


KAPREALIAN ENGINEERING
INCORPORATED

reviewed
12/2/92
sas

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November 17, 1992

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

Attention: Mr. Scott Seery

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

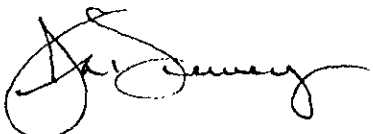
Dear Mr. Seery:

Per the request of Mr. Dave Camille of Unocal Corporation, enclosed please find our report dated November 12, 1992, for the above referenced site.

If you should have any questions, please feel free to call our office at (510) 602-5100.

Sincerely,

Kaprealian Engineering, Inc.



Judy A. Dewey

jad\82

Enclosure

cc: Dave Camille, Unocal Corporation

Review
12/2/92
SOS

KEI-P89-0301.QR12
November 12, 1992

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

Attention: Mr. Dave Camille

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

Dear Mr. Camille:

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-P89-0301.P4) dated July 23, 1991, and as modified in KEI's quarterly report (KEI-P89-0301.QR11) dated August 18, 1992. The wells are currently monitored and sampled on a quarterly basis. This report covers the work performed by KEI from August through October of 1992.

BACKGROUND

The subject site currently contains a Unocal service station facility. Two underground gasoline storage tanks, one waste oil tank, and the product piping were removed from the site in March of 1989 during tank replacement activities. The fuel tank pit and the waste oil tank pit were subsequently overexcavated in order to remove contaminated soil. Four monitoring wells and two exploratory borings have been installed at the site. On February 1, 1990, well MW2 was destroyed in preparation for additional soil excavation in the vicinity of this well. Soil excavation in the vicinity of well MW2 was completed in April of 1990. Monitoring well MW2 was then replaced with a new well (MW2A) in March of 1991. A water well survey has also been performed within a one-half mile radius of the site.

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-P89-0301.QR10) dated June 2, 1992.

RECENT FIELD ACTIVITIES

The four wells (MW1, MW2A, MW3, and MW4) were monitored twice and were sampled once during the quarter. During monitoring, the wells were checked for depth to water and the presence of free product. Prior to sampling, the wells were also checked for the presence of a sheen. No free product or sheen was noted in any of the wells during the quarter. The monitoring data collected this quarter are summarized in Table 1.

Water samples were collected from the wells on October 20, 1992. Prior to sampling, the wells were each purged of between 9 and 10 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 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 a state-certified laboratory.

HYDROLOGY

The measured depth to ground water at the site on October 20, 1992, ranged between 10.14 and 11.84 feet below grade. The water levels in all of the wells have shown net decreases ranging from 0.08 to 0.18 feet since July 20, 1992. Based on the water level data gathered during the quarter, the ground water flow direction appeared to be to the northwest, as shown on the attached Potentiometric Surface Maps, Figures 1 and 2. The flow direction reported this quarter is similar to the northwesterly flow direction reported in the previous four quarters. The average hydraulic gradient across the site on October 20, 1992, was approximately 0.002.

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, TPH as diesel by EPA method 3510/modified 8015, 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 3, and the concentrations of tetra-

chloroethene and trichloroethene 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

Based on the analytical results of the samples collected and evaluated to date, KEI recommends the continuation of the current ground water monitoring and sampling program for the existing wells, per KEI's proposal (KEI-P89-0301.P4) dated July 23, 1991, and as modified in KEI's quarterly report (KEI-P89-0301.QR11) dated August 18, 1992.

As shown in Table 2, Sequoia Analytical Laboratory has reported that the hydrocarbons detected in the ground water samples collected from wells MW3 and MW4 during the past four quarters of sampling did not appear to be gasoline. The laboratory further reported (see attached laboratory analytical sheets) that the hydrocarbons detected in wells MW3 and MW4 are "due to solvent peaks in the EPA 8010 range." The EPA method 8010 analyses performed on the ground water samples collected from all four wells during the past two quarters of sampling (see Table 3) confirms the presence of several chlorinated solvents in the ground water. The highest concentrations of the chlorinated solvents are detected in Unocal's upgradient monitoring wells MW3 and MW4, as shown on the attached Figure 4. Based on the northwesterly ground water flow direction at the site, it appears that the source of the chlorinated solvent contamination detected in the ground water may be from an off-site source(s).

In order to determine potential sources of the chlorinated solvent contamination, KEI recommends that the following tasks be conducted during the upcoming quarter:

1. Conduct a site reconnaissance to determine whether any businesses that use solvents (dry cleaners, photo labs., etc.) are located upgradient (south, southeast, and east) of the Unocal site.
2. Review Unocal's historical General Arrangement Plans to determine whether any potential sources of solvent contamination may have previously existed in the vicinity of wells MW3 and MW4.
3. Review Unocal's real estate files to determine the previous uses of the site (prior to Unocal's occupation of the site).

This task may also involve conducting a title search for the subject parcel.

4. Contacting the Alameda County Health Care Services Agency (ACHCS) to obtain any information on known solvent contamination sources that may exist in the vicinity of the Unocal site.

Based on the results of the above tasks, KEI will make further recommendations for any additional subsurface investigation work that may be warranted for the Unocal site.

off-site well access

Lastly, KEI previously recommended the installation of one additional downgradient well (MW5), as shown on the attached Figure 5. The proposed location of this well has been changed twice due to access problems and the presence of underground utilities. As of the date of this report, KEI understands that Unocal is in the process of obtaining off-site access permission for this well, but has experienced delays because the property is in receivership. KEI will proceed with the well installation as soon as off-site access permission and the necessary permits are obtained.

DISTRIBUTION

A copy of this report should be sent to Mr. Scott Seery of the ACHCS, to 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
Senior Environmental Engineer



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

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



Timothy R. Ross
Project Manager

/bp

Attachments: Tables 1, 2 & 3
Location Map
Potentiometric Surface Maps - Figures 1 and 2
Concentrations of Petroleum Hydrocarbons - Figure 3
Concentrations of Chlorinated Solvents - Figure 4
Proposed Well Location Map - Figure 5
Laboratory Analyses
Chain of Custody documentation

TABLE 1

SUMMARY OF MONITORING DATA

<u>Well No.</u>	<u>Ground Water Elevation (feet)</u>	<u>Depth to Water (feet)</u>	<u>Product Thickness (feet)</u>	<u>Sheen</u>	<u>Water Purged (gallons)</u>
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(Monitored and Sampled on October 20, 1992)

MW1	21.96	10.79	0	No	10
MW2A	21.94	11.84	0	No	10
MW3	22.19	10.37	0	No	9
MW4	22.18	10.14	0	No	9

(Monitored on August 20, 1992)

MW1	21.99	10.76	0	--	0
MW2A	22.03	11.75	0	--	0
MW3	22.22	10.34	0	--	0
MW4	22.22	10.10	0	--	0

<u>Well #</u>	<u>Surface Elevation* (feet)</u>
MW1	32.75
MW2A	33.78
MW3	32.56
MW4	32.32

-- Sheen determination was not performed.

