HYDRO
ENVIRONMENTAL
TECHNOLOGIES, INC.

Received Sep. 27 '94
— JS.

QUARTERLY MONITORING REPORT

Tharco Corporation
2222 Grant Avenue
San Lorenzo, California

Sampling Date: July 8, 1994

Prepared by:

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.
2363 Mariner Square Drive, Suite 243
Alameda, California 94501
HETI Job No. 7-282

Prepared for:

THARCO CORPORATION
2222 Grant Avenue
San Lorenzo, California 94850-8600

August 8, 1994

HYDRO ENVIRONMENTAL TECHNOLOGIES, INC.

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1.0 INTRODUCTION

This report presents the results of quarterly ground water sampling conducted by Hydro-Environmental Technologies, Inc. (HETI) at the Tharco facility in San Lorenzo (Figure 1). Sampling was performed on July 8, 1994.

2.0 BACKGROUND

An underground diesel fuel storage tank was excavated and removed from the site in July, 1993. Ground water in the tank excavation was observed to stabilize at approximately seven to eight feet below ground surface. Laboratory analysis was performed on soil and ground water samples collected from the excavation during tank removal activities. Total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene and total xylenes (BTEX) were detected in these samples.

HETI was retained by Tharco in early 1994 to conduct a preliminary subsurface investigation. HETI installed three ground water monitoring wells at the site in March, 1994. Petroleum hydrocarbons were detected in soil samples collected during the drilling of two of the three wells. Petroleum hydrocarbons were detected in water samples collected from all three wells. The depth to ground water was measured to be five feet below grade. The ground water flow direction was estimated to be to the south. Results of the investigation were presented in HETI's *Subsurface Investigation Report* dated July 7, 1994.

3.0 FIELD ACTIVITIES

On July 8, 1994, the depth to water in each of the wells was gauged to the nearest hundredth of a foot using an electronic depth sounder. Gauging data is included in Table 1. Following gauging, the wells were purged of three well casing volumes. Purging and sampling data is included in Appendix A.

After purging and recovery of the water level in the wells to at least 80 percent of their static levels, ground water samples were collected with dedicated, polyethylene bailers. The samples were transferred to appropriate sample containers provided by the laboratory. Sample containers were documented, labeled and placed in a cooler. A chain of custody was prepared and accompanied the samples to the laboratory; a copy is included in Appendix B. All sampling was performed according to HETI standard protocol, using methods which are consistent with guidelines established by the lead regulatory agencies. A copy of HETI's Drilling, Well Construction and Sampling Protocols was previously included in HETI's *Subsurface Investigation Report* dated July 7, 1994. Ground water sample analysis was performed by PACE Incorporated, a state DHS-certified laboratory located in Novato, California. The

samples were analyzed for total petroleum hydrocarbons as gasoline (TPHg) by EPA Method 8015 (modified), benzene, toluene, ethylbenzene and total xylenes (BTEX) by EPA Method 8020 (modified) and total petroleum hydrocarbons as diesel (TPHd) by EPA Method 8015 (modified).

4.0 RESULTS

4.1 Ground Water Data

The depth to ground water in the wells was measured to be from 5.28 to 5.93 feet below grade. No separate-phase petroleum was detected in the purge water from any of the wells. The depth to water measurements were combined with wellhead elevation data previously collected by HETI to calculate ground water elevations. The groundwater elevations are shown on Figure 3, the Ground Water Contour Map.

The ground water flow direction is southerly at a gradient of 0.014 feet/feet (1.4%). This flow direction and gradient are consistent with previous data. As shown on Table 1, ground water elevations have decreased by approximately one-half of a foot since the first set of groundwater samples was collected in March 1994.

4.2 Laboratory Analytical Results

Petroleum hydrocarbons were detected in ground water samples collected from monitoring wells MW-1 and MW-2 at concentrations of 120 parts per billion (ppb) and 110 ppb TPHg, respectively. Benzene was detected in ground water samples collected from monitoring wells MW-1, MW-2 and MW-3 at concentrations of 37 ppb, 1.1 ppb and 0.8 ppb, respectively. TPHd was detected in ground water samples collected from monitoring wells MW-1, MW-2 and MW-3 at concentrations of 0.1 ppm, 0.67 ppm and 0.27 ppm, respectively.

Cumulative analytical results are presented in Table 1, and are graphically illustrated on Figure 4, the Hydrocarbon Concentration Map. A copy of the laboratory report is attached as Appendix B.

