



KAPREALIAN ENGINEERING, INC.

Consulting Engineers

P.O. BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581

May 25, 1990

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

RE: Unocal Service Station #5781
3535 Pierson Street
Oakland, California

Gentlemen:

Per the request of Mr. Rick Sisk of Unocal Corporation, enclosed please find our report and work plan/proposal, both dated May 21, 1990, for the above referenced site.

Should you have any questions, please feel free to call our office at (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.

Judy A. Dewey

jad\82

Enclosure

cc: Rick Sisk, Unocal Corporation

90 MAY 29 AM 11:12



KAPREALIAN ENGINEERING, INC.

Consulting Engineers

PO. BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581

KEI-P89-1204.R6
May 21, 1990

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

Attention: Mr. Rick Sisk

RE: Preliminary Subsurface Investigation at
Unocal Service Station #5781
3535 Pierson Street
Oakland, California

Dear Mr. Sisk:

This report presents the results of a preliminary subsurface investigation for the referenced site in accordance with Kaprealian Engineering, Inc's. (KEI) proposal KEI-P89-1204.P1 dated January 10, 1990. The purpose of the investigation was 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.

Drilling and soil sampling of three exploratory borings.

Soil sampling.

Laboratory analyses.

Data analysis and report preparation.

SITE DESCRIPTION AND BACKGROUND

The subject site is developed and consists of a Unocal Service Station. The station occupies the northwest corner at the intersection of Pierson Street with MacArthur Boulevard in Oakland, California. In addition, the site is situated southwest of and adjacent to the Highway 580 off-ramp for MacArthur Boulevard. The site is located near the base of a east-northeast trending hillside area on relatively gently sloping developed property.

KEI's initial field work was conducted on December 14, 1989, when three underground storage tanks were removed from the site. The tanks consisted of two 10,000 gallon fuel storage tanks, and one 280 gallon waste oil tank. The fuel tanks were made of steel and no apparent holes or cracks were observed. However, the waste oil tank had one hole of approximately 1.25 square inches.

Three soil samples, labeled A1, B1, and A2/B2, were taken from beneath the fuel tanks at a depth of about 12.5 feet. In addition, two soil samples, labeled SW1 and SW2, were collected from the fuel tank pit sidewalls at a depth of 10.5 feet. The fuel tank pit sidewalls were analyzed for total petroleum hydrocarbons (TPH) as gasoline and benzene, toluene, xylenes and ethylbenzene (BTX&E). Analyses of the samples by Sequoia Analytical Laboratory in Redwood City, California, indicate levels of TPH as gasoline ranging from non-detectable to 46 ppm, with non-detectable levels of BTX&E in all samples, except for samples A2/B2 and SW2, which showed benzene at 0.10 ppm and 0.65 ppm, respectively.

Also on December 14, 1989, one soil sample, labeled W01, was collected from beneath the waste oil tank at a depth of 6 feet. The waste oil tank pit sample was analyzed by Sequoia Analytical Laboratory in Redwood City, California, for TPH as gasoline, BTX&E, TPH as diesel, total oil and grease (TOG), EPA method 8010 compounds and the metals cadmium, chromium, lead and zinc. The analytical results of soil sample W01 indicated TPH as gasoline at 670 ppm, 5.4 ppm benzene, TPH as diesel at 8,300 ppm and TOG at 48,000 ppm. EPA method 8010 results showed 1,2-dichlorobenzene at 10 ppb, tetrachloroethene at 77 ppb, and 1,1,1-trichloroethane at 15 ppb. Metals concentrations were as follows: cadmium non-detectable; chromium 8.3 ppm, lead 340 ppm, and zinc 70 ppm.

On January 17, 1990, two soil samples, labeled P1 and P2, were collected from beneath the product pipe trenches at depths of 5.5 to 6.0 feet. Analyses of these samples by Sequoia Analytical indicate non-detectable levels of TPH as gasoline and BTX&E constituents for both samples. KEI recommended further soil excavation in the area of the waste oil tank, and the installation of three monitoring wells at the site, to begin to define the vertical extent of soil contamination, to determine the ground water flow direction, and to determine if the ground water has been impacted. Documentation of the soil sampling activities are presented in KEI's report (KEI-J89-1204.R2) dated February 9, 1990. The results of the laboratory analyses for the soil samples collected from underground storage tanks and from pipe trenches are summarized in Table 1, and sample collection locations are shown on the attached Site Plan, Figure 1.

On February 22, 1990, KEI returned to the site to collect additional soil samples from the excavated waste oil tank pit. On this date, one soil sample, labeled WO1(16), was collected from beneath the waste oil tank at a depth of 16 feet. In addition, four soil samples, labeled SWA through SWD, were collected from the sidewalls of the waste oil tank pit excavation at depths of 9.0 to 10.0 feet. The lateral excavation was terminated due to the presence of underground sewer and gas lines on the south and west sides, and the existing building on the north side. A 12-inch diameter conductor casing was installed in the excavation at sample location WO1(16) prior to backfilling. Analytical results of sidewall soil sample SWB indicated non-detectable levels of all constituents analyzed, except for TPH as gasoline, which was 2.0 ppm. Analytical results of the soil sample, WO1(16), collected from the bottom of the excavation at a depth of 16 feet, indicate levels of TPH as gasoline at 15 ppm with 0.06 ppm benzene, 74 ppm TPH as diesel, 910 ppm TOG, and non-detectable levels of all 8010 compounds. Laboratory analyses of the remaining three sidewall samples, SWA, SWC and SWD, showed levels of TOG ranging from 4,100 ppm to 17,000 ppm, TPH as diesel ranging from 360 ppm to 1,400 ppm, TPH as gasoline ranging from 40 ppm to 220 ppm, with benzene levels from 0.31 to 2.3 ppm and non-detectable levels of all EPA method 8010 compounds except tetrachloroethene, which ranged from 40 ppb to 160 ppb. Sample SWD also showed 1,1,1-trichloroethane at 5.8 ppb. The results of the additional soil sampling activities are presented in KEI's report (KEI-P89-1204.R3) dated March 30, 1990. The laboratory analytical results of the soil samples, collected from the waste oil tank pit, are summarized in Table 2, and the locations of soil samples are shown on the attached Site Plan, Figure 2.

FIELD ACTIVITIES

On April 9 and 10, 1990, three eight-inch diameter exploratory borings (designated as MW1, MW2 and MW3 on the attached Site Plan, Figure 3) were drilled at the site. The borings were drilled, sampled (soil only) and backfilled in accordance with the guidelines of the Regional Water Quality Control Board (RWQCB), and the County well standards.

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

The borings were drilled to total depths ranging from 40 to 50 feet. Ground water was not encountered during drilling activities. The borings were observed for ground water accumulation for a period of up to 15 hours prior to backfilling with neat cement. Soil samples were collected for laboratory analysis and lithologic logging purposes at a maximum spacing of 5 foot

intervals, changes in lithology, and obvious areas of contamination, beginning at a depth of approximately 5 feet below grade until the borings were terminated. 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 boring was fully backfilled with neat cement placed with a tremie pipe from the total depth drilled up to the surface. The borings were not converted to monitoring wells because ground water was not encountered.

ANALYTICAL RESULTS

Soil samples were analyzed at Sequoia Analytical Laboratory in Redwood City, California. All samples were accompanied by properly executed Chain of Custody documentation. 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, samples collected from MW1 were analyzed for TPH as diesel by EPA method 3550 in conjunction with modified 8015, for TOG by EPA 418.1 with clean up, and for EPA method 8010 compounds.

Analytical results of all of the soil samples, collected from the borings (MW1, MW2 and MW3), indicate non-detectable levels of TPH as gasoline and BTX&E in all soil samples. In boring MW1, TPH as diesel, TOG and EPA 8010 compounds were non-detectable in all samples. Results of the soil analyses are summarized in Table 3. Copies of the laboratory analyses and Chain of Custody documentation are attached to this report.

HYDROLOGY AND GEOLOGY

The water table underlying the site was not encountered during drilling activities to the maximum depth explored (50 feet).

Based on review of regional geologic maps ("Areal and Engineering Geology of the Oakland East Quadrangle, California" by Dorothy H. Radbruch (1969) in U.S.G.S. Map GQ-769; and "Map Showing Recently Active Breaks Along the Hayward Fault Zone and the Southern Part of the Calaveras Fault Zone, California" by Dorothy H. Radbruch-Hall (1974) in U.S.G.S. Map I-813), the subject site is underlain by undivided Quaternary deposits (Qu) and is closely adjacent to a mapped geologic contact with the upper member of the Quaternary San Antonio Formation (Qsu). In addition, the site is situated approximately 1,200 to 2,800 feet southwest of mapped splays of the active Hayward Fault Zone.

The results of our subsurface study indicate that the site is generally underlain by very stiff clay and silty clay to the maximum depth explored. Locally, interbedded zones of clayey gravel, well-to-poorly-graded gravel, clayey sand, and silt beds were encountered in each boring to depths below grade of about 22-1/2, 20 and 14-1/2 feet in borings MW1, MW2 and MW3, respectively.

