KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P.O. BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581

91 MAR 12 8:19:43

March 11, 1991

Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, CA 94621

Attention: Mr. ~~Gil Wistar~~ PS

RE: Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

Dear Mr. Wistar:

Per the request of Mr. Ron Bock of Unocal Corporation, enclosed please find our report dated March 11, 1991, for the above referenced site.

Should you have any questions, please feel free to call our office at (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.

Judy A. Dewey

jad\82

Enclosure

cc: Ron Bock, Unocal Corporation

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KEI-P89-0902.QR4
March 11, 1991

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

Attention: Mr. Ron Bock

RE: Quarterly Report
Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

Dear Mr. Bock:

This report presents the results of the fourth quarter of monitoring and sampling of the monitoring wells at the referenced site by Kaprealian Engineering, Inc. (KEI), per proposal KEI-P89-0902.P2 dated February 5, 1990. The wells are currently monitored monthly and sampled on a quarterly basis. This report covers the work performed by KEI from December, 1990 through February, 1991.

SITE DESCRIPTION AND BACKGROUND

The subject site is presently used as a gasoline station. The site is situated on gently sloping, southwest trending topography, and is located approximately 600 feet southeast of Peralta Creek. A Location Map and Site Plans are attached to this report.

On September 11, 1989, KEI collected soil samples following the removal of two fuel storage tanks (one 10,000 unleaded gasoline, and one 10,000 super unleaded gasoline) and one waste oil tank (550 gallon) at the site. The tanks were made of steel and no apparent holes or cracks were observed in any of the tanks. Four soil samples (designated as A1, A2, B1 and B2) were collected at a depth of 14 feet from the fuel tank pit and one sample (designated as WO1) was collected at a depth of 9.5 feet from the waste oil tank pit. In addition, five piping trench samples (designated as P1, P2, P3, P3{7.5} and P4) were collected at depths ranging from 3 to 7.5 feet. The locations of the samples are shown on the attached Site Plan, Figure 2.

All soil samples were analyzed by Sequoia Analytical Laboratory in Redwood City, California, for total petroleum hydrocarbons (TPH) as gasoline, and benzene, toluene, xylenes and ethylbenzene (BTX&E). In addition, the sample collected from the waste oil tank pit was

analyzed for TPH as diesel, total oil and grease (TOG) and EPA method 8010 compounds.

Analytical results of the soil samples collected from the fuel storage tank pit showed TPH as gasoline levels ranging from 1.8 ppm to 10 ppm. Analytical results of pipe trench soil samples indicated levels of TPH as gasoline ranging from non-detectable to 17 ppm for all samples, except for one sample (labeled P3) from a depth of 3.5 feet, which showed 690 ppm. After further excavation, the analytical results of soil sample P3 at a depth of 7.5 feet indicated non-detectable levels of TPH as gasoline and BTX&E. The analytical results of the soil sample collected from the waste oil tank pit indicated levels of TPH as diesel at 3.3 ppm, and TOG at 58 ppm. Documentation of soil sample collection and analytical results were presented in KEI's report (KEI-J89-0902.R1) dated October 9, 1989. Results of the soil sample analyses from that report are summarized in Table 3.

Based on these analytical results, KEI recommended installation of three monitoring wells, which were constructed on December 12, 1989 and are designated as MW1, MW2 and MW3 on the attached Site Plan, Figure 1. The three wells were each drilled and completed to total depths of 44 feet and ground water was encountered at a depth of about 35 feet beneath the surface during drilling. The wells were developed on December 28 and 29, 1989, and were initially sampled on January 5, 1990.

Water and selected soil samples were analyzed at Sequoia Analytical Laboratory in Redwood City, California, for TPH as gasoline and BTX&E.

