KAPREALIAN ENGINEERING
INCORPORATED

KEI-P88-1204.QR12
November 25, 1992

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

Attention: Mr. Edward C. Ralston

RE: Quarterly Report
Former Unocal Service Station #2512
1300 Davis Street
San Leandro, California

Dear Mr. Ralston:

This report presents the results of the most recent quarter of monitoring and sampling of the monitoring wells at the referenced site by Kaprealian Engineering, Inc. (KEI), per KEI's proposal (KEI-P88-1204.P6) dated July 15, 1992. The wells are currently monitored monthly and sampled on a quarterly basis, except for wells MW1 and MW5, which are no longer sampled. This report covers the work performed by KEI from June through October of 1992.

BACKGROUND

The subject site formerly contained a Unocal service station facility. The station building, pump islands, and other station facilities have been demolished and removed from the site. Six exploratory borings were drilled at the site in January of 1989. Subsequently, contaminated soil in the vicinity of boring EB6 was overexcavated laterally (20'x15') to the ground water depth (17 feet below grade). Seven monitoring wells have been installed at the site. Free product has been detected intermittently in one well (MW3). Two underground gasoline storage tanks, a waste oil tank, and the product piping were removed from the site in July 1992. Soil excavation activities are currently ongoing at the site. Borings installed by others on adjacent properties have shown EPA Method 8010 constituent contamination. This contamination apparently originated from a nearby former dry cleaning operation.

A site description, detailed background information including a summary of all of the soil and ground water subsurface investigation/remediation work conducted to date, site hydrogeologic conditions, and tables that summarize all of the soil and ground water sample analytical results are presented in KEI's quarterly report (KEI-P88-1204.QR11) dated July 14, 1992.

2401 Stanwell Drive Suite 400
Concord, California 94520
Tel 510 602 5100 Fax 510 687 0602

RECENT FIELD ACTIVITIES

The seven monitoring wells (MW1 through MW7) were monitored three times during the period from June through October of 1992. KEI was unable to monitor or sample the seven wells during the scheduled sampling event for August of 1992 due to the tank removal and soil excavation activities that were ongoing at that time. KEI was also unable to monitor the wells during September of 1992. Monitoring wells MW2, MW6, and MW7 were sampled once during October of 1992. Monitoring well MW4 was inaccessible for sampling, well MW3 was not sampled due to the presence of free product, and wells MW1 and MW5 are no longer sampled. During monitoring, the wells were checked for depth to water and the presence of free product. Prior to sampling, wells MW2, MW6, and MW7 were also checked for the presence of a sheen. No free product or sheen was noted in any of the wells during the reporting period, except for free product observed in well MW3 during all of the monitoring events. The monitoring data collected this quarter are summarized in Table 1.

Water samples were collected from wells MW2, MW6, and MW7 on October 30, 1992. Prior to sampling, the wells were each purged of between 10 and 11 gallons of water by the use of a surface pump. The samples were collected by the use of a clean Teflon bailer. The samples were decanted into clean VOA vials that were then sealed with Teflon-lined screw caps and stored in a cooler, on ice, until delivery to a state-certified laboratory.

HYDROLOGY

The measured depth to ground water at the site on October 30, 1992, ranged between 16.31 and 17.38 feet below grade. The water levels in all of the accessible wells have shown net decreases ranging from 0.68 to 1.08 feet since May 26, 1992. Based on the water level data gathered during the quarter, the ground water flow direction appeared to be predominantly to the west (varying from west to southwest), as shown on the attached Figures 1, 2, and 3. The average hydraulic gradient across the site on October 30, 1992, was approximately 0.002.

During the July 1992 monitoring event, KEI discovered that the Christy boxes for wells MW2 through MW5 were damaged. Since the wells were each previously surveyed to Mean Sea Level (MSL) at the top of the Christy box (well cover), the reference elevations previously determined for these wells are no longer accurate. Therefore, the ground water elevations for these wells are unknown.

WELL SURVEY

As previously recommended, KEI reviewed additional data from the files of the County of Alameda Public Works Agency (CAPWA). The well survey primarily focused on the area northeast of and within a 1/2-mile radius of the Unocal site. The purpose of the well survey was to locate any active water wells that potentially could influence ground water flow direction at the site. The ground water flow direction at the subject site changed from a predominantly west-southwesterly direction to a generally northeasterly direction during the February, March, and April 1992 monitoring events.

Six sites with existing monitoring/testing wells are located within this area, and are listed in Table 4. Caterpillar, Inc. has three sites where a total of 18 wells are located. The City of San Leandro site contains three wells, and two other sites contain one well each. Four other wells designated as irrigation (2) and industrial (2) are also located within this area and are listed in Table 5.

In addition to wells located to the northeast of the Unocal site, up to 18 irrigation wells are located on Virginia Street, which extends west-southwest of the site. These wells are between 20 and 30 feet deep. The current status of these wells is not known to KEI.

ANALYTICAL RESULTS

The ground water samples were analyzed at Sequoia Analytical Laboratory and were accompanied by properly executed Chain of Custody documentation. The samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline by EPA method 5030/modified 8015, benzene, toluene, xylenes, and ethylbenzene (BTX&E) by EPA method 8020, and for EPA method 8010 constituents.

The ground water sample analytical results are summarized in Tables 2 and 3. The concentrations of TPH as gasoline and benzene detected in the ground water samples collected this quarter are shown on the attached Figure 4. Copies of the laboratory analytical results and the Chain of Custody documentation are attached to this report.

DISCUSSION AND RECOMMENDATIONS

As previously discussed, KEI conducted an additional well survey during the quarter in order to identify active water wells that could influence ground water flow direction at the Unocal site. A

number of wells were located. However, the ground water flow at the site during this quarter was in a westerly to southwesterly direction, consistent with the previous predominant direction. KEI recommends that in the event the ground water flow direction again changes from the predominant west to southwest direction, a site reconnaissance be conducted to locate any pumping wells among the wells identified during the well survey.

