KAPREALIAN ENGINEERING
INCORPORATED

FIRE DEPARTMENT
APR 1 - 1992
CITY OF SAN LEANDRO

April 14, 1992

City of San Leandro
Fire Department
835 E. 14th Street
San Leandro, CA 94577

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

Gentlemen:

Per the request of Mr. Rick Sisk of Unocal Corporation, enclosed please find our report dated April 9, 1992, for the above referenced site.

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

Sincerely,

Kaprealian Engineering, Inc.

Judy A. Dewey

jad\15

Enclosure

cc: Rick Sisk, Unocal Corporation

2401 Stanwell Drive, Suite 400
Concord, California 94520
Tel: 510.602.5100 Fax: 510.687.0602

KAPREALIAN ENGINEERING
INCORPORATED

KEI-P88-1204.R5
April 9, 1992

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

Attention: Mr. Rick Sisk

RE: Continuing Ground Water Investigation at
Unocal Service Station #2512
1300 Davis Street
San Leandro, California

Dear Mr. Sisk:

This report presents the results of Kaprealian Engineering, Inc's. (KEI) soil and ground water investigation for the referenced site, in accordance with KEI's proposal KEI-P88-1204.P6 dated July 15, 1991. The purpose of the investigation was to further define the degree and extent of ground water contamination at and in the vicinity of the site. The report also presents the results of the monitoring and sampling program of the existing wells during December 1991 through February 1992. The scope of the work performed by KEI consisted of the following:

Coordination with regulatory agencies

Geologic logging of one boring for the installation of one monitoring well

Soil sampling

Ground water monitoring, purging, and sampling

Laboratory analyses

Data analysis, interpretation, and report preparation

SITE DESCRIPTION AND BACKGROUND

The subject site is presently used as a gasoline station. The site is situated on gently sloping, westward trending topography, and is located approximately two miles east-northeast of the present shoreline of San Francisco Bay. Also, the site is located approximately 2,000 feet south of San Leandro Creek. A Location Map, Site Vicinity Maps, and a Site Plan are attached to this report.

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Per Unocal Corporation's procedure for site divestments, KEI's work at the site began on December 30, 1988, when KEI was asked to install exploratory borings. On January 3, 1989, six exploratory borings, designated as EB1 through EB6 on the attached Site Plan, Figure 2, were drilled at the site. The six borings were drilled to depths ranging from 26.5 to 30 feet below grade, and ground water was encountered at depths ranging from 25 to 26.5 feet beneath the surface.

Soil and water samples were analyzed by Sequoia Analytical Laboratory in Redwood City, California. Soil and water samples collected from borings EB2 through EB6 were analyzed for total petroleum hydrocarbons (TPH) as gasoline, and benzene, toluene, xylenes, and ethylbenzene (BTX&E). Soil samples collected from boring EB6 were also analyzed for TPH as diesel and total oil and grease (TOG). Soil and water samples collected from boring EB1 were analyzed for TPH as diesel, BTX&E, TOG, and EPA method 8010 constituents.

Analytical results of soil samples collected from borings EB1 through EB6 indicated levels of TPH as gasoline ranging from non-detectable to 73 ppm. Benzene was detected only in samples EB5(20) and EB6(15) at concentrations of 0.12 ppm and 0.065 ppm, respectively. Analytical results of soil samples collected from boring EB6 indicated levels of TPH as diesel ranging from 3 ppm to 160 ppm, and levels of TOG ranging from 130 ppm to 7,800 ppm. Analytical results of the water samples collected from borings EB2, EB3, and EB4 indicated non-detectable levels of TPH as gasoline. Analytical results of the water samples collected from borings EB5 and EB6 indicated levels of TPH as gasoline at concentrations of 340 ppb and 1,500 ppb, respectively. Benzene was detected in water samples collected from borings EB2 and EB6 at concentrations of 8.2 ppb and 1.5 ppb, respectively. The results of the soil analyses are summarized in Table 3, and the results of the water analyses are summarized in Table 4. Documentation of the exploratory boring installation procedures, sample collection techniques, and the analytical results are presented in KEI's report (KEI-P88-1204.R1) dated February 3, 1989. Based on the results of the exploratory boring investigation, KEI proposed the installation of three monitoring wells.

On April 17, 1989, three two-inch diameter monitoring wells (designated as MW1, MW2, and MW3 on the attached Site Vicinity Map, Figure 1) were installed at the site. The three wells were drilled and completed to total depths of 33 feet below grade. Ground water was encountered at depths ranging from 17.5 to 18.5 feet below grade. The wells were developed on April 24, 1989, and were initially sampled on April 25, 1989.

Water and selected soil samples were analyzed by Sequoia Analytical Laboratory in Redwood City, California, for TPH as gasoline, BTX&E, TPH as diesel, TOG, and EPA method 8010 constituents. Analytical results of the soil samples collected from MW1, MW2, and MW3 indicated levels of TPH as gasoline ranging from non-detectable to 6.2 ppm, levels of TOG ranging from non-detectable to 180 ppm, and non-detectable levels of benzene, TPH as diesel and EPA method 8010 constituents. Analytical results of the water samples collected from MW1, MW2, and MW3 indicated levels of TPH as gasoline ranging from non-detectable to 56 ppb, levels of TPH as diesel ranging from non-detectable to 5,700 ppb, and levels of benzene ranging from non-detectable to 0.35 ppb. The results of the soil analyses are summarized in Table 3, and results of the water analyses are summarized in Tables 2 and 2a. Documentation of the well installation procedures, sample collection techniques, and the analytical results are presented in KEI's report (KEI-P88-1204.R2) dated May 16, 1990.

On May 11, 1989, at KEI's recommendation, the area surrounding exploratory boring EB6 (shown on the attached Site Plan, Figure 2) was excavated. Four soil samples, labeled SWA, SWB, SWC, and SWD, were collected from the sidewalls of the excavation at a depth of approximately 16.5 feet below grade (six inches above the water table). The samples were analyzed for TPH as diesel and TOG. Analytical results of the soil samples indicated levels of TPH as diesel ranging from 16 ppm to 26 ppm, and levels of TOG ranging from 170 ppm to 850 ppm. Results of the soil analyses are summarized in Table 3. Documentation of the excavation investigation procedures, sample collection techniques, and the analytical results are presented in KEI's report (KEI-J88-1204.R4) dated June 15, 1989.

Based on the results of the excavation soil samples and ground water contamination levels that had been previously detected in the monitoring wells, KEI recommended the installation of three additional monitoring wells.

On August 16, 1989, three additional two-inch diameter monitoring wells (designated as MW4, MW5, and MW6 on the attached Site Vicinity Map, Figure 1) were installed at the site. The new wells were drilled and completed to total depths of 33 feet below grade. Ground water was encountered at depths of approximately 19.8 to 22 feet below grade during drilling. The new wells (MW4, MW5, and MW6) were developed on August 27, 1989, and were initially sampled on August 29, 1989. The existing wells (MW1, MW2, and MW3) were sampled on August 10, 1989.

Water and selected soil samples were analyzed by Sequoia Analytical Laboratory in Redwood City, California, for TPH as gasoline, BTX&E, and TOG. In addition, the water samples were analyzed for TPH as diesel. Analytical results of the soil samples collected from the borings for monitoring wells MW4, MW5, and MW6 indicated non-detectable levels of all constituents analyzed, except for soil sample MW4(5), which showed 3.3 ppm of TPH as gasoline and 0.11 ppm of xylenes, and soil sample MW5(20), which showed 20 ppm of TPH as gasoline. Analytical results of water samples collected from MW1, MW2, MW4, MW5, and MW6 indicated non-detectable levels of TPH as gasoline, benzene, TPH as diesel, and TOG, except for MW4 and MW5, which indicated TPH as diesel at concentrations of 120 ppb and 100 ppb, respectively. Analytical results of the water sample collected from MW3 indicated 3,200 ppb of TPH as gasoline, 73 ppb of benzene, 860 ppb of TPH as diesel, and a non-detectable level of TOG. The results of the soil analyses are summarized in Table 3, and results of the water analyses are summarized in Table 2. Documentation of the well installation procedures, sample collection techniques, and the analytical results are presented in KEI's report (KEI-P88-1204.QR1) dated September 27, 1989. Based on the analytical results, KEI recommended a monthly monitoring and quarterly sampling program for all existing wells.

A field reconnaissance of the subject site was performed on August 24, 1990, and the reconnaissance revealed the presence of soil borings within the existing asphalt parking area at the adjacent property located southwest of the site (see the attached Site Vicinity Map). KEI reviewed a report prepared by Applied Geosystems (AGS) of San Jose, California, dated April 30, 1990, (AGS #60004-1), documenting this work. Soil and ground water samples were collected from five borings (B1 through B5) on the adjacent property. Analytical results of soil samples indicated non-detectable levels of petroleum hydrocarbons in all samples, except for 200 ppm of TOG and 0.058 ppm of toluene detected at 16 feet in boring B5 (which is located immediately southwest of Unocal's MW3). Also, tetrachloroethene was detected in borings B2, B3, and B4 at depths of 15 to 17.5 feet below grade at levels ranging from 0.0052 ppm to 0.0460 ppm. TPH as gasoline was detected in water samples collected from borings B2 and B3 at levels of 220 ppb and 50 ppb, respectively; these borings are located near a former dry cleaning operation (see the attached Site Vicinity Map). Also, tetrachloroethene (PCE) was detected in the water samples from all five borings at levels ranging from 2.2 ppb to 540 ppb, with the greatest concentrations obtained from borings B2, B3, and B4 (which are located near the former dry cleaning operation).

