KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P. O. BOX 913
BENICIA, CA 94510
(707) 746-6915 (707) 746-6916
FAX: (707) 746-5581

December 7, 1989

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

Attention: Mr. Scott Seery

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

Dear Mr. Seery:

Per the request of Mr. Tim Ross of Unocal Corporation, enclosed please find our report dated October 30, 1989 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

Enclosure

cc: Tim Ross, Unocal

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KEI-P89-0301.QR1
October 30, 1989

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

Dear Mr. Ross:

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 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 July through September, 1989.

BACKGROUND

The subject site is presently used as a gasoline station. The site vicinity and site details are shown on the attached sketch.

KEI's work at the site began when KEI was asked to drill two exploratory borings at the site. The borings were drilled 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 drilled on March 6, 1989 to depths of 10.5 and 13.5 feet. Water was encountered in one of the borings at a depth 12 feet. Analytical results of selected soil samples collected from the borings showed 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 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 beneath the tank. Sidewall samples (collected at a depth of 10.5 feet) were

analyzed by Sequoia Analytical Laboratory in Redwood City, California, for total petroleum hydrocarbon (TPH) as gasoline and benzene, toluene, xylenes and ethylbenzene (BTX&E). One soil sample was taken from the native material beneath the waste oil tank and additionally analyzed for TPH as diesel, TOG and 8240. 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 levels ranging from 24 ppm to 150 ppm, and benzene levels ranging from 1.3 ppm to 3.1 ppm. To comply with the requirements of the regulatory agencies and based on results of the preliminary investigations, KEI proposed installation of four monitoring wells. Results of the soil samples from the tank excavation are summarized in KEI's report (KEI-P89-0301.R3) dated March 27, 1989.

Four monitoring wells were installed on May 24, 1989. Water samples from the four wells showed non-detectable levels of benzene. KEI proposed a monitoring and sampling program of the existing wells. Details of the monitoring well installation are summarized in KEI's report (KEI-P89-0301.R6) dated June 26, 1989.

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 September 13, 1989. Prior to sampling, the wells were each purged 15 gallons. 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 generally toward the north-northwest. On September 15, 1989, ground water flow was to the northwest with a gradient of 0.0023. Ground water flow direction appears to have been previously toward the northwest based on water level readings conducted on June 5, 1989. During the quarter, water levels have decreased 0.31, 0.21, 0.14 and 0.59

feet in wells MW1, MW2, MW3 and MW4, respectively, when compared to readings obtained on June 5, 1989 during the previous quarter. The measured depth to water at the site on September 13, 1989 ranged between 9.87 and 11.33 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, the sample from MW2 (adjacent to the former waste oil tank) was analyzed for TPH as diesel using EPA method 3510 in conjunction with modified 8015, total oil and grease (TOG) using EPA method 503A&E, and purgeable halocarbons using EPA method 8010.

The analytical results show non-detectable levels of BTX&E in wells MW3 and MW4, unchanged from the previous quarter. In wells MW1 and MW2, benzene levels were 32 ppb and 2.0 ppb, respectively, rising from non-detectable in the June, 1989 analyses. Levels of TPH as gasoline, identified in all wells, have increased slightly or otherwise remained reasonably constant since our June analyses. Results of the current 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 comparison of this quarter with the water quality results obtained immediately after well installation (collected June 6, 1989) shows an increase in benzene concentrations in wells MW1 and MW2. Well MW1 benzene concentrations increased from non-detectable to 32 ppb, and well MW2 benzene concentrations increased from non-detectable to 2.0 ppb.

KEI is presently arranging for excavation of soil to a depth of 10 feet in the vicinity of MW2, per recommendations in KEI's report (KEI-P89-0301.R6) dated June 26, 1989.

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-P89-0301.P2) dated June 19, 1989.

DISTRIBUTION

A copy of this report should be sent to Alameda County Health Agency, 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 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, 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.

Paul King

Paul H. King
Hydrogeologist

Don R Braun

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

KEI-P89-0301.QR1
October 30, 1989

TABLE 1

SUMMARY OF MONITORING DATA

Date	Well No.	Depth to Water (feet)	Product Thickness	Sheen	Water Bailed (gallons)
9/13/89	MW1	10.63	0	None	15
	MW2	11.33	0	None	15
	MW3	10.09	0	None	15
	MW4	9.87	0	None	15
8/17/89	MW1	10.56	0	None	25
	MW2	11.26	0	None	10
	MW3	10.06	0	None	10
	MW4	9.88	0	None	10
7/21/89	MW1	10.53	0	None	25
	MW2	11.28	0	None	15
	MW3	10.13	0	None	15
	MW4	9.86	0	None	15