5.0 CERTIFICATION

This report was prepared under the supervision of a professional engineer. All statements, conclusions and recommendations are based solely upon field observations and analytical analyses performed by a state-certified laboratory related to the work performed by Hydro-Environmental Technologies, Inc.

It is possible that variations in the soil or groundwater conditions exist beyond the points explored in this investigation. Also, site conditions are subject to change at some time in the future due to variations in rainfall, temperature, regional water usage, or other factors.

The service performed by Hydro-Environmental Technologies, Inc. has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.

Hydro-Environmental Technologies, Inc. includes in this report chemical analytical data from a state-certified laboratory. These analyses are performed according to procedures suggested by the U.S. EPA and the State of California. Hydro-Environmental Technologies, Inc. is not responsible for laboratory errors in procedure or result reporting.

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

Prepared by:

Ruary Allan

Ruary Allan

Reviewed by:

Scott D. Kellstedt
Operations Manager

John H. Turney P. E.
Senior Engineer

TABLES

Table 1

GROUND WATER ELEVATIONS AND SAMPLE ANALYTICAL RESULTS

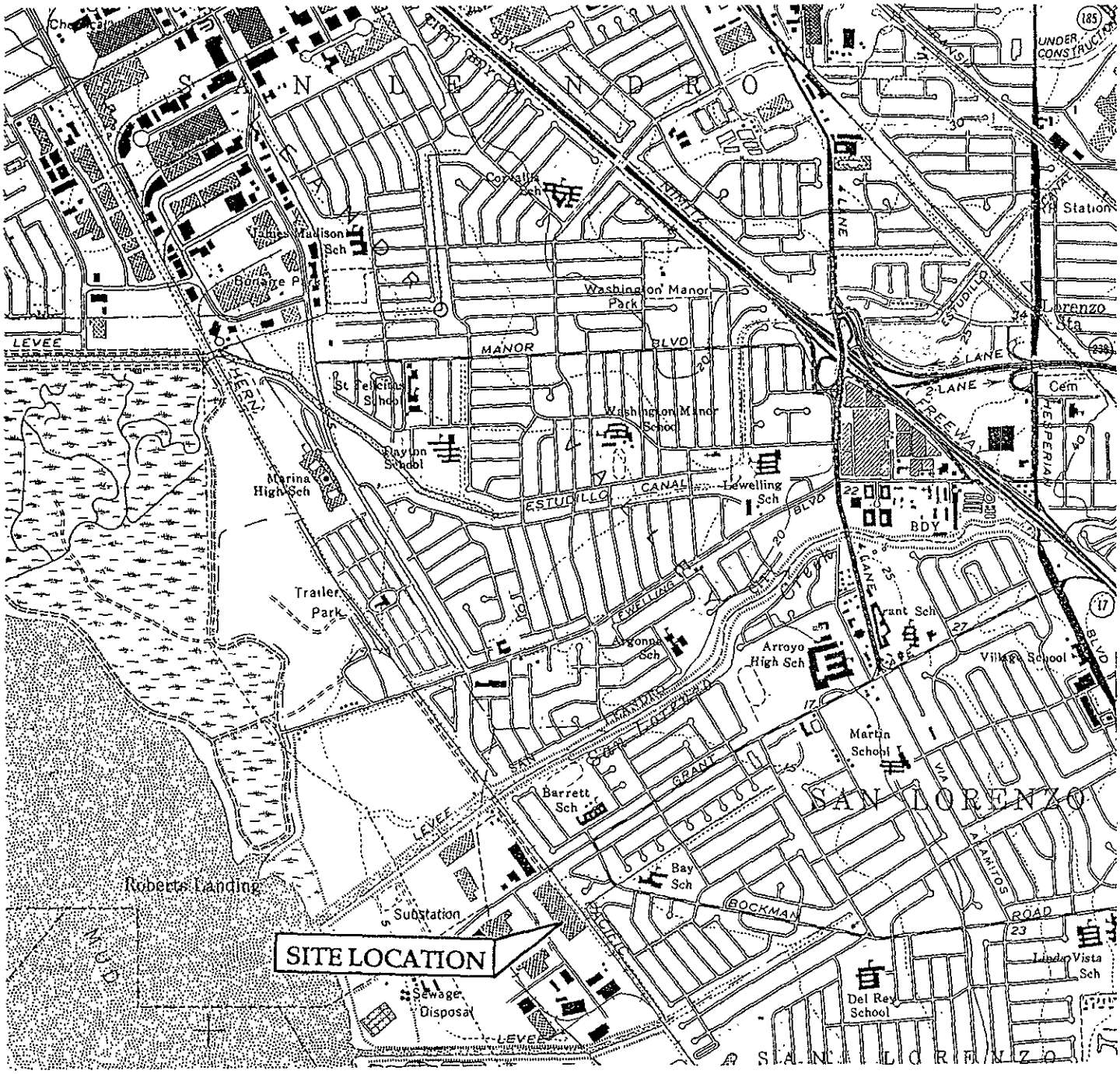
Tharco
2222 Grant Avenue
San Leandro, CA

