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

November 7, 1991

Regional Water Quality Control Board
2101 Webster #500
Oakland, CA 94612

Attention: Mr. Lester Feldman

RE: Unocal Service Station #5484
18950 Lake Chabot Road
Castro Valley, California

Comment changed
• 11/7 QR

Dear Mr. Feldman:

Per the request of Mr. Ron Bock of Unocal Corporation, enclosed please find our report dated November 7, 1991, for the above referenced site.

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

Sincerely,

Kaprealian Engineering, Inc.

Judy A. Dewey

jad\65

Enclosure

cc: Ron Bock, Unocal Corporation

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

KEI-P90-0806.QR1
November 7, 1991

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

Attention: Mr. Ron Bock

RE: Quarterly Report
Unocal Service Station #5484
18950 Lake Chabot Road
Castro Valley, California

Dear Mr. Bock:

This report presents the results of the first quarter of monitoring and sampling of the monitoring wells at the referenced site by Kaprealian Engineering, Inc. (KEI), per KEI's proposal KEI-P90-0806.P1 dated January 9, 1991, and report KEI-P90-0806.R2, dated June 27, 1991. The wells are currently monitored monthly and sampled on a quarterly basis, except for wells MW4 and MW6, which are sampled bi-annually. This report covers the work performed by KEI from July through October, 1991.

BACKGROUND

The site is presently used as a Unocal Service Station. The site is located at the southeast corner at the intersection of Lake Chabot Road and Quail Avenue in Castro Valley, California. The site is situated on gently to moderately sloping, south-southeast trending topography, and is located near the base of moderately steep, southward sloping, hillside areas. In addition, the site is located approximately 600 feet northeast of an unnamed creek, and is situated near the northern boundary of the valley that incorporates Castro Valley. A Location Map and Site Plans are attached to this report.

Previous activities at the site have been conducted by Applied GeoSystems (AGS) of Fremont, California. The activities have included the installation of six monitoring wells and five soil borings, and also included soil sampling activities related to underground storage tank removal operations. The following discussion of the background data for this site is based on review of the following AGS reports:

1. Quarterly Ground-Water Monitoring for First Quarter 1991, AGS 18061-6, dated April 19, 1991;

2. Quarterly Ground-Water Monitoring for First and Second Quarter 1990, AGS 18061-6, dated 7/3/90;

3. Report, Supplemental Subsurface Investigation, Quarterly Ground-Water Monitoring and Evaluation of Soil Remediation Alternatives, AGS 18061-5, dated 7/3/90;

4. Report, Soil Excavation, Aeration, and Sampling Related to Underground Storage Tank Removal, AGS 18061-4, dated 3/30/90;

5. Report, Supplemental Subsurface Environmental Investigation, AGS 18061-3, dated 9/11/89;

6. Letter Report No. 18061-2 regarding quarterly ground water monitoring, dated 1/6/89;

7. Report, Subsurface Environmental Investigation, AGS 18061-1, dated 8/30/88.

As reported by AGS in the above reports, work began on the site when three two-inch diameter monitoring wells (designated as MW1, MW2, and MW3 on the attached Site Plans, Figures 1 and 2) were installed on July 12 and 13, 1988, to depths of 30.5, 19.5, and 20.5 feet below grade, respectively. Ground water was initially encountered at a depth of 8 feet below grade in MW1, and at 20 feet below grade in MW3, but was apparently not encountered during drilling in MW2.

Analytical results of the soil samples collected from the borings for wells MW1 through MW3 showed levels of total petroleum hydrocarbons (TPH) as gasoline ranging from 3 ppm to 79 ppm, with benzene levels ranging from 0.006 ppm to 0.83 ppm. Results of the soil analyses are presented in Table 4.

Also, a well search was conducted by AGS within 1/2-mile radius of the site. Two wells are apparently located approximately 1/2 mile south of the site. One well (State Well No. 3S/2W 4F 1) is a test well located on Betrose Court, water level is unknown, but total depth is 52 feet below grade. The second well (State Well No. 3S/2W 4H 2) is a domestic well located on Lenard Drive with a water level at 36 feet below grade, and a total depth of 220 feet below grade. Both wells are considered downgradient from the subject site.

Apparently, during a site monitoring visit conducted on October 14, 1988, AGS observed a nine-inch thick, brown, floating product in

well MW3. Through bailing techniques, the product thickness was reduced to less than 0.01 inches on April 14, 1989, and was not detected on May 19, 1989.