As discussed previously in this report, KEI recently discovered that the Christy boxes for Unocal's monitoring wells MW2 through MW5 were damaged during the recent tank removal and soil excavation activities conducted at the site. Additional soil excavation work has been proposed for this site. Upon completion of the soil excavation activities, KEI will inspect the well casings for these wells in order to determine whether the wells were damaged. KEI will repair the wells (if necessary), replace or repair the Christy boxes, and then resurvey all of the wells to MSL. KEI recommends that the current monthly monitoring and quarterly sampling program be temporarily discontinued until all of the excavation work is completed and the wells have been inspected and repaired (as necessary).

DISTRIBUTION

A copy of this report should be sent to the Alameda County Health Care Services Agency, to Mr. Dan Sullivan of the City of San Leandro, 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 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, 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 (510) 602-5100.

Sincerely,

Kaprealian Engineering, Inc.

Thomas J. Berkins

Thomas J. Berkins
Senior Environmental Engineer

Joel G. Greger

Joel G. Greger, C.E.G.
Senior Engineering Geologist

License No. 1633
Exp. Date 6/30/94

Timothy R. Ross

Timothy R. Ross
Project Manager

/bp

Attachments: Tables 1 through 5
Location Map
Ground Water Flow Direction Maps - Figures 1, 2 & 3
Concentrations of Petroleum Hydrocarbons - Figure 4
Laboratory Analyses
Chain of Custody documentation

KEI-P88-1204.QR12
November 25, 1992

TABLE 1

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

Well #	Ground Water Elevation (feet)	Depth to Water (feet)	Product Thickness (feet)	Sheen	Water Purged (gallons)
(Monitored and Sampled on October 30, 1992)					
MW1*	16.11	16.58	0	--	0
MW2	***	17.38	0	No	11
MW3	***	17.08	0.07	N/A	0
MW4	WELL WAS INACCESSIBLE				
MW5	WELL WAS INACCESSIBLE				
MW6	16.12	17.07	0	No	11
MW7	15.78	16.31	0	No	10
(Monitored on July 24, 1992)					
MW1	16.15	16.54	0	--	0
MW2	***	16.66	0	--	0
MW3	WELL WAS INACCESSIBLE				
MW4	***	16.10	0	--	0
MW5	***	16.73	0	--	0
MW6	16.19	17.00	0	--	0
MW7	15.83	16.26	0	--	0
(Monitored and Purged on July 6, 1992)					
MW3	16.24**	16.60	0.14	N/A	54
(Monitored on June 23, 1992)					
MW1	16.44	16.25	0	--	0
MW2	16.28	16.76	0	--	0
MW3	16.26**	16.52	0.06	N/A	0
MW4	16.36	16.02	0	--	0
MW5	16.39	16.63	0	--	0
MW6	16.49	16.70	0	--	0
MW7	16.29	15.80	0	--	0
(Monitored and Purged on June 9, 1992)					
MW3	16.46**	16.29	0.03	N/A	55 with 2 oz. of product

KEI-P88-1204.QR12
November 25, 1992

TABLE 1 (Continued)

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

Well #	Surface Elevation**** (feet)
MW1	32.69
MW2	33.04
MW3	32.73
MW4	32.38
MW5	33.02
MW6	33.19
MW7	32.09

* Monitored only.

** Ground water elevations were corrected for presence of free product by the use of an assumed specific gravity 0.77.

*** The Christy boxes for wells MW2 through MW5 were damaged during recent tank removal and soil excavation activities at the site; therefore, the ground water elevation could not be accurately determined.

**** The elevations of the tops of the well covers have been surveyed relative to MSL.

-- Sheen determination was not performed.

KEI-P88-1204.QR12
November 25, 1992

TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Well #	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	TOG (ppm)
10/30/92	MW1	NOT SAMPLED						
	MW2	--	1,200♦	ND	ND	ND	ND	--
	MW3	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT						
	MW4	WELL WAS INACCESSIBLE						
	MW5	NOT SAMPLED						
	MW6	--	ND	ND	ND	ND	ND	--
	MW7	--	ND	ND	ND	ND	ND	--
5/26/92	MW1	NOT SAMPLED						
	MW2	--	2,900	8.8	9.3	36	54	--
	MW3*	2,400,000	1,300,000	5,100	66,000	160,000	20,000	880
	MW4	ND	120	0.59	0.82	1.9	ND	--
	MW5	NOT SAMPLED						
	MW6	--	ND	ND	ND	0.65	ND	--
	MW7	--	ND	ND	ND	0.60	ND	--
2/27/92	MW1	NOT SAMPLED						
	MW2	--	330	12	12	93	10	--
	MW3	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT						
	MW4	ND	43	ND	1.0	2.5	0.37	--
	MW5	NOT SAMPLED						
	MW6	--	ND	3.2	ND	3.8	ND	--
	MW7	--	38	ND	0.97	4.0	0.69	--
11/19/91	MW1	NOT SAMPLED						
	MW2	--	220	2.5	8.4	14	2.4	--
	MW3	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT						
	MW4	ND	ND	ND	ND	ND	ND	--
	MW5	NOT SAMPLED						
	MW6	--	ND	ND	ND	ND	ND	--
8/15/91	MW1	NOT SAMPLED						
	MW2	--	ND	ND	ND	ND	ND	ND
	MW3	NOT SAMPLED DUE TO A TRACE OF FREE PRODUCT						
	MW4	ND	ND	ND	ND	ND	ND	ND
	MW5	NOT SAMPLED						
	MW6	--	ND	ND	ND	ND	ND	ND

