



KAPREALIAN ENGINEERING, INC.

Consulting Engineers

PO BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX. (707) 746-5581

KEI-P89-0301.QR2

January 16, 1990

Unocal Corporation
2175 N. California Blvd., Suite #650
Walnut Creek, CA 94596

Attention: Mr. Tim Ross

RE: Quarterly Report
Unocal Service Station #6277
15803 E. 14th Street
San Leandro, California 94578

Dear Mr. Ross:

This report presents the results of the second quarter of monitoring and sampling of the monitoring wells at the referenced site by Kaprealian Engineering, Inc. (KEI), per proposal KEI-P89-0301.P2 dated June 19, 1989. The wells are currently monitored monthly and sampled on a quarterly basis. This report covers the work performed by KEI from October through December, 1989.

BACKGROUND

The subject site is presently used as a gasoline station. A Site Location Map and detailed Site Plan are attached to this report.

KEI's work at the site began when KEI was asked to install two exploratory borings at the site. The borings were installed at the request of Alameda County to explore for the possible presence of soil contamination in the vicinity of the proposed new underground storage tank pit location. The borings were installed on March 6, 1989 to depths of 10.5 and 13.5 feet. Water was encountered in the borings at depths of 11 and 12 feet. Analytical results of selected soil samples collected from the borings showed total petroleum hydrocarbons (TPH) as gasoline ranging from non-detectable to 620 ppm. Based on results of the preliminary investigation, KEI recommended that the contractor excavate the tank pit to a depth of approximately 13 feet. Results of the exploratory boring investigation are presented in KEI's report (KEI-P89-0301.R1) dated March 13, 1989.

On March 13, 1989, KEI collected soil samples following the removal of two 10,000 gallon underground fuel storage tanks and one waste oil tank at the site. Water was encountered in the excavation at a depth of 11 feet, prohibiting the collection of soil samples from immediately beneath the tank. Sidewall samples

(collected at a depth of 10.5 feet) were analyzed for TPH as gasoline, and benzene, toluene, xylenes and ethylbenzene (BTX&E). One sample was taken from the native material beneath the waste oil tank and additionally analyzed for TPH as diesel, total oil and grease (TOG) and EPA method 8240 compounds.

Based on the subjective evidence observed in the field, it was decided to excavate additional soil from three of the four tank pit walls. The analytical results of the final sidewall samples collected from the fuel tank pit had TPH as gasoline levels ranging from 24 ppm to 150 ppm, and benzene levels ranging from 1.6 ppm to 40 ppm. Results of the soil samples from the tank excavation are summarized in KEI's report KEI-P89-0301.R3 dated March 27, 1989. To comply with the requirements of the regulatory agencies and based on results of the preliminary investigations, KEI proposed installation of four monitoring wells.

On May 24, 1989, four two-inch diameter monitoring wells, designated as MW1 through MW4, were installed at the site. Documentation of the well installation, sampling and sample results are provided in KEI's report (KEI-P89-0301.R6) dated June 26, 1989. Based on the sample results, KEI recommended a monthly monitoring and quarterly sampling program for all of the wells and additional excavation of soil to a depth of 10 feet in the vicinity of MW2. The monitoring and sampling program was initiated in July, 1989. This report presents the results of the most recent quarter of monitoring and sampling.

FIELD ACTIVITIES

The four wells 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 December 12, 1989. Prior to sampling, the wells were purged of between 15 and 35 gallons using an acrylic surfaced bailer. 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 sealed with Teflon-lined screw caps and stored on ice until delivery to the state certified laboratory.

HYDROLOGY

Based on the water level data gathered during the quarter, ground water flow direction appeared to be to the north-northwest on December 12, 1989, relatively unchanged from the previous quarter. Water levels have fluctuated during the quarter, but have shown a net decrease of between 0.02 and 0.07 feet from the previous quarter. The measured depth to water at the site on December 12, 1989 varied between 9.91 and 11.37 feet.

ANALYTICAL RESULTS

Water samples were analyzed at Sequoia Analytical Laboratory in Redwood City, 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. In addition, water samples from well MW2 were analyzed for TPH as diesel using EPA method 3510 in conjunction with modified 8015, TOG using EPA method 418.1 with clean up and halogenated volatile organics using EPA method 8010.

