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

KEI-P90-1103.QR1
November 13, 1991

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

Attention: Mr. Rick Sisk

RE: Quarterly Report
Unocal Service Station #0752
800 Harrison Street
Oakland, California

Dear Mr. Sisk:

This report presents the results of the first quarter of monitoring and sampling of the monitoring wells at the referenced site by Kaprealian Engineering, Inc. (KEI), per KEI's proposal KEI-P90-1103.P1 dated February 1, 1991. The wells are currently monitored monthly and sampled on a quarterly basis. This report covers the work performed by KEI from July through September, 1991.

BACKGROUND

The subject site is presently used as a gasoline station. The site is characterized by gently sloping, southward trending topography, and is located approximately 0.5 miles north-northeast from the Oakland Inner Harbor. The site is also located northeast and across 8th Street from a Shell Service Station, which is located adjacent to and northeast of a currently closed Arco Service Station (which is located at the intersection of 7th Street with Harrison). In addition, a gasoline and diesel service station referred to as "Mandrin Auto Service" is located east-southeast of the site at Alice Street and 8th Street. A Location Map, Site Vicinity Map, and Site Plans are attached to this report.

KEI's initial field work was conducted on November 9, 1990, when two underground gasoline storage tanks and one waste oil tank were removed from the site. The tanks consisted of one 10,000 gallon regular unleaded gasoline tank, one 10,000 gallon super unleaded gasoline storage tank, and one 280 gallon waste oil tank. The tanks were made of steel and no apparent holes or cracks were observed in the fuel tanks; however, the waste oil tank had one 1/8 square inch hole located on the side. Mr. Dennis Byrne of the Alameda County Health Agency (ACHA) was present during tank removal and subsequent soil sampling.

Two soil samples, labeled A1 and B1, were collected from beneath the fuel tanks at depths of approximately 14 feet below grade. Two soil samples, labeled A2 and B2, were collected from the fuel tank pit east sidewall at depths of approximately 12 feet below grade. One soil sample, labeled WO1, was collected from beneath the waste oil tank at a depth of approximately 6.5 feet below grade. Sample point locations are as shown on the attached Site Plan, Figure 2.

On November 12, 1990, due to observed soil contamination in the area of sample point A1, KEI collected an additional soil sample, labeled C(19), from the fuel tank pit at a depth of approximately 19 feet below grade.

KEI returned to the site on December 20, 1990, in order to collect soil samples from beneath the pump islands. Six samples, labeled D1 through D6, were collected from beneath the six fuel dispensers, and one sample, labeled P1, was collected from the product pipe trench. These samples were collected at depths of about 2.5 feet below grade. Sample point locations are shown on the attached Site Plan, Figure 2.

KEI again returned to the site on December 26, 1990, for additional soil excavation due to obvious contamination observed in the area beneath sample point D2 during previous excavation activities. One additional soil sample, labeled D2(6), was collected from beneath the fuel dispenser and below the sample point D2 at a depth of about six feet below grade.

At the request of the ACHA, on January 3, 1991, KEI returned to the site in order to collect one additional soil sample, labeled WO1(9.5), from the waste oil tank pit. Sample point locations are as shown on the attached Site Plan, Figure 2. After sampling, the waste oil tank pit was excavated to the sample depth of 9.5 feet below grade.

All samples were analyzed by Sequoia Analytical Laboratory in Concord, California. All soil samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline, and benzene, toluene, xylenes, and ethylbenzene (BTX&E). In addition, the soil sample (WO1) collected from the waste oil tank pit was analyzed for TPH as diesel, total oil and grease (TOG), EPA method 8010 and 8270 constituents, and the metals cadmium, chromium, lead, zinc, and nickel. Soil sample WO1(9.5), collected beneath sample WO1, was analyzed for TPH as gasoline, BTX&E, TOG, and the metals chromium, lead, zinc, and nickel.

Analytical results of the soil samples collected from the fuel tank pit indicated non-detectable levels of TPH as gasoline for sidewall samples A2 and B2. Analytical results of the soil samples [A1, B1

and C(19)] collected from the fuel tank pit indicated levels of TPH as gasoline at 1,200 ppm, 45 ppm, and 3,800 ppm, respectively.

Analytical results of soil samples collected from beneath the dispensers and the pipe trench indicated non-detectable levels of TPH as gasoline and benzene for samples P1 and D1 through D6, except for sample D2, which showed 45 ppm of TPH as gasoline, and 0.22 ppm of benzene. However, sample D2(6), collected beneath sample D2 at a depth of 6 feet below grade, showed 1,200 ppm of TPH as gasoline, and 0.24 ppm of benzene.

Analytical results of the soil sample (WO1) collected from beneath the waste oil tank pit indicated non-detectable levels of TPH as gasoline, BTX&E, TPH as diesel, TOG, EPA methods 8010 and 8270 constituents, and cadmium. Chromium, lead, zinc, and nickel were detected at concentrations of 43 ppm, 1,100 ppm, 130 ppm and 12 ppm, respectively. However, sample WO1(9.5), collected from beneath sample WO1 at a depth of 9.5 feet below grade, showed non-detectable levels of TPH as gasoline, BTX&E, TOG, and lead. Chromium, zinc, and nickel were detected at concentrations of 61 ppm, 20 ppm and 40 ppm, respectively. Results of the soil analyses are summarized in Table 5.