KEI-P88-1204.QR12
November 25, 1992

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Well #	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	TOG (ppm)
5/24/91	MW1	--	ND	ND	ND	ND	ND	ND
	MW2	--	ND	1.5	ND	ND	ND	ND
	MW3	2,000	23,000	940	3,400	2,600	590	ND
	MW4	ND	ND	0.64	ND	ND	ND	ND
	MW5	ND	ND	ND	ND	ND	ND	ND
	MW6	--	ND	ND	ND	ND	ND	ND
2/04/91	MW1	ND	ND	ND	0.31	0.62	ND	ND
	MW2	ND	ND	ND	0.38	0.87	ND	ND
	MW3	NOT SAMPLED DUE TO A TRACE OF FREE PRODUCT						
	MW4	ND	ND	ND	0.72	1.1	ND	ND
	MW5	ND	ND	ND	0.35	ND	ND	ND
	MW6	ND	ND	ND	ND	ND	ND	ND
11/06/90	MW1	ND	ND	ND	ND	ND	ND	ND
	MW2	ND	ND	ND	0.42	1.4	ND	ND
	MW3	940	16,000	820	1,500	770	2,200	ND
	MW4	ND	ND	ND	0.36	0.98	ND	ND
	MW5	ND	ND	ND	ND	ND	ND	ND
	MW6	ND	ND	1.6	0.35	ND	ND	ND
8/09/90	MW1	ND	ND	ND	ND	ND	ND	ND
	MW2	ND	ND	ND	ND	ND	ND	ND
	MW3	500	1,900	56	140	140	31	ND
	MW4	ND	ND	ND	ND	ND	ND	ND
	MW5	ND	ND	ND	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND	ND	ND
5/10/90	MW1	ND	ND	ND	ND	ND	ND	ND
	MW2	ND	43	ND	1.0	ND	ND	ND
	MW3	850	6,200	94	460	540	160	2.8
	MW4	88	54	ND	2.0	0.37	ND	ND
	MW5	83	ND	ND	ND	0.31	ND	ND
	MW6	ND	ND	ND	1.2	ND	ND	ND

KEI-P88-1204.QR12
November 25, 1992

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Well #	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	TOG (ppm)
2/23/90	MW1	ND	ND	ND	ND	ND	ND	ND
	MW2	ND	44	ND	ND	ND	ND	ND
	MW3	350	ND	0.32	ND	ND	ND	1.3
	MW4	ND	ND	ND	ND	ND	ND	ND
	MW5	ND	ND	ND	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND	ND	ND
11/21/89	MW1	ND	ND	ND	ND	ND	ND	8.9
	MW2	ND	48	ND	0.51	ND	ND	1.6
	MW3	110	1,900	ND	ND	ND	ND	3.8
	MW4	ND	ND	ND	ND	ND	ND	ND
	MW5	70	ND	ND	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND	ND	ND
8/29/89	MW4	120	ND	ND	ND	ND	ND	ND
	MW5	100	ND	ND	0.94	ND	0.30	ND
	MW6	ND	ND	ND	ND	ND	ND	ND
8/10/89	MW1	ND	ND	ND	ND	ND	ND	ND
	MW2	ND	ND	ND	0.39	ND	ND	ND
	MW3	860	3,200	73	140	240	35	ND
4/25/89	MW1	100	ND	0.31	ND	ND	ND	--
	MW2	ND	32	0.35	ND	ND	ND	--
	MW3	5,700	56	ND	ND	0.49	0.31	--

-- Indicates analysis was not performed.

ND = Non-detectable.

♦ Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be gasoline.

* Free product was detected in well MW3; however, a water sample was collected and analyzed to determine if the product was predominantly hydrocarbon based.

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

KEI-P88-1204.QR12
November 25, 1992

TABLE 3

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Well #	Tetrachloroethene	1,1-Dichloroethane	1,1,1-Trichloroethane	Chloromethane	1,1-Dichloroethene	1,2-Dichlorobenzene
10/30/92	MW2	ND	ND	ND	ND	ND	ND
	MW3	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT					
	MW4	WELL WAS INACCESSIBLE					
	MW6	1.2	ND	ND	ND	ND	ND
	MW7	2.2	ND	ND	ND	ND	ND
5/26/92	MW2	ND	ND	ND	ND	ND	ND
	MW3	ND	ND	ND	ND	ND	ND
	MW4	2.4	13	3.5	ND	0.83	ND
	MW6	1.1	ND	ND	ND	ND	1.7
	MW7	2.2	ND	ND	ND	ND	ND
2/27/92	MW2	ND	ND	ND	ND	ND	ND
	MW3	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT					
	MW4	3.5	6.0	ND	ND	ND	ND
	MW6	1.5	ND	ND	ND	ND	1.6
	MW7	2.4	ND	ND	ND	ND	ND
11/19/91	MW2	ND	ND	ND	ND	ND	ND
	MW3	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT					
	MW4	3.4	ND	ND	ND	ND	ND
	MW6	1.3	ND	ND	ND	ND	ND
8/15/91	MW2	ND	ND	ND	ND	ND	ND
	MW3	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT					
	MW4	3.6	ND	ND	ND	ND	ND
	MW6	1.2	ND	ND	ND	ND	ND

TABLE 3 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Well #	Tetrachloro-ethene	1,1-Dichloro-ethane	1,1,1-Trichloro-ethane	Chloro-methane	1,1-Dichlo-roethene	1,2-Dichlo-robenzene
5/24/91	MW1	4.6	ND	ND	ND	ND	ND
	MW2	ND	ND	ND	ND	ND	ND
	MW3	ND	ND	ND	ND	ND	ND
	MW4	4.1	2.5	3.9	ND	ND	ND
	MW5	0.89	ND	ND	ND	ND	ND
	MW6	0.88	ND	ND	5.6	ND	ND
11/06/90	MW1	4.8	ND	ND	ND	ND	ND
	MW2	ND	ND	ND	ND	ND	ND
	MW3	ND	ND	ND	ND	ND	ND
	MW4	2.9	ND	ND	ND	ND	ND
	MW5	0.7	ND	ND	ND	ND	ND
	MW6	1.2	ND	ND	ND	ND	ND
4/25/89	MW1*	3.3	ND	ND	ND	ND	ND
	MW2	0.68	ND	ND	ND	ND	ND
	MW3	1.0	ND	ND	ND	ND	ND

NOTE: All EPA method 8010 constituents were non-detectable, except for those shown in the above table.

* Trichloroethene was detected at 0.55 ppb.

ND = Non-detectable.

