Vee
4/21/93

KAPREALIAN ENGINEERING
INCORPORATED

KEI-P89-0805.QR8
March 30, 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 December of 1992 through February 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.

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 report (KEI-P89-0805.R9) dated September 25, 1992.

RECENT FIELD ACTIVITIES

The 12 monitoring wells (MW1 through MW12) were monitored three times and were sampled once during the quarter, except for wells MW3 and MW5, which were not sampled due to the presence of free product, and wells MW8 and MW9, which were inaccessible throughout the quarter and therefore were neither monitored nor sampled during

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Concord, California 94520
Tel: 510.602.5100 Fax: 510.687.0602

the quarter. In addition, wells MW3 and MW5 were monitored and purged three additional times during the quarter. Recovery well RW1 was also monitored once during the February 24, 1993, monitoring and sampling event. 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 well MW3 during three of the six monitoring events, and the free product observed in well MW5 during five of the six monitoring events. The monitoring data collected this quarter are summarized in Table 1.

Water samples were collected from all of the wells (except MW3, MW5, MW8, and MW9) on February 24, 1993. Prior to sampling, the wells were each purged of between 4 and 10 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 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 February 24, 1993, ranged between 6.74 and 12.70 feet below grade. The water levels in all of the wells have shown net increases ranging from 0.66 to 3.02 feet since November 20, 1992, except for well MW12, which showed a net decrease of 0.03 feet. Based on the water level data gathered during the quarter, the ground water flow direction appeared to be predominantly to the southwest, as shown on the attached Potentiometric Surface Maps, Figures 1, 2, and 3. The flow direction has been southwest or south-southwest since February of 1990 (eleven consecutive quarters). The average hydraulic gradient across the site on February 24, 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.

The ground water sample analytical results 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 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 until a remediation system is designed and implemented at the subject site. In the interim, a continuous surface-skimming free product recovery system has been installed in MW5.

As shown on the attached laboratory analysis sheet, Sequoia Analytical Laboratory reported that the ground water sample collected from well MW2 on February 24, 1993, "does not appear to contain gasoline. Purgeable hydrocarbons are due mainly to an unidentified peak in the methyl tert butyl ether (MTBE) range." Therefore, KEI recommends that future ground water samples collected from well MW2 also be analyzed for MTBE.

KEI has previously submitted a work plan/proposal (KEI-P89-0805.P7R) dated February 15, 1993, to conduct a pilot vapor extraction test at the subject site. This work plan was approved by the Alameda County Health Care Services (ACHCS) Agency in a letter to Unocal dated March 12, 1993. The pilot vapor extraction test has been scheduled for April 12 through 16, 1993. Results of the vapor extraction test will be summarized in a technical report. The results of this test are anticipated to be incorporated into the formulation of a Remedial Action Plan for the site.

DISTRIBUTION

A copy of this report should be sent to the ACHCS, 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
Senior Environmental Engineer

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

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

Aram Kaloustian
Project Engineer

/bp

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

KEI-P89-0805.QR8
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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 February 24, 1993)						
MW1	73.91	7.16	0	No	9	0
MW2	73.59	8.03	0	No	9	0
MW3	73.76*	8.26	0.01	N/A	0	0
MW4	73.31	8.17	0	No	9	0
MW5	73.69*	7.91	0.01	N/A	0	<1
MW6	73.73	6.74	0	No	10	0
MW7	73.98	7.85	0	No	7	0
MW8	WELL WAS INACCESSIBLE					
MW9	WELL WAS INACCESSIBLE					
MW10	70.67	11.23	0	No	8	0
MW11	65.73	12.70	0	No	4	0
MW12	67.76	12.13	0	No	4	0
RW1	74.01	7.19	0	--	0	0
(Monitored on February 10, 1993)						
MW3	73.01*	9.01	0.01	--	50	<1
MW5	72.91	8.68	Trace	--	50	<1
MW8	WELL WAS INACCESSIBLE					
(Monitored on January 30, 1993)						
MW1	73.44	7.63	0	--	0	0
MW2	72.63	8.99	0	--	0	0
MW3	73.11	8.90	0	--	0	0
MW4	73.13	8.35	0	--	0	0
MW5	73.01	8.58	Trace	N/A	0	0
MW6	73.22	7.25	0	--	0	0
MW7	73.62	8.21	0	--	0	0
MW8	WELL WAS INACCESSIBLE					
MW9	WELL WAS INACCESSIBLE					
MW10	70.30	11.60	0	--	0	0
MW11	64.26	14.17	0	--	0	0
MW12	66.71	13.18	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 January 9, 1993)				
MW3	73.46	8.55	0	--	50	0
MW5	73.37	8.22	0	--	50	0
MW8	WELL WAS INACCESSIBLE					
		(Monitored on December 21, 1992)				
MW1	72.95	8.12	0	--	0	0
MW2	72.48	9.14	0	--	0	0
MW3	72.23	9.78	Trace	N/A	50	<1
MW4	72.38	9.10	0	--	0	0
MW5	72.10*	9.50	0.01	N/A	50	<1
MW6	72.76	7.71	0	--	0	0
MW7	73.41	8.42	0	--	0	0
MW8	WELL WAS INACCESSIBLE					
MW9	WELL WAS INACCESSIBLE					
MW10	68.49	13.41	0	--	0	0
MW11	66.09	12.34	0	--	0	0
MW12	67.78	12.11	0	--	0	0
		(Monitored on December 4, 1992)				
MW3	71.71	10.30	0	--	48	0
MW5	71.62*	10.03	0.08	--	49	0
MW8	WELL WAS INACCESSIBLE					