* The elevations of the tops of the well covers have been surveyed relative to Mean Sea Level.

TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

<u>Date</u>	<u>Sample Well #</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethylbenzene</u>
10/20/92	MW1	ND	720	110	1.4	110	18
	MW2A	ND	96	2.8	ND	1.6	1.8
	MW3	ND	180*	ND	ND	ND	ND
	MW4	ND	110*	ND	ND	ND	ND
7/20/92	MW1	62+	630	100	2.8	52	6.3
	MW2A	ND	99	8.6	ND	0.95	2.4
	MW3	ND	120*	ND	ND	ND	ND
	MW4	ND	80*	ND	ND	ND	ND
4/23/92	MW1	--	530	100	7.9	60	4.6
	MW2A	ND	190	15	ND	2.0	15
	MW3	--	150*	1.6	ND	ND	ND
	MW4	--	120*	ND	ND	ND	ND
1/13/92	MW1	--	450	240	4.6	73	8.6
	MW2A	ND	160	11	2.0	5.9	10
	MW3	--	120*	ND	ND	ND	ND
	MW4	--	58*	ND	ND	ND	ND
9/10/91	MW1	--	280	38	3.1	22	4.1
	MW2A	65	180	8.7	0.93	13	15
	MW3	--	170	ND	ND	ND	ND
	MW4	--	56	ND	ND	ND	ND
6/10/91	MW1	--	310	1.5	ND	0.31	ND
	MW2A	100	54	1.2	ND	0.69	ND
	MW3	--	160	0.65	ND	ND	ND
	MW4	--	64	ND	ND	ND	ND
3/15/91	MW1	--	110	21	ND	8.4	ND
	MW2A	ND	160	2.5	ND	51	ND
	MW3	--	150	ND	ND	0.45	ND
	MW4	--	53	ND	ND	ND	ND
12/14/90	MW1	--	450	150	6.8	49	0.28
	MW3	--	150	ND	ND	ND	ND
	MW4	--	54	ND	ND	ND	ND

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

<u>Date</u>	<u>Sample Well #</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethylbenzene</u>
9/19/90	MW1	--	140	ND	ND	3.5	ND
	MW3	--	74	0.74	ND	ND	ND
	MW4	--	61	ND	ND	ND	ND
6/25/90	MW1	--	310	10	0.89	2.1	0.37
	MW3	--	190	1.5	0.68	5.3	ND
	MW4	--	66	ND	ND	ND	ND
3/29/90	MW1	--	320	12	1.6	3.5	0.31
	MW3	--	85	ND	ND	ND	ND
	MW4	--	120	0.39	ND	ND	ND
12/12/89	MW1	--	340	100	13	44	3.4
	MW2	1,700	660	220	6.6	36	13
	MW3	--	120	6.7	0.64	1.5	0.46
	MW4	--	97	4.6	ND	ND	ND
9/13/89	MW1	--	550	32	17	52	3.4
	MW2	ND	170	2.0	0.38	9.5	ND
	MW3	--	76	ND	ND	ND	ND
	MW4	--	77	ND	ND	ND	ND
6/06/89	MW1	--	590	ND	ND	ND	ND
	MW2	ND	77	ND	ND	ND	ND
	MW3	--	32	ND	ND	ND	ND
	MW4	--	37	ND	ND	ND	ND

+ Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be diesel.

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

-- Indicates analysis was not performed.

ND = Non-detectable.

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

TABLE 3

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	Tetra- chloroethene	Trichloro- ethene	1,2-Dichloro- ethane	Total 1,2-dichloro- ethene	TOG (ppm)
10/20/92	MW1	230	22	ND	16**	--
	MW2A	64	11	ND	ND	--
	MW3	1,100	20	ND	ND	--
	MW4	360	17	ND	ND	--
7/20/92	MW1	200	7.4	ND	ND	--
	MW2A	35	7.2	ND	4.8**	ND
	MW3	1,400	25	ND	ND	--
	MW4	440	11	ND	ND	--
4/23/92	MW2A	17	5.6	ND	1.9**	ND
1/13/92	MW2A*	33	ND	ND	2.1**	ND
6/10/91	MW2A	150	10	ND	ND	ND
3/15/91	MW2A	67	8.2	ND	2.6**	ND
12/12/89	MW2	30	9.0	ND	ND	1.2
9/13/89	MW2	18	6.1	4.2	1.2	<50
6/06/89	MW2	110	4.4	2.8	ND	ND

* 1,1,2-Trichloroethane was also detected at a level of 9.9 ppb.

** Reported as cis-1,2-dichloroethene. Trans-1,2-dichloroethene was non-detectable.

ND = Non-detectable.


-- Indicates analysis was not performed.