DISCUSSION AND RECOMMENDATIONS

The analytical results of our subsurface exploration to depths below grade of 40 to 50 feet indicates non-detectable levels of TPH as gasoline, TPH as diesel, BTX&E, TOG and EPA 8010 compounds for all samples analyzed. However, due to the confirmed soil contamination in the vicinity of the waste oil tank pit, and in order to determine the lateral and vertical extent of the soil contamination, KEI recommends that three additional exploratory borings be drilled closely adjacent to the old waste oil tank pit to a maximum depth of 50 feet at locations shown on the attached Site Plan, Figure 3. Our proposal for this work is attached for your review and consideration.

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 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.

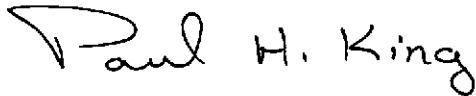
The results of this study are based on the data obtained from the field and laboratory analyses obtained from a state certified laboratory. We have analyzed this data using what we believe to be currently applicable engineering techniques and principles in the Northern California region. We make no warranty, 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.

KEI-P89-1204.R6
May 21, 1990
Page 6

Should you have any questions regarding this report, please do not hesitate to call me at (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.



Paul H. King
Hydrogeologist



Don R. Braun
Certified Engineering Geologist

License No. 1310
Exp. Date 6/30/90



Mardo Kaprealian
President

jad

Attachments: Tables 1, 2 & 3
Location Map
Site Plans - Figures 1, 2 & 3
Boring Logs
Laboratory Results
Chain of Custody documentation
Proposal

KEI-P89-1204.R6
May 21, 1990

TABLE 1

SUMMARY OF LABORATORY ANALYSES
SOIL

(Samples collected on December 14, 1989
and January 17, 1990)

<u>Sample</u>	<u>Depth (feet)</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethylbenzene</u>
A1	12.5	3.5	ND	ND	ND	ND
B1	12.5	ND	ND	ND	ND	ND
A2/B2	12.5	5.8	0.10	ND	ND	ND
SW1	10.5	15	ND	ND	ND	ND
SW2	10.5	46	0.65	ND	ND	ND
P1	5.5	ND	ND	ND	ND	ND
P2	6.0	ND	ND	ND	ND	ND
W01*	6	670	5.4	15	17	2.3
Detection Limits		1.0	0.05	0.1	0.1	0.1

* All EPA method 8010 compounds were non-detectable, except 1,2-dichlorobenzene at 10 ppb, tetrachloroethene at 77 ppb, and 1,1,1-trichloroethane at 15 ppb. Metals concentrations were as follows: cadmium non-detectable, chromium 8.3 ppm, lead 340 ppm, and zinc 70 ppm. TPH as diesel showed 8,300 ppm, and TOG showed 48,000 ppm.

ND = Non-detectable.

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

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May 21, 1990

TABLE 2

SUMMARY OF LABORATORY ANALYSES
SOIL

(Samples collected on February 22, 1990)

<u>Sample</u>	<u>Depth (feet)</u>	<u>TOG</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethyl- benzene</u>
*W01(16)	16.0	910	74	15	0.060	ND	2.0	0.10
**SWA	9.0	17,000	1,400	220	2.3	2.1	23	7.3
*SWB	10.0	ND	ND	2.0	ND	ND	ND	ND
***SWC	10.0	4,100	460	63	0.31	0.33	2.2	1.3
****SWD	10.0	6,400	360	40	0.32	ND	4.0	0.49
Detection Limits		50	1.0	1.0	0.05	0.10	0.10	0.10

* All EPA method 8010 compounds were non-detectable.

** All EPA method 8010 compounds were non-detectable, except tetrachloroethene at 160 ppb.

*** All EPA method 8010 compounds were non-detectable, except tetrachloroethene at 56 ppb.

**** All EPA method 8010 compounds were non-detectable, except tetrachloroethene at 40 ppb and 1,1,1-trichloroethane at 5.8 ppb.

ND = Non-detectable.

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

KEI-P89-1204.R6
May 21, 1990

TABLE 3

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on April 9 and 10, 1990)

<u>Sample Number</u>	<u>Depth (feet)</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethyl-benzene</u>
MW1(5)*	5	ND	ND	ND	ND	ND	ND
MW1(9.5)*	9.5	ND	ND	ND	ND	ND	ND
MW1(15)*	15	ND	ND	ND	ND	ND	ND
MW1(20)*	20	ND	ND	ND	ND	ND	ND
MW1(25)*	25	ND	ND	ND	ND	ND	ND
MW1(30)*	30	ND	ND	ND	ND	ND	ND
MW1(35)*	35	ND	ND	ND	ND	ND	ND
MW1(40)*	40	ND	ND	ND	ND	ND	ND
MW1(45)*	45	ND	ND	ND	ND	ND	ND
MW1(50)*	50	ND	ND	ND	ND	ND	ND
MW2(5)	5	ND	ND	ND	ND	ND	ND
MW2(10)	9.5	ND	ND	ND	ND	ND	ND
MW2(12)	12	ND	ND	ND	ND	ND	ND
MW2(15)	15	ND	ND	ND	ND	ND	ND
MW2(20)	20	ND	ND	ND	ND	ND	ND
MW2(25)	25	ND	ND	ND	ND	ND	ND
MW2(30)	30	ND	ND	ND	ND	ND	ND
MW2(35)	35	ND	ND	ND	ND	ND	ND
MW2(40)	39.5	ND	ND	ND	ND	ND	ND
MW3(5)	5	ND	ND	ND	ND	ND	ND
MW3(10)	10	ND	ND	ND	ND	ND	ND
MW3(15)	15	ND	ND	ND	ND	ND	ND
MW3(20)	20	ND	ND	ND	ND	ND	ND
MW3(25)	25	ND	ND	ND	ND	ND	ND
MW3(30)	30	ND	ND	ND	ND	ND	ND
MW3(35)	35	ND	ND	ND	ND	ND	ND
MW3(40)	40	ND	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 compounds were all non-detectable.

ND = Non-detectable.

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



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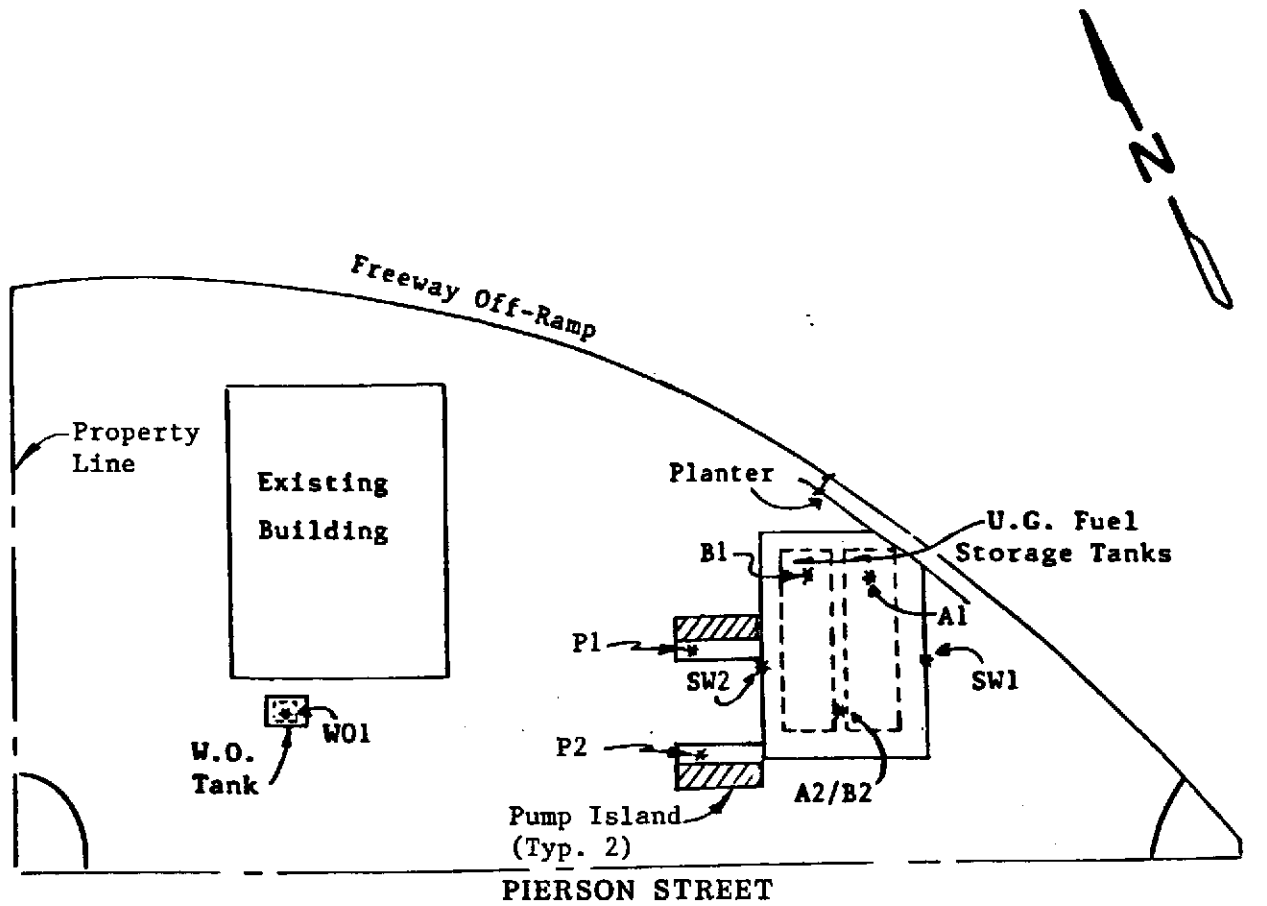
LOCATION MAP