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TABLE 1 (Continued)

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

Well #	Surface 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

-- Sheen determination was not performed.

* The ground water elevation was corrected due to the presence of free product by the use of a specific gravity of 0.75.

** The elevations of the tops of the well covers have been surveyed relative to Mean Sea Level, per City of Oakland Benchmark #1336.

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TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
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
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

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TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
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
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

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TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
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
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

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
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

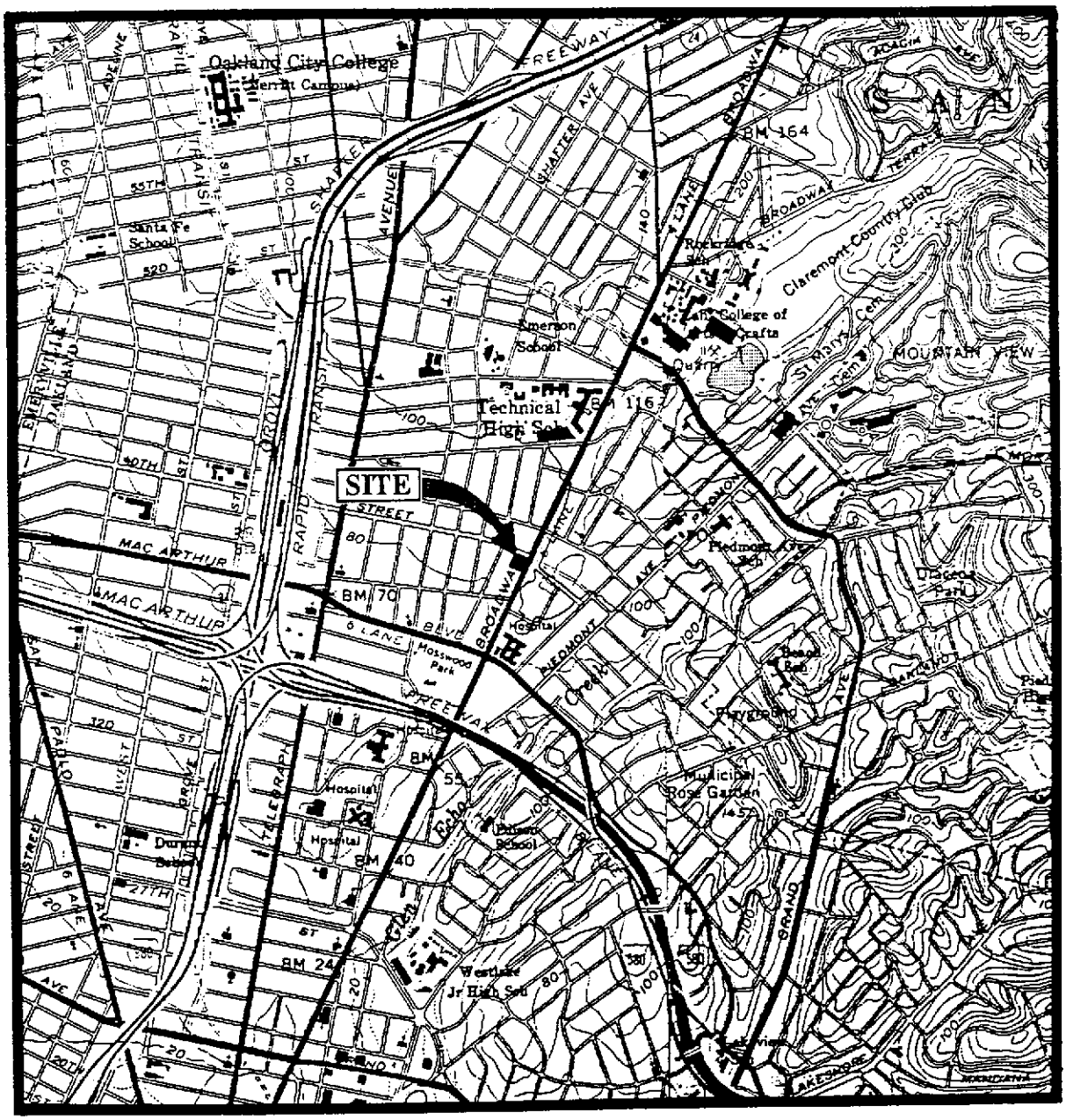
♦ Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be gasoline.