KEI-P89-0301.QR1
October 30, 1989

TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

(Collected on September 13, 1989)

Sample Well #	Depth to Water (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
MW1	10.67	550	32	17	52	3.4
MW2*	11.47	170	2.0	0.38	9.5	ND
MW3	10.18	76	ND	ND	ND	ND
MW4	9.96	77	ND	ND	ND	ND
Detection Limits (ppb)		30	0.3	0.3	0.3	0.3

NOTES:

* Analysis was also performed for TOG, TPH as diesel and EPA method 8010. TOG was <50 ppm. TPH as diesel was non-detectable. EPA 8010 showed 4.2 ppb of 1,2-dichloroethane; 1.2 ppb of total 1,2-dichloroethene; 18 ppb of tetrachloroethene, and 6.1 ppb of trichloroethene.

ND = ND = Non-detectable.

All results are in ppb.

Depth to water measurements presented here were recorded after well purging, but prior to sample collection.

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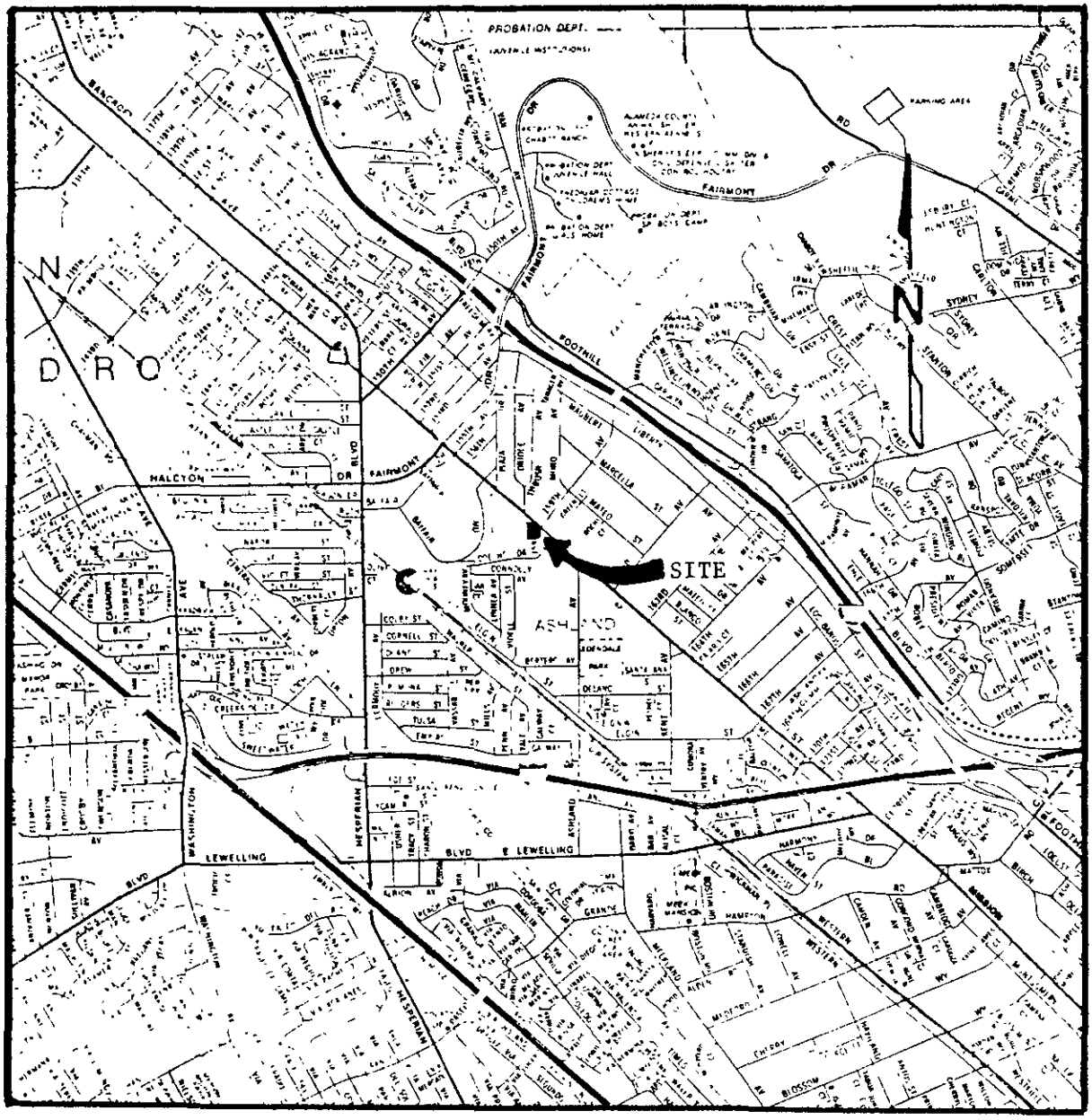
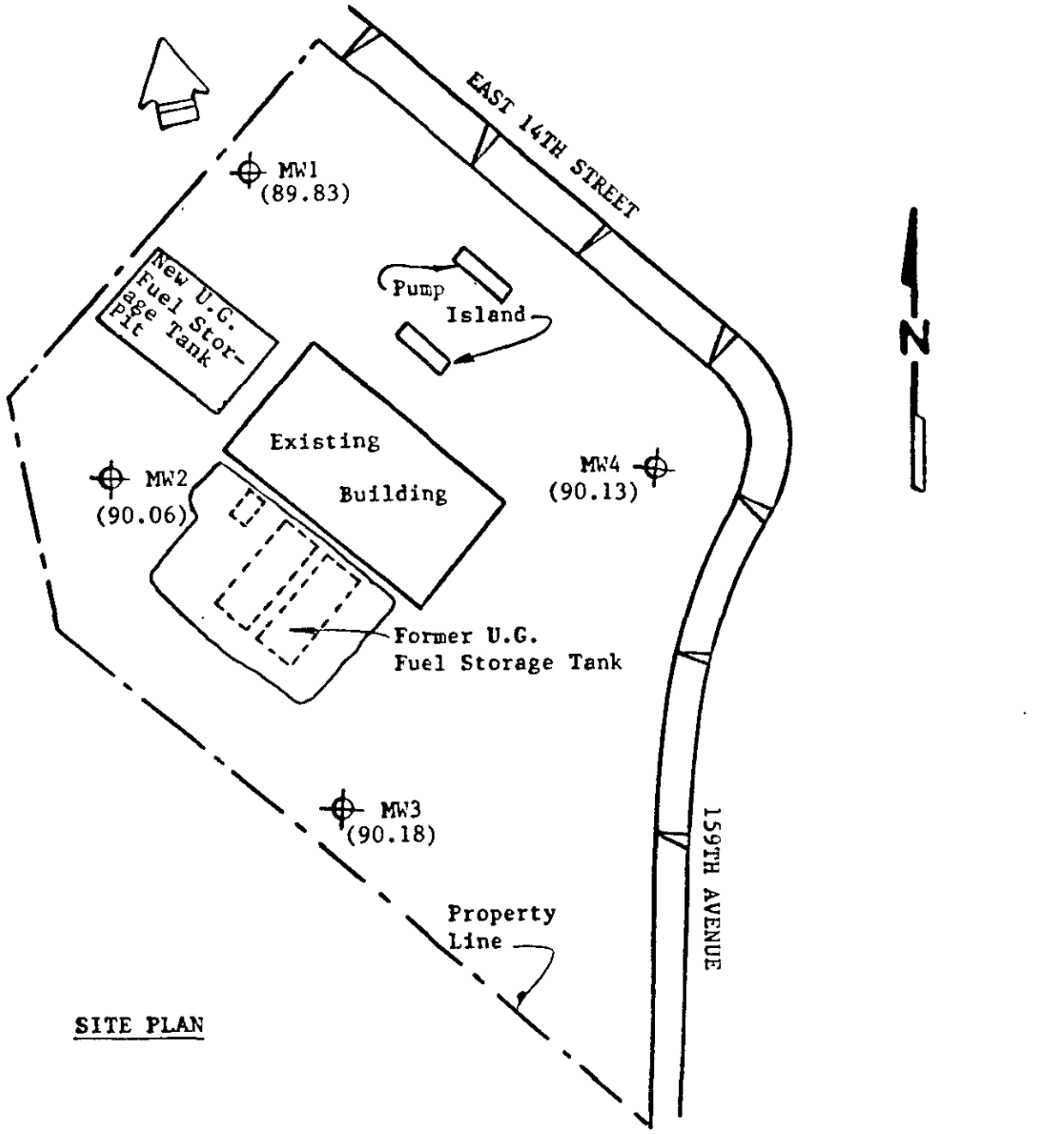


LOCATION MAP

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

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P. O. BOX 913
BENICIA, CA 94510
(415) 676 - 9100 (707) 746 - 6915



SITE PLAN

⊕ Monitoring Well

( ) Ground water elevation in feet on 9/13/89. Surface elevation at top of MW4 assumed 100' as datum.