Based on the analytical results, KEI recommended that an in-situ remediation system design be developed and implemented to deal with the residual soil contamination in the fuel tank pit in the vicinity of sample point locations A1 and C(19), and at the southerly pump island in the vicinity of sample location D2(6). However, prior to designing a remediation system and in order to comply with the requirements of the Regional Water Quality Control Board (RWQCB) and the ACHA, KEI recommended the installation of three monitoring wells and two exploratory borings at the site. Documentation of tank and piping removal protocol, sample collection techniques, and analytical results of the soil samples from the tank excavation are summarized in KEI's report (KEI-J90-1103.R1) dated February 1, 1991.

On May 29 and 30, 1991, three two-inch diameter monitoring wells and two exploratory borings (designated as MW1, MW2, and MW3, and EB1 and EB2, respectively, on the attached Site Plan, Figure 1) were installed at the site. The monitoring wells were drilled and completed to total depths ranging from 33 to 35 feet below grade. The exploratory borings were each drilled to total depths of 23 feet below grade and were fully grouted with neat Portland cement. Ground water was encountered at depths ranging from about 22.5 to 24 feet beneath the surface during drilling. The wells were developed on June 1, 1991, and were initially sampled on June 5, 1991.

Water samples from MW1, MW2, and MW3 and selected soil samples from EB1, EB2, MW1, MW2, and MW3 were analyzed at Sequoia Analytical Laboratory in Concord, California. All soil and water samples were analyzed for TPH as gasoline and BTX&E. In addition, soil and water samples collected from MW1 (adjacent to the waste oil tank) were analyzed for TPH as diesel, TOG, EPA method 8010 constituents, and for the metals cadmium, chromium, lead, nickel, and zinc.

Analytical results of the soil samples collected from the borings for monitoring wells MW1, MW2, and MW3, and from soil borings EB1 and EB2, indicated non-detectable levels of TPH as gasoline and benzene in all analyzed samples, except for samples MW1(5), MW1(10), MW1(15), and MW3(23) which showed levels of TPH as gasoline at levels of 1.1 ppm, 43 ppm, 250 ppm and 2.9 ppm, respectively, and in samples EB1(15), MW1(15), MW2(15.5), MW2(20), and MW3(23) which showed benzene levels ranging from 0.0079 ppm to 0.80 ppm. In MW1, TPH as diesel, TOG, and all EPA method 8010 compounds were non-detectable in all samples, except for samples MW1(5), MW1(10), and MW1(15), which showed levels of TPH as diesel at 2.2 ppm, 43 ppm, and 120 ppm, respectively. Also in MW1, cadmium was non-detectable for all samples; chromium was detected at levels ranging from 20 ppm to 110 ppm; lead at levels ranging from 4.2 ppm to 11 ppm, nickel at levels ranging from 24 ppm to 42 ppm, and zinc at levels ranging from 23 ppm to 30 ppm.

Analytical results of the ground water samples collected from monitoring wells MW1 and MW2 indicated levels of TPH as gasoline ranging from 47 ppb to 49 ppb with non-detectable levels of BTX&E. In MW3, TPH as gasoline was detected at a level of 5,800 ppb and benzene at a level of 1,200 ppb. In MW1, TPH as diesel, TOG, and EPA method 8010 constituents were non-detectable, except for chloroform at 7.8 ppb, tetrachloroethene at 2.9 ppb and trichloroethene at 1.3 ppb. Also in MW1, chromium, lead, nickel, and zinc were detected at concentrations of 0.0083 ppm, 0.011 ppm, 0.063 ppm and 0.023 ppm, respectively, and cadmium was non-detectable. Results of the soil analyses are summarized in Tables 3 and 4, and the water analyses in Table 2.

Based on the analytical results, KEI recommended the implementation of a monthly monitoring and quarterly sampling program. Documentation of well installation procedures, sample collection techniques, and analytical results are presented in KEI's report (KEI-P90-1103.R4) dated July 5, 1991.

RECENT FIELD ACTIVITIES

The three wells (MW1, MW2, and MW3) were monitored three times and sampled once during the quarter. During monitoring on September 30, 1991, 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 September 30, 1991. Prior to sampling, the wells were each purged of between seven and eight gallons by the use of a surface pump. Samples were then collected using a clean Teflon bailer. Samples were decanted into clean VOA vials and/or one-liter amber bottles, as appropriate, which were then sealed with Teflon-lined screw caps and stored in a cooler, on ice, until delivery to the State certified laboratory.

HYDROLOGY AND GEOLOGY

Based on the water level data gathered on September 30, 1991, the ground water flow direction appeared to be toward the south at a hydraulic gradient of approximately 0.008, changed slightly from the southwest flow direction recorded on June 5, 1991. Water levels have decreased steadily during the quarter, showing a net decrease of between 0.51 and 0.58 feet in all wells since June 5, 1991. The measured depth to ground water at the site on September 30, 1991 ranged between 21.29 and 22.50 feet below grade.