Based on a site inspection conducted on December 27, 1990, a well (MW-DC) is present near the former dry cleaner operation (see the

attached Site Vicinity Map). Communication with Unocal Corporation on January 2, 1991, indicated that this well was not installed at the request of Unocal.

A follow-up site visit was conducted by KEI during March of 1991 in an attempt to determine the well owner. None of the adjacent property owners or tenants were aware of the presence of the well and/or who installed the well. KEI subsequently reviewed a report, titled "Report of Subsurface Environmental Conditions" (dated October 9, 1990), which was prepared by Hageman-Schenk, Inc. (HSI) for the current property owner (1335 to 1370 Davis Street).

Investigations conducted by HSI indicate that the well was apparently a former water supply well for the dry cleaners located at 1370 Davis Street. The well is six inches in diameter, extends to a depth of approximately 28 feet below grade, and has a water level of 18 feet (as of August 1, 1990). At the time of HSI's investigation (June 7, 1990), the well was plugged with soil and other debris to a depth of about 8 feet below grade. Analytical results of a soil sample collected from the soil plug within the well showed 1.2 ppm of tetrachloroethene. After the well was unplugged, a water sample was collected on September 12, 1990, and the sample showed a level of 33 ppb of tetrachloroethene. The soil and water samples were not analyzed for petroleum hydrocarbons. In addition to collecting soil and water samples from the dry cleaners' well, HSI also collected soil samples from six soil borings (A1 through A5 and HS-B-1), located at the northwest perimeter of the dry cleaners building, as well as six soil samples from beneath the concrete floor inside the building. Tetrachloroethene was detected in all soil borings at concentrations ranging from 0.0069 ppm to 0.20 ppm. The October 9, 1990, HSI report concluded that the tetrachloroethene soil and ground water contamination detected throughout the site was probably the result of small-scale spillage of tetrachloroethene over a long period of time. The HSI report recommended the installation of at least three monitoring wells; however, it does not appear that any further subsurface investigations have been conducted at the site as of March of 1991.

In KEI's quarterly report (KEI-P88-1204.QR8) dated July 15, 1991, KEI recommended that no additional ground water samples be collected and analyzed from wells MW1 and MW5, since both wells had shown non-detectable levels of TPH as gasoline and benzene for the four previous quarters of sampling.

Free product was first detected in Unocal well MW3 on August 1, 1991, at a thickness of 0.02 feet. The thickness of product in MW3 showed a general increase during the quarter ending November 1991,

and was detected at a thickness of 0.26 feet on November 19, 1991. Approximately 27 ounces of product had been purged from well MW3 through November 19, 1991. Therefore, KEI recommended weekly purging of product from MW3 until the source could be verified and eliminated. Previous field notes during purging activities indicated that the product is black to dark brown and has an odor similar to that of parts cleaning solvent. A sample of this product was recommended to be collected and submitted to a laboratory for analysis to aid in determining the ultimate source of this product.

Based on the past levels of contamination detected in well MW3 at the subject Unocal site, and the predominant west-southwest ground water flow direction, KEI previously recommended (work plan/proposal KEI-P88-1204.P6 dated July 15, 1991) the installation of one off-site monitoring well to further define the extent of ground water contamination. KEI did not recommend the use of the "dry cleaner well" (MW-DC), since the integrity, construction, and previous use of the well was unknown or otherwise unclear.

RECENT FIELD ACTIVITIES

On February 11 , 1992, one additional two-inch diameter monitoring well (designated as MW7 on the attached Site Vicinity Map, Figure 1) was installed at the site. The well was drilled, constructed, and completed in accordance with the guidelines of the Regional Water Quality Control Board (RWQCB), and California Well Standards, per Bulletin 74-90.

The subsurface materials penetrated and details of the construction of the well are described in the attached Boring Logs.

Well MW7 was drilled and completed to a total depth 30 feet below grade. Ground water was encountered at a depth of 17 feet beneath the surface during drilling. Soil samples were taken for laboratory analysis and for lithologic logging purposes at a maximum spacing of 5 foot intervals, and at or within the soil/ground water interface, beginning at a depth of approximately 4.5 feet below grade and continuing until ground water was encountered. Soil sampling conducted below the ground water table was for lithologic logging purposes only. The undisturbed soil samples were taken by driving a California-modified split-spoon sampler ahead of the drilling augers. The two-inch diameter brass liners holding the samples were sealed with aluminum foil, plastic caps and tape, and stored in a cooled ice chest for delivery to a certified laboratory. The well casing was installed with a watertight cap and padlock. A round, watertight, flush-mounted well cover was cemented in place over the well casing.

The surface of the well cover over MW7, the well covers of all previously existing wells (MW1 through MW6), and the off-site well MW-DC were surveyed by Kier & Wright of Pleasanton, California, to Mean Sea Level (MSL) and to a vertical accuracy of 0.01 feet.

Well MW7 was developed on February 12, 1992. Prior to development, all wells were checked for depth to water table (by the use of an electronic sounder) and the presence of free product (by the use of an interface probe or paste tape). No free product was noted in any of the wells on February 12, 1992; however, a heavy sheen was noted in MW3. After recording the monitoring data, well MW7 was purged with a surface pump of 140 gallons (until the evacuated water was clear and reasonably free of suspended sediment). Monitoring and well development data are summarized in Table 1.

The six existing wells (MW1 through MW6) were monitored monthly during December 1991 through February 1992. In addition, well MW3 was monitored and purged of 55 gallons of water on a bi-weekly basis (5 times). Monitoring wells MW2, MW4, MW6, and MW7 were sampled on February 27, 1992. Well MW3 was not sampled due to the presence of 0.09 feet of free product. Wells MW1 and MW5 are no longer sampled (as previously recommended by KEI). Prior to sampling, monitoring data were collected, the wells were each purged of 13 gallons, and water samples were then collected by the use of a clean Teflon bailer. Samples were decanted into clean VOA vials and/or one-liter amber bottles, as appropriate, then sealed with Teflon-lined screw caps and stored in a cooler, on ice, until delivery to a state-certified laboratory.

ANALYTICAL RESULTS

Water samples from wells MW2, MW4, MW6, and MW7, and selected soil samples from the boring of MW7, were analyzed at Sequoia Analytical Laboratory in Concord, California. All samples analyzed were accompanied by properly executed Chain of Custody documentation. The samples were analyzed for TPH as gasoline by EPA method 5030 in conjunction with modified 8015, and BTX&E by EPA method 8020. All soil samples from MW7, and the water sample collected from well MW4, were also analyzed for TPH as diesel by the use of EPA method 3550 (soil) and 3510 (water) in conjunction with modified 8015. In addition, water samples collected from wells MW2, MW4, MW6, and MW7 were analyzed for EPA method 8010 constituents.

Analytical results of the soil samples collected from the boring of MW7 indicated non-detectable levels of TPH as gasoline, TPH as diesel, and BTX&E in all analyzed samples. Analytical results of the water sample collected from MW6 indicated a non-detectable level of TPH as gasoline, and the samples collected from MW2, MW4,

and MW7 showed levels of TPH as gasoline ranging from 38 ppb to 330 ppb. Benzene was non-detectable in wells MW4 and MW7 and was detected at levels of 12 ppb and 3.2 ppb in wells MW2 and MW6, respectively. In well MW4, TPH as diesel was non-detectable. In wells MW2, MW4, MW6, and MW7, all EPA method 8010 constituents were non-detectable, except for tetrachloroethene, which was detected at levels of 3.5 ppb, 1.5 ppb, and 2.4 ppb in wells MW4, MW6, and MW7, respectively; 6.0 ppb of 1,1-dichloroethane was detected in well MW4; and 1.6 ppb of 1,2-dichlorobenzene was detected in well MW6. The concentrations of TPH as gasoline and benzene detected in the ground water samples collected on February 27, 1992, are shown on the attached Site Vicinity Map, Figure 1c. The results of the soil analyses are summarized in Table 3, and the results of the water analyses are summarized in Tables 2 and 2a. Copies of the laboratory analyses and Chain of Custody documentation are attached to this report.

HYDROLOGY AND GEOLOGY

Based on the water level data gathered during December 1991 and January 1992, the ground water flow direction appeared to be predominantly toward the west-southwest (as shown on the attached Site Vicinity Maps, Figures 1a and 1b), with an average hydraulic gradient of approximately 0.002 to 0.003. The ground water flow direction during February 1992 appeared to be toward the northeast at an average hydraulic gradient of approximately 0.0035 (see the attached Site Vicinity Map, Figure 1). Water levels have fluctuated during the quarter, and show a net increase in all of the wells ranging from 2.12 to 2.76 feet since November 19, 1991. The measured depth to ground water at the site on February 27, 1992, ranged between 14.12 and 15.70 feet below grade.

Based on review of regional geologic mapping (U.S. Geological Survey Professional Paper 943 "Flatland deposits of the San Francisco Bay Region, California - Their geology and engineering properties, and their importance to comprehensive planning," by E.J. Helley and K.R. Lajoie, 1979), the subject site is underlain by coarse-grained alluvium (Qhac). This deposit is described as typically consisting of unconsolidated, moderately sorted, permeable sand and silt, at thicknesses ranging from less than 10 feet to as much as 50 feet. This unit is assumed to overlie late Pleistocene alluvial fan deposits at depth.