The analytical results show that TPH as gasoline was detected in all of the wells at concentrations ranging from 97 to 660 ppb, and benzene was detected in all of the wells at concentrations ranging from 4.6 to 220 ppb. 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

KEI has scheduled additional excavation of soil to a depth of 10 feet in the vicinity of well MW2, as shown on the attached Site Plan for the first week of February, 1990. Prior to excavation, well MW2 will be decommissioned. To further define the extent of ground water contamination, KEI recommends the installation of one off-site monitoring well. A proposal is attached for your review and consideration. In addition, KEI recommends the continuation of the current monitoring and sampling program of the existing wells per KEI's proposal (KEI-P89-0301.P2) dated June 19, 1989.

DISTRIBUTION

A copy of this report should be sent to the Alameda County Health Agency, the Alameda County Flood Control District, 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.

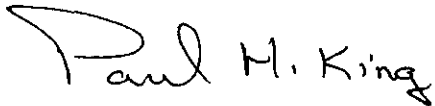
The results of this study are based on the data obtained from the field work and laboratory analyses. We have analyzed this data using what we believe to be currently applicable engineering techniques and principles in the Northern California region. We make no warranty, either expressed or implied, except that our services have been performed in accordance with generally accepted professional principles and practices existing for such work.

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January 16, 1990
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If you have any questions regarding this report, please do not hesitate to call me at (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.



Paul H. King
Hydrogeologist



Don R. Braun
Certified Engineering Geologist

License No. 1310
Exp. Date 6/30/90



Mardo Kaprealian
President

Attachments: Tables 1 and 2
Location Map
Site Plan
Laboratory Analyses
Chain of Custody documentation
Proposal

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January 16, 1990

TABLE 1

SUMMARY OF MONITORING DATA

<u>Date</u>	<u>Well No.</u>	<u>Depth to Water (feet)</u>	<u>Product Thickness</u>	<u>Sheen</u>	<u>Water Bailed (gallons)</u>
12/12/89	MW1	10.65	0	None	35
	MW2	11.37	0	None	20
	MW3	10.16	0	None	15
	MW4	9.91	0	None	15
11/07/89	MW1	10.62	0	None	30
	MW2	11.45	0	None	20
	MW3	10.20	0	None	0
	MW4	9.90	0	None	0
10/09/89	MW1	10.70	0	None	30
	MW2	11.52	0	None	20
	MW3	10.30	0	None	0
	MW4	9.99	0	None	0

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TABLE 2

SUMMARY OF LABORATORY ANALYSES

<u>Sample</u> <u>Well #</u>	<u>Depth to</u> <u>Water</u> <u>(feet)</u>	<u>TPH as</u> <u>Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethyl-</u> <u>benzene</u>
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(Collected on December 12, 1989)

MW1	10.65	340	100	13	44	3.4
MW2*	11.45	660	220	6.6	36	13
MW3	10.20	120	6.7	0.64	1.5	0.46
MW4	9.10	97	4.6	ND	ND	ND

(Collected on June 6, 1989)

MW1	10.31	590	ND	ND	ND	ND
MW2**	11.08	77	ND	ND	ND	ND
MW3	9.86	32	ND	ND	ND	ND
MW4	9.64	37	ND	ND	ND	ND

Detection Limits		30	0.3	0.3	0.3	0.3
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* TPH as diesel showed 1,700 ppb, TOG showed 1.2 ppm and EPA method 8010 showed 30 ppb of tetrachloroethane and 9.0 ppb of trichloroethene.

** TPH as diesel and TOG were non-detectable. EPA method 8010 showed 2.8 ppb of 1,2-dichloroethane; 110 ppb of tetrachloroethane; and, 4.4 ppb of trichloroethene.

ND = Non-detectable.

All results are in parts per billion (ppb), unless otherwise specified.