Based on review of regional geologic maps (U.S. Geological Survey Professional Paper 943 "Flatland Deposits - Their Geology and Engineering Properties and Their Importance to Comprehensive Planning" by E.J. Helley and K.R. Lajoie, 1979), the subject site is underlain by Quaternary-age dune sand deposits referred to as the Merritt Sand (Qps). The Merritt Sand is described as typically consisting of loose, well-sorted, fine-to medium-grained sand with silt. This sand apparently reaches a maximum depth of about 50 feet below grade in Oakland.

The results of our subsurface study indicate that the site is immediately underlain by artificial fill materials which extend to depths of about 2.5 to 5.5 feet below grade, except at MW3, where the fill materials were confirmed to only extend to a depth of about 1 foot below grade. The native earth materials underlying the fill consist of very fine-to fine-grained sand that is predominantly poorly graded or is clayey or silty sand. These sandy materials extend to depths below grade of about 32 to 33 feet, where a silty to sandy clay layer was encountered that extends to at least the maximum depth explored (33 to 35 feet below grade). However, at MW3, this clay bed varies from a very sandy clay to a very clayey sand.

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 benzene, toluene, xylenes, and ethylbenzene (BTX&E) using EPA method 8020. In addition, the ground water sample collected from monitoring well MW1 was analyzed for TPH as diesel using EPA method 3510 in conjunction with modified 8015, TOG using Standard Method 5520B&F, and the metals cadmium, chromium, nickel, lead, and zinc.

Analytical results of the ground water samples collected from monitoring well MW1 indicated non-detectable levels of TPH as gasoline and BTX&E. Analytical results of the ground water samples collected from monitoring wells MW2 and MW3 indicated levels of TPH as gasoline at concentrations of 130 ppb and 6,800 ppb, respectively. Benzene was detected in monitoring wells MW2 and MW3 at concentrations of 18 ppb and 1,400 ppb, respectively. In monitoring well MW1, TPH as diesel, TOG, and cadmium, nickel, and lead were non-detectable, and chromium and zinc were detected at 0.019 and 0.11 ppm, respectively. Results of the analyses are summarized in Table 2. Copies of the analytical results and Chain of Custody documentation are attached to this report.

DISCUSSION AND RECOMMENDATIONS

A representative of KEI reviewed the RWQCB's files on August 13, 1991, in order to obtain information on sites with ground water contamination in the vicinity of the Unocal site. The following is a summary of this file review:

Fire Station #12, 822 Alice Street

This site is located southeast of and within 300 feet of the Unocal site (see the attached Site Vicinity Map). A 550 gallon underground diesel tank was removed in 1988 or 1989. Soil contamination was detected at levels greater than 100 ppm. One well has been installed, and according to the latest (third) quarterly report, TPH as diesel was non-detectable in the ground water sample collected on May 2, 1990. Based on a south to southwesterly ground water flow direction at the Unocal site, it is not considered likely that contamination from the Unocal site and the fire station has commingled.

Former Shell Station, 416 Eighth Street at Broadway

This site is located three blocks north-northwest of the Unocal site and reportedly had seven monitoring wells. The ground water flow direction is reported as varying from the north-northwest to the northwest on April 8, 1991. Based on the opposing directions of ground water flow and the distance from the Unocal site, it is not considered likely that contamination from the Unocal site and the former Shell station have commingled.

Other Sites

No information was contained in the RWQCB files for the adjacent Shell service station (Eighth Street at Harrison Street), the former Arco service station (Seventh at Harrison Street), the Auto Service station (Eighth Street at Alice Street), or the Rind Gas station (Eighth Street at Alice Street).

KEI recommends re-reviewing RWQCB files periodically for updated information on the above mentioned adjacent sites.

Based on the analytical results collected and evaluated to date and no evidence of free product or sheen in any of the wells, KEI recommends the continuation of the current monitoring and sampling program of the existing wells, per KEI's proposal (KEI-P90-1103.P1) dated February 1, 1991.

It appears that only limited soil contamination is present at the site, specifically at MW1 at depths of 5 to 15 feet below grade, at the area of the southern most fuel dispenser [sample D2(6)], and in the central areas of the fuel tank pit [samples A1 and C(19)].

However, the extent of ground water contamination at the site has not been defined, especially in the downgradient direction, and therefore additional monitoring wells are necessary. A work plan/proposal (recommending additional monitoring wells in order to further define the extent of ground water contamination at the site) is attached for your review and consideration.

DISTRIBUTION

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

Should 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

Joel G. Greger
Certified Engineering Geologist

License No. 1633
Exp. Date 6/30/92

Timothy R. Ross
Project Manager

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Attachments: Tables 1 through 5
Location Map
Site Vicinity Map
Site Plans - Figures 1, 1a & 2
Laboratory Analyses
Chain of Custody documentation
Work Plan/Proposal

KEI-P90-1103.QR1
November 13, 1991

TABLE 1

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

Well #	Ground Water Elevation (feet)	Depth to Water (feet)	Product Thickness	Sheen	Gallons Pumped
(Monitored and Sampled on September 30, 1991)					
MW1	12.44	22.50	0	No	8
MW2	12.77	22.20	0	No	7
MW3	12.10	21.29	0	No	7
(Monitored on August 30, 1991)					
MW1	12.58	22.36	0	--	0
MW2	12.90	22.07	0	--	0
MW3	12.24	21.15	0	--	35
(Monitored on July 31, 1991)					
MW1	12.64	22.30	--	--	0
MW2	12.95	22.02	--	--	0
MW3	12.29	21.10	--	--	53

Well #	Surface Elevation* (feet)
MW1	34.94
MW2	34.97
MW3	33.39

-- Determination not performed.