However, review of the boring logs previously completed by KEI (EB1 through EB6, and MW1 through MW6) indicate the site is underlain predominantly by silty clay materials to at least the maximum depth explored (33 feet below grade). An apparent intermittent clayey silt bed was encountered at approximately 10 feet below grade. In

one boring (MW1), a clayey sand bed was encountered between depths of about 6 to 10 feet below grade; otherwise, only clay materials were noted to have been encountered.

The results of our recent subsurface study indicate that the vicinity of well MW7 is underlain predominantly by silty clay with clayey silt zones to the maximum depth explored (30 feet below grade), except for a clayey sand bed between depths of approximately 13 to 15 feet below grade. Ground water was apparently encountered at a depth of about 17 feet below grade during drilling on February 11, 1992, and later stabilized at a depth of 14.12 feet below grade on February 27, 1992.

DISCUSSION AND RECOMMENDATIONS

Based on the analytical results collected and evaluated to date, KEI recommends the continuation of the current monitoring and sampling program of the existing wells, per KEI's proposal (KEI-P88-1204.P6) dated July 15, 1991. All of the wells are monitored monthly and sampled quarterly, except for wells MW1 and MW5, which are no longer sampled. The results of the monitoring program will be documented and evaluated after each monitoring and sampling event. Recommendations for altering or terminating the program will be made as needed.

There appears to have been a significant change in the flow direction at the subject site sometime between January 20, 1992, and February 27, 1992. The ground water flow direction has been reported to be toward the west-southwest since at least September 18, 1991. However, based on the ground water level data collected on February 27, 1992, the ground water flow direction appeared to be toward the northeast. The reason for this observed change is unknown, but could be related to pumping from an adjacent water well. KEI therefore recommends that a water well survey be conducted within a 1/2-mile radius of the site.

Lastly, as previously recommended by KEI, a sample of the free product in well MW3 will be collected and analyzed during the upcoming quarter. The sample will be analyzed to determine if the product is predominantly hydrocarbon-based (i.e., gasoline, diesel, or oil), or a halogenated volatile organic compound. These analyses should further pinpoint if the free product in MW3 is from a release at the Unocal service station, or from a release at the adjacent property.

DISTRIBUTION

A copy of this report should be sent to the Mr. Larry Seto of the Alameda County Health Care Services Agency, to the City of San Leandro, and to the Regional Water Quality Control Board, San Francisco Bay Region.

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 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 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, 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.

Should 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
Certified Engineering Geologist

License No. 1633
Exp. Date 6/30/92

Timothy R. Ross
Project Manager

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Attachments: Tables 1, 2, 2a, 3 & 4
Location Map
Site Vicinity Maps - Figures 1, 1a, 1b & 1c
Site Plan - Figure 2
Boring Logs
Laboratory Analyses
Chain of Custody documentation

KEI-P88-1204.R5
April 9, 1992

TABLE 1

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

Well #	Ground Water Elevation (feet)	Depth to Water (feet)	Product Thickness	Sheen	Gallons Pumped	Product Purged (ounces)
(Monitored and Sampled on February 27, 1992)						
MW1♦	17.33	15.36	0	--	0	0
MW2	17.64	15.40	0	No	13	0
MW3♦	17.82*	14.98	0.09	N/A	0	0
MW4	17.42	14.96	0	No	13	0
MW5♦	17.52	15.50	0	--	0	0
MW6	17.49	15.70	0	No	13	0
MW7	17.97	14.12	0	No	13	0
(Monitored on February 12, 1992)						
MW1	18.12	14.57	0	--	0	0
MW2	18.59	14.45	0	--	0	0
MW3	18.76	13.97	0	Yes	55	0
MW4	18.27	14.11	0	--	0	0
MW5	18.38	14.64	0	--	0	0
MW6	18.33	14.86	0	--	0	0
MW7**	18.90	13.19	0	--	140	0
(Monitored on January 20, 1992)						
MW1	15.87	16.82	0	--	0	0
MW2	15.67	17.37	0	--	0	0
MW3	15.70*	17.27	0.31	N/A	55	4
MW4	15.78	16.60	0	--	0	0
MW5	15.86	17.16	0	--	0	0
MW6	15.94	17.25	0	--	0	0
(Monitored on January 7, 1992)						
MW3	16.15*	16.69	0.14	N/A	55	2

KEI-P88-1204.R5
April 9, 1992

TABLE 1 (Continued)

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

Well #	Ground Water Elevation (feet)	Depth to Water (feet)	Product Thickness	Sheen	Gallons Pumped	Product Purged (ounces)
		(Monitored on December 18, 1991)				
MW1	14.80	17.89	0	--	0	0
MW2	14.58	18.46	0	--	0	0
MW3	14.60*	18.28	0.19	N/A	55	2
MW4	14.71	17.67	0	--	0	0
MW5	14.72	18.30	0	--	0	0
MW6	14.81	18.38	0	--	0	0
		(Monitored on December 2, 1991)				
MW3	14.77*	18.21	0.32	N/A	55	6

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

-- Sheen determination was not performed.

♦ Monitored only.

* The elevations of the ground water were corrected using an assumed specific gravity of 0.77 for the free product.

** Well MW7 was also developed.

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

KEI-P88-1204.R5
April 9, 1992

TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Well #	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	TOG (ppm)
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
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

KEI-P88-1204.R5
April 9, 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)
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
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

KEI-P88-1204.R5
April 9, 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)
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	--
Detection Limits		50	30	0.30	0.30	0.30	0.30	5.0

-- Indicates analysis not performed.

ND = Non-detectable.

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

KEI-P88-1204.R5
April 9, 1992

TABLE 2a

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Well #	Tetrachloro-ethene	1,1-Dichloro-ethane	1,1,1-Trichloro-ethane	Chloro-methane
2/27/92	MW2	ND	ND	ND	ND
	MW3	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT			
	MW4	3.5	6.0	ND	ND
	MW6**	1.5	ND	ND	ND
	MW7	2.4	ND	ND	ND
11/19/91	MW2	ND	ND	ND	ND
	MW3	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT			
	MW4	3.4	ND	ND	ND
	MW6	1.3	ND	ND	ND
8/15/91	MW2	ND	ND	ND	ND
	MW3	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT			
	MW4	3.6	ND	ND	ND
	MW6	1.2	ND	ND	ND
5/24/91	MW1	4.6	ND	ND	ND
	MW2	ND	ND	ND	ND
	MW3	ND	ND	ND	ND
	MW4	4.1	2.5	3.9	ND
	MW5	0.89	ND	ND	ND
	MW6	0.88	ND	ND	5.6
11/06/90	MW1	4.8	ND	ND	ND
	MW2	ND	ND	ND	ND
	MW3	ND	ND	ND	ND
	MW4	2.9	ND	ND	ND
	MW5	0.7	ND	ND	ND
	MW6	1.2	ND	ND	ND
4/25/89	MW1*	3.3	ND	ND	ND
	MW2	0.68	ND	ND	ND
	MW3	1.0	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.

** 1,2 - Dichlorobenzene was detected at 1.6 ppb.

ND = Non-detectable.

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

KEI-P88-1204.R5
April 9, 1992

TABLE 3

SUMMARY OF LABORATORY ANALYSES
SOIL

Sample Number	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	TOG
(Collected on January 3, 1989)								
EB1(5)*	5.0	5.0	--	ND	0.05	ND	ND	ND
EB1(10)*	10.0	1.0	--	ND	ND	ND	ND	ND
EB1(15)*	15.0	1.0	--	ND	ND	ND	ND	ND
EB1(25)*	25.0	2.0	--	--	--	--	--	ND
EB2(10)	10.0	--	ND	ND	ND	ND	ND	--
EB2(15)	15.0	--	ND	ND	ND	ND	ND	--
EB2(20)	20.0	--	ND	ND	ND	ND	ND	--
EB2(25)	25.0	--	1.9	ND	ND	ND	ND	--
EB3(5)	5.0	--	ND	ND	ND	ND	ND	--
EB3(10)	10.0	--	ND	ND	ND	ND	ND	--
EB3(15)	15.0	--	2.7	ND	ND	ND	ND	--
EB3(20)	20.0	--	2.2	ND	ND	ND	ND	--
EB3(25)	25.0	--	ND	ND	ND	ND	ND	--
EB4(5)	5.0	--	ND	ND	ND	ND	ND	--
EB4(10)	10.0	--	ND	ND	ND	ND	ND	--
EB4(15)	15.0	--	ND	ND	ND	ND	ND	--
EB4(20)	20.0	--	ND	ND	ND	ND	ND	--
EB4(25)	25.0	--	ND	ND	ND	ND	ND	--
EB5(5)	5.0	--	ND	ND	ND	ND	ND	--
EB5(10)	10.0	--	ND	ND	ND	ND	ND	--
EB5(15)	15.0	--	2.0	ND	ND	ND	ND	--
EB5(20)	20.0	--	17	0.12	0.15	1.4	0.25	--
EB5(25)	25.0	--	3.9	ND	ND	0.17	ND	--
EB6(5)	5.0	10	1.8	ND	ND	ND	ND	7,800
EB6(10)	10.0	160	73	ND	ND	ND	ND	1,200
EB6(15)	15.0	40	17	0.065	ND	0.21	ND	900
EB6(25)	25.0	3.0	ND	ND	ND	ND	ND	130
(Collected on May 11, 1989)								
SWA	16.5	21	--	--	--	--	--	850
SWB	16.5	18	--	--	--	--	--	580
SWC	16.5	26	--	--	--	--	--	680
SWD	16.5	16	--	--	--	--	--	170