Analytical results of the soil samples, collected from the borings for monitoring wells MW1 through MW3, indicated non-detectable levels of TPH as gasoline and BTX&E in all samples except in MW3 at 5 feet, which showed levels of TPH as gasoline at 1,200 ppm, and benzene at 4.5 ppm. Analytical results of the water samples collected from the wells showed non-detectable levels of TPH as gasoline and BTX&E in all wells. Documentation of monitoring well installation, sampling and sample results were presented in KEI's report (KEI-P89-0902.R5) dated February 5, 1990. Results of the water sample analyses are summarized in Table 2, and the soil sample analyses in Table 3.

Due to the levels of TPH as gasoline (1,200 ppm) encountered in the soil sample collected from well MW3 at a depth of 5 feet, KEI recommended the installation of four exploratory borings to define the extent of the soil contamination. These exploratory borings were drilled on March 14, 1990, and are designated as EB1, EB2, EB3 and EB4 on the attached Site Plan, Figure 1. The four borings were

drilled to depths of 10.5 to 11 feet. Samples were analyzed for TPH as gasoline and BTX&E. The analytical results of soil samples collected from the borings indicated non-detectable levels of TPH as gasoline in all soil samples except EB1(5), EB3(5) and EB3(10), which showed levels of TPH as gasoline at 1,100 ppm, 58 ppm and 3.0 ppm, respectively. In addition, the analytical results indicated non-detectable levels of benzene in all soil samples except EB1(5), EB1(10), EB3(10) and EB4(5), which showed levels of benzene at 1.8 ppm, 0.0050 ppm, 0.12 ppm and 0.010 ppm, respectively. Also, toluene was detected in all soil samples at level ranging from 0.034 ppm to 2.5 ppm. Documentation of sample collection and sample results were presented in KEI's report (KEI-P89-0902.R6) dated April 23, 1990. Soil sample results are summarized in Table 3. Based on these analytical results, KEI recommended the excavation of the contaminated soil between the pump island and exploratory boring EB3, as indicated on the attached Site Plan, Figure 1.

RECENT FIELD ACTIVITIES

The three wells (MW1, MW2 and MW3) were monitored three times and sampled once during the quarter. During monitoring, the wells were checked for depth to water and presence of free product and sheen. No free product or sheen was noted in any of the wells during the quarter. Monitoring data are summarized in Table 1.

Water samples were collected from the wells on February 12, 1991. Prior to sampling, the wells were purged of 15 gallons each and then sampled using a clean Teflon bailer. The samples were decanted into clean VOA vials and/or one liter amber bottles as appropriate, sealed with Teflon-lined screw caps, and stored on ice in a cooler until delivery to a state certified laboratory.

HYDROLOGY AND GEOLOGY

Based on the water level data gathered during the quarter, the ground water flow direction appeared to be to the southwest on February 12, 1991, similar to the previous quarter, with an approximate hydraulic gradient of .018. In addition, monitoring data indicate that water levels in all wells have continuously increased during the quarter, showing a net increase ranging from 0.25 to 0.32 feet since November 14, 1990. The measured depth to ground water at the site on February 12, 1991 ranged from 32.05 to 33.15 feet.

Based on review of regional geologic maps (U.S. Geological Survey Map GQ-769, "Areal and Engineering Geology of the Oakland East Quadrangle, California" by Dorothy H. Radbruch, 1969), the site is underlain by the lower member of the Quaternary-age San Antonio

Formation (Qsl). This unit typically consists of gravel with a silty clay matrix.

The results of our subsurface exploration indicates that the site is underlain by artificial fill materials varying in thickness from about 4 to 6 feet. The native earth material at the site typically consists of clayey gravel with sand to the maximum depth explored (11 feet), with exception of the vicinity of boring EB1, where a 2-1/2 foot thick lens of clay materials was encountered directly below the fill materials.

ANALYTICAL RESULTS

Ground water samples were analyzed at Sequoia Analytical Laboratory in Concord, California, and were accompanied by properly executed Chain of Custody documentation. The samples were analyzed for TPH as gasoline using EPA method 5030 in conjunction with modified 8015, and BTX&E using EPA method 8020.

Analytical results of the ground water samples collected from monitoring wells MW1, MW2 and MW3 indicate non-detectable levels of TPH as gasoline and benzene in all samples except for 0.32 ppb of benzene in well MW1. Results of the water analyses are summarized in Table 2. Copies of the analytical results and Chain of Custody documentation are attached to this report.

