MONITORING
PLANNING
DISPOSING
SAMPLING
mpds SERVICES, INCORPORATED

MPDS-UN5325-05
January 27, 1995

Unocal Corporation
2000 Crow Canyon Place, Suite 400
P.O. Box 5155
San Ramon, California 94583

Attention: Mr. David DeWitt

RE: Quarterly Data Report
Unocal Service Station #5325
3220 Lakeshore Avenue
Oakland, California

FILE # 5325 SS X BP ____
RPT ____ QM X TRANSMITTAL ____
1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____

Dear Mr. DeWitt:

This data report presents the results of the most recent quarter of monitoring and sampling of the monitoring wells at the referenced site by MPDS Services, Inc.

RECENT FIELD ACTIVITIES

The monitoring wells that were monitored and sampled during this quarter are indicated in Table 1. Prior to sampling, the wells were checked for depth to water and the presence of free product or sheen. The monitoring data and the ground water elevations are summarized in Table 1. The ground water flow direction during the most recent quarter is shown on the attached Figure 1.

Ground water samples were collected on December 24, 1994. Prior to sampling, the wells were each purged of between 6 and 36 gallons of water. During purging operations, the field parameters pH, temperature, and electrical conductivity were recorded and are presented in Table 2. Once the field parameters were observed to stabilize, and where possible, a minimum of approximately four casing volumes had been removed from each well, samples were then collected using a clean Teflon bailer. The samples were decanted into clean VOA vials, which were then sealed with Teflon-lined screw caps, labeled, and stored in a cooler, on ice, until delivery to a state-certified laboratory. MPDS Services, Inc. transported the purged ground water to the Unocal Refinery located in Rodeo, California, for treatment and discharge to San Pablo Bay under NPDES permit.

ANALYTICAL RESULTS

The ground water samples were analyzed at Sequoia Analytical Laboratory and were accompanied by properly executed Chain of Custody documentation. The analytical results of the ground water samples collected to date are summarized in Table 3. The concentrations of Total Petroleum Hydrocarbons (TPH) as gasoline and benzene detected in the ground water

samples collected this quarter are shown on the attached Figure 2. Copies of the laboratory analytical results and the Chain of Custody documentation are attached to this report.

LIMITATIONS

Environmental changes, either naturally-occurring or artificially-induced, may cause changes in ground water levels and flow paths, thereby changing the extent and concentration of any contaminants.

DISTRIBUTION

A copy of this report should be sent to the Alameda County Health Care Services Agency.

If you have any questions regarding this report, please do not hesitate to call Mr. Nubar Srabian at (510) 602-5120.

Sincerely,

MPDS Services, Inc.

Sarkis A. Karkarian
Staff Engineer

Joel G. Greger, C.E.G.
Senior Engineering Geologist

License No. EG 1633
Exp. Date 8/31/96

/bp

Attachments: Tables 1, 2 & 3
Location Map
Figures 1 & 2
Laboratory Analyses
Chain of Custody documentation

cc: Mr. Greg Gurss, GeoStrategies, Inc., Rancho Cordova

TABLE 1

SUMMARY OF MONITORING DATA

Well #	Ground Water Elevation (feet)	Depth to Water (feet)♦	Total Well Depth (feet)♦	Product Thickness (feet)	Sheen	Water Purged (gallons)
(Monitored and Sampled on December 24, 1994)						
U-1	0.42	8.04	19.85	0	No	18
U-2	0.35	7.27	19.55	0	No	8
U-3	-0.30	11.28	19.79	0	No	6
U-4	1.34	9.81	20.24	0	No	15
U-5	0.55	6.43	20.07	0	No	36
U-6	0.47	6.67	23.80	0	No	12
(Monitored and Sampled on September 22, 1994)						
U-1	-0.20	8.66	19.90	0	No	17
U-2	-0.31	7.93	19.58	0	No	10
U-3	-0.78	11.76	19.80	0	No	12
U-4	0.36	10.79	20.19	0	No	20
U-5	0.08	6.90	20.12	0	No	35
U-6	-0.20	7.34	23.83	0	No	12
(Monitored and Sampled on June 22, 1994)						
U-1	0.07	8.39	19.84	0	No	17
U-2	0.02	7.60	19.55	0	No	9.5
U-3	-0.66	11.64	19.80	0	No	9
U-4	0.99	10.16	20.25	0	No	17
U-5	0.15	6.83	20.08	0	No	34.5
U-6	0.00	7.14	23.80	0	No	11.5
(Monitored and Sampled on February 16, 1994)						
U-1	-3.22	8.54	19.84	0	No	17
U-2	-3.20	7.73	19.53	0	No	10
U-3	-3.76	11.62	19.79	0	No	9