Sample I.D. #	Sampling Date	TOC (feet)	DTW (feet)	GWE (feet)	TPHg (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	TPHd (ppm)	(ppb)
MW-1	3/29/94	109.93	5.41	104.52	ND<50	2.4	ND<0.5	ND<0.5	0.6	0.05	50
	7/8/94	109.93	5.93	104.00	120	37	ND<0.5	ND<0.5	0.6	0.10	100
MW-2	3/29/94 (1)	109.68	4.81	104.87	460	8.4	0.6	3.4	1.6	1.0 (2)	1000
	7/8/94	109.68	5.28	104.40	110	1.1	ND<0.5	ND<0.5	ND<0.5	0.67	670
MW-3	3/29/94	109.88	5.34	104.54	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.08	80
	7/8/94	109.88	5.74	104.14	ND<50	0.8	ND<0.5	ND<0.5	ND<0.5	0.27 (3)	27

Notes:

TOC:	Top of casing elevation
DTW:	Depth to water
GWE:	Ground water elevation
TPHg:	Total petroleum hydrocarbons as gasoline by EPA Method 8015 (DHS-modified)
BTEX:	Benzene, toluene, ethylbenzene and total xylenes by EPA Method 8020 (DHS-modified)
TPHd:	Total petroleum hydrocarbons as diesel by EPA Method 3510/8015 (DHS-modified)
ppb:	Parts per billion
ppm:	Parts per million
(1)	MW-2 resampled for TPHd on 4/12/94: original 3/29/94 sample lost by laboratory
(2)	High boiling point hydrocarbons beyond range of diesel standard were present in sample
(3)	Hydrocarbons present do not match the standard diesel pattern.