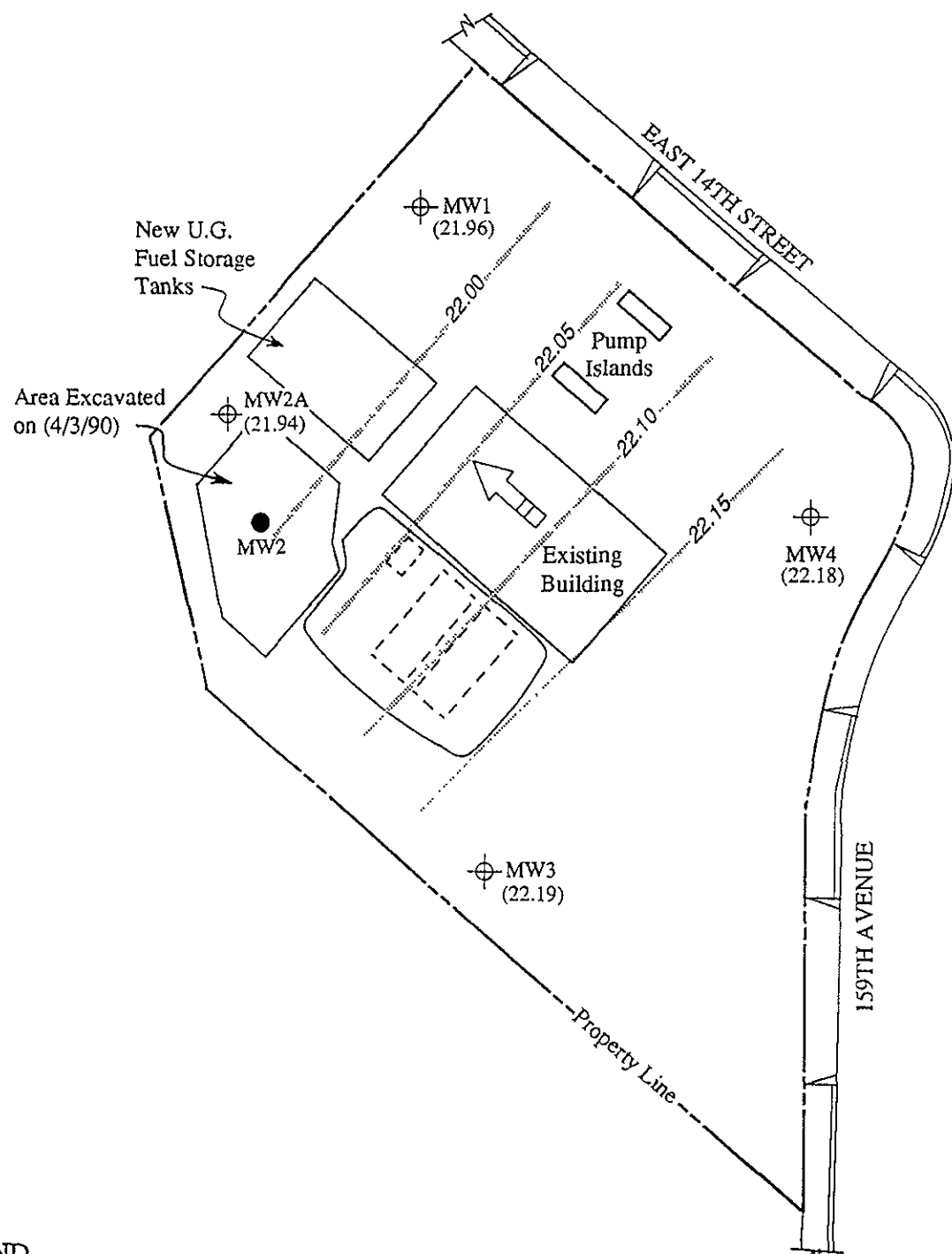
Results in parts per billion (ppb), unless otherwise indicated.






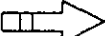

Base modified from 7.5 minute U.S.G.S. San Leandro and Hayward Quadrangles
 (Both photorevised 1980)

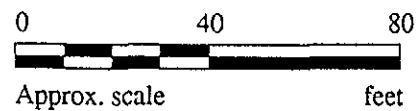


 <p>KAPREALIAN ENGINEERING INCORPORATED</p>	<p>UNOCAL SERVICE STATION #6277 15803 EAST 14TH STREET SAN LEANDRO, CA</p>	<p>LOCATION MAP</p>
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LEGEND

-  Monitoring well
-  Monitoring well (destroyed 2/1/90)
-  Ground water elevation in feet above Mean Sea Level
-  Direction of ground water flow
-  Contours of ground water elevation

