KAPREALIAN ENGINEERING
INCORPORATED

KEI-P89-0805.QR9
June 22, 1993

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

Attention: Mr. Edward C. Ralston

RE: Quarterly Report
Unocal Service Station #0746
3943 Broadway
Oakland, California

Dear Mr. Ralston:

This report presents the results of the most recent quarter of monitoring and sampling of the monitoring wells at the referenced site by Kaprealian Engineering, Inc. (KEI), per KEI's proposal (KEI-P89-0805.P6) dated April 15, 1991, and as modified in KEI's quarterly report (KEI-P89-0805.QR5) dated December 13, 1991. The wells are currently monitored monthly and sampled on a quarterly basis. This report covers the work performed by KEI from March through May of 1993.

BACKGROUND

The subject site contains a Unocal service station facility. Two underground fuel storage tanks, one waste oil tank, and the product piping were removed from the site in August of 1989 during tank replacement activities. The fuel tank pit was subsequently overexcavated in order to remove contaminated soil. Twelve monitoring wells (seven on-site and five off-site) and one recovery well have been installed at and in the vicinity of the site. In addition, a pilot vapor extraction test was conducted at the site in April of 1993.

A site description, detailed background information including a summary of all of the soil and ground water subsurface investigation/remediation work conducted to date, site hydrogeologic conditions, and tables that summarize all of the soil and ground water sample analytical results are presented in KEI's reports (KEI-P89-0805.R9) dated September 25, 1992, and (KEI-P89-0805.R10) dated May 18, 1993.

RECENT FIELD ACTIVITIES

The 12 monitoring wells (MW1 through MW12) were monitored three times and were sampled once during the quarter, except for wells

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MW3 and MW5, which were not sampled due to the presence of free product, and wells MW8 and MW9, which were only monitored once because they were inaccessible during the first two monitoring events of the quarter. In addition, wells MW3 and MW5 were monitored and purged three additional times during the quarter. Recovery well RW1 was also monitored two times during the quarter. During monitoring, the wells were checked for depth to water and the presence of free product. Prior to sampling, the wells were also checked for the presence of a sheen. No free product or sheen was noted in any of the wells during the quarter, except for the free product observed in wells MW3 and MW5 throughout the quarter, and the sheen observed in recovery well RW1 during the May 25, 1993, monitoring and sampling event. The monitoring data collected this quarter are summarized in Table 1.

Ground water samples were collected from all of the wells (except MW3 and MW5) on May 25, 1993. Prior to sampling, the wells were each purged of between 3 and 9 gallons of water by the use of a surface pump. The samples were collected by the use of a clean Teflon bailer. The samples were decanted into clean VOA vials that were then sealed with Teflon-lined screw caps, labeled, and stored in a cooler, on ice, until delivery to a state-certified laboratory.

HYDROLOGY

The measured depth to ground water at the site on May 25, 1993, ranged between 7.48 and 15.14 feet below grade. The water levels in all of the wells have shown net decreases ranging from 0.58 to 2.44 feet since February 24, 1993. Based on the water level data gathered during the quarter, the ground water flow direction appeared to range from the south-southwest to the southwest, as shown on the attached Potentiometric Surface Maps, Figures 1, 2, and 3. The flow direction has been to the southwest or south-southwest since February of 1990 (11 consecutive quarters). The average hydraulic gradient across the site and vicinity on May 25, 1993, was approximately 0.04.

ANALYTICAL RESULTS

The ground water samples were analyzed at Sequoia Analytical Laboratory and were accompanied by properly executed Chain of Custody documentation. The samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline by EPA method 5030/modified 8015, and benzene, toluene, xylenes, and ethylbenzene by EPA method 8020. In addition, the ground water sample collected from well MW2 was analyzed for methyl tert butyl ether (MTBE) by EPA method 8020 (modified).

The analytical results of all of the ground water samples collected from the monitoring wells to date are summarized in Table 2. The concentrations of TPH as gasoline and benzene detected in the ground water samples collected this quarter are shown on the attached Figures 4 and 5, respectively. Copies of the laboratory analytical results and the Chain of Custody documentation are attached to this report.

DISCUSSION AND RECOMMENDATIONS

Based on the analytical results for the ground water samples collected and evaluated to date, KEI recommends the continuation of the current ground water monitoring and sampling program, per KEI's proposal (KEI-P89-0805.P6) dated April 15, 1991, and as modified in KEI's quarterly report (KEI-P89-0805.QR5) dated December 13, 1991. In addition, KEI recommends that future ground water samples collected from well MW2 continue to be analyzed for MTBE.

KEI also recommends the continuation of the bi-weekly purging of monitoring wells MW3, MW5, and MW8 in order to reduce the levels of contamination in the vicinity of these wells. A continuous surface-skimming free product recovery system has been installed in well MW5. KEI also recommends that one additional surface-skimming free product recovery system be installed in MW3.

DISTRIBUTION

A copy of this report should be sent to the Alameda County Health Care Services Agency, and to Mr. Lester Feldman of the Regional Water Quality Control Board, San Francisco Bay Region.

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.

Our studies assume that the field and laboratory data are reasonably representative of the site as a whole, and assume that subsurface conditions are reasonably conducive to interpolation and extrapolation.

The results of this study are based on the data obtained from the field and laboratory analyses obtained from a state-certified laboratory. We have analyzed these data using what we believe to be currently applicable engineering techniques and principles in the Northern California region. We make no warranty, either expressed or implied, regarding the above, including laboratory

analyses, except that our services have been performed in accordance with generally accepted professional principles and practices existing for such work.

If you have any questions regarding this report, please do not hesitate to call at (510) 602-5100.

Sincerely,

Kaprealian Engineering, Inc.

Thomas J. Berkins

Thomas J. Berkins
Senior Environmental Engineer

Joel G. Greger

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

License No. 1633
Exp. Date 6/30/94

Aram Kaloustian

Aram Kaloustian
Project Engineer

/jad

Attachments: Tables 1 & 2
Location Map
Potentiometric Surface Maps - Figures 1, 2 & 3
Concentrations of TPH as Gasoline - Figure 4
Concentrations of Benzene - Figure 5
Laboratory Analyses
Chain of Custody documentation

QMRs dated June 22, 1993 and Sep 24, 1993 show different well cover elevation. Send correct data.