FIGURES



SCALE 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

CALIF

QUADRANGLE LOCATION

SOURCE: USGS 7.5 MINUTE SERIES TOPOGRAPHIC MAP
ENTITLED: SAN LEANDRO, CALIF. QUADRANGLE
PHOTOREVISED: 1979

NORTH

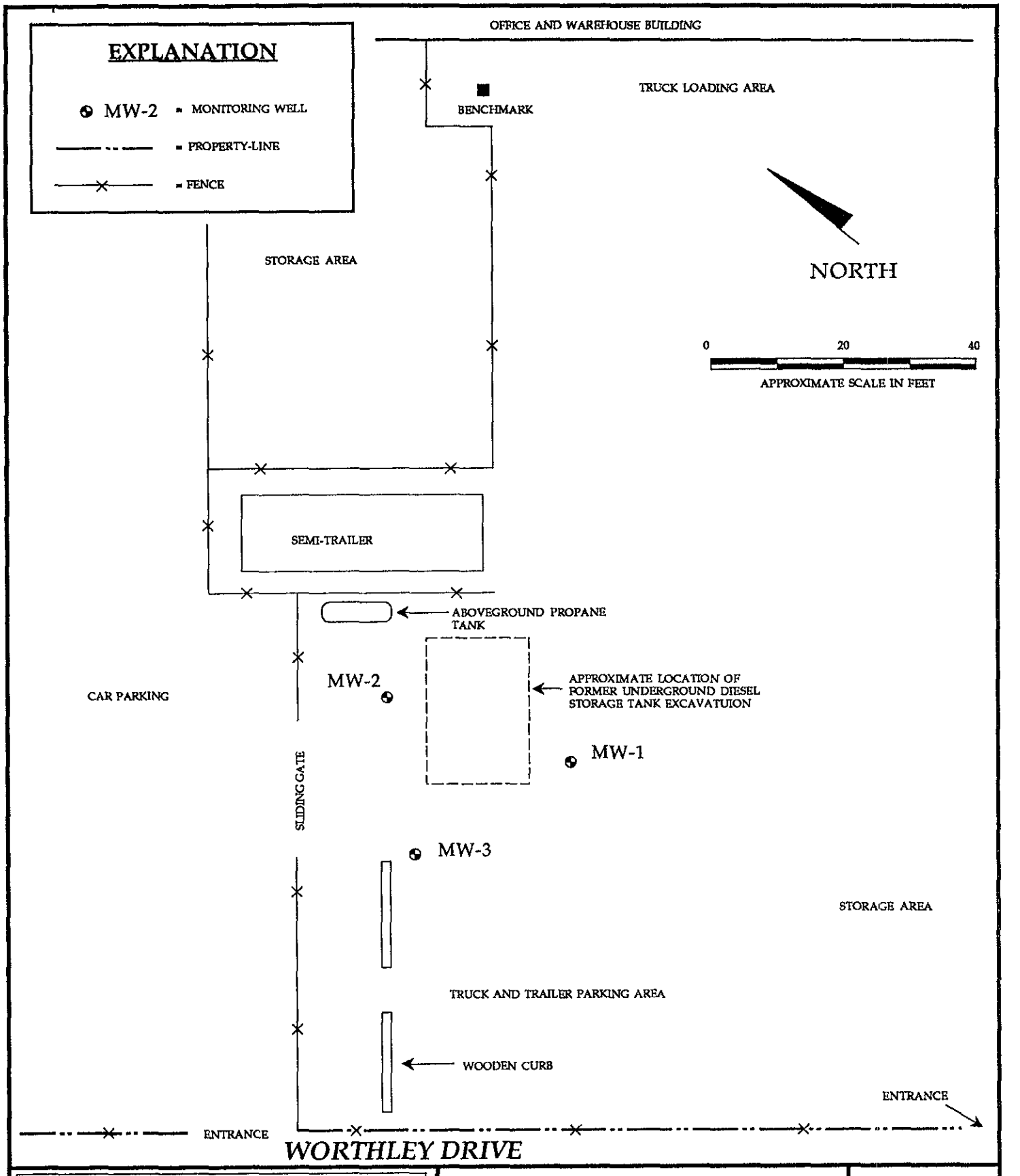
HYDRO-
ENVIRONMENTAL
TECHNOLOGIES, INC.