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

ND = Non-detectable.

-- Indicates analysis was not performed.

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

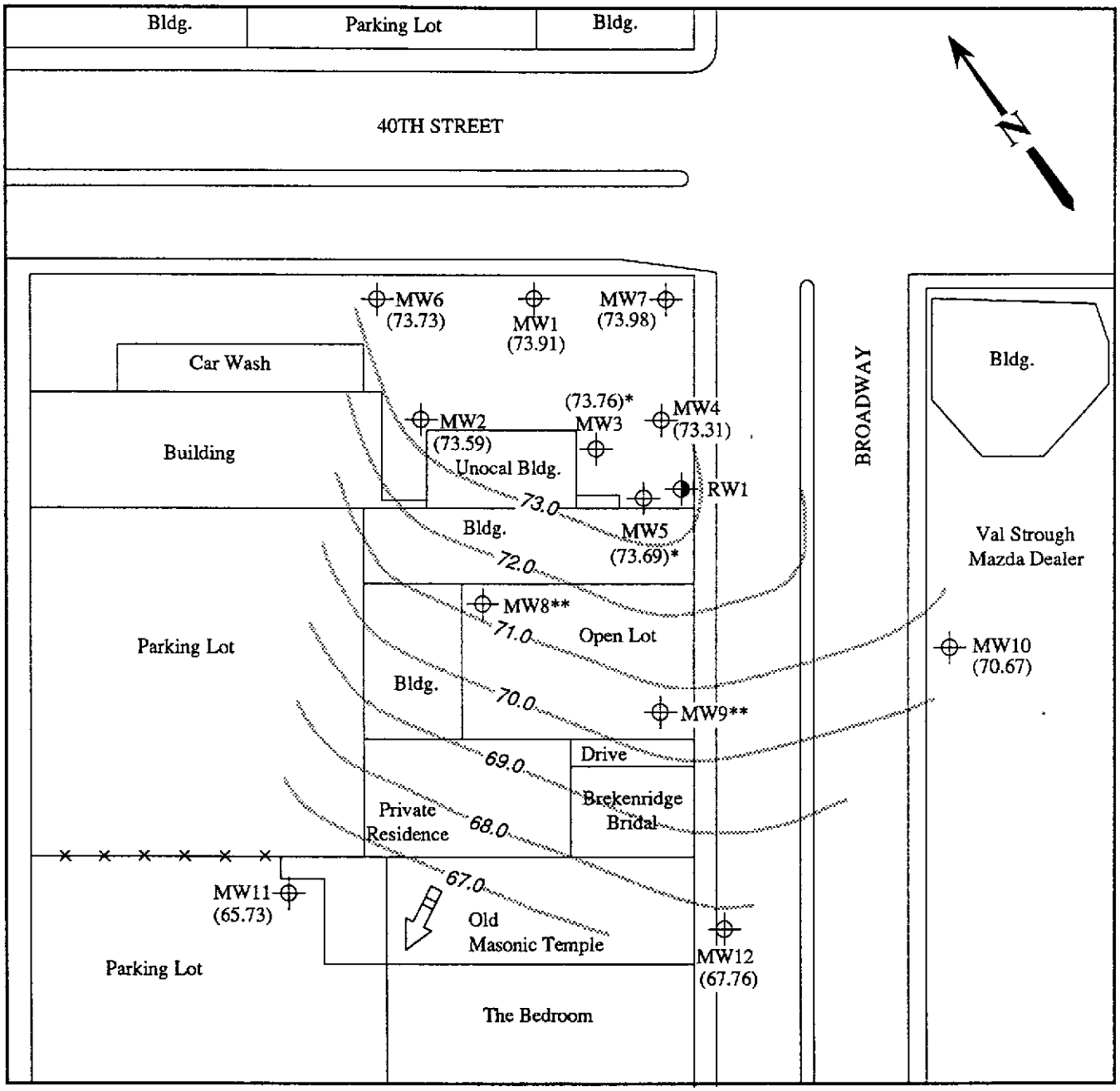


Base modified from 7.5 minute U.S.G.S. Oakland East and West Quadrangles (both photorevised 1980)