DISCUSSION AND RECOMMENDATIONS

As shown in Table 2, the analytical results of ground water samples collected from monitoring wells MW1, MW2 and MW3, for five rounds of sampling (January, 1990 to February, 1991) consistently show non-detectable levels of TPH as gasoline and benzene, except for a level of benzene detected at 0.32 ppb in monitoring well MW1 on February 12, 1991. In addition, the excavation of contaminated soil (see the attached Site Plan, Figure 1, for location) is tentatively scheduled for March, 1991. When completed, KEI will submit a report documenting the results of soil sample analyses from the excavation. Therefore, based on analytical results collected and evaluated to date and no evidence of free product or sheen in any of the wells, KEI recommends quarterly monitoring and sampling of the existing wells for one additional quarter.

DISTRIBUTION

A copy of this report should be sent to Alameda County Health Care Services, and to 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 this 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 me at (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.

Thomas J. Berkins
Senior Environmental Engineer

Don R. Braun
Certified Engineering Geologist

License No. 1310
Exp. Date 6/30/92

\bam:jad

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

KEI-P89-0902.QR4
March 11, 1991

TABLE 1

SUMMARY OF MONITORING DATA

Date	Well No.	Ground Water Elevation (feet)	Depth to Water (feet)	Product Thickness	Sheen	Water Bailed (gallons)
2/12/91	MW1	69.22	33.02	0	None	15
	MW2	69.01	33.15	0	None	15
	MW3	67.95	32.05	0	None	15
1/10/91	MW1	68.93	33.31	0	None	0
	MW2	68.69	33.47	0	None	0
	MW3	67.66	32.34	0	None	0
12/11/90	MW1	68.89	33.35	0	None	0
	MW2	68.66	33.50	0	None	0
	MW3	67.65	32.35	0	None	0

Well #	Surface Elevation* (feet)
MW1	102.24
MW2	102.16
MW3	100.00

* Elevation of top of well covers surveyed to an assumed datum of 100.00 feet at top of MW3 well cover.

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TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Well #	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
2/12/91	MW1	ND	0.32	ND	ND	ND
	MW2	ND	ND	0.42	0.51	ND
	MW3	ND	ND	ND	ND	ND
11/14/90	MW1	ND	ND	ND	ND	ND
	MW2	ND	ND	ND	ND	ND
	MW3	ND	ND	ND	ND	ND
8/09/90	MW1	ND	ND	ND	ND	ND
	MW2	ND	ND	ND	ND	ND
	MW3	ND	ND	ND	ND	ND
5/11/90	MW1	ND	ND	7.1	ND	ND
	MW2	ND	ND	ND	ND	ND
	MW3	ND	ND	ND	ND	ND
1/05/90	MW1	ND	ND	ND	ND	ND
	MW2	ND	ND	ND	ND	ND
	MW3	ND	ND	ND	ND	ND
Detection Limits		30	0.3	0.3	0.3	0.3

ND = Non-detectable.