* Elevation of top of well covers surveyed to MSL per City of Oakland disk stamped "25/A" at elevation 28.81 feet MSL.

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TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Number	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
9/30/91	MW1*	ND	ND	ND	ND	ND	ND
	MW2	--	130	18	0.53	9.6	14
	MW3	--	6,800	1,400	130	240	290
6/05/91	MW1**	ND	47	ND	ND	ND	ND
	MW2	--	49	ND	ND	ND	ND
	MW3	--	5,800	1,200	40	97	140
Detection Limits		50	30	0.3	0.3	0.3	0.3

* TOG was non-detectable. Chromium was detected at 0.019 ppm, and zinc was detected at 0.11 ppm. Cadmium, nickel, and lead were non-detectable.

** TOG and all EPA method 8010 constituents were non-detectable, except for chloroform at 7.8 ppb, tetrachloroethene at 2.9 ppb, and trichloroethene at 1.3 ppb. Chromium was detected at 0.0083 ppm, lead at 0.011 ppm, nickel at 0.063 ppm, and zinc at 0.023 ppm. Cadmium was non-detectable.

ND = Non-detectable.

-- Indicates analyses not performed.

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

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TABLE 3

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample Number	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
5/23/91	MW1(5)*	5	2.2	1.1	ND	ND	0.010	ND
&	MW1(10)*	10	43	43	ND	0.0059	0.43	0.0074
5/30/91	MW1(15)*	15	120	250	0.80	0.73	2.9	0.91
	MW1(20)*	20	ND	ND	ND	ND	ND	ND
	MW1(24)*	24	ND	ND	ND	ND	0.0073	ND
	MW2(5)	5	--	ND	ND	ND	0.0054	ND
	MW2(10)	10	--	ND	ND	ND	ND	ND
	MW2(15.5)	15.5	--	ND	0.015	ND	0.025	0.0064
	MW2(20)	20	--	ND	0.0086	ND	ND	ND
	MW2(22)	22	--	ND	ND	ND	ND	ND
	MW3(5)	5	--	ND	ND	ND	ND	ND
	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(23)	23	--	2.9	0.0079	ND	0.031	0.012
	EB1(5.5)	5.5	--	ND	ND	ND	ND	ND
	EB1(10)	10	--	ND	ND	ND	ND	ND
	EB1(15)	15	--	ND	0.0087	ND	ND	ND
	EB1(20)	20	--	ND	ND	ND	ND	ND
	EB1(22)	22	--	ND	ND	ND	ND	ND
	EB2(5.5)	5.5	--	ND	ND	ND	ND	ND
	EB2(10)	10	--	ND	ND	ND	ND	ND
	EB2(15)	15	--	ND	ND	ND	ND	ND
	EB2(20)	20	--	ND	ND	ND	ND	ND
	EB2(22.5)	22.5	--	ND	ND	ND	ND	ND
Detection Limits			1.0	1.0	0.0050	0.0050	0.0050	0.0050

* TOG and all EPA method 8010 constituents were non-detectable.

ND = Non-detectable.

-- Indicates analyses not performed.

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

KEI-P90-1103.QR1
November 13, 1991

TABLE 4

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample	Depth (feet)	Cadmium	Chromium	Lead	Nickel	Zinc
5/29/91	MW1(5)	5	ND	64	11	32	30
	MW1(10)	10	ND	48	7.1	24	27
	MW1(15)	15	ND	110	6.0	42	28
	MW1(20)	20	ND	32	4.2	36	23
	MW1(24)	24	ND	20	5.0	31	23
Detection Limits			0.50	0.25	0.25	2.5	0.50

ND = Non-detectable.

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

KEI-P90-1103.QR1
November 13, 1991

TABLE 5

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on November 9 & 12, December 20 & 26, 1990
and January 3, 1991)

Sample	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
A1	14.0	1,200	3.0	38	170	25
A2	12.0	ND	ND	0.0082	0.024	ND
B1	14.0	45	0.29	2.7	10	1.4
B2	12.0	ND	0.0063	0.0056	0.011	ND
C(19)	19.0	3,800	11	90	210	36
WO1*	6.5	ND	ND	ND	ND	ND
WO1(9.5)**	9.5	ND	ND	ND	ND	ND
D1	2.5	ND	ND	ND	ND	ND
D2	2.5	45	0.22	1.8	5.5	0.71
D2(6)	6.0	1,200	0.24	28	170	28
D3	2.5	ND	ND	ND	ND	ND
D4	2.5	ND	ND	ND	ND	ND
D5	2.5	ND	ND	ND	ND	ND
D6	2.5	ND	ND	ND	ND	0.018
P1	2.5	ND	ND	ND	ND	ND
Detection Limits		1.0	0.0050	0.0050	0.0050	0.0050

* TOG, TPH as diesel, cadmium, all EPA methods 8010 and 8270 constituents were non-detectable. Chromium, lead, zinc, and nickel were detected at 43 ppm, 1,100 ppm, 130 ppm and 12 ppm, respectively.