Unocal Service Station #5781
3535 Pierson Street
Oakland, California

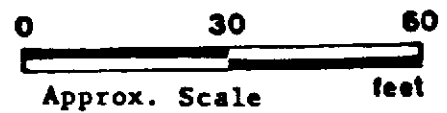


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SITE PLAN
Figure 1



LEGEND

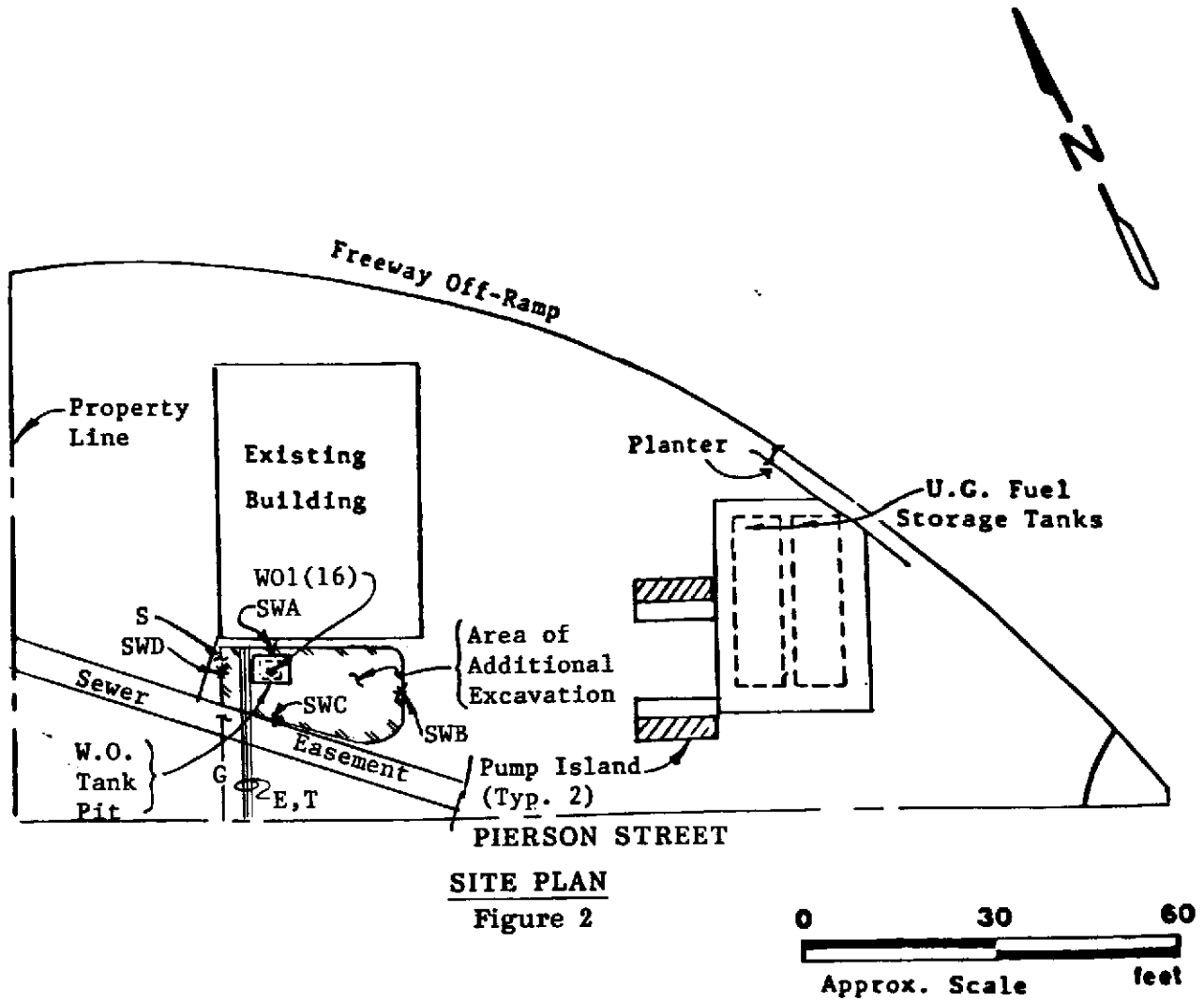
* Sample Point Location

Unocal Service Station #5781
3535 Pierson Street
Oakland, California



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LEGEND

- * Sample Point Location
- E Electrical
- T Telephone
- G Natural Gas
- S Sewer

Unocal Service Station #5781
3535 Pierson Street
Oakland, California

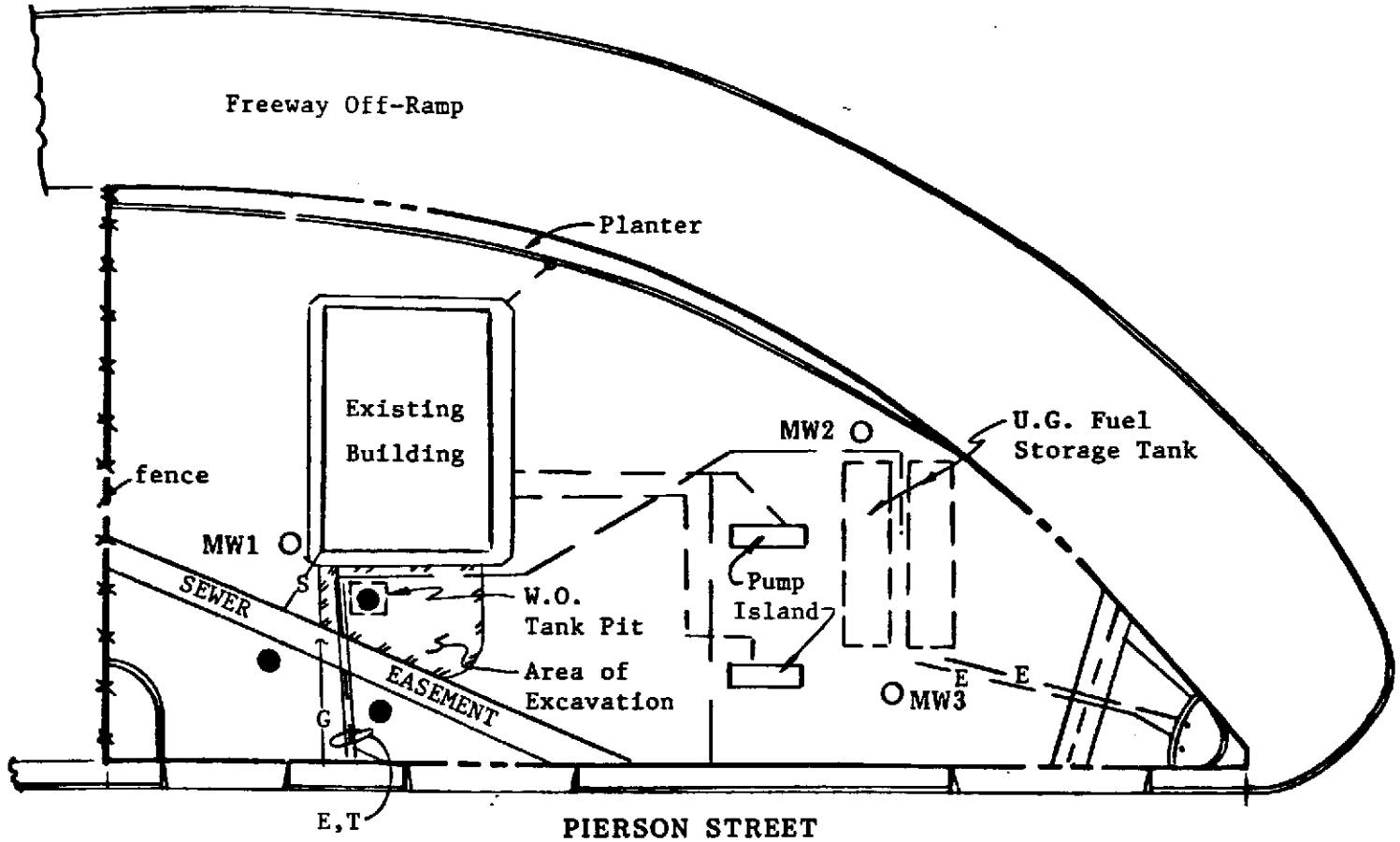
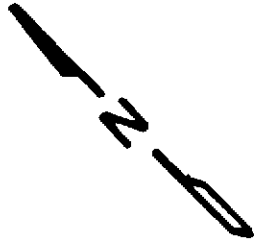


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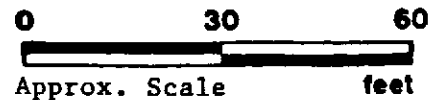


SITE PLAN

Figure 3

LEGEND

- Exploratory Boring (proposed)
- E U.G. Electrical Line
- T U.G. Telephone Line
- G U.G. Natural Gas Line
- S U.G. Sewer Line
- Exploratory Boring (existing)