KEI-P88-1204.R5
April 9, 1992

TABLE 3 (Continued)

SUMMARY OF LABORATORY ANALYSES
SOIL

Sample Number	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	TOG
(Collected on April 17, 1989)								
MW1	5.0	ND	4.0	ND	ND	ND	ND	ND
MW1	10.0	ND	ND	ND	ND	ND	ND	ND
MW1	15.0	ND	ND	ND	ND	ND	ND	ND
MW1	17.0	ND	ND	ND	ND	ND	ND	31
MW2*	5.0	ND	ND	ND	ND	ND	ND	31
MW2*	10.0	ND	1.1	ND	ND	ND	ND	60
MW2*	15.0	ND	ND	ND	ND	ND	ND	71
MW3	5.0	ND	ND	ND	ND	ND	ND	ND
MW3	10.0	ND	1.1	ND	ND	ND	ND	ND
MW3	15.0	ND	1.2	ND	ND	ND	ND	32
MW3	17.0	ND	6.2	ND	0.21	0.42	ND	180
(Collected on August 16, 1989)								
MW4	5.0	--	3.3	ND	ND	0.11	ND	ND
MW4	10.0	--	ND	ND	ND	ND	ND	ND
MW4	15.0	--	ND	ND	ND	ND	ND	ND
MW4	19.0	--	ND	ND	ND	ND	ND	ND
MW5	5.0	--	ND	ND	ND	ND	ND	ND
MW5	10.0	--	ND	ND	ND	ND	ND	ND
MW5	15.0	--	ND	ND	ND	ND	ND	ND
MW5	20.0	--	20	ND	ND	ND	ND	ND
MW5	22.0	--	ND	ND	ND	ND	ND	ND
MW6	5.0	--	ND	ND	ND	ND	ND	ND
MW6	10.0	--	ND	ND	ND	ND	ND	ND
MW6	15.0	--	ND	ND	ND	ND	ND	ND
MW6	20.0	--	ND	ND	ND	ND	ND	ND

KEI-P88-1204.R5
April 9, 1992

TABLE 3 (Continued)

SUMMARY OF LABORATORY ANALYSES
SOIL

Sample Number	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	TOG
(Collected on February 11, 1992)								
MW7(5)	5.0	ND	ND	ND	ND	ND	ND	--
MW7(9.5)	9.5	ND	ND	ND	ND	ND	ND	--
MW7(15)	15.0	ND	ND	ND	ND	ND	ND	--
MW7(16.5)	16.5	ND	ND	ND	ND	ND	ND	--
Detection Limits		1.0	1.0	0.05	0.1	0.1	0.1	50

-- Indicates analysis not performed.

ND = Non-detectable.

* EPA method 8010 constituents were non-detectable.

Results in parts per million (ppm), unless otherwise indicated.

KEI-P88-1204.R5
April 9, 1992

TABLE 4

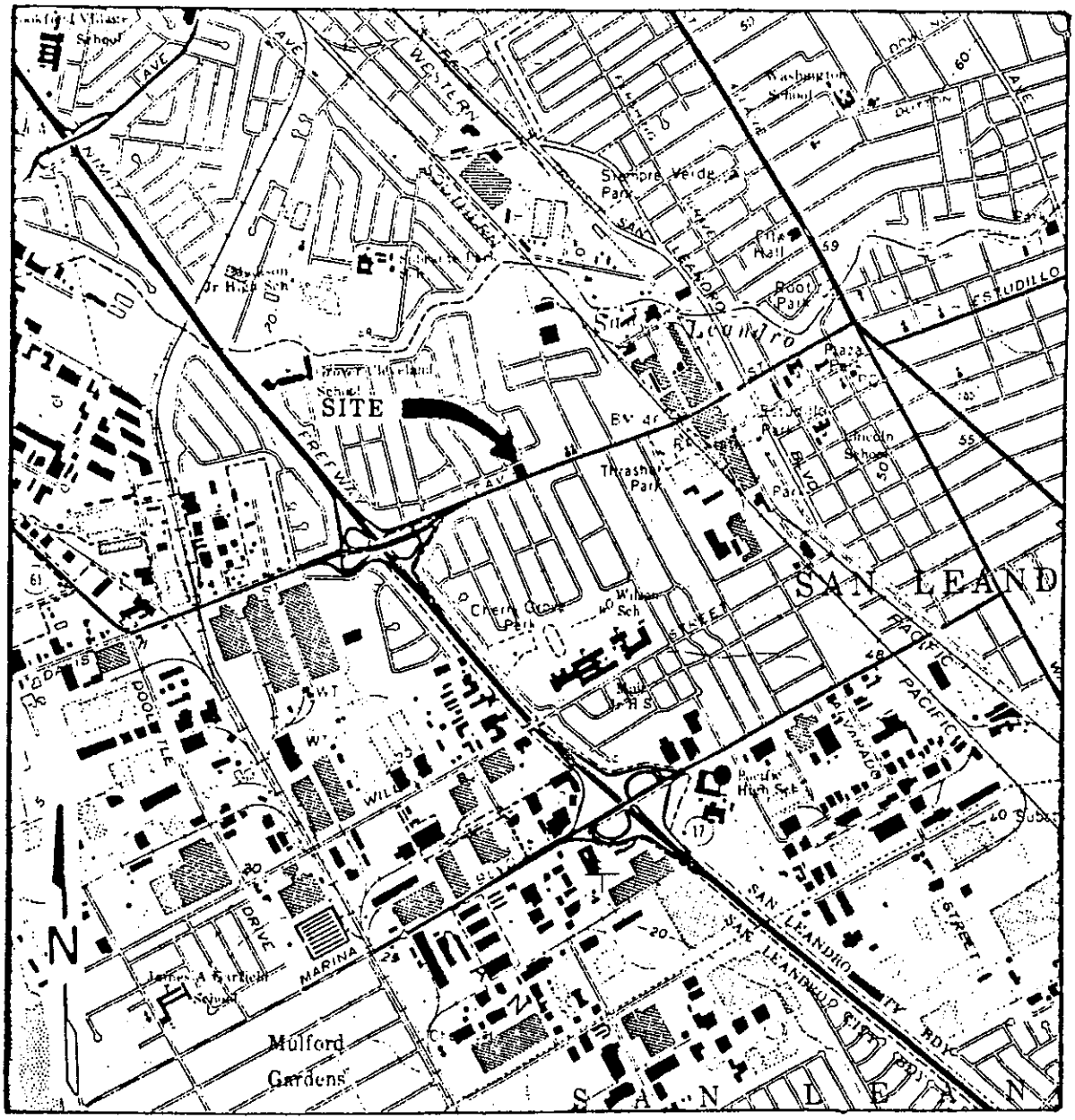
SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Number	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
1/03/89	EB1	ND	--	ND	3.5	ND	ND
	EB2	--	ND	8.2	7.4	3.3	0.67
	EB3	--	ND	ND	ND	ND	ND
	EB4	--	ND	ND	ND	ND	0.73
	EB5	--	340	ND	ND	ND	0.63
	EB6	--	1,500	1.5	1.4	12	8.1
Detection Limits		50	50	0.5	0.5	0.5	0.5

ND = Non-detectable.

-- Indicates analysis not performed.

