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

KEI-P88-025B-1
August 26, 1988

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

Attn: Mr. Tim Ross

Re: Groundwater Sampling Update Report
Unocal Service Station #5366
7375 Amador Valley Road
Dublin, California

Dear Mr. Ross:

This update report summarizes the results of the most recent quarter of monitoring and sampling of four groundwater monitoring wells at the referenced site. The work was performed according to the recommendations in our proposal KEI-P88-025B, dated May 12, 1988.

BACKGROUND

Kaprealian Engineering, Inc. (KEI) conducted its initial investigation at the site on February 18 and 19, 1988, which consisted of soil sampling following the removal of three underground fuel storage tanks. Six samples of native soil were collected from the sidewalls of the fuel tank pit, and two groundwater samples were collected. The analytical results provided by HAZCAT Mobile Organics Laboratory showed total petroleum hydrocarbon (TPH) levels ranging from non-detectable to 1700 parts per million (ppm) for the soil samples. Benzene levels in the two groundwater samples were non-detectable and 8200 ppb. The results of this investigation are summarized in KEI's report KEI-J88-025 dated February 25, 1988. KEI recommended the installation of four groundwater monitoring wells to begin to determine the lateral and vertical extent of the groundwater contamination. The wells were installed by KEI on April 14, 1988. Water samples from the four wells had benzene levels ranging from non-detectable to 960 ppb. The results of this investigation are summarized in report number KEI-J88-025A-1 dated May 11, 1988. KEI proposed a nine month program of monthly monitoring and quarterly sampling of the four wells.

FIELD ACTIVITIES

The four existing wells at the site were monitored three times and sampled once during the quarter. During monitoring, the wells were checked for depth to water, odor and visual presence of floating product. After monitoring, the wells were purged and were allowed to recover. Monitoring data are summarized in Table 1. No floating product, sheen or odor was noted in any of the wells during the quarter. Water samples were taken from the wells on July 25, 1988. Prior to sampling, the wells were purged at least five (5) well volumes using an acrylic surface bailer. Samples were then collected using a clean Teflon bailer, which was carefully raised from the well to minimize volatilization. Samples were decanted into clean VOA vials which were sealed with Teflon-lined screw caps and stored on ice until delivery to the certified laboratory.

LABORATORY ANALYSES

The water samples were analyzed at Sequoia Analytical Laboratory in Redwood City, California. The samples were analyzed for total petroleum hydrocarbon (TPH) as gasoline, benzene, toluene, xylene and ethylbenzene (BTXE) using EPA methods 5030, 8015 and 8020. The results are summarized in Table 2. In addition, the sample from MW-3 was analyzed for Halogenated Volatile Organics (EPA 601). Copies of the laboratory analyses and chain of custody form are attached to this report.

DISCUSSION AND RECOMMENDATIONS

During monitoring and sampling, no floating product or sheen was noted in any of the wells. Slight odor was noted in MW-1. The laboratory results showed non-detectable levels of benzene, toluene, xylene and TPH in wells MW-2, MW-3 and MW-4. The benzene level of MW-1 was 170 ppb and the TPH as gasoline level was 6100 ppb.

A comparison of the recent results with the results of the previous sampling shows a substantial decrease of TPH and benzene in wells MW-1 and MW-2. Well MW-2 now shows non-detectable levels of all constituents. The benzene level in MW-1 decreased from 960 ppb to 170 ppb.

To document the levels of TPH and BTXE in the wells, KEI recommends that the quarterly monitoring and sampling program be continued as recommended in our May 12, 1988 proposal. KEI will submit an update report following the next sampling which should be scheduled for October, 1988.

A copy of this report should be sent to the Alameda County Department of Environmental Health, and to the Regional Water Quality Control Board.

LIMITATIONS

Soil deposits and rock formations may vary in thickness, lithology, saturation, strength and other properties across any site. In addition, environmental changes, either naturally-occurring or artificially-induced, may cause changes in groundwater 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 investigations. 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.

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

Sincerely,

Kaprealian Engineering, Inc.

Jean Semansky
Geologist

Jae Yang, P.E.