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

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March 11, 1991

TABLE 3

SUMMARY OF LABORATORY ANALYSES
SOIL

Sample Number	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
(Collected on March 14, 1990)						
EB1(5)	5	1,100	1.8	2.5	7.0	10
EB1(10)	10	ND	0.0050	0.034	ND	ND
EB2(8)	8	ND	ND	0.080	ND	ND
EB2(10)	10	ND	ND	0.070	ND	ND
EB3(5)	5	58	ND	0.068	0.31	0.090
EB3(10)	10	3.0	0.12	0.036	0.0072	ND
EB4(5)	5	ND	0.10	0.060	0.024	0.013
EB4(10)	10	ND	ND	0.055	ND	ND
(Collected on December 12, 1989)						
MW1(5)	5	ND	ND	ND	ND	ND
MW1(10)	10	ND	ND	ND	ND	ND
MW1(15)	15	ND	ND	ND	ND	ND
MW1(20)	20	ND	ND	ND	ND	ND
MW1(25)	25	ND	ND	ND	ND	ND
MW1(29.5)	29.5	ND	ND	ND	ND	ND
MW1(34.5)	34.5	ND	ND	ND	ND	ND
MW2(5)	5	ND	ND	ND	ND	ND
MW2(10)	10	ND	ND	ND	ND	ND
MW2(15)	14.5	ND	ND	ND	ND	ND
MW2(20)	20	ND	ND	ND	ND	ND
MW2(25)	25	ND	ND	ND	ND	ND
MW2(27)	27	ND	ND	ND	ND	ND
MW2(30)	30	ND	ND	ND	ND	ND
MW2(33.5)	33.5	ND	ND	ND	ND	ND
MW2(35)	35	ND	ND	ND	ND	ND
MW3(5)	5	1,200	4.5	2.0	63	21
MW3(10)	10	ND	ND	ND	ND	ND
MW3(15)	15	ND	ND	ND	ND	ND
MW3(20)	20	ND	ND	ND	ND	ND
MW3(25)	25	ND	ND	ND	ND	ND
MW3(30)	30	ND	ND	ND	ND	ND
MW3(34.5)	34.5	ND	ND	ND	ND	ND
MW3(36)	36	ND	ND	ND	ND	ND

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TABLE 3 (Continued)

SUMMARY OF LABORATORY ANALYSES
SOIL

Sample Number	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
(Collected on September 11, 1989)						
A1	14	10	ND	ND	0.11	ND
A2	14	5.0	ND	ND	ND	ND
B1	14	3.0	ND	ND	ND	ND
B2	14	1.8	ND	ND	ND	ND
P1*	3	17	0.23	ND	ND	ND
P2*	3	ND	ND	ND	ND	ND
P3*	3.5	690	3.2	0.36	19	ND
P3(7.5)*	7.5	ND	ND	ND	ND	ND
P4*	3.5	5.0	ND	ND	ND	ND
WO1**	9.5	ND	ND	ND	ND	ND

* Organic lead was non-detectable, except for sample P3, which showed 0.058 ppm.

** TPH as diesel was 3.3 ppm, TOG was 58 ppm, and all EPA method 8010 constituents were non-detectable.

ND = Non-detectable

Results in parts per million (ppm), unless otherwise indicated.