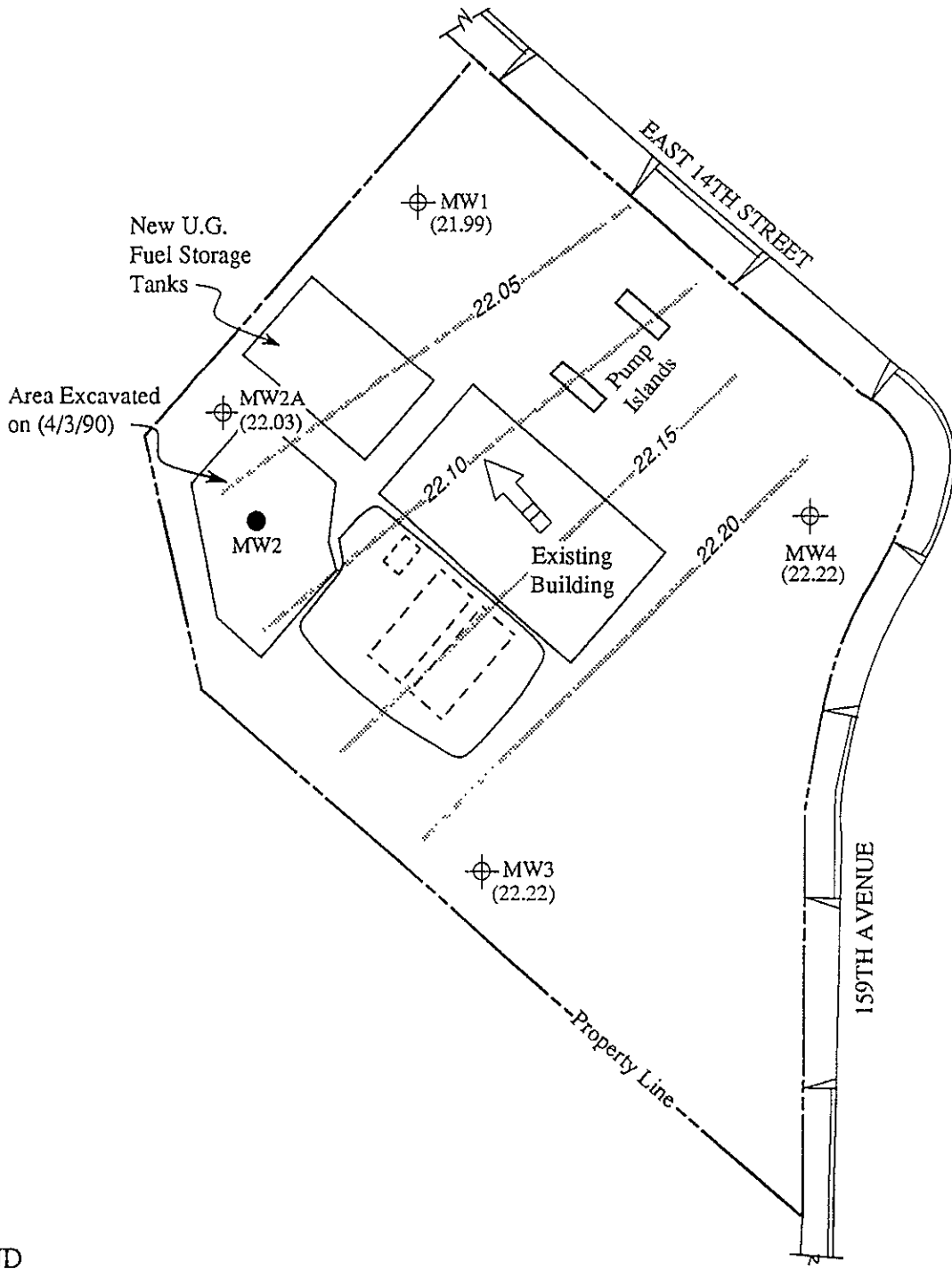


POTENTIOMETRIC SURFACE MAP FOR THE OCTOBER 20, 1992 MONITORING EVENT


**KAPREALIAN ENGINEERING
INCORPORATED**

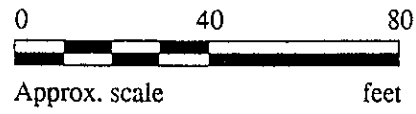
**UNOCAL SERVICE STATION #6277
15803 EAST 14TH STREET
SAN LEANDRO, CA**

**FIGURE
1**



LEGEND

- Monitoring well
- Monitoring well (destroyed 2/1/90)
- () Ground water elevation in feet above Mean Sea Level
- Direction of ground water flow
- Contours of ground water elevation

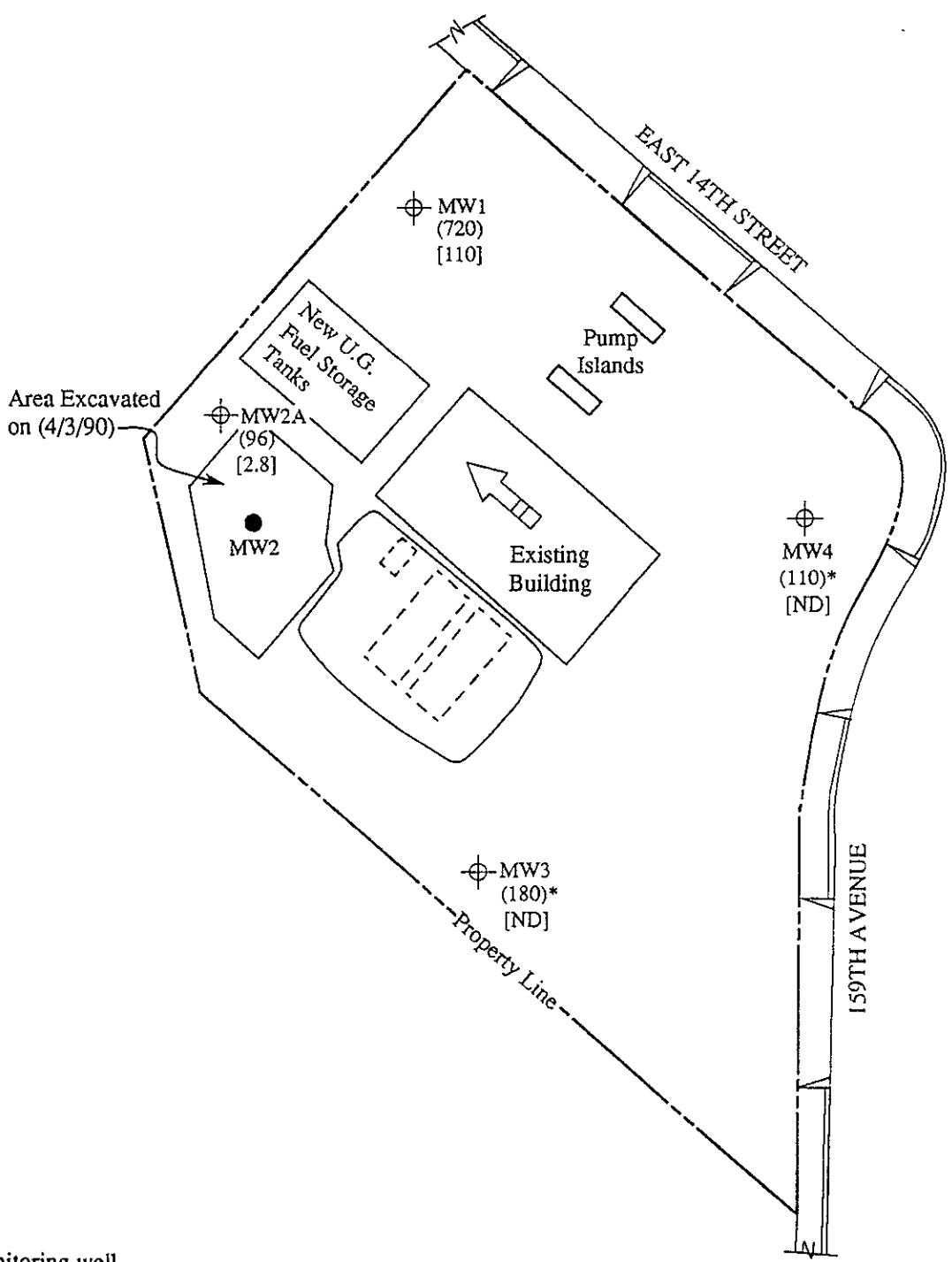


POTENTIOMETRIC SURFACE MAP FOR THE AUGUST 20, 1992 MONITORING EVENT



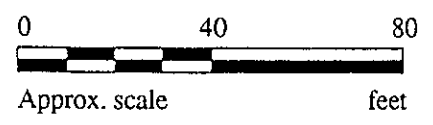
**UNOCAL SERVICE STATION #6277
15803 EAST 14TH STREET
SAN LEANDRO, CA**

**FIGURE
2**



LEGEND

- ⊕ Monitoring well
- Monitoring well (destroyed 2/1/90)
- () Concentration of TPH as gasoline in ppb
- [] Concentration of benzene in ppb
- Direction of ground water flow