0 2000 4000

Approx. scale feet

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



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

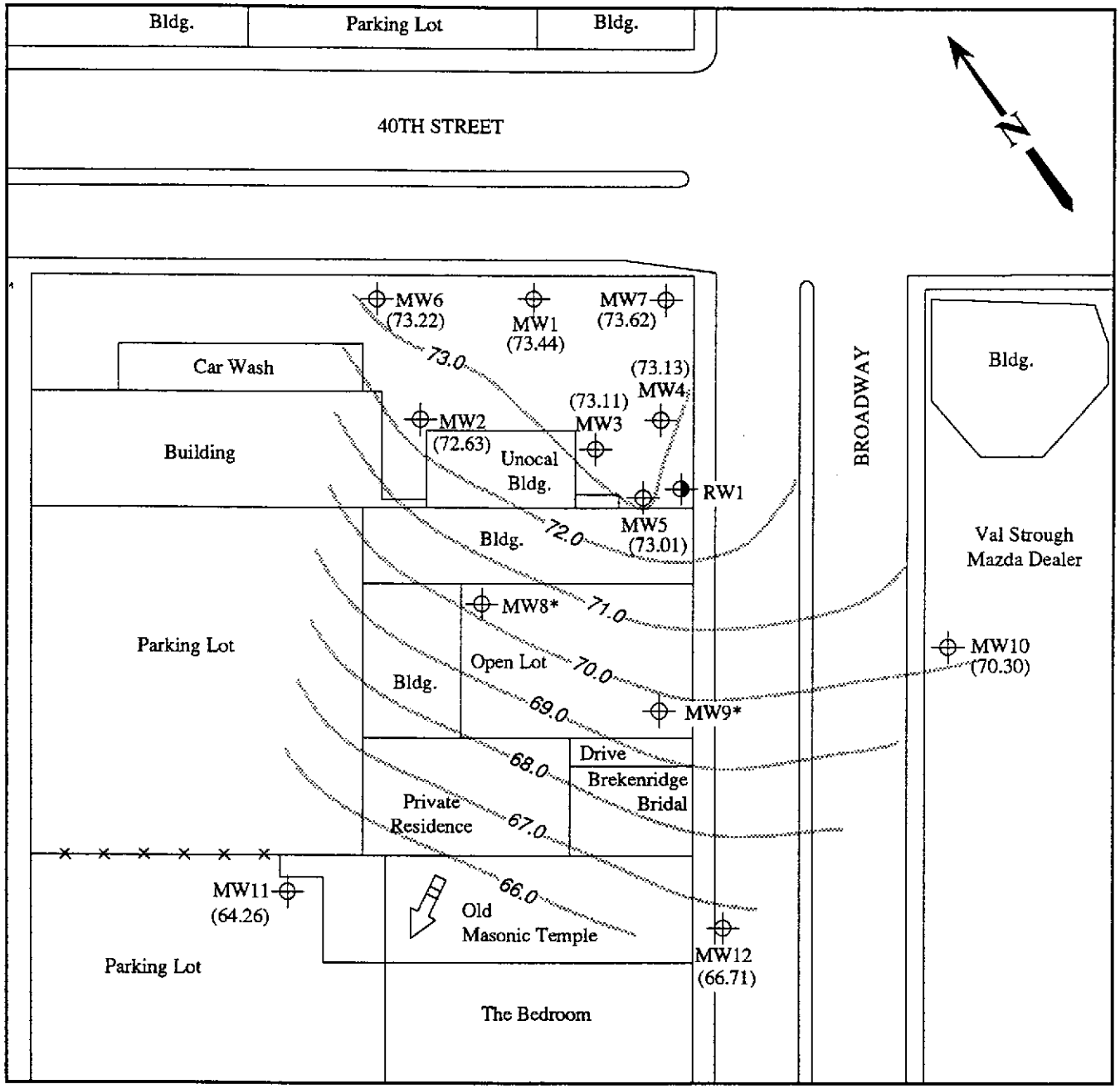
Approx. scale feet

POTENTIOMETRIC SURFACE MAP FOR THE FEBRUARY 24, 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

* Well was inaccessible.