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June 22, 1993

TABLE 1

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

Well #	Ground Water Elevation (feet)	Depth to Water (feet)	Product Thickness (feet)	Sheen	Water Purged (Gallons)	Product Purged (ounces)
(Monitored and Sampled on May 25, 1993)						
MW1	73.20	7.87	0	No	9	0
MW2	72.58	9.04	0	No	8	0
MW3*	72.58**	9.45	0.03	N/A	0	0
MW4	72.73	8.75	0	No	8	0
MW5*	72.06**	9.63	0.13	N/A	0	0
MW6	72.99	7.48	0	No	9	0
MW7	73.40	8.43	0	No	7	0
MW8	71.59	10.12	0	No	8	0
MW9	69.63	11.50	0	No	8	0
MW10	69.88	12.02	0	No	7	0
MW11	63.29	15.14	0	No	3	0
MW12	66.21	13.68	0	No	3	0
RW1	72.62	8.58	0	Yes	0	0
(Monitored on May 12, 1993)						
MW3	72.46**	9.57	0.03	N/A	50	<1
MW5	72.33**	9.28	0.02	N/A	50	<1
MW8	WELL WAS INACCESSIBLE					
RW1	72.38**	8.82	0	--	0	0
(Monitored on April 28, 1993)						
MW1	73.16	7.91	0	--	0	0
MW2	72.75	8.87	0	--	0	0
MW3	72.59**	9.44	0.03	N/A	50	<1
MW4	72.12	9.36	0	--	0	0
MW5	72.47**	9.14	0.02	N/A	50	<1
MW6	72.89	7.58	0	--	0	0
MW7	73.44	8.39	0	--	0	0
MW8	WELL WAS INACCESSIBLE					
MW9	WELL WAS INACCESSIBLE					
MW10	69.79	12.11	0	--	0	0
MW11	64.56	13.87	0	--	0	0
MW12	66.47	13.42	0	--	0	0

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TABLE 1 (Continued)

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

Well #	Ground Water Elevation (feet)	Depth to Water (feet)	Product Thickness (feet)	Sheen	Water Purged (Gallons)	Product Purged (ounces)
		(Monitored on April 8, 1993)				
MW3	72.89**	9.14	0.02	N/A	50	<1
MW5	72.76**	8.84	0.01	N/A	50	<1
MW8	WELL WAS INACCESSIBLE					
		(Monitored on March 22, 1993)				
MW1	74.81	6.26	0	--	0	0
MW2	72.12	9.50	0	--	0	0
MW3	73.22**	8.81	0.02	N/A	50	0
MW4	73.36	8.12	0	--	0	0
MW5	73.14**	8.46	0.01	N/A	50	0
MW6	74.62	5.85	0	--	0	0
MW7	74.86	6.97	0	--	0	0
MW8	WELL WAS INACCESSIBLE					
MW9	WELL WAS INACCESSIBLE					
MW10	71.01	10.89	0	--	0	0
MW11	69.48	8.95	0	--	0	0
MW12	68.67	11.22	0	--	0	0
		(Monitored on March 9, 1993)				
MW3	72.85**	9.18	0.02	N/A	50	<1
MW5	72.73**	8.87	0.01	N/A	50	<1
MW8	WELL WAS INACCESSIBLE					

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TABLE 1 (Continued)

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

Well	Well Cover Elevation*** (feet)
MW1	81.07
MW2	81.62
MW3	82.01
MW4	81.48
MW5	81.59
MW6	80.47
MW7	81.83
MW8	81.71
MW9	81.13
MW10	81.90
MW11	78.43
MW12	79.89
RW1	81.20

* Monitored only.

** Ground water elevation corrected due to the presence of free product.

*** The elevations of the tops of the well covers have been surveyed relative to Mean Sea Level (MSL), per City of Oakland Benchmark BM#1336 (elevation = 82.28 MSL).

N/A = Not applicable.

-- Sheen determination was not performed.

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TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
5/25/93	MW1	260	27	4.9	54	2.6
	MW2*	1,300♦	ND	ND	ND	ND
	MW3	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT				
	MW4	74	10	ND	1.8	4.6
	MW5	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT				
	MW6	ND	ND	ND	ND	ND
	MW7	ND	ND	ND	ND	ND
	MW8	1,200	5.4	ND	21	9.0
	MW9	160	6.1	ND	1.1	7.4
	MW10	ND	ND	ND	ND	ND
	MW11	ND	ND	0.75	1.0	ND
	MW12	ND	ND	ND	ND	ND
2/24/93	MW1	1,100	280	4.9	140	120
	MW2	11,000♦	ND	ND	ND	ND
	MW3	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT				
	MW4	140	12	0.64	3.7	9.4
	MW5	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT				
	MW6	ND	ND	ND	ND	ND
	MW7	ND	ND	ND	ND	ND
	MW8	WELL WAS INACCESSIBLE				
	MW9	WELL WAS INACCESSIBLE				
	MW10	ND	ND	ND	ND	ND
	MW11	ND	ND	ND	ND	ND
	MW12	ND	ND	ND	ND	ND
11/20/92	MW1	ND	0.75	ND	ND	ND
	MW2	510♦	ND	ND	ND	ND
	MW3	1,100,000♦♦	1,800	6,400	15,000	3,000
	MW4	ND	6.2	ND	0.52	1.2
	MW5	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT				
	MW6	ND	ND	ND	ND	ND
	MW7	ND	ND	ND	ND	ND
	MW8	WELL WAS INACCESSIBLE				
	MW9	WELL WAS INACCESSIBLE				
	MW10	ND	ND	ND	ND	ND
	MW11	ND	ND	ND	ND	ND
	MW12	ND	ND	ND	ND	ND