Unocal Service Station #5781
 3535 Pierson Street
 Oakland, California

B O R I N G L O G

Project No. KEI-P89-1204	Boring & Casing Diameter 9" 2"	Logged By D.L. <i>John Braun</i>
Project Name Unocal Oakland - Pierson	Well Head Elevation N/A	Date Drilled 4/9/90
Boring No. MW1	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description
		0		A. C. Pavement. Sand and Gravel
	N O T E N C O U N T E R E D D U R I N G D R I L L I N G		CL/ CH	Clay with silt, 5-10% sand, soft, moist, olive brown.
2/2/3		5	ML/ MH	Clayey silt, 30% clay, 5-10% coarse-grained sand, soft to firm, moist, very dark grayish brown.
5/7/8		10	CL/ CH	Clay, 5-10% sand, trace silt, stiff, moist, dark brown. Clay, as above, except with gravel to 1/2" diameter, 10-15% sand.
12/16/21				Clay, 5-10% sand, very stiff, slightly moist, dark brown, minor organic material
8/16/20		15		
10/17/22				Clay, as above, trace to 5% silt, dark yellowish brown.
7/14/22		20		

B O R I N G L O G

Project No. KEI-P89-1204	Boring & Casing Diameter 9" 2"	Logged By D.L. <i>D.L. Brown</i>
Project Name Unocal Oakland - Pierson	Well Head Elevation N/A	Date Drilled 4/9/90
Boring No. MW1	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description
10/16/21			CL/CH GC	Clay, trace silt, dark yellowish brown. Clayey gravel, 5-10% sand, gravel to 3/8" diameter, dense, moist, dark yellowish brown.
9/12/18		25	CL/CH	Clay, trace silt and sand, stiff, moist, olive brown, trace organic matter.
9/12/19				
12/16/21		30		Clay, as above, trace to 5% sand, trace silt, olive brown to dark brown
7/11/18				Clay with silt, 15-20% silt, 5% sand, stiff, moist, dark yellowish brown.
7/14/16		35		
9/12/17				Silty clay, 5-10% sand, stiff to very stiff, slightly moist, dark yellowish brown.
9/15/23		40		

B O R I N G L O G

Project No. KEI-P89-1204		Boring & Casing Diameter 9" 2"		Logged By D.L. <i>Paul Bauer</i>
Project Name Unocal Oakland - Pierson		Well Head Elevation N/A		Date Drilled 4/9/90
Boring No. MW1		Drilling Method Hollow-stem Auger	Drilling Company EGI	
Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description
9/16/26			CL/ CH	Silty clay, as above.
8/11/16	45			Sandy clay, 10-15% silt, 30% sand, sand is coarse to fine grained, very stiff, slightly moist, dark yellowish brown.
12/16/18				Clay, with silt, trace sand, very stiff, slightly moist, dark brown, stiffness increasing with depth.
11/18/32	50			
		55		
		60		TOTAL DEPTH: 50'

B O R I N G L O G

Project No. KEI-P89-1204	Boring & Casing Diameter 9" 2"	Logged By D.L. <i>Dr. L. Brown</i>
Project Name Unocal Oakland - Pierson	Well Head Elevation N/A	Date Drilled 4/10/90
Boring No. MW2	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description
			CL/ CH	Silty clay to clay with silt, 5-15% sand, very stiff, moist, dark yellowish brown to olive brown.
7/10/18		25		Clay, trace silt and sand, very stiff, moist, olive brown, trace organic matter.
9/16/23		30		Sandy clay, 5-10% gravel to 1/2" diameter, hard, moist, dark yellowish brown.
			CL/ CH	
9/13/19		35		Sandy clay, trace gravel, less sand than above, moist, dark yellowish brown.
8/12/14		40		
				TOTAL DEPTH: 40'

B O R I N G L O G

Project No. KEI-P89-1204	Boring & Casing Diameter 9" 2"	Logged By W.W. <i>D. Braun</i>
Project Name Unocal Oakland - Pierson	Well Head Elevation N/A	Date Drilled 4/10/90
Boring No. MW3	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Stratigraphy USCS	Description
		0		A. C. Pavement Clay, sand and gravel fill.
2/2/3	N O T E N C O U N T E R E D D U R I N G D R I L L I N G	5	SC	Clayey sand, yellowish brown to olive brown, loose to very loose, moist.
			CL/ CH	Silty clay, soft to firm, moist, yellowish brown.
2/2/2		10	MH	Clayey silt, 5-10% sand, trace to 5% gravel, soft to firm, moist, black.
			SC	Clayey sand, trace gravel to 1/4" diameter, medium dense, moist, dark yellowish brown.
4/8/13		15	CL/ CH	Sandy clay, 30-35% sand, very stiff, moist, dark yellowish brown.
		20		Trace of gravel to 5/8" diameter at 19 feet. Clay, trace sand and silt, stiff, moist, olive brown.

B O R I N G L O G

Project No. KEI-P89-1204	Boring & Casing Diameter 9" 2"	Logged By W.W. <i>D. Braun</i>
Project Name Unocal Oakland - Pierson	Well Head Elevation N/A	Date Drilled 4/10/90
Boring No. MW3	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati- graphy USCS	Description
4/7/12		25	CL/ CH	Clay and silty clay, dark yellowish brown, very stiff, moist.
8/10/12		30		Clay, trace silt, very stiff, moist, olive brown, homogeneous.
9/12/17		35		Clay, trace of fine well rounded gravel and trace of silt, moist, olive brown, very stiff.
10/17/23		40		Sandy clay, trace to 5% fine gravel, trace to 5% sand, hard, moist, olive brown.
				TOTAL DEPTH: 40'



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

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

Client Project ID: Unocal #5781, Oakland. 3535 Pierson St
Matrix Descript: Soil
Analysis Method: EPA 5030/8015/8020
First Sample #: 004-1563

Sampled: Apr 9, 1990
Received: Apr 11, 1990
Analyzed: Apr 16, 1990
Reported: Apr 25, 1990

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons		Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
		mg/kg (ppm)	Benzene mg/kg (ppm)			
004-1563	MW1-5	N.D.	N.D.	N.D.	N.D.	N.D.
004-1564	MW1-9.5	N.D.	N.D.	N.D.	N.D.	N.D.
004-1565	MW1-15	N.D.	N.D.	N.D.	N.D.	N.D.
004-1566	MW1-20	N.D.	N.D.	N.D.	N.D.	N.D.
004-1567	MW1-25	N.D.	N.D.	N.D.	N.D.	N.D.
004-1568	MW1-30	N.D.	N.D.	N.D.	N.D.	N.D.
004-1569	MW1-35	N.D.	N.D.	N.D.	N.D.	N.D.
004-1570	MW1-40	N.D.	N.D.	N.D.	N.D.	N.D.
004-1571	MW1-45	N.D.	N.D.	N.D.	N.D.	N.D.
004-1572	MW1-50	N.D.	N.D.	N.D.	N.D.	N.D.

Detection Limits:	1.0	0.0050	0.0050	0.0050	0.0050
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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.

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Belinda C. Vega
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 #5781, Oakland, 3535 Pierson St Matrix Descript: Soil Analysis Method: EPA 5030/8015/8020 First Sample #: 004-1573	Sampled: Apr 10, 1990 Received: Apr 11, 1990 Analyzed: Apr 16, 1990 Reported: Apr 25, 1990
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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)
004-1573	MW2-5	N.D.	N.D.	N.D.	N.D.	N.D.
004-1574	MW2-10	N.D.	N.D.	N.D.	N.D.	N.D.
004-1575	MW2-12	N.D.	N.D.	N.D.	N.D.	N.D.
004-1576	MW2-15	N.D.	N.D.	N.D.	N.D.	N.D.
004-1577	MW2-20	N.D.	N.D.	N.D.	N.D.	N.D.
004-1578	MW2-25	N.D.	N.D.	N.D.	N.D.	N.D.
004-1579	MW2-30	N.D.	N.D.	N.D.	N.D.	N.D.
004-1580	MW2-35	N.D.	N.D.	N.D.	N.D.	N.D.
004-1581	MW2-40	N.D.	N.D.	N.D.	N.D.	N.D.

Detection Limits:	1.0	0.0050	0.0050	0.0050	0.0050
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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.

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Belinda C. Vega
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 #5781, Oakland. 3535 Pierson St Matrix Descript: Soil Analysis Method: EPA 5030/8015/8020 First Sample #: 004-1582	Sampled: Apr 10, 1990 Received: Apr 11, 1990 Analyzed: Apr 17, 1990 Reported: Apr 25, 1990
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TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons		Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
		mg/kg (ppm)	Benzene mg/kg (ppm)			
004-1582	MW3-5	N.D.	N.D.	N.D.	N.D.	N.D.
004-1583	MW3-10	N.D.	N.D.	N.D.	N.D.	N.D.
004-1584	MW3-15	N.D.	N.D.	N.D.	N.D.	N.D.
004-1585	MW3-20	N.D.	N.D.	N.D.	N.D.	N.D.
004-1586	MW3-25	N.D.	N.D.	N.D.	N.D.	N.D.
004-1587	MW3-30	N.D.	N.D.	N.D.	N.D.	N.D.
004-1588	MW3-35	N.D.	N.D.	N.D.	N.D.	N.D.
004-1589	MW3-40	N.D.	N.D.	N.D.	N.D.	N.D.