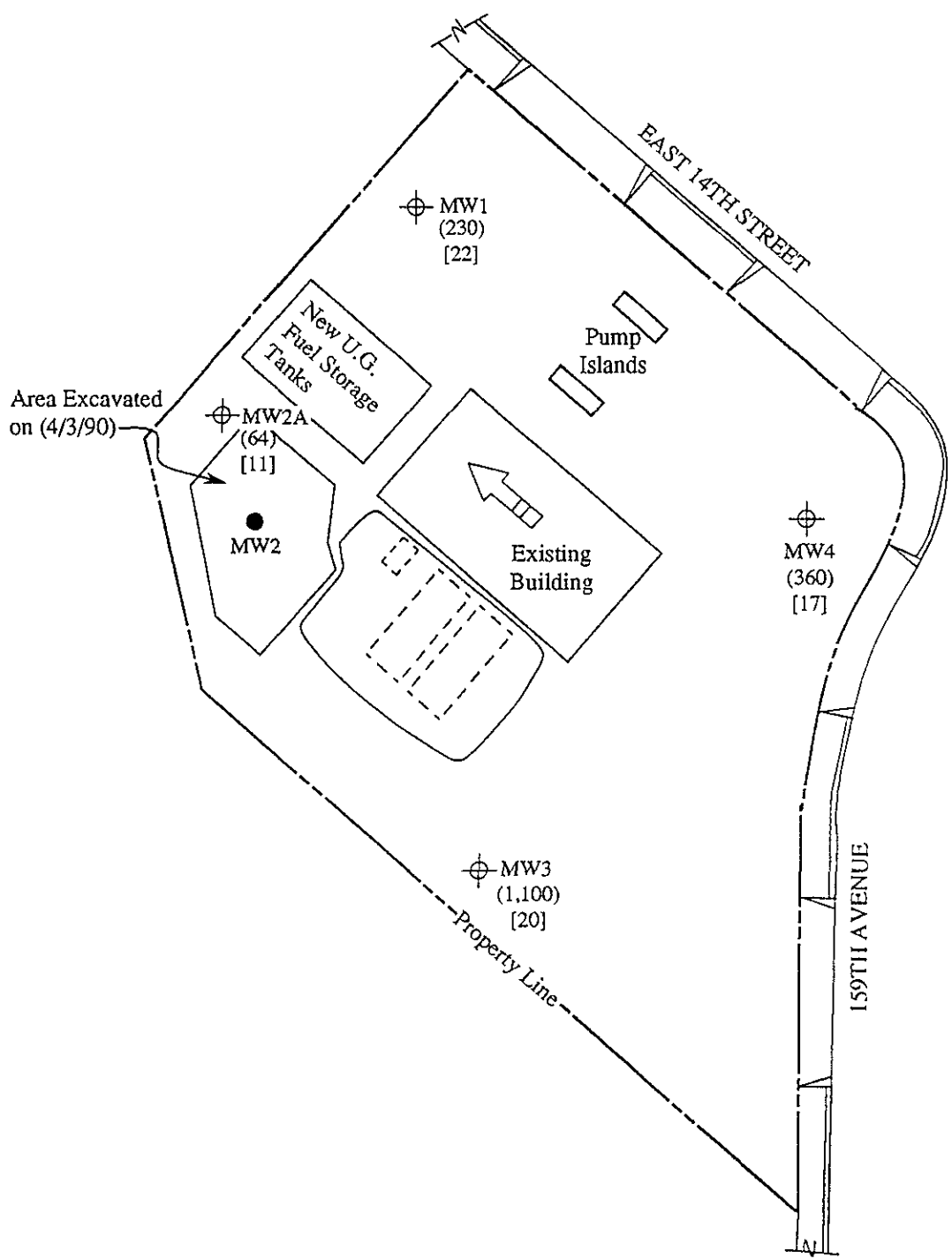
* The lab reported that the hydrocarbons detected do not appear to be gasoline.

PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUND WATER ON OCTOBER 20, 1992



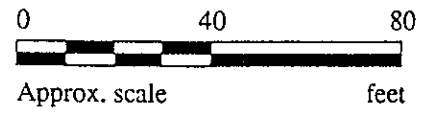
UNOCAL SERVICE STATION #6277
15803 EAST 14TH STREET
SAN LEANDRO, CA

FIGURE
3



LEGEND

- Monitoring well
- Monitoring well (destroyed 2/1/90)
- Concentration of tetrachloroethene
- Concentration of trichloroethene
- Direction of ground water flow