Well #	Well Casing Elevation (feet)*
U-1	8.46
U-2	7.62
U-3	10.98
U-4	11.15
U-5	6.98
U-6	7.14

TABLE 1 (Continued)

SUMMARY OF MONITORING DATA

◆ The depth to water level and total well depth measurements are taken from the top of the well casings.

* The elevations of the top of the well casings are surveyed relative to City of Oakland benchmark, at the northeasterly corner of Weller and Cheney Avenue (elevation = 9.055', city datum; add 3.00' to U.S.G.S. datum). Prior to June 22, 1994, the well casing elevations were U-1 = 5.32', U2 = 4.53', and U-3 = 7.86' Mean Sea Level.

TABLE 2

RECORD OF THE TEMPERATURE, CONDUCTIVITY, AND pH VALUES
IN THE MONITORING WELLS DURING PURGING AND PRIOR TO SAMPLING

(Measured on December 24, 1994)

Well #	Gallons per Casing Volume	Time	Gallons Purged	Casing Volumes Purged	Temperature (°F)	Conductivity ([μmhos/cm] x1000)	pH
U-1	4.37	10:37	0	0	69.6	1.38	8.58
			4.5	1.03	72.1	1.42	7.69
			9	2.06	71.6	1.49	7.29
			13.5	3.09	71.4	1.46	7.32
		10:55	18	4.12	71.8	1.44	7.34
U-2	4.54	13:00	0	0	72.1	1.49	7.65
			4.5	0.99	71.9	1.52	7.42
		13:07	8	1.76	72.4	1.56	7.23
			WELL DEWATERED				
U-3	3.15	09:30	0	0	72.1	1.21	7.91
			3	0.95	72.6	1.18	7.63
		09:36	6	1.90	72.2	1.24	7.42
			WELL DEWATERED				
U-4	6.78	10:00	0	0	72.1	1.02	7.96
			7	1.03	73.2	1.10	7.48
			14	2.06	73.8	1.12	7.50
		10:16	15	2.21	66.2	1.09	7.33
			WELL DEWATERED				
U-5	8.87	12:00	0	0	69.2	1.95	7.45
			9	1.01	69.9	1.96	7.48
			17	1.92	71.2	1.90	7.41
			26	2.93	71.0	1.88	7.38
		12:30	36	4.06	70.8	1.86	7.37
U-6	2.91	11:15	0	0	70.8	1.57	7.81
			3	1.03	71.2	1.62	7.62
			6	2.06	72.1	1.65	7.51
			9	3.09	72.4	1.65	7.46
		13:25	12	4.12	72.6	1.64	7.39