Detection Limits:	1.0	0.0050	0.0050	0.0050	0.0050
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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.

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Kaprealian Engineering, Inc.

P.O. Box 996

Benicia, CA 94510

Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal #5781, Oakland. 3535 Pierson St

Matrix Descript: Soil

Analysis Method: EPA 3550/8015

First Sample #: 004-1563

Sampled: Apr 10, 1990

Received: Apr 11, 1990

Extracted: Apr 18, 1990

Analyzed: Apr 23, 1990

Reported: Apr 25, 1990

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons mg/kg (ppm)
004-1563	MW1-5	N.D.
004-1564	MW1-9.5	N.D.
004-1565	MW1-15	N.D.
004-1566	MW1-20	N.D.
004-1567	MW1-25	N.D.
004-1568	MW1-30	N.D.
004-1569	MW1-35	N.D.
004-1570	MW1-40	N.D.
004-1571	MW1-45	N.D.
004-1572	MW1-50	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.

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Kaprealian Engineering, Inc.
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Benicia, CA 94510

Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal #5781, Oakland, 3535 Pierson St
Matrix Descript: Soil
Analysis Method: EPA 418.1 (I.R. with clean-up)
First Sample #: 004-1563

Sampled: Apr 10, 1990
Received: Apr 11, 1990
Extracted: Apr 23, 1990
Analyzed: Apr 23, 1990
Reported: Apr 25, 1990

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS

Sample Number	Sample Description	Petroleum Oil mg/kg (ppm)
004-1563	MW1-5	N.D.
004-1564	MW1-9.5	N.D.
004-1565	MW1-15	N.D.
004-1566	MW1-20	N.D.
004-1567	MW1-25	N.D.
004-1568	MW1-30	N.D.
004-1569	MW1-35	N.D.
004-1570	MW1-40	N.D.
004-1571	MW1-45	N.D.
004-1572	MW1-50	N.D.

Detection Limits:

50

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 #5781, Oakland, 3535 Pierson St	Sampled: Apr 9, 1990
P.O. Box 996	Sample Descript: Soil MW1-5	Received: Apr 11, 1990
Benicia, CA 94510	Analysis Method: EPA 5030/8010	Analyzed: Apr 14, 1990
Attention: Mardo Kaprealian, P.E.	Lab Number: 004-1563	Reported: Apr 25, 1990

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane.....	5.0	N.D.
Bromoform.....	5.0	N.D.
Bromomethane.....	5.0	N.D.
Carbon tetrachloride.....	5.0	N.D.
Chlorobenzene.....	5.0	N.D.
Chloroethane.....	25	N.D.
2-Chloroethylvinyl ether.....	5.0	N.D.
Chloroform.....	5.0	N.D.
Chloromethane.....	5.0	N.D.
Dibromochloromethane.....	5.0	N.D.
1,2-Dichlorobenzene.....	10	N.D.
1,3-Dichlorobenzene.....	10	N.D.
1,4-Dichlorobenzene.....	10	N.D.
1,1-Dichloroethane.....	5.0	N.D.
1,2-Dichloroethane.....	5.0	N.D.
1,1-Dichloroethene.....	5.0	N.D.
Total 1,2-Dichloroethene.....	5.0	N.D.
1,2-Dichloropropane.....	5.0	N.D.
cis-1,3-Dichloropropene.....	5.0	N.D.
trans-1,3-Dichloropropene.....	5.0	N.D.
Methylene chloride.....	10	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.....	5.0	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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Kapreallan Engineering, Inc.	Client Project ID: Unocal #5781, Oakland. 3535 Pierson St	Sampled: Apr 9, 1990
P.O. Box 996	Sample Descript: Soil MW1-9.5	Received: Apr 11, 1990
Benicia, CA 94510	Analysis Method: EPA 5030/8010	Analyzed: Apr 14, 1990
Attention: Mardo Kapreallan, P.E.	Lab Number: 004-1564	Reported: Apr 25, 1990

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane.....	5.0	N.D.
Bromoform.....	5.0	N.D.
Bromomethane.....	5.0	N.D.
Carbon tetrachloride.....	5.0	N.D.
Chlorobenzene.....	5.0	N.D.
Chloroethane.....	25	N.D.
2-Chloroethylvinyl ether.....	5.0	N.D.
Chloroform.....	5.0	N.D.
Chloromethane.....	5.0	N.D.
Dibromochloromethane.....	5.0	N.D.
1,2-Dichlorobenzene.....	10	N.D.
1,3-Dichlorobenzene.....	10	N.D.
1,4-Dichlorobenzene.....	10	N.D.
1,1-Dichloroethane.....	5.0	N.D.
1,2-Dichloroethane.....	5.0	N.D.
1,1-Dichloroethene.....	5.0	N.D.
Total 1,2-Dichloroethene.....	5.0	N.D.
1,2-Dichloropropane.....	5.0	N.D.
cis-1,3-Dichloropropene.....	5.0	N.D.
trans-1,3-Dichloropropene.....	5.0	N.D.
Methylene chloride.....	10	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.....	5.0	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 #5781, Oakland, 3535 Pierson St	Sampled: Apr 9, 1990
P.O. Box 996	Sample Descript: Soil MW1-15	Received: Apr 11, 1990
Benicia, CA 94510	Analysis Method: EPA 5030/8010	Analyzed: Apr 14, 1990
Attention: Mardo Kaprealian, P.E.	Lab Number: 004-1565	Reported: Apr 25, 1990

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane.....	5.0	N.D.
Bromoform.....	5.0	N.D.
Bromomethane.....	5.0	N.D.
Carbon tetrachloride.....	5.0	N.D.
Chlorobenzene.....	5.0	N.D.
Chloroethane.....	25	N.D.
2-Chloroethylvinyl ether.....	5.0	N.D.
Chloroform.....	5.0	N.D.
Chloromethane.....	5.0	N.D.
Dibromochloromethane.....	5.0	N.D.
1,2-Dichlorobenzene.....	10	N.D.
1,3-Dichlorobenzene.....	10	N.D.
1,4-Dichlorobenzene.....	10	N.D.
1,1-Dichloroethane.....	5.0	N.D.
1,2-Dichloroethane.....	5.0	N.D.
1,1-Dichloroethene.....	5.0	N.D.
Total 1,2-Dichloroethene.....	5.0	N.D.
1,2-Dichloropropane.....	5.0	N.D.
cis-1,3-Dichloropropene.....	5.0	N.D.
trans-1,3-Dichloropropene.....	5.0	N.D.
Methylene chloride.....	10	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.....	5.0	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. P.O. Box 996 Benicia, CA 94510 Attention: Mardo Kaprealian, P.E.	Client Project ID: Unocal #5781, Oakland, 3535 Pierson St Sample Descript: Soil MW1-20 Analysis Method: EPA 5030/8010 Lab Number: 004-1566	Sampled: Apr 9, 1990 Received: Apr 11, 1990 Analyzed: Apr 14, 1990 Reported: Apr 25, 1990
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HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane.....	5.0	N.D.
Bromoform.....	5.0	N.D.
Bromomethane.....	5.0	N.D.
Carbon tetrachloride.....	5.0	N.D.
Chlorobenzene.....	5.0	N.D.
Chloroethane.....	25	N.D.
2-Chloroethylvinyl ether.....	5.0	N.D.
Chloroform.....	5.0	N.D.
Chloromethane.....	5.0	N.D.
Dibromochloromethane.....	5.0	N.D.
1,2-Dichlorobenzene.....	10	N.D.
1,3-Dichlorobenzene.....	10	N.D.
1,4-Dichlorobenzene.....	10	N.D.
1,1-Dichloroethane.....	5.0	N.D.
1,2-Dichloroethane.....	5.0	N.D.
1,1-Dichloroethene.....	5.0	N.D.
Total 1,2-Dichloroethene.....	5.0	N.D.
1,2-Dichloropropane.....	5.0	N.D.
cis-1,3-Dichloropropene.....	5.0	N.D.
trans-1,3-Dichloropropene.....	5.0	N.D.
Methylene chloride.....	10	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.....	5.0	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 #5781, Oakland. 3535 Pierson St	Sampled: Apr 9, 1990
P.O. Box 996	Sample Descript: Soil MW1-25	Received: Apr 11, 1990
Benicia, CA 94510	Analysis Method: EPA 5030/8010	Analyzed: Apr 14, 1990
Attention: Mardo Kaprealian, P.E.	Lab Number: 004-1567	Reported: Apr 25, 1990

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane.....	5.0	N.D.
Bromoform.....	5.0	N.D.
Bromomethane.....	5.0	N.D.
Carbon tetrachloride.....	5.0	N.D.
Chlorobenzene.....	5.0	N.D.
Chloroethane.....	25	N.D.
2-Chloroethylvinyl ether.....	5.0	N.D.
Chloroform.....	5.0	N.D.
Chloromethane.....	5.0	N.D.
Dibromochloromethane.....	5.0	N.D.
1,2-Dichlorobenzene.....	10	N.D.
1,3-Dichlorobenzene.....	10	N.D.
1,4-Dichlorobenzene.....	10	N.D.
1,1-Dichloroethane.....	5.0	N.D.
1,2-Dichloroethane.....	5.0	N.D.
1,1-Dichloroethene.....	5.0	N.D.
Total 1,2-Dichloroethene.....	5.0	N.D.
1,2-Dichloropropane.....	5.0	N.D.
cis-1,3-Dichloropropene.....	5.0	N.D.
trans-1,3-Dichloropropene.....	5.0	N.D.
Methylene chloride.....	10	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.....	5.0	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 #5781, Oakland, 3535 Pierson St	Sampled: Apr 9, 1990
P.O. Box 996	Sample Descript: Soil MW1-30	Received: Apr 11, 1990
Benicia, CA 94510	Analysis Method: EPA 5030/8010	Analyzed: Apr 14, 1990
Attention: Mardo Kaprealian, P.E.	Lab Number: 004-1568	Reported: Apr 25, 1990