0 60 120

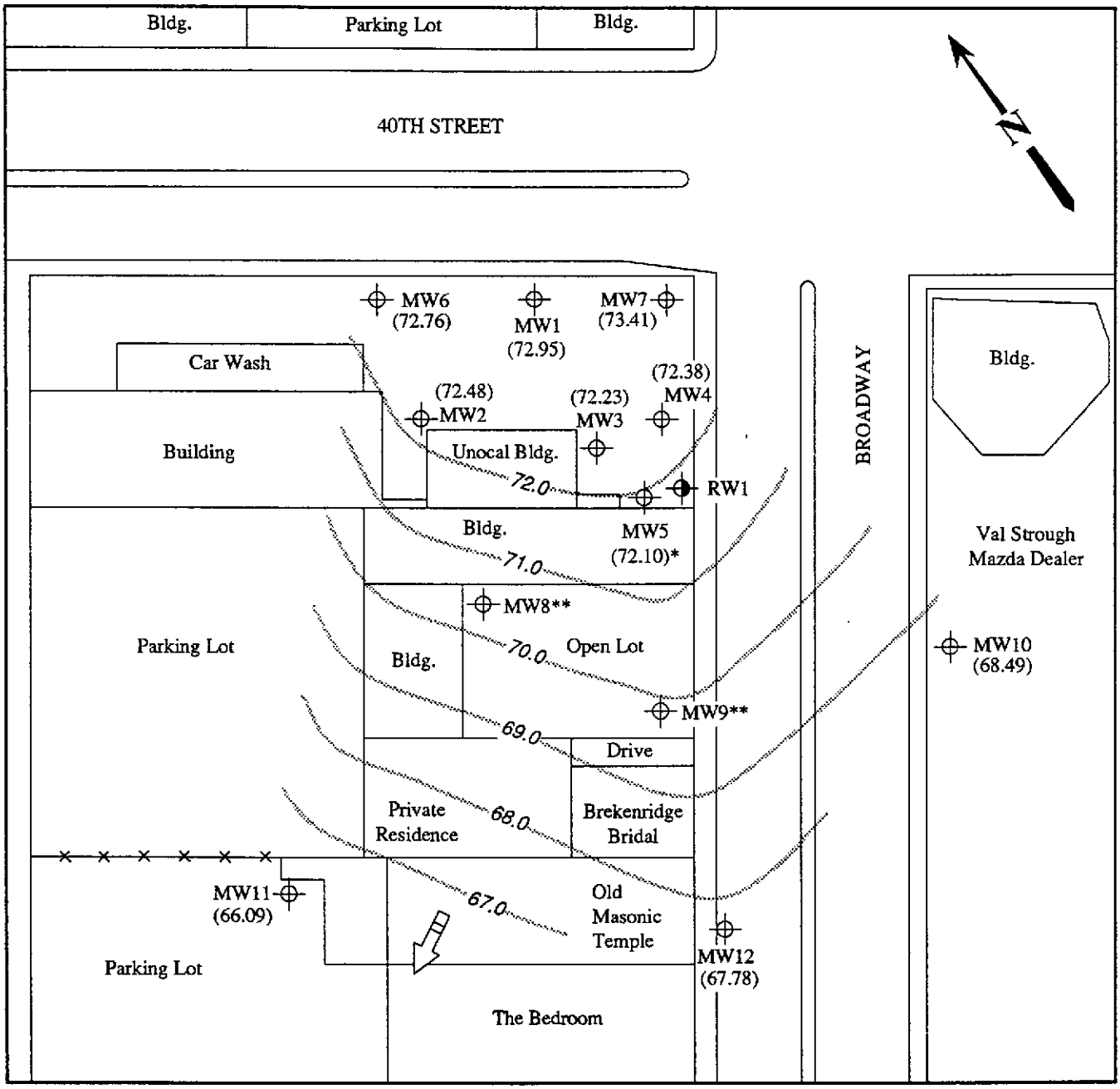
Approx. scale feet

POTENTIOMETRIC SURFACE MAP FOR THE JANUARY 30, 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