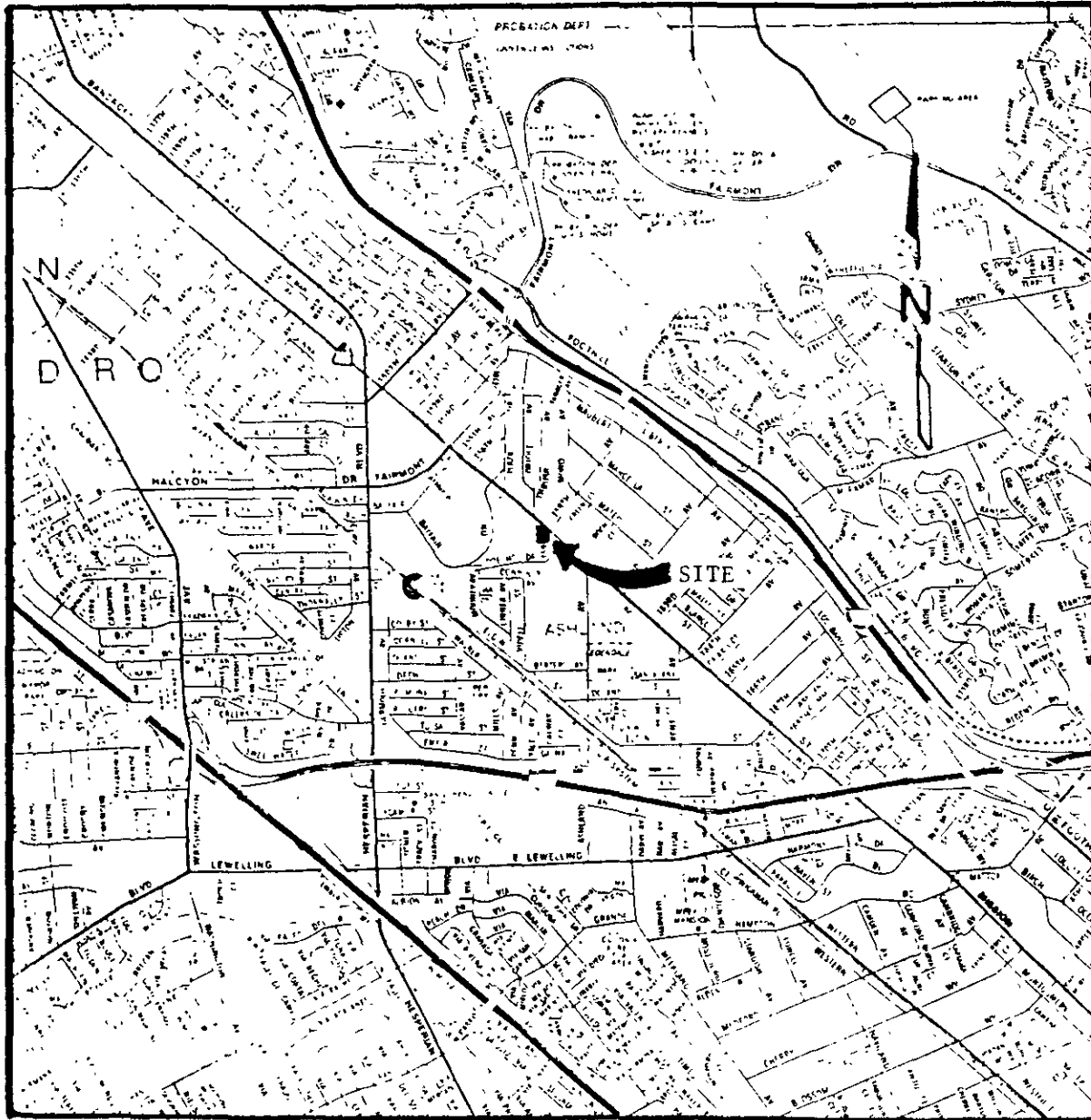
KAPREALIAN ENGINEERING, INC.