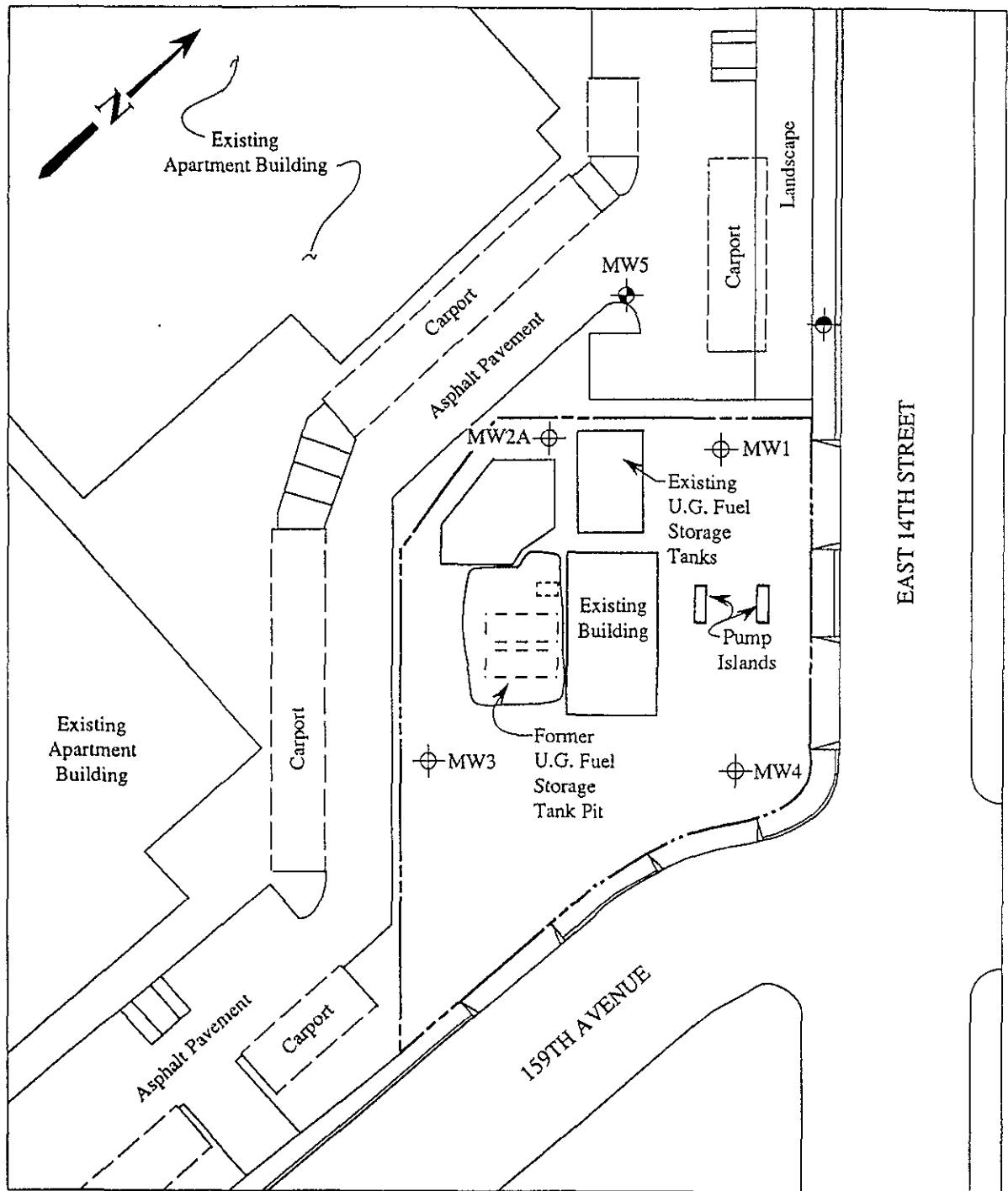


CHLORINATED SOLVENT CONCENTRATIONS IN GROUND WATER ON OCTOBER 20, 1992



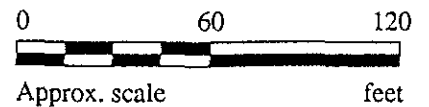
**UNOCAL SERVICE STATION #6277
15803 EAST 14TH STREET
SAN LEANDRO, CA**

**FIGURE
4**



LEGEND

- ⊕ Monitoring well
- ⊕ Monitoring well (proposed)
- ⊕ Monitoring well (previously attempted)



PROPOSED MONITORING WELL LOCATION MAP



**UNOCAL SERVICE STATION #6277
 15803 E. 14TH STREET
 SAN LEANDRO, CA**

**FIGURE
 5**



Kapreallan Engineering, Inc. 2401 Stanwell Drive, Suite 400 Concord, CA 94520 Attention: Mardo Kapreallan, P.E.	Client Project ID: Unocal, 15803 E. 14th St., San Leandro Sample Matrix: Water Analysis Method: EPA 5030/8015/8020 First Sample #: 210-0617	Sampled: Oct 20, 1992 Received: Oct 20, 1992 Reported: Oct 30, 1992
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TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 210-0617 MW1	Sample I.D. 210-0618 MW2A	Sample I.D. 210-0619 MW3*	Sample I.D. 210-0620 MW4*	Sample I.D. Matrix Blank
Purgeable Hydrocarbons	50	720	96	180	110	
Benzene	0.5	110	2.8	N.D.	N.D.	
Toluene	0.5	1.4	N.D.	N.D.	N.D.	
Ethyl Benzene	0.5	18	1.8	N.D.	N.D.	
Total Xylenes	0.5	110	1.6	N.D.	N.D.	
Chromatogram Pattern:		Gasoline	Gasoline	Discrete Peaks	Discrete Peaks	

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0
Date Analyzed:	10/23/92	10/23/92	10/23/92	10/23/92	10/23/92
Instrument Identification:	HP-2	HP-2	HP-2	HP-2	HP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	112	103	103	103	100

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

SEQUOIA ANALYTICAL


Scott A. Chieffo
Project Manager

Please Note:	* The above samples do not appear to contain gasoline. Purgeable hydrocarbons are due to solvent peaks in the EPA 8010 range.
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SEQUOIA ANALYTICAL

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

Kapreallan Engineering, Inc.	Client Project ID:	Unocal, 15803 E. 14th St., San Leandro	Sampled:	Oct 20, 1992
2401 Stanwell Drive, Suite 400	Sample Matrix:	Water	Received:	Oct 20, 1992
Concord, CA 94520	Analysis Method:	EPA 3510/3520/8015	Reported:	Oct 30, 1992
Attention: Mardo Kapreallan, P.E.	First Sample #:	210-0617		

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 210-0617 MW1	Sample I.D. 210-0618 MW2A	Sample I.D. 210-0619 MW3	Sample I.D. 210-0620 MW4	Sample I.D. Matrix Blank
Extractable Hydrocarbons	50	N.D.	N.D.	N.D.	N.D.	
Chromatogram Pattern:		--	--	--	--	

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0
Date Extracted:	10/23/92	10/23/92	10/23/92	10/23/92	10/23/92
Date Analyzed:	10/28/92	10/28/92	10/28/92	10/28/92	10/28/92
Instrument Identification:	HP-3B	HP-3B	HP-3B	HP-3B	HP-3B

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

SEQUOIA ANALYTICAL


Scott A. Chieffo
Project Manager



SEQUOIA ANALYTICAL

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

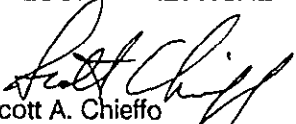
Kaprealian Engineering, Inc.	Client Project ID: Unocal, 15803 E. 14th St., San Leandro	Sampled: Oct 20, 1992
2401 Stanwell Drive, Suite 400	Sample Descript: Water, MW1	Received: Oct 20, 1992
Concord, CA 94520	Analysis Method: EPA 5030/8010	Analyzed: 10/22&10/23/92
Attention: Mardo Kaprealian, P.E.	Lab Number: 210-0617	Reported: Oct 30, 1992

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane.....	10	N.D.
Bromoform.....	10	N.D.
Bromomethane.....	20	N.D.
Carbon tetrachloride.....	10	N.D.
Chlorobenzene.....	10	N.D.
Chloroethane.....	20	N.D.
2-Chloroethylvinyl ether.....	20	N.D.
Chloroform.....	10	N.D.
Chloromethane.....	20	N.D.
Dibromochloromethane.....	10	N.D.
1,3-Dichlorobenzene.....	10	N.D.
1,4-Dichlorobenzene.....	10	N.D.
1,2-Dichlorobenzene.....	10	N.D.
1,1-Dichloroethane.....	10	N.D.
1,2-Dichloroethane.....	10	N.D.
1,1-Dichloroethene.....	10	N.D.
cis-1,2-Dichloroethene.....	10	16
trans-1,2-Dichloroethene.....	10	N.D.
1,2-Dichloropropane.....	10	N.D.
cis-1,3-Dichloropropene.....	10	N.D.
trans-1,3-Dichloropropene.....	10	N.D.
Methylene chloride.....	100	N.D.
1,1,2,2-Tetrachloroethane.....	10	N.D.
Tetrachloroethene.....	10	230
1,1,1-Trichloroethane.....	10	N.D.
1,1,2-Trichloroethane.....	10	N.D.
Trichloroethene.....	10	22
Trichlorofluoromethane.....	10	N.D.
Vinyl chloride.....	20	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