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

TABLE 4

MONITORING/TESTING WELLS LOCATED IN THE NE QUADRANT OF STUDY AREA
(CAPWA DATA)

Well No.	Owner	Well Location	Well Depth (feet)	Depth Ground Water at Site (feet)
2S/3W 26N 3	Caterpillar Inc.	Lucille St.	66	22
N 4	Caterpillar Inc.	375 Preda	44	14
2S/3W 26M 3	W.M. Concrete Inc.	851 Peralta Ave.	30	21
2S/3W 26P 16	Caterpillar Inc.	800 Davis	39	22
26P 17	Caterpillar Inc.	800 Davis	39	22
26P 18	Caterpillar Inc.	800 Davis	40	21
2S/3W 26P 24	City of San Leandro	Davis & San Leandro	40	34
26P 25	City of San Leandro	Davis & San Leandro	41	30
26P 26	City of San Leandro	Davis & San Leandro	40	32
26P 27	Caterpillar	800 Davis	?	?
26P 28	Caterpillar	800 Davis	36	23
26P 29	Caterpillar	800 Davis	45	19
26P 30	Caterpillar	800 Davis	39	23
26P 31	Caterpillar	800 Davis	37	23
26P 32	Caterpillar	800 Davis	40	22
26P 33	Caterpillar	800 Davis	41	25
26P 34	Caterpillar	800 Davis	43	22
26P 35	Caterpillar	800 Davis	41	18
26P 36	Caterpillar	800 Davis	43	25
26P 37	Caterpillar	800 Davis	41	24
26P 38	Caterpillar	800 Davis	43	18
26P 39	Caterpillar	800 Davis	50	25
26P 40	Hertz Penske	2366 Alvarado	50	25

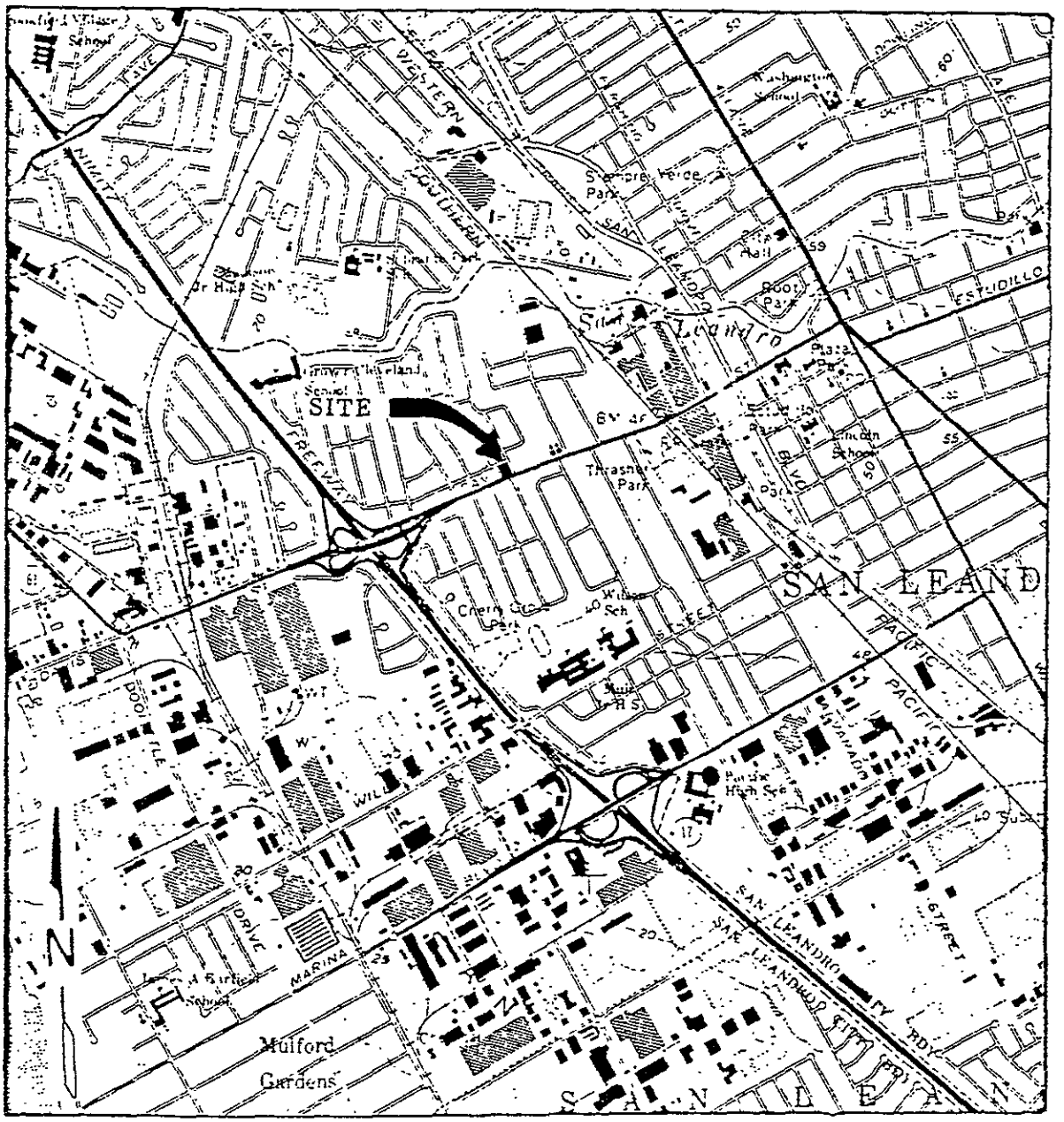
KEI-P88-1204.QR12
November 25, 1992

TABLE 5

OTHER WELLS LOCATED WITHIN THE NE QUADRANT OF STUDY AREA
(CAPWA DATA)

Well No.	Date Drilled	Owner	Use	Well Location	Well Depth (feet)	Depth to Ground Water at Site (feet)
2S/3W 26M1	11/66	Cherry City Nursery	Irrigation	1034 Peralta Ave.	340	--
2S/3W 26N1	1977	John Costa	Industrial	1052 Davis	66	--
2S/3W 26P1		Yacer Plumbing	Irrigation	1129A San Leandro Blvd.	41	31
2S/3W 26L1		Caterpillar Inc.	Industrial	Alvarado & Davis	92	32

NOTE: In addition, on Virginia Street, which is adjacent to the site and extends to the west-southwest from the site, as many as 18 domestic wells may still be in operation for irrigation purposes. These wells are between 20 and 30 feet deep. The depth to water in these wells is not known to KEI at this time.