Consulting Engineers

P O BOX 913

BENICIA, CA 94510

(707) 746-6915



LOCATION MAP

Unocal Service Station #6277
15803 E. 14th Street
San Leandro, California

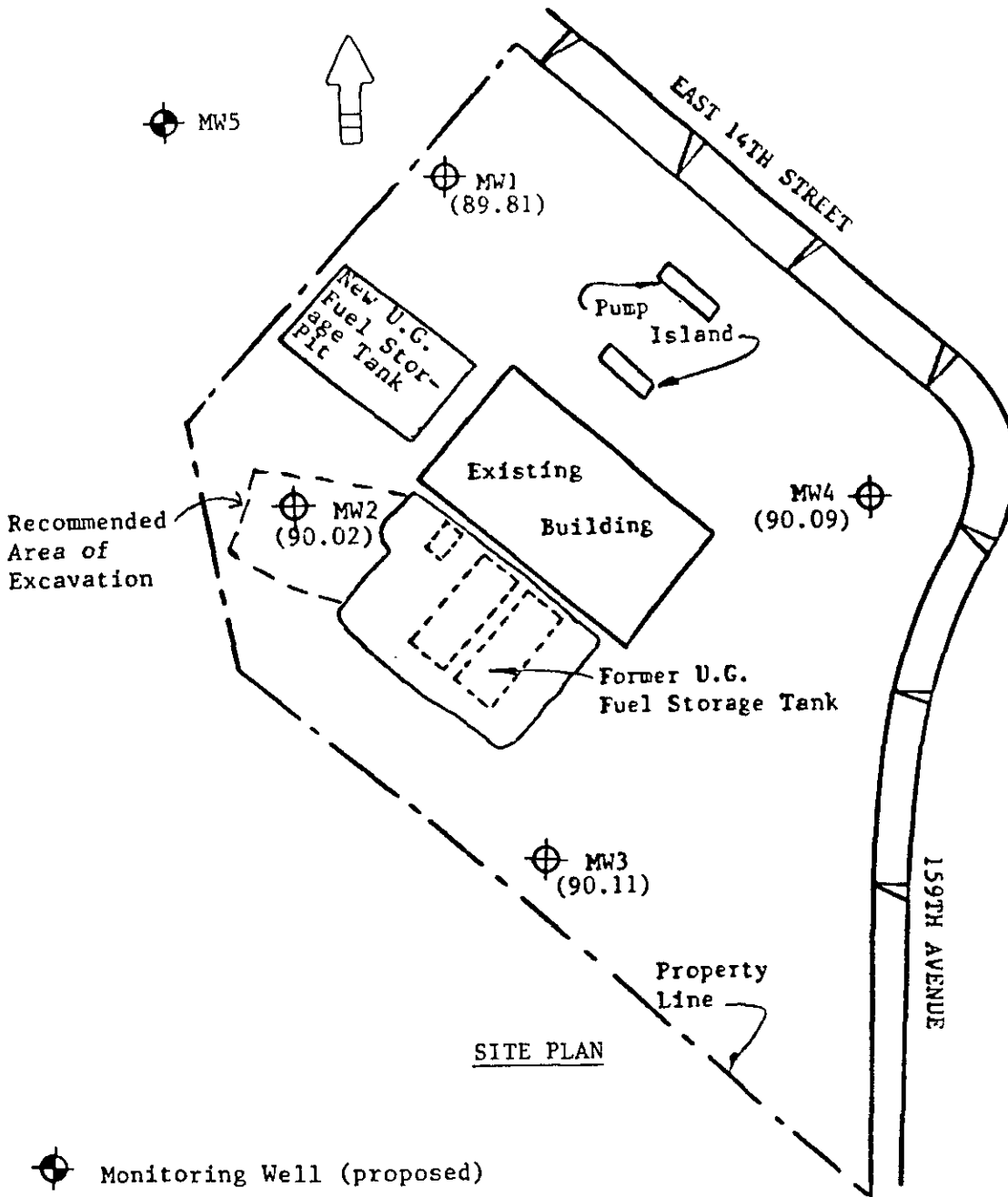


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SITE PLAN

⊕ Monitoring Well (proposed)

⊕ Monitoring Well (existing)

() Water table elevation in feet on 12/12/89. Top of MW4 well cover assumed 100.00' as datum.

➔ Ground water flow direction.



Approx. Scale feet

Unocal Service Station #6277
15803 East 14th Street
San Leandro, California



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaprealian Engineering, Inc.	Client Project ID: Unocal, San Leandro, E. 14th/159th Ave.	Sampled: Dec 12, 1989
P.O. Box 996	Matrix Descript: Water	Received: Dec 12, 1989
Benicia, CA 94510	Analysis Method: EPA 5030/8015/8020	Analyzed: Dec 14, 1989
Attention: Mardo Kaprealian, P.E.	First Sample #: 912-1406	Reported: Dec 20, 1989

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

Sample Number	Sample Description	Low/Medium B.P.	Benzene	Toluene	Ethyl Benzene	Xylenes
		Hydrocarbons				
		$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)
9121406 A-B	MW1	340	100	13	3.4	44
9121407 A-B	MW2	660	220	6.6	13	36
9121408 A-B	MW3	120	6.7	0.64	0.46	1.5
9121409 A-B	MW4	97	4.6	N.D.	N.D.	N.D.