TABLE 3

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
12/24/94	U-1	50,000	2,500	9,700	2,400	17,000
	U-2	32,000	1,500	890	1,300	5,000
	U-3	ND	ND	ND	ND	ND
	U-4	ND	ND	ND	ND	ND
	U-5	8,700	560	70	670	430
	U-6	6,900	500	59	600	380
9/22/94	U-1	6,100♦	ND	ND	ND	ND
	U-2	8,500♦	29	ND	ND	ND
	U-3	ND	ND	ND	ND	ND
	U-4	ND	0.78	1.3	ND	1.4
	U-5	170	8.4	10	8.5	18
	U-6	130	1.3	0.80	ND	0.73
6/22/94	U-1	200	ND	ND	5.9	21
	U-2	31,000	2,200	62	1,500	3,500
	U-3	ND	ND	ND	ND	ND
	U-4	ND	ND	ND	ND	ND
	U-5	210	7.1	13	4.5	26
	U-6	ND	ND	ND	ND	ND
2/16/94	U-1	6,800♦♦	ND	ND	ND	ND
	U-2	980♦♦	49	13	2.7	40
	U-3	ND	ND	ND	ND	ND
11/16/93	U-1	690♦	ND	ND	ND	ND
	U-2	510♦	ND	ND	ND	ND
	U-3	ND	ND	ND	ND	ND
8/08/93	U-1	4,900**	79	ND	832	270
&	U-2	5,600**	420	ND	410	670
8/09/93	U-3	210	5.0	9.7	0.7	4.1
5/07/93	U-1	8,700	600	240	650	3,300
	U-2	17,000	1,800	660	1,700	4,000
	U-3	ND	ND	ND	ND	ND
2/22/93	U-1	34,000	1,400	5,500	910	7,300
	U-2	3,400	2,400	2,100	1,200	5,800
	U-3	ND	ND	ND	ND	ND

TABLE 3 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
6/11/92	U-1	1,000	80	1.4	6.7	41
	U-2	620	17	2.1	ND	37
	U-3	ND	ND	ND	ND	ND
8/20/92	U-1	400*	1	ND	ND	0.6
	U-2	700	28	6.5	1.3	4.6
	U-3	ND	ND	ND	ND	ND
5/05/92	U-1	230	1.2	ND	ND	ND
	U-2	1,600	120	52	6.2	290
	U-3	ND	ND	ND	ND	ND
2/12/92	U-1	250	ND	ND	ND	ND
	U-2	410	1.9	ND	0.36	0.40
	U-3	ND	ND	ND	ND	ND
10/09/91	U-1	ND	ND	ND	ND	ND
	U-2	230	7.1	ND	ND	11
	U-3	ND	ND	ND	ND	ND
7/03/91	U-1	140	21	4.3	0.36	17
	U-2	2,100	150	25	3.1	290
	U-3	ND	ND	ND	ND	ND
4/01/91	U-1	160	13	8.6	1.0	15
	U-2	1,700	250	89	34	190
	U-3	ND	1.0	2.9	0.53	5.4
1/07/91	U-1	250	22	16	4.2	17
	U-2	1,900	67	5.8	58	69
	U-3	ND	ND	ND	ND	1.8
8/10/90	U-1	690	38	75	8.6	130
	U-2	780	27	46	15	130
	U-3	ND	ND	ND	ND	ND

TABLE 3 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

♦ Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be gasoline.

♦♦ Sequoia Analytical Laboratory reported that the hydrocarbons detected appeared to be a gasoline and non-gasoline mixture.