** TOG and lead were non-detectable. Chromium, zinc, and nickel were detected at 61 ppm, 20 ppm and 40 ppm, respectively.

ND = Non-detectable.

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

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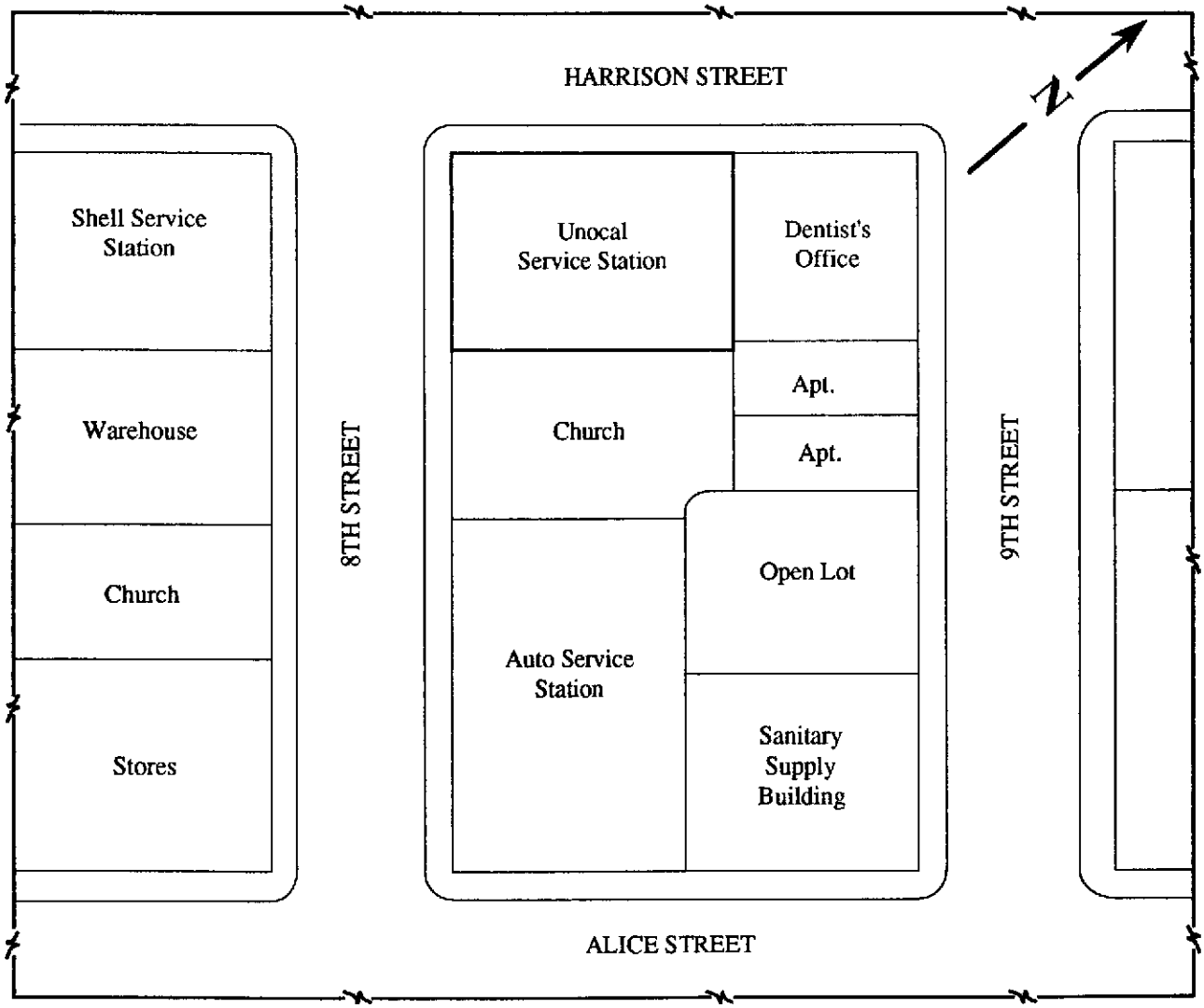