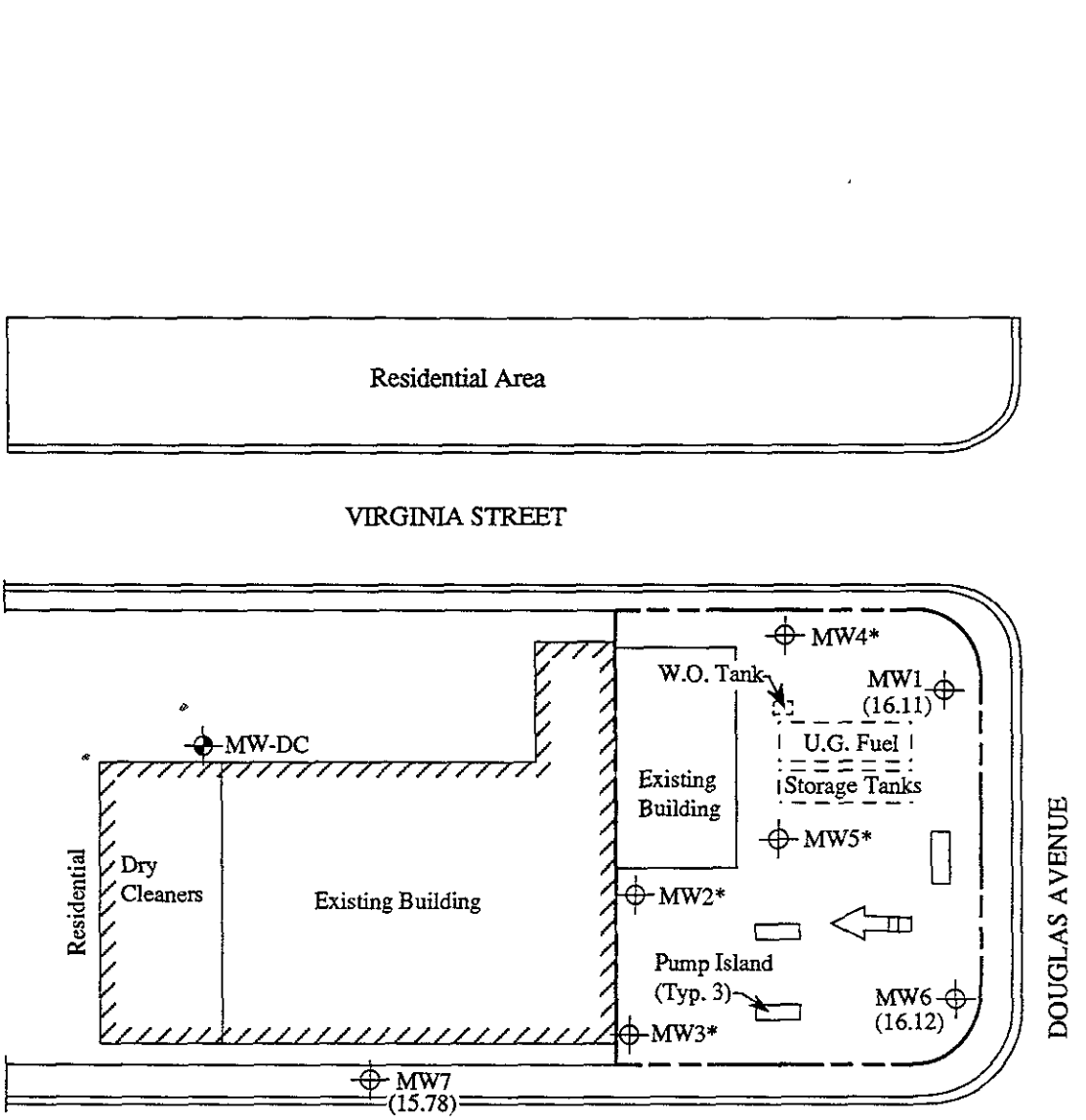


Base modified from 7.5 minute U.S G.S. San Leandro Quadrangle
(photorevised 1980)

0 2000 4000

Approx. scale feet

KAPREALIAN ENGINEERING INCORPORATED	UNOCAL SERVICE STATION #2512 1300 DAVIS STREET SAN LEANDRO, CA	LOCATION MAP



LEGEND

- Monitoring well (by KEI)
- Monitoring well (by others)
- ( ) Ground water elevation in feet above Mean Sea Level
- Direction of ground water flow
- * Ground water elevation data not available

