CLEAR
10:10	9	67.0	6.27	799	CLEAR

Purged Water Containment Purge Method Used:

9 gals stored in 1 55 gal (drums); Any previous drums? 1 Capacity 55 GAL

Groundwater Sampling Water Level Recovery (Depth to groundwater in feet)

(P) After purging: 8.89 (I) Initially: 7.96 (S) Before sampling: 8.03 Time: 11:58

SAMPLE TIME: 12:00

(P-S)/P-I) x 100 = 100 % Total Recovery: 92 %

Sample Containers (How many? Preservatives?)

1 liter amber glass: — ; 40 ml VOA: 3 ; 500 ml polypropylene: —

REMARKS:

SAMPLER: TRIDIB GUHA **SIGNATURE:**

(Print)

ADVANCED ASSESSMENT AND REMEDIATION SERVICES

GROUNDWATER MONITORING WELL PURGE/SAMPLING WORKSHEET

PROJECT NAME: Sekhon Gas Station PROJECT NUMBER: 00015

SITE ADDRESS: 6600 Foothill Blvd., Oakland, CA

WELL NUMBER: MW-2 WELL CASING DIA.: 2" DATE: 3-21-02

Stagnant Volume Calculation

Total Well Depth (ft) - Initial Depth to Water = Water Column Height (ft) - Time: 8:10

25 8.18 16.82

Water column Height (ft) x Gallons/Linear Foot = Stagnant Volume (Gallons)

16.82 0.17 2.86

(Gallons/Linear Foot: 2" dia. = 0.17; 4" dia. = 0.66; 6" dia. = 1.5)

Groundwater Inspection

Floating Product (ft. or in.): NONE Sheen/Iridescence: YES Odor: YES

Time	Volume Purged (gal)	Temperature (degrees F)	pH	Conductivity µS	Color/Turbidity/Other
8:20	0	67.4	6.84	916	CLEAR
8:30	3	67.8	6.40	935	"
8:40	6	68.2	6.26	989	"
8:50	9	68.0	6.32	978	"

Purged Water Containment Purge Method Used:

9 gals stored in 1 55 gal (drums); Any previous drums? 1 Capacity 55 GAL

Groundwater Sampling Water Level Recovery (Depth to groundwater in feet)

(P) After purging: 9.10 (I) Initially: 8.18 (S) Before sampling: 8.22 Time: 11:28

SAMPLE TIME: 11:30

(P-S)/P-I) x 100 = 100 % Total Recovery: 96%

Sample Containers (How many? Preservatives?)

1 liter amber glass: — ; 40 ml VOA: 3 ; 500 ml polypropylene: —

REMARKS:

SAMPLER: TRIDIB GUHA **SIGNATURE:**

(Print)

ADVANCED ASSESSMENT AND REMEDIATION SERVICES

GROUNDWATER MONITORING WELL PURGE/SAMPLING WORKSHEET

PROJECT NAME: Sekhon Gas Station PROJECT NUMBER: 00015

SITE ADDRESS: 6600 Foothill Blvd., Oakland, CA

WELL NUMBER: MW-3 WELL CASING DIA.: 2" DATE: 3-21-02

Stagnant Volume Calculation

Total Well Depth (ft)	-	Initial Depth to Water	=	Water Column Height (ft)	-	Time:
25		8.80		16.2		8:05

Water column Height (ft)	x	Gallons/Linear Foot	=	Stagnant Volume (Gallons)
16.2		0.17		2.75

(Gallons/Linear Foot: 2" dia. = 0.17; 4" dia. = 0.66; 6" dia. = 1.5)

Groundwater Inspection

Floating Product (ft. or in.): NONE Sheen/Iridescence: NONE Odor: YES

Time	Volume Purged (gal)	Temperature (degrees F)	pH	Conductivity µS	Color/Turbidity/Other
9:00	0	68.0	6.48	473	CLEAR WITH BROWN SUSPENDED GEL
9:10	3	67.7	6.37	478	" " "
9:20	6	67.6	6.30	479	" " "
9:30	9	67.5	6.32	481	" " "

Purged Water Containment Purge Method Used:

9 gals stored in 1 55 gal (drums); Any previous drums? 1 Capacity 55 GAL

Groundwater Sampling Water Level Recovery (Depth to groundwater in feet)

(P) After purging: 9.71 (I) Initially: 8.80 (S) Before sampling: 8.85 Time: 11:43

SAMPLE TIME: 11:45

(P-S)/P-I) x 100 = 100 % Total Recovery: 94%

Sample Containers (How many? Preservatives?)

1 liter amber glass: —; 40 ml VOA: 3; 500 ml polypropylene: —

REMARKS:

SAMPLER: TRIDIB GUHA **SIGNATURE:**

(Print)

ADVANCED ASSESSMENT AND REMEDIATION SERVICES

APPENDIX B

Certified Analytical Reports and Chain-of-Custody Documents

North State Environmental Laboratory
CA ELAP # 1753
90 South Spruce Avenue, Suite V • South San Francisco, CA 94080 • **(650) 266-4563** • FAX (650) 266-4560

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

Lab Number: 02-0376
Client: Advanced Assessment & Remd.
Project: SEKHON GAS STATION/6600 FOOTHILL BLVD.