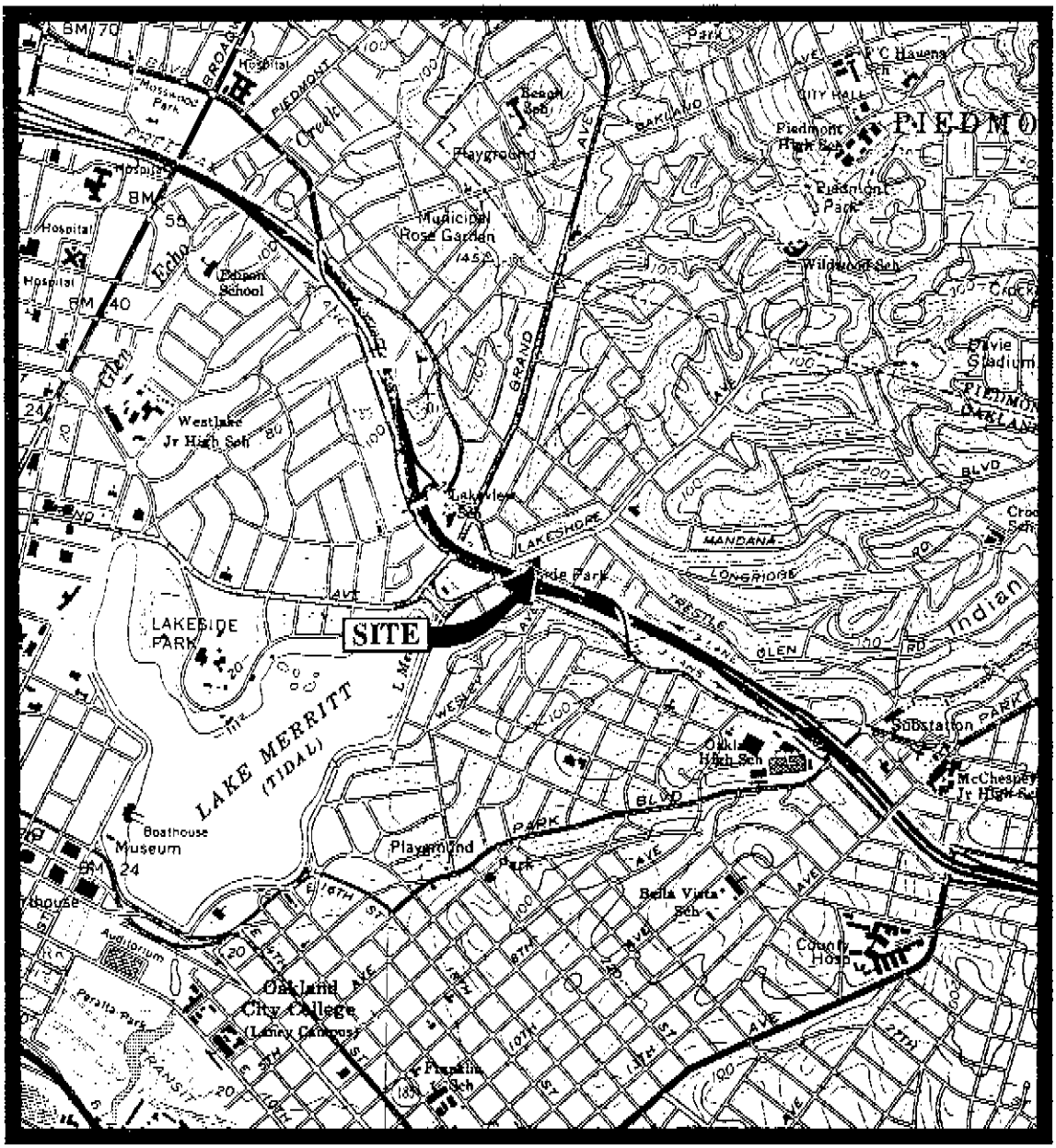
* The positive result for gasoline does not appear to have a typical gasoline pattern.

** The concentration reported as gasoline is primarily due to the presence of a combination of gasoline and a discrete peak not indicative of gasoline.

ND = Non-detectable.

Results are in micrograms per liter (µg/L), unless otherwise indicated.

Note: Laboratory analyses data prior to November 16, 1993, were provided by GeoStrategies, Inc.

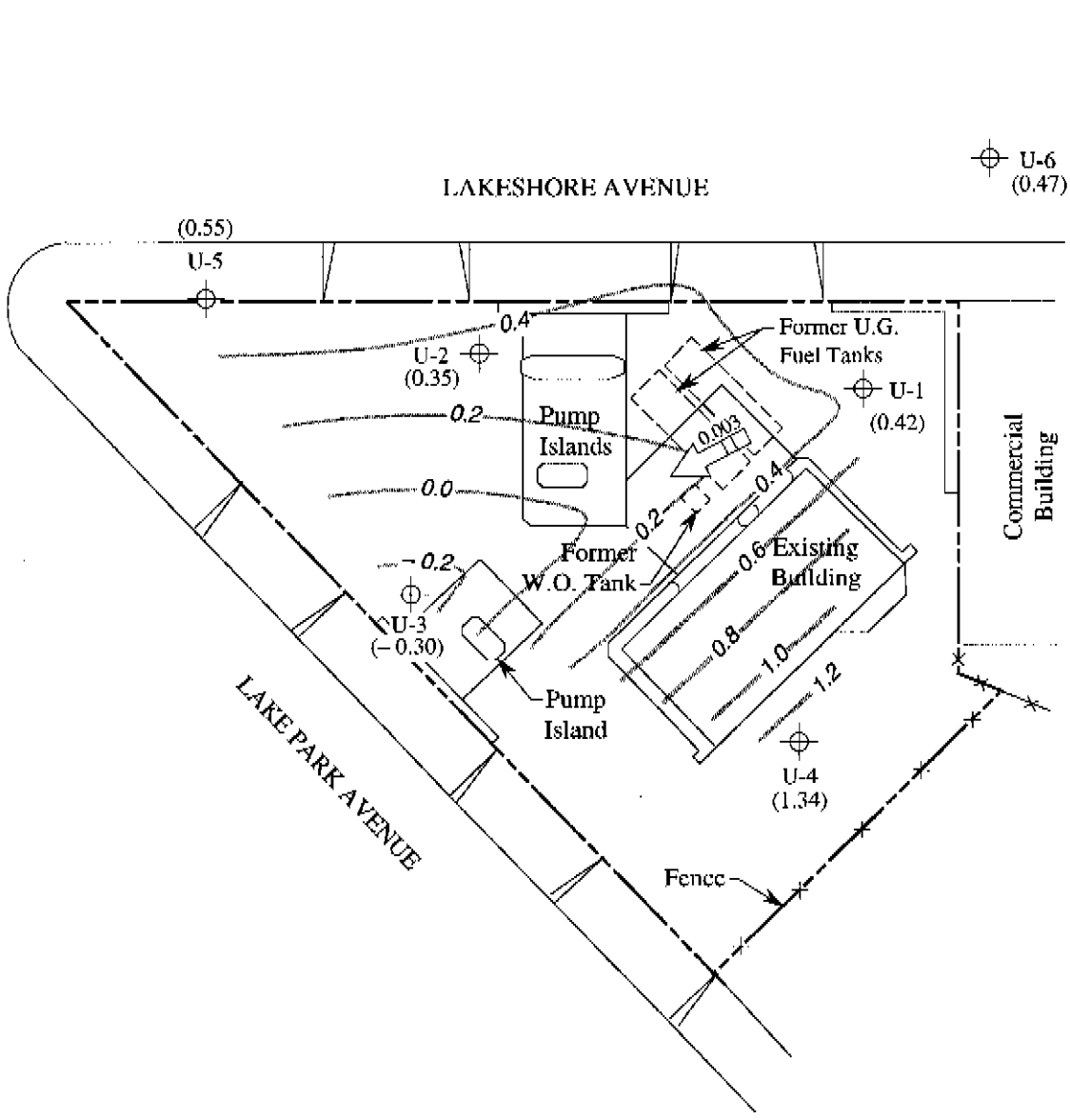


Base modified from 7.5 minute U.S.G.S.
Oakland East and West Quadrangles
(both photorevised 1980)

0 2000 4000

Approx. scale feet

mpds SERVICES, INCORPORATED	**UNOCAL SERVICE STATION #5325** **3220 LAKESHORE AVENUE** **OAKLAND, CALIFORNIA**	**LOCATION MAP**



LEGEND

- Monitoring well
- ( ) Ground water elevation in feet above Mean Sea Level
- #.## Direction of ground water flow with approximate hydraulic gradient
- Contours of ground water elevation

0 40 80

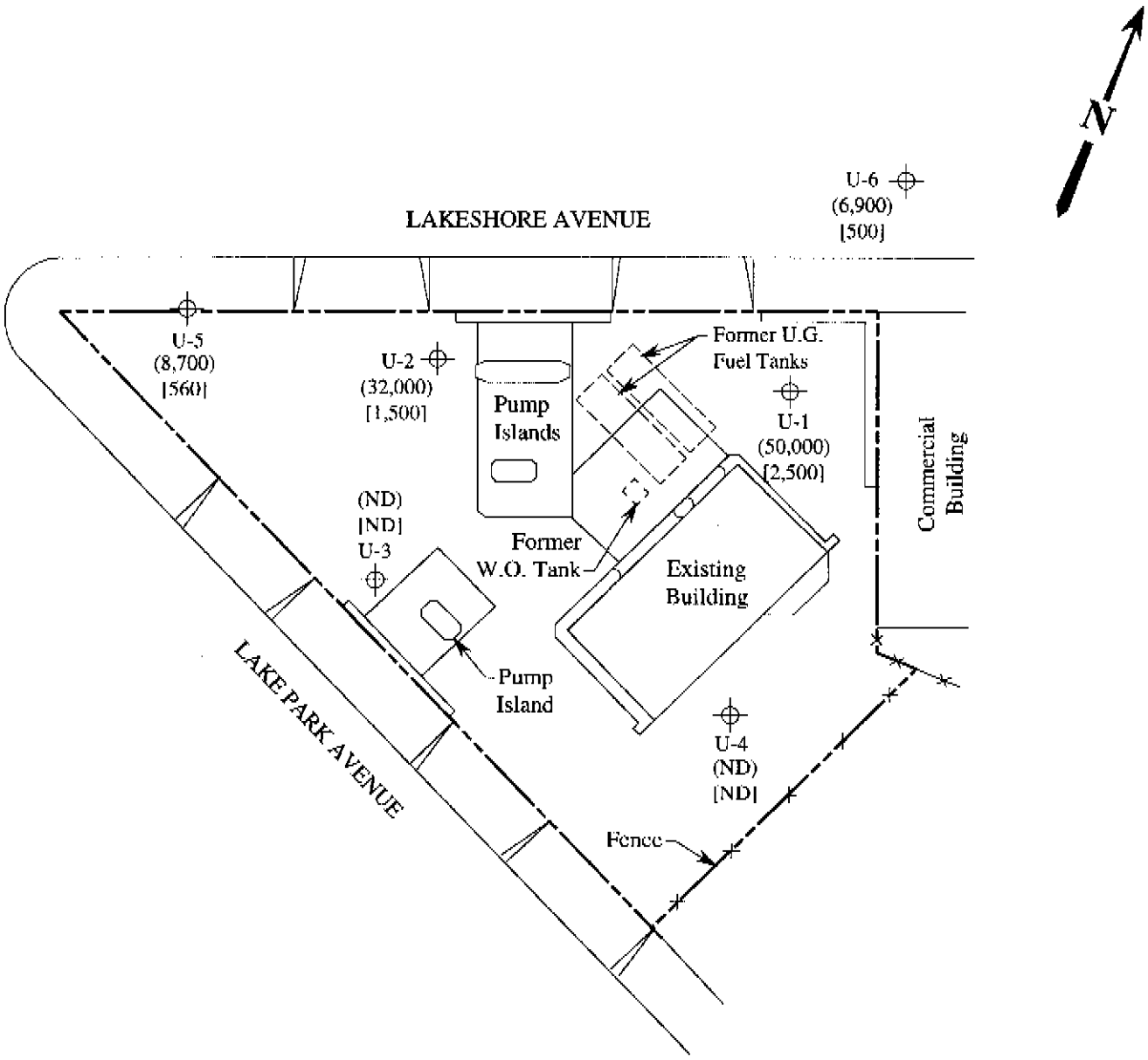
Approx. scale feet

POTENTIOMETRIC SURFACE MAP FOR THE DECEMBER 24, 1994 MONITORING EVENT

mpds SERVICES, INCORPORATED

UNOCAL SERVICE STATION #5325
3220 LAKESHORE AVENUE
OAKLAND, CALIFORNIA

FIGURE
1



LEGEND

- ⊕ Monitoring well
- ( ) Concentration of TPH as gasoline in µg/L
- [ ] Concentration of benzene in µg/L