SITE LOCATION MAP

Tharco
2222 Grant Avenue
San Lorenzo, California

Figure
1

7-282 3/94



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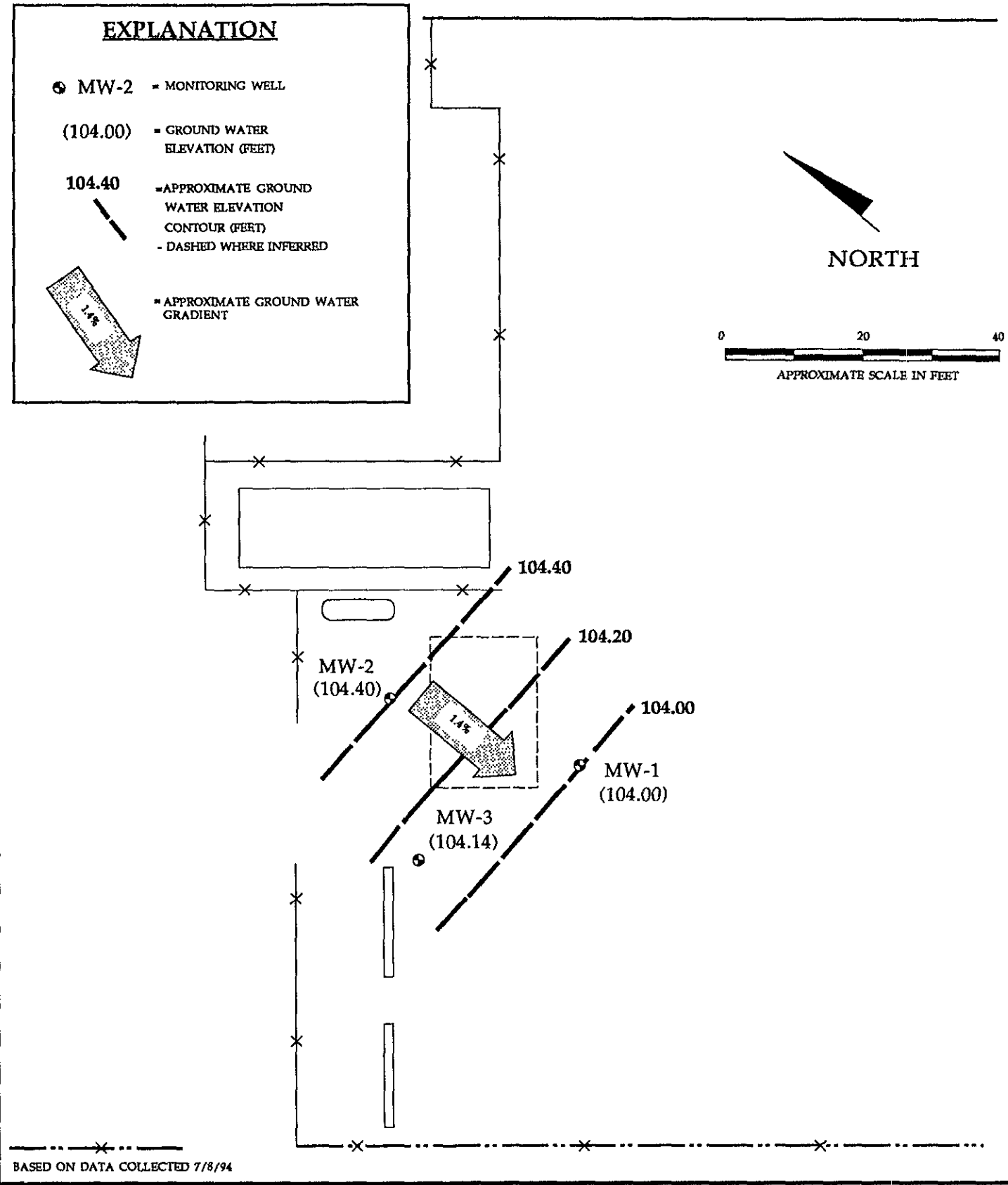
ENVIR◆NMENTAL
TECHN◆LOGIES, INC.