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane.....	5.0	N.D.
Bromoform.....	5.0	N.D.
Bromomethane.....	5.0	N.D.
Carbon tetrachloride.....	5.0	N.D.
Chlorobenzene.....	5.0	N.D.
Chloroethane.....	25	N.D.
2-Chloroethylvinyl ether.....	5.0	N.D.
Chloroform.....	5.0	N.D.
Chloromethane.....	5.0	N.D.
Dibromochloromethane.....	5.0	N.D.
1,2-Dichlorobenzene.....	10	N.D.
1,3-Dichlorobenzene.....	10	N.D.
1,4-Dichlorobenzene.....	10	N.D.
1,1-Dichloroethane.....	5.0	N.D.
1,2-Dichloroethane.....	5.0	N.D.
1,1-Dichloroethene.....	5.0	N.D.
Total 1,2-Dichloroethene.....	5.0	N.D.
1,2-Dichloropropane.....	5.0	N.D.
cis-1,3-Dichloropropene.....	5.0	N.D.
trans-1,3-Dichloropropene.....	5.0	N.D.
Methylene chloride.....	10	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.....	5.0	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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Kapreallan Engineering, Inc. P.O. Box 996 Benicia, CA 94510 Attention: Mardo Kapreallan, P.E.	Client Project ID: Unocal #5781, Oakland. 3535 Pierson St Sample Descript: Soil MW1-35 Analysis Method: EPA 5030/8010 Lab Number: 004-1569	Sampled: Apr 9, 1990 Received: Apr 11, 1990 Analyzed: Apr 14, 1990 Reported: Apr 25, 1990
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HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane.....	5.0	N.D.
Bromoform.....	5.0	N.D.
Bromomethane.....	5.0	N.D.
Carbon tetrachloride.....	5.0	N.D.
Chlorobenzene.....	5.0	N.D.
Chloroethane.....	25	N.D.
2-Chloroethylvinyl ether.....	5.0	N.D.
Chloroform.....	5.0	N.D.
Chloromethane.....	5.0	N.D.
Dibromochloromethane.....	5.0	N.D.
1,2-Dichlorobenzene.....	10	N.D.
1,3-Dichlorobenzene.....	10	N.D.
1,4-Dichlorobenzene.....	10	N.D.
1,1-Dichloroethane.....	5.0	N.D.
1,2-Dichloroethane.....	5.0	N.D.
1,1-Dichloroethene.....	5.0	N.D.
Total 1,2-Dichloroethene.....	5.0	N.D.
1,2-Dichloropropane.....	5.0	N.D.
cis-1,3-Dichloropropene.....	5.0	N.D.
trans-1,3-Dichloropropene.....	5.0	N.D.
Methylene chloride.....	10	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.....	5.0	N.D.
Vinyl chloride.....	10	N.D.

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaprealian Engineering, Inc. P.O. Box 996 Benicia, CA 94510 Attention: Mardo Kaprealian, P.E.	Client Project ID: Unocal #5781, Oakland, 3535 Pierson St Sample Descript: Soil MW1-40 Analysis Method: EPA 5030/8010 Lab Number: 004-1570	Sampled: Apr 9, 1990 Received: Apr 11, 1990 Analyzed: Apr 14, 1990 Reported: Apr 25, 1990
--	---	--

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane.....	5.0	N.D.
Bromoform.....	5.0	N.D.
Bromomethane.....	5.0	N.D.
Carbon tetrachloride.....	5.0	N.D.
Chlorobenzene.....	5.0	N.D.
Chloroethane.....	25	N.D.
2-Chloroethylvinyl ether.....	5.0	N.D.
Chloroform.....	5.0	N.D.
Chloromethane.....	5.0	N.D.
Dibromochloromethane.....	5.0	N.D.
1,2-Dichlorobenzene.....	10	N.D.
1,3-Dichlorobenzene.....	10	N.D.
1,4-Dichlorobenzene.....	10	N.D.
1,1-Dichloroethane.....	5.0	N.D.
1,2-Dichloroethane.....	5.0	N.D.
1,1-Dichloroethene.....	5.0	N.D.
Total 1,2-Dichloroethene.....	5.0	N.D.
1,2-Dichloropropane.....	5.0	N.D.
cis-1,3-Dichloropropene.....	5.0	N.D.
trans-1,3-Dichloropropene.....	5.0	N.D.
Methylene chloride.....	10	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.....	5.0	N.D.
Vinyl chloride.....	10	N.D.

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

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

Client Project ID: Unocal #5781, Oakland, 3535 Pierson St
Sample Descript: Soil MW1-45
Analysis Method: EPA 5030/8010
Lab Number: 004-1571

Sampled: Apr 9, 1990
Received: Apr 11, 1990
Analyzed: Apr 14, 1990
Reported: Apr 25, 1990

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane.....	5.0	N.D.
Bromoform.....	5.0	N.D.
Bromomethane.....	5.0	N.D.
Carbon tetrachloride.....	5.0	N.D.
Chlorobenzene.....	5.0	N.D.
Chloroethane.....	25	N.D.
2-Chloroethylvinyl ether.....	5.0	N.D.
Chloroform.....	5.0	N.D.
Chloromethane.....	5.0	N.D.
Dibromochloromethane.....	5.0	N.D.
1,2-Dichlorobenzene.....	10	N.D.
1,3-Dichlorobenzene.....	10	N.D.
1,4-Dichlorobenzene.....	10	N.D.
1,1-Dichloroethane.....	5.0	N.D.
1,2-Dichloroethane.....	5.0	N.D.
1,1-Dichloroethene.....	5.0	N.D.
Total 1,2-Dichloroethene.....	5.0	N.D.
1,2-Dichloropropane.....	5.0	N.D.
cis-1,3-Dichloropropene.....	5.0	N.D.
trans-1,3-Dichloropropene.....	5.0	N.D.
Methylene chloride.....	10	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.....	5.0	N.D.
Vinyl chloride.....	10	N.D.

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaprealian Engineering, Inc.	Client Project ID: Unocal #5781, Oakland. 3535 Pierson St	Sampled: Apr 9, 1990
P.O. Box 996	Sample Descript: Soil MW1-50	Received: Apr 11, 1990
Benicia, CA 94510	Analysis Method: EPA 5030/8010	Analyzed: Apr 14, 1990
Attention: Mardo Kaprealian, P.E.	Lab Number: 004-1572	Reported: Apr 25, 1990

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane.....	5.0	N.D.
Bromoform.....	5.0	N.D.
Bromomethane.....	5.0	N.D.
Carbon tetrachloride.....	5.0	N.D.
Chlorobenzene.....	5.0	N.D.
Chloroethane.....	25	N.D.
2-Chloroethylvinyl ether.....	5.0	N.D.
Chloroform.....	5.0	N.D.
Chloromethane.....	5.0	N.D.
Dibromochloromethane.....	5.0	N.D.
1,2-Dichlorobenzene.....	10	N.D.
1,3-Dichlorobenzene.....	10	N.D.
1,4-Dichlorobenzene.....	10	N.D.
1,1-Dichloroethane.....	5.0	N.D.
1,2-Dichloroethane.....	5.0	N.D.
1,1-Dichloroethene.....	5.0	N.D.
Total 1,2-Dichloroethene.....	5.0	N.D.
1,2-Dichloropropane.....	5.0	N.D.
cis-1,3-Dichloropropene.....	5.0	N.D.
trans-1,3-Dichloropropene.....	5.0	N.D.
Methylene chloride.....	10	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.....	5.0	N.D.
Vinyl chloride.....	10	N.D.