Lic. #25337
Exp. Date 12/3/89

Attachments: Tables 1 & 2
Location Plan
Laboratory Analyses
Chain of Custody

Table -1
Summary of Monitoring Data

Date	Well No.	Depth to Water (feet)	Sheen	Odor	Water Bailed (gallons)
5/18/88	MW-1	10.339	None	None	25
	MW-2	10.619	None	None	25
	MW-3	10.484	None	None	25
	MW-4	10.682	None	None	25
6/29/88	MW-1	10.729	None	Slight	25
	MW-2	10.970	None	None	21
	MW-3	11.071	None	None	22
	MW-4	10.990	None	None	23
7/25/88	MW-1	10.802	None	Slight	25
	MW-2	11.063	None	None	25
	MW-3	11.198	None	None	23
	MW-4	11.223	None	None	25

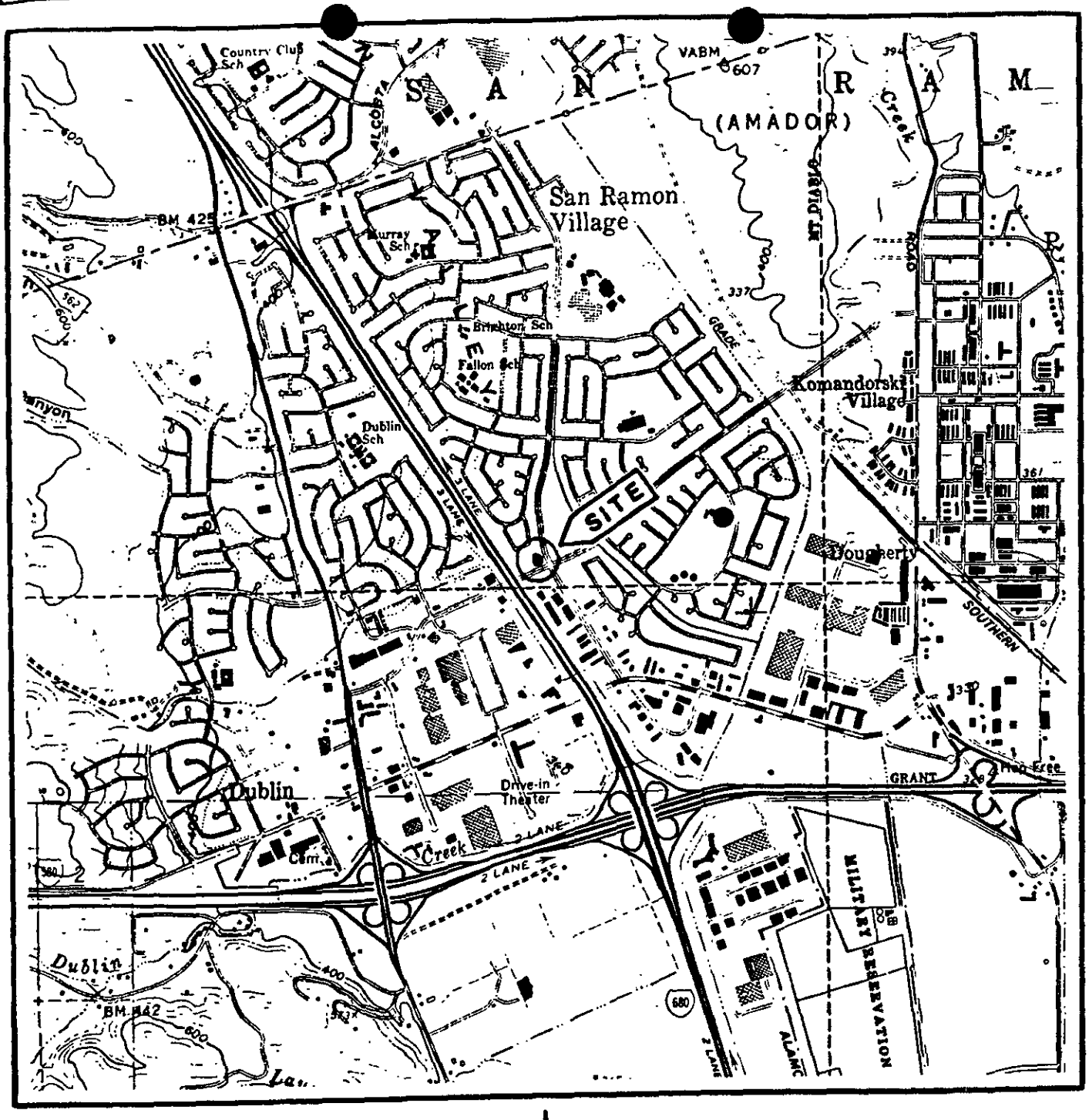
Table -2

Summary of Laboratory Analyses
(Parts per billion)