 Scott A. Chieffo
 Project Manager



SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID: Unocal, 15803 E. 14th St., San Leandro	Sampled: Oct 20, 1992
2401 Starwell Drive, Suite 400	Sample Descript: Water, MW2A	Received: Oct 20, 1992
Concord, CA 94520	Analysis Method: EPA 5030/8010	Analyzed: 10/22&10/23/92
Attention: Mardo Kaprealian, P.E.	Lab Number: 210-0618	Reported: Oct 30, 1992

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane.....	10	N.D.
Bromoform.....	10	N.D.
Bromomethane.....	20	N.D.
Carbon tetrachloride.....	10	N.D.
Chlorobenzene.....	10	N.D.
Chloroethane.....	20	N.D.
2-Chloroethylvinyl ether.....	20	N.D.
Chloroform.....	10	N.D.
Chloromethane.....	20	N.D.
Dibromochloromethane.....	10	N.D.
1,3-Dichlorobenzene.....	10	N.D.
1,4-Dichlorobenzene.....	10	N.D.
1,2-Dichlorobenzene.....	10	N.D.
1,1-Dichloroethane.....	10	N.D.
1,2-Dichloroethane.....	10	N.D.
1,1-Dichloroethene.....	10	N.D.
cis-1,2-Dichloroethene.....	10	N.D.
trans-1,2-Dichloroethene.....	10	N.D.
1,2-Dichloropropane.....	10	N.D.
cis-1,3-Dichloropropene.....	10	N.D.
trans-1,3-Dichloropropene.....	10	N.D.
Methylene chloride.....	100	N.D.
1,1,2,2-Tetrachloroethane.....	10	N.D.
Tetrachloroethene.....	10	64
1,1,1-Trichloroethane.....	10	N.D.
1,1,2-Trichloroethane.....	10	N.D.
Trichloroethene.....	10	11
Trichlorofluoromethane.....	10	N.D.
Vinyl chloride.....	20	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

Scott A. Chieffo
 Scott A. Chieffo
 Project Manager



Kaprealian Engineering, Inc.	Client Project ID: Unocal, 15803 E. 14th St., San Leandro	Sampled: Oct 20, 1992
2401 Stanwell Drive, Suite 400	Sample Descript: Water, MW3	Received: Oct 20, 1992
Concord, CA 94520	Analysis Method: EPA 5030/8010	Analyzed: 10/22&10/23/92
Attention: Mardo Kaprealian, P.E.	Lab Number: 210-0619	Reported: Oct 30, 1992

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane.....	10	N.D.
Bromoform.....	10	N.D.
Bromomethane.....	20	N.D.
Carbon tetrachloride.....	10	N.D.
Chlorobenzene.....	10	N.D.
Chloroethane.....	20	N.D.
2-Chloroethylvinyl ether.....	20	N.D.
Chloroform.....	10	N.D.
Chloromethane.....	20	N.D.
Dibromochloromethane.....	10	N.D.
1,3-Dichlorobenzene.....	10	N.D.
1,4-Dichlorobenzene.....	10	N.D.
1,2-Dichlorobenzene.....	10	N.D.
1,1-Dichloroethane.....	10	N.D.
1,2-Dichloroethane.....	10	N.D.
1,1-Dichloroethene.....	10	N.D.
cis-1,2-Dichloroethene.....	10	N.D.
trans-1,2-Dichloroethene.....	10	N.D.
1,2-Dichloropropane.....	10	N.D.
cis-1,3-Dichloropropene.....	10	N.D.
trans-1,3-Dichloropropene.....	10	N.D.
Methylene chloride.....	100	N.D.
1,1,2,2-Tetrachloroethane.....	10	N.D.
Tetrachloroethene.....	10	1,100
1,1,1-Trichloroethane.....	10	N.D.
1,1,2-Trichloroethane.....	10	N.D.
Trichloroethene.....	10	20
Trichlorofluoromethane.....	10	N.D.
Vinyl chloride.....	20	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

Scott A. Chieffo
 Scott A. Chieffo
 Project Manager



SEQUOIA ANALYTICAL

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Kaprealian Engineering, Inc.	Client Project ID: Unocal, 15803 E. 14th St., San Leandro	Sampled: Oct 20, 1992
2401 Stanwell Drive, Suite 400	Sample Descript: Water, MW4	Received: Oct 20, 1992
Concord, CA 94520	Analysis Method: EPA 5030/8010	Analyzed: 10/22&10/23/92
Attention: Mardo Kaprealian, P.E.	Lab Number: 210-0620	Reported: Oct 30, 1992

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane.....	10	N.D.
Bromoform.....	10	N.D.
Bromomethane.....	20	N.D.
Carbon tetrachloride.....	10	N.D.
Chlorobenzene.....	10	N.D.
Chloroethane.....	20	N.D.
2-Chloroethylvinyl ether.....	20	N.D.
Chloroform.....	10	N.D.
Chloromethane.....	20	N.D.
Dibromochloromethane.....	10	N.D.
1,3-Dichlorobenzene.....	10	N.D.
1,4-Dichlorobenzene.....	10	N.D.
1,2-Dichlorobenzene.....	10	N.D.
1,1-Dichloroethane.....	10	N.D.
1,2-Dichloroethane.....	10	N.D.
1,1-Dichloroethene.....	10	N.D.
cis-1,2-Dichloroethene.....	10	N.D.
trans-1,2-Dichloroethene.....	10	N.D.
1,2-Dichloropropane.....	10	N.D.
cis-1,3-Dichloropropene.....	10	N.D.
trans-1,3-Dichloropropene.....	10	N.D.
Methylene chloride.....	100	N.D.
1,1,2,2-Tetrachloroethane.....	10	N.D.
Tetrachloroethene.....	10	360
1,1,1-Trichloroethane.....	10	N.D.
1,1,2-Trichloroethane.....	10	N.D.
Trichloroethene.....	10	17
Trichlorofluoromethane.....	10	N.D.
Vinyl chloride.....	20	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.