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager



KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER		SITE NAME & ADDRESS					ANALYSES REQUESTED					TURN AROUND TIME:		
Doug Wade		Unocal-Oakland # 5781 3535 Pinson St (X MacArthur)										Regular		
WITNESSING AGENCY												REMARKS		
SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	CONT.	NO. OF	SAMPLING LOCATION	TPH-G	BTEX	VOC	TRACHL	PCB	REMARKS
MW1 (5)	4-9-90		✓	✓	✓	✓	SEE SAMPLE ID NO		✓	✓	✓	✓	✓	0041563
MW1 (9.5)	"		✓	✓	✓	✓			✓	✓	✓	✓	✓	1564
MW1 (15)	"		✓	✓	✓	✓			✓	✓	✓	✓	✓	1565
MW1 (20)	"		✓	✓	✓	✓			✓	✓	✓	✓	✓	1566
MW1 (25)	"		✓	✓	✓	✓			✓	✓	✓	✓	✓	1567
MW1 (30)	"		✓	✓	✓	✓			✓	✓	✓	✓	✓	1568
MW1 (35)	"		✓	✓	✓	✓			✓	✓	✓	✓	✓	1569
MW1 (40)	"		✓	✓	✓	✓			✓	✓	✓	✓	✓	1570
MW1 (45)	"		✓	✓	✓	✓			✓	✓	✓	✓	✓	1571

Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 4/11/90 850	Received by: (Signature) <i>Tim McLean</i>	The following MUST BE completed by the laboratory accepting samples for analysis: 1. Have all samples received for analysis been stored in ice? <input checked="" type="checkbox"/> 2. Will samples remain refrigerated until analyzed? <input checked="" type="checkbox"/> 3. Did any samples received for analysis have head space? <input checked="" type="checkbox"/> 4. Were samples in appropriate containers and properly packaged? <input checked="" type="checkbox"/>
Relinquished by: (Signature) <i>Tim McLean</i>	Date/Time 4/11/90 130	Received by: (Signature) <i>[Signature]</i>	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	

<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
Signature	Title	Date
		4/11/90

SENT BY: XEROX Telecopier 7017: 4-30-90 : 11:02AM :
 4:53649235-
 707 746 5581: # 2



KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Doay/Wade
 WITNESSING AGENCY: _____
 SITE NAME & ADDRESS: Unocal - Oakland #5781
3835 Pinson St. (XMedulla)
 ANALYSES REQUESTED: TPH-G, BTEX, TPH-D, TOG (HIB), BO 10
 TURN AROUND TIME: Regular

SAMPLE ID NO.	DATE	TIME	SOL.	WATER	GRID	CONT.	NO. OF CONT.	SAMPLING LOCATION	ANALYSES REQUESTED					REMARKS
									TPH-G	BTEX	TPH-D	TOG (HIB)	BO 10	
MW1-(50)	4-9-90		✓		✓		1	See Sample Id 9a	✓	✓	✓	✓	✓	0041572
MW2-(5)	4-10-90		✓		✓		1		✓	✓				0041573
MW2-(8)	"		✓		✓		1		✓	✓				0041574
MW2-(12)	"		✓		✓		1		✓	✓				1575
MW2-(15)	"		✓		✓		1		✓	✓				1576
MW2-(20)	"		✓		✓		1		✓	✓				1577
MW2-(25)	"		✓		✓		1		✓	✓				1578
MW2-(30)	"		✓		✓		1		✓	✓				1579
MW2-(35)	"		✓		✓		1		✓	✓				1580

Relinquished by: (Signature) [Signature] Date/Time 4/1/90 8:30 Received by: (Signature) Tom McLean

Relinquished by: (Signature) Tom McLean Date/Time 4/1/90 1:30 Received by: (Signature) [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:

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

Signature: [Signature] Title: [Signature] Date: 4/1/90

SENT BY: XEROX Telecopier 7017: 4-30-90 :11:03AM : 4153649233- 707 748 5581: # 3



KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Dong/Wade

WITNESSING AGENCY: _____

SITE NAME & ADDRESS: Unocal-Oakland #5781
3535 Pinson St (x Modality)

ANALYSES REQUESTED: TPH-G BTX-E

TURN AROUND TIME: Regular

SAMPLE ID NO.	DATE	TIME	SAMPLING LOCATION					NO. OF CONT.	ANALYSES REQUESTED	REMARKS
			SOIL	WATER	GRAB	COMP	CONT.			
MW2-(2)	4-10-90		✓		✓		1	sample #10	TPH-G BTX-E	0041581
MW3-(5)	4-10-90		✓		✓		1		TPH-G BTX-E	1582
MW3-(10)	"		✓		✓		1		TPH-G BTX-E	1583
MW3-(18)	"		✓		✓		1		TPH-G BTX-E	1584
MW3-(20)	"		✓		✓		1		TPH-G BTX-E	1585
MW3-(22)	"		✓		✓		1		TPH-G BTX-E	1586
MW3-(24)	"		✓		✓		1		TPH-G BTX-E	1587
MW3-(30)	"		✓		✓		1		TPH-G BTX-E	1588
MW3-(35)	"		✓		✓		1		TPH-G BTX-E	1589
MW3-(40)	"		✓		✓		1		TPH-G BTX-E	

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

- Have all samples received for analysis been stored in ice?
- Will samples remain refrigerated until analyzed?
- Did any samples received for analysis have head space? no
- Were samples in appropriate containers and properly packaged?

Relinquished by: (Signature) [Signature] Date/Time 4/11/90 Received by: (Signature) Tom McPain

Relinquished by: (Signature) Tom McPain Date/Time 4/11/90 Received by: (Signature) [Signature]

Relinquished by: (Signature) _____ Date/Time _____ Received by: (Signature) _____

Signature: [Signature] Title: SA Date: 4/11/90



KAPREALIAN ENGINEERING, INC.

Consulting Engineers

P.O. BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581

KEI-P89-1204.P2

May 21, 1990

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

Attention: Mr. Rick Sisk

RE: Work Plan/Proposal
Unocal Service Station #5781
3535 Pierson Street
Oakland, California

INTRODUCTION

1. Background:

The subject site is developed and consists of a Unocal Service Station. The station occupies the northwest corner at the intersection of Pierson Street with MacArthur Boulevard in Oakland, California. In addition, the site is situated southwest of and adjacent to the Highway 580 off-ramp for MacArthur Boulevard. The site is located near the base of a east-northeast trending hillside area on relatively gently sloping developed property.

KEI's initial field work was conducted on December 14, 1989, when three underground storage tanks were removed from the site. The tanks consisted of two 10,000 gallon fuel storage tanks, and one 280 gallon waste oil tank. The fuel tanks were made of steel and no apparent holes or cracks were observed. However, the waste oil tank had one hole of approximately 1.25 square inches.

Three soil samples, labeled A1, B1, and A2/B2, were taken from beneath the fuel tanks at a depth of about 12.5 feet. In addition, two soil samples, labeled SW1 and SW2, were collected from the fuel tank pit sidewalls at a depth of 10.5 feet. The fuel tank pit sidewalls were analyzed for total petroleum hydrocarbons (TPH) as gasoline and benzene, toluene, xylenes and ethylbenzene (BTX&E). Analyses of the samples by Sequoia Analytical Laboratory in Redwood City, California, indicate levels of TPH as gasoline ranging from non-detectable to 46 ppm, with non-detectable levels of BTX&E in all samples, except for samples A2/B2 and SW2, which showed benzene at 0.10 ppm and 0.65 ppm, respectively.

Also on December 14, 1989, one soil sample, labeled W01, was collected from beneath the waste oil tank at a depth of 6 feet. The waste oil tank pit sample was analyzed by Sequoia Analytical Laboratory in Redwood City, California, for TPH as gasoline, BTX&E, TPH as diesel, total oil and grease (TOG), EPA method 8010 compounds and the metals cadmium, chromium, lead and zinc. The analytical results of soil sample W01 indicated TPH as gasoline at 670 ppm, 5.4 ppm benzene, TPH as diesel at 8,300 ppm and TOG at 48,000 ppm. EPA method 8010 results showed 1,2-dichlorobenzene at 10 ppb, tetrachloroethene at 77 ppb, and 1,1,1-trichloroethane at 15 ppb. Metals concentrations were as follows: cadmium non-detectable; chromium 8.3 ppm, lead 340 ppm, and zinc 70 ppm.

On January 17, 1990, two soil samples, labeled P1 and P2, were collected from beneath the product pipe trenches at depths of 5.5 to 6.0 feet. Analyses of these samples by Sequoia Analytical indicate non-detectable levels of TPH as gasoline and BTX&E constituents for both samples. KEI recommended further soil excavation in the area of the waste oil tank, and the installation of three monitoring wells at the site, to begin to define the vertical extent of soil contamination, to determine the ground water flow direction, and to determine if the ground water has been impacted. Documentation of the soil sampling activities are presented in KEI's report (KEI-J89-1204.R2) dated February 9, 1990.

On February 22, 1990, KEI returned to the site to collect additional soil samples from excavated waste oil tank pit. On this date, one soil sample, labeled W01(16), was collected from beneath the waste oil tank at a depth of 16 feet. In addition, four soil samples, labeled SWA through SWD, were collected from the sidewalls of the waste oil tank pit excavation at depths of 9.0 to 10.0 feet. The lateral excavation was terminated due to the presence of underground sewer and gas lines on the south and west sides, and the existing building on the north side. A 12-inch diameter conductor casing was installed in the excavation at sample location W01(16) prior to backfilling. Analytical results of sidewall soil sample SWB indicate non-detectable levels of all constituents analyzed, except for TPH as gasoline, which was 2.0 ppm. Analytical results of the soil sample, W01(16), collected from the bottom of the excavation at a depth of 16 feet, indicate levels of TPH as gasoline at 15 ppm with 0.06 ppm benzene, 74 ppm TPH as diesel, 910 ppm TOG, with non-detectable levels of all 8010 compounds. Laboratory analyses of the remaining three sidewall samples,

SWA, SWC and SWD, showed levels of TOG ranging from 4,100 ppm to 17,000 ppm, TPH as diesel ranging from 360 ppm to 1,400 ppm, TPH as gasoline ranging from 40 ppm to 220 ppm, with benzene levels from 0.31 to 2.3 ppm and non-detectable levels of all EPA method 8010 compounds except tetrachloroethene, which ranged from 40 ppb to 160 ppb. Sample SWD also showed 1,1,1-trichloroethane at 5.8 ppb. The results of the additional soil sampling activities are presented in KEI's report (KEI-P89-1204.R3) dated March 30, 1990.