0 50 100

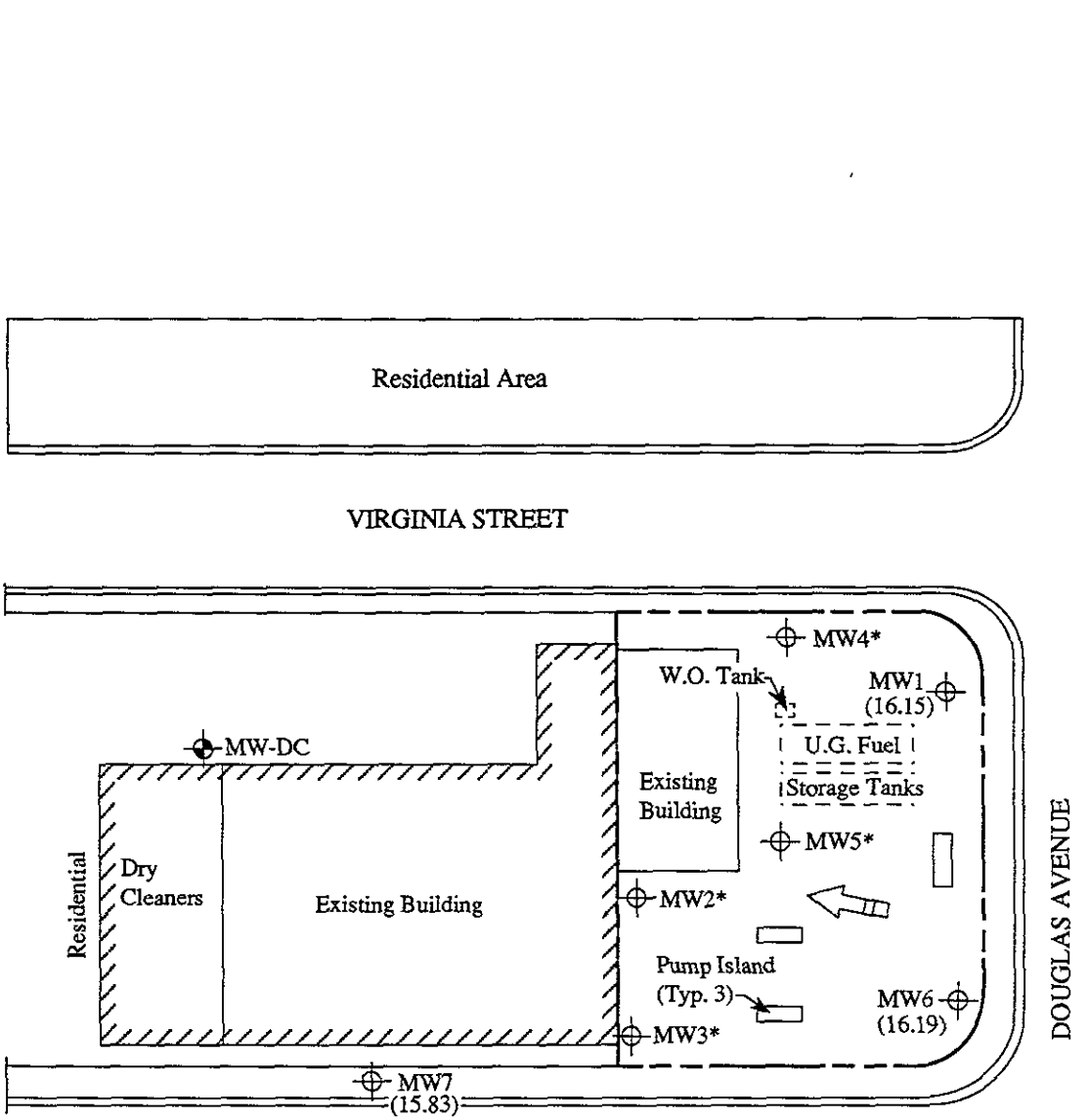
Approx. scale feet

GROUND WATER FLOW DIRECTION MAP FOR THE OCTOBER 30, 1992 MONITORING EVENT

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #2512
1300 DAVIS STREET
SAN LEANDRO, CA

FIGURE
1



LEGEND

- Monitoring well (by KEI)
- Monitoring well (by others)
- ( ) Ground water elevation in feet above Mean Sea Level
- Direction of ground water flow
- * Ground water elevation data not available