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

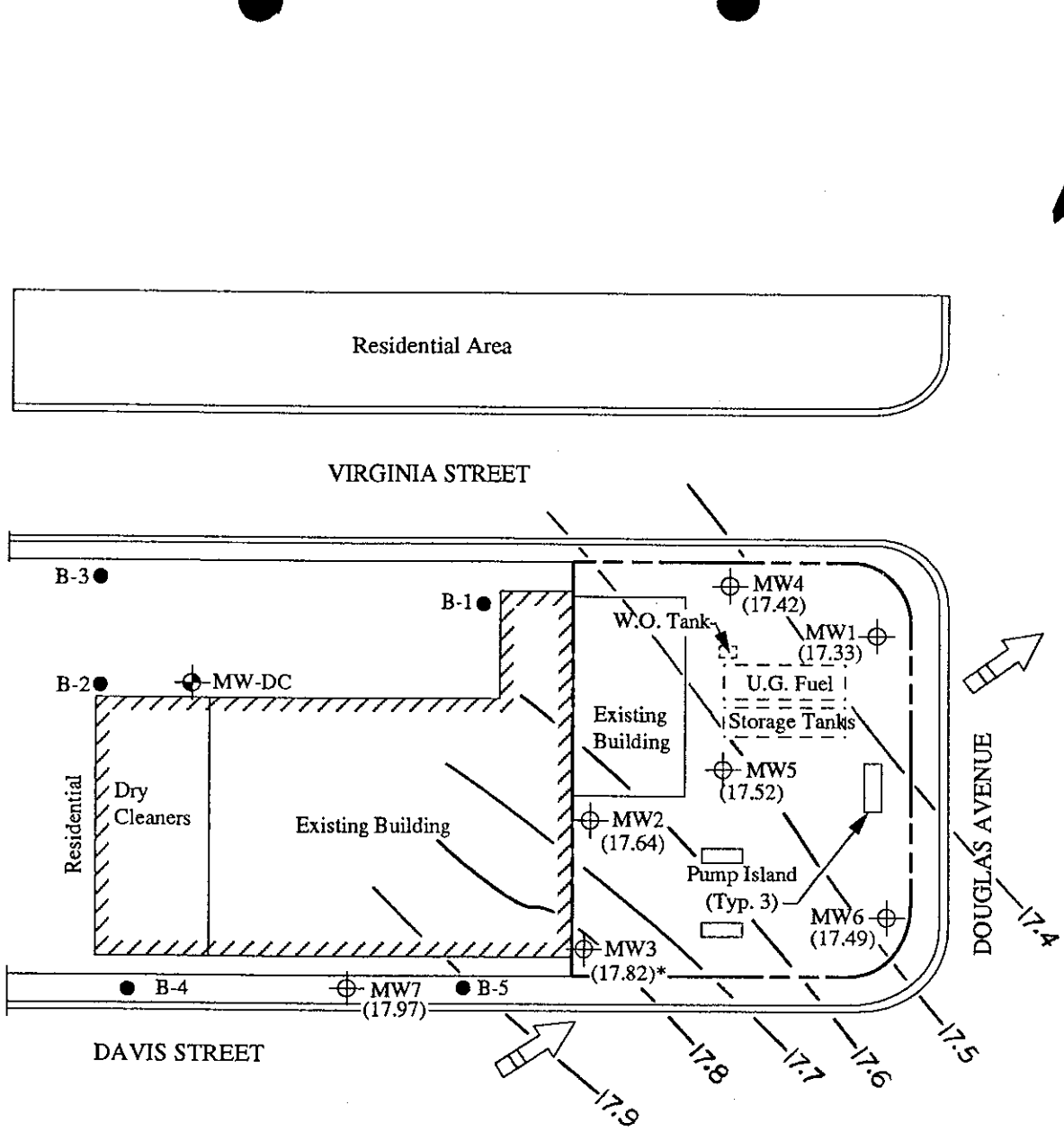


Base modified from 7.5 minute U.S.G.S. San Leandro Quadrangle
(photorevised 1980)

0 2000 4000

Approx. scale feet

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



SITE VICINITY MAP

LEGEND

- Existing Monitoring Well (by KEI)
- Existing Monitoring Well (by others)
- ● Appropriate location of existing off-site Soil Borings (by AGS)
- ( ) Ground water elevation in feet above mean sea level on 2/27/92
- Direction of ground water flow
- —— Contours of ground water elevation
- * Ground water elevation corrected due to the presence of free product

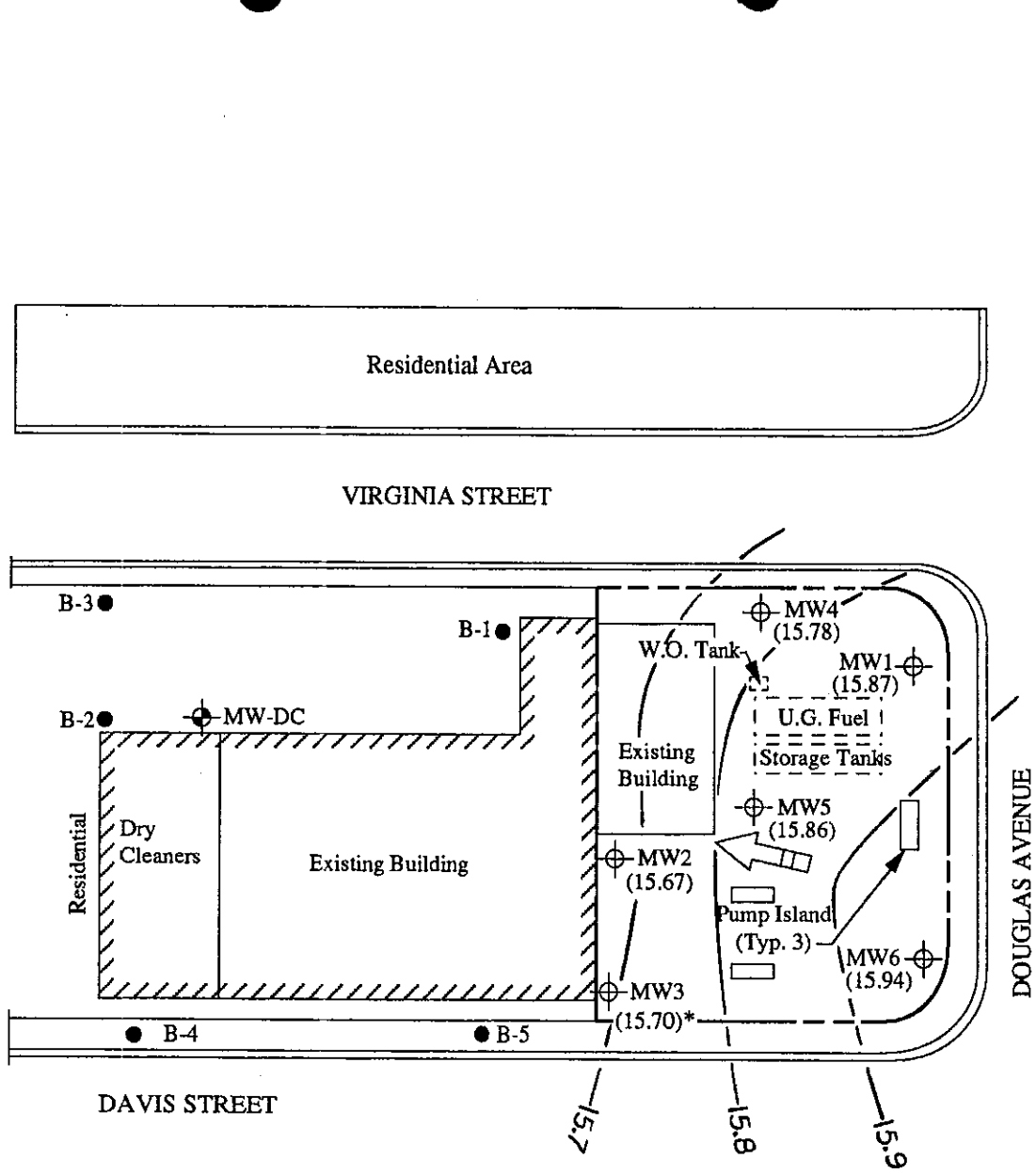
0 50 100

Approx. scale feet

KAPREALIAN ENGINEERING
INCORPORATED

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

FIGURE
1



SITE VICINITY MAP

LEGEND

- Existing Monitoring Well (by KEI)
- Existing Monitoring Well (by others)
- ● Appropriate location of existing off-site Soil Borings (by AGS)
- ( ) Ground water elevation in feet above mean sea level on 1/20/92
- 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

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UNOCAL SERVICE STATION #2512
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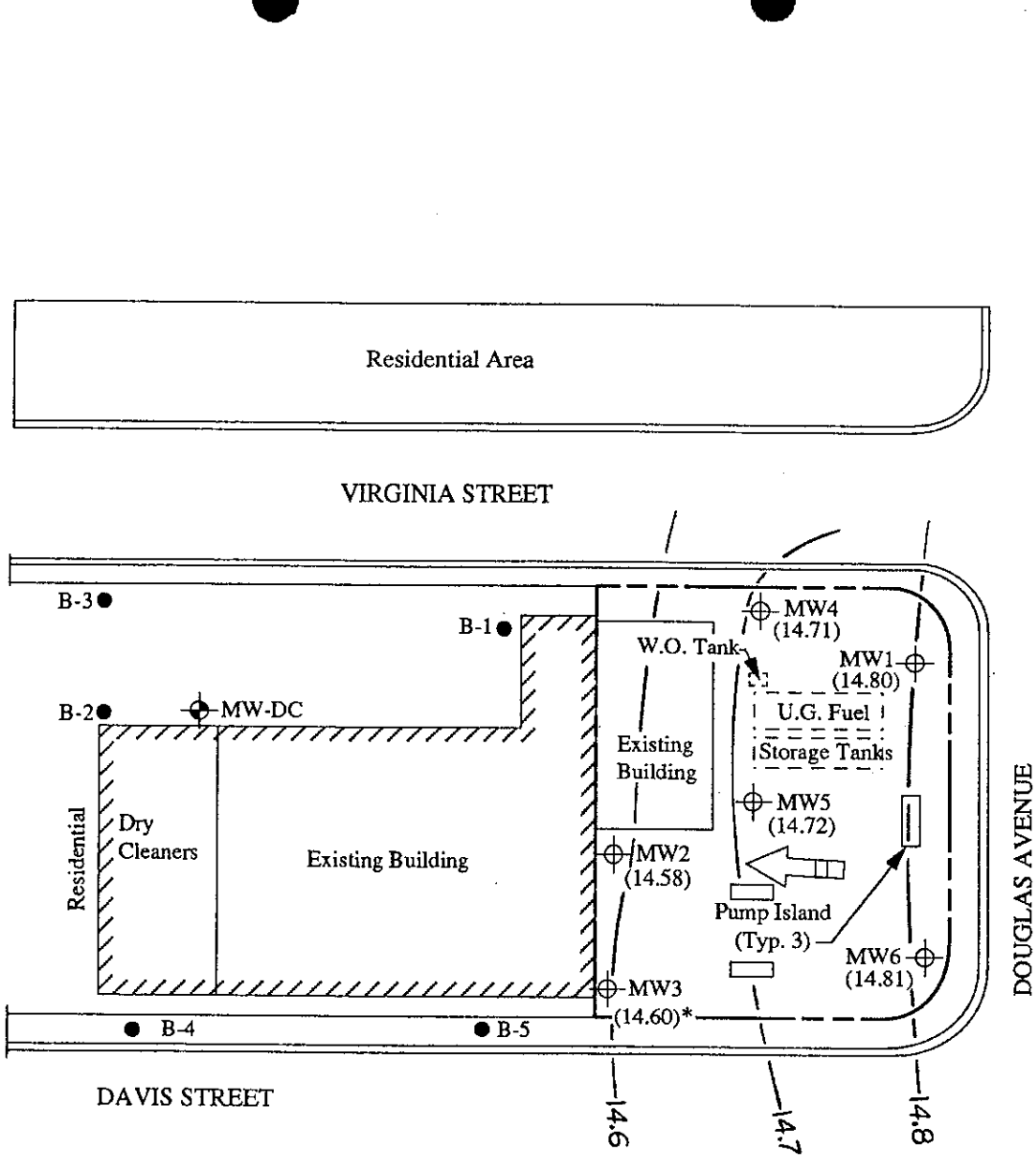
SAN LEANDRO, CA