SITE VICINITY MAP

0 75 150
Approx. scale feet

Unocal Service Station #0752
800 Harrison Street
Oakland, CA

KAPREALIAN ENGINEERING, INC.
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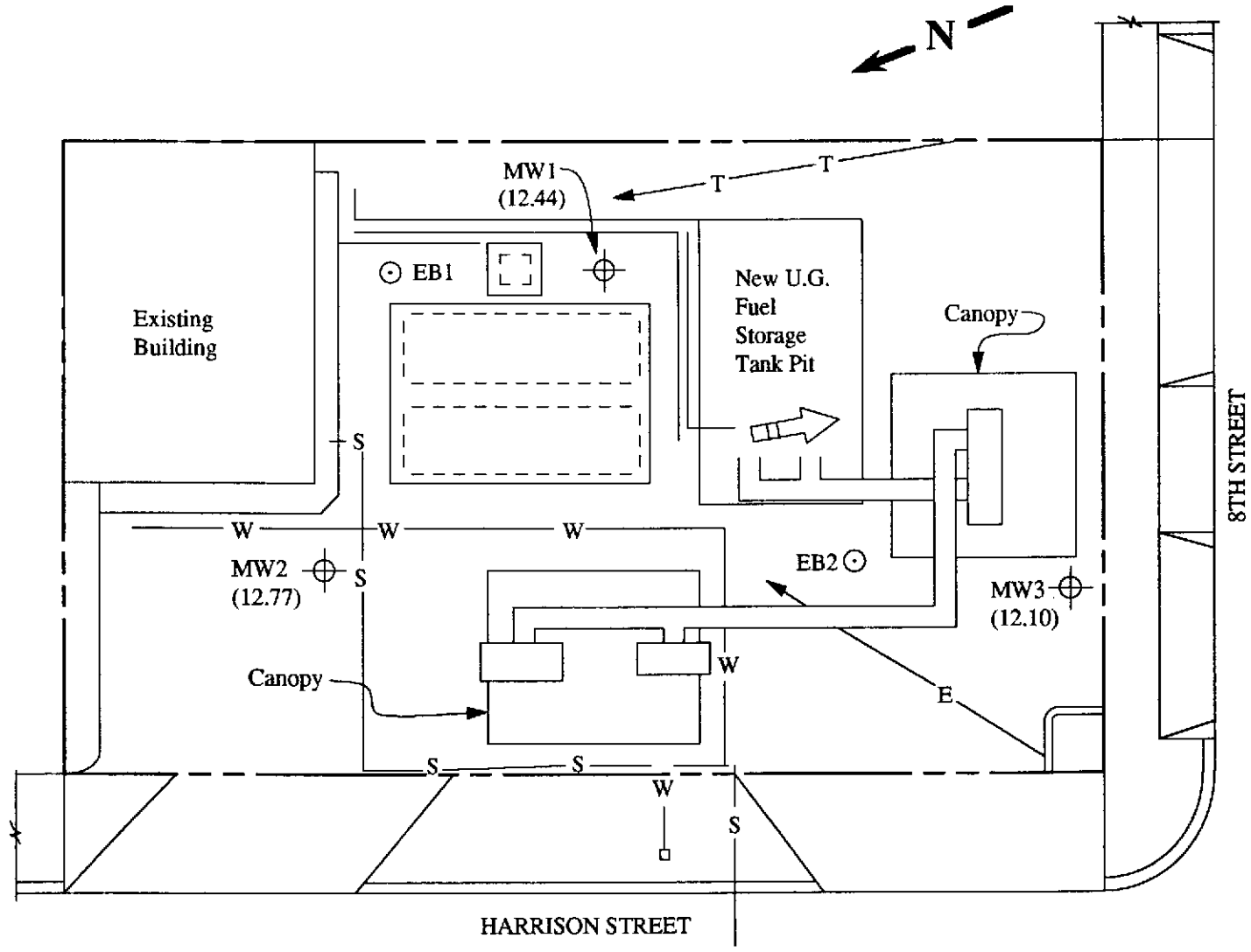

LEGEND

- Monitoring well
- Exploratory boring
- ( ) Elevation of ground water table in feet above Mean Sea Level on 9/30/91
- Direction of ground water flow