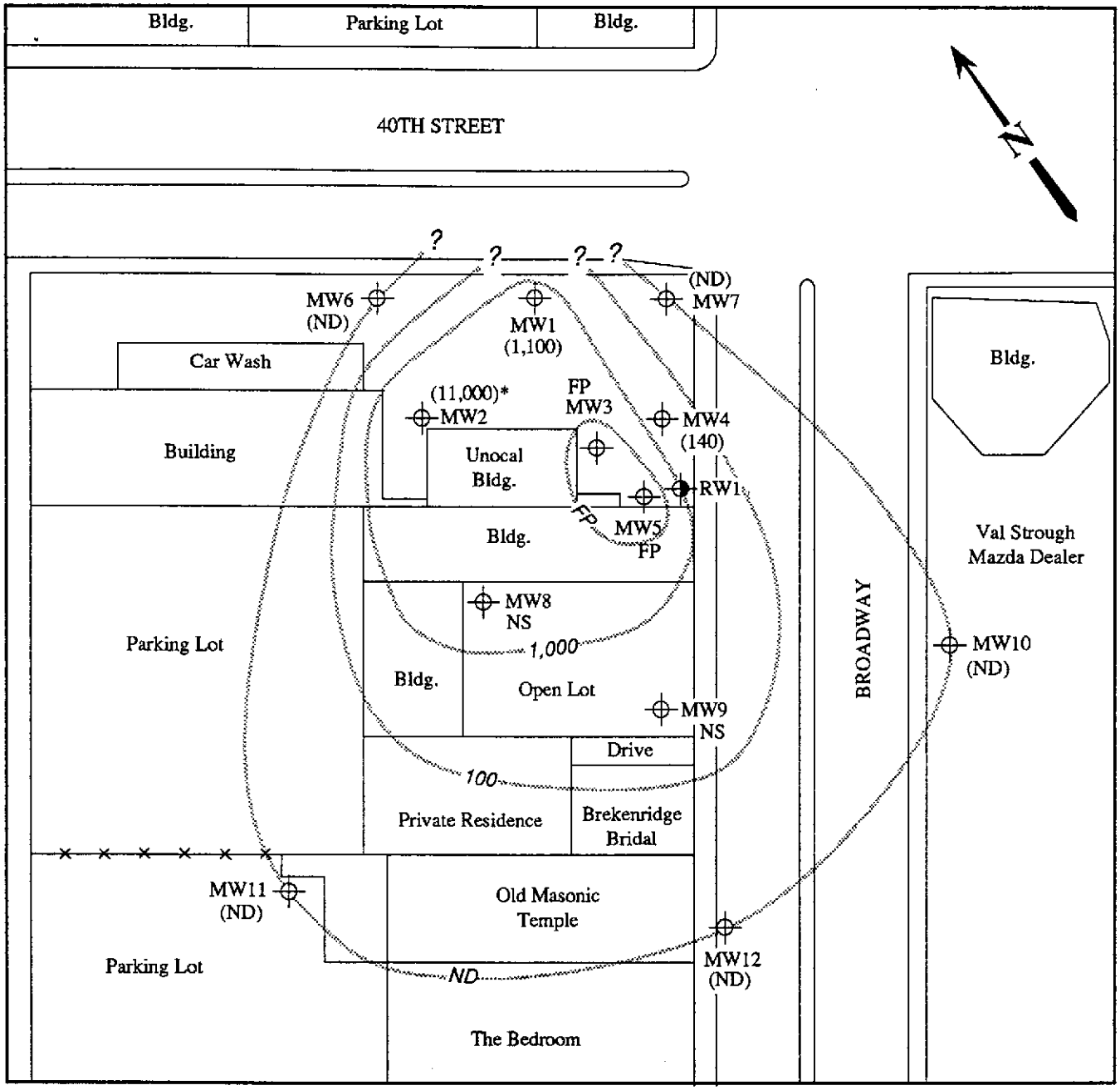
Approx. scale feet

POTENTIOMETRIC SURFACE MAP FOR THE DECEMBER 21, 1992 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, NS = Not sampled