SITE PLAN

Tharco Corporation
2222 Grant Avenue
San Lorenzo, California

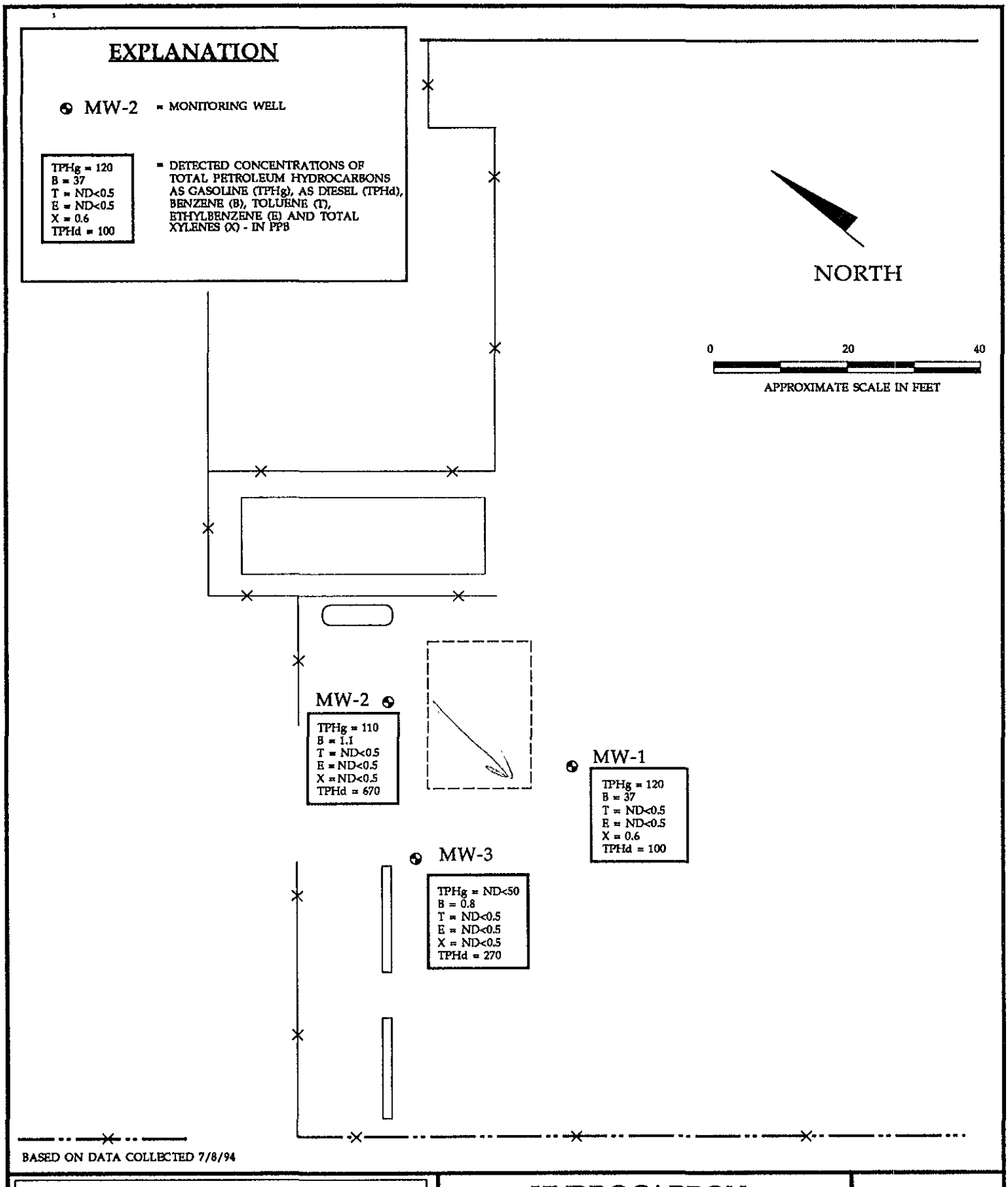
Figure
2

7-282 5/94



BASED ON DATA COLLECTED 7/8/94

HYDR◆- ENVIR◆NMENTAL TECHN◆LOGIES, INC.	GROUND WATER CONTOUR MAP Tharco Corporation 2222 Grant Avenue San Lorenzo, California	Figure 3 7-282 7/94



HYDR◆- ENVIR◆NMENTAL TECHN◆LOGIES, INC.	HYDROCARBON CONCENTRATION MAP Tharco Corporation 2222 Grant Avenue San Lorenzo, California	Figure 4 7-282 7/94

APPENDIX A

PURGED/SAMPLED BY: R. Allan DATE: 7-13-94

GAUGING DATA:

Depth to bottom: 18.40 ft.

Depth to water: 5.93 ft.

Saturated Thickness: 12.47 ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
4 in.	x 0.65
6 in.	x 1.44

Well casing volume 2.0 gallons

volumes to purge x 3 vols.

*Total volume to purge = 6 gallons

* unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer / Submersible pump/ Suction lift pump/ _____ (circle one)

Time	Volume (gallons)	Temp. (°F)	Conductivity (mS/cm)	pH
11.30	0			
	2	72.3	10.25	7.77
	4	71.3	11.04	7.60
	6	70.4	10.19	7.56
	8	72.9	12.11	7.30

Color: tan Turbidity: high

Recharge: good SPP ϕ ft. sl. odor

SAMPLING DATA:

Sampling method: Dedicated bailer _____

Sample for: (circle)

TPHg/BTEX	METALS	TOG	8010	
TPHd	O-Pb	TEL	8020	
TPH mo	Total Pb	EDB	8240	
601	602	Nitrates	8260	8270

Other: _____

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

MONITORING WELL PURGE/SAMPLE SHEET

WELL # MW-1

LOCATION Tharco, San Lorenzo

Job No. 7-282

SHEET 1 of 1

PURGED/SAMPLED BY: R. Allan DATE: 7-13-94

GAUGING DATA:

Depth to bottom: 15.70 ft.

Depth to water: 5.28 ft.

Saturated Thickness: 9.42 ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
4 in.	x 0.65
6 in.	x 1.44

Well casing volume 1.51 gallons

volumes to purge x 3 vols.

*Total volume to purge = 5 gallons

* unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer/ Submersible pump/ Suction lift pump/ _____
(circle one)

Time	Volume (gallons)	Temp. (°F)	Conductivity (mS/cm)	pH
11.20A	0			
	2	73.5	7.34	8.54
	4	71.2	8.65	7.83
	6	70.2	9.44	7.55
	7	70.0	9.59	7.61

Color: brown Turbidity: mod-high

Recharge: good SPP ϕ ft.