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TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
8/26/92	MW1	ND	ND	ND	ND	ND
	MW2	ND	ND	ND	ND	ND
	MW3	20,000	690	1,900	5,700	1,300
	MW4	120	86	0.52	1.6	0.57
	MW5	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT				
	MW6	ND	ND	ND	ND	ND
	MW7	ND	ND	ND	ND	0.73
	MW8	1,800	12	8.0	13	4.0
	MW9	250	13	ND	3.8	8.6
	MW10	ND	ND	ND	ND	ND
	MW11	ND	ND	ND	ND	ND
	MW12	ND	ND	ND	ND	ND
5/23/92	MW1	ND	ND	ND	ND	ND
	MW2	ND	ND	ND	ND	ND
	MW3	25,000	300	130	4,900	880
	MW4	ND	ND	ND	ND	ND
	MW5	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT				
	MW6	ND	ND	ND	ND	ND
	MW7	ND	ND	ND	ND	ND
	MW8	2,100	8.6	1.6	28	1.7
	MW9	460	18	0.66	3.2	1.4
	MW10	ND	ND	ND	ND	ND
	MW11	ND	ND	ND	ND	ND
2/06/92	MW1	ND	ND	ND	ND	ND
	MW2	ND	0.36	0.66	0.62	ND
	MW3	24,000	600	1,800	5,800	1,200
	MW4	5,700	2,200	140	980	57
	MW5	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT				
	MW6	ND	ND	ND	ND	ND
	MW7	ND	ND	ND	ND	ND
	MW8	2,600	4.1	7.0	93	31
	MW9	660	41	1.0	15	33
	MW10	ND	ND	ND	ND	ND
	MW11	ND	ND	ND	ND	ND

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
11/19/91	MW1	ND	ND	ND	ND	ND
	MW2	ND	ND	ND	ND	ND
	MW3	22,000	250	440	3,000	660
	MW4	55	9.2	4.5	6.7	1.4
	MW5	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT				
	MW6	ND	ND	ND	ND	ND
	MW7	32	ND	ND	ND	ND
	MW8	1,600	8.1	1.8	52	19
	MW9	360	17	0.45	11	15
8/28/91	MW1	ND	ND	ND	ND	ND
	MW2	ND	ND	ND	ND	ND
	MW3	16,000	650	2,200	5,400	1,100
	MW4	2,000	1,500	20	300	120
	MW5	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT				
	MW6	ND	ND	ND	ND	ND
	MW7	ND	ND	ND	ND	ND
	MW8	1,800	3.2	1.9	74	19
	MW9	450	17	0.9	14	13
5/28/91	MW1	ND	ND	ND	ND	ND
	MW2	ND	ND	ND	ND	ND
	MW3	24,000	570	1,100	4,200	810
	MW4	38	ND	ND	1.9	ND
	MW5	24,000	2,300	3,400	6,000	1,300
	MW6	ND	ND	ND	0.42	ND
	MW7	39	ND	ND	0.73	ND
	MW8	4,800	4.2	1.3	170	5.1
	MW9	590	6.0	0.43	1.4	6.8
2/25/91	MW1	ND	ND	ND	ND	ND
	MW2	ND	0.68	0.42	0.86	ND
	MW3	37,000	730	2,900	7,300	1,300
	MW4	22,000	600	1,300	2,800	780
	MW5	25,000	950	1,300	3,500	900
	MW6	ND	0.37	0.40	1.5	0.35
	MW7	70	ND	ND	0.52	ND
	MW8	5,300	17	6.1	300	53
	MW9	390	13	1.1	14	2.8

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
11/07/90	MW1	45	ND	ND	ND	ND
	MW2	ND	ND	ND	ND	ND
	MW3	42,000	1,400	5,000	7,500	1,800
	MW4	180	1.5	0.37	26	6.3
	MW5	20,000	640	1,100	3,000	670
	MW6	ND	ND	ND	ND	ND
	MW7	ND	ND	ND	ND	ND
	MW8	4,700	28	38	7,200	86
	MW9	480	7.8	1.2	47	13
8/16/90	MW1	ND	ND	ND	ND	ND
	MW2	ND	ND	6.7	ND	ND
	MW3	6,800	600	660	160	760
	MW4	3,600	480	17	260	230
	MW5	16,000	1,400	1,900	660	2,800
2/15/90	MW1	170	7.9	ND	2.8	2.2
	MW2	ND	ND	ND	ND	ND
	MW3	20,000	1,700	2,100	3,100	750
	MW4	150	8.0	8.0	45	10
	MW5	24,000	1,500	1,700	3,600	260
11/01/89	MW1	ND	ND	ND	0.30	ND
	MW2	200	ND	ND	1.2	3.0
	MW3	13,000	57	48	120	1.7

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

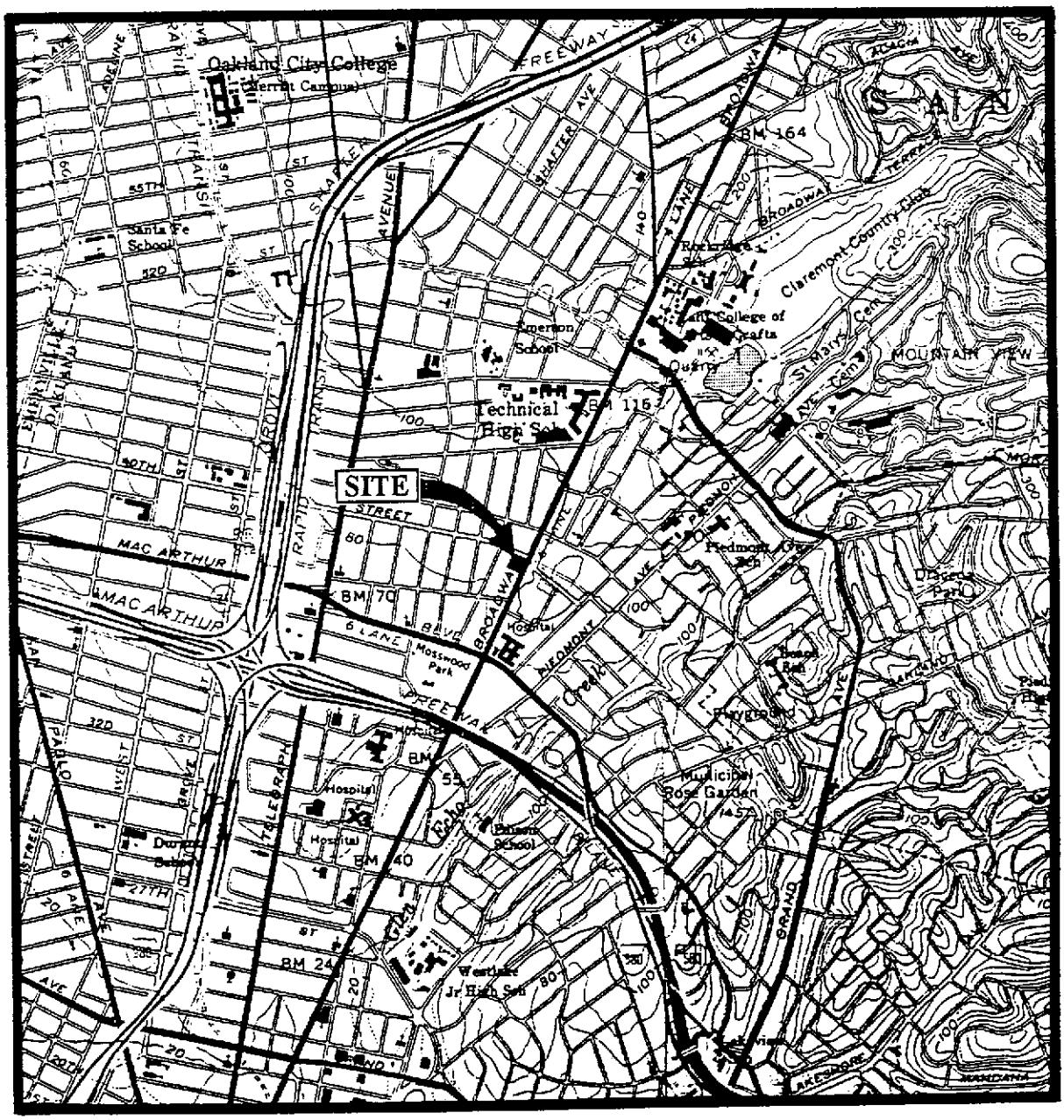
♦♦ Sequoia Analytical Laboratory reported that the hydrocarbons detected appeared to be gasoline and non-gasoline mixture.