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

0 60 120

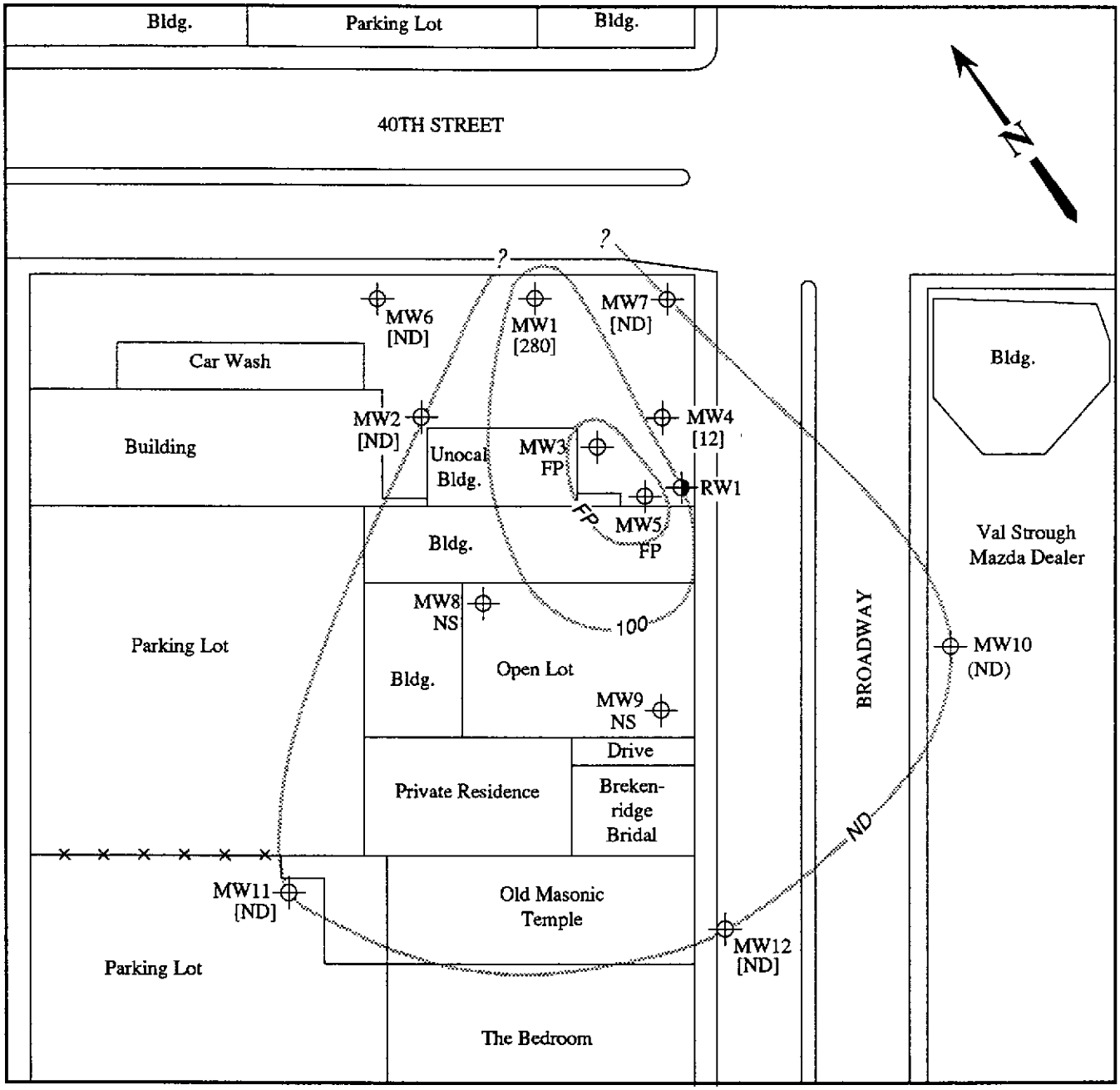
Approx. scale feet

CONCENTRATIONS OF TPH AS GASOLINE IN GROUND WATER ON FEBRUARY 24, 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, NS = Not sampled