FIGURE
1a



SITE VICINITY MAP

LEGEND

- Existing Monitoring Well (by KEI)
- Existing Monitoring Well (by others)
- Appropriate location of existing off-site Soil Borings (by AGS)
- ( ) Ground water elevation in feet above mean sea level on 12/18/91
- 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

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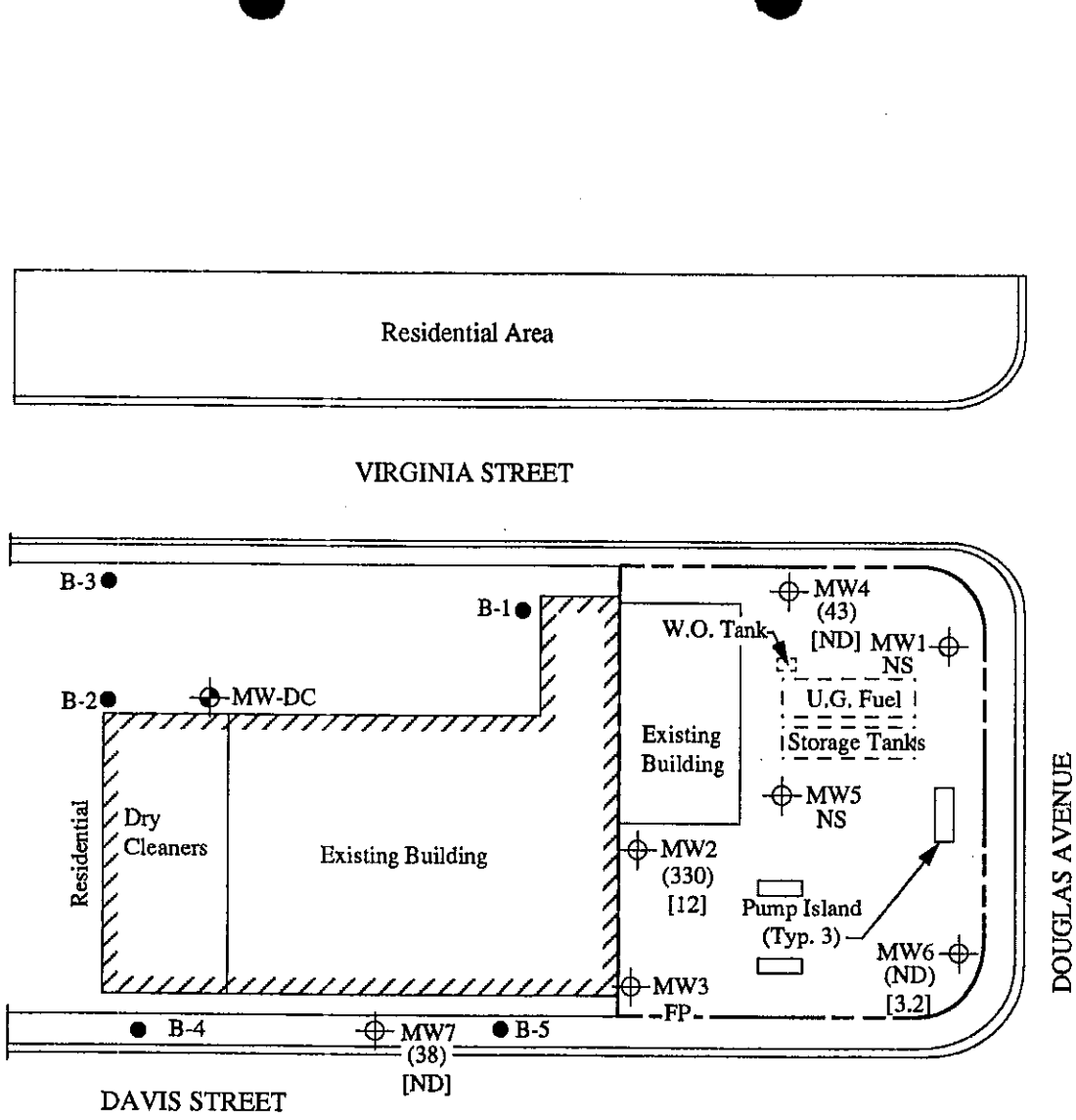
SAN LEANDRO, CA

FIGURE
1b



SITE VICINITY MAP

(Samples Collected on 2/27/92)

LEGEND

- ⊕ Existing Monitoring Well (by KEI)
- ⊕ Existing Monitoring Well (by others)
- ● Appropriate location of existing off-site Soil Borings (by AGS)
- ( ) Concentrations of TPH as gasoline in ppb
- [ ] Concentrations of benzene in ppb
- < > Concentrations of TPH as diesel in ppb
- NS = Not sampled
- FP = Free product

0 50 100

Approx. scale feet

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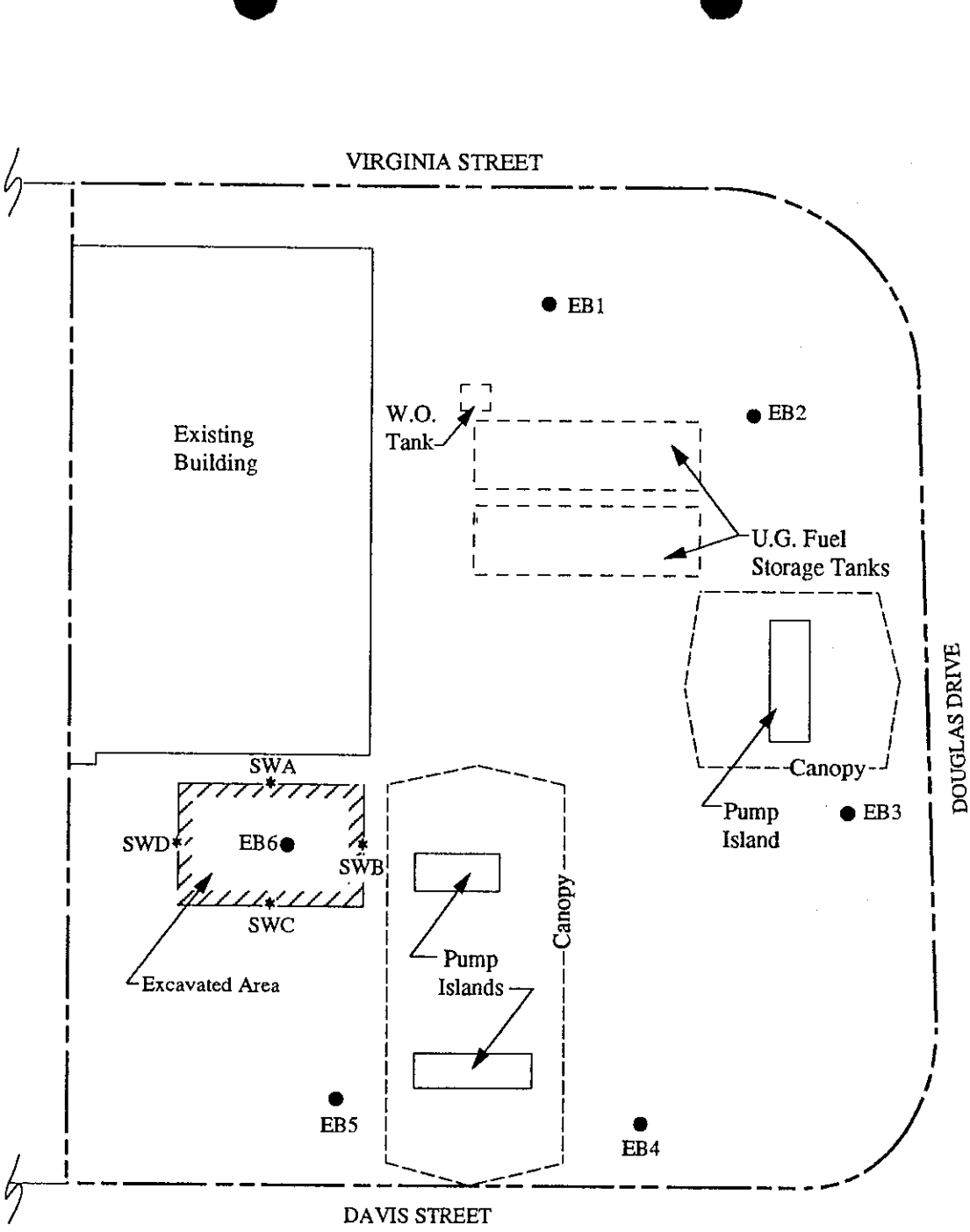
1300 DAVIS STREET
SAN LEANDRO, CA