* MTBE was detected at 2,700 ppb.

ND = Non-detectable.

-- Indicates analysis was not performed.

Results in parts per billion (ppb), unless otherwise indicated.



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

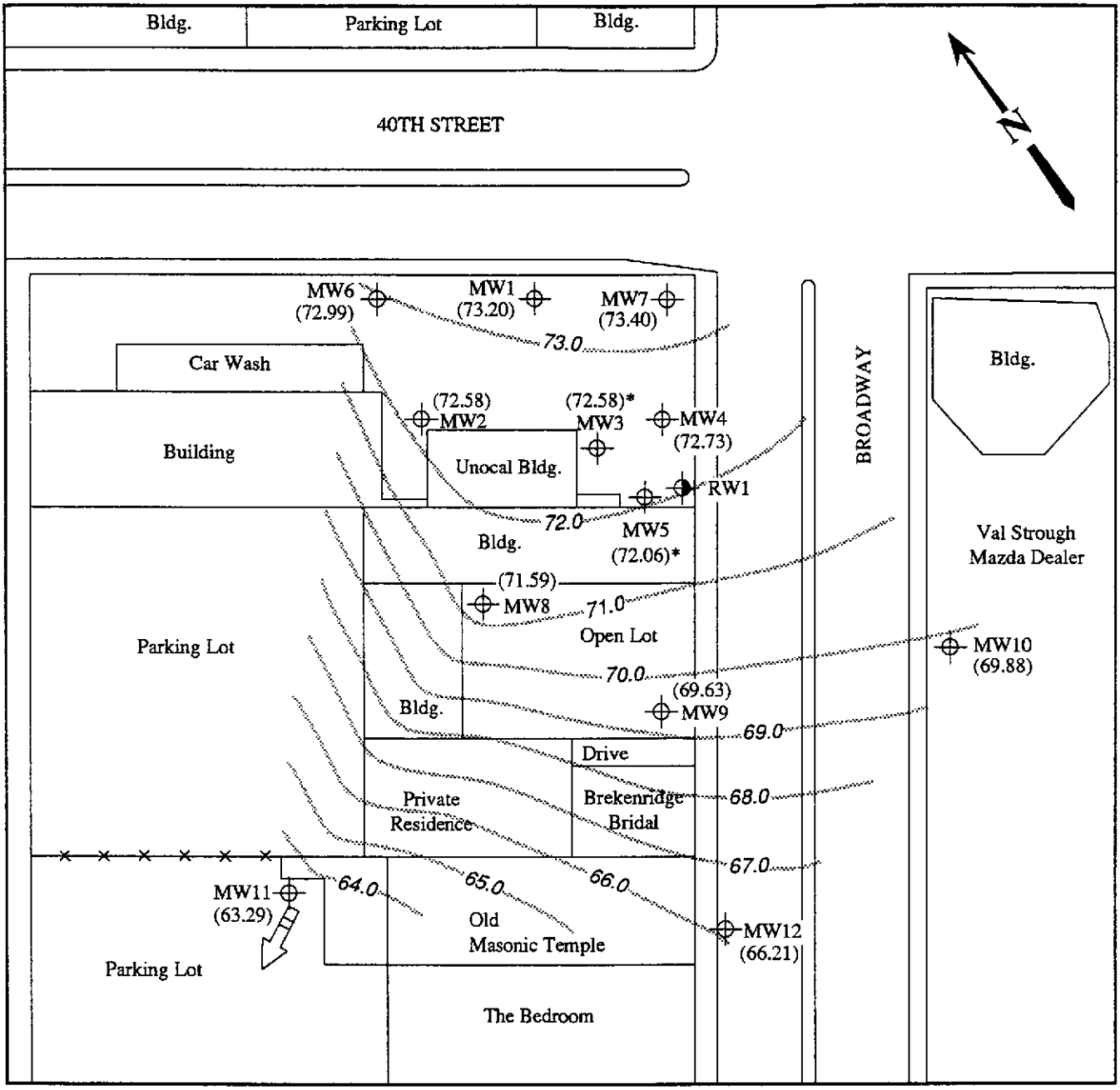
KAPREALIAN ENGINEERING INCORPORATED	UNOCAL SERVICE STATION #0746 3943 BROADWAY OAKLAND, CA	LOCATION MAP

1/28/93

left msg for Ed.
Rala to call
to see if he still
wants meeting w/
~~KE~~ I, Unocal and
ACDEH -

3943 Bdwy - Oak UNOCAL

1) will VE alone be adequate?
w/o GW extraction - consider
the high benzene conc
found in GW - ~~Pilot test~~ well
2) Consider pumping MW-3 or
other to see recovery rate.
is RW-1 poorly located?
DONE - all prior