SAMPLING DATA:

Sampling method: Dedicated bailer/ _____

Sample for: (circle)

TPHg/BTEX	METALS	TOG	8010
TPHd	O-Pb	TEL	8020
TPH mo	Total Pb	EDB	8240
601	602	Nitrates	8260 8270

Other: _____

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

MONITORING WELL PURGE/SAMPLE SHEET

WELL # MW-2

LOCATION Tosco, San Lorenzo

Job No. 7-282

SHEET 1 of 1

PURGED/SAMPLED BY: R. Allan DATE: 7-13-94

GAUGING DATA:

Depth to bottom: 18.25 ft.

Depth to water: 5.74 ft.

Saturated Thickness: 12.51 ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
4 in.	x 0.65
6 in.	x 1.44

Well casing volume 2.00 gallons

volumes to purge x 3 vols.

*Total volume to purge = 6 gallons

* unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer / Submersible pump / Suction lift pump / _____ (circle one)

Time	Volume (gallons)	Temp. (°F)	Conductivity (mS/cm)	pH
11:50	0			
	2	75.7	2.07	8.23
	4	75.1	1.95	7.80
	6	74.8	1.96	7.60

Color: brownish grey Turbidity: med-high

Recharge: good SPP Ø ft.

SAMPLING DATA:

Sampling method: Dedicated bailer _____

Sample for: (circle)

TPHg/BTEX	METALS	TOG	8010
TPHd	O-Pb	TEL	8020
TPH mo	Total Pb	EDB	8240
601	602	Nitrates	8260 8270

Other: _____

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

MONITORING WELL PURGE/SAMPLE SHEET

WELL # MW-3

LOCATION Tranco, San Lorenzo

Job No. 7-282

SHEET 1 of 1

APPENDIX B

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

HYDRO ENVIRONMENTAL
2363 Mariner Square Dr. #263
ALAMEDA, CA 94501

July 22, 1994
PACE Project Number: 440715505

Attn: Mr. Ruary Allan

Client Reference: 7-282

PACE Sample Number:			70 0356342	
Date Collected:			07/13/94	
Date Received:			07/15/94	
Client Sample ID:			MW-1	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	07/19/94
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	120	07/19/94
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	07/19/94
Benzene	ug/L	0.5	37	07/19/94
Toluene	ug/L	0.5	ND	07/19/94
Ethylbenzene	ug/L	0.5	ND	07/19/94
Xylenes, Total	ug/L	0.5	0.6	07/19/94
EXTRACTABLE FUELS EPA 3510/8015				
Extractable Fuels, as Diesel	mg/L	0.05	0.10	07/19/94
Date Extracted			07/18/94	

11 Digital Drive
Novato, CA 94949
TEL: 415-883-6100
FAX: 415-883-2673

REPORT OF LABORATORY ANALYSIS

July 22, 1994
PACE Project Number: 440715505

Client Reference: 7-282

PACE Sample Number:			70 0356350	
Date Collected:			07/13/94	
Date Received:			07/15/94	
Client Sample ID:			MW-2	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	07/19/94
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	110	07/19/94
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	07/19/94
Benzene	ug/L	0.5	1.1	07/19/94
Toluene	ug/L	0.5	ND	07/19/94
Ethylbenzene	ug/L	0.5	ND	07/19/94
Xylenes, Total	ug/L	0.5	ND	07/19/94
EXTRACTABLE FUELS EPA 3510/8015				
Extractable Fuels, as Diesel	mg/L	0.05	0.67	07/19/94
Date Extracted			07/18/94	

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TEL: 415-883-6100
FAX: 415-883 2673

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REPORT OF LABORATORY ANALYSIS

Mr. Ruary Allan
Page 3

July 22, 1994
PACE Project Number: 440715505

Client Reference: 7-282

PACE Sample Number:			70 0356369	
Date Collected:			07/13/94	
Date Received:			07/15/94	
Client Sample ID:			MW-3	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	07/19/94
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	07/19/94
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	07/19/94
Benzene	ug/L	0.5	0.8	07/19/94
Toluene	ug/L	0.5	ND	07/19/94
Ethylbenzene	ug/L	0.5	ND	07/19/94
Xylenes, Total	ug/L	0.5	ND	07/19/94
EXTRACTABLE FUELS EPA 3510/8015				
Extractable Fuels, as Diesel	mg/L	0.05	0.27 HP	07/20/94
Date Extracted			07/18/94	

These data have been reviewed and are approved for release.