0 60 120

Approx. scale feet

CONCENTRATIONS OF BENZENE IN GROUND WATER ON FEBRUARY 24, 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:	Feb 24, 1993
2401 Stanwell Dr., Ste. 400	Sample Matrix:	Water	Received:	Feb 24, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Reported:	Mar 5, 1993
Attention: Mardo Kaprealian, P.E.	First Sample #:	302-0897		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 302-0897 MW 1	Sample I.D. 302-0898 MW 2*	Sample I.D. 302-0899 MW 4	Sample I.D. 302-0900 MW 6	Sample I.D. 302-0901 MW 7	Sample I.D. 302-0902 MW 10
Purgeable Hydrocarbons	50	1,100	11,000	140	N.D.	N.D.	N.D.
Benzene	0.5	280	N.D.	12	N.D.	N.D.	N.D.
Toluene	0.5	4.9	N.D.	0.64	N.D.	N.D.	N.D.
Ethyl Benzene	0.5	120	N.D.	9.4	N.D.	N.D.	N.D.
Total Xylenes	0.5	140	N.D.	3.7	N.D.	N.D.	N.D.
Chromatogram Pattern:		Gasoline	Discrete Peak	Gasoline	--	--	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	100	1.0	1.0	1.0	1.0
Date Analyzed:	3/1/93	3/2/93	3/1/93	3/1/93	3/1/93	3/1/93
Instrument Identification:	HP-4	HP-5	HP-4	HP-4	HP-4	HP-4
Surrogate Recovery, %: (QC Limits = 70-130%)	78	109	96	105	103	104

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 mainly to an unidentified peak in the MTBE range.

methyl tri butyl ether

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:	Feb 24, 1993
2401 Stanwell Dr., Ste. 400	Sample Matrix:	Water	Received:	Feb 24, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Reported:	Mar 5, 1993
Attention: Mardo Kaprealian, P.E.	First Sample #:	302-0903		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 302-0903 MW 11	Sample I.D. 302-0904 MW 12	Sample I.D. Matrix Blank
Purgeable Hydrocarbons	50	N.D.	N.D.	
Benzene	0.5	N.D.	N.D.	
Toluene	0.5	N.D.	N.D.	
Ethyl Benzene	0.5	N.D.	N.D.	
Total Xylenes	0.5	N.D.	N.D.	
Chromatogram Pattern:		--	--	

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0
Date Analyzed:	3/1/93	3/1/93	3/1/93
Instrument Identification:	HP-4	HP-5	HP-5
Surrogate Recovery, %: (QC Limits = 70-130%)	102	107	109

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

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Scott A. Chieffo
Project Manager

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

Client Project ID: Unocal, 3943 Broadway, Oakland
QC Sample Group: 3020897-904
Reported: Mar 5, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020
Analyst:	A.T.	A.T.	A.T.	A.T.
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Mar 1, 1993	Mar 1, 1993	Mar 1, 1993	Mar 1, 1993
QC Sample #:	302-0856	302-0856	302-0856	302-0856
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	20	20	20	60
Conc. Matrix Spike:	22	22	22	75
Matrix Spike % Recovery:	110	110	110	125
Conc. Matrix Spike Dup.:	20	21	21	72
Matrix Spike Duplicate % Recovery:	100	105	105	120
Relative % Difference:	9.5	4.6	4.6	4.1

Laboratory blank contained the following analytes: None Detected

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Scott A. Chieffo
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

KAPREALIAN ENGINEERING
INCORPORATED

CHAIN OF CUSTODY

SAMPLER	SITE NAME & ADDRESS
Vartkes	Unocal / Oakland
WITNESSING AGENCY	3943 Broadway

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	ANALYSES REQUESTED: TPHG+BTXE	REMARKS
MW 1	2/24/93	12:30 pm.		X	X		2	Monitoring Well	X	3020897AB
MW 2	"			X	X		2	" "	X	898AB
MW 4	"			X	X		2	" "	X	899AB
MW 6	"			X	X		2	" "	X	900AB
MW 7	"			X	X		2	" "	X	901AB
MW 10	"			X	X		2	" "	X	902AB
MW 11	"			X	X		2	" "	X	903AB
MW 12	"	5:25 pm.		X	X		2	" "	X	904AB

TURN AROUND TIME: Regular

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
W. Oakdale	2/24/93 6:55	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	2-25-93 2037	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	2-26-93 1204	
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

Signature | Title: Analyst | Date: 2-24-93

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