LEGEND

- Monitoring well
- 6-inch diameter recovery well
- ( ) Ground water elevation in feet above Mean Sea Level
- Direction of ground water flow
- Contours of ground water elevation
- * Ground water elevation corrected due to the presence of free product

0 60 120

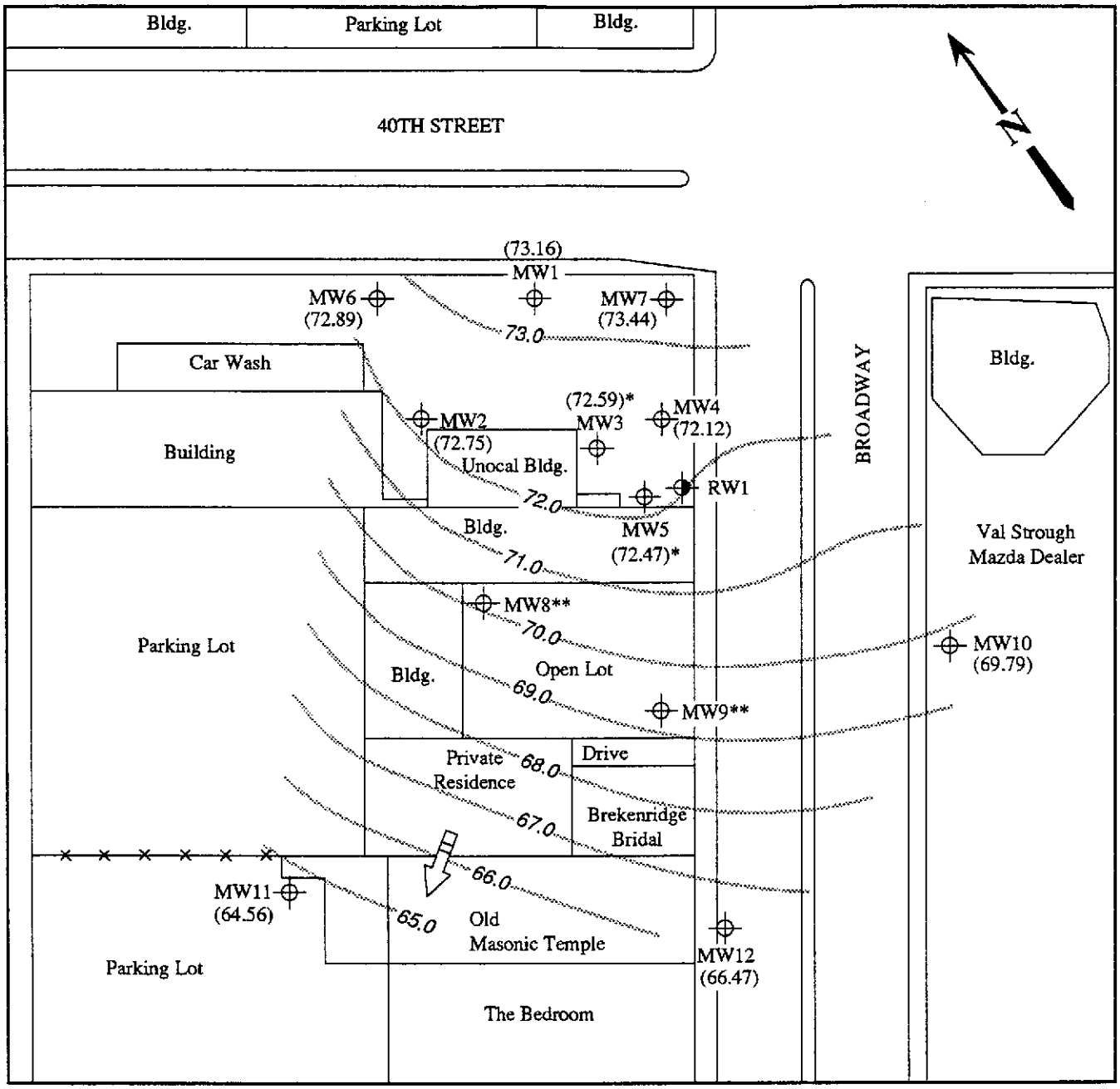
Approx. scale feet

POTENTIOMETRIC SURFACE MAP FOR THE MAY 25, 1993 MONITORING EVENT

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #0746
3943 BROADWAY
OAKLAND, CA

FIGURE
1



LEGEND

- Monitoring well
- 6-inch diameter recovery well
- ( ) Ground water elevation in feet above Mean Sea Level
- Direction of ground water flow
- Contours of ground water elevation