E,T = Electrical and telephone lines
W,S = Water and sewer lines

SITE PLAN

Figure 1

0 20 40
Approx. scale feet

Unocal Service Station #0752
800 Harrison Street
Oakland, CA

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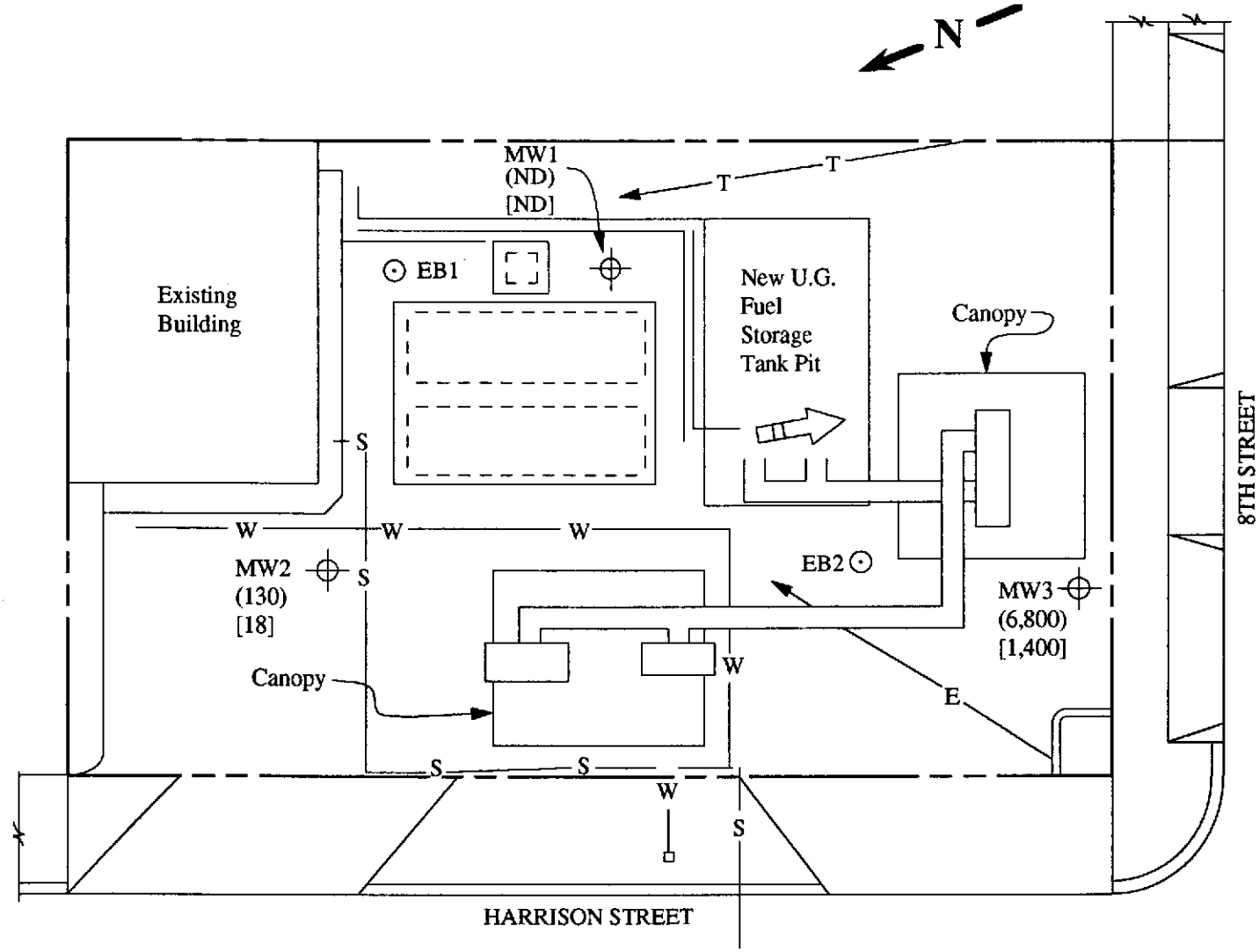

LEGEND

- Monitoring well
- Exploratory boring
- ( ) Concentrations of TPH as gasoline in ppb
- [ ] Concentrations of benzene in ppb
- Direction of ground water flow

E,T = Electrical and telephone lints
W,S = Water and sewer lines

SITE PLAN
Figure 1a
(Samples collected on 9/30/91)

0 20 40
Approx. scale feet

Unocal Service Station #0752
800 Harrison Street
Oakland, CA

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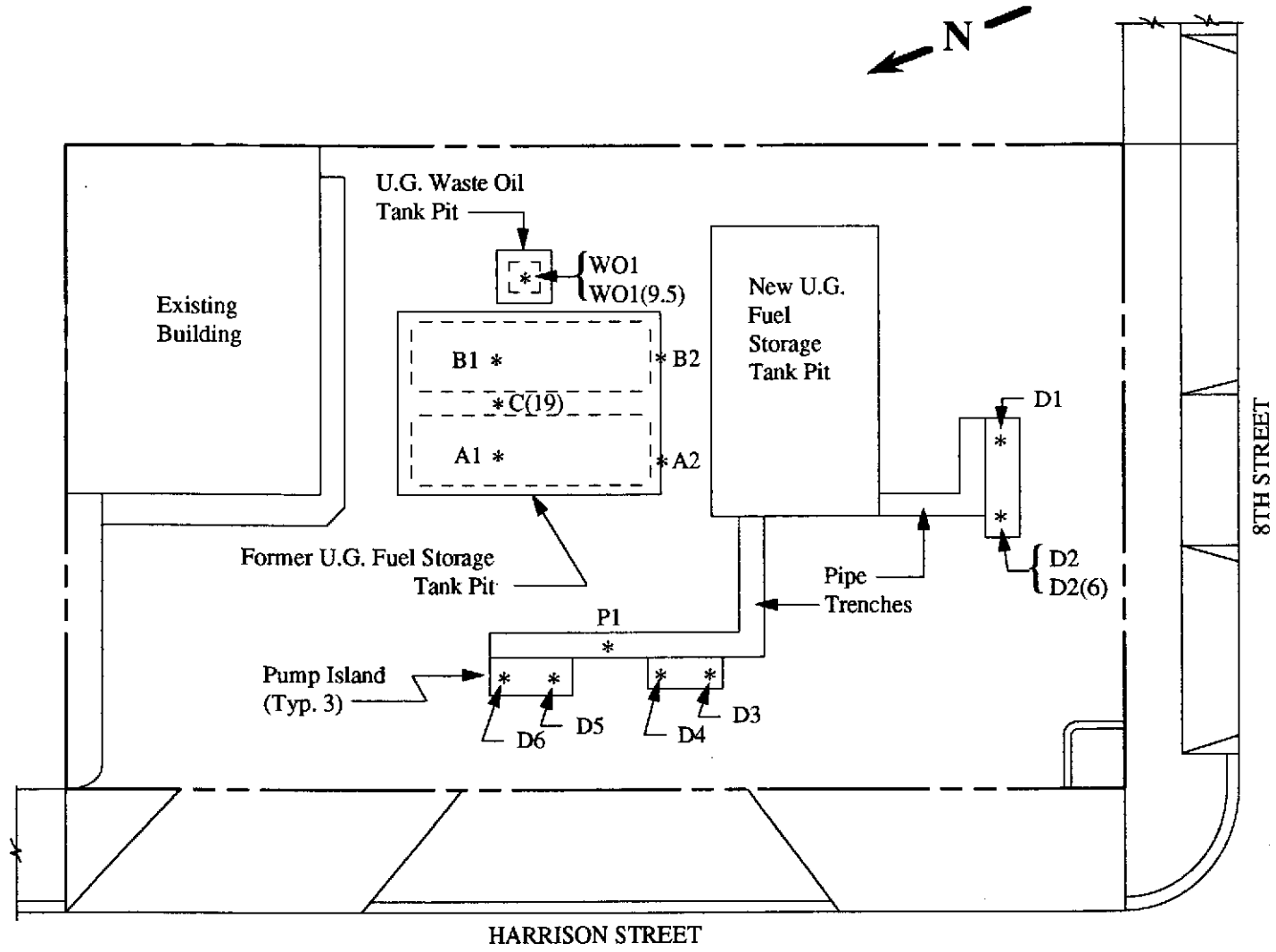