On April 9 and 10, 1990, three eight-inch diameter exploratory borings (designated as MW1, MW2 and MW3 on the attached Site Plan) were drilled at the site. The borings were drilled, sampled (soil only) and backfilled in accordance with the guidelines of the Regional Water Quality Control Board (RWQCB), and the County well standards.

The borings were drilled to total depths ranging from 40 to 50 feet. Ground water was not encountered during drilling activities. The borings were observed for ground water accumulation for a period of up to 15 hours prior to backfilling with neat cement on the same day as the boring was drilled. Soil samples were collected for laboratory analysis and lithologic logging purposes at a maximum spacing of 5 foot intervals, changes in lithology, and obvious areas of contamination, beginning at a depth of approximately 5 feet below grade until the borings were terminated. 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 boring was fully backfilled with neat cement placed with a tremie pipe from the total depth drilled up to the surface. The borings were not converted to monitoring wells because ground water was not encountered.

Analytical results of the soil samples, collected from the borings (MW1 through MW3), indicate non-detectable levels of TPH as gasoline and BTX&E in all of the samples. Documentation of analytical results are presented in KEI's report (KEI-P89-1204.R6) dated May 21, 1990.

2. Site Description:

The service station site occupies the west corner at the intersection of Pierson Street and MacArthur Boulevard in Oakland, California. A Location Map and a Site Plan are attached to this report.

PROPOSED FIELD WORK

PHASE II - DEFINING THE EXTENT OF SUBSURFACE CONTAMINATION

1. KEI proposes to install three additional eight-inch diameter exploratory borings, designated as EB1, EB2 and EB3 on the attached Site Plan, using hollow stem auger equipment. Permits will be obtained from the Alameda County Health Department and/or the Alameda County Flood Control and Water Conservation District as necessary prior to beginning work.

The borings will be drilled to a total depth of 50 feet below grade.

2. Soil samples will be collected at a maximum spacing of 5 foot intervals, at changes in lithology, at any areas of obvious contamination and at the soil/water interface (if encountered) beginning at a depth of approximately 5 feet below grade. Sampling will continue until the first water table is encountered. Classification of soil will be done using the Unified Soil Classification System (USCS) by KEI's field engineer or geologist. Samples will be collected in a California modified split-spoon sampler with two-inch diameter brass liners. The sampler will be advanced ahead of the drilling augers at designated depths by dropping a 140 pound hammer 30 inches. Blow counts will be recorded. The samples will be removed from the sampler, retained in the brass liners, and sealed with aluminum foil, plastic caps and tape. They will be labeled and stored in a cooler on ice for delivery to a state certified laboratory.

California modified split-spoon samplers and brass tubes will be decontaminated prior to each use with a trisodium phosphate solution wash followed by a clean water rinse. Hollow stem augers will be steam cleaned prior to each use. Steam cleaning will be performed on visqueen. Water from the steam cleaning will be contained on the visqueen and placed in DOT-approved 55-gallon drums, pending appropriate disposal.

Once completed, soil borings will be filled to the surface using a neat cement grout.

Soil excavated during subsurface investigation will be stockpiled and covered with visqueen on-site. Composite samples will be collected to determine appropriate disposal.

3. Finalized Boring Logs will be prepared from field logs and submitted to the Alameda County Department of Health and to the RWQCB, San Francisco Bay Region.
4. Ground water is not anticipated at the site to 50 feet below grade based on the previous drilling on 4/9/90.

Properly executed Chain of Custody documentation will accompany all samples.

5. Laboratory Analyses:

Selected soil samples will be analyzed by Sequoia Analytical Laboratory in Redwood City, California, a state certified laboratory, for TPH as gasoline using EPA method 8015 in conjunction with modified 8015 and BTX&E using EPA method 8020 as recommended by the RWQCB, and as specified in the Tri-regional guidelines.

Analytical results will be presented in tabular form, showing sample depths, results and detection limits.

The analytical results will be used to delineate the vertical and lateral extent of the contaminants in the soil.

6. Conclusions:

Conclusions and results of Phase II will be described in a technical report.

The technical report will be submitted to the Alameda County Department of Health, and to the RWQCB.

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.

Approved by:



Don R. Braun
Certified Engineering Geologist

License No. 1310
Exp. Date 6/30/90

c11

Attachments: Location Map
Site Plan



KAPREALIAN ENGINEERING, INC.
Consulting Engineers

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(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581



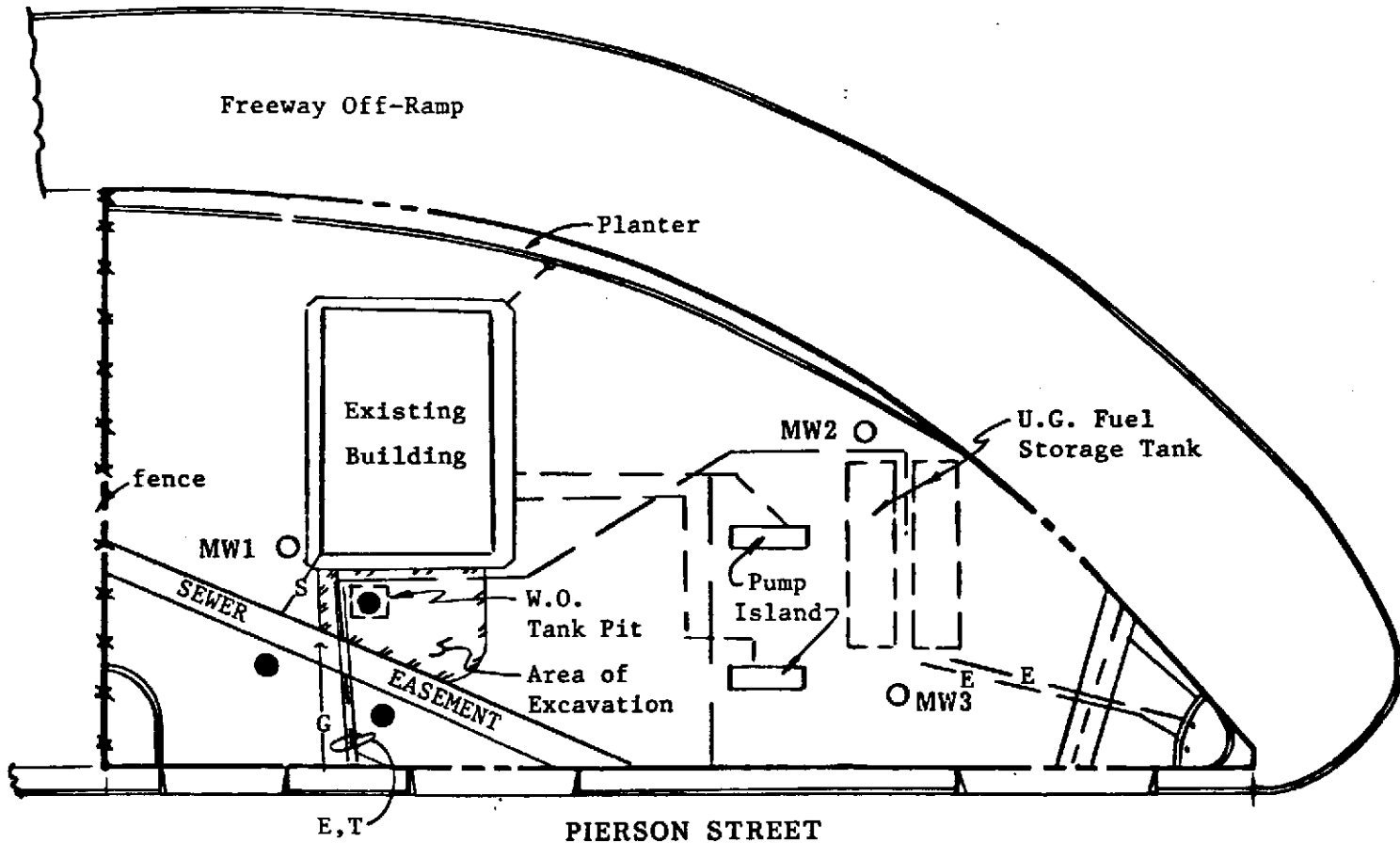
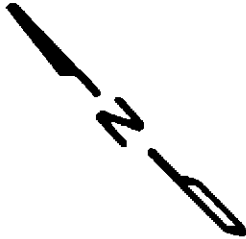
LOCATION MAP

Unocal Service Station #5781
3535 Pierson Street
Oakland, California



KAPREALIAN ENGINEERING, INC.
Consulting Engineers

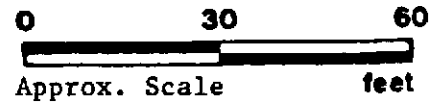
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(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581



SITE PLAN

LEGEND

- Exploratory Boring (proposed)
- E U.G. Electrical Line
- T U.G. Telephone Line
- G U.G. Natural Gas Line
- S U.G. Sewer Line
- Exploratory Boring (existing)



Unocal Service Station #5781
3535 Pierson Street
Oakland, California