* Ground water elevation corrected due to the presence of free product

** Well was inaccessible.

0 60 120

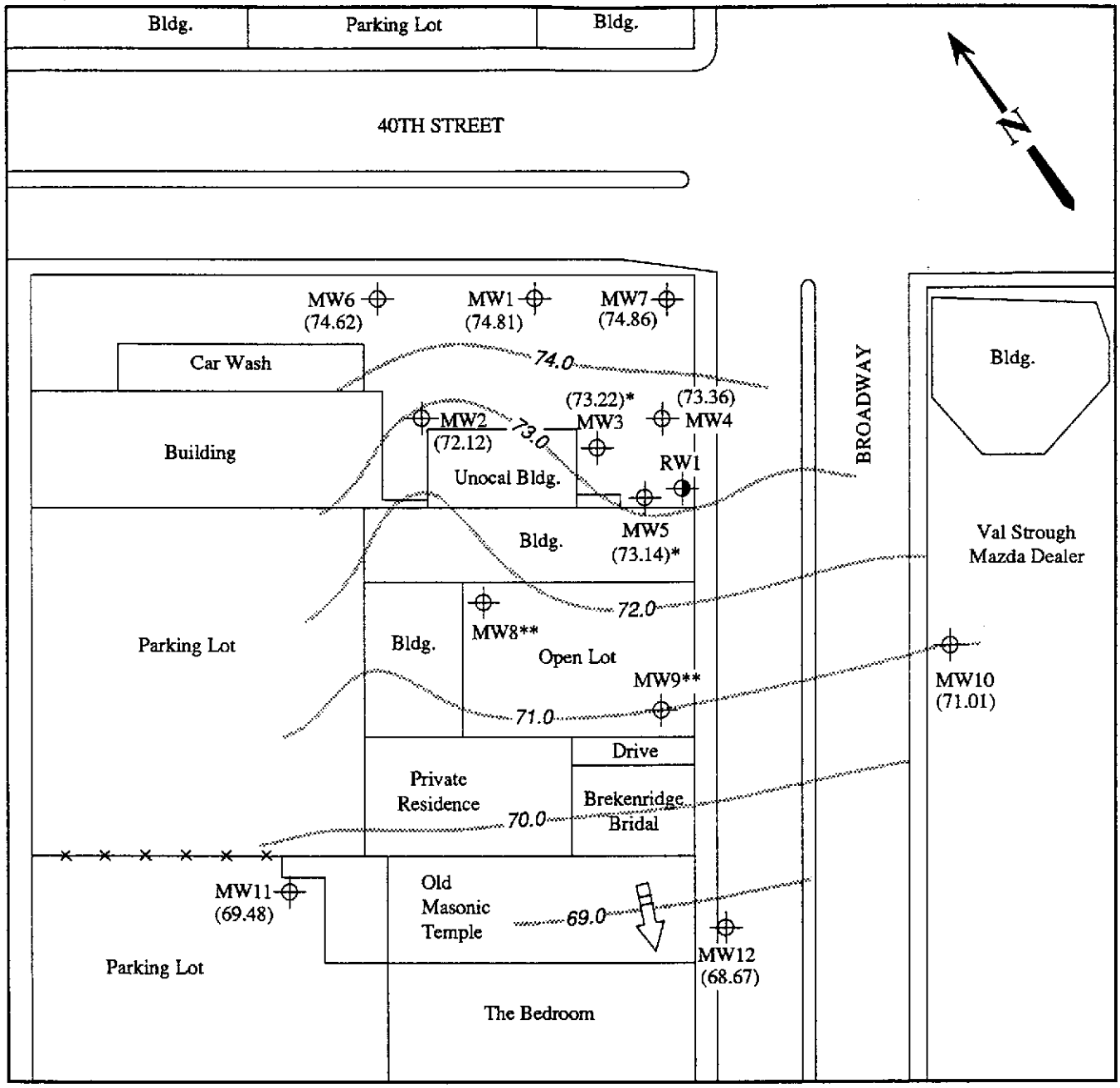
Approx. scale feet

POTENTIOMETRIC SURFACE MAP FOR THE APRIL 28, 1993 MONITORING EVENT

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #0746
3943 BROADWAY
OAKLAND, CA

FIGURE
2



LEGEND

- Monitoring well
- 6-inch diameter recovery well
- ( ) Ground water elevation in feet above Mean Sea Level
- Direction of ground water flow
- Contours of ground water elevation
- * Ground water elevation corrected due to the presence of free product
- ** Well was inaccessible.

0 60 120

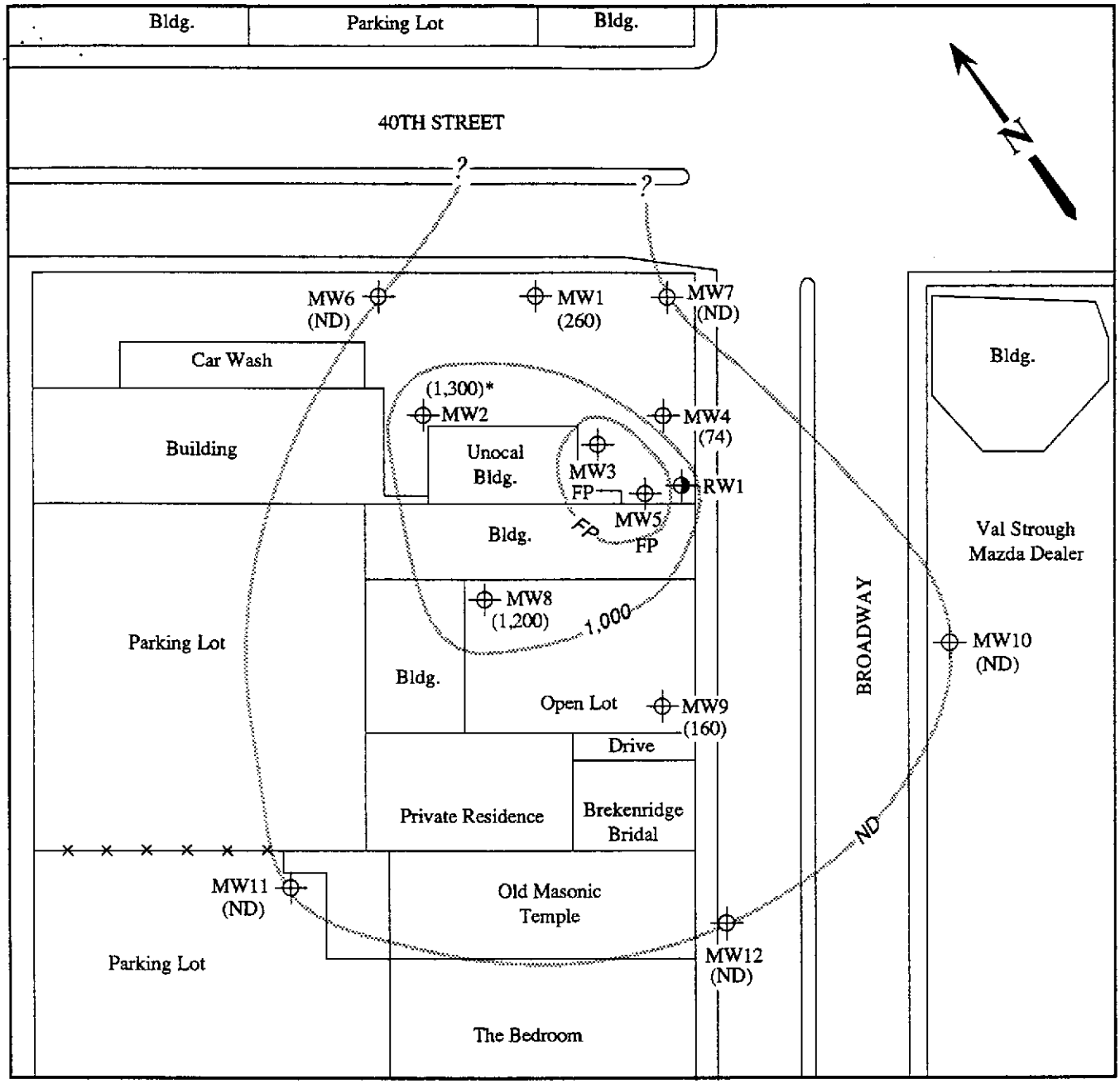
Approx. scale feet

POTENTIOMETRIC SURFACE MAP FOR THE MARCH 22, 1993 MONITORING EVENT

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #0746
3943 BROADWAY
OAKLAND, CA

FIGURE
3



LEGEND

- Monitoring well
- 6-inch diameter recovery well
- ( ) Concentration of TPH as gasoline in ppb
- Approximate iso-concentration contours of TPH as gasoline contamination in ground water in ppb

ND = Non-detectable, FP = Free product,

* The lab reported that the hydrocarbons detected do not appear to be gasoline.