Date	Sample Well #	Depth (feet)	TPH Gasoline	TPH Diesel	Benzene	Toluene	Xylene
7/25/88	MW-1	10.875	6100	---	170	2.1	94
	MW-2	11.088	ND	---	ND	ND	ND
	MW-3*	11.250	--	ND	ND	ND	ND
	MW-4	11.083	ND	---	ND	ND	ND
4/29/88	MW-1	10.250	10,000	---	960	17	1500
	MW-2	10.479	170	---	2.7	0.6	13
	MW-3	10.604	ND	---	ND	ND	ND
	MW-4	10.542	ND	---	ND	ND	ND

TPH = Total Petroleum Hydrocarbons
ND = Not Detected

* Halogenated Volatile Organics were not detected.



Source: U.S. Geological Survey
7.5-Minute Quadrangle
Dublin
Photorevised 1980

N

Approximate Scale

2000 1000 0 2000 4000

feet

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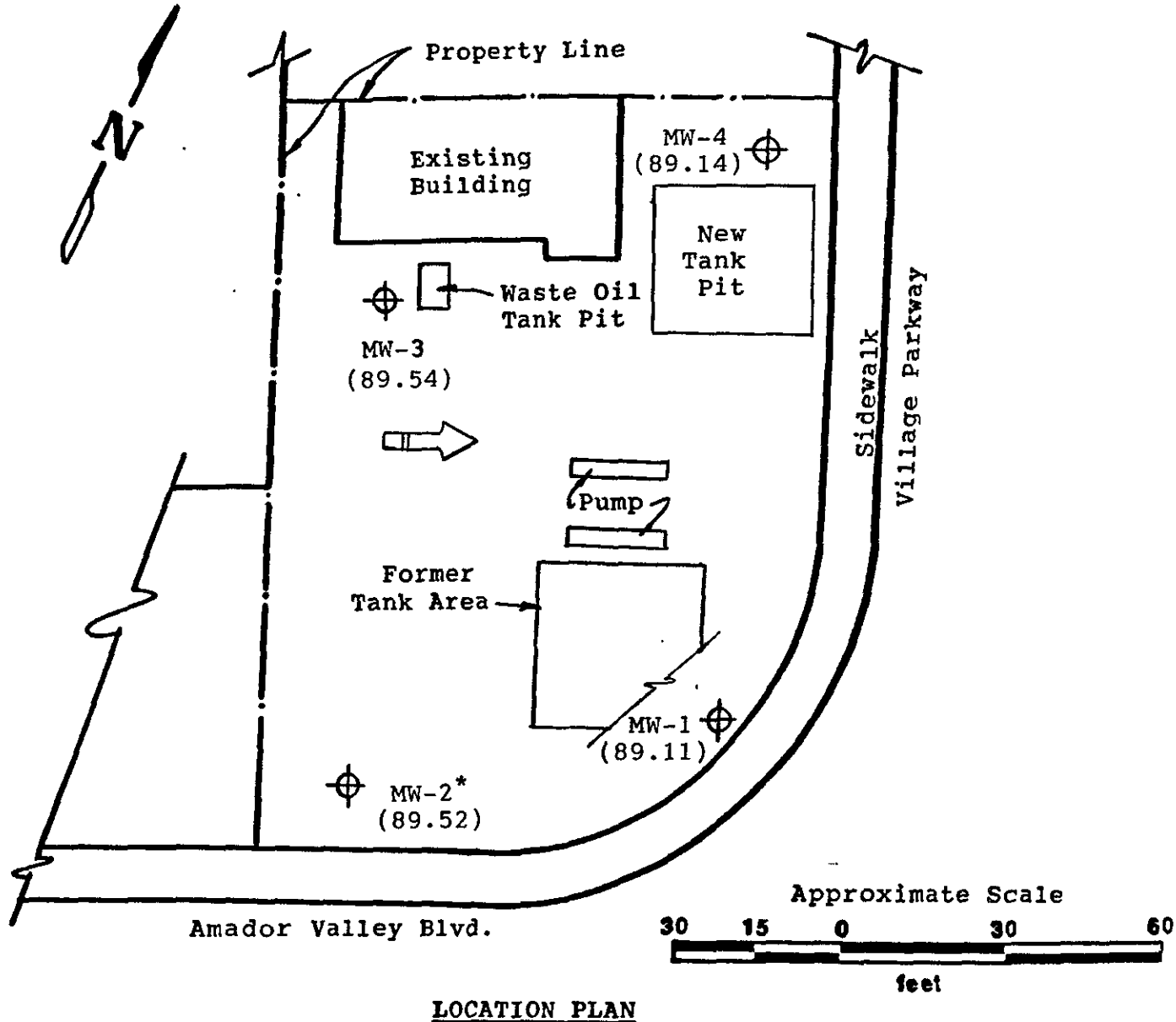