LEGEND

* Sample Point Location

SITE PLAN

Figure 2

0 20 40

Approx. scale feet

Unocal Service Station #0752
800 Harrison Street
Oakland, CA

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 800 Harrison St.	Sampled:	Sep 30, 1991
P.O. Box 996	Matrix Descript:	Water	Received:	Sep 30, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Oct 4, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	110-0091	Reported:	Oct 23, 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)
110-0091	MW1	N.D.	N.D.	N.D.	N.D.	N.D.
110-0092	MW2	130	18	0.53	14	9.6
110-0093	MW3	6,800	1,400	130	290	240
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

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 800 Harrison St.	Sampled:	Sep 30, 1991
P.O. Box 996	Matrix Descript:	Water	Received:	Sep 30, 1991
Benicia, CA 94510	Analysis Method:	EPA 3510/8015	Extracted:	Oct 7, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	110-0091	Analyzed:	Oct 11, 1991
			Reported:	Oct 23, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons µg/L (ppb)
110-0091	MW1	N.D.

Detection Limits:	50

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.
Analytes reported as N.D. were not present above the stated limit of detection.

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Laboratory Director

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 800 Harrison St.	Sampled:	Sep 30, 1991
P.O. Box 996	Matrix Descript:	Water	Received:	Sep 30, 1991
Benicia, CA 94510	Analysis Method:	SM 5520 B&F (Gravimetric)	Extracted:	Oct 3, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	110-0091	Analyzed:	Oct 7, 1991
			Reported:	Oct 23, 1991

TOTAL RECOVERABLE PETROLEUM OIL

Sample Number	Sample Description	Oil & Grease mg/L (ppm)
110-0091	MW1	N.D.

Detection Limits:	5.0

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 800 Harrison St.	Sampled:	Sep 30, 1991
P.O. Box 996	Sample Descript:	Water, MW1	Received:	Sep 30, 1991
Benicia, CA 94510			Analyzed:	10/7-15/91
Attention: Mardo Kaprealian, P.E.	Lab Number:	110-0091	Reported:	Oct 23, 1991

LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Cadmium	0.010	N.D.
Chromium	**0.0050**	**0.019**
Nickel	0.050	N.D.
Lead	0.0050	N.D.
Zinc	**0.010**	**0.11**

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

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(510) 686-9600 • FAX (510) 686-9689

Kaprealian Engineering, Inc.
P.O. Box 996
Benicia, CA 94510
Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal, Oakland, 800 Harrison St.
QC Sample Group: 1100091-3
Reported: Oct 23, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA8015	EPA8015
Analyst:	R.H./J.F.	R.H./J.F.	R.H./J.F.	R.H./J.F.	A. Tuzon	A. Tuzon
Reporting Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Date Analyzed:	Oct 4, 1991	Oct 4, 1991	Oct 4, 1991	Oct 4, 1991	Oct 12, 1991	Oct 12, 1991
Sample #:	110-0091	110-0092	110-0093	Blank	110-0091	Blank
Surrogate % Recovery:	98	100	110	110	96	120

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

% 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, INC.

CHAIN OF CUSTODY

SAMPLER: Vartkes

WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal / Oakland 800 Harrison str.

ANALYSES REQUESTED

TURN AROUND TIME: Regular

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPHG & BTXE	TPHD	TCE (5.5.2 & B+H)	5 METALS		REMARKS
MW 1	9/30/91	P.M. 3:05		✓	✓		5	Monitoring Well	✓	✓	✓	✓	110009 1	AE VOA's Preserved in HCl.
MW 2	"	P.M. 3:45		✓	✓		2	" "	✓				92 AB	
MW 3	"	P.M. 4:25		✓	✓		2	" "	✓				93 AB	METALS Preserved in HNO_3

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
W. Tuckfield	9/30/91 5:50	Beth Hooper
Beth Hooper	9/30/91 1750	
	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	9/30/91 1800	
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

BS — Signature; Yes — Title; 9/30/91 — Date