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
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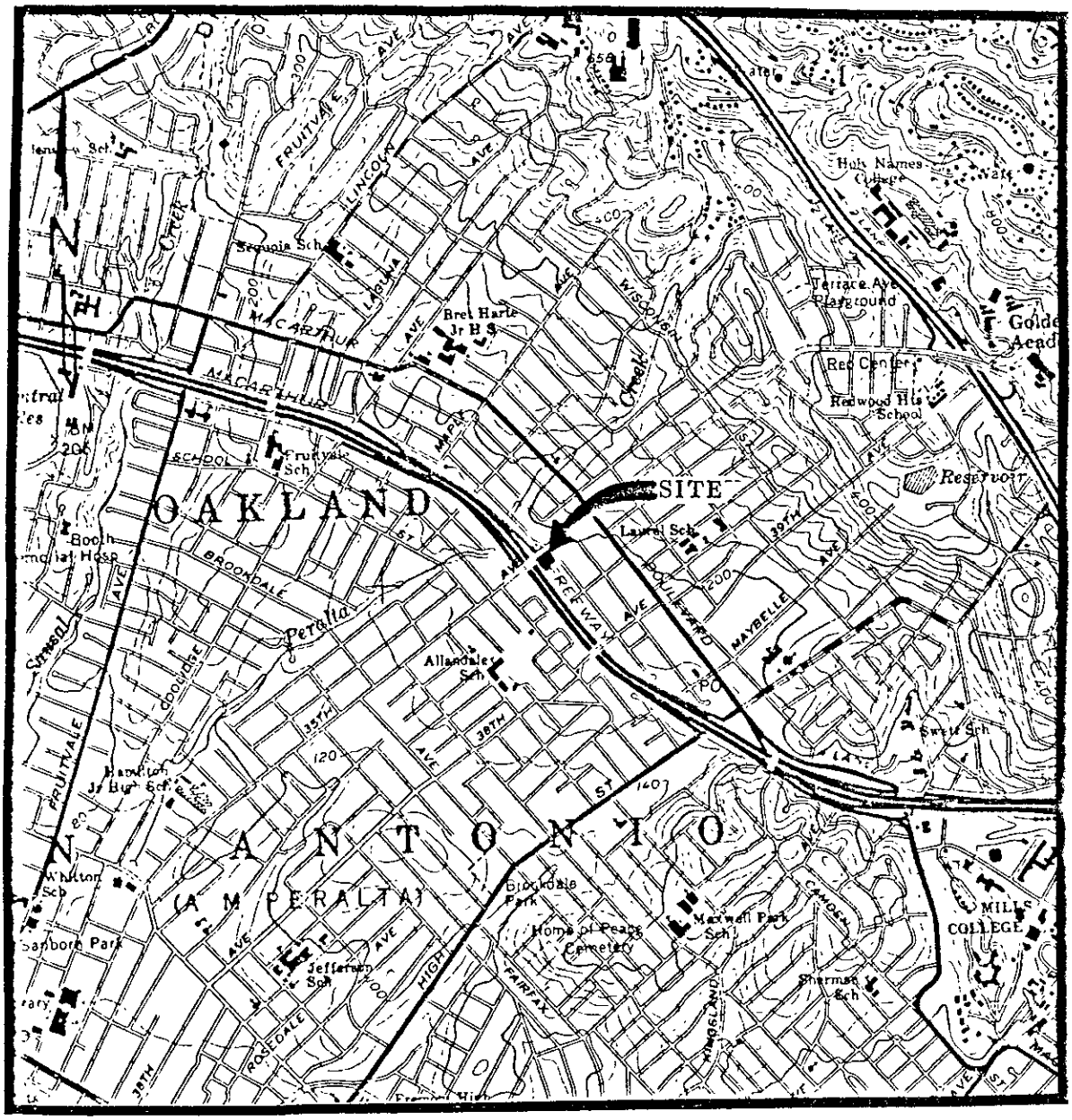

LOCATION MAP

Base modified from U.S.G.S 7.5 minute Oakland East Quadrangle (photorevised 1980)