FIGURE
1c



SITE PLAN

LEGEND

- ● Exploratory boring
- * Sample Point Location

0 20 40

Approx. scale feet

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1300 DAVIS STREET
SAN LEANDRO, CA

FIGURE
2

KAPREALIAN ENGINEERING
INCORPORATED

MAJOR DIVISIONS		SYMBOLS	TYPICAL SOIL DESCRIPTIONS
GRAVELS (More than 1/2 of coarse fraction > No. 4 sieve size)		GW	Well graded gravels or gravel - sand mixtures, little or no fines
		GP	Poorly graded gravels or gravel - sand mixtures, little or no fines
		GM	Silty gravels, gravel - sand - silt mixtures
		GC	Clayey gravels, gravel - sand - clay mixtures
SANDS (More than 1/2 of coarse fraction < No. 4 sieve size)		SW	Well graded sands or gravelly sands, little or no fines
		SP	Poorly graded sands or gravelly sands, little or no fines
		SM	Silty sands, sand - silt mixtures
		SC	Clayey sands, sand - clay mixtures
SILTS & CLAYS LL < 50		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
SILTS & CLAYS LL > 50		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS		Pt	Peat and other highly organic soils
DUAL (TRANSITION) SOILS			Soil characterisitics are transitional between the soil classifications listed above

CLASSIFICATION CHART (Unified Soil Classification System)

BORING LOG

Project No. KEI-P88-1204	**Boring & Casing Diameter** 8-1/4" 2"	**Logged By** D.L.
Project Name Unocal San Leandro, 1300 Davis Street	**Well Cover Elevation** 32.09' MSL	**Date Drilled** 2/11/92
Boring No. MW7	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
		0		Asphalt and concrete slab
				Silty clay with approximately 5-10% gravel, stiff, moist, very dark grayish brown; fill.
			CH	
5/7/11		5		Clay, estimated at 5 to 10% silt and sand, stiff to very stiff, moist, very dark gray to black.
			ML	Sandy silt, estimated at 5 to 10% clay, sand is fine- to medium-grained, stiff, moist, olive brown.
4/5/10		10		
			CH	Clay with silt, trace sand, very stiff, moist, very dark grayish brown with root holes, trace organic matter.
4/6/9			SC	Clayey sand, estimated at 15 to 30% variable clay content, sand is fine- to coarse-grained, medium dense, moist, olive brown , with iron oxide staining.
		15		
4/4/7	▽			Silty clay, trace to an estimated 10% variable sand content, stiff to very stiff, moist to wet, olive brown, with root holes, trace organic matter.
			CL	
6/6/8		20		Silty clay, trace sand, stiff, moist, wet in voids, dark grayish brown, with root holes, fibrous cemented nodules common below 20 feet.

BORING LOG

Project No.	Boring & Casing Diameter	Logged By
KEI-P88=1204	8-1/4" 2"	D.L.
Project Name	**Well Cover Elevation**	**Date Drilled**
San Leandro, Davis	32.09' MSL	2/11/92
Boring No.	**Drilling Method** Hollow-stem Auger	**Drilling Company**
MW7		EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
11/13/9		25	CL	Silty clay, estimated at 30 to 45% variable silt content, stiff to very stiff, moist, wet in voids, olive brown with iron oxide staining.
7/8/10		30		TOTAL DEPTH: 30'
		35		
		40		

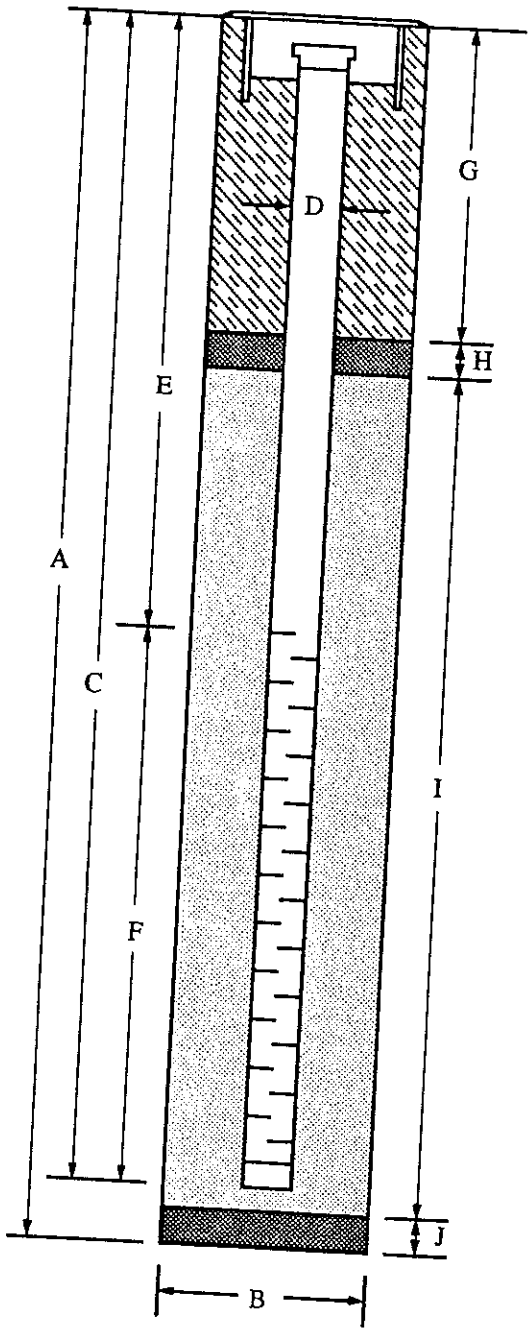
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal - San Leandro, Davis Street WELL NO. MW7

PROJECT NUMBER: KEI-P88-1204

WELL PERMIT NO.: ACFD&WCD #91476

Flush-mounted Well Cover



A. Total Depth : 30'

B. Boring Diameter: 8-1/4"

Drilling Method: Hollow Stem Auger

C. Casing Length: 30'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 10'

F. Perforated Length: 20'

Perforation Type: Machined Slot

Perforation Size: 0.010"

G. Surface Seal: 6'

Seal Material: Cement/sand slurry

H. Seal: 2'

Seal Material: Bentonite

I. Filter Pack: 22'

Pack Material: RMC Lonestar Sand

Size: #2/12

J. Bottom Seal: none

Seal Material: N/A

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal #2512, 1300 Davis St., San Leandro	Sampled:	Feb 11, 1992
P.O. Box 996	Matrix Descript:	Soil	Received:	Feb 12, 1992
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Feb 12, 1992
Attention: Mardo Kaprealian, P.E.	First Sample #:	202-0420	Reported:	Feb 28, 1992

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
202-0420	MW7 (5)	N.D.	N.D.	N.D.	N.D.	N.D.
202-0421	MW7 (9.5)	N.D.	N.D.	N.D.	N.D.	N.D.
202-0422	MW7 (15)	N.D.	N.D.	N.D.	N.D.	N.D.
202-0423	MW7 (16.5)	N.D.	N.D.	N.D.	N.D.	N.D.

Method Detection Limits:	**1.0**	**0.0050**	**0.0050**	**0.0050**	**0.0050**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal #2512, 1300 Davis St., San Leandro	Sampled:	Feb 11, 1992
P.O. Box 996	Matrix Descript:	Soil	Received:	Feb 12, 1992
Benicia, CA 94510	Analysis Method:	EPA 3550/8015	Extracted:	Feb 24, 1992
Attention: Mardo Kaprealian, P.E.	First Sample #:	202-0420	Analyzed:	Feb 27, 1992
			Reported:	Feb 28, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons mg/kg (ppm)
202-0420	MW7 (5)	N.D.
202-0421	MW7 (9.5)	N.D.
202-0422	MW7 (15)	N.D.
202-0423	MW7 (16.5)	N.D.