0 50 100

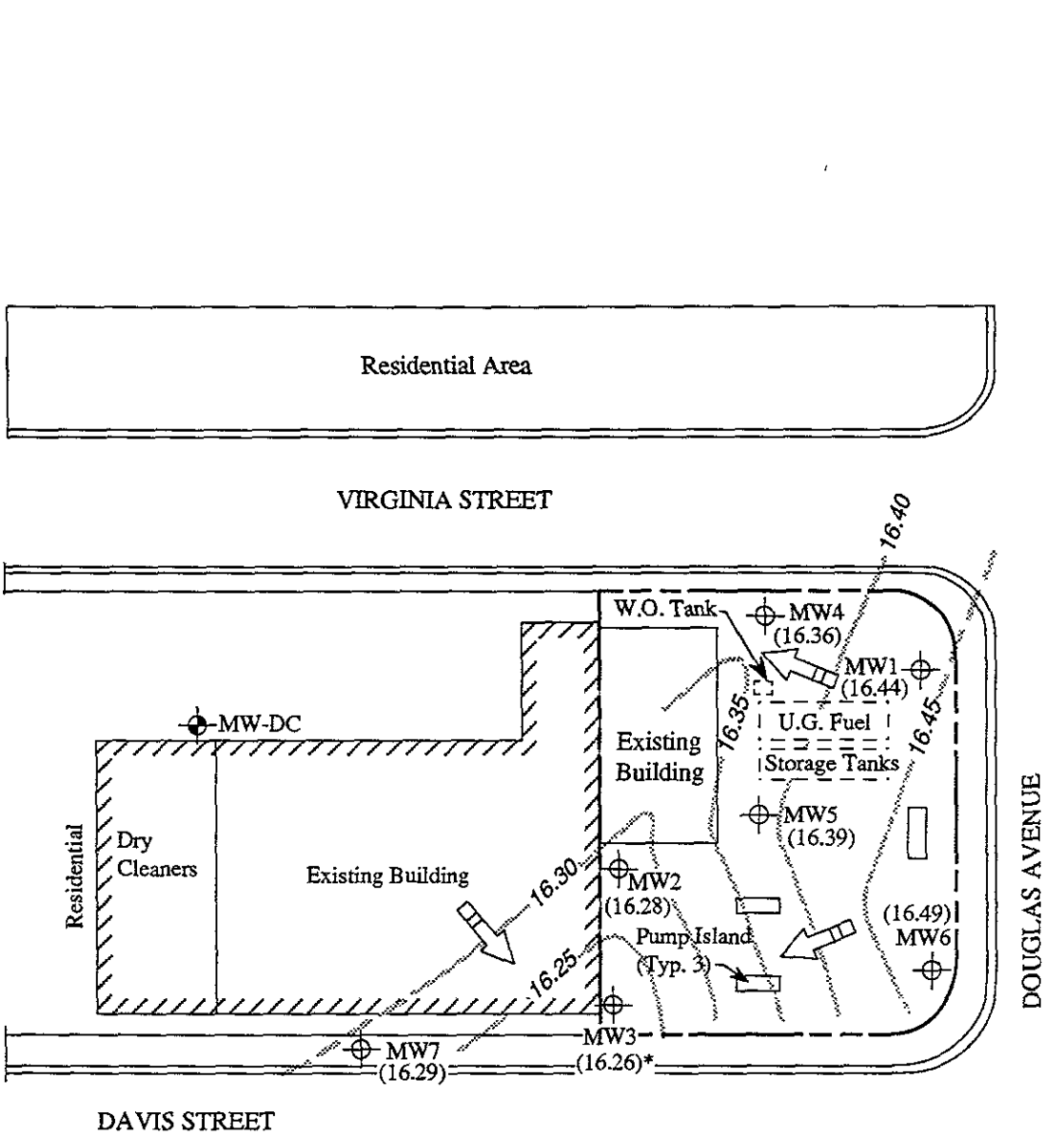
Approx. scale feet

GROUND WATER FLOW DIRECTION MAP FOR THE JULY 24, 1992 MONITORING EVENT

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #2512
1300 DAVIS STREET
SAN LEANDRO, CA

FIGURE
2



LEGEND

- Monitoring well (by KEI)
- Monitoring well (by others)
- ( ) Ground water elevation in feet above Mean Sea Level
- Direction of ground water flow
- Contours of ground water elevation
- * Ground water elevation corrected due to the presence of free product

0 50 100

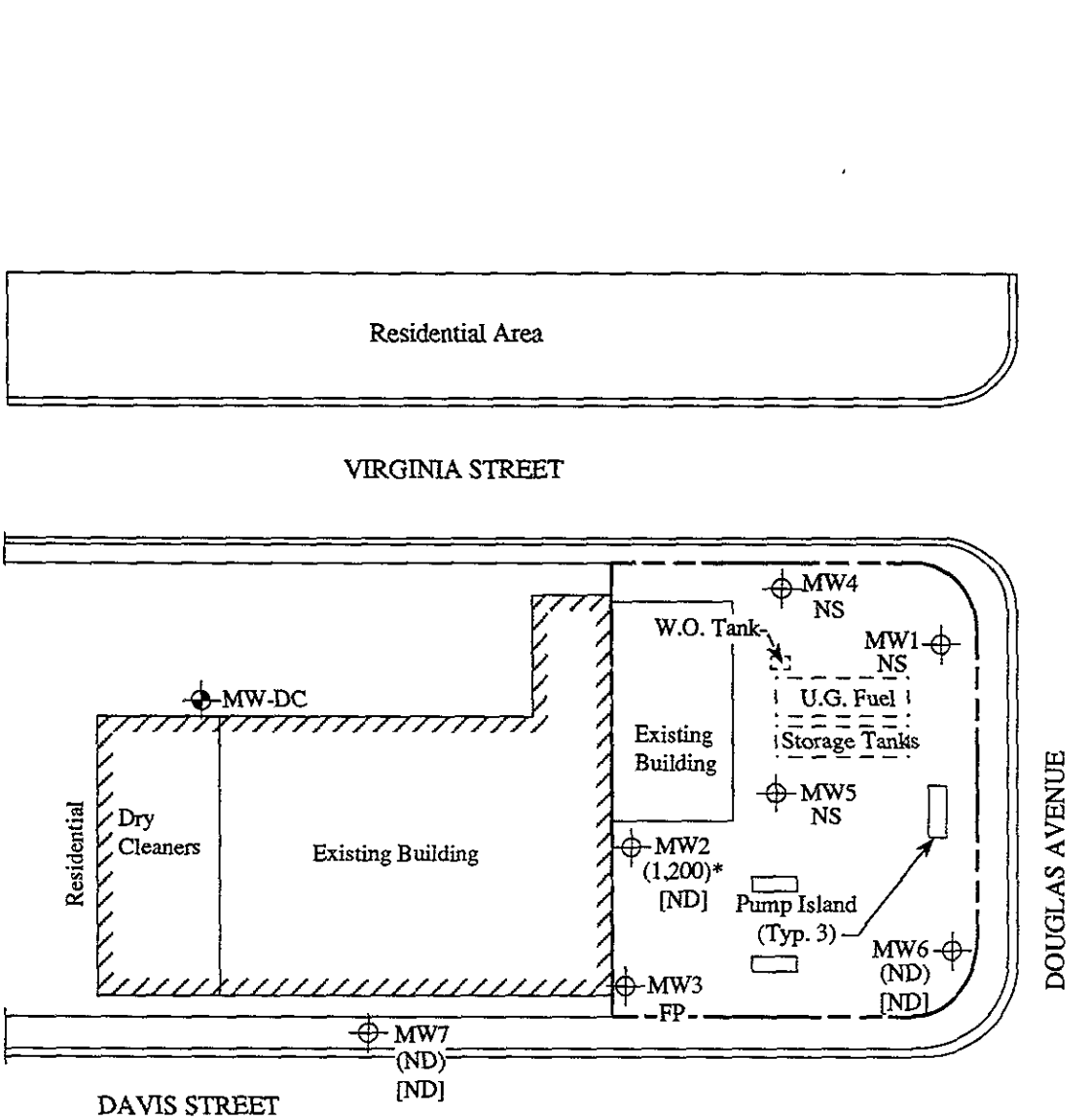
Approx. scale feet

POTENTIOMETRIC SURFACE MAP FOR THE JUNE 23, 1992 MONITORING EVENT

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #2512
1300 DAVIS STREET
SAN LEANDRO, CA

FIGURE
3



LEGEND

- Existing Monitoring Well (by KEI)
- Existing Monitoring Well (by others)
- ( ) Concentration of TPH as gasoline in ppb
- [ ] Concentration of benzene in ppb

NS = Not sampled

FP = Free product

ND = Non-detectable

* The lab reported that the hydrocarbons detected did not appear to be gasoline.