Unocal S/S #6129
3420 - 35th Avenue
Oakland, CA

KAPREALIAN ENGINEERING, INC.
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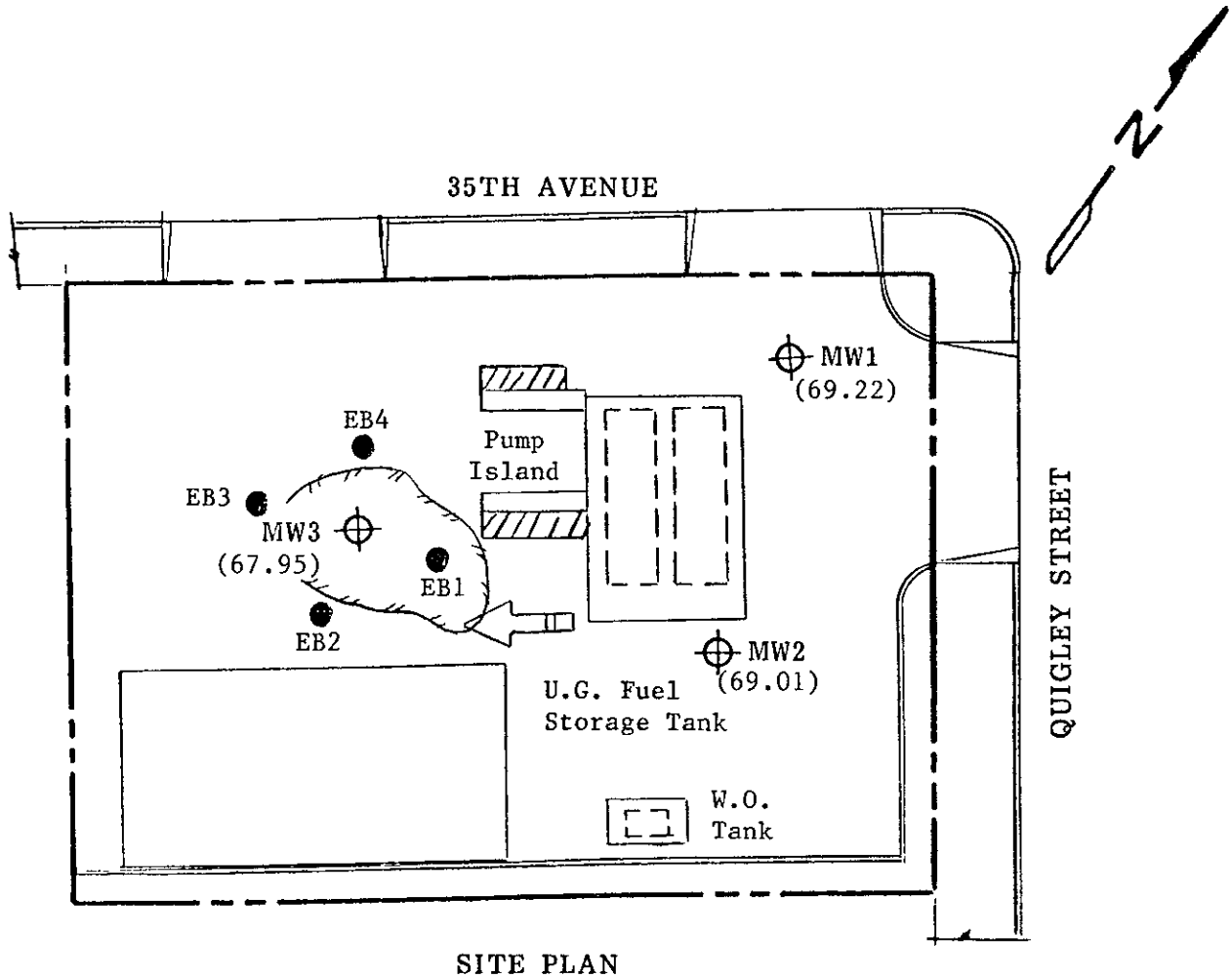

SITE PLAN
Figure 1

0 30 60
Approx. Scale feet

LEGEND

- Exploratory Boring
- Monitoring Well
- ( ) Ground water elevation in feet on 2/12/91. Surface elevation at top of MW3 assumed 100.00 feet as datum.
- Direction of ground water flow.
- Proposed area of excavation

Unocal Service Station #6129
3420 - 35th Avenue
Oakland, California

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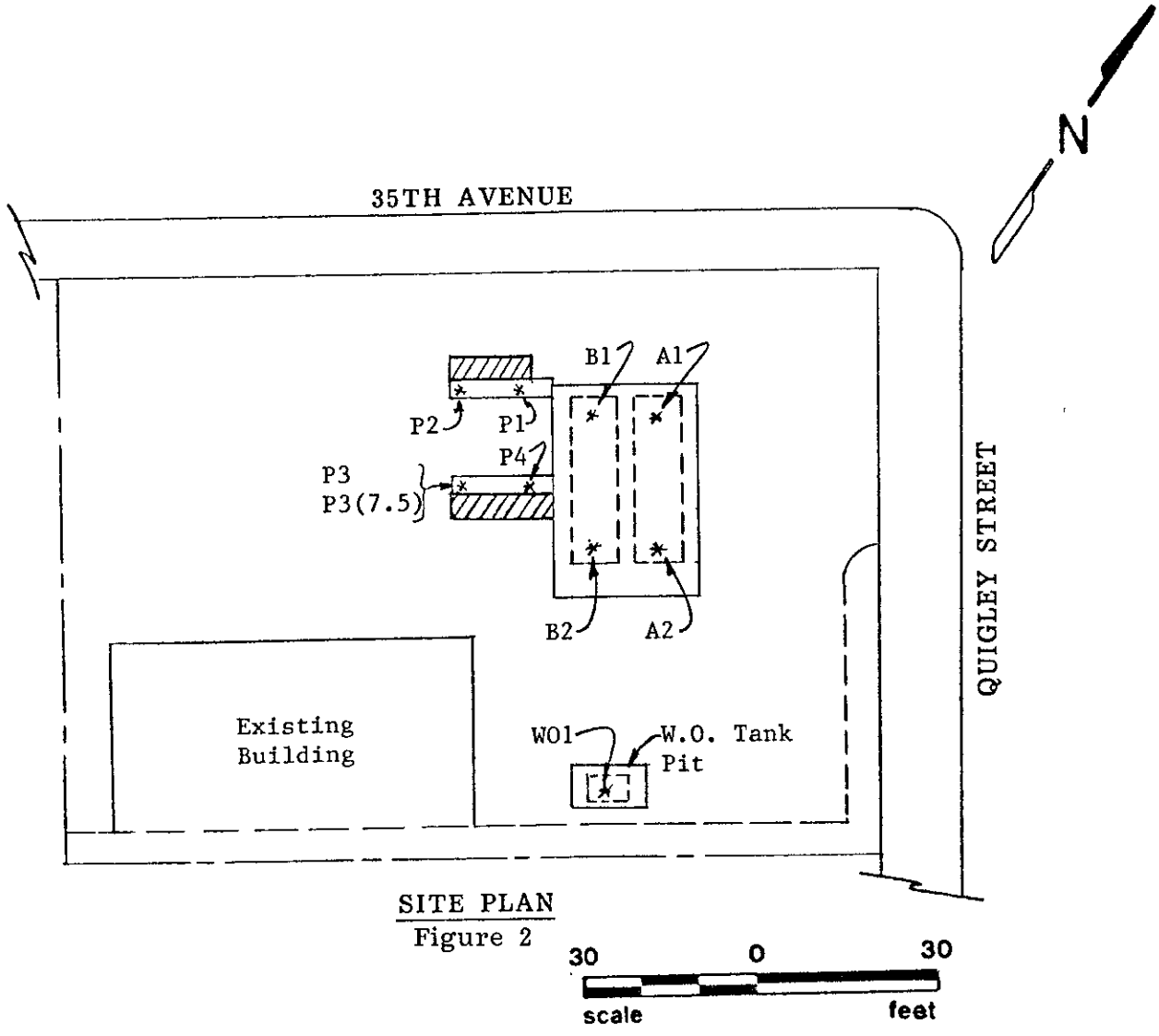

SITE PLAN
Figure 2

LEGEND

* Sample Point Location

Unocal S/S #6129
3420 35th Avenue
Oakland, CA

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 3420 35th Ave., Oakland	Sampled: Feb 12, 1991
P.O. Box 996	Matrix Descript:	Water	Received: Feb 12, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed: Feb 15, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	102-0302 A-B	Reported: Feb 19, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
102-0302 A-B	MW-1	N.D.	0.32	N.D.	N.D.	N.D.
102-0303 A-B	MW-2	N.D.	N.D.	0.42	N.D.	0.51
102-0304 A-B	MW-3	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: JOE

WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal / Oakland 3420 33th Ave

ANALYSES REQUESTED: TPHG, BTXE

TURN AROUND TIME: Regular

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	REMARKS
MW-1	2/12/91	am		✓	✓		2	MW	VOA-s preserved
MW-2	"	"		✓	✓		2	"	
MW-3	"	"		✓	✓		2	"	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	2/12/91 5:05	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature) K. Walters 2/12

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

1. Have all samples received for analysis been stored in ice?
2. Will samples remain refrigerated until analyzed?
3. Did any samples received for analysis have head space? NO
4. Were samples in appropriate containers and properly packaged?

Signature [signature] Title Login Date 2/12