Method Detection Limits:	**1.0**

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

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

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

Client Project ID: Unocal #2512, 1300 Davis St., San Leandro
QC Sample Group: 2020420-423
Reported: Feb 28, 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:	K.E.	K.E.	K.E.	K.E.	A. Tuzon
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	Feb 12, 1992	Feb 12, 1992	Feb 12, 1992	Feb 12, 1992	Feb 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:	0.40	0.40	0.40	1.2	10
Conc. Matrix Spike:	0.38	0.38	0.40	1.2	7.6
Matrix Spike % Recovery:	95	95	100	100	76
Conc. Matrix Spike Dup.:	0.38	0.39	0.42	1.2	7.8
Matrix Spike Duplicate % Recovery:	95	98	105	100	78
Relative % Difference:	0.0	2.6	4.8	0.0	2.6

Laboratroy blank contained the following analytes: None Detected

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

% 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

SEQUOIA ANALYTICAL

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

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

Client Project ID: Unocal #2512, 1300 Davis St., San Leandro
QC Sample Group: 2020420-423
Reported: Feb 28, 1992

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA8015	EPA8015
Analyst:	K.E.	K.E.	K.E.	K.E.	K.E.	A. Tuzon	A. Tuzon
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	Feb 12, 1992	Feb 12, 1992	Feb 12, 1992	Feb 12, 1992	Feb 12, 1992	Feb 27, 1992	Feb 27, 1992
Sample #:	202-0420	202-0421	202-0422	202-0423	Blank	202-0420	202-0421
Surrogate % Recovery:	96	100	100	84	80	110	110

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Belinda C. Vega
Laboratory Director

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

Client Project ID: Unocal #2512, 1300 Davis St., San Leandro
QC Sample Group: 2020420-424
Reported: Feb 28, 1992

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA8015	EPA8015	EPA8015
Analyst:	A. Tuzon	A. Tuzon	A. Tuzon
Reporting Units:	mg/kg	mg/kg	mg/kg
Date Analyzed:	Feb 27, 1992	Feb 27, 1992	Feb 27, 1992
Sample #:	202-0422	202-0423	Blank
Surrogate % Recovery:	100	110	120

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Belinda C. Vega
Laboratory Director

% 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: [signature]

WITNESSING AGENCY

SITE NAME & ADDRESS: UNOCAL #2512 / SAN LEANDRO, 1300 DAVIS STREET

ANALYSES REQUESTED: TPH(G), BTEX, TPH(D)

TURN AROUND TIME: REGULAR

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	REMARKS
MW7(S)	2-11-92		X		X		1	SEE SAMPLE ID NO.	2020420
MW7(9.5)	2-11-92		X		X		1		421
MW7(15)	2-11-92		X		X		1		422
MW7(16.5)	2-11-92		X		X		1		423

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature] (KET)	2-12-92 8:55 AM	[signature]
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)

The following MUST BE completed by the laboratory accepting samples for analysis:

1. Have all samples received for analysis been stored in ice? ✓
2. Will samples remain refrigerated until analyzed? ✓
3. Did any samples received for analysis have head space? N/A
4. Were samples in appropriate containers and properly packaged? ✓

Signature	Title	Date
AMK	LS	2-12-92

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal/ 1300 Davis St., San Leandro	Sampled:	Feb 27, 1992
P.O. Box 996	Matrix Descript:	Water	Received:	Feb 27, 1992
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Mar 9, 1992
Attention: Mardo Kaprealian, P.E.	First Sample #:	202-1111	Reported:	Mar 16, 1992

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)
202-1111	MW2	330	12	12	10	93
202-1112	MW4	43	N.D.	1.0	0.37	2.5
202-1113	MW6	N.D.	3.2	N.D.	N.D.	3.8
202-1114	MW7	38	N.D.	0.97	0.69	4.0
Method Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.

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Belinda C. Vega
Laboratory Director

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal/ 1300 Davis St., San Leandro	Sampled:	Feb 27, 1992
P.O. Box 996	Matrix Descript:	Water, MW4	Received:	Feb 27, 1992
Benicia, CA 94510	Analysis Method:	EPA 3510/8015	Extracted:	Mar 5, 1992
Attention: Mardo Kaprealian, P.E.	First Sample #:	202-1112	Analyzed:	Mar 11, 1992
			Reported:	Mar 16, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons µg/L (ppb)
202-1112	MW4	N.D.

Method Detection Limits:	**50**

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal/ 1300 Davis St., San Leandro	Sampled:	Feb 27, 1992
P.O. Box 996	Sample Descript:	Water, MW2	Received:	Feb 27, 1992
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Mar 9, 1992
Attention: Mardo Kaprealian, P.E.	Lab Number:	202-1111	Reported:	Mar 16, 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	0.50	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	0.50	N.D.
2-Chloroethylvinyl ether	0.50	N.D.
Chloroform	0.50	N.D.
Chloromethane	0.50	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	0.50	N.D.

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

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Laboratory Director

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal/ 1300 Davis St., San Leandro	Sampled:	Feb 27, 1992
P.O. Box 996	Sample Descript:	Water, MW4	Received:	Feb 27, 1992
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Mar 9, 1992
Attention: Mardo Kaprealian, P.E.	Lab Number:	202-1112	Reported:	Mar 16, 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	0.50	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	0.50	N.D.
2-Chloroethylvinyl ether	0.50	N.D.
Chloroform	0.50	N.D.
Chloromethane	0.50	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	6.0
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	3.5
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	0.50	N.D.

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

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Laboratory Director

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal/ 1300 Davis St., San Leandro	Sampled:	Feb 27, 1992
P.O. Box 996	Sample Descript:	Water, MW6	Received:	Feb 27, 1992
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Mar 9, 1992
Attention: Mardo Kaprealian, P.E.	Lab Number:	202-1113	Reported:	Mar 16, 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	0.50	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	0.50	N.D.
2-Chloroethylvinyl ether	0.50	N.D.
Chloroform	0.50	N.D.
Chloromethane	0.50	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	1.6
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	1.5
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	0.50	N.D.

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

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Belinda C. Vega
Laboratory Director

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal/ 1300 Davis St., San Leandro	Sampled:	Feb 27, 1992
P.O. Box 996	Sample Descript:	Water, MW7	Received:	Feb 27, 1992
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Mar 9, 1992
Attention: Mardo Kaprealian, P.E.	Lab Number:	202-1114	Reported:	Mar 16, 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	0.50	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	0.50	N.D.
2-Chloroethylvinyl ether	0.50	N.D.
Chloroform	0.50	N.D.
Chloromethane	0.50	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**	**2.4**
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	0.50	N.D.

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

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Laboratory Director

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

Client Project ID: Unocal/ 1300 Davis St., San Leandro
QC Sample Group: 2021111-1114
Reported: Mar 16, 1992

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015	EPA 8015
Analyst:	K.E.	K.E.	K.E.	K.E.	K.E.	A. Tuzon	A. Tuzon
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Mar 9, 1992	Mar 9, 1992	Mar 9, 1992	Mar 9, 1992	Mar 9, 1992	Mar 11, 1992	Mar 11, 1992
Sample #:	202-1111	202-1112	202-1113	202-1114	Blank	202-1112	Blank
Surrogate % Recovery:	95	100	92	98	86	120	120

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Belinda C. Vega
Laboratory Director

% 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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Benicia, CA 94510
Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal/ 1300 Davis St., San Leandro
QC Sample Group: 2021111-1114
Reported: Mar 16, 1992

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8010	EPA 8010	EPA 8010	EPA 8010	EPA 8010
Analyst:	M.N.	M.N.	M.N.	M.N.	M.N.
Reporting Units:	ug/L	ug/L	ug/L	ug/L	ug/L
Date Analyzed:	Mar 9, 1992	Mar 9, 1992	Mar 9, 1992	Mar 9, 1992	Mar 9, 1992
Sample #:	202-1111	202-1112	202-1113	202-1114	Blank
Surrogate #1 % Recovery:	115	103	110	98	86
Surrogate #2 % Recovery:	88	88	90	88	90

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Belinda C. Vega
Laboratory Director

% 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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Benicia, CA 94510
Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal/ 1300 Davis St., San Leandro
QC Sample Group: 2021111-1114
Reported: Mar 16, 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:	K.E./K.N./J.F.	K.E./K.N./J.F.	K.E./K.N./J.F.	K.E./K.N./J.F.	A. Tuzon
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Mar 9, 1992	Mar 9, 1992	Mar 9, 1992	Mar 9, 1992	Mar 9, 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:	24	25	22	72	290
Matrix Spike % Recovery:	120	125	110	120	98
Conc. Matrix Spike Dup.:	21	22	21	64	330
Matrix Spike Duplicate % Recovery:	105	110	105	106	110
Relative % Difference:	13	13	4.6	12	13

Laboratory blank contained the following analytes: None Detected

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Belinda C. Vega
Laboratory Director

$$\%\ \text{Recovery:} = \frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$$

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

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

Client Project ID: Unocal/ 1300 Davis St., San Leandro
QC Sample Group: 2021111-1114
Reported: Mar 16, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloroethene	Trichloro-ethene	Chloro-benzene
Method:	EPA 8010	EPA 8010	EPA 8010
Analyst:	M. Nguyen	M. Nguyen	M. Nguyen
Reporting Units:	µg/L	µg/L	µg/L
Date Analyzed:	Mar 9, 1992	Mar 9, 1992	Mar 9, 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	12
Matrix Spike % Recovery:	110	110	120
Conc. Matrix Spike Dup.:	11	11	11
Matrix Spike Duplicate % Recovery:	110	110	110
Relative % Difference:	0.0	0.0	8.7

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

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Belinda C. Vega
Laboratory Director

% 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: RAY (KEI)
WITNESSING AGENCY:

SITE NAME & ADDRESS: UNOCAL SAN LEANDRO
1300 DAVIS ST

ANALYSES REQUESTED: TPHG, BTXE 8010, TPHD as Diesel

TURN AROUND TIME: REGULAR

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPHG	BTXE 8010	TPHD as Diesel		REMARKS
MW2	2.27			X	X		4	VOA	X	X	X		2021111 AD
MW4	"			X	X		4	VOA AMB	X	X	X	X	1112 AE
MW6	"			X	X		4	VOA	X	X	X		1113 AD
MW7	"			X	X		4	VOA	X	X	X		1114 AD

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Ray KEI	2-27-92	A. Nagra
Tim Hall 2/28 2:50p	2-28-92 2:50PM	

The following MUST BE completed by the laboratory accepting samples for analysis:

1. Have all samples received for analysis been stored in ice? YES
2. Will samples remain refrigerated until analyzed? YES
3. Did any samples received for analysis have head space? NO
4. Were samples in appropriate containers and properly packaged? YES

A. Nagra — Signature; Analyst — Title; 2/27/92 — Date