0 60 120

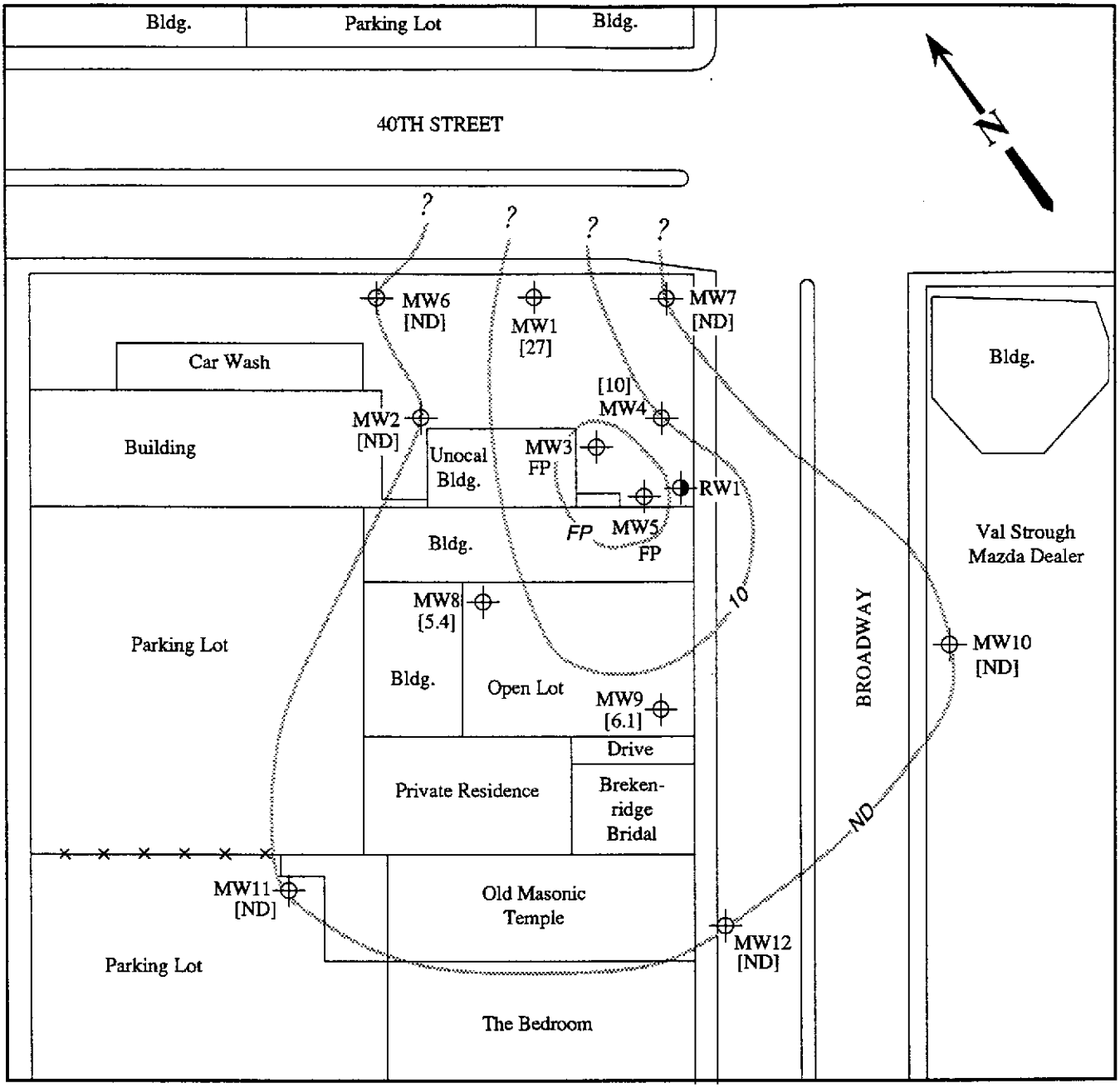
Approx. scale feet

CONCENTRATIONS OF TPH AS GASOLINE IN GROUND WATER ON MAY 25, 1993

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #0746
3943 BROADWAY
OAKLAND, CA

FIGURE
4



LEGEND

- Monitoring well
- 6-inch diameter recovery well
- [ ] Concentration of benzene in ppb
- Approximate iso-concentration contours of benzene contamination in ground water in ppb

ND = Non-detectable, FP = Free product

0 60 120

Approx. scale feet

CONCENTRATIONS OF BENZENE IN GROUND WATER ON MAY 25, 1993

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #0746
3943 BROADWAY
OAKLAND, CA

FIGURE
5

SEQUOIA ANALYTICAL
1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 3943 Broadway, Oakland	Sampled: May 25, 1993
2401 Stanwell Dr., Ste. 400	Sample Matrix:	Water	Received: May 25, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Reported: Jun 3, 1993
Attention: Mardo Kaprealian, P.E.	First Sample #:	305-1336	

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 305-1336 MW 1	Sample I.D. 305-1337 MW 2*	Sample I.D. 305-1338 MW 4	Sample I.D. 305-1339 MW 6	Sample I.D. 305-1340 MW 7	Sample I.D. 305-1341 MW 8
Purgeable Hydrocarbons	50	260	1,300	74	N.D.	N.D.	1,200
Benzene	0.5	27	N.D.	10	N.D.	N.D.	5.4
Toluene	0.5	4.9	N.D.	N.D.	N.D.	N.D.	N.D.
Ethyl Benzene	0.5	2.6	N.D.	4.6	N.D.	N.D.	9.0
Total Xylenes	0.5	54	N.D.	1.8	N.D.	N.D.	21
Chromatogram Pattern:		Gasoline	Discrete Peak	Gasoline	--	--	Gasoline

Quality Control Data

Report Limit Multiplication Factor:	1.0	20	1.0	1.0	1.0	5.0
Date Analyzed:	6/2/93	6/2/93	6/2/93	6/2/93	6/2/93	6/2/93
Instrument Identification:	HP-2	HP-5	HP-2	HP-2	HP-2	HP-4
Surrogate Recovery, %: (QC Limits = 70-130%)	103	104	104	103	105	93

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

Please Note: * The above sample does not appear to contain gasoline. Purgeable Hydrocarbons are due to MTBE peak.