Detection Limits:	30.0	0.3	0.3	0.3	0.3
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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
Project Manager



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

Client Project ID: Unocal, San Leandro, E. 14th/159th Ave.
Matrix Descript: Water
Analysis Method: EPA 3510/8015
First Sample #: 912-1407 D

Sampled: Dec 12, 1989
Received: Dec 12, 1989
Extracted: Dec 15, 1989
Analyzed: Dec 18, 1989
Reported: Dec 20, 1989

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons $\mu\text{g/L}$ (ppb)
9121407 D	MW2	1,700

Detection Limits: 50.0

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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Belinda C. Vega
Project Manager



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680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kapreallan Engineering, Inc.	Client Project ID:	Unocal, San Leandro, E. 14th/159th Ave.	Sampled:	Dec 12, 1989
P.O. Box 996	Matrix Descript:	Water	Received:	Dec 12, 1989
Benicia, CA 94510	Analysis Method:	EPA 418.1 (I.R. with clean-up)	Extracted:	Dec 14, 1989
Attention: Mardo Kapreallan, P.E.	First Sample #:	912-1407 C	Analyzed:	Dec 15, 1989
			Reported:	Dec 20, 1989

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS

Sample Number	Sample Description	Petroleum Oil mg/L (ppm)
9121407 C	MW2	1.2

Detection Limits:	1.0
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Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL


Belinda C. Vega
Project Manager



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680 Chesapeake Drive • Redwood City, CA 94063
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Kaprealian Engineering, Inc.
P.O. Box 996
Benicia, CA 94510
Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal, San Leandro, E. 14th/159th Ave.
Sample Descript: Water, MW2
Analysis Method: EPA 5030/8010
Lab Number: 912-1407 E-G

Sampled: Dec 12, 1989
Received: Dec 12, 1989
Analyzed: Dec 18, 1989
Reported: Dec 20, 1989

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane.....	10.0	N.D.
Bromoform.....	10.0	N.D.
Bromomethane.....	10.0	N.D.
Carbon tetrachloride.....	10.0	N.D.
Chlorobenzene.....	10.0	N.D.
Chloroethane.....	50.0	N.D.
2-Chloroethylvinyl ether.....	10.0	N.D.
Chloroform.....	5.0	N.D.
Chloromethane.....	5.0	N.D.
Dibromochloromethane.....	5.0	N.D.
1,2-Dichlorobenzene.....	20.0	N.D.
1,3-Dichlorobenzene.....	20.0	N.D.
1,4-Dichlorobenzene.....	20.0	N.D.
1,1-Dichloroethane.....	5.0	N.D.
1,2-Dichloroethane.....	5.0	N.D.
1,1-Dichloroethene.....	10.0	N.D.
Total 1,2-Dichloroethene.....	10.0	N.D.
1,2-Dichloropropane.....	5.0	N.D.
cis-1,3-Dichloropropene.....	50.0	N.D.
trans-1,3-Dichloropropene.....	50.0	N.D.
Methylene chloride.....	20.0	N.D.
1,1,2,2-Tetrachloroethane.....	5.0	N.D.
Tetrachloroethene.....	5.0	30
1,1,1-Trichloroethane.....	5.0	N.D.
1,1,2-Trichloroethane.....	5.0	N.D.
Trichloroethene.....	5.0	9.0
Trichlorofluoromethane.....	10.0	N.D.
Vinyl chloride.....	20.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

SEQUOIA ANALYTICAL


Belinda C. Vega
Project Manager



KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER JOE/KEI		SITE NAME & ADDRESS Unocal / San Leandro E. 14th / 159th Ave.				ANALYSES REQUESTED TPHG, BTXG TOG TPHD GOL				TURN AROUND TIME: 5 days
WITNESSING AGENCY										REMARKS
SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	NO. OF CONT.	SAMPLING LOCATION			
MW1	12/12/89			✓	✓	2	MW	✓	✓	✓
MW2	"	Noon		✓	✓	7	"	✓	✓	✓
MW3	"			✓	✓	2	"	✓	✓	✓
MW4	"			✓	✓	2	"	✓	✓	✓
Relinquished by: (Signature) <i>Joe Lewis</i>		Date/Time 12/12/89		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? 2. Will samples remain refrigerated until analyzed? 3. Did any samples received for analysis have head space? 4. Were samples in appropriate containers and properly packaged?				
Relinquished by: (Signature)		Date/Time		Received by: (Signature)						
Relinquished by: (Signature)		Date/Time		Received by: (Signature)						
Relinquished by: (Signature)		Date/Time		Received by: (Signature)						
						Signature	Title	Date		