ND = Non-detectable

0 40 80

Approx. scale feet

PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUND WATER ON DECEMBER 24, 1994

mpds SERVICES, INCORPORATED

UNOCAL SERVICE STATION #5325
3220 LAKESHORE AVENUE
OAKLAND, CALIFORNIA

FIGURE
2

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

MPDS Services	Client Project ID:	Unocal #5325, 3220 Lakeshore, Oakland	Sampled:	Dec 24, 1994
2401 Stanwell Dr., Ste. 400	Matrix Descript:	Water	Received:	Dec 27, 1994
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Reported:	Jan 12, 1995
Attention: Avo Avedisslan	First Sample #:	412-1885		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Sample Number	Sample Description	Purgeable Hydrocarbons µg/L	Benzene µg/L	Toluene µg/L	Ethyl Benzene µg/L	Total Xylenes µg/L
412-1885	U-1	50,000	2,500	9,700	2,400	17,000
412-1886	U-2	32,000	1,500	890	1,300	5,000
412-1887	U-3	ND	ND	ND	ND	ND
412-1888	U-4	ND	ND	ND	ND	ND
412-1889	U-5	8,700	560	70	670	430
412-1890	U-6	6,900	500	59	600	380
Detection Limits:		**50**	**0.50**	**0.50**	**0.50**	**0.50**

Total Purgeable Petroleum Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as ND were not present above the stated limit of detection.

SEQUOIA ANALYTICAL, #1271

Signature on File

Alan B. Kemp
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
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2401 Stanwell Dr., Ste. 400	Matrix Descript:	Water	Received:	Dec 27, 1994
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Reported:	Jan 12, 1995
Attention: Avo Avedissian	First Sample #:	412-1885		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Sample Number	Sample Description	Chromatogram Pattern	DL Mult. Factor	Date Analyzed	Instrument ID	Surrogate Recovery, % QC Limits: 70-130
412-1885	U-1	Gasoline	100	1/8/95	HP-2	103
412-1886	U-2	Gasoline	100	1/8/95	HP-2	99
412-1887	U-3	--	1.0	1/7/95	HP-5	95
412-1888	U-4	--	1.0	1/7/95	HP-5	97
412-1889	U-5	Gasoline	20	1/7/95	HP-5	94
412-1890	U-6	Gasoline	10	1/7/95	HP-5	82

SEQUOIA ANALYTICAL, #1271

Signature on File

Alan B. Kemp
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
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MPDS Services
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Avo Avedissian

Client Project ID: Unocal #5325, 3220 Lakeshore, Oakland
Matrix: Liquid
QC Sample Group: 4121885-890
Reported: Jan 13, 1995

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Tuzon	A. Tuzon	A. Tuzon	A. Tuzon
MS/MSD Batch#:	4121808	4121808	4121808	4121808
Date Prepared:	1/8/95	1/8/95	1/8/95	1/8/95
Date Analyzed:	1/8/95	1/8/95	1/8/95	1/8/95
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Matrix Spike % Recovery:	95	100	100	105
Matrix Spike Duplicate % Recovery:	100	105	110	110
Relative % Difference:	5.1	4.7	9.5	4.7
LCS Batch#:	LCS010895	LCS010895	LCS010895	LCS010895
Date Prepared:	1/8/95	1/8/95	1/8/95	1/8/95
Date Analyzed:	1/8/95	1/8/95	1/8/95	1/8/95
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2
LCS % Recovery:	97	99	107	105
% Recovery Control Limits:	71-133	72-128	72-130	71-120