SEQUOIA ANALYTICAL
1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 3943 Broadway, Oakland	Sampled: May 25, 1993
2401 Stanwell Dr., Ste. 400	Sample Matrix:	Water	Received: May 25, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Reported: Jun 3, 1993
Attention: Mardo Kaprealian, P.E.	First Sample #:	305-1342	

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 305-1342 MW 9	Sample I.D. 305-1343 MW 10	Sample I.D. 305-1344 MW 11	Sample I.D. 305-1345 MW 12	Sample I.D. Matrix Blank
Purgeable Hydrocarbons	50	160	N.D.	N.D.	N.D.	
Benzene	0.5	6.1	N.D.	N.D.	N.D.	
Toluene	0.5	N.D.	N.D.	0.75	N.D.	
Ethyl Benzene	0.5	7.4	N.D.	N.D.	N.D.	
Total Xylenes	0.5	1.1	N.D.	1.0	N.D.	
Chromatogram Pattern:		Gasoline	--	--	--	

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0
Date Analyzed:	6/2/93	6/2/93	6/2/93	6/2/93	6/2/93
Instrument Identification:	HP-2	HP-4	HP-4	HP-4	HP-4
Surrogate Recovery, %: (QC Limits = 70-130%)	101	98	98	102	103

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

SEQUOIA ANALYTICAL

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 3943 Broadway, Oakland	Sampled:	May 25, 1993
2401 Stanwell Dr., Ste. 400	Sample Descript:	Water	Received:	May 25, 1993
Concord, CA 94520	Analysis for:	MTBE (EPA 8020 - Modified)		
Attention: Mardo Kaprealian, P.E.	First Sample #:	305-1337	Analyzed:	Jun 2, 1993
			Reported:	Jun 3, 1993

LABORATORY ANALYSIS FOR: MTBE (EPA 8020 - Modified)

Sample Number	Sample Description	Detection Limit µg/L	Sample Result µg/L
305-1337	MW 2	12	2,700

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

for Scott A. Chieffo
Project Manager

SEQUOIA ANALYTICAL
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(510) 686-9600 • FAX (510) 686-9689

Kaprealian Engineering, Inc.
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal, 3943 Broadway, Oakland
Matrix: Water
QC Sample Group 3051336-1345

Reported: Jun 3, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	J.F.	J.F.	J.F.	J.F.
Conc. Spiked:	20	20	20	60
Units:	µg/L	µg/L	µg/L	µg/L
LCS Batch#:	2LCS060293	2LCS060293	2LCS060293	2LCS060293
Date Prepared:	6/2/93	6/2/93	6/2/93	6/2/93
Date Analyzed:	6/2/93	6/2/93	6/2/93	6/2/93
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4
LCS % Recovery:	93	92	95	103
Control Limits:	70-130	70-130	70-130	70-130
MS/MSD Batch #:	3060019	3060019	3060019	3060019
Date Prepared:	6/2/93	6/2/93	6/2/93	6/2/93
Date Analyzed:	6/2/93	6/2/93	6/2/93	6/2/93
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4
Matrix Spike % Recovery:	90	95	95	105
Matrix Spike Duplicate % Recovery:	90	95	100	107
Relative % Difference:	0.0	0.0	5.1	1.9

SEQUOIA ANALYTICAL

Scott A. Chieffo
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 LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.

KAPREALIAN ENGINEERING
INCORPORATED

CHAIN OF CUSTODY

SAMPLER: RAY (KEI)
WITNESSING AGENCY:
SITE NAME & ADDRESS: UNOCAL OAKLAND 3943 BROADWAY

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPHG	BTXE	MTBE					REMARKS
MW1	5/25			X	X		2	VOA's	X	X		3051	336	A	B	VOA's Preserved
MW2	4			X	X		4	VOAS	X	X	X		1337	A	B	
MW4	4			X	X		2	VOA's	X	X			1338	A	B	
MW6	4			X	X		4	4	X	X			1339	A	B	
MW7	4			X	X		4	4	X	X			1340	A	B	
MW8	4			X	X		4	4	X	X			1341	A	B	
MW9	4			X	X		4	4	X	X			1342	A	B	
MW10	4			X	X		4	4	X	X			1343	A	B	
MW11	4			X	X		4	4	X	X		4	1344	A	B	

ANALYSES REQUESTED

TURN AROUND TIME: 5 days

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
RAY (KEI)	5-25-93	Laura Arnold 5:50pm 5/25/93
Laura Arnold	5/26/93 1451	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	5-26-93 16:30	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)

The following MUST BE completed by the laboratory accepting samples for analysis:

1. Have all samples received for analysis been stored in 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

Laura Arnold — Signature
SAMPLE Control — Title
5/25/93 — Date

2401 Stanwell Drive, Suite 400
Concord, California 94520
Tel: 510.602.5100 Fax: 510.687.0602

KAPREALIAN ENGINEERING
INCORPORATED

CHAIN OF CUSTODY

SAMPLER	SITE NAME & ADDRESS
Ray Kelly	UNOCAL OAKLAND 3943 BROADWAY
WITNESSING AGENCY	

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	ANALYSES REQUESTED: TPHG	BTXE						TURN AROUND TIME: 5 days / REMARKS
MW12	5/25			x	x		2	VOA's	x	x	305	34	5AB			VOA's Preserved

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Ray Kelly	5-25-93	Lauri Arnold 550pm 5/25/93
Lauri Arnold 5/26/93	5:26pm	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)

The following MUST BE completed by the laboratory accepting samples for analysis:

1. Have all samples received for analysis been stored in 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

Lauri Arnold — SAMPLE COURIER — 5/25/93
Signature — Title — Date

2401 Stanwell Drive, Suite 400
Concord, California 94520
Tel: 510.602.5100 Fax: 510.687.0602