Ground water flow direction

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

Kapreallan Engineering, Inc.	Client Project ID:	Unocal, San Leandro, E. 14th St.	Sampled:	Sep 13, 1989
P.O. Box 913	Matrix Descript:	Water	Received:	Sep 13, 1989
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Sep 20, 1989
Attention: Mardo Kapreallan, P.E.	First Sample #:	909-1442 A-B	Reported:	Sep 21, 1989

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)
9091442 A-B	MW1	550	32	17	3.4	52
9091443 A-B	MW2	170	2.0	0.38	N.D.	9.5
9091444 A-B	MW3	76	N.D.	N.D.	N.D.	N.D.
9091445 A-B	MW4	77	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**30.0**	**0.3**	**0.3**	**0.3**	**0.3**

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

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 St.	Sampled:	Sep 13, 1989
P.O. Box 913	Matrix Descript:	Water	Received:	Sep 13, 1989
Benicia, CA 94510	Analysis Method:	EPA 3510/8015	Extracted:	Sep 20, 1989
Attention: Mardo Kaprealian, P.E.	First Sample #:	909-1443 C	Analyzed:	Sep 20, 1989
			Reported:	Sep 21, 1989

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons µg/L (ppb)
9091443 C	MW2	N.D.

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.

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

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Kapreallan Engineering, Inc.	Client Project ID:	Unocal, San Leandro, E. 14th St.	Sampled:	Sep 13, 1989
P.O. Box 913	Matrix Descript:	Water	Received:	Sep 13, 1989
Benicia, CA 94510	Analysis Method:	SM 503 A&E (Gravimetric)	Extracted:	Sep 20, 1989
Attention: Mardo Kapreallan, P.E.	First Sample #:	909-1443 D	Analyzed:	Sep 20, 1989
			Reported:	Sep 21, 1989

TOTAL RECOVERABLE OIL & GREASE

Sample Number	Sample Description	Oil & Grease mg/L (ppm)
9091443 D	MW2	< 50

Detection Limits:	5.0

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

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 St.	Sampled:	Sep 13, 1989
P.O. Box 913	Sample Descript:	Water, MW2	Received:	Sep 13, 1989
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Sep 18, 1989
Attention: Mardo Kaprealian, P.E.	Lab Number:	909-1443 E-F	Reported:	Sep 21, 1989

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	1.0	N.D.
Bromoform	1.0	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	1.0	N.D.
Chlorobenzene	1.0	N.D.
Chloroethane	5.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.5	N.D.
Chloromethane	0.5	N.D.
Dibromochloromethane	0.5	N.D.
1,2-Dichlorobenzene	2.0	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
1,1-Dichloroethane	0.5	N.D.
1,2-Dichloroethane	**0.5**	**4.2**
1,1-Dichloroethene	1.0	N.D.
Total 1,2-Dichloroethene	**1.0**	**1.2**
1,2-Dichloropropane	0.5	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	2.0	N.D.
1,1,2,2-Tetrachloroethane	0.5	N.D.
Tetrachloroethene	**0.5**	**18**
1,1,1-Trichloroethane	0.5	N.D.
1,1,2-Trichloroethane	0.5	N.D.
Trichloroethene	**0.5**	**6.1**
Trichlorofluoromethane	1.0	N.D.
Vinyl chloride	2.0	N.D.

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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CHAIN OF CUSTODY

SAMPLER: Ray K'z (Signature) DATE/TIME OF COLLECTION: 9/13/89 TURN AROUND TIME: 1 Week

SAMPLE DESCRIPTION AND PROJECT NUMBER: UNOCAL SAN LEANDRO
E 14TH ST

SAMPLE #	ANALYSES	GRAB OR COMP.	NUMBER OF CONTAINERS	SOIL/ WATER
MW1	TPHG BTXE	Grab	2V	W
MW2	" "	"	"	"
	EPA 601	"	"	"
	TOG 503 A/E	"	1L	"
	TPH Das Diesel	"	"	"
MW3	TPHG - BTXE	"	2V	"
MW11	" "	"	"	"

RELINQUISHED BY*	TIME/DATE	RECEIVED BY*	TIME/DATE
1. Ray (KEI)	3:05 PM 9/13/89	Derek Newcomb	
2.			
3.			

* STATE AFFILIATION NEXT TO SIGNATURE

REMARKS:

NOTE: IF REGULAR TURNAROUND, SOIL ANALYSES MUST BE COMPLETED WITHIN 14 CALENDAR DAYS OF SAMPLE COLLECTION. WATER ANALYSES MUST BE COMPLETED WITHIN 7 CALENDAR DAYS FOR BTX&E (UNLESS SAMPLE HAS BEEN PRESERVED), AND 14 CALENDAR DAYS FOR TPH AS GASOLINE; EXTRACT TPH AS DIESEL WITHIN 14 CALENDAR DAYS.