0 50 100

Approx. scale feet

PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUND WATER ON OCTOBER 30, 1992

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #2512
1300 DAVIS STREET
SAN LEANDRO, CA

FIGURE
4

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 1300 Davis St., San Leandro	Sampled:	Oct 30, 1992
2401 Stanwell Drive, Suite 400	Sample Matrix:	Water	Received:	Oct 30, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Reported:	Nov 13, 1992
Attention: Mardo Kaprealian, P.E.	First Sample #:	211-0020		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 211-0020 MW-2*	Sample I.D. 211-0021 MW-6	Sample I.D. 211-0022 MW-7	Sample I.D. Matrix Blank
Purgeable Hydrocarbons	50	1,200	N.D.	N.D.	
Benzene	0.5	N.D.	N.D.	N.D.	
Toluene	0.5	N.D.	N.D.	N.D.	
Ethyl Benzene	0.5	N.D.	N.D.	N.D.	
Total Xylenes	0.5	N.D.	N.D.	N.D.	
Chromatogram Pattern:		Discrete Peak	--	--	

Quality Control Data

Report Limit Multiplication Factor:	20	1.0	1.0	1.0
Date Analyzed:	11/4/92	11/3/92	11/3/92	11/3/92
Instrument Identification:	HP-4	HP-4	HP-4	HP-4
Surrogate Recovery, %: (QC Limits = 70-130%)	108	101	101	100

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard
Analytes reported as N.D. were not detected above the stated reporting limit

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Scott A. Chieffo
Project Manager

Please Note. * The above sample does not appear to contain gasoline. Purgeable Hydrocarbons are due mainly to an unidentified solvent peak in the MTBE range. Please note that this peak caused the Reporting Limit to be raised X 20

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 1300 Davis St., San Leandro	Sampled:	Oct 30, 1992
2401 Stanwell Drive, Suite 400	Sample Descript:	Water, MW-2	Received:	Oct 30, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8010	Analyzed:	Nov 10, 1992
Attention: Mardo Kaprealian, P.E.	Lab Number:	211-0020	Reported:	Nov 13, 1992

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

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

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 1300 Davis St., San Leandro	Sampled:	Oct 30, 1992
2401 Stanwell Drive, Suite 400	Sample Descript:	Water, MW-6	Received:	Oct 30, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8010	Analyzed:	Nov 10, 1992
Attention: Mardo Kaprealian, P.E.	Lab Number:	211-0021	Reported:	Nov 13, 1992

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	1.2
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

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

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Scott A. Chieffo
Project Manager

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 1300 Davis St., San Leandro	Sampled:	Oct 30, 1992
2401 Stanwell Drive, Suite 400	Sample Descript:	Water, MW-7	Received:	Oct 30, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8010	Analyzed:	Nov 10, 1992
Attention: Mardo Kapreallan, P.E.	Lab Number:	211-0022	Reported:	Nov 13, 1992

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	2.2
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

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

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Project Manager

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Kaprealian Engineering, Inc.
2401 Stanwell Drive, Suite 400
Concord, CA 94520
Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal, 1300 Davis St., San Leandro
QC Sample Group: 2110020-22
Reported: Nov 13, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020
Analyst:	J.F.	J.F.	J.F.	J.F.
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Nov 3, 1992	Nov 3, 1992	Nov 3, 1992	Nov 3, 1992
QC Sample #:	210-1063	210-1063	210-1063	210-1063
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	20	20	20	60
Conc. Matrix Spike:	20	21	21	71
Matrix Spike % Recovery:	100	105	105	118
Conc. Matrix Spike Dup.:	20	21	21	72
Matrix Spike Duplicate % Recovery:	100	105	105	120
Relative % Difference:	0.0	0.0	0.0	1.4

Laboratory blank contained the following analytes: None Detected

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Scott A. Chieffo
Project Manager

% 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

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Kaprealian Engineering, Inc.
2401 Stanwell Drive, Suite 400
Concord, CA 94520
Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal, 1300 Davis St., San Leandro
QC Sample Group: 2110020-22
Reported: Nov 13, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloroethene	Trichloro-ethene	Chloro-benzene
Method:	EPA 8010	EPA 8010	EPA 8010
Analyst:	K.Nill	K.Nill	K.Nill
Reporting Units:	µgL	µgL	µgL
Date Analyzed:	Nov 10, 1992	Nov 10, 1992	Nov 10, 1992
QC Sample #:	Matrix Blank	Matrix Blank	Matrix Blank
Sample Conc.:	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10
Conc. Matrix Spike:	11	11	10
Matrix Spike % Recovery:	110	110	100
Conc. Matrix Spike Dup.:	12	11	10
Matrix Spike Duplicate % Recovery:	120	110	100
Relative % Difference:	8.7	0.0	0.0

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.
Laboratory Blank contained the following analytes. None detected

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

% 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

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Kaprealian Engineering, Inc.
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Concord, CA 94520
Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal, 1300 Davis St., San Leandro
QC Sample Group: 2110020-22
Reported: Nov 13, 1992

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8010	EPA 8010	EPA 8010	EPA 8010
Analyst:	K. Nill	K. Nill	K. Nill	K. Nill
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Nov 10, 1992	Nov 10, 1992	Nov 10, 1992	Nov 10, 1992
Sample #:	211-0020	211-0021	211-0022	Matrix Blank
Surrogate #1 % Recovery:	94	96	96	91
Surrogate #2 % Recovery:	97	96	99	96

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

% 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: Varttes

WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal / San Leandro, 1300 Davis St.

TURN AROUND TIME: Regular

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPHG & BTXE	8010						REMARKS
MW 2	10/30/92	12:00 Noon		X	X		4	Monitoring well	X	X						2110020AD
MW 6	"	|		X	X		4	" "	X	X						021AD
MW 7	"	2:05 pm		X	X		4	" "	X	X						022AD

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[illegible]	10/30/92 3:10	[illegible] 10/30/92 1510
K. Graves	10:00 am 1305 11-2-92	[illegible]
[illegible]	11-2-92 1421	[illegible]

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	Title	Date
[illegible]	Analyst	10/30/92