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Kaprealian Engineering, Inc.
2401 Stanwell Drive, Suite 400
Concord, CA 94520

Client Project ID: Unocal, 15803 E. 14th St., San Leandro

Attention: Mardo Kaprealian, P.E. QC Sample Group: 2100617-620

Reported: Oct 30, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes	Diesel
Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA8015
Analyst:	A.T.	A.T.	A.T.	A.T.	K.Wimer
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Oct 23, 1992	Oct 23, 1992	Oct 23, 1992	Oct 23, 1992	Oct 28, 1992
QC Sample #:	Matrix Blank	Matrix Blank	Matrix Blank	Matrix Blank	Matrix Blank
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	20	20	20	60	300
Conc. Matrix Spike:	20	20	21	66	282
Matrix Spike % Recovery:	100	100	105	110	94
Conc. Matrix Spike Dup.:	20	21	21	66	270
Matrix Spike Duplicate % Recovery:	100	105	105	110	90
Relative % Difference:	0.0	4.9	0.0	0.0	4.3

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:	$\frac{\text{Conc. of M.S.} - \text{Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$
Relative % Difference:	$\frac{\text{Conc. of M.S.} - \text{Conc. of M.S.D.}}{(\text{Conc. of M.S.} + \text{Conc. of M.S.D.}) / 2} \times 100$



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Kaprealian Engineering, Inc.
2401 Stanwell Drive, Suite 400
Concord, CA 94520

Client Project ID: Unocal, 15803 E. 14th St., San Leandro

Attention: Mardo Kaprealian, P.E. QC Sample Group: 2100617-620

Reported: Oct 30, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloroethene	Trichloro-ethene	Chloro-benzene
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Method:	EPA 8010	EPA 8010	EPA 8010
Analyst:	K. Nill	K. Nill	K. Nill
Reporting Units:	µg/L	µg/L	µg/L
Date Analyzed:	Oct 26, 1992	Oct 26, 1992	Oct 26, 1992
QC Sample #:	210-0710	210-0710	210-0710

Sample Conc.: N.D. N.D. N.D.

Spike Conc. Added: 10 10 10

Conc. Matrix Spike: 9.8 11 8.9

Matrix Spike % Recovery: 98 110 89

Conc. Matrix Spike Dup.: 9.9 10 9.1

Matrix Spike Duplicate % Recovery: 99 100 91

Relative % Difference: 1.0 9.5 2.2

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:	$\frac{\text{Conc. of M.S.} - \text{Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$
Relative % Difference:	$\frac{\text{Conc. of M.S.} - \text{Conc. of M.S.D.}}{(\text{Conc. of M.S.} + \text{Conc. of M.S.D.}) / 2} \times 100$



SEQUOIA ANALYTICAL

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Kapreallan Engineering, Inc.

Client Project ID: Unocal, 15803 E. 14th St., San Leandro

P.O. Box 996

Benicia, CA 94510

Attention: Mardo Kapreallan, P.E. QC Sample Group: 2100617-620

Reported: Oct 30, 1992

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8015	EPA 8015	EPA 8015	EPA 8015	EPA 8015
Analyst:	K. Wimer	K. Wimer	K. Wimer	K. Wimer	K. Wimer
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Oct 28, 1992	Oct 28, 1992	Oct 28, 1992	Oct 28, 1992	Oct 28, 1992
Sample #:	210-0617	210-0618	210-0619	210-0620	Matrix Blank

Surrogate % Recovery:	98	94	89	86	103
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SEQUOIA ANALYTICAL

Scott A. Chieffo
Scott A. Chieffo
Project Manager

% Recovery:	$\frac{\text{Conc. of M.S.} - \text{Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$
Relative % Difference:	$\frac{\text{Conc. of M.S.} - \text{Conc. of M.S.D.}}{(\text{Conc. of M.S.} + \text{Conc. of M.S.D.}) / 2} \times 100$



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Kaprealian Engineering, Inc.

Client Project ID: Unocal, 15803 E. 14th St., San Leandro

P.O. Box 996

Benicia, CA 94510

Attention: Mardo Kaprealian, P.E. QC Sample Group: 2100617-620

Reported: Oct 30, 1992

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8010	EPA 8010	EPA 8010	EPA 8010	EPA 8010
Analyst:	K. Nill	K. Nill	K. Nill	K. Nill	K. Nill
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Oct 23, 1992	Oct 23, 1992	Oct 23, 1992	Oct 23, 1992	Oct 23, 1992
Sample #:	210-0617	210-0618	210-0619	210-0620	Matrix Blank

Surrogate #1

% Recovery:	125	124	128	128	153
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Surrogate #2

% Recovery:	130	129	130	130	130
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SEQUOIA ANALYTICAL

Scott A. Chieffo
 Scott A. Chieffo
 Project Manager

% Recovery:	$\frac{\text{Conc. of M.S.} - \text{Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$
Relative % Difference:	$\frac{\text{Conc. of M.S.} - \text{Conc. of M.S.D.}}{(\text{Conc. of M.S.} + \text{Conc. of M.S.D.}) / 2} \times 100$



KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER			SITE NAME & ADDRESS					ANALYSES REQUESTED			TURN AROUND TIME:	
Vartkes			Unocal / San Leandro 15803 E. 14 th str.								Regular	
WITNESSING AGENCY								TPHG: BTXE	TPHD	BOIO	REMARKS	
SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION				
MW 1	10/20/92	12:50 pm.	X	X			5	Monitoring well	X	X		X
MW 2A	"	"	X	X			5	" "	X	X		X
MW 3	"	"	X	X			5	" "	X	X		X
MW 4	"	3:05 pm.	X	X			5	" "	X	X	X	

2100607AE
↓
618AE
619AE
620AE

Relinquished by: (Signature) <i>W. Tacholjaro</i>	Date/Time 10/20/92 4:15	Received by: (Signature) <i>Jim Cotta</i>
Relinquished by: (Signature) <i>Suzanne Pansji</i>	Date/Time 10-21-92	Received by: (Signature) <i>[Signature]</i>
Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 10-21-92	Received by: (Signature) <i>[Signature]</i>
Relinquished by: (Signature)	Date/Time	Received by: (Signature)

- The following MUST BE completed by the laboratory accepting samples for analysis:
- Have all samples received for analysis been stored in ice? Y
 - Will samples remain refrigerated until analyzed? Y
 - Did any samples received for analysis have head space? N
 - Were samples in appropriate containers and properly packaged? Y
- J.C. Analyst 10-20-92
Signature Title Date