Darrell C. Cain
Regional Director

11 Digital Drive
Novato, CA 94949
TEL: 415-883-6100
FAX: 415-883-2673

Mr. Ruary Allan
Page 4

FOOTNOTES
for pages 1 through 3

July 22, 1994
PACE Project Number: 440715505

Client Reference: 7-282

HP	Hydrocarbons present do not match the Diesel Standard pattern.
MDL	Method Detection Limit
ND	Not detected at or above the MDL.

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Novato, CA 94949
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FAX: 415-883-2673

Mr. Ruary Allan
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QUALITY CONTROL DATA

July 22, 1994
PACE Project Number: 440715505

Client Reference: 7-282

EXTRACTABLE FUELS EPA 3510/8015
Batch: 70 32151
Samples: 70 0356342, 70 0356350, 70 0356369

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Extractable Fuels, as Diesel	mg/L	0.05	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Extractable Fuels, as Diesel	mg/L	0.05	1.00	92%	94%	2%

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Mr. Ruary Allan
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QUALITY CONTROL DATA

July 22, 1994
PACE Project Number: 440715505

Client Reference: 7-282

PURGEABLE FUELS AND AROMATICS
Batch: 70 32152
Samples: 70 0356342

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			-
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

SPIKE AND SPIKE DUPLICATE:

Parameter	Units	MDL	700354439	Spike	Spike Recv	Spike Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	ND	1000	91%	94%	3%

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	1000	93%	96%	3%

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Mr. Ruary Allan
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QUALITY CONTROL DATA

July 22, 1994
PACE Project Number: 440715505

Client Reference: 7-282

PURGEABLE FUELS AND AROMATICS
Batch: 70 32153
Samples: 70 0356350, 70 0356369

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			-
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

SPIKE AND SPIKE DUPLICATE:

Parameter	Units	MDL	700356067	Spike	Spike Recv	Spike Dupl Recv	RPD
Benzene	ug/L	0.5	ND	100	90%	89%	1%
Toluene	ug/L	0.5	ND	100	94%	93%	1%
Ethylbenzene	ug/L	0.5	ND	100	95%	93%	2%
Xylenes, Total	ug/L	0.5	ND	300	96%	96%	0%

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Benzene	ug/L	0.5	100	101%	98%	3%
Toluene	ug/L	0.5	100	105%	103%	2%
Ethylbenzene	ug/L	0.5	100	108%	106%	2%
Xylenes, Total	ug/L	0.5	300	110%	108%	2%

Mr. Ruary Allan
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FOOTNOTES
for pages 5 through 7

July 22, 1994
PACE Project Number: 440715505

Client Reference: 7-282

MDL	Method Detection Limit
ND	Not detected at or above the MDL.
RPD	Relative Percent Difference

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Novato, CA 94949
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FAX: 415-883-2673

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150740

CHAIN-OF-CUSTODY RECORD
Analytical Request

Client: HYDRO-ENVIRONMENTAL
Address: 2363 MARINER SQ DR. #243, ALAMEDA CA 94501
Phone: (510) 521-2684

Report To: HYDRO-ENVIRONMENTAL
Bill To: AS ABOVE
P.O. # / Billing Reference:
Project Name / No.: 7-282

Pace Client No.:
Pace Project Manager:
Pace Project No.: 440715505
*Requested Due Date:

Sampled By (PRINT): RUARY ALAN
Sampler Signature: Ruary Alan
Date Sampled: 7-13-94

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	H_2SO_4	HNO_3	VOA	ANALYSES REQUEST: TPHg/BTEX	TPHd	REMARKS
1	MW-1	1PM	H_2O	356342	5	X			X	X	X	
2	MW-2	↓	↓	356350	5	X			X	X	X	
3	MW-3			356369	5	X			X	X	X	
4												
5												
6												
7												
8												

COOLER NOS.	BAILERS	SHIPMENT METHOD OUT / DATE	SHIPMENT METHOD RETURNED / DATE

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	ACCEPTED BY / AFFILIATION	DATE	TIME
All	Ruary Alan HETI	K. Williams	7/14/94	5 pm
All	K. Williams	Donald Johanski/Pace	7/15/94	1117
	Donald Johanski Pace	PACE	7/15/94	1245

Additional Comments:
2 x 1L ambers for each TPHd
3 x VOA for each TPHg/BTEX
10/4 A/1

ORIGINAL

SEE REVERSE SIDE FOR INSTRUCTIONS