


KAPREALIAN ENGINEERING
INCORPORATED

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May 2, 1994

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

Attention: Ms. Eva Chu

RE: Unocal Service Station #6419
6401 Dublin Boulevard
Dublin, California

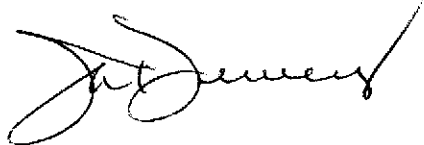
Dear Ms. Chu:

Per the request of Mr. Edward C. Ralston of Unocal Corporation, enclosed please find our report dated April 7, 1994, 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.



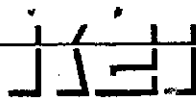
Judy A. Dewey

jad\82

Enclosure

Enclosed recommendations to
① monitor monthly for logs.
② Sample quarterly for
TPH-G, TPH-D, BTEX

cc: Edward C. Ralston, Unocal Corporation



KAPREALIAN ENGINEERING
INCORPORATED

KEI-P93-0401.R5
April 7, 1994

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

Attention: Mr. Edward C. Ralston

RE: Preliminary Ground Water Investigation at
Unocal Service Station #6419
6401 Dublin Boulevard
Dublin, California

Dear Mr. Ralston:

This report presents the results of Kaprealian Engineering, Inc's. (KEI) most recent soil and ground water investigation for the referenced site, in accordance with KEI's proposal (KEI-P93-0401.P2) dated January 7, 1994. The purpose of the investigation was to further determine the vertical and lateral extent of any remaining soil contamination at the site, to determine the ground water flow direction at the site, and to determine the lateral extent of any existing ground water contamination at the site. The scope of work performed by KEI consisted of the following:

Coordination with regulatory agencies

Geologic logging of three borings for the installation of three monitoring wells

Soil sampling

Ground water monitoring, purging, and sampling

Laboratory analyses

Data analysis, interpretation, and report preparation

SITE DESCRIPTION AND BACKGROUND

The subject site contains a Unocal service station facility. The site occupies flat terrain and is situated on the northwest corner of the intersection of Dublin Boulevard and Dougherty Road. The site is also located approximately 0.3 mile west of the Chabot Canal. In addition, a BP service station (formerly Mobil) is located east-southeast and adjacent to the Unocal site across Dublin Boulevard. A Location Map is attached to this report.

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KEI's field work was initiated on September 7, 1993, when three underground storage tanks were removed from the site. The tanks consisted of one 10,000 gallon regular unleaded gasoline storage tank, one 10,000 gallon super unleaded gasoline storage tank, and one 550 gallon waste oil storage tank. The tanks were made of steel, and no apparent holes or cracks were observed in any of the tanks. Tank removal and soil sampling were performed in the presence of Mr. Jeff Shapiro of the Alameda County Health Care Services (ACHCS) Agency. Mr. Ron Johansen of the Dougherty Fire Authority was also present during tank removal operations.

Eight soil samples, labeled D1 through D8, were collected from beneath the product dispensers at depths ranging from 2.5 feet to 5.5 feet below grade. Seven soil samples, labeled P1 through P7, were collected from the product piping trenches at depths ranging from 3 feet to 7 feet below grade. These samples were collected by the use of a driven tube-type soil sampler. In addition, two soil samples, labeled ST1 and ST2, were collected from the former septic tank pit located on the west side of the existing building. The former septic tank contained approximately 400 gallons of liquid that was previously sampled and analyzed for proper disposal prior to tank removal. The former underground septic tank had a 6,000 gallon capacity and was physically removed from the site on September 11, 1993. The tank was made of steel, and no holes or cracks were observed in the tank. The soil samples ST1 and ST2 were collected from bulk material excavated by backhoe at depths of approximately 10 feet below grade. Sample point locations are shown on the attached Figure 3.

KEI returned to the site on September 8, 1993, in order to collect the required soil samples from the fuel and waste oil storage tank pit excavations. Ground water (with an apparent sheen) was observed in the fuel tank pit at a depth of about 14 feet below grade. Per the direction of Mr. Jeff Shapiro of the ACHCS, five soil samples, labeled SW1 through SW5, were collected from the sidewalls of the fuel tank pit at depths of about 13.5 feet below grade. Two soil samples, labeled B1 and B2, were collected from the bottom of the fuel tank pit excavation at depths of about 17 feet and 15.5 feet below grade, respectively. These samples were also collected from bulk material excavated by backhoe. In addition, one soil sample, labeled WO1, was collected from the waste oil tank pit at a depth of about 8 feet below grade. Sample point locations are also shown on the attached Figure 3.

On September 10, 1993, the fuel tank pit was excavated to a depth of about 16.5 feet below grade, and approximately 7,000 gallons of water were pumped from the this pit by H&H Environmental Services. Ground water then stabilized in the fuel tank pit at a depth of about 15 feet below grade. Some sheen was observed on top of the water at the southwest corner of the fuel tank pit. KEI then

collected one water sample, labeled W1, from the fuel tank pit. Mr. Shapiro of the ACHCS was present during water sampling activities.

On September 14, 1993, one additional water sample, labeled W2, was collected from the fuel tank pit. Prior to the collection of this sample, approximately 12,000 gallons of ground water were again pumped from the fuel tank pit by H&H Environmental Services on September 13 and 14, 1993. Ground water (with some sheen still present at the southwest corner of the fuel tank pit) then stabilized in the fuel tank pit at a depth of about 12 feet below grade. Mr. Shapiro was again present during water sampling activities.

All excavated soil that was generated during this tank and piping replacement project was stockpiled on-site and sampled prior to disposal. The septic tank pit excavation was backfilled and compacted with clean imported soil. Two 12,000 gallon unleaded gasoline storage tanks and one 520 gallon waste oil storage tank were installed in the existing tank pit locations. The new fuel and waste oil tanks were all made of fiberglass-coated, double-wall steel. All backfilling and new tank and piping installation activities were performed by Paradiso Construction Company of San Leandro, California. The subsurface soils observed in the excavations consisted primarily of silty clay. Ground water stabilized in the fuel tank pit at a depth of about 15 feet below grade on September 10, 1993, and was present at a depth of approximately 12 feet below grade on September 14, 1993.

All of the soil and ground water samples collected were analyzed by Sequoia Analytical Laboratory in Concord, California. All soil samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline by EPA method 5030/modified 8015, for benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA method 8020, and for total lead. In addition, samples ST1 and ST2 were also analyzed for total oil and grease (TOG) by Standard Methods 5520E&F. The sample collected from the waste oil tank pit (W01) was analyzed for TPH as gasoline, TPH as diesel by EPA method 3550/modified 8015, BTEX, TOG, halogenated organic compounds (EPA method 8010), and the metals cadmium, chromium, lead, nickel, and zinc.

Both water samples were analyzed for TPH as gasoline and BTEX. In addition, water sample W1 was analyzed for TPH as diesel, TOG, EPA method 8010 constituents, and the metals cadmium, chromium, lead, nickel, and zinc. The results of the soil analyses are summarized in Tables 5 and 6, and the results of the water analyses are summarized in Table 7.

Based on the analytical results of the soil samples collected during the removal and replacement of the underground tanks and

pipng, KEI concluded that no significant concentrations of hydrocarbon contamination appeared to be present in the soil in the vicinity of the former gasoline storage tanks, the former waste oil storage tank, the product piping trenches, or the former septic tank. The initial water sample collected from the fuel tank pit (after an initial purging of about 7,000 gallons of water) showed concentrations of TPH as gasoline and benzene at 2,600 ppb and 33 ppb, respectively, with non-detectable levels of TOG and EPA method 8010 constituents. However, after a total of approximately 19,000 gallons of water were purged from the fuel tank pit, the second water sample showed significantly decreased concentrations of TPH as gasoline and benzene (740 ppb and 14 ppb, respectively).

Based on the analytical results of the ground water samples collected during tank replacement operations, KEI concluded that further work was warranted at the site. Therefore, in order to comply with the requirements of the Regional Water Quality Control Board (RWQCB) and the ACHCS, KEI recommended the installation of three ground water monitoring wells at the site. The purpose of these wells would be to further determine the vertical and lateral extent of any remaining soil contamination at the site, to determine the ground water flow direction at the site, and to determine the lateral extent of any existing ground water contamination at the site.

In addition, it was KEI's understanding that several monitoring wells had been installed at an adjacent BP service station. Therefore, KEI proposed to review the file for this site at the RWQCB in order to gather and evaluate available site assessment and/or remediation information for the BP facility. KEI also proposed a site reconnaissance for the subject Unocal service station.

RECENT FIELD ACTIVITIES

On February 24 and 25, 1994, three two-inch diameter monitoring wells (designated as MW1 through MW3 on the attached Figure 1) were installed at the site. The wells were each drilled, constructed, and completed in accordance with the guidelines of the Regional Water Quality Control Board (RWQCB) and the California Well Standards (per Bulletin 74-90). The subsurface materials penetrated and details of the construction of the wells are described in the attached Boring Logs and Well Construction Diagrams, respectively.

The three wells were each drilled and completed to total depths ranging from 19 to 20 feet below grade. Ground water was encountered at depths ranging from 11 to 17.5 feet below grade during drilling. Soil samples were collected for laboratory analysis and for lithologic logging purposes at a maximum spacing of 5 foot

intervals, at significant changes in lithology, at obvious areas of contamination, and at or within the soil/ground water interface, beginning at a depth of approximately 5 feet below grade and continuing until ground water was encountered. A representative soil sample of the saturated zone was collected from the boring for well MW2 at a depth of 19 feet below grade and submitted for particle size analysis (sieve and hydrometer) for verification of filter pack and well screen design. Other soil sampling conducted below the water table was for lithologic logging purposes only. The undisturbed soil samples were collected by driving a California-modified split-spoon sampler (lined with brass liners) ahead of the drilling augers. The two-inch diameter brass liners holding the samples were sealed with aluminum foil, plastic caps and tape, labeled, and stored in a cooler, on ice, until delivery to a state-certified laboratory.

Each well casing was installed with a watertight cap and padlock. A round, watertight, flush-mounted well cover was cemented in place over each well casing. The top of each well casing was surveyed by Kier & Wright of Pleasanton, California, to Mean Sea Level (MSL) and to a vertical accuracy of 0.01 foot.

The new wells were developed on March 8, 1994. Prior to development, the wells were checked for the depth to the 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. After recording the monitoring data, the three wells were each purged (by the use of a surface pump) of 35 to 50 gallons of water until the evacuated water was clear and free of visible suspended sediment. Monitoring and well development data are summarized in Table 1.

The three new wells (MW1 through MW3) were sampled on March 14, 1994. During monitoring, the wells were checked for depth to water and the presence of free product or sheen. No free product or sheen was noted in any of the wells. After recording the monitoring data, the wells were each purged of 10 gallons of water by the use of a surface pump. During purging operations, the field parameters pH, temperature, and electrical conductivity were recorded and are presented in Table 2. Once the field parameters were observed to stabilize and a minimum of approximately four casing volumes had been removed from each well, water samples were then 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, labeled, and stored in a cooler, on ice, until delivery to a state-certified laboratory.

ANALYTICAL RESULTS

Water and selected soil samples from the borings of MW1 through MW3 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/modified 8015, and benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA method 8020. In addition, the water samples collected from MW1 (located adjacent to the waste oil tank) were analyzed for TPH as diesel by EPA method 3510/modified 8015, and the metals cadmium, lead, nickel, and zinc.

The concentrations of TPH as gasoline and benzene detected in the ground water samples collected on March 14, 1994, are shown on the attached Figure 2. The results of the soil analyses are summarized in Table 4, and the results of the water analyses are summarized in Table 3. Copies of the laboratory analyses and the Chain of Custody documentation are attached to this report.

HYDROLOGY AND GEOLOGY

On March 14, 1994, the measured depth to ground water in the monitoring wells ranged from 7.23 to 7.93 feet below the top of the well casings. As shown in the attached Table 1, the ground water in two of the three monitoring wells at the site (MW1 and MW3) was at an elevation of 323.18 feet above MSL. Ground water in the third well (MW2) was at an elevation of 323.17 feet above MSL. Based on this data, a reliable ground water flow direction cannot be determined for the March 14, 1994, monitoring and sampling event. A similar situation exists relative to the ground water elevations in the three monitoring wells for the March 8, 1994, monitoring event (when the wells were also developed). On that date, the ground water elevations in wells MW1 and MW2 were the same (323.36 ft. MSL), and within 0.03 foot (0.36 inch) of the ground water elevation in MW3. Therefore, based on the ground water elevation data gathered during March of 1994, the hydraulic gradient in the vicinity of the three wells appears to be very flat.

The site is situated within the Dublin Sub-basin of the Livermore Valley Ground Water Basin, as defined by the Alameda County Flood Control and Water Conservation District (Zone 7), and by the California Department of Water Resources Bulletin 118-2. Regionally, the ground water flow direction is toward the southeast, based on ground water contours presented in the Zone 7 Fall 1993 Ground Water Contour Map Report.

Based on review of regional geologic maps (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 Holocene fine-grained alluvium (Qhaf) that is described as typically consisting of unconsolidated, plastic, moderately to poorly sorted silt and clay materials that are rich in organic material and that are generally less than 10 feet thick. The site is also situated slightly less than 0.5 mile from two mapped geologic contacts separating the Qhaf sediments from Late Pleistocene alluvial deposits (Qpa) and Holocene medium-grained alluvium (Qham). The Qpa sequence is described as typically consisting of sediments that are weakly consolidated, poorly sorted, irregularly interbedded clay, silt, sand and gravel, with a thickness of at least 150 feet. The younger Holocene Qham deposits are described as generally consisting of well bedded but unconsolidated, moderately sorted, moderately permeable fine sand, silt, and clayey silt, with occasional thin beds of coarse sand. The Qham sediments attain a thickness of up to 12 feet in the vicinity of the subject site.

The results of our subsurface study indicate that in the vicinity of the three newly installed monitoring wells MW1 through MW3, the site is underlain by fill materials to a depth of between 3.5 to 5 feet below grade. The fill is in turn underlain by lenticular or irregularly interbedded units of alluvium consisting generally of silty clay and clayey silt to the maximum depth explored (20 feet below grade).

As of March of 1994, the unsaturated zone in the vicinity of the three monitoring wells is approximately 8 feet thick and consists predominantly of artificial fill materials and silty clay. Lesser amounts of clayey silt are also present.

The first water bearing unit beneath the site (first aquifer) is composed predominantly of clayey or sandy silt, with lesser amounts of silty clay. The sediments immediately above and below the water table consist of silty clay.

The results of the particle size analysis (sieve and hydrometer) of the soil sample collected from the saturated zone in the boring for monitoring well MW2 at a depth of 19 feet below grade indicate that the sample is composed of approximately 55% silt, 41% clay and 4% sand. The sample is classified as silt (ML). The results of the particle size analysis are shown on the attached Particle Size Distribution sheets and Graph of Acquired Data.

FILE REVIEWS

On December 29, 1993, a representative of KEI conducted a file review at the Oakland offices of the RWQCB, San Francisco Bay Region, in order to identify and obtain information on sites with ongoing or previous environmental assessment and remediation work

near the Unocal facility. Two sites were identified. The first site contains a facility called American Building Components (ABC) and is situated at 6253 Dougherty Road, approximately two city blocks north of the Unocal site. No information was contained in the file for the ABC site, except for a letter from the County (dated more than a year ago) requiring a site investigation. The second site identified near the Unocal facility is a BP service station (formerly Mobil) located at 6400 Dublin Boulevard, directly east-southeast of the Unocal site. The RWQCB file on this site did not contain any information.

On January 6, 1994, a representative of KEI conducted a second file review at the ACHCS offices in Oakland. The file for the BP service station facility (formerly Mobil) was reviewed and contained a number of site assessment reports dating back to January 7, 1993. A summary of the information collected from these reports is given below.

Seven monitoring wells have been installed at the BP site. The ground water flow direction appears to be to the southwest based on data collected in October of 1992, and in April and August of 1993. The hydraulic gradient at the site on these dates was reported to be between 0.002 and 0.003. A report by Alisto Engineering Group, dated October 21, 1993, contains a summary of analytical results of ground water samples collected from the monitoring wells at the BP site since October 27, 1992. The highest concentrations of hydrocarbon contaminants were detected in monitoring well MW4, located adjacent to and apparently downgradient of the underground fuel storage tanks. The highest concentrations of hydrocarbons detected in MW4 were as follows: TPH as gasoline at 2,300 ppb (October 27, 1993), TPH as diesel at 500 ppb (April 9, 1993), and benzene at 78 ppb (also on April 9, 1993). Somewhat lower concentrations of hydrocarbon contaminants were also detected in ground water samples collected from monitoring well MW3, which is also located adjacent to the underground fuel storage tanks.

DISCUSSION AND RECOMMENDATIONS

Based on the analytical results of the soil samples collected during the installation of three monitoring wells (MW1 through MW3), it appears that the soils surrounding the area near the underground fuel storage tanks at the Unocal site have not been significantly impacted by hydrocarbon contamination. In addition, based on the soil samples collected during the removal and replacement of the underground storage tanks and lines, no significant hydrocarbon contamination has been detected in any of the soil samples collected to date.

However, based on the analytical results of the ground water samples collected and evaluated to date, KEI recommends the

implementation of a monitoring and sampling program of the three monitoring wells at the site. This monitoring program is recommended in order to verify the analytical results of the ground water samples collected to date. The wells should be monitored on a monthly basis, and should be purged and sampled on a quarterly basis. The proposed program should be conducted for a period of 12 months. 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 warranted.

DISTRIBUTION

Copies of this report should be sent to the ACHCS, and to the RWQCB, 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.

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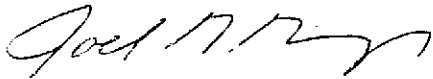
Should you have any questions regarding this report, please do not hesitate to call at (510) 602-5100.

Sincerely,

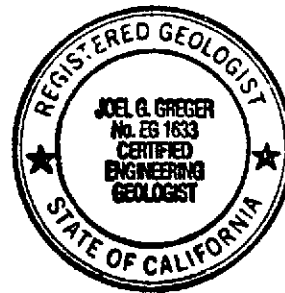
Kaprealian Engineering, Inc.



Haig (Gary) Tejirian
Project Geologist



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



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



Timothy R. Ross
Project Manager

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Attachments: Tables 1 through 7
Location Map
Figures 1 through 3
Boring Logs
Well Construction Diagrams
Particle Size Distribution Results and
Graph of Acquired Data
Laboratory Analyses
Chain of Custody documentation

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 April 7, 1994

TABLE 1

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

<u>Well #</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>	<u>Well Depth (feet)♦</u>
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(Monitored and Sampled on March 14, 1994)

MW1	323.18	7.27	0	No	10	19.38
MW2	323.17	7.23	0	No	10	19.85
MW3	323.18	7.93	0	No	10	19.06

(Monitored and Developed on March 8, 1994)

MW1	323.36	7.09	0	--	35	19.32
MW2	323.36	7.04	0	--	50	19.79
MW3	323.33	7.78	0	--	40	19.00

<u>Well #</u>	<u>Top of Casing Elevation* (feet)</u>
MW1	330.45
MW2	330.40
MW3	331.11

* The elevation of the tops of the well casings have been surveyed relative to MSL, per the benchmark on the northwest corner of Dougherty Road and Sierra Way (elevation = 331.728 MSL).

♦ The depth to water and well depth measurements were taken from the top of the well casings.

-- Sheen determination was not performed.

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TABLE 2

RECORD OF THE TEMPERATURE, CONDUCTIVITY, AND pH VALUES
 IN THE MONITORING WELLS DURING PURGING AND PRIOR TO SAMPLING

(Measured on March 14, 1994)

<u>Well</u>	<u>Gallons per Casing Volume</u>	<u>Time</u>	<u>Gallons Purged</u>	<u>Casing Volumes Purged</u>	<u>Temperature (°F)</u>	<u>Conductivity ([μmhos/cm]x100)</u>	<u>pH</u>
MW1	2.06	12:50	2	0.97	72.8	10.48	7.60
			4	1.94	72.4	10.48	7.55
			6	2.91	72.2	10.48	7.55
		13:30	10	4.85	71.3	10.48	7.54
MW2	2.15	11:20	2	0.93	74.9	17.5	6.77
			4	1.86	74.8	17.7	6.78
			6	2.79	74.8	17.9	6.80
		11:40	10	4.65	74.6	17.8	6.76
MW3	1.89	11:55	2	1.06	74.9	15.3	6.75
			4	2.12	74.9	15.3	6.76
			6	3.17	74.9	15.3	6.77
		12:30	10	5.29	74.6	15.3	7.74

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TABLE 3

SUMMARY OF LABORATORY ANALYSES
WATER

<u>Date</u>	<u>Sample Number</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl-benzene</u>	<u>Xylenes</u>
3/14/94	MW1*	810♦	1,800*	17	ND	ND	ND
	MW2	--	ND	ND	2.8	1.1	8.0
	MW3	--	150**	ND	ND	ND	ND

* The metals cadmium and lead were non-detectable. Chromium, nickel, and zinc were detected at concentrations of 0.012 mg/L, 0.030 mg/L, and 0.039 mg/L, respectively.

♦ Sequoia Analytical Laboratory reported that the hydrocarbons detected appeared to be a diesel and non-diesel mixture.

* Sequoia Analytical Laboratory reported that the hydrocarbons detected appeared to be a gasoline and non-gasoline mixture.

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

ND = Non-detectable.

-- Indicates analysis was not performed.

Results are in micrograms per liter ($\mu\text{g/L}$), unless otherwise indicated.

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TABLE 4
SUMMARY OF LABORATORY ANALYSES
SOIL

<u>Date</u>	<u>Sample Number</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethylbenzene</u>	<u>Xylenes</u>
2/24/94	MW1(5)	ND	ND	ND	ND	ND
	MW1(10)	ND	ND	ND	ND	ND
	MW1(12)	ND	ND	ND	ND	ND
	MW2(5)	ND	ND	ND	ND	ND
	MW2(10)	ND	ND	ND	ND	ND
	MW2(12)	ND	ND	ND	ND	ND
	MW2(17)	ND	ND	ND	ND	ND
	MW3(5)	ND	ND	ND	ND	ND
	MW3(9.5)	ND	ND	ND	ND	ND
	MW3(11)	ND	ND	ND	ND	ND

NOTE: The soil samples were collected at the depths below grade indicated in the () of the respective sample number.

ND = Non-detectable.

Results are in milligrams per kilogram (mg/kg), unless otherwise indicated.

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April 7, 1994

TABLE 5

SUMMARY OF LABORATORY ANALYSES
SOIL

<u>Date</u>	<u>Sample</u>	<u>Depth (feet)</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl- benzene</u>	<u>Xylenes</u>	<u>Total Lead</u>
9/07/93	D1	2.5	ND	ND	ND	ND	ND	14
	D2	2.5	ND	ND	ND	ND	ND	6.4
	D3	2.5	ND	ND	ND	ND	ND	6.2
	D4	2.5	ND	ND	ND	ND	ND	6.2
	D5	5.5	ND	ND	ND	ND	ND	6.3
	D6	5.5	ND	ND	ND	ND	ND	9.8
	D7	5.5	ND	ND	ND	ND	ND	6.1
	D8	5.5	ND	ND	ND	ND	0.030	4.8
	P1	3.0	ND	ND	0.0068	ND	0.012	6.4
	P2	3.0	ND	0.0073	0.012	ND	0.015	5.0
	P3	3.0	9.7	0.15	1.2	0.36	2.4	4.9
	P4	4.75	1.8	0.0061	0.012	0.066	0.053	6.8
	P5	7.0	ND	ND	ND	ND	ND	6.3
	P6	6.0	ND	ND	0.011	0.048	0.032	17
	P7	6.0	2.4	ND	0.011	0.048	0.032	6.1
	ST1*	10.0	ND	ND	ND	ND	ND	6.8
	ST2*	10.0	ND	ND	ND	ND	ND	6.6
08/93	B1	17.0	ND	0.0071	0.014	0.0072	0.026	5.9
	B2	15.5	1.2	0.017	0.010	0.13	0.017	7.3

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April 7, 1994

TABLE 5 (Continued)

SUMMARY OF LABORATORY ANALYSES
SOIL

<u>Date</u>	<u>Sample</u>	<u>Depth (feet)</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl- benzene</u>	<u>Xylenes</u>	<u>Total Lead</u>
9/08/93	SW1	13.5	ND	ND	0.013	ND	0.019	6.2
(Con't)	SW2	13.5	ND	0.0054	0.011	ND	0.012	6.0
	SW3	13.5	ND	0.0050	0.011	0.0065	0.013	6.2
	SW4	13.5	2.6	0.11	0.28	0.067	0.34	6.5
	SW5	13.5	ND	0.0084	0.011	ND	0.021	6.8
	WO1	8.0	6.8	0.050	ND	0.28	0.020	6.3

* TOG was non-detectable.

ND = Non-detectable.

Results are in milligrams per kilogram (mg/kg), unless otherwise indicated.

KEI-P93-0401.R5
April 7, 1994

TABLE 6
SUMMARY OF LABORATORY ANALYSES
SOIL

<u>Date</u>	<u>Sample</u>	<u>Depth (feet)</u>	<u>TOG</u>	<u>TPH as Diesel</u>	<u>EPA Method 8010 Constituents (ppb)</u>	<u>Cadmium</u>	<u>Chromium</u>	<u>Nickel</u>	<u>Zinc</u>
9/08/93	W01	8.0	ND	ND	ND	1.0	30	42	42

ND = Non-detectable.

Results are in milligrams per kilogram (mg/kg), unless otherwise indicated.

KEI-P93-0401.R5
 April 7, 1994

TABLE 7

SUMMARY OF LABORATORY ANALYSES
 WATER

<u>Date</u>	<u>Sample</u>	<u>Depth to Water (feet)</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl-benzene</u>	<u>Xylenes</u>	<u>TPH as Diesel</u>	<u>TOG (ppm)</u>	<u>EPA Method 8010 Constituents</u>
9/10/93	W1	15	2,600	33	19	150	190	530*	ND	ND
9/14/93	W2	12	740	14	32	13	75	--	--	--

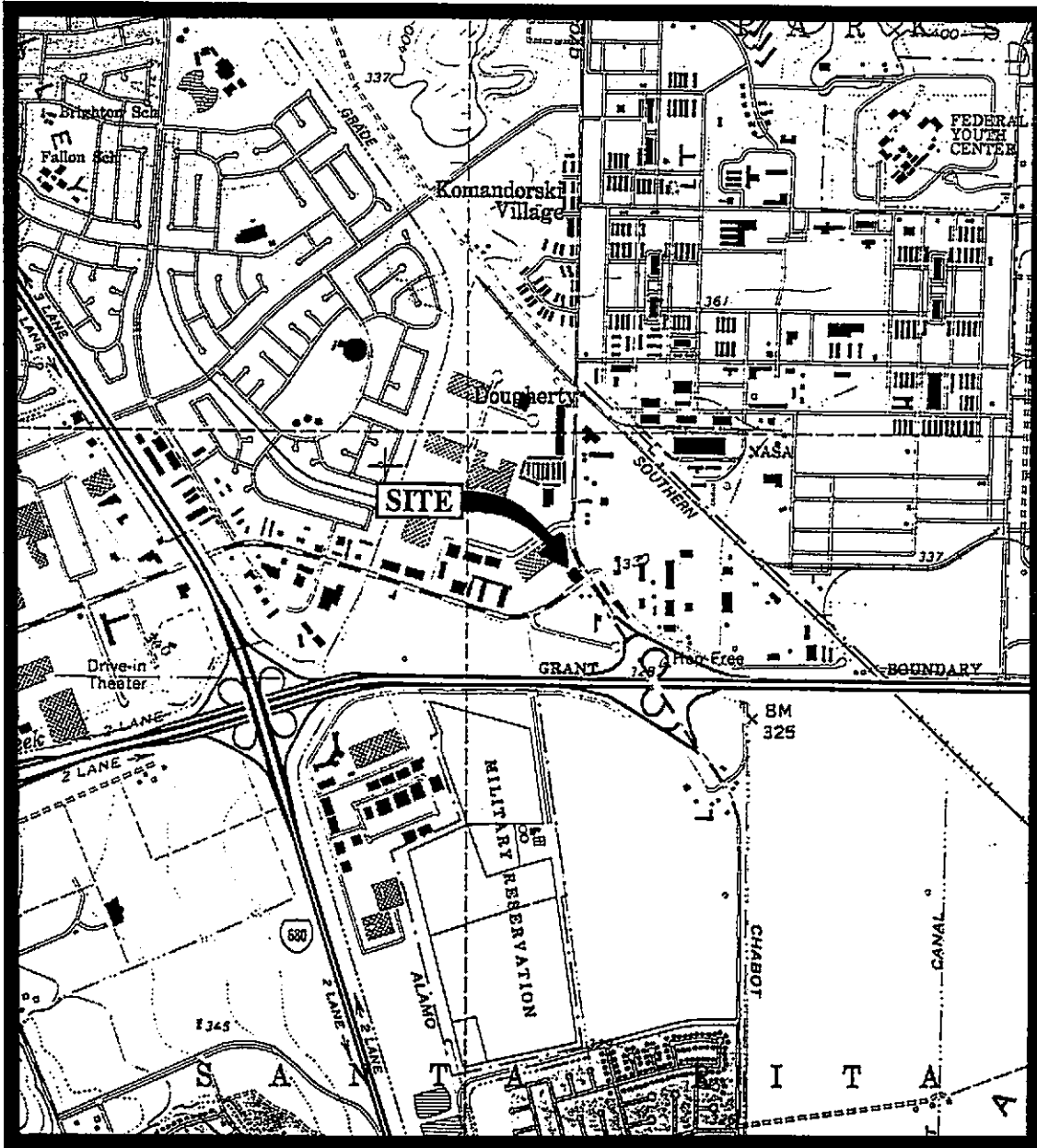
<u>Sample</u>	<u>Cadmium (ppm)</u>	<u>Chromium (ppm)</u>	<u>Lead (ppm)</u>	<u>Nickel (ppm)</u>	<u>Zinc (ppm)</u>
W1	0.014	0.28	0.018	0.46	0.46

ND = Non-detectable.

-- Indicates analysis was not performed.

* Sequoia Analytical Laboratory reported that the total extractable hydrocarbons detected appeared to consist of a diesel and non-diesel mixture.

Results are in micrograms per liter ($\mu\text{g/L}$), unless otherwise indicated.



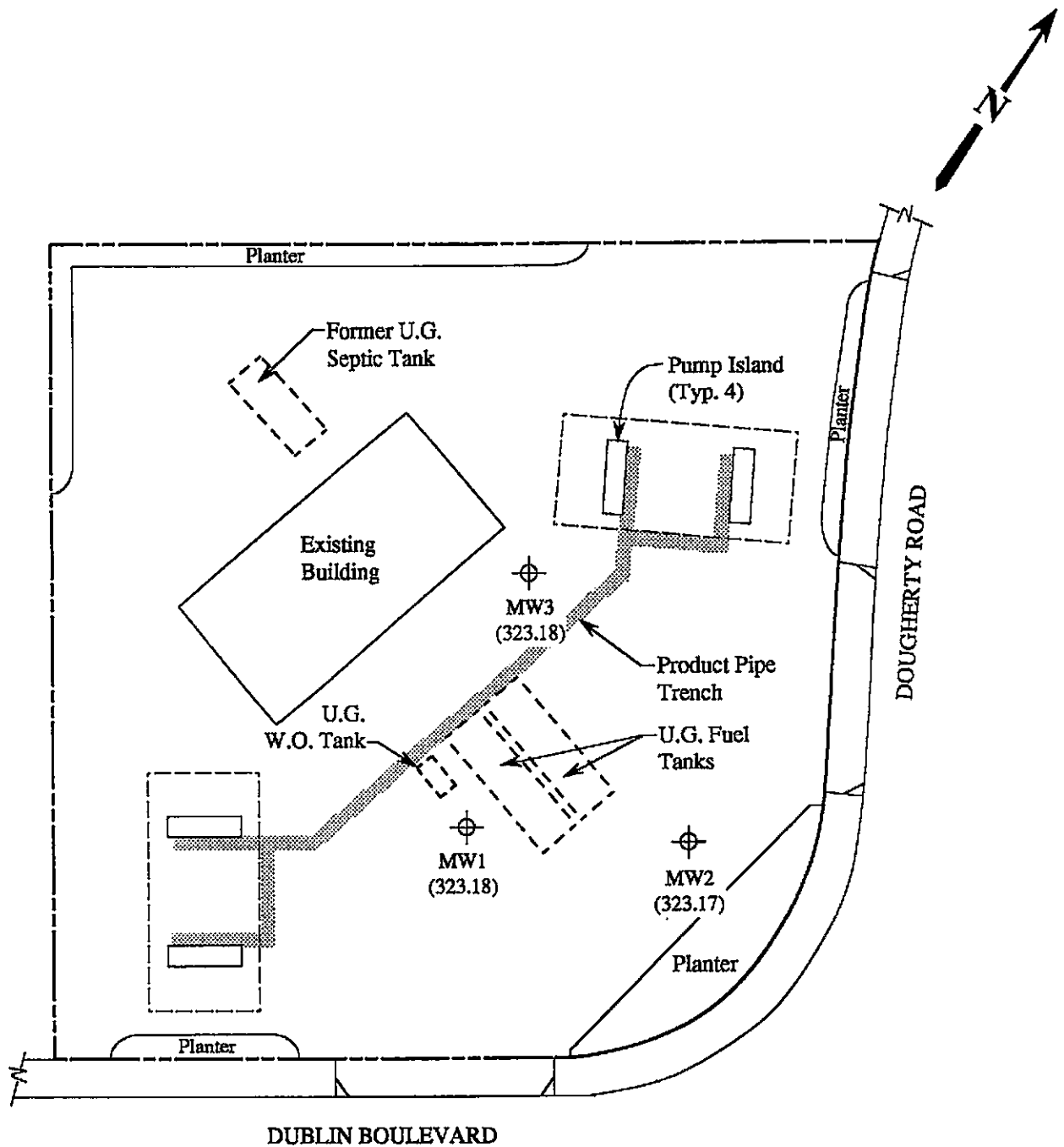
Base modified from 7.5 minute U.S.G.S. Dublin Quadrangle
(photorevised 1980)



KEI
KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #6419
6401 DUBLIN BOULEVARD
DUBLIN, CALIFORNIA

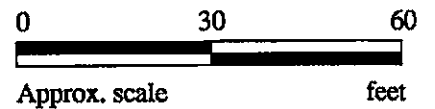
**LOCATION
MAP**



LEGEND

⊕ Monitoring well

() Ground water elevation in feet above Mean Sea Level

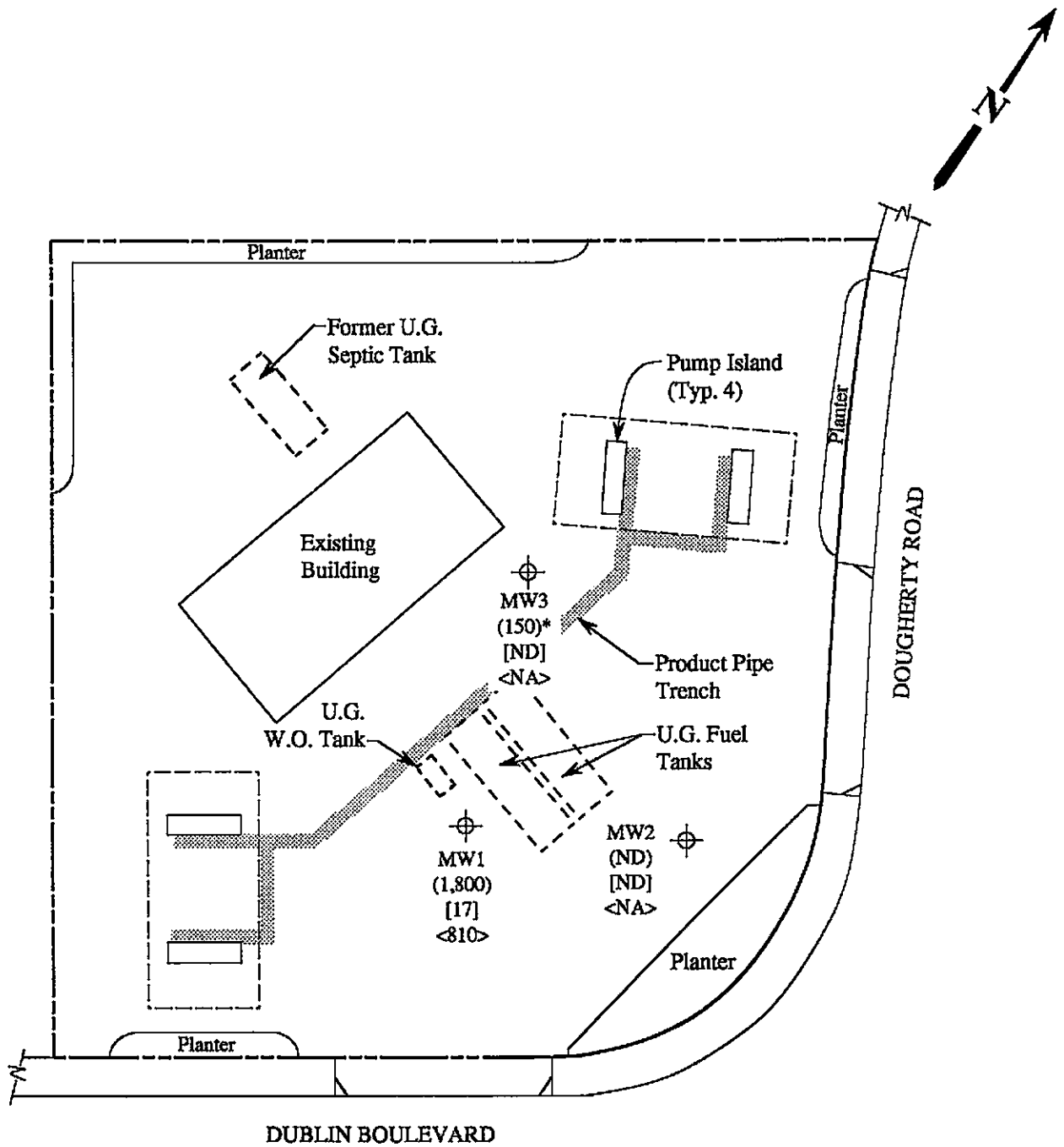


GROUND WATER ELEVATIONS FOR THE MARCH 14, 1994 MONITORING EVENT



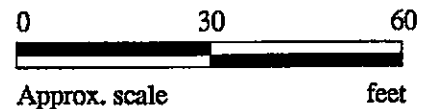
**UNOCAL SERVICE STATION #6419
6401 DUBLIN BOULEVARD
DUBLIN, CALIFORNIA**

**FIGURE
1**



LEGEND

- ⊕ Monitoring well
- () Concentration of TPH as gasoline in $\mu\text{g/L}$
- [] Concentration of benzene in $\mu\text{g/L}$
- < > Concentration of TPH as diesel in $\mu\text{g/L}$
- ND = Non-detectable, NA = Not analyzed



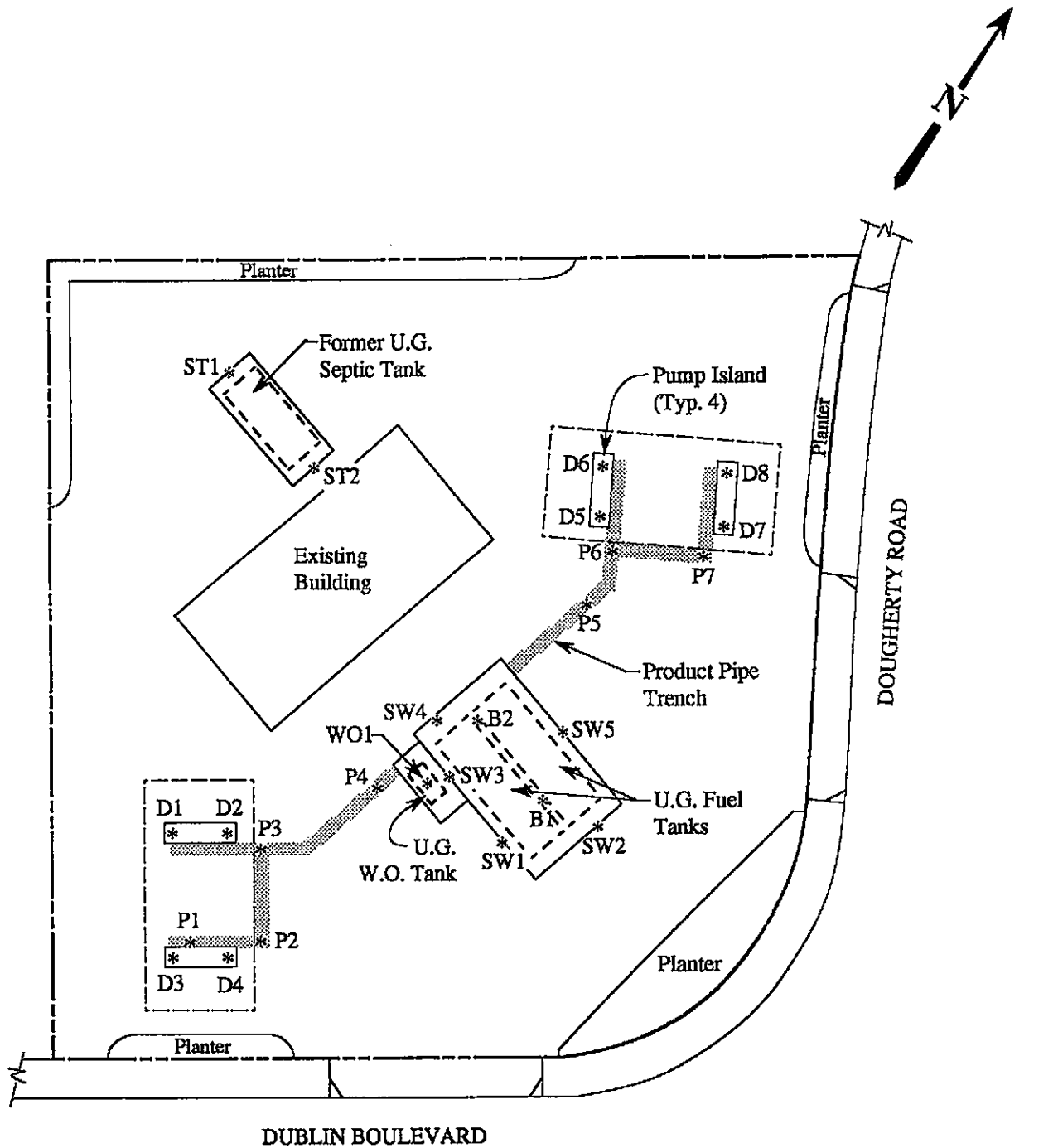
* The lab reported that the hydrocarbons detected did not appear to be gasoline.

PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUND WATER ON MARCH 14, 1993



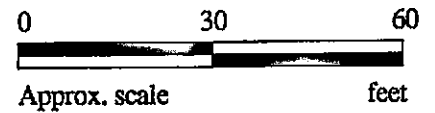
**UNOCAL SERVICE STATION #6419
6401 DUBLIN BOULEVARD
DUBLIN, CALIFORNIA**

**FIGURE
2**



LEGEND

* Soil sample point location



SOIL SAMPLE POINT LOCATION MAP



**UNOCAL SERVICE STATION #6419
6401 DUBLIN BOULEVARD
DUBLIN, CALIFORNIA**

**FIGURE
3**

BORING LOG

Project No. KEI-P93-0401	Boring Diameter	8.5"	Logged By	JGG
	Casing Diameter	2"	D.L.	CEG 1633
Project Name Unocal S/S #6419 6401 Dublin Blvd., Dublin	Well Cover Elevation N/A		Date Drilled 2/24/94	
	Boring No. MW1	Drilling Method Hollow-stem Auger	Drilling Company Woodward Drilling	

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description
		0		A.C. Pavement over sand and gravel base.
			GC	Clayey gravel with sand, medium dense, moist, dark greenish gray and black, mottled, disturbed (fill).
			GP	Gravel and sand, loose, moist, brown, gravel is fine grained (fill).
3/4/6		5	MH	Clayey silt, stiff, moist, black, with iron oxide staining, disturbed above 4.5 feet, clay content increasing with depth.
			CL	Silty clay, estimated at 35-45% silt, stiff, moist, black, with caliche nodules to 1/2 inch in diameter.
3/5/8				Clayey silt, estimated at 30-40% clay, stiff, moist, very dark gray.
		10	MH	Clayey silt, estimated at 30-40% clay, trace fine grained sand, stiff, moist, olive brown.
4/5/7	▽		ML	Silt with sand, estimated at 10-15% clay, stiff, moist, olive brown.
			MH	Sandy silt, trace clay, stiff, very moist, olive brown.
			MH	Clayey silt, trace fine grained sand, stiff, moist, olive brown and olive gray, mottled.
4/6/9		15	ML	Silt, estimated at 15-30% clay, and 5-10% sand, stiff, moist, olive and olive brown, mottled, grades to sandy silt below 15.5 feet.
			CL	Clay estimated at 15-30% silt, very stiff, moist, olive brown and dark greenish gray, mottled.
			ML	Silt with sand, stiff, moist, dark greenish gray.
5/8/11			SP	Poorly graded sand, estimated at 5-15% silt, medium dense, wet, dark greenish gray.
			ML	Clayey silt, very stiff, moist, dark greenish gray, with caliche.
		20		TOTAL DEPTH: 19'

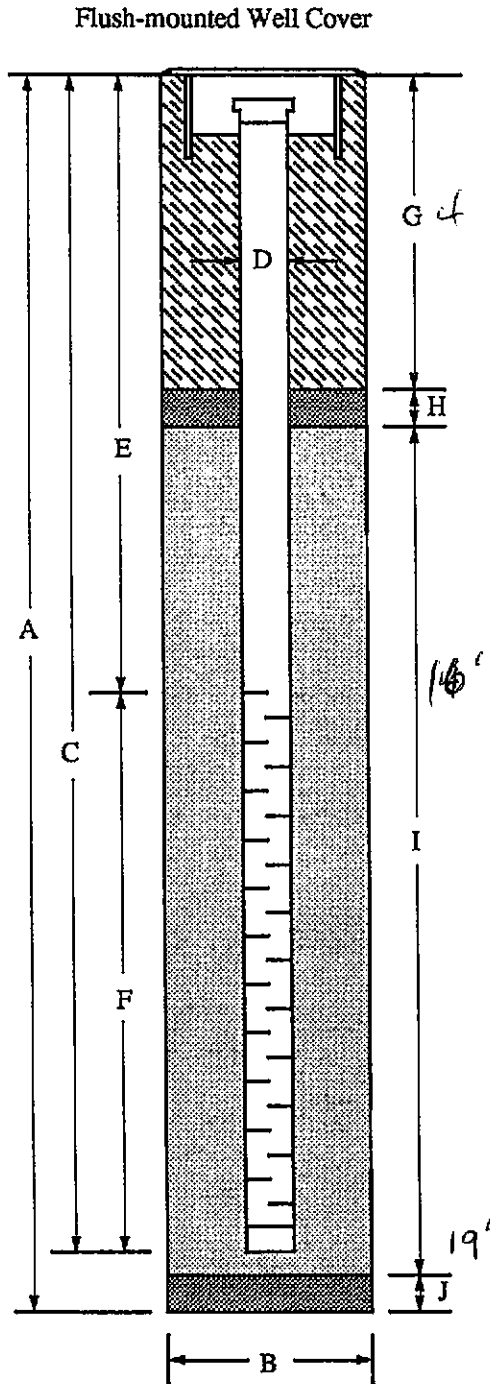
WELL CONSTRUCTION DIAGRAM

PROJECT NAME: Unocal S/S #6419, 6401 Dublin Blvd., Dublin

WELL NO.: MW1

PROJECT NUMBER: KEI-P93-0401

WELL PERMIT NO.: ACFC & WCD #94071



- A. Total Depth : 19'
- B. Boring Diameter: 8.5"
Drilling Method: Hollow Stem Auger
- C. Casing Length: 19'
Material: Schedule 40 PVC
- D. Casing Diameter: OD = 2.375"
ID = 2.067"
- E. Depth to Perforations: 4'
- F. Perforated Length: 15'
Perforation Type: Machined Slot
Perforation Size: 0.010"
- G. Surface Seal: 2'
Seal Material: Neat Cement
- H. Seal: 1'
Seal Material: Bentonite
- I. Filter Pack: 16'
Pack Material: RMC Lonestar Sand
Size: #2/12
- J. Bottom Seal: None
Seal Material: N/A

BORING LOG

Project No. KEI-P93-0401	Boring Diameter 8.5" Casing Diameter 2"	Logged By <i>J66</i> D.L. <i>LE6 1633</i>
Project Name Unocal S/S #6419 6401 Dublin Blvd., Dublin	Well Cover Elevation N/A	Date Drilled 2/25/94
Boring No. MW2	Drilling Method Hollow-stem Auger	Drilling Company Woodward Drilling

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description
		0		A.C. Pavement over sand and gravel base.
			CL	Silty clay, stiff, moist, black grading to olive brown (fill).
			GC	Clayey gravel with sand, gravel to 2 3/4 inches in diameter, dense, moist, dark olive gray, disturbed, pocketed (fill).
			CH	Silty clay, stiff, moist, black.
3/5/7		5	SM	Poorly graded sand, predominantly medium grained, loose, moist, dark olive gray.
			ML	Silt, trace clay grading to 10-15% clay, stiff, moist, dark olive gray.
			CH	Silty clay, stiff, moist, black, high plasticity.
3/5/10		10	CL	Silty clay, estimated at 35-45% silt, stiff, moist, olive brown and very dark grayish brown, mottled, with root holes, locally grades to very clayey silt.
			MH	Clayey silt, stiff, moist, olive brown and brown, mottled.
3/6/7			ML	Silt, estimated at 20-30% clay, and 5-10% sand, stiff, moist, olive brown and brown, mottled.
3/6/9		15	CL	Silty clay, estimated at 30-40% silt, stiff, moist, olive and olive brown, mottled, with caliche nodules to 3/4 inch in diameter.
				Silty clay, as above, except olive brown.
4/6/9	▽		MH	Clayey silt, estimated at 35-45% clay, stiff, moist, olive to olive brown, trace organic matter.
3/4/6			ML	Silt, estimated at 15-30% clay, stiff, very moist, olive, with trace caliche.
		20	CL	Silty clay, stiff, moist, olive and olive brown, mottled.
TOTAL DEPTH: 20'				

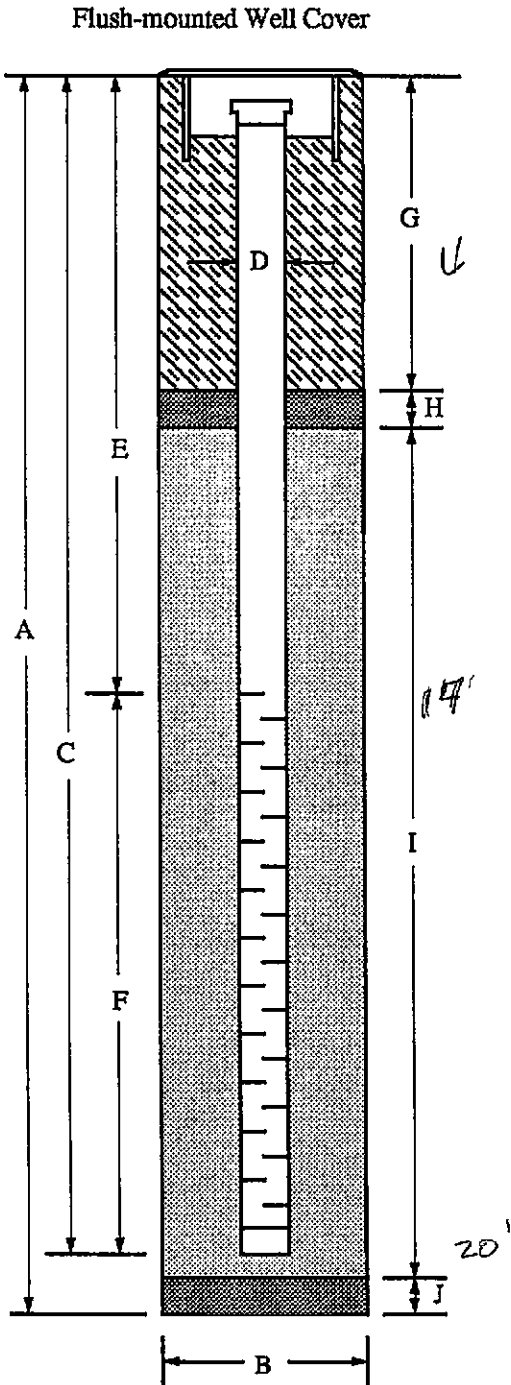
WELL CONSTRUCTION DIAGRAM

PROJECT NAME: Unocal S/S #6419, 6401 Dublin Blvd., Dublin

WELL NO.: MW2

PROJECT NUMBER: KEL-P93-0401

WELL PERMIT NO.: ACFC & WCD #94071



- A. Total Depth : 20'
- B. Boring Diameter: 8.5"
Drilling Method: Hollow Stem Auger
- C. Casing Length: 20'
Material: Schedule 40 PVC
- D. Casing Diameter: OD = 2.375"
ID = 2.067"
- E. Depth to Perforations: 4'
- F. Perforated Length: 16'
Perforation Type: Machined Slot
Perforation Size: 0.010"
- G. Surface Seal: 1.5'
Seal Material: Neat Cement
- H. Seal: 1.5'
Seal Material: Bentonite
- I. Filter Pack: 17'
Pack Material: RMC Lonestar Sand
Size: #2/12
- J. Bottom Seal: None
Seal Material: N/A

BORING LOG

Project No. KEI-P93-0401	Boring Diameter 8.5" Casing Diameter 2"	Logged By JGG D.L. LEB 1633
Project Name Unocal S/S #6419 6401 Dublin Blvd., Dublin	Well Cover Elevation N/A	Date Drilled 2/24/94
Boring No. MW3	Drilling Method Hollow-stem Auger	Drilling Company Woodward Drilling

Penetration blows/6"	G. W. level	Depth (feet)	Samples	Stratigraphy USCS	Description
		0			A.C. Pavement over sand and gravel base.
				GC	Clayey gravel with sand and clayey sand with gravel, medium dense to dense, moist, dark greenish gray, disturbed, pocketed, with debris (fill).
				SC	Clayey sand, trace gravel, medium dense, moist, very dark gray, disturbed (fill).
4/7/8		5		CL	Silty clay, estimated at 35-45% silt, stiff, moist, black, with root holes.
3/5/8				MH	Clayey silt, estimated at 30-40% clay, trace sand and gravel to 1/4 inch in diameter, stiff, moist, very dark grayish brown, with roots and root holes.
3/5/8		10		ML	Silt with clay, estimated at 10-15% sand, stiff, moist, wet in voids, dark brown and very dark gray, mottled.
4/6/10	▽			MH	Sandy silt, estimated at 10-20% clay, sand is fine to coarse grained, stiff, moist, wet in voids, olive brown.
4/10/13				MH	Clayey silt, very stiff, moist, olive brown with root holes.
		15		CL	Clay, estimated at 15-25% silt, stiff, moist, olive brown, with caliche nodules to 1 inch in diameter.
3/6/8				ML	Clayey silt, stiff, moist, olive brown.
				CL	Clay, estimated at 15-25% silt, stiff to very stiff, moist, olive brown, with caliche and trace organic matter.
5/8/8					
		20			TOTAL DEPTH: 19'

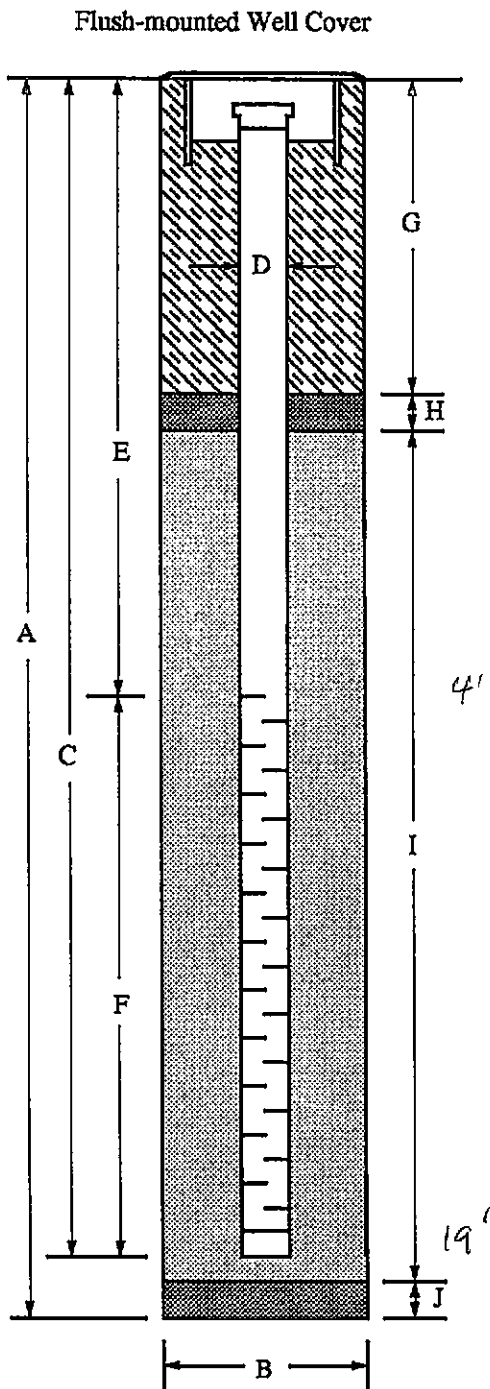
WELL CONSTRUCTION DIAGRAM

PROJECT NAME: Unocal S/S #6419, 6401 Dublin Blvd., Dublin

WELL NO.: MW3

PROJECT NUMBER: KEI-P93-0401

WELL PERMIT NO.: ACFC & WCD #94071



- A. Total Depth : 19'
- B. Boring Diameter: 8.5"
- Drilling Method: Hollow Stem Auger
- C. Casing Length: 19'
- Material: Schedule 40 PVC
- D. Casing Diameter: OD = 2.375"
ID = 2.067"
- E. Depth to Perforations: 4'
- F. Perforated Length: 15'
- Perforation Type: Machined Slot
- Perforation Size: 0.010"
- G. Surface Seal: 2'
- Seal Material: Neat Cement
- H. Seal: 1'
- Seal Material: Bentonite
- I. Filter Pack: 16'
- Pack Material: RMC Lonestar Sand
- Size: #2/12
- J. Bottom Seal: None
- Seal Material: N/A



Particle Size Distribution by Sieve and Hydrometer

Method: **ASTM D422-63**

Client: **Kaprealian Engineering, Inc.**

Client Project ID: **Unocal #6419, Dublin**

Received: **02/25/94**

Analyzed: **03/07/94**

Client ID: **MW2 (19)**

Sample Description: **Soil**

Lab ID: **4021454**

SIEVE TEST

A. Total weight of sample:	195.08 g
B. Weight retained in No. 10 sieve:	0.37 g
C. % passing No. 10 sieve:	99.81 %

Sieve test for weight
retained in a No. 10 sieve.

SIEVE SIZE	WEIGHT RETAINED(g)	% RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
1 1/2 in	0.00	0.00	0.00	100.00
3/8 in	0.00	0.00	0.00	100.00
No. 4	0.00	0.00	0.00	100.00
No. 10	0.37	0.19	0.19	99.81
No. 18	0.0081	0.00	0.19	99.81
No. 35	0.13	0.07	0.26	99.74
No. 50	0.80	0.41	0.67	99.33
No. 80	1.09	0.56	1.23	98.77
No. 200	5.46	2.80	4.03	95.97

HYDROMETER TEST

ELAPSED TIME (min)	TEMP. (deg C)	HYDROMETER READING (H)	CORRECTED READING (R)	(L)	PARTICLE DIAM. in mm (S)	% SUSPENDED (P)
2	20	56	52	7.8	0.0270	84.9
5	20	51	47	8.6	0.0179	76.8
10	20	47	43	9.2	0.0131	70.2
15	20	44	40	9.7	0.0110	65.3
25	20	40	36	10.4	0.0088	58.8
40	20	36	32	11.1	0.0072	52.3
60	20	34	30	11.4	0.0059	49.0
90	20	32	28	11.7	0.0049	45.7
120	20	29	25	12.2	0.0044	40.8
1440	20	22	18	13.3	0.0013	29.4

Weight of soil used in hydrometer test (D):	65 g
Hydrosopic moisture correction factor (G):	0.94
Specific gravity (Assumed):	2.65
Dispersing agent correction factor (E):	3
Meniscus correction factor (F):	1
Temp./Spec. gravity dependent constant (K):	0.01365

Formulas:

$$R = H - E - F$$

$$S = K[\text{SQRT}(L/T)]$$

$$P = (R/W)100$$

$$W = (J \times 100)/C$$

$$J = D \times G$$





Method: **ASTM D422-63**
Analyzed: 03/07/94
Lab ID: 4021454
Client ID: MW2 (19)

Graphing Data:		
% SUSPENDED (P)	PARTICLE DIAM. in mm (S)	Sieve Size
100.00	37.5	1 1/2 in
100.00	9.5	3/8 in
100.00	4.75	No. 4
99.81	2	No. 10
99.81	0.991	No. 18
99.74	0.495	No. 35
99.33	0.295	No. 50
98.77	0.18	No. 80
95.97	0.075	No. 200
84.9	0.0270	
76.8	0.0179	
70.2	0.0131	
65.3	0.0110	
58.8	0.0088	
52.3	0.0072	
49.0	0.0059	
45.7	0.0049	
40.8	0.0044	
29.4	0.0013	

Sample Composition:		
(1) Gravel, passing 3-in. and retained on No. 4 Sieve	0.00	%
(2a) Coarse Sand, passing No. 4 and retained on No. 10 Sieve	0.19	%
(2b) Medium Sand, passing No. 10 and retained on No. 48 Sieve	0.48	%
(2c) Fine Sand, passing No. 48 and retained on No. 200 Sieve	3.36	%
(3) Silt size, 0.074 to 0.005 mm	55.13	%
(4) Clay Size, smaller than 0.005 mm	40.84	%
	100	%

SEQUOIA ANALYTICAL

Alan B. Kemp
Project Manager





Sequoia Analytical

680 Chesapeake Drive
1900 Bates Avenue, Suite L
819 Striker Avenue, Suite 8
Concord, CA 94520
Sacramento, CA 95834

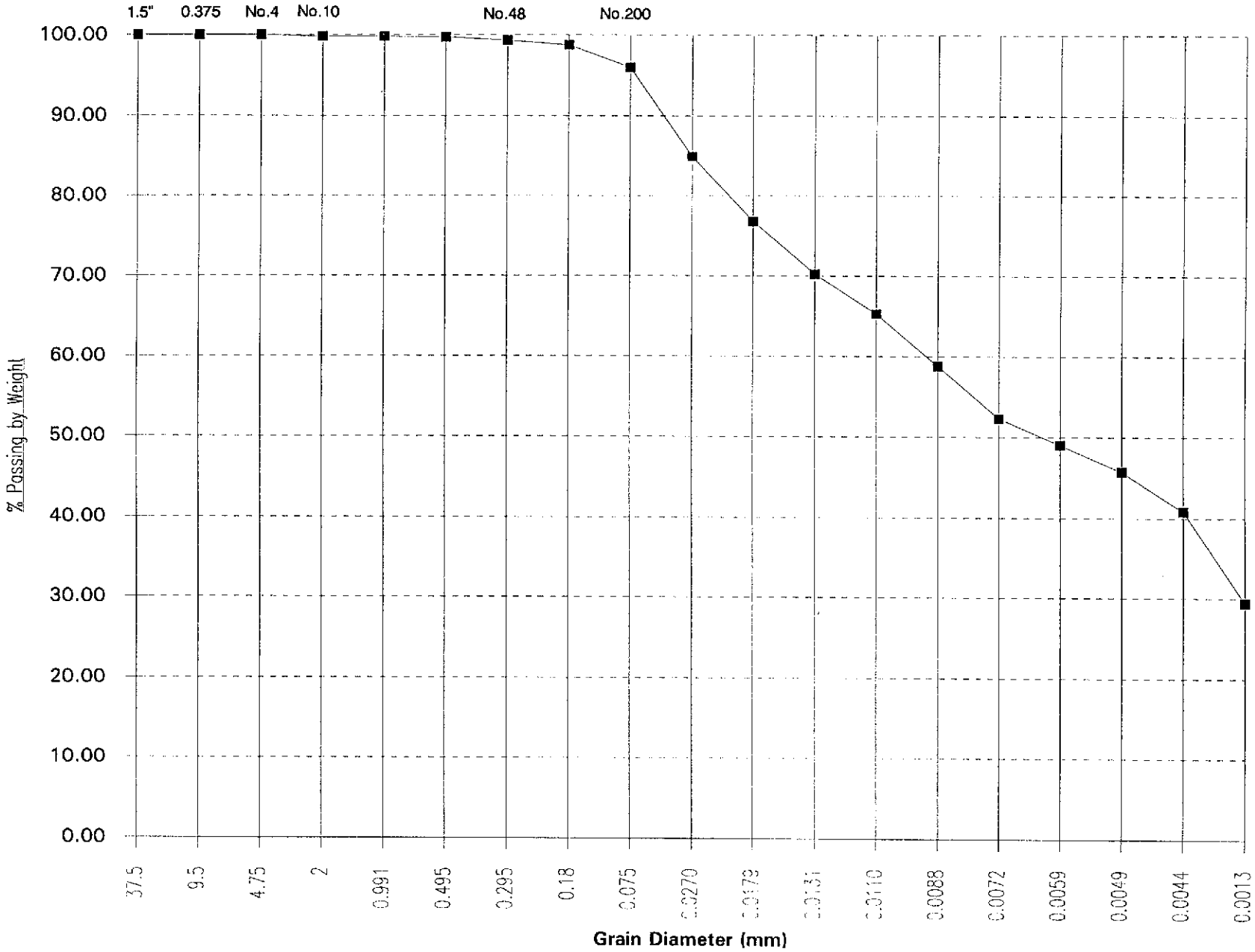
Redwood City, CA 94063

(415) 364-9600
(510) 686-9600
(916) 921-9600

FAX (415) 364-9233
FAX (510) 686-9689
FAX (916) 921-0100

Graph of Acquired Data

U.S. Standard Sieve Sizes:





680 Chesapeake Drive • Redwood City, CA 94063 • (415) 364-9600

18939 120th Ave., N.E., Suite 101 • Bothell, WA 98011 • (206) 481-9200

819 Striker Ave., Suite 8 • Sacramento, CA 95834 • (916) 921-9600

East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200

1900 Bates Ave., Suite LM • Concord, CA 94520 • (510) 686-9600

15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Company Name: <u>ARCELIAN ENGINEERING, INC.</u>		Project Name: <u>6401 DUBLIN BLVD, DUBLIN</u>	
Address: <u>2401 STANWELL DR, SUITE 400</u>		UNOCAL Project Manager: <u>ED RALSTON</u>	
City: <u>CONCORD</u>	State: <u>CA</u>	Zip Code: <u>94520</u>	
Telephone: <u>(510) 682-5100</u>		FAX #: <u>687-0602</u>	
Report To: <u>AVO</u>		Sampler: <u>DOUG LEE</u>	
		Site #: <u>6419</u>	
QC Data: <input checked="" type="checkbox"/> Level A (Standard) <input type="checkbox"/> Level B <input type="checkbox"/> Level C <input type="checkbox"/> Level D			

Turnaround 10 Working Days 2 Working Days
 Time: 5 Working Days 24 Hours
 3 Working Days 2 - 8 Hours

Drinking Water
 Waste Water
 Other

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	SIEVE HYDROMETER										Comments							
1. <u>MW 2 (19)</u>	<u>2/25/94</u>	<u>SOIL</u>	<u>1</u>	<u>BAG</u>		<u>X</u>																<u>4021454</u>	
2.																							
3.																							
4.																							
5.																							
6.																							
7.																							
8.																							
9.																							
10.																							

Relinquished By: <u>[Signature]</u> (KEL)	Date: <u>2/25/94</u>	Time: <u>3:04 p</u>	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab: <u>Melissa Chow</u>	Date: <u>2/25/94</u>	Time: <u>3:04 pm</u>

Were Samples Received in Good Condition? Yes No Samples on Ice? Yes No Method of Shipment _____ Page ___ of ___

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____

2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____

Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client

Yellow - Sequoia

White - Sequoia



Kaprealian Engineering, Inc. 2401 Stanwell Dr., Ste. 400 Concord, CA 94520 Attention: Avo Avedissian	Client Project ID: Unocal #6419, 6401 Dublin Blvd., Dublin Sample Matrix: Water Analysis Method: EPA 5030/8015/8020 First Sample #: 403-0594	Sampled: Mar 14, 1994 Received: Mar 15, 1994 Reported: Mar 29, 1994
---	---	---

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 403-0594 MW 1*	Sample I.D. 403-0595 MW 2	Sample I.D. 403-0596 MW 3**	Sample I.D. Matrix Blank
Purgeable Hydrocarbons	50	1,800	N.D.	150	
Benzene	0.5	17	N.D.	N.D.	
Toluene	0.5	N.D.	2.8	N.D.	
Ethyl Benzene	0.5	N.D.	1.1	N.D.	
Total Xylenes	0.5	N.D.	8.0	N.D.	
Chromatogram Pattern:		Gasoline and Discrete Peak	--	Discrete Peak	

Quality Control Data

Report Limit Multiplication Factor:	5.0	1.0	1.0	1.0
Date Analyzed:	3/25/94	3/23/94	3/23/94	3/23/94
Instrument Identification:	HP-2	HP-2	HP-2	HP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	101	99	99	111

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

SEQUOIA ANALYTICAL, #1271


 Alan B. Kemp
 Project Manager

Please Note:

* This sample appears to contain gasoline and a non-gasoline mixture. "Discrete Peak" refers to an unidentified peak in the MTBE range.
 ** This sample does not appear to contain gasoline. "Discrete Peak" refers to an unidentified peak in the MTBE range.





Kapreallan Engineering, Inc. 2401 Stanwell Dr., Ste. 400 Concord, CA 94520 Attention: Avo Avedissian	Client Project ID: Unocal #6419, 6401 Dublin Blvd., Dublin Sample Matrix: Water Analysis Method: EPA 3510/3520/8015 First Sample #: 403-0594	Sampled: Mar 14, 1994 Received: Mar 15, 1994 Reported: Mar 29, 1994
---	---	---

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 403-0594 MW 1*	Sample I.D. Matrix Blank
Extractable Hydrocarbons	50	810	

Chromatogram Pattern: Diesel and Unidentified Hydrocarbons <C14

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0
Date Extracted:	3/16/94	3/16/94
Date Analyzed:	3/18/94	3/16/94
Instrument Identification:	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, #1271


 Alan B. Kemp
 Project Manager

Please Note:
 * This sample appears to contain diesel and a non-diesel mixture. "Unidentified Hydrocarbons <C14" are probably gasoline.





Kaprealian Engineering, Inc. 2401 Stanwell Dr., Ste. 400 Concord, CA 94520 Attention: Avo Avedissian	Client Project ID: Unocal #6419, 6401 Dublin Blvd., Dublin Sample Descript: Water, MW 1 Lab Number: 403-0594	Sampled: Mar 14, 1994 Received: Mar 15, 1994 Analyzed: Mar 22, 1994 Reported: Mar 29, 1994
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LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Cadmium.....	0.010	N.D.
Chromium.....	0.010	0.012
Lead.....	0.020	N.D.
Nickel.....	0.020	0.030
Zinc.....	0.020	0.039

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

SEQUOIA ANALYTICAL, #1271


Alan B. Kemp
Project Manager





Kaprealian Engineering, Inc.
 2401 Stanwell Dr., Ste. 400
 Concord, CA 94520
 Attention: Avo Avedissian

Client Project ID: Unocal #6419, 6401 Dublin Blvd., Dublin
 Matrix: Liquid

QC Sample Group: 4030594-96

Reported: Apr 7, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes	Diesel
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015 Mod.
Analyst:	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha	K. Wimer

MS/MSD					
Batch#:	4030596	4030596	4030596	4030596	BLK031694
Date Prepared:	3/23/94	3/23/94	3/23/94	3/23/94	3/16/94
Date Analyzed:	3/23/94	3/23/94	3/23/94	3/23/94	3/16/94
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2	HP-3B
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L	300 µg/L
Matrix Spike % Recovery:	110	105	105	107	87
Matrix Spike Duplicate % Recovery:	110	105	105	107	81
Relative % Difference:	0.0	0.0	0.0	0.0	6.8

LCS Batch#:	1LCS032394	1LCS032394	1LCS032394	1LCS032394	BLK031694
Date Prepared:	3/23/94	3/23/94	3/23/94	3/23/94	3/16/94
Date Analyzed:	3/23/94	3/23/94	3/23/94	3/23/94	3/16/94
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2	HP-3B
LCS % Recovery:	105	103	103	105	87

% Recovery Control Limits:	71-133	72-128	72-130	71-120	28-122
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Please Note:
 The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL, #1271

Alan B. Kemp
 Project Manager





Kaprealian Engineering, Inc.
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Avo Avedissian

Client Project ID: Unocal #6419, 6401 Dublin Blvd., Dublin
Matrix: Liquid

QC Sample Group: 4030594-96

Reported: Apr 7, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha

MS/MSD				
Batch#:	4030721	4030721	4030721	4030721
Date Prepared:	3/25/94	3/25/94	3/25/94	3/25/94
Date Analyzed:	3/25/94	3/25/94	3/25/94	3/25/94
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Matrix Spike				
% Recovery:	105	100	100	102
Matrix Spike Duplicate %				
Recovery:	115	105	110	107
Relative % Difference:	9.1	4.9	9.5	4.8

LCS Batch#:	1LCS032594	1LCS032594	1LCS032594	1LCS032594
Date Prepared:	3/25/94	3/25/94	3/25/94	3/25/94
Date Analyzed:	3/25/94	3/25/94	3/25/94	3/25/94
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2
LCS % Recovery:	90	89	88	89

% Recovery Control Limits:	71-133	72-128	72-130	71-120
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Please Note:

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL, #1271


Alan B. Kemp
Project Manager





Sequoia Analytical

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1900 Bates Avenue, Suite L
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Kaprealian Engineering, Inc.
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Avo Avedissian

Client Project ID: Unocal #6419, 6401 Dublin Blvd., Dublin

QC Sample Group: 403-0594

Reported: Apr 7, 1994

QUALITY CONTROL DATA REPORT

SURROGATE

	EPA	EPA
Method:	8015 Mod.	8015 Mod.
Analyst:	K. Wimer	K. Wimer
Reporting Units:	µg/L	µg/L
Date Analyzed:	3/18/94	3/16/94
Sample #:	403-0594	Matrix Blank

Surrogate		
% Recovery:	82	90

SEQUOIA ANALYTICAL, #1271


Alan B. Kemp
Project Manager

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

4030594.KEI <7>



680 Chesapeake Drive • Redwood City, CA 94063 • (415) 364-9600

819 Striker Ave., Suite 8 • Sacramento, CA 95834 • (916) 921-9600

1900 Bates Ave., Suite LM • Concord, CA 94520 • (510) 686-9600

18939 120th Ave., N.E., Suite 101 • Bothell, WA 98011 • (206) 481-9200

East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200

15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Company Name: Kaprealian Engineering Inc. Project Name: 6401 Dublin Blvd. Dublin, Ca.
 Address: 2401 Stanwell Dr # 400 UNOCAL Project Manager:
 City: Concord State: Ca Zip Code: 94583
 Telephone: 510-602-5100 FAX #: 510-687-0602 Site #: 6419
 Report To: Avo Avedissian Sampler: Divan Melkoun QC Data: Level A (Standard) Level B Level C Level D

Turnaround 10 Working Days 2 Working Days
 Time: 5 Working Days 24 Hours
 3 Working Days 2 - 8 Hours

Drinking Water Waste Water Other
 Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Analyses Requested					Comments	
						TPH-G	BTXE	TPH-D	5 Metals			
1. MW1	3/14/94		4			✓	✓	✓	✓			4030594 A-D
2. MW2	3/14/94		2			✓	✓					↓ 0595 A-B
3. MW3	3/14/94		2			✓	✓					↓ 0596 J
4.												
5.												
6.												
7.												
8.												
9.												
10.												

Relinquished By: <u>Divan Melkoun</u>	Date: <u>3-15-94</u>	Time: <u>8:35</u>	Received By: <u>Orellis</u>	Date: <u>3-15</u>	Time: <u>8:35</u>
Relinquished By: _____	Date: _____	Time: _____	Received By: _____	Date: _____	Time: _____
Relinquished By: _____	Date: _____	Time: _____	Received By Lab: _____	Date: _____	Time: _____

Were Samples Received in Good Condition? Yes No Samples on Ice? Yes No Method of Shipment SAL Page ___ of ___

To be completed upon receipt of report:
 1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____
 2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____
 Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client
Yellow - Sequoia
White - Sequoia



Kaprealian Engineering, Inc.
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Avo Avedissian

Client Project ID: Unocal #6419, 6401 Dublin Blvd, Dublin
Sample Matrix: Soil
Analysis Method: EPA 5030/8015/8020
First Sample #: 402-1675

Sampled: Feb 24-25, 1994
Received: Feb 25, 1994
Reported: Mar 14, 1994

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

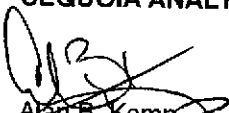
Analyte	Reporting Limit mg/kg	Sample I.D. 402-1675 MW 1 (5)	Sample I.D. 402-1676 MW 1 (10)	Sample I.D. 402-1677 MW 1 (12)	Sample I.D. 402-1678 MW 2 (5)	Sample I.D. 402-1679 MW 2 (10)	Sample I.D. 402-1680 MW 2 (12)
Purgeable Hydrocarbons	1.0	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Benzene	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Toluene	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Ethyl Benzene	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Total Xylenes	0.005	N.D.	N.D.	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	1.0
Date Analyzed:	3/9/94	3/9/94	3/9/94	3/9/94	3/9/94	3/9/94
Instrument Identification:	HP-4	HP-4	HP-4	HP-4	HP-4	HP-4
Surrogate Recovery, %: (QC Limits = 70-130%)	103	104	106	103	97	101

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

SEQUOIA ANALYTICAL #1271


Alan B. Kemp
Project Manager





SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc. 2401 Stanwell Dr., Ste. 400 Concord, CA 94520 Attention: Avo Avedissian	Client Project ID: Unocal #6419, 6401 Dublin Blvd, Dublin Sample Matrix: Soil Analysis Method: EPA 5030/8015/8020 First Sample #: 402-1681	Sampled: Feb 24-25, 1994 Received: Feb 25, 1994 Reported: Mar 14, 1994
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TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

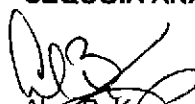
Analyte	Reporting Limit mg/kg	Sample I.D. 402-1681 MW 2 (17)	Sample I.D. 402-1682 MW 3 (5)	Sample I.D. 402-1683 MW 3 (9.5)	Sample I.D. 402-1684 MW 3 (11)	Sample I.D. Method Blank
Purgeable Hydrocarbons	1.0	N.D.	N.D.	N.D.	N.D.	
Benzene	0.005	N.D.	N.D.	N.D.	N.D.	
Toluene	0.005	N.D.	N.D.	N.D.	N.D.	
Ethyl Benzene	0.005	N.D.	N.D.	N.D.	N.D.	
Total Xylenes	0.005	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 Analyzed:	3/9/94	3/9/94	3/9/94	3/9/94	3/9/94
Instrument Identification:	HP-4	HP-4	HP-4	HP-4	HP-4
Surrogate Recovery, %: (QC Limits = 70-130%)	103	99	98	99	116

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

SEQUOIA ANALYTICAL #1271


Alan B. Kemp
Project Manager



SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Avo Avedissian

Client Project ID: Unocal #64-19, 6401 Dublin Blvd, Dublin
Matrix: Solid

QC Sample Group: 4021675-1684

Reported: Mar 14, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A.T.	A.T.	A.T.	A.T.

MS/MSD				
Batch#:	4021632	4021632	4021632	4021632
Date Prepared:	3/9/94	3/9/94	3/9/94	3/9/94
Date Analyzed:	3/9/94	3/9/94	3/9/94	3/9/94
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4
Conc. Spiked:	0.40 mg/kg	0.40 mg/kg	0.40 mg/kg	1.2 mg/kg
Matrix Spike				
% Recovery:	90	90	90	92
Matrix Spike Duplicate %				
Recovery:	93	93	95	94
Relative % Difference:	3.3	3.3	5.4	2.2

LCS Batch#:	2LCS030994	2LCS030994	2LCS030994	2LCS030994
Date Prepared:	3/9/94	3/9/94	3/9/94	3/9/94
Date Analyzed:	3/9/94	3/9/94	3/9/94	3/9/94
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4
LCS % Recovery:	98	94	88	93

% Recovery Control Limits:	55-145	47-149	47-155	56-140
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Please Note:

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL #1271

Alan B. Kemp
Project Manager



680 Chesapeake Drive • Redwood City, CA 94063 • (415) 364-9600
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 East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200
 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Company Name: KAPREALIAN ENGINEERING, INC.		Project Name: 6401 DUBLIN BLVD., DUBLIN	
Address: 2401 STANWELL DR., SUITE 400		UNOCAL Project Manager: ED RALSTON	
City: CONCORD	State: CA	Zip Code: 94520	
Telephone: (510) 602-5100		FAX #: 687-0602	
Report To: AVO		Site #: 6419	
Sampler: BOUG LEE		QC Data: <input checked="" type="checkbox"/> Level A (Standard) <input type="checkbox"/> Level B <input type="checkbox"/> Level C <input type="checkbox"/> Level D	

Turnaround 10 Working Days 2 Working Days
 Time: 5 Working Days 24 Hours
 3 Working Days 2 - 8 Hours

Drinking Water
 Waste Water
 Other

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Analyses Requested										Comments		
1. MW1 (5)	2/24/94	SOIL	1	TUBE		X	X											4021675
2. MW1 (10)	↓																	676
3. MW1 (12)	↓																	677
4. MW2 (5)	2/25/94																	678
5. MW2 (10)	↓																	679
6. MW2 (12)	↓																	680
7. MW2 (17)	↓																	681
8. MW3 (5)	2/24/94																	682
9. MW3 (9.5)	↓																	683
10. MW3 (11)	↓																	684

Relinquished By: <i>[Signature]</i> (KE)	Date: 2/25/94	Time: 3:04 p	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab: <i>Melrose-Cummins</i>	Date: 2/25/94	Time: 3:04 p

Were Samples Received in Good Condition? Yes No
 Samples on Ice? Yes No
 Method of Shipment _____
 Page 1 of 1

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? Yes No If no, what analyses are still needed? _____
 2) Was the report issued within the requested turnaround time? Yes No If no, what was the turnaround time? _____

Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client
 Yellow - Sequoia
 White - Sequoia