Date Reported: 03/28/2002

Gasoline,BTEX and MTBE by Methods 8015M and 8020

Analyte	Method	Result	Unit	Date Sampled	Date Analyzed
Sample: 02-0376-01 Client ID: MW-1/GW				03/21/2002	W
Benzene	SW8020F	ND<0.5	UG/L		03/26/2002
Ethylbenzene	SW8020F	ND<0.5	UG/L		03/26/2002
Gasoline Range Organics	SW8020F	95	UG/L		03/26/2002
Methyl-tert-butyl ether	SW8020F	72.5	UG/L		03/26/2002
Toluene	SW8020F	ND<0.5	UG/L		03/26/2002
Xylenes	SW8020F	ND<1.0	UG/L		03/26/2002
Sample: 02-0376-02 Client ID: MW-2/GW				03/21/2002	W
Benzene	SW8020F	3.4	UG/L		03/26/2002
Ethylbenzene	SW8020F	1.6	UG/L		03/26/2002
Gasoline Range Organics	SW8020F	452	UG/L		03/26/2002
Methyl-tert-butyl ether	SW8020F	*79100	UG/L		03/26/2002
Toluene	SW8020F	ND<0.5	UG/L		03/26/2002
Xylenes	SW8020F	2.1	UG/L		03/26/2002
Sample: 02-0376-03 Client ID: MW-3/GW				03/21/2002	W
Benzene	SW8020F	1.1	UG/L		03/26/2002
Ethylbenzene	SW8020F	1	UG/L		03/26/2002
Gasoline Range Organics	SW8020F	274	UG/L		03/26/2002
Methyl-tert-butyl ether	SW8020F	7520	UG/L		03/26/2002
Toluene	SW8020F	ND<0.5	UG/L		03/26/2002
Xylenes	SW8020F	2.5	UG/L		03/26/2002

*Confirmed by GC/MS method 8260.

North State Environmental Laboratory
CA ELAP # 1753
90 South Spruce Avenue, Suite V • South San Francisco, CA 94080 • (650) 266-4563 • FAX (650) 266-4560

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

Quality Control/Quality Assurance

Lab Number: 02-0376
Client: Advanced Assessment & Remd.
Project: SEKHON GAS STATION/6600 FOOTHILL BLVD.

Date Reported: 03/28/2002

Gasoline,BTEX and MTBE by Methods 8015M and 8020

Analyte	Method	Reporting Limit	Unit	Blank	Avg MS/MSD Recovery	RPD
Gasoline Range	SW8020F	50	UG/L	ND	87/94	8
Benzene	SW8020F	0.5	UG/L	ND	103/106	3
Toluene	SW8020F	0.5	UG/L	ND	98/101	3
Ethylbenzene	SW8020F	0.5	UG/L	ND	96/97	1
Xylenes	SW8020F	1.0	UG/L	ND	96/97	1
Methyl-tert-butyl	SW8020F	0.5	UG/L	ND	116/117	1

ELAP Certificate NO:1753
Reviewed and Approved

John A. Murphy, Laboratory Director

North State Environmental Analytical Laboratory

90 South Spruce Avenue, Suite W, South San Francisco, CA 94080
Phone: (650) 266-4563 Fax: (650) 266-4560

02-0376

Chain of Custody / Request for Analysis

Lab Job No.:_____ Page 1 of 1

Client: ADVANCED ASSESSMENT & R&D. SVC.	Report to: TRIDIB GUHA	Phone: 925-363-1997	Turnaround Time: 5 DAYS
Mailing Address: 2380 SALVIO STREET CONCORD, CA 94520	Billing to: SAME	Fax: 925-363-1998	Date: 3/21/02
		PO# / Billing Reference:	Sampler: T. GUHA

Project / Site Address: SEKHON GAS STATION, 6600 FOOTHILL BLVD., OAKLAND, CA

Analysis Requested: TPH-G (8015) / MTBE

Sample ID	Sample Type	Container No. / Type	Pres.	Sampling Date / Time	TPH-G (8015) / MTBE	Comments / Hazards
MW-1/GW	WATER	3 VOAs	HCL	3/21/02 12:00	✓	
MW-2/GW	↓	3 VOAs	↓	3/21/02 11:30	✓	
MW-3/GW	✓	3 VOAs	↓	3/21/02 11:45	✓	

Relinquished by: Tridib Guha	Date: 3/21/02	Time: 12:55	Received by: [signature] NSE	Lab Comments: RECEIVED IN FIELD IN GOOD COND. COOLER → 4°C
Relinquished by:	Date:	Time:	Received by: LAB	
Relinquished by:	Date:	Time:	Received by:	