LOCATION PLAN

⊕ Monitoring Well

( ) Groundwater Elevation in feet (4-29-88)

⇨ Direction of Groundwater flow

* Surface Elevation of MW-2 Assumed 100' as datum

UNOCAL STATION # 5366
7375 Amador Valley Blvd.
Dublin, California

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222 • FAX (415) 364-9233

Kaprealian Engineering, Inc.
P.O. Box 913
Benicia, CA 94510
Attn: Mardo Kaprealian, P.E.
President

Date Sampled: 07/25/88
Date Received: 07/26/88
Date Analyzed: 08/01/88
Date Reported: 08/02/88

Project: Unocal, Dublin, Village Pkwy/Amador

TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTEX DISTINCTION

Sample Number	Sample Description	Low to Medium Boiling Point Hydrocarbons	Benzene	Toluene	Ethyl Benzene	Xylenes
	Water	ppb	ppb	ppb	ppb	ppb
8071999	MW-1	6100	170	2.1	430	94
8072000	MW-2	N.D.	N.D.	N.D.	N.D.	N.D.
8072002	MW-4	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		50	0.5	0.5	0.5	0.5

Method of Analysis: EPA 5030/8015/8020

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

SEQUOIA ANALYTICAL LABORATORY

Scot Coca

Arthur G. Burton
Laboratory Director

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TOTAL PETROLEUM HYDROCARBONS

Sample Number	Sample Description	Detection Limit	High Boiling Point Hydrocarbons
	Water	ppb	ppb
8072001	MW-3	50	N.D.

Method of Analysis: EPA 3510/8015

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

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HALOGENATED VOLATILE ORGANICS

Sample Number: 8072001

Sample Description: Water, MW-3

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	N.D.
1,1-Dichloroethene	1.0	N.D.
trans-1,2-Dichloroethene	1.0	N.D.
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	N.D.
1,1,1-Trichloroethane	0.5	N.D.
1,1,2-Trichloroethane	0.5	N.D.
Trichloroethene	0.5	N.D.
Trichlorofluoromethane	1.0	N.D.
Vinyl chloride	2.0	N.D.

Method of Analysis: EPA 5030/8010
Analytes reported as N.D. were not present above the stated limit of detection.

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Project: Unocal, Dublin,
Village Pkwy/Amador

AROMATIC VOLATILE ORGANICS

Sample Number	Sample Description
8072001	Water, MW-3

Analyte	Detection Limit µg/L	Sample Results µg/L
Benzene	0.5	N.D.
Chlorobenzene	1.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,2-Dichlorobenzene	2.0	N.D.
Ethyl Benzene	0.5	N.D.
Toluene	0.5	N.D.
Xylenes	0.5	N.D.

Method of Analysis: EPA 5030/8020

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

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CHAIN OF CUSTODY

SAMPLER: Ray(KEI) (signature) DATE/TIME OF COLLECTION: 7/25/88 TURN AROUND TIME: 1 Week

SAMPLE DESCRIPTION AND PROJECT NUMBER: UNOCAL DUBLIN VILLAGE PKWY / AMADOR

SAMPLE #	ANALYSES	GRAB OR COMP.	NUMBER OF CONTAINERS	SOIL/ WATER	
MW1	TPH, BTXE	Grab	2	W	8071999
MW2	" "	"	2	W	8072000
MW4	" "	"	2	W	8072002
MW3	TPHas Diesel	Grab	2U+	W	8072001
	601-602		1 Lit		

RELINQUISHED BY*	TIME/DATE	RECEIVED BY*	TIME/DATE
1. Ray(KEI)	7/25/88 6.00 PM	A. Butler Signature	6:00 7/25/88
2.			
3.			
4.			

* STATE AFFILIATION NEXT TO SIGNATURE

REMARKS: