KAPREALIAN ENGINEERING, INC.
Consulting Engineers
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KEI-P90-1103.R4
July 5, 1991

Unocal Corporation
2000 Crow Canyon Place, Suite 400
San Ramon, CA 94583

Attention: Mr. Rick Sisk

RE: Preliminary Ground Water Investigation at
Unocal Service Station #0752
800 Harrison Street
Oakland, California

Dear Mr. Sisk:

This report presents the results of soil and ground water investigation for the referenced site in accordance with Kaprealian Engineering, Inc's. (KEI) proposal KEI-P90-1103.P1 dated February 1, 1991. The purpose of the investigation was to determine the ground water flow direction, and to begin to determine the degree and extent of the subsurface soil and ground water contamination at the site. The scope of the work performed by KEI consisted of the following:

Coordination with regulatory agencies.

Geologic logging of five borings for the installation of three monitoring wells and two exploratory borings.

Soil sampling.

Ground water monitoring, purging and sampling.

Laboratory analyses.

Data analysis and report preparation.

SITE DESCRIPTION AND BACKGROUND

The subject site is presently used as a gasoline station. The site is characterized by gently sloping, southward trending topography, and is located approximately 0.5 miles north-northeast from the Oakland Inner Harbor. The site is located northeast and across 8th Street from a Shell Service Station, which is located adjacent to and northeast of a currently closed Arco Service Station at the intersection of 7th Street with Harrison. Also, a gasoline and diesel service station referred to as "Mandrin Auto Service" is

located east-southeast of the site at Alice Street and 8th Street. A Location Map, Site Vicinity Map, and Site Plans are attached to this report.

KEI's initial field work was conducted on November 9, 1990, when two underground fuel storage tanks and one waste oil tank were removed from the site. The tanks consisted of one 10,000 gallon regular unleaded tank, one 10,000 gallon super unleaded fuel storage tank, and one 280 gallon waste oil tank. The tanks were made of steel and no apparent holes or cracks were observed in the fuel tanks; however, **the waste oil tank had one 1/8 square inch hole located on the side.** Mr. Dennis Byrne of the Alameda County Health Agency (ACHA) was present during tank removal and subsequent soil sampling.

but was ND for TPH-g, d + BTEX + O+G

Two soil samples, labeled A1 and B1, were collected from beneath the fuel tanks at a depth of approximately 14 feet below grade. Two soil samples, labeled A2 and B2, were collected from the fuel tank pit east sidewall at a depth of approximately 12 feet below grade. One soil sample, labeled WO1, was collected from beneath the waste oil tank at a depth of approximately 6.5 feet below grade. Sample point locations are as shown on the attached Site Plan, Figure 2.

On November 12, 1990, due to observed soil contamination in the area of sample point A1, KEI collected an additional soil sample, labeled C(19), from the fuel tank pit at a depth of approximately 19 feet below grade.

KEI returned to the site on December 20, 1990, in order to collect soil samples from beneath the pump islands. Six samples, labeled D1 through D6, were collected from beneath the six fuel dispensers, and one sample, labeled P1, was collected from the product pipe trench. These samples were collected at a depth of about 2.5 feet below grade. Sample point locations are shown on the attached Site Plan, Figure 2.

KEI again returned to the site on December 26, 1990 for additional soil excavation due to obvious contamination in the area beneath sample point D2 observed during previous excavation activities. One additional soil sample, labeled D2(6), was collected from beneath the fuel dispenser and below the sample point D2 at a depth of about 6 feet below grade.

At the request of the ACHA, on January 3, 1991 KEI returned to the site in order to collect one additional soil sample, labeled WO1(9.5), from the waste oil tank pit. Sample point locations are as shown on the attached Site Plan, Figure 2. After sampling, the waste oil tank pit was excavated to the sample depth of 9.5 feet.

All samples were analyzed by Sequoia Analytical Laboratory in Concord, California. All soil samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline, and benzene, toluene, xylenes and ethylbenzene (BTX&E). In addition, the soil sample WO1, collected from the waste oil tank pit, was analyzed for TPH as diesel, total oil and grease (TOG), EPA methods 8010 and 8270 constituents, and the metals cadmium, chromium, lead, zinc and nickel. The additional soil sample WO1(9.5), collected beneath sample WO1, was analyzed for TPH as gasoline, BTX&E, TOG and the metals chromium, lead, zinc and nickel.

Analytical results of the soil samples, collected from the fuel tank pit, indicated non-detectable levels of TPH as gasoline for sidewall samples A2 and B2. Analytical results of the soil samples (A1, B1 and C[19]), collected from the fuel tank pit, indicated levels of TPH as gasoline at 1,200 ppm, 45 ppm and 3,800 ppm, respectively.

Analytical results of soil samples, collected from beneath the dispensers and the pipe trench, indicated non-detectable levels of TPH as gasoline and benzene for samples P1 and D1 through D6, except for sample D2, which showed 45 ppm of TPH as gasoline, and 0.22 ppm of benzene. However, sample D2(6), collected beneath sample D2 at a depth of 6 feet, showed 1,200 ppm of TPH as gasoline, and 0.24 ppm of benzene.

Analytical results of the soil sample WO1, collected from beneath the waste oil tank pit, indicated non-detectable levels of TPH as gasoline, BTX&E, TPH as diesel, TOG, EPA methods 8010 and 8270 constituents and cadmium. Chromium, lead, zinc and nickel were detected at concentrations of 43 ppm, 1,100 ppm, 130 ppm and 12 ppm, respectively. However, sample WO1(9.5), collected from beneath sample WO1 at a depth of 9.5 feet, showed non-detectable levels of TPH as gasoline, BTX&E, TOG and lead. Chromium, zinc and nickel were detected at concentrations of 61 ppm, 20 ppm and 40 ppm, respectively. Results of the soil analyses are summarized in Table 5.

Based on the analytical results, **KEI recommended that an in-situ remediation system design be developed and implemented to deal with the residual soil contamination in the fuel tank pit in the vicinity of sample point locations A1 and C(19), and at the southerly pump island in the vicinity of sample location D2(6).** However, prior to designing a remediation system and to comply with the requirements of the Regional Water Quality Control Board (RWQCB) and the ACHA, KEI recommended the installation of three monitoring wells and two exploratory borings at the site. Results of the soil samples from the tank excavation are summarized in KEI's report (KEI-J90-1103.R1) dated February 1, 1991.

RECENT FIELD ACTIVITIES

On May 29 and 30, 1991, three two-inch diameter monitoring wells and two exploratory borings (designated as MW1, MW2 and MW3, and EB1 and EB2, respectively, on the attached Site Plan, Figure 1) were installed at the site. The wells were drilled, constructed and completed in accordance with the guidelines of the 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.

The monitoring wells were drilled and completed to total depths ranging from 33 to 35 feet. The exploratory borings were each drilled to total depths of 23 feet and were fully grouted with neat Portland cement. Ground water was encountered at depths ranging from about 22-1/2 to 24 feet beneath the surface during drilling. Soil samples were taken for laboratory analysis and lithologic logging purposes at a maximum spacing of 5 foot intervals, and at the soil/ground water interface beginning at a depth of approximately 5 feet below grade until ground water was encountered. The exploratory borings were drilled approximately 1/2 foot into the saturated zone. Soil samples were obtained below the first encountered ground water in the monitoring wells (only at the depths indicated on the attached Boring Logs) for lithologic logging purposes only. The undisturbed soil samples were taken 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, and placed in plastic zip-lock baggies, and stored in a cooled ice chest for delivery to a 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 surface of each well cover was surveyed by Kier & Wright of Pleasanton, California, to Mean Sea Level (MSL) and to a vertical accuracy of 0.01 feet.

The wells were developed on June 1, 1991. Prior to development, the wells were checked for depth to the water table using an electronic sounder, presence of free product (using an interface probe or paste tape) and sheen. No free product or sheen was noted in any of the wells. After recording the monitoring data, the wells were developed with a surface pump until the evacuated water was clear and free of suspended sediment. During development, the wells were purged of 85 to 90 gallons. Monitoring and well development data are summarized in Table 1.

The wells were sampled on June 5, 1991. Prior to sampling, monitoring data was collected and the wells each purged of 15 gallons. Water samples were then collected using a clean Teflon bailer, which was rinsed with distilled water prior to sampling each well. The samples were decanted into clean glass VOA vials, sealed with Teflon-lined screw caps, and labeled and stored in a cooler on ice until delivery to a certified laboratory.

ANALYTICAL RESULTS

Water samples from MW1, MW2 and MW3 and selected soil samples from EB1, EB2, MW1, MW2 and MW3 were analyzed at Sequoia Analytical Laboratory in Concord, California. All samples were accompanied by properly executed Chain of Custody documentation. All soil and water samples were analyzed for TPH as gasoline by EPA method 5030 in conjunction with modified 8015, and BTX&E by EPA method 8020. In addition, soil and water samples collected from MW1 (adjacent to the waste oil tank) were analyzed for TPH as diesel by EPA method 3550 (soil) and 3510 (water) in conjunction with modified 8015, for TOG by Standard Method 5520E&F (soil) and 5520B&F (water), for chlorinated solvents (halogenated volatile organics) using EPA method 8010, and for the metals cadmium, chromium, lead, nickel and zinc.

Analytical results of the soil samples, collected from the borings for monitoring wells MW1, MW2 and MW3 and soil borings EB1 and EB2, indicate non-detectable levels of TPH as gasoline and benzene in all analyzed samples, except for samples MW1(5), MW1(10), MW1(15), and MW3(23) which showed levels of TPH as gasoline at levels of 1.1 ppm, 43 ppm, 250 ppm and 2.9 ppm, respectively, and in samples EB1(15), MW1(15), MW2(15.5), MW2(20) and MW3(23) which showed benzene levels ranging from 0.0079 ppm to 0.80 ppm. In MW1, TPH as diesel, TOG and all EPA method 8010 compounds were non-detectable in all samples, except for samples MW1(5), MW1(10) and MW1(15), which showed levels of TPH as diesel at 2.2 ppm, 43 ppm and 120 ppm, respectively. Also in MW1, cadmium was non-detectable for all samples; chromium was detected at levels ranging from 20 ppm to 110 ppm; lead at levels ranging from 4.2 ppm to 11 ppm, nickel at levels ranging from 24 ppm to 42 ppm, and zinc at levels ranging from 23 ppm to 30 ppm.

Analytical results of the ground water samples collected from monitoring wells MW1 and MW2 indicate levels of TPH as gasoline ranging from 47 ppb to 49 ppb with non-detectable levels of BTX&E. In MW3, TPH as gasoline was detected at a level of 5,800 ppb, and benzene at a level of 1,200 ppb. In MW1, TPH as diesel, TOG and EPA method 8010 constituents were non-detectable, except for chloroform at 7.8 ppb, tetrachloroethene at 2.9 ppb and trichloroethene at 1.3 ppb. Also in MW1, chromium, lead, nickel and zinc

were detected at concentrations of 0.0083 ppm, 0.011 ppm, 0.063 ppm and 0.023 ppm, respectively, and cadmium was non-detectable. Results of the soil analyses are summarized in Tables 3 and 4, and the water analyses in Table 2. Concentrations of TPH as gasoline and benzene from the ground water samples taken from the monitoring wells are plotted on the attached Site Plan, Figure 1a. Copies of the laboratory analyses and Chain of Custody documentation are attached to this report.

HYDROLOGY AND GEOLOGY

The water table stabilized in the monitoring wells at depths ranging from 20.79 to 22.02 feet below the surface. **The ground water flow direction appeared to be toward the southwest on June 5, 1991,** with a hydraulic gradient of approximately .0083, (based on water level data collected from the three monitoring wells prior to purging and sampling).

Based on review of regional geologic maps (U.S. Geological Survey Professional Paper 943 "Flatland Deposits - 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 Quaternary-age dune sand deposits referred to as the Merritt Sand (Qps). The Merritt Sand is described as typically consisting of loose, well-sorted, fine-to medium-grained sand with silt and reaches a maximum depth of about 50 feet near Oakland.

The results of our subsurface study indicate that the site is immediately underlain by artificial fill materials which extend to depths of about 2-1/2 to 5-1/2 feet below grade, except at MW3 where the fill materials were confirmed to only extend to a depth of about 1 foot. The native earth materials underlying the fill consist of very fine-to fine-grained sand which is predominantly poorly graded or is clayey or silty sand. These sandy materials extend to depths below grade of about 32 to 33 feet, where a silty to sandy clay layer was encountered and extends to at least the maximum depth explored (33 to 35 feet). However, at MW3, this clay bed varies from a very sandy clay to a very clayey sand.

DISCUSSION AND RECOMMENDATIONS

Based on the analytical results, KEI recommends implementation of a monitoring and sampling program. 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 needed.

The extent of ground water contamination at the site has not been defined, especially in the downgradient direction, and therefore additional monitoring wells are necessary. However, prior to preparing a detailed work plan for additional wells, KEI recommends that an RWQCB file review be conducted for known or suspected ground water contamination sites in the vicinity of the Unocal site, and that potential areas of off-site monitoring wells be evaluated. A work plan recommending additional monitoring wells will be prepared in the near future for your review and consideration.

Also, it appears that only limited soil contamination is present at the site, specifically at MW1 at depths of 5 to 15 feet below grade, at the area of the southern most fuel dispenser (sample D2[6]), and in the central areas of the fuel tank pit (samples A1 and C[19]).

DISTRIBUTION

A copy of this report should be sent to the Alameda County Health Care Services, 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 ground water levels and flow paths, thereby changing the extent and concentration of any contaminants. Our studies assume that the field and laboratory data are reasonably representative of the site as a whole, and assume that subsurface conditions are reasonably conducive to interpolation and extrapolation.

The results of this study are based on the data obtained from the field and laboratory analyses obtained from a state certified laboratory. We have analyzed 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 (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.

Thomas J. Berkins
Senior Environmental Engineer

Don R. Braun
Certified Engineering Geologist

License No. 1310
Exp. Date 6/30/92

Timothy R. Ross
Project Manager

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Attachments: Tables 1 through 5
Location Map
Site Vicinity Map
Site Plans - Figures 1, 1a & 2
Boring Logs
Particle Size Analysis - Plate 1
Laboratory Results
Chain of Custody documentation

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TABLE 1

SUMMARY OF GROUND WATER MONITORING AND PURGING DATA

Well #	Ground Water Elevation (feet)	Depth to Water (feet)	Product Thickness	Sheen	Gallons Pumped
(Monitored and Developed on June 1, 1991)					
MW1	13.00	21.94	0	No	85
MW2	13.28	21.69	0	No	90
MW3	12.68	20.71	0	No	85
(Monitored and Sampled on June 5, 1991)					
MW1	12.92	22.02	0	No	15
MW2	13.18	21.79	0	No	15
MW3	12.60	20.79	0	No	15

Well #	Surface Elevation* (feet)
MW1	34.94
MW2	34.97
MW3	33.39

* Elevation of top of well covers surveyed to MSL per City of Oakland disk stamped "25/A" at elevation 28.81 feet MSL.

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TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Number	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
6/05/91	MW1*	ND	47 } MDL < 50	ND	ND	ND	ND
	MW2	--	49 }	ND	ND	ND	ND
	MW3	--	5,800	1,200	40	97	140
Detection Limits		50	30	0.3	0.3	0.3	0.3

* TOG and all EPA method 8010 constituents were non-detectable, except for chloroform at 7.8 ppb, tetrachloroethene at 2.9 ppb, and trichloroethene at 1.3 ppb. Chromium was detected at 0.0083 ppm, lead at 0.011 ppm, nickel at 0.063 ppm, and zinc at 0.023 ppm. Cadmium was non-detectable.

ND = Non-detectable.

-- Indicates analyses not performed.

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

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July 5, 1991

TABLE 3

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample Number	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
5/23/91	MW1(5)*	5	2.2	1.1	ND	ND	0.010	ND
&	MW1(10)*	10	43	43	ND	0.0059	0.43	0.0074
5/30/91	MW1(15)*	15	120	250	0.80	0.73	2.9	0.91
	MW1(20)*	20	ND	ND	ND	ND	ND	ND
	MW1(24)*	24	ND	ND	ND	ND	0.0073	ND
	MW2(5)	5	--	ND	ND	ND	0.0054	ND
	MW2(10)	10	--	ND	ND	ND	ND	ND
	MW2(15.5)	15.5	--	ND	0.015	ND	0.025	0.0064
	MW2(20)	20	--	ND	0.0086	ND	ND	ND
	MW2(22)	22	--	ND	ND	ND	ND	ND
	MW3(5)	5	--	ND	ND	ND	ND	ND
	MW3(10)	10	--	ND	ND	ND	ND	ND
	MW3(15)	15	--	ND	ND	ND	ND	ND
	MW3(20)	20	--	ND	ND	ND	ND	ND
	MW3(23)	23	--	2.9	0.0079	ND	0.031	0.012
	EB1(5.5)	5.5	--	ND	ND	ND	ND	ND
	EB1(10)	10	--	ND	ND	ND	ND	ND
	EB1(15)	15	--	ND	0.0087	ND	ND	ND
	EB1(20)	20	--	ND	ND	ND	ND	ND
	EB1(22)	22	--	ND	ND	ND	ND	ND
	EB2(5.5)	5.5	--	ND	ND	ND	ND	ND
	EB2(10)	10	--	ND	ND	ND	ND	ND
	EB2(15)	15	--	ND	ND	ND	ND	ND
	EB2(20)	20	--	ND	ND	ND	ND	ND
	EB2(22.5)	22.5	--	ND	ND	ND	ND	ND
Detection Limits			1.0	1.0	0.0050	0.0050	0.0050	0.0050

* TOG and all EPA method 8010 constituents were non-detectable.

ND = Non-detectable.

-- Indicates analyses not performed.

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

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TABLE 4

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample	Depth (feet)	Cadmium	Chromium	Lead	Nickel	Zinc
5/29/91	MW1(5)	5	ND	64	11	32	30
	MW1(10)	10	ND	48	7.1	24	27
	MW1(15)	15	ND	110	6.0	42	28
	MW1(20)	20	ND	32	4.2	36	23
	MW1(24)	24	ND	20	5.0	31	23
Detection Limits			0.50	0.25	0.25	2.5	0.50

ND = Non-detectable.

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

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July 5, 1991

TABLE 5

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on November 9 & 12, December 20 & 26, 1990
and January 3, 1991)

Sample	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
A1	14.0	1,200	3.0	38	170	25
A2	12.0	ND	ND	0.0082	0.024	ND
B1	14.0	45	0.29	2.7	10	1.4
B2	12.0	ND	0.0063	0.0056	0.011	ND
C(19)	19.0	3,800	11	90	210	36
WO1*	6.5	ND	ND	ND	ND	ND
WO1(9.5)**	9.5	ND	ND	ND	ND	ND
D1	2.5	ND	ND	ND	ND	ND
D2	2.5	45	0.22	1.8	5.5	0.71
D2(6)	6.0	1,200	0.24	28	170	28
D3	2.5	ND	ND	ND	ND	ND
D4	2.5	ND	ND	ND	ND	ND
D5	2.5	ND	ND	ND	ND	ND
D6	2.5	ND	ND	ND	ND	0.018
P1	2.5	ND	ND	ND	ND	ND
Detection Limits		1.0	0.0050	0.0050	0.0050	0.0050

* TOG, TPH as diesel, cadmium, all EPA methods 8010 and 8270 constituents were non-detectable. Chromium, lead, zinc and nickel were detected at 43 ppm, 1,100 ppm, 130 ppm and 12 ppm, respectively.

** TOG and lead were non-detectable. Chromium, zinc and nickel were detected at 61 ppm, 20 ppm and 40 ppm, respectively.

ND = Non-detectable.

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

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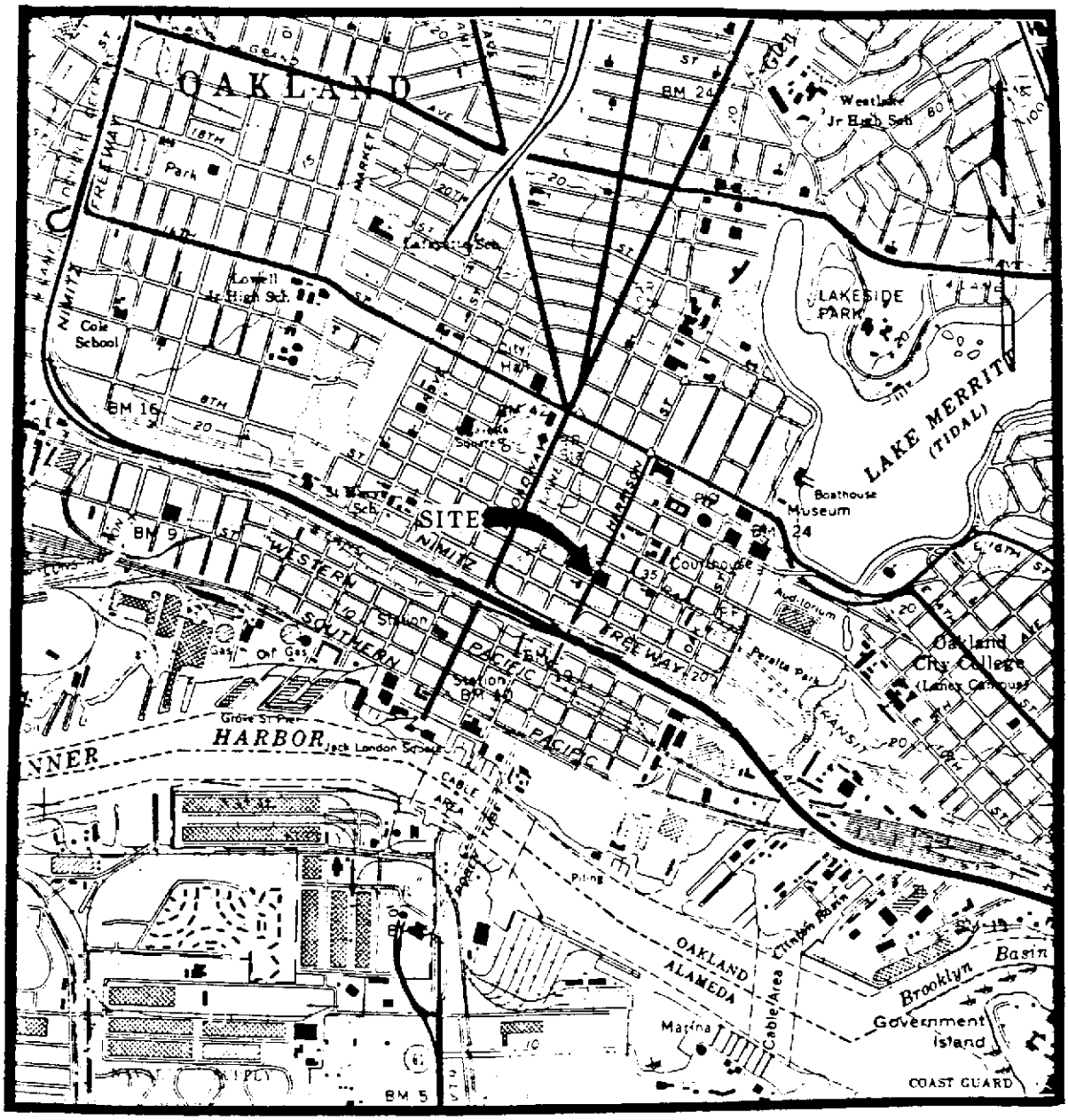

LOCATION MAP

Base from U.S.G.S. 7.5 minute Oakland West Quadrangle (photorevised 1980)

Unocal S/S #0752
800 Harrison Street
Oakland, CA

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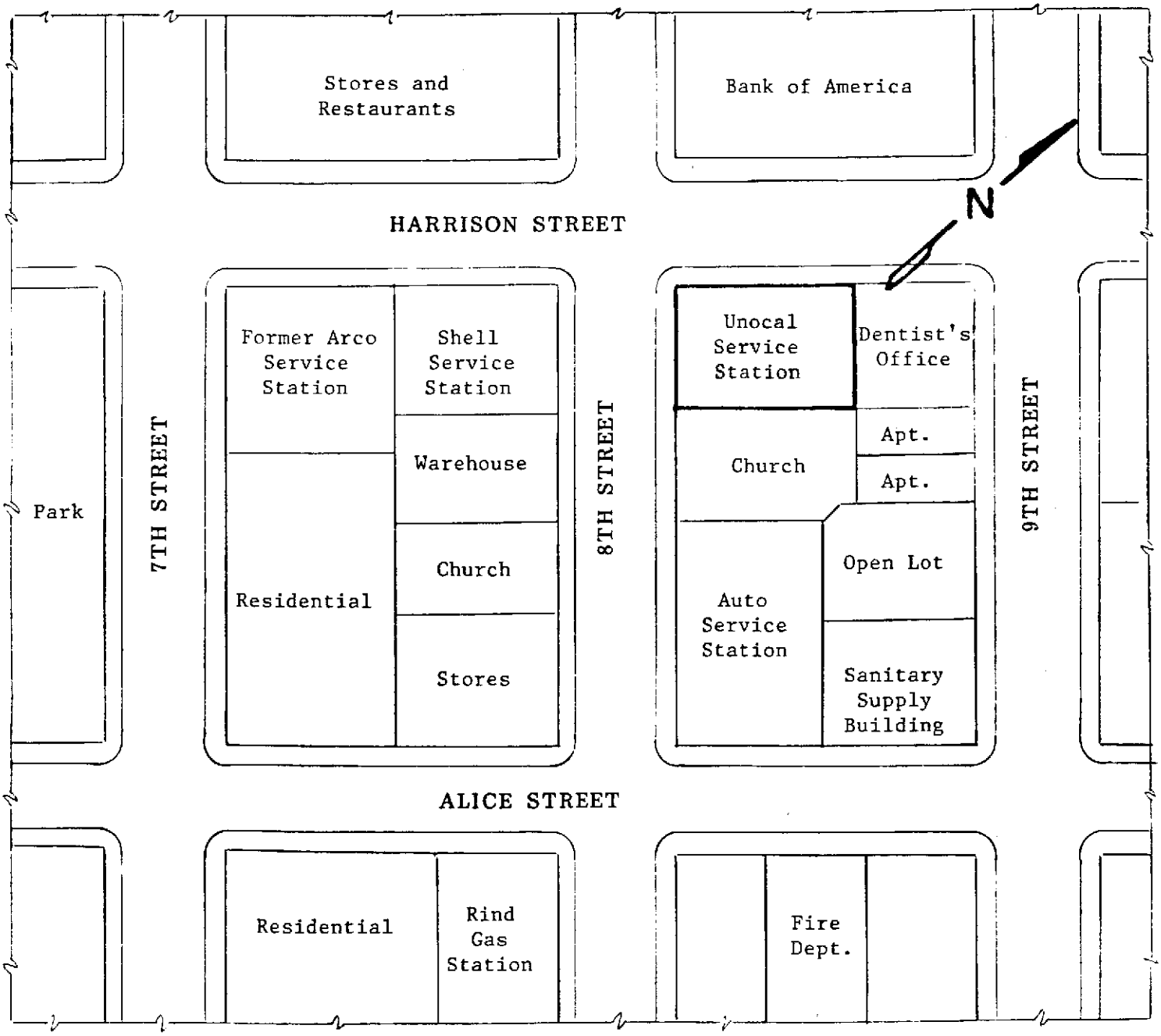

SITE VICINITY MAP

0 100 200
Approx. scale feet

Unocal S/S #0752
800 Harrison Street
Oakland, CA

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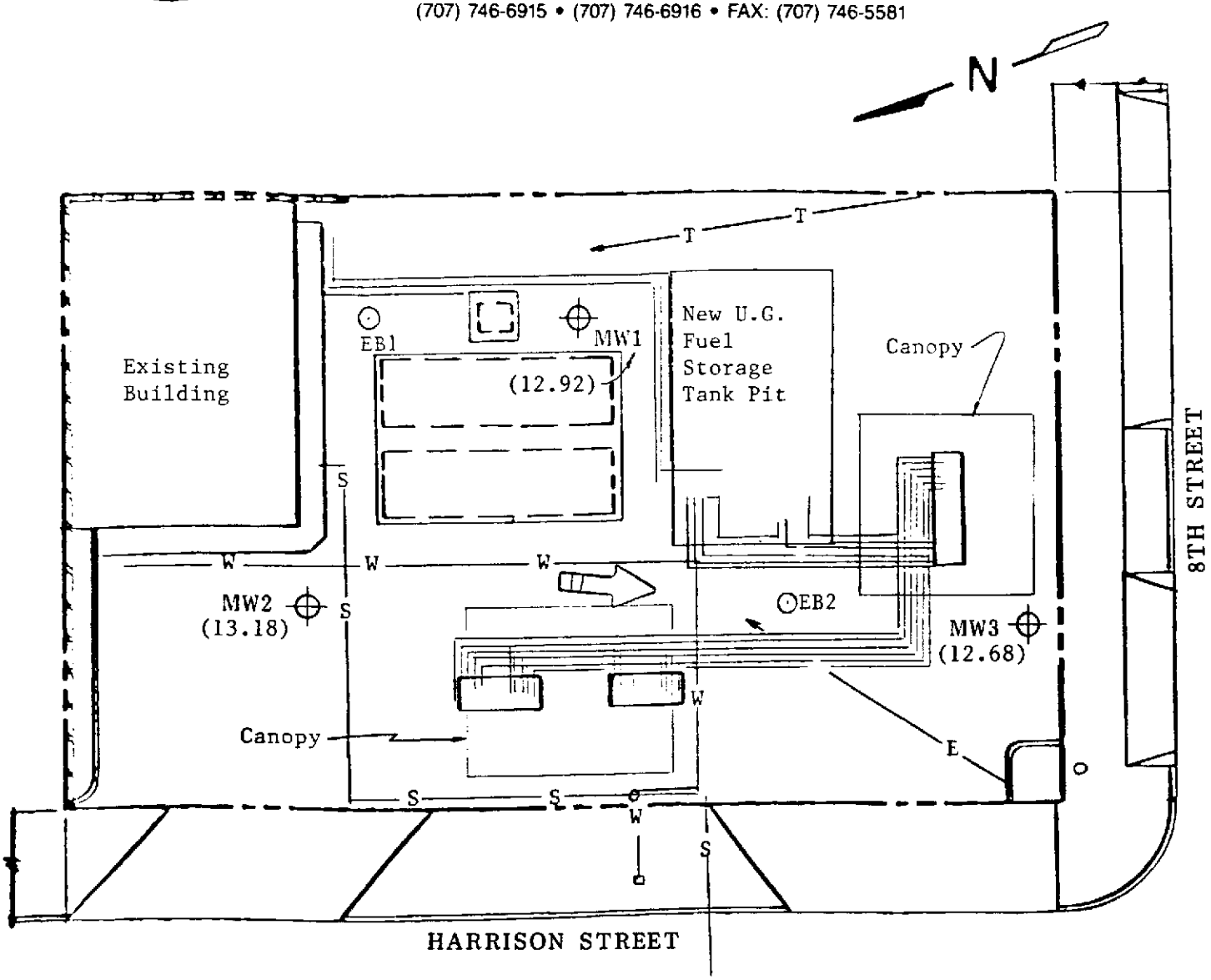

SITE PLAN
Figure 1

LEGEND

- Monitoring well
- Exploratory boring
- ( ) Elevation of ground water table in feet above Mean Sea Level on 6/5/91
- Direction of ground water flow
- W,S = Water and sewer lines
- E,T = Electrical and telephone lines

0 20 40
Approx. scale feet

Unocal S/S #0752
800 Harrison Street
Oakland, CA

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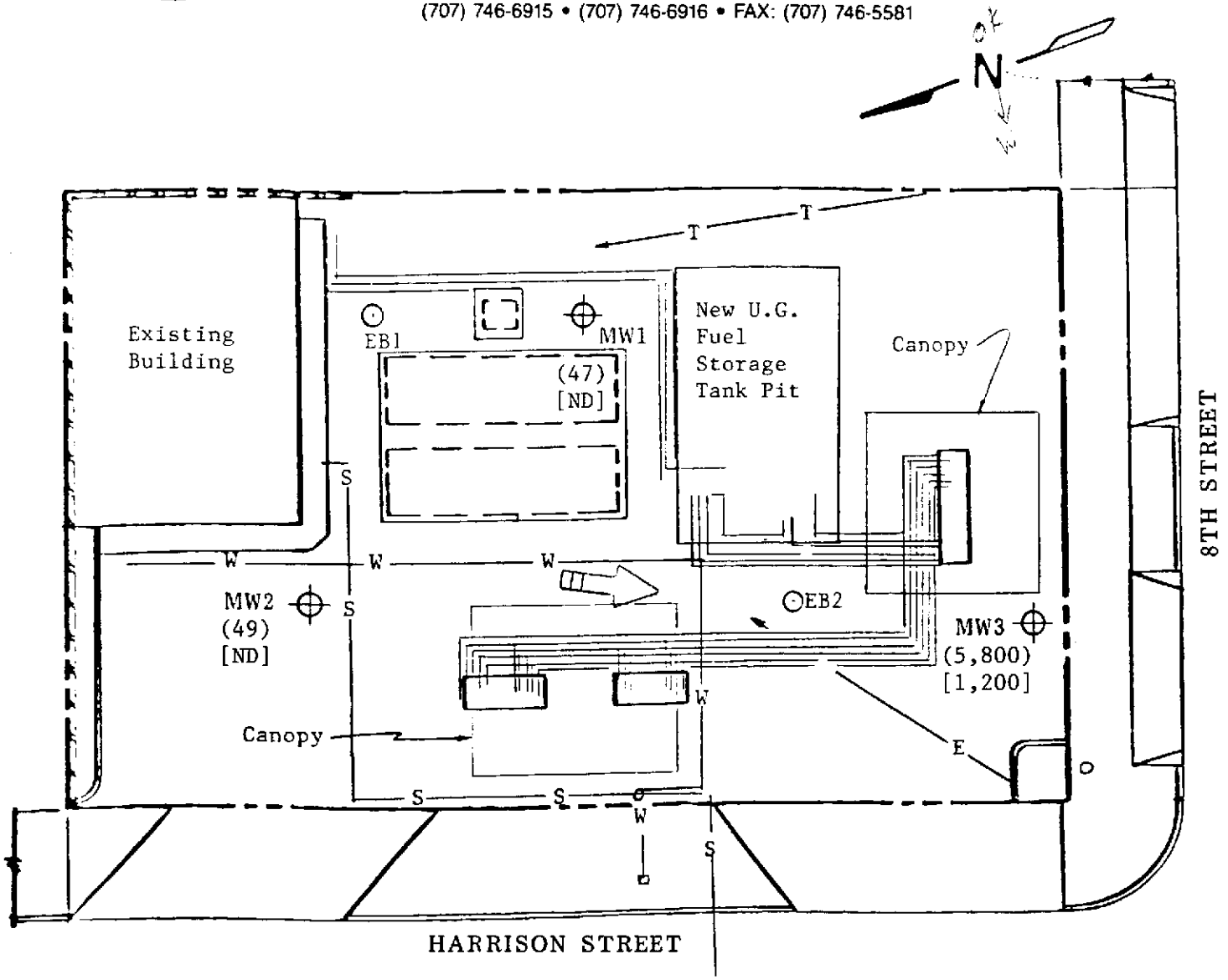

SITE PLAN
Figure 1a

LEGEND

- Monitoring well
- Exploratory boring
- ( ) Level of TPH as gasoline in ppb
- [ ] Level of benzene in ppb
- Direction of ground water flow
- E,T=Electrical and telephone lines
- W,S=Water and sewer lines

0 20 40
Approx. scale feet

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800 Harrison Street
Oakland, CA

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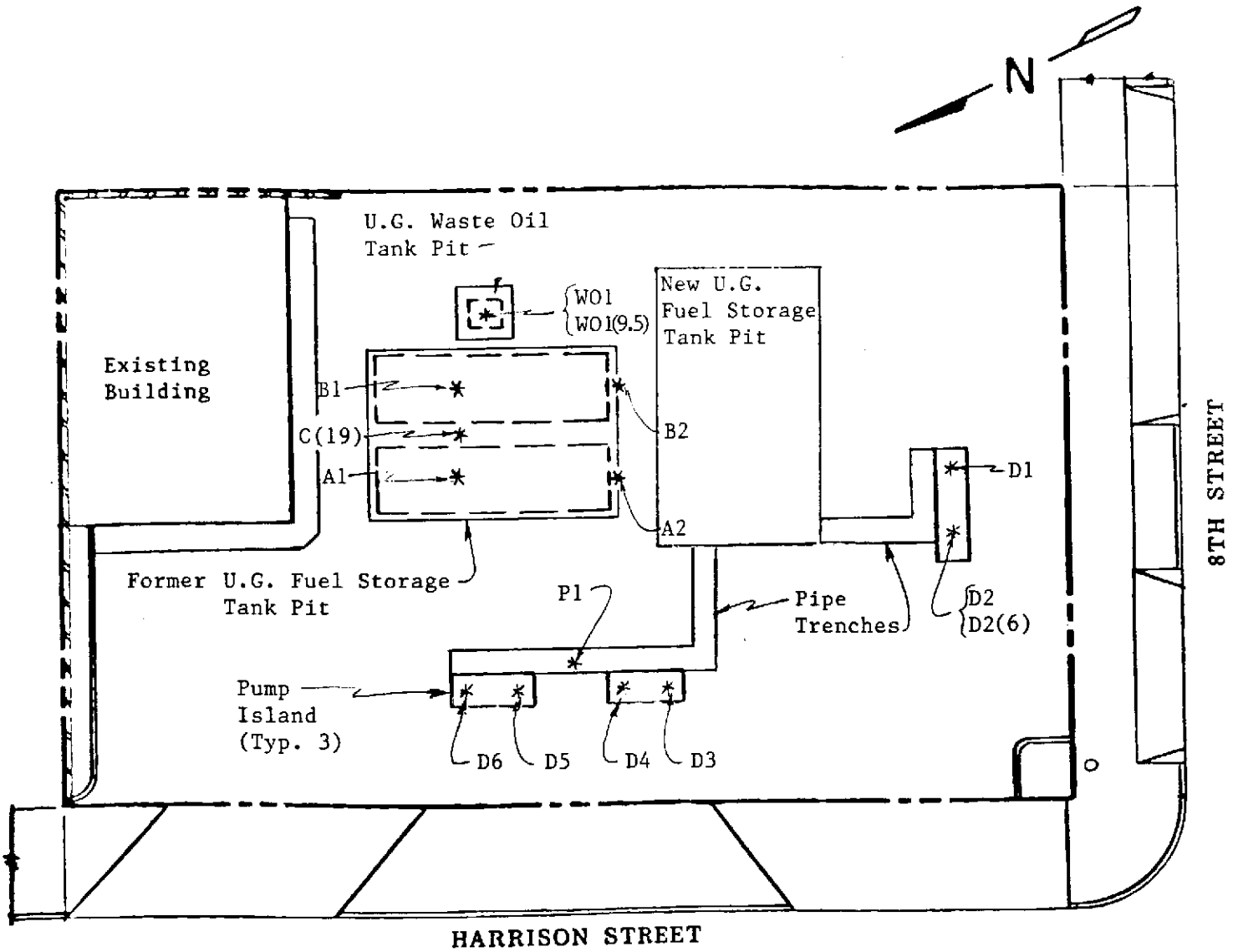


SITE PLAN
Figure 2

0 20 40
Approx. scale feet

LEGEND

* Sample Point Location

Unocal S/S #0752
800 Harrison Street
Oakland, CA

BORING LOG

Project No. KEI-P90-1103	**Boring Diameter** 8"	**Logged By** W.W.
Project Name Unocal 800 Harrison St. Oakl	**Well Cover Elevation** N/A	**Date Drilled** 5/29/91
Boring No. EB1	**Drilling Method** Hollow-stem Auger	**Drilling Company** Woodward Drilling

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
		0		6" thick concrete slab over sand and gravel.
			SM	Fill material consisting of silty sand, with bricks and concrete chunks to 5" diameter, trace gravel, moist, dense, dark yellowish brown.
9/18/27		5	SP	Fine-grained sand, trace silt and clay, moist, dense, light yellowish brown and yellowish brown mottled with traces of gray.
11/15/18		10		Very fine- to fine-grained sand, trace silt, moist, dense yellowish brown.
8/10/21		15		Fine-grained sand, trace clay and silt, moist, dense, yellowish brown and light brownish gray mottled.
			SP	
11/22/33		20		Fine-grained sand, trace clay and silt, moist, very dense, gray to light brownish gray.

BORING LOG

Project No. KEI-P90-1103	**Boring Diameter** 8"	**Logged By** W.W. DRB
Project Name Unocal 800 Harrison St. Oakl	**Well Cover Elevation** N/A	**Date Drilled** 5/29/91
Boring No. EB1	**Drilling Method** Hollow-stem Auger	**Drilling Company** Woodward Drilling

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
10/20/33	▽		SP	Very fine- to fine-grained sand, trace silt, saturated below 22.3', very dense, olive gray.
		25		
		30		
		35		
		40		TOTAL DEPTH: 23'

BORING LOG

Project No. KEI-P90-1103	**Boring Diameter** 8"	**Logged By** W.W. DRB
Project Name Unocal 800 Harrison St. Oakl	**Well Cover Elevation** N/A	**Date Drilled** 5/29/91
Boring No. EB2	**Drilling Method** Hollow-stem Auger	**Drilling Company** Woodward Drilling

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
		0		Asphalt pavement over sand and gravel.
			SM	Fill material consisting of silty sand, with brick and concrete chunks, moist, brown to yellowish brown.
			SP	
		5		
5/8/12				Very fine- to fine-grained sand, trace silt, moist, medium dense, yellowish brown.
				Very fine- to fine-grained sand, trace silt, moist, trace root holes, dense, yellowish brown to dark yellowish brown.
14/16/19		10		
			SP/ SC	Fine-grained sand, with clay, trace silt, moist, dense, yellowish brown.
8/16/23		15		
			SP	Very fine- to fine-grained sand, trace clay and silt, moist, dense, light yellowish brown to light olive brown, trace gray mottling.
12/18/23		20		

BORING LOG

Project No.	Boring Diameter	Logged By
KEI-P90-1103	8"	W.W. DRB
Project Name Unocal 800 Harrison St. Oakl	**Well Cover Elevation** N/A	**Date Drilled** 5/29/91
Boring No. EB2	**Drilling Method** Hollow-stem Auger	**Drilling Company** Woodward Drilling

Penetration blows/6"	G. W. level	Depth (feet) Samples	Stratigraphy USCS	Description
11/18/37	▽	25 30 35 40	SP	Very fine- to fine-grained sand, saturated below 22.9', trace clay, very dense, light olive brown. TOTAL DEPTH: 23'

B O R I N G L O G

Project No. KEI-P90-1109	**Boring & Casing Diameter** 9" 2"	**Logged By** W.W. DRB
Project Name Unocal 800 Harrison St. Oakl	**Well Cover Elevation**	**Date Drilled** 5/29/91
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		5" thick concrete slab over sand and gravel.
				Fill material consisting of silt, clay and gravel, with concrete, wood and glass, moist, gray, brown and yellowish brown mottled.
			SP/ SM	
10/18/28		5		Fine-grained sand, with silt, trace clay, moist, dense, pale brown to yellowish brown, trace black specks.
		10		Fine-grained sand, with silt, trace root holes, moist, dense, olive gray and greenish gray mottled.
18/18/18				
6/12/20		15		Fine-grained sand, with silt, trace silt, trace clay, moist, dense,olive brown with slight greenish gray mottling.
20/25/38			SP	Fine-grained sand, trace silt, moist, very dense, dark greenish gray to olive gray.
15/		20		Fine-grained sand, as above, moist, dense, olive gray.

BORING LOG

Project No. KEI-P90-1109	**Boring & Casing Diameter** 9" 2"	**Logged By** W.W.
Project Name Unocal 800 Harrison St. Oakl	**Well Cover Elevation**	**Date Drilled** 5/29/91
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
/19/23			SP	Fine-grained sand, trace silt, moist, dense, olive gray.
20/28/32	▽	25	SP/ SM	Fine-grained sand, with silt, saturated, very dense, grayish brown to light olive brown.
28/32/45		30	SP	Very fine- to fine-grained sand, trace silt, saturated, very dense, grayish brown.
18/23/35		35	CL/ CH	Clay, with silt, trace fine-grained sand, moist, hard, light brownish gray to pale brown.
		40		TOTAL DEPTH:35'

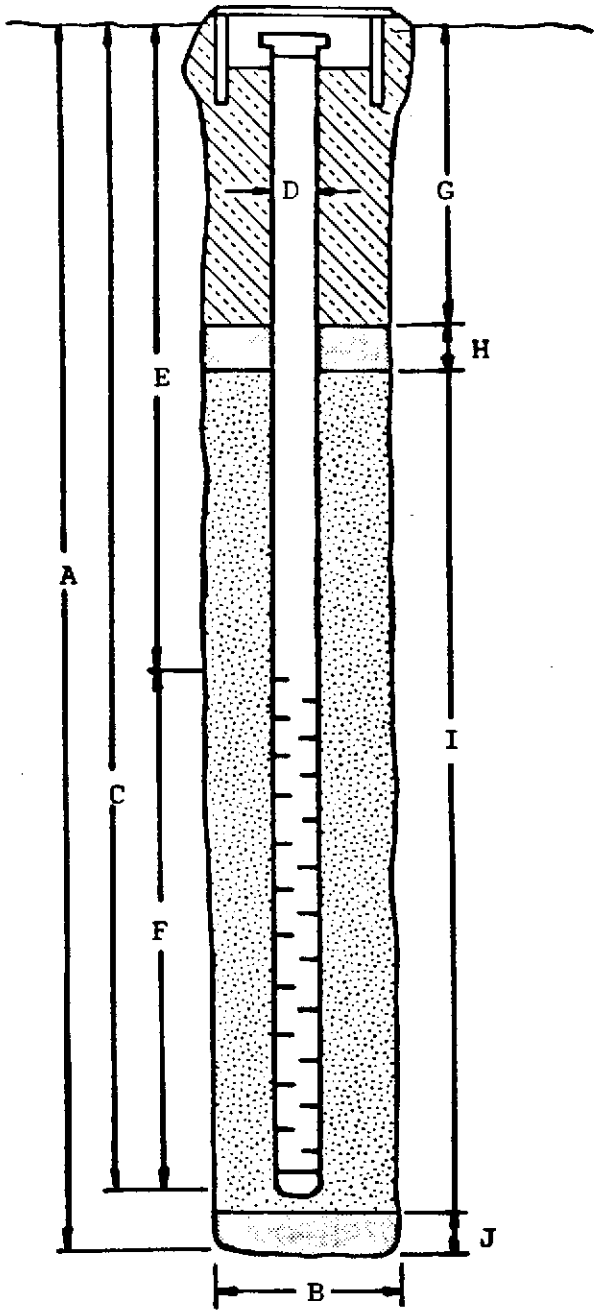
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal 800 Harrison St. Oakland BORING/WELL NO. MW1

PROJECT NUMBER: KEI-J90-1103

WELL PERMIT NO.:

Flush-mounted Well Cover



A. Total Depth: 35'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 33.5'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375" ID = 2.067"

E. Depth to Perforations: 13.5'

F. Perforated Length: 20'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 9.5'

Seal Material: Neat Cement

H. Seal: 2'

Seal Material: Bentonite

I. Gravel Pack: 23.5'

Pack Material: RMC Lonestar Sand

Size: #3

J. Bottom Seal: none

Seal Material: N/A

*Boring diameter can vary from 8-1/4" to 9" depending on bit wear.

BORING LOG

Project No. KEI-P90-1103	**Boring & Casing Diameter** 9" 2"	**Logged By** W.W. DRB
Project Name Unocal 800 Harrison St. Oakl	**Well Cover Elevation**	**Date Drilled** 5/29/91
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		Asphalt pavement over sand and gravel.
			SC and CL	Fill material consisting of clayey sand and sandy clay, trace brick, trace gravel, moist, brown.
			SC	
6/11/20		5		Clayey sand, field estimated at approximately 15% to 20% clay, sand is fine-grained, moist, dense, dark yellowish brown.
15/19/30		10		Very fine- to fine-grained sand, approximately 15% clay, moist, dense, dark yellowish brown, slight grayish brown mottling.
4/7/9		15		Very fine- to fine-grained sand, approximately 10% clay, moist, medium dense, trace root holes, yellowish brown.
				Very fine- to fine-grained sand, approximately 10% to 15% clay, trace silt, moist, medium dense, gray to olive gray.
19/17/25		20	SP	Very fine- to fine-grained sand, trace clay and silt, dense, moist, greenish gray to dark greenish gray.

BORING LOG

Project No. KEI-P90-1103	**Boring & Casing Diameter** 9" 2"	**Logged By** W.W. DRB
Project Name Unocal 800 Harrison St. Oakl	**Well Cover Elevation**	**Date Drilled** 5/29/91
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
17/28/42	▽		SP	Very fine- to fine-grained sand, trace silt, saturated below 22.5', very dense, dark grayish brown.
		25		
22/38/50-3"				Very fine- to fine-grained sand, trace silt, saturated, very dense, grayish brown.
		30		Very fine- to fine-grained sand, saturated, very dense, dark grayish brown.
24/38/50			CL	Sandy clay, approximately 15% to 20% fine-grained sand, trace silt, moist, hard, light brownish gray.
		35		
		40		TOTAL DEPTH: 33'

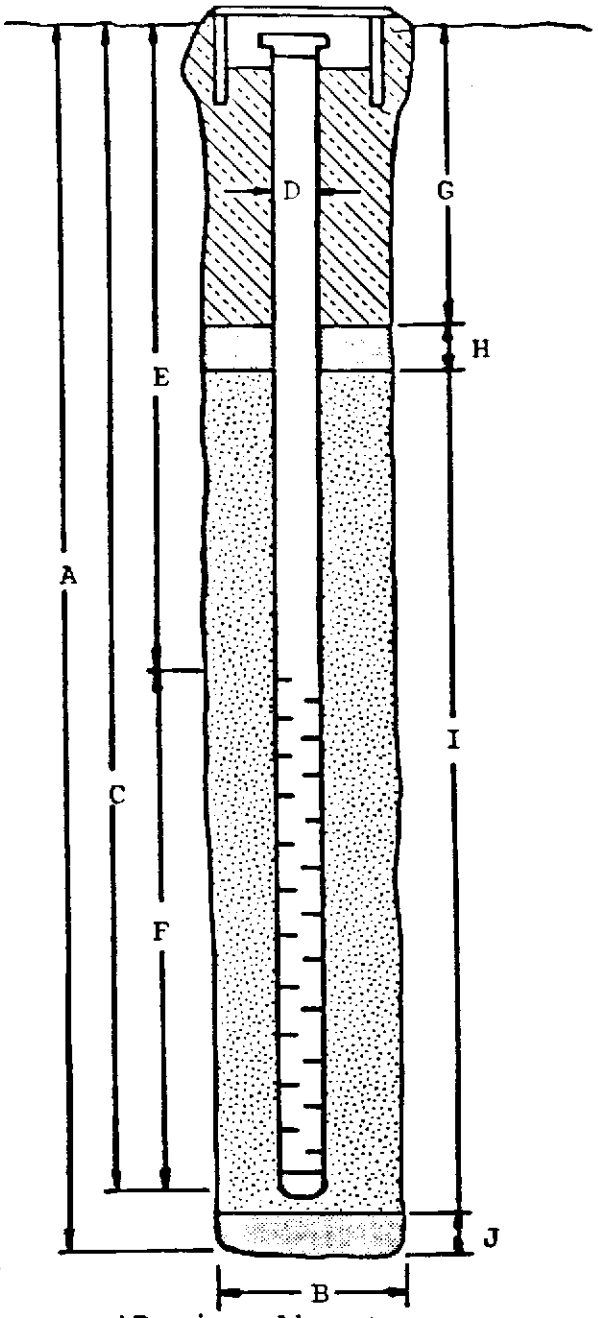
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal 800 Harrison St. Oakland BORING/WELL NO. MW2

PROJECT NUMBER: KEI-J90-1103

WELL PERMIT NO.:

Flush-mounted Well Cover



A. Total Depth: 33'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 33'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375" ID = 2.067"

E. Depth to Perforations: 15'

F. Perforated Length: 18'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 11'

Seal Material: Neat Cement

H. Seal: 2'

Seal Material: Bentonite

I. Gravel Pack: 20'

Pack Material: RMC Lonestar Sand

Size: #3

J. Bottom Seal: none

Seal Material: N/A

*Boring diameter can vary from 8-1/4" to 9" depending on bit wear.

B O R I N G L O G

Project No. KEI-P90-1103	**Boring & Casing Diameter** 9" 2"	**Logged By** W.W. DRB
Project Name Unocal 800 Harrison St. Oakl	**Well Cover Elevation**	**Date Drilled** 5/30/91
Boring No. MW3	**Drilling Method** Hollow-stem Auger	**Drilling Company** Woodward Drilling

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
		0		Asphalt pavement over sand and gravel.
			SM	Very fine- to fine-grained sand, with approximately 10% silt, moist, medium dense, very dark grayish brown.
				Sand, as above, brown, trace clay.
3/6/14		5	SP/ SC	Very fine- to fine-grained sand, with approximately 10% clay, trace silt, moist, medium dense, dark yellowish brown with light grayish brown mottling.
16/18/22		10		Very fine- to fine-grained sand, with approximately 5% clay, trace silt, moist, dense, yellowish to grayish brown, changing to olive gray below 10.3'.
16/33/41		15		Fine-grained sand, with approximately 5% clay, moist, very dense, olive.
9/14/		20		Fine-grained sand, with approximately 5% clay, moist, dense, light olive gray.

BORING LOG

Project No.	Boring & Casing Diameter	Logged By
KEI-P90-1103	9" 2"	W.W. DRB
Project Name Unocal 800 Harrison St. Oakl	**Well Cover Elevation**	**Date Drilled** 5/30/91
Boring No. MW3	**Drilling Method** Hollow-stem Auger	**Drilling Company** Woodward Drilling

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
/22			SP/ SC	Sand, with clay, as above.
12/24/33	▽		SP	Fine-grained sand, trace silt, very moist to saturated below 23.3', very dense, gray to greenish gray.
16/28/42		25		Very fine- to fine-grained sand, trace silt, saturated, very dense, greenish gray.
19/29/40		30		Very fine- to fine-grained sand, trace silt, saturated, very dense, dark grayish brown to olive brown.
9/14/22			SP/ SC	Very fine- to fine-grained sand, with approximately 10% clay, very moist, very dense, light brownish gray.
			SC/ CL	Very clayey sand to very sandy clay, moist to very moist, dense to hard, light yellowish brown.
		35		
		40		TOTAL DEPTH: 33'

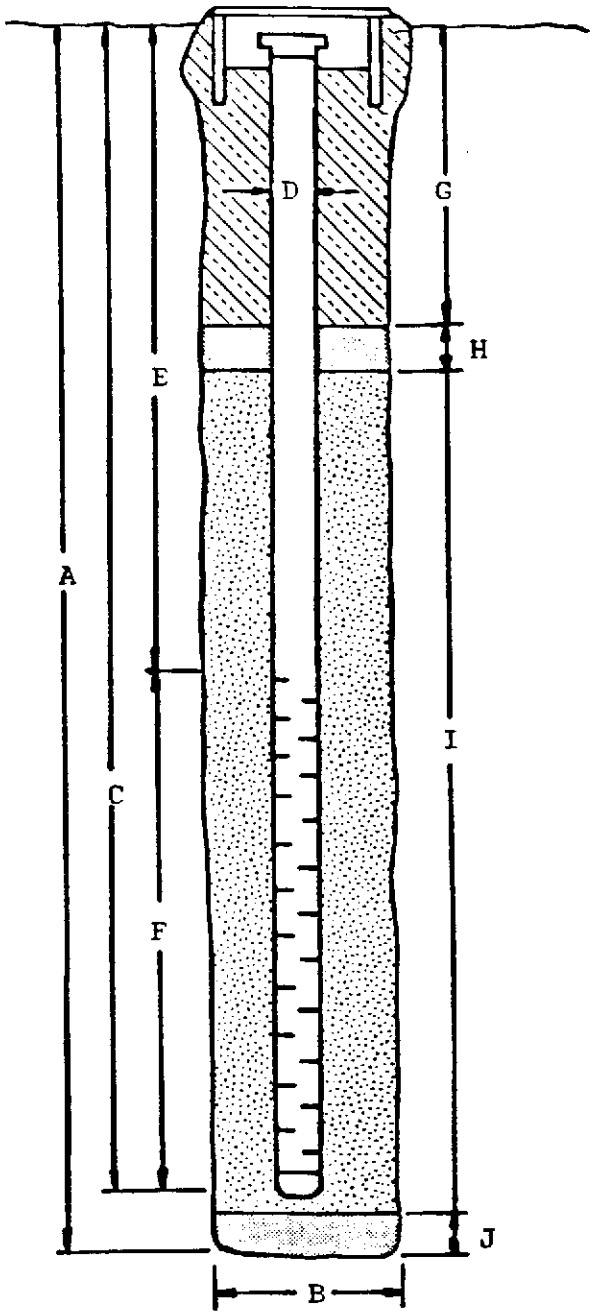
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal 800 Harrison St. Oakland BORING/WELL NO. MW3

PROJECT NUMBER: KEI-J90-1103

WELL PERMIT NO.:

Flush-mounted Well Cover



A. Total Depth: 33'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 33'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"
ID = 2.067"

E. Depth to Perforations: 15'

F. Perforated Length: 18'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 11'

Seal Material: Neat Cement

H. Seal: 2'

Seal Material: Bentonite

I. Gravel Pack: 20'

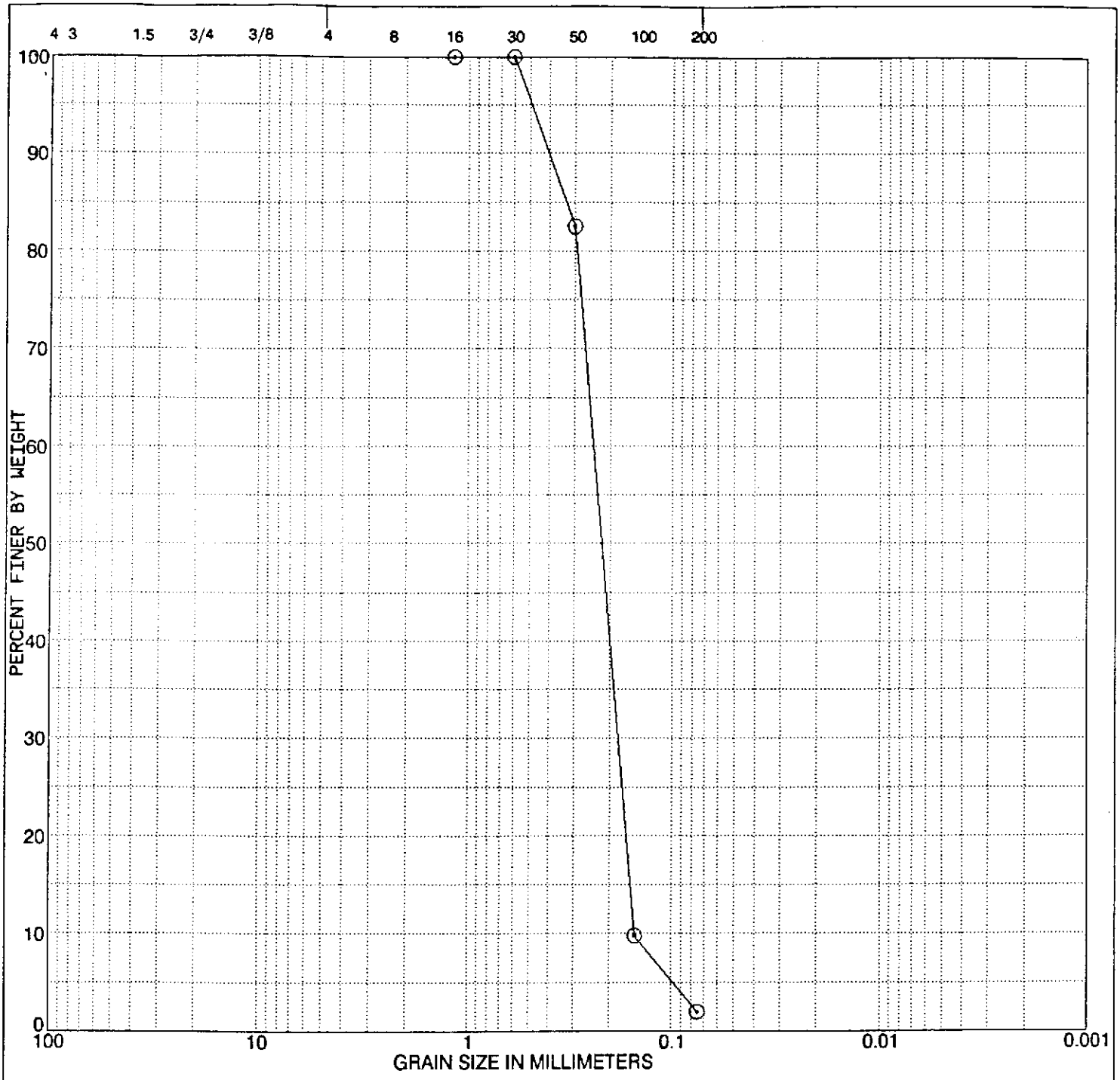
Pack Material: RMC Lonestar Sand

Size: #3

J. Bottom Seal: none

Seal Material: N/A

*Boring diameter can vary from 8-1/4" to 9" depending on bit wear.



Cobbles	GRAVEL		SAND			SILT	CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE		

SYMBOL	SAMPLE SOURCE	CLASSIFICATION
⊙	MW-2 @ 30.0'	Brown Sand (SP)

Herzog Associates
Laboratory Testing Services

Job No: 6232.1-0-8
Job Id: KA005
Appr:
Drwn: LTS
Date: JUN 1991

PARTICLE SIZE ANALYSIS

UNOCAL-OAKLAND

HARRISON STREET

PLATE 1

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	Jun 5, 1991
P.O. Box 996	Matrix Descript:	Water	Received:	Jun 5, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jun 13, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	106-0130 AB	Reported:	Jun 19, 1991

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)
106-0130 AB	MW-1	47	N.D.	N.D.	N.D.	N.D.
106-0131 AB	MW-2	49	N.D.	N.D.	N.D.	N.D.
106-0132 AB	MW-3	5,800	1,200	40	140	97
Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

1060130.KEI <1>

SEQUOIA ANALYTICAL

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(415) 686-9600 • FAX (415) 686-9689

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

Client Project ID: Unocal, 800 Harrison St., Oakland
QC Sample Group: 1060130-32
Reported: Jun 19, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	R.H./J.F.	R.H./J.F.	R.H./J.F.	R.H./J.F.
Reporting Units:	ppb	ppb	ppb	ppb
Date Analyzed:	Jun 13, 1991	Jun 13, 1991	Jun 13, 1991	Jun 13, 1991
QC Sample #:	105-1008	105-1008	105-1008	105-1008
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	20	20	20	60
Conc. Matrix Spike:	20	19	21	69
Matrix Spike % Recovery:	100	95	110	120
Conc. Matrix Spike Dup.:	18	17	18	67
Matrix Spike Duplicate % Recovery:	90	85	90	110
Relative % Difference:	11	11	15	2.9

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Julia R. Malerstein
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled: - - - - - -
P.O. Box 996	Sample Descript.:	D I Blank	Received: - - - - - -
Benicia, CA 94510	Analysis Method:	EPA 5030/ 8015/8020	Analyzed: Jun 13, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	- - - - - -	Reported: Jun 19, 1991

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

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Low to Medium Boiling Point Hydrocarbons	30	N.D.
Benzene	0.30	N.D.
Toluene	0.30	N.D.
Ethyl Benzene	0.30	N.D.
Xylenes	0.30	N.D.

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

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

Client Project ID: Unocal, 800 Harrison St., Oakland
QC Sample Group: 1060130-32
Reported: Jun 19, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	R.H./J.F.	R.H./J.F.	R.H./J.F.	R.H./J.F.
Reporting Units:	ppb	ppb	ppb	ppb
Date Analyzed:	Jun 13, 1991	Jun 13, 1991	Jun 13, 1991	Jun 13, 1991
Sample #:	106-0130	106-0131	106-0132	Blank
Surrogate % Recovery:	89	89	100	100

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	Jun 5, 1991
P.O. Box 996	Matrix Descript:	Water	Received:	Jun 5, 1991
Benicia, CA 94510	Analysis Method:	EPA 3510/8015	Extracted:	Jun 10, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	106-0130 C	Analyzed:	Jun 13, 1991
			Reported:	Jun 19, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons µg/L (ppb)
106-0130 C	MW-1	N.D.

Detection Limits:	50

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

1060130.KEI <5>

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled: ------
P.O. Box 996	Matrix Descript:	D I Blank	Received: ------
Benicia, CA 94510	Analysis Method:	EPA 3510/8015	Extracted: Jun 10, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	------	Analyzed: Jun 13, 1991
			Reported: Jun 19, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons µg/L (ppb)
------	D I Blank	N.D.

Detection Limits:	50

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

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

Client Project ID: Unocal, 800 Harrison St., Oakland
QC Sample Group: 1060130-32
Reported: Jun 19, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Diesel
Method:	EPA 8015
Analyst:	JRM
Reporting Units:	µg/L
Date Analyzed:	Jun 13, 1991
QC Sample #:	BLK061091
Sample Conc.:	N.D.
Spike Conc. Added:	300
Conc. Matrix Spike:	180
Matrix Spike % Recovery:	61
Conc. Matrix Spike Dup.:	220
Matrix Spike Duplicate % Recovery:	72
Relative % Difference:	20

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	Jun 5, 1991
P.O. Box 996	Matrix Descript:	Water	Received:	Jun 5, 1991
Benicia, CA 94510	Analysis Method:	SM 5520 B&F (Gravimetric)	Extracted:	Jun 11, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	106-0130 D	Analyzed:	Jun 12, 1991
			Reported:	Jun 19, 1991

TOTAL RECOVERABLE PETROLEUM OIL

Sample Number	Sample Description	Oil & Grease mg/L (ppm)
106-0130 D	MW-1	N.D.

Detection Limits:	5.0

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

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

1060130.KEI <8>

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

Client Project ID: Unocal, 800 Harrison St., Oakland
QC Sample Group: 1060130-32
Reported: Jun 19, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Oil & Grease
Method:	SM 5520 B&F
Analyst:	D. Newcomb
Reporting Units:	mg/L
Date Analyzed:	Jun 12, 1991
QC Sample #:	Matrix Blank 061291M
Sample Conc.:	N.D.
Spike Conc. Added:	100
Conc. Matrix Spike:	76
Matrix Spike % Recovery:	76
Conc. Matrix Spike Dup.:	80
Matrix Spike Duplicate % Recovery:	80
Relative % Difference:	5.1

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

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1900 Bates Avenue • Suite LM • Concord, California 94520
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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	Jun 5, 1991
P.O. Box 996	Sample Descript:	Water, MW-1	Received:	Jun 5, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Jun 12, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	106-0130 EF	Reported:	Jun 19, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	1.0	N.D.
Bromoform	1.0	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	1.0	N.D.
Chlorobenzene	1.0	N.D.
Chloroethane	5.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	**0.50**	**7.8**
Chloromethane	0.50	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dichlorobenzene	2.0	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	1.0	N.D.
cis-1,2-Dichloroethene	1.0	N.D.
trans-1,2-Dichloroethene	1.0	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	2.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	**0.50**	**2.9**
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	**0.50**	**1.3**
Trichlorofluoromethane	1.0	N.D.
Vinyl chloride	2.0	N.D.

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

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled: - - - - - -
P.O. Box 996	Sample Descript:	D I Blank	Received: - - - - - -
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed: Jun 12, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	- - - - - -	Reported: Jun 19, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	1.0	N.D.
Bromoform	1.0	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	1.0	N.D.
Chlorobenzene	1.0	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	5.0	N.D.
Chloroform	1.0	N.D.
Chloromethane	0.50	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
1,1-Dichloroethane	2.0	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	1.0	N.D.
trans-1,2-Dichloroethene	1.0	N.D.
1,2-Dichloropropane	1.0	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	2.0	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.
	2.0	N.D.

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

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Julia R. Malerstein
Project Manager

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

Client Project ID: Unocal, 800 Harrison St., Oakland
QC Sample Group: 1060130-32
Reported: Jun 19, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloroethene	Trichloro-ethene	Chloro-benzene	Benzene	Toluene	Chloro-benzene (PID)
Method:	EPA 8010	EPA 8010	EPA 8010	EPA 8020	EPA 8020	EPA 8020
Analyst:	S. Le	S. Le	S. Le	S. Le	S. Le	S. Le
Reporting Units:	ppb	ppb	ppb	ppb	ppb	ppb
Date Analyzed:	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991
QC Sample #:	105-0144	105-0144	105-0144	105-0144	105-0144	105-0144
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	10	10	10
Conc. Matrix Spike:	9.0	9.3	10	8.2	7.8	8.8
Matrix Spike % Recovery:	90	93	100	82	78	88
Conc. Matrix Spike Dup.:	8.6	8.8	10	8.0	7.6	8.5
Matrix Spike Duplicate % Recovery:	86	88	100	80	76	85
Relative % Difference:	4.5	5.5	0	2.5	2.5	3.5

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

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

Client Project ID: Unocal, 800 Harrison St., Oakland
QC Sample Group: 106-0130
Reported: Jun 19, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8010	EPA 8010
Analyst:	S. Le	S. Le
Reporting Units:	ppb	ppb
Date Analyzed:	Jun 12, 1991	Jun 12, 1991
Sample #:	106-0130	106-0131
Surrogate #1 % Recovery:	160	190
Surrogate #2 % Recovery:	86	94

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	Jun 5, 1991
P.O. Box 996	Sample Descript:	Water, MW-1	Received:	Jun 5, 1991
Benicia, CA 94510			Analyzed:	6/13-14/91
Attention: Mardo Kaprealian, P.E.	Lab Number:	106-0130 G	Reported:	Jun 19, 1991

LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Cadmium	0.010	N.D.
Chromium	0.0050	0.0083
Lead	0.0050	0.011
Nickel	0.050	0.063
Zinc	0.010	0.023

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

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

1060130.KEI <14>

SEQUOIA ANALYTICAL

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

Client Project ID: Unocal, 800 Harrison St., Oakland
QC Sample Group: 1060130-32
Reported: Jun 19, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Cadmium	Chromium	Lead	Nickel	Zinc
Method:	EPA 7130	EPA 7191	EPA 7421	EPA 7521	EPA 7950
Analyst:	N. Herrera	N. Herrera	N. Herrera	N. Herrera	N. Herrera
Reporting Units:	mg/L	mg/L	mg/L	mg/L	mg/L
Date Analyzed:	Jun 14, 1991	Jun 20, 1991	Jun 13, 1991	Jun 14, 1991	Jun 14, 1991
QC Sample #:	106-0130	106-0130	106-0130	106-0130	106-0130
Sample Conc.:	N.D.	0.0083	0.011	0.063	0.023
Spike Conc. Added:	0.10	0.10	0.20	0.050	0.10
Conc. Matrix Spike:	0.10	0.10	0.19	0.067	0.13
Matrix Spike % Recovery:	100	92	90	130	110
Conc. Matrix Spike Dup.:	0.12	0.12	0.22	0.067	0.15
Matrix Spike Duplicate % Recovery:	120	110	100	130	130
Relative % Difference:	18	18	15	0	14

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

KEI

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER	SITE NAME & ADDRESS	ANALYSES REQUESTED	TURN AROUND TIME:
Ray (KEI)	UNOCAL OAKLAND 800 HARRISON ST		REGULAR
WITNESSING AGENCY			

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPHG	BTXE	TPHDw D...	1CG 5520 F	8010	METALS	(CD, CR, PB, ZN, NI)	REMARKS
MW1	6-5			X	X		3 AMB 4 VOA		X	X	X	X	X	X	X	1060130 A-G
MW2	"			X	X		2 VOA		X	X						131 AB
MW3	"			X	X		"		X	X						132 C

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Ray (KEI)	6-5-8[illegible]	16:46 K.N.[illegible]
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	6/7 ~~[illegible]~~ 11:05 AM	[signature]

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 - metals to be preserved in lab K.N.

Signature	Title	Date
K.N.[illegible]	Sample control	6/5

SEQUOIA ANALYTICAL

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	5/29-30/91
P.O. Box 996	Matrix Descript:	Soil	Received:	May 31, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jun 12, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	105-0970	Reported:	Jun 17, 1991

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)
105-0970	MW1(5)	1.1	N.D.	N.D.	N.D.	0.010
105-0971	MW1(10)	43	N.D.	0.0059	0.0074	0.43
105-0972	MW1(15)	250	0.80	0.73	0.91	2.9
105-0973	MW1(20)	N.D.	N.D.	N.D.	N.D.	N.D.
105-0974	MW1(24)	N.D.	N.D.	N.D.	N.D.	0.0073
105-0975	MW2(5)	N.D.	N.D.	N.D.	N.D.	0.0054
105-0976	MW2(10)	N.D.	N.D.	N.D.	N.D.	N.D.
105-0977	MW2(15.5)	N.D.	0.015	N.D.	0.0064	0.025
105-0978	MW2(20)	N.D.	0.0086	N.D.	N.D.	N.D.
105-0979	MW2(22)	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**1.0**	**0.0050**	**0.0050**	**0.0050**	**0.0050**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

1050970.KEI <1>

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	May 30, 1991
P.O. Box 996	Matrix Descript:	Soil	Received:	May 31, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jun 12, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	105-0980	Reported:	Jun 17, 1991

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)
105-0980	MW3(5)	N.D.	N.D.	N.D.	N.D.	N.D.
105-0981	MW3(10)	N.D.	N.D.	N.D.	N.D.	N.D.
105-0982	MW3(15)	N.D.	N.D.	N.D.	N.D.	N.D.
105-0983	MW3(20)	N.D.	N.D.	N.D.	N.D.	N.D.
105-0984	MW3(23)	2.9	0.0079	N.D.	0.012	0.031
Detection Limits:		**1.0**	**0.0050**	**0.0050**	**0.0050**	**0.0050**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

1050970.KEI <2>

SEQUOIA ANALYTICAL

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	
P.O. Box 996	Sample Descript.:	Matrix Blank	
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed: Jun 12, 1991
Attention: Mardo Kaprealian, P.E.	Q.C. Sample Grou	1050970-84	Reported: Jun 17, 1991

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

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Low to Medium Boiling Point Hydrocarbons	1.0	N.D.
Benzene	0.0050	N.D.
Toluene	0.0050	N.D.
Ethyl Benzene	0.0050	N.D.
Xylenes	0.0050	N.D.

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

1050970.KEI <3>

SEQUOIA ANALYTICAL

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

Client Project ID: Unocal, 800 Harrison St., Oakland
QC Sample Group: 1050970-84
Reported: Jun 17, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.
Reporting Units:	ppm	ppm	ppm	ppm
Date Analyzed:	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991
QC Sample #:	105-0965	105-0965	105-0965	105-0965
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.40	0.40	0.40	1.2
Conc. Matrix Spike:	0.37	0.35	0.40	1.2
Matrix Spike % Recovery:	93	88	100	100
Conc. Matrix Spike Dup.:	0.35	0.33	0.38	1.1
Matrix Spike Duplicate % Recovery:	88	83	95	92
Relative % Difference:	5.6	5.9	5.1	8.7

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

% Recovery:	$\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}}$	x 100
Relative % Difference:	$\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}}$	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, 800 Harrison St., Oakland
QC Sample Group: 1050970-84
Reported: Jun 17, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.
Reporting Units:	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Date Analyzed:	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991
Sample #:	105-0970	105-0971	105-0972	105-0973	105-0974	105-0975	105-0976
Surrogate % Recovery:	96	100	86	100	100	100	100

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

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

Client Project ID: Unocal, 800 Harrison St., Oakland
QC Sample Group: 1050970-84
Reported: Jun 17, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.
Reporting Units:	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Date Analyzed:	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991
Sample #:	105-0977	105-0978	105-0979	105-0980	105-0981	105-0982	105-0983
Surrogate % Recovery:	96	92	93	93	94	90	91

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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

Client Project ID: Unocal, 800 Harrison St., Oakland
QC Sample Group: 1050970-84
Reported: Jun 17, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA8015/8020	EPA8015/8020
Analyst:	J.F./S.L./R.H.	J.F./S.L./R.H.
Reporting Units:	ppm	ppm
Date Analyzed:	Jun 12, 1991	Jun 12, 1991
Sample #:	105-0984	Blank
Surrogate % Recovery:	85	98

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	May 29, 1991
P.O. Box 996	Matrix Descript:	Soil	Received:	May 31, 1991
Benicia, CA 94510	Analysis Method:	EPA 3550/8015	Extracted:	Jun 1, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	105-0970	Analyzed:	6/11-12/91
			Reported:	Jun 17, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons mg/kg (ppm)
105-0970	MW1(5)	2.2
105-0971	MW1(10)	43
105-0972	MW1(15)	120
105-0973	MW1(20)	N.D.
105-0974	MW1(24)	N.D.

Detection Limits:	**1.0**

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

1050970.KEI <8>

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	- - - - - -
P.O. Box 996	Matrix Descript:	Matrix Blank	Received:	- - - - - -
Benicia, CA 94510	Analysis Method:	EPA 3550/8015	Extracted:	Jun 11, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	- - - - - -	Analyzed:	Jun 12, 1991
			Reported:	Jun 17, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons mg/kg (ppm)
- - - - - -	Matrix Blank	N.D.

Detection Limits:	**1.0**

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

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

Client Project ID: Unocal, 800 Harrison St., Oakland
QC Sample Group: 1050970-84
Reported: Jun 17, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Diesel
Method:	EPA 8015
Analyst:	JRM
Reporting Units:	mg/kg
Date Analyzed:	Jun 12, 1991
QC Sample #:	BLK061191
Sample Conc.:	N.D.
Spike Conc. Added:	10
Conc. Matrix Spike:	9.2
Matrix Spike % Recovery:	92
Conc. Matrix Spike Dup.:	9.0
Matrix Spike Duplicate % Recovery:	90
Relative % Difference:	2.2

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	May 29, 1991
P.O. Box 996	Matrix Descript:	Soil	Received:	May 31, 1991
Benicia, CA 94510	Analysis Method:	SM 5520 E&F (Gravimetric)	Extracted:	Jun 6, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	105-0970	Analyzed:	Jun 7, 1991
			Reported:	Jun 17, 1991

TOTAL RECOVERABLE PETROLEUM OIL

Sample Number	Sample Description	Oil & Grease mg/kg (ppm)
105-0970	MW1(5)	N.D.
105-0971	MW1(10)	N.D.
105-0972	MW1(15)	N.D.
105-0973	MW1(20)	N.D.
105-0974	MW1(24)	N.D.

Detection Limits:	**30**

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

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

1050970.KEI <11>

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

Client Project ID: Unocal, 800 Harrison St., Oakland
QC Sample Group: 1050970-84
Reported: Jun 17, 1991

QUALITY CONTROL DATA REPORT

ANALYTE
Oil & Grease

Method:	SM 5520 E&F
Analyst:	D. Newcomb
Reporting Units:	mg/L
Date Analyzed:	Jun 7, 1991
QC Sample #:	Matrix BLK061091

Sample Conc.:	N.D.
Spike Conc. Added:	5,000
Conc. Matrix Spike:	4,300
Matrix Spike % Recovery:	87
Conc. Matrix Spike Dup.:	4,000
Matrix Spike Duplicate % Recovery:	80
Relative % Difference:	7.6

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Julia R. Malerstein
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	May 29, 1991
P.O. Box 996	Sample Descript:	Soil, MW1(5)	Received:	May 31, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Jun 7, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	105-0970	Reported:	Jun 17, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	10	N.D.
Bromomethane	10	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	10	N.D.
2-Chloroethylvinyl ether	10	N.D.
Chloroform	5.0	N.D.
Chloromethane	10	N.D.
Dibromochloromethane	5.0	N.D.
1,2-Dichlorobenzene	5.0	N.D.
1,3-Dichlorobenzene	5.0	N.D.
1,4-Dichlorobenzene	5.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
cis-1,2-Dichloroethene	5.0	N.D.
trans-1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	10	N.D.
trans-1,3-Dichloropropene	10	N.D.
Methylene chloride	20	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	10	N.D.
Vinyl chloride	10	N.D.

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

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Julia R. Malerstein
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1050970.KEI <13>

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	May 29, 1991
P.O. Box 996	Sample Descript:	Soil, MW1(10)	Received:	May 31, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Jun 7, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	105-0971	Reported:	Jun 17, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	10	N.D.
Bromomethane	10	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	10	N.D.
2-Chloroethylvinyl ether	10	N.D.
Chloroform	5.0	N.D.
Chloromethane	10	N.D.
Dibromochloromethane	5.0	N.D.
1,2-Dichlorobenzene	5.0	N.D.
1,3-Dichlorobenzene	5.0	N.D.
1,4-Dichlorobenzene	5.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
cis-1,2-Dichloroethene	5.0	N.D.
trans-1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	10	N.D.
trans-1,3-Dichloropropene	10	N.D.
Methylene chloride	20	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	10	N.D.
Vinyl chloride	10	N.D.

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

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	May 29, 1991
P.O. Box 996	Sample Descript:	Soil, MW1(15)	Received:	May 31, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Jun 7, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	105-0972	Reported:	Jun 17, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	10	N.D.
Bromomethane	10	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	10	N.D.
2-Chloroethylvinyl ether	10	N.D.
Chloroform	5.0	N.D.
Chloromethane	10	N.D.
Dibromochloromethane	5.0	N.D.
1,2-Dichlorobenzene	5.0	N.D.
1,3-Dichlorobenzene	5.0	N.D.
1,4-Dichlorobenzene	5.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
cis-1,2-Dichloroethene	5.0	N.D.
trans-1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	10	N.D.
trans-1,3-Dichloropropene	10	N.D.
Methylene chloride	20	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	10	N.D.
Vinyl chloride	10	N.D.

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

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Julia R. Malerstein
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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	May 29, 1991
P.O. Box 996	Sample Descript:	Soil, MW1(20)	Received:	May 31, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Jun 7, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	105-0973	Reported:	Jun 17, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	10	N.D.
Bromomethane	10	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	10	N.D.
2-Chloroethylvinyl ether	10	N.D.
Chloroform	5.0	N.D.
Chloromethane	10	N.D.
Dibromochloromethane	5.0	N.D.
1,2-Dichlorobenzene	5.0	N.D.
1,3-Dichlorobenzene	5.0	N.D.
1,4-Dichlorobenzene	5.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
cis-1,2-Dichloroethene	5.0	N.D.
trans-1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	10	N.D.
trans-1,3-Dichloropropene	10	N.D.
Methylene chloride	20	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	10	N.D.
Vinyl chloride	10	N.D.

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

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1050970.KEI <16>

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	May 29, 1991
P.O. Box 996	Sample Descript:	Soil, MW1(24)	Received:	May 31, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Jun 7, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	105-0974	Reported:	Jun 17, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	10	N.D.
Bromomethane	10	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	10	N.D.
2-Chloroethylvinyl ether	10	N.D.
Chloroform	5.0	N.D.
Chloromethane	10	N.D.
Dibromochloromethane	5.0	N.D.
1,2-Dichlorobenzene	5.0	N.D.
1,3-Dichlorobenzene	5.0	N.D.
1,4-Dichlorobenzene	5.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
cis-1,2-Dichloroethene	5.0	N.D.
trans-1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	10	N.D.
trans-1,3-Dichloropropene	10	N.D.
Methylene chloride	20	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	10	N.D.
Vinyl chloride	10	N.D.

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

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Project Manager

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled: - - - - - -
P.O. Box 996	Sample Descript:	Matrix Blank	Received: - - - - - -
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed: Jun 7, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	- - - - - -	Reported: Jun 17, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	10	N.D.
Bromomethane	10	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	10	N.D.
2-Chloroethylvinyl ether	10	N.D.
Chloroform	5.0	N.D.
Chloromethane	10	N.D.
Dibromochloromethane	5.0	N.D.
1,2-Dichlorobenzene	5.0	N.D.
1,3-Dichlorobenzene	5.0	N.D.
1,4-Dichlorobenzene	5.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
cis-1,2-Dichloroethene	5.0	N.D.
trans-1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	10	N.D.
trans-1,3-Dichloropropene	10	N.D.
Methylene chloride	20	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	10	N.D.
Vinyl chloride	10	N.D.

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

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

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Kaprealian Engineering, Inc. Client Project ID: Unocal, 800 Harrison St., Oakland
P.O. Box 996
Benicia, CA 94510
Attention: Mardo Kaprealian, P.E. QC Sample Group: 1050970-84 Reported: Jun 17, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloroethene	Trichloro-ethene	Chloro-benzene	Benzene	Toluene	Chloro-benzene (PID)
Method:	EPA 8010	EPA 8010	EPA 8010	EPA 8020	EPA 8020	EPA 8020
Analyst:	S. Le	S. Le	S. Le	S. Le	S. Le	S. Le
Reporting Units:	ppb	ppb	ppb	ppb	ppb	ppb
Date Analyzed:	Jun 6, 1991	Jun 6, 1991	Jun 6, 1991	Jun 6, 1991	Jun 6, 1991	Jun 6, 1991
QC Sample #:	BLK060691	BLK060691	BLK060691	BLK060691	BLK060691	BLK060691
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	100	100	100	100	100	100
Conc. Matrix Spike:	82	96	110	86	84	91
Matrix Spike % Recovery:	82	96	110	86	84	91
Conc. Matrix Spike Dup.:	91	98	110	94	88	93
Matrix Spike Duplicate % Recovery:	91	98	110	94	88	93
Relative % Difference:	10	2.1	0	8.9	4.7	2.2

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

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

Client Project ID: Unocal, 800 Harrison St., Oakland
QC Sample Group: 1050970-74
Reported: Jun 17, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8010	EPA 8010	EPA 8010	EPA 8020	EPA 8020	EPA 8020
Analyst:	S. Le	S. Le	S. Le	S. Le	S. Le	S. Le
Reporting Units:	ppb	ppb	ppb	ppb	ppb	ppb
Date Analyzed:	Jun 7, 1991	Jun 7, 1991	Jun 7, 1991	Jun 7, 1991	Jun 7, 1991	Jun 7, 1991
Sample #:	105-0970	105-0971	105-0972	105-0973	105-0974	Blank
Surrogate #1 % Recovery:	180	220	190	210	150	160
Surrogate #2 % Recovery:	85	87	83	82	89	93

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	May 29, 1991
P.O. Box 996	Sample Descript:	Soil, MW1(5)	Received:	May 31, 1991
Benicia, CA 94510			Extracted:	Jun 6, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	105-0970	Analyzed:	6/13-14/91
			Reported:	Jun 17, 1991

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cadmium	0.50	N.D.
Chromium	0.25	64
Lead	0.25	11
Nickel	2.5	32
Zinc	0.50	30

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

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	May 29, 1991
P.O. Box 996	Sample Descript:	Soil, MW1(10)	Received:	May 31, 1991
Benicia, CA 94510			Extracted:	Jun 6, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	105-0971	Analyzed:	6/13-14/91
			Reported:	Jun 17, 1991

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cadmium	0.50	N.D.
Chromium	0.25	48
Lead	0.25	7.1
Nickel	2.5	24
Zinc	0.50	27

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

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

1050970.KEI <22>

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	May 29, 1991
P.O. Box 996	Sample Descript:	Soil, MW1(15)	Received:	May 31, 1991
Benicia, CA 94510			Extracted:	Jun 6, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	105-0972	Analyzed:	6/13-14/91
			Reported:	Jun 17, 1991

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cadmium	0.50	N.D.
Chromium	0.25	110
Lead	0.25	6.0
Nickel	2.5	42
Zinc	0.50	28

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

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

1050970.KEI <23>

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	May 29, 1991
P.O. Box 996	Sample Descript:	Soil, MW1(20)	Received:	May 31, 1991
Benicia, CA 94510			Extracted:	Jun 6, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	105-0973	Analyzed:	6/13-14/91
			Reported:	Jun 17, 1991

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cadmium	0.50	N.D.
Chromium	0.25	32
Lead	0.25	4.2
Nickel	2.5	36
Zinc	0.50	23

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

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	May 29, 1991
P.O. Box 996	Sample Descript:	Soil, MW1(24)	Received:	May 31, 1991
Benicia, CA 94510			Extracted:	Jun 6, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	105-0974	Analyzed:	6/13-14/91
			Reported:	Jun 17, 1991

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cadmium	0.50	N.D.
Chromium	0.25	20
Lead	0.25	5.0
Nickel	2.5	31
Zinc	0.50	23

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

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

1050970.KEI <25>

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Wade Weston

WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal - Oakland, 800 Harrison ST.

TURN AROUND TIME: Regular

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPH-G/BTXE	TPH-D	TOG (5030 D+E)	BOIC Metals Cd Cr Pb Zn Ni	REMARKS
MW1-(5)	5/29/91		✓		✓		1	See Sample ID#	✓	✓	✓	✓	1050970
MW1-(10)	"		✓		✓		1		✓	✓	✓	✓	971
MW1-(15)	"		✓		✓		1		✓	✓	✓	✓	972
MW1-(20)	"		✓		✓		1		✓	✓	✓	✓	973
MW1-(24)	"		✓		✓		1		✓	✓	✓	✓	974
MW2(5)	5/30/91		✓		✓		1		✓				975
MW2-(10)	"		✓		✓		1		✓				976
MW2-(15.5)	"		✓		✓		1		✓				977
MW2(20)	"		✓		✓		1		✓				978

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Wade Weston	5/31/91 0900	
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? no
4. Were samples in appropriate containers and properly packaged? ✓

Signature | Title | 5/31/91 Date

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Wade Weston

WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal - Oakland, 800 Harrison ST.

TURN AROUND TIME: Regular

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	ANALYSES REQUESTED: TPH-G/BTXE	REMARKS
MW2-(22)	5/30/91		✓		✓		1	See Sample ID ↵	✓	1050 979
MW3-(5)	"		✓		✓		1		✓	980
MW3-(10)	"		✓		✓		1		✓	981
MW3-(15)	"		✓		✓		1		✓	982
MW3-(20)	"		✓		✓		1		✓	983
MW3-(23)	"		✓		✓		1		✓	984

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Wade Weston	5/31/91 0900	[signature] DDH
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
nquished by: (Signature)	Date/Time	Received by: (Signature)
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? no
4. Were samples in appropriate containers and properly packaged? —

[signature] DDH — Signature; [signature] — Title; 5/31/91 — Date

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland	Sampled:	May 29, 1991
P.O. Box 996	Matrix Descript:	Soil	Received:	May 31, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jun 12, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	105-0985	Reported:	Jun 17, 1991

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)
105-0985	EB1(5.5)	N.D.	N.D.	N.D.	N.D.	N.D.
105-0986	EB1(10)	N.D.	N.D.	N.D.	N.D.	N.D.
105-0987	EB1(15)	N.D.	0.0087	N.D.	N.D.	N.D.
105-0988	EB1(20)	N.D.	N.D.	N.D.	N.D.	N.D.
105-0989	EB1(22)	N.D.	N.D.	N.D.	N.D.	N.D.
105-0990	EB2(5.5)	N.D.	N.D.	N.D.	N.D.	N.D.
105-0991	EB2(10)	N.D.	N.D.	N.D.	N.D.	N.D.
105-0992	EB2(15)	N.D.	N.D.	N.D.	N.D.	N.D.
105-0993	EB2(20)	N.D.	N.D.	N.D.	N.D.	N.D.
105-0994	EB2(22.5)	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**1.0**	**0.0050**	**0.0050**	**0.0050**	**0.0050**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

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

Client Project ID: Unocal, 800 Harrison St., Oakland
QC Sample Group: 1050985-94
Reported: Jun 17, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.
Reporting Units:	ppm	ppm	ppm	ppm
Date Analyzed:	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991
QC Sample #:	105-0965	105-0965	105-0965	105-0965
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.40	0.40	0.40	1.2
Conc. Matrix Spike:	0.37	0.35	0.40	1.2
Matrix Spike % Recovery:	93	88	100	100
Conc. Matrix Spike Dup.:	0.35	0.33	0.38	1.1
Matrix Spike Duplicate % Recovery:	88	83	95	92
Relative % Difference:	5.6	5.9	5.1	8.7

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, 800 Harrison St., Oakland		
P.O. Box 996	Sample Descript.:	Matrix Blank		
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jun 12, 1991
Attention: Mardo Kaprealian, P.E.	Q.C. Sample Grou	1050985-94	Reported:	Jun 17, 1991

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

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Low to Medium Boiling Point Hydrocarbons	1.0	N.D.
Benzene	0.0050	N.D.
Toluene	0.0050	N.D.
Ethyl Benzene	0.0050	N.D.
Xylenes	0.0050	N.D.

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Kaprealian Engineering, Inc. Client Project ID: Unocal, 800 Harrison St., Oakland
P.O. Box 996
Benicia, CA 94510
Attention: Mardo Kaprealian, P.E. QC Sample Group: 1050985-94 Reported: Jun 17, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.
Reporting Units:	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Date Analyzed:	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991
Sample #:	105-0985	105-0986	105-0987	105-0988	105-0989	105-0990	105-0991
Surrogate % Recovery:	92	92	94	93	94	85	92

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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(415) 686-9600 • FAX (415) 686-9689

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

Client Project ID: Unocal, 800 Harrison St., Oakland
QC Sample Group: 1050985-94
Reported: Jun 17, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.	J.F./S.L./R.H.
Reporting Units:	ppm	ppm	ppm	ppm
Date Analyzed:	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991	Jun 12, 1991
Sample #:	105-0992	105-0993	105-0994	Blank
Surrogate % Recovery:	100	100	90	98

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Wade Weston
WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal - Oakland
800 Harrison St.

TURN AROUND TIME: Regular

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPH-G/BTXE	TPH-D	TOG (5503 D+E)	8010 Metals Cd, Cr, Pb, Zn, Ni	REMARKS
EB1-(5.5)	5/29/91		✓		✓		1	See Sample I.D.*	✓				1050985
EB1-(10)	"		✓		✓		1		✓				986
EB1-(15)	"		✓		✓		1		✓				987
EB1-(20)	"		✓		✓		1		✓				988
EB1-(22)	"		✓		✓		1		✓				989
EB2-(5.5)	"		✓		✓		1		✓				990
EB2-(10)	"		✓		✓		1		✓				991
EB2-(15)	"		✓		✓		1		✓				992
EB2(20)	"		✓		✓		1		✓				993

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Wade Weston	5/31/91 0900	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
quished 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/U
4. Were samples in appropriate containers and properly packaged?

Signature: _____ Title: analyst Date: 5/31/91

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Wade Weston

WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal - Oakland, 800 Harrison St.

ANALYSES REQUESTED: TPH-G/BTXE

TURN AROUND TIME: Regular

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	REMARKS
EB2 (22.5)	5/29/91		✓		✓		1	Exploration Boring	1050994

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Wade Weston	5/31/91 0900	[signature]
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
inquished 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? NO
4. Were samples in appropriate containers and properly packaged? —

Signature [signature] Title [signature] Date 5/31/91