SEQUOIA ANALYTICAL, #1271

Signature on File

Alan B. Kemp
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

Sequoia Analytical

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MPDS Services
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Avo Avedissian

Client Project ID: Unocal #5325, 3220 Lakeshore, Oakland
Matrix: Liquid
QC Sample Group: 4121885-890

Reported: Jan 13, 1995

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Tuzon	A. Tuzon	A. Tuzon	A. Tuzon
MS/MSD Batch#:	4121882	4121882	4121882	4121882
Date Prepared:	1/7/95	1/7/95	1/7/95	1/7/95
Date Analyzed:	1/7/95	1/7/95	1/7/95	1/7/95
Instrument I.D.#:	HP-5	HP-5	HP-5	HP-5
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Matrix Spike % Recovery:	100	105	105	107
Matrix Spike Duplicate % Recovery:	100	105	105	105
Relative % Difference:	0.0	0.0	0.0	1.9
LCS Batch#:	3LCS010795	3LCS010795	3LCS010795	3LCS010795
Date Prepared:	1/7/95	1/7/95	1/7/95	1/7/95
Date Analyzed:	1/7/95	1/7/95	1/7/95	1/7/95
Instrument I.D.#:	HP-5	HP-5	HP-5	HP-5
LCS % Recovery:	96	100	100	99
% Recovery Control Limits:	71-133	72-128	72-130	71-120

SEQUOIA ANALYTICAL, #1271

Signature on File

Alan B. Kemp
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

M P D S Services, Inc.
2401 Stanwell Drive, Suite 400, Concord, CA 94520
Tel: (510) 602-5120 Fax: (510) 689-1918

CHAIN OF CUSTODY

SAMPLER: (Joe) HOVSIA AJEMIAN
WITNESSING AGENCY:
UNOCAL S/S # 5325 CITY: Oakland
ADDRESS: 3220 Lakeshore
ANALYSES REQUESTED
TURN AROUND TIME: Regular

SAMPLE ID NO.	DATE	TIME	WATER	GRAB	COMP	NO. OF CONT	SAMPLING LOCATION	TPH-GAS BTEX	TPH-DIESEL	TOG	8010				REMARKS
U-1	12-24-94	11:03 A.M	✓	✓		2(VOA)	Wells	✓					4121885	A,B	VOA-s preserved
U-2	"	1:38 P.M	✓	✓		"	"	✓					4121886		
U-3	"	9:50 A.M	✓	✓		"	"	✓					4121887		
U-4	"	10:25 A.M	✓	✓		"	"	✓					4121888		
U-5	"	12:42 P.M	✓	✓		"	"	✓					4121889		
U-6	"	11:35 A.M	✓	✓		"	"	✓					4121890	✓	

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:
(SIGNATURE) Joe Ajemian	12-27-94 11:30 P.M	(SIGNATURE) 12/27/94 1130 9°C
(SIGNATURE)	12/28/94 8:00 AM	(SIGNATURE)
(SIGNATURE)	12-28	(SIGNATURE) 1:35 12/28/94
(SIGNATURE)		(SIGNATURE)

THE FOLLOWING MUST BE COMPLETED BY THE LABORATORY ACCEPTING SAMPLES FOR ANALYSES:

1. HAVE ALL SAMPLES RECEIVED FOR ANALYSIS BEEN STORED ON ICE? yes
2. WILL SAMPLES REMAIN REFRIGERATED UNTIL ANALYZED? yes
3. DID ANY SAMPLES RECEIVED FOR ANALYSIS HAVE HEAD SPACE? no
4. WERE SAMPLES IN APPROPRIATE CONTAINERS AND PROPERLY PACKAGED? yes

SIGNATURE: TITLE: Analyst DATE: 12/27/94