On May 23 and 24, 1989, and June 5, 1989, three four-inch diameter monitoring wells (designated as MW4, MW5, and MW6 on the attached Site Plan, Figure 2) were installed to depths of 24 to 29 feet below grade. Analytical results of the soil samples collected during drilling showed non-detectable levels of TPH as gasoline and benzene, toluene, xylenes, and ethylbenzene (BTX&E) in all samples, except soil sample S-13.5-B5, collected from well MW5 at a depth of 13.5 feet below grade, which showed a TPH as gasoline level of 2.4 ppm. Analytical results of the soil samples are presented in Table 4.

On June 12 through June 16, 1989, two underground 10,000 gallon (unleaded and super unleaded) gasoline storage tanks, and one 280 gallon waste oil storage tank, were excavated and removed from the site. The fuel tank pit was excavated to a depth of 14.5 feet below grade, and the waste oil tank pit was excavated to a depth of 8 feet below grade. Only a small amount of ground water was reported to be encountered in the fuel tank pit. The condition of the excavated tanks was not noted in the AGS reports.

Between June 21, 1989, and August 1, 1989, further excavation of soil around the former gasoline tank pit and service islands was conducted. Soil was excavated to the east edge of the City sidewalk, to a depth of 15 feet below grade.

The highest concentrations of TPH as gasoline (up to 4,300 ppm) encountered in the soil samples collected after tank removal were detected in samples from the southwest corner of the tank pit. Composite soil samples from the floor and sidewalls of the final excavation apparently indicated TPH as gasoline concentrations of less than detection limits, while discreet soil samples are reported to contain 8.9 ppm or less of TPH as gasoline. Analytical results of two soil samples collected from the waste oil tank pit at a depth of 8 feet below grade indicated 480 ppm and 87 ppm of TPH as gasoline, and 1,300 ppm and 1,800 ppm of total oil and grease (TOG). Analytical results of all soil samples collected from the tank pit excavations are presented as Table 5, and location of soil sample points are presented on the attached Site Plans, Figures 3, 4, and 5. The final depth of the excavation pit, as determined by AGS, is presented as Figure 6.

On June 19, 1989, two new 12,000 gallon fiberglass-coated double wall steel fuel tanks and a new 520 gallon fiberglass-coated double wall steel waste oil tank were placed at the north side of the station building at the locations identified on the attached Site

Plan, Figure 7. Monitoring wells MW1 and MW3 are reported to have been destroyed and removed during the soil excavation activities.

Five soil borings (designated as B7 through B11 on the attached Site Plan, Figure 7) were drilled at the site on November 17 and 18, 1989, for further evaluation of the lateral and vertical extent of soil contamination at the southwestern and southern portions of the site. The borings were drilled to depths ranging from 15.5 to 20.5 feet below grade. The borings were left open until November 22, 1989, and water levels in the borings reportedly ranged between 6.48 to 12.65 feet below grade. Soil samples collected from depths ranging from 4 to 19.5 feet below grade were analyzed at a laboratory. Analytical results of the soil samples collected from depths of 10 feet below grade showed levels of TPH as gasoline ranging from 6.1 ppm to 220 ppm. In addition, analytical results of the soil samples collected from depths at and below 15 feet below grade showed levels of TPH as gasoline ranging from 3.4 ppm to 66 ppm. The analytical results are presented in Table 6.

The analytical results of all ground water samples previously collected from the monitoring wells by AGS (from July 1988 through February 1991) are presented in Table 2a.

On May 7, 1991, one two-inch diameter monitoring well and one exploratory boring (designated as MW7 and EB1, respectively, on the attached Site Plan, Figure 2) were installed at the site by KEI. The monitoring well was drilled and completed to a total depth of 19.8 feet below grade, while the exploratory boring was drilled to a total depth of 7 feet below grade. Ground water was not encountered within boring EB1 and is estimated to have been initially encountered in well MW7 at a depth of about 17 feet below grade, but was measured approximately four hours after completion of the drilling activities at a depth of about 13-1/4 feet below grade. Ground water did not rapidly enter the borehole during drilling, and therefore a precise depth to initial ground water cannot be provided. Well MW7 was developed on May 15, 1991, and wells MW2 and MW4 through MW7 were sampled on May 23, 1991.

Water samples collected from monitoring wells MW2 and MW4 through MW7, and selected soil samples collected from EB1 and MW7, were analyzed at Sequoia Analytical Laboratory in Concord, California. Soil and water samples were analyzed for TPH as gasoline, and BTX&E. In addition, soil and water samples collected from MW7 (adjacent to the waste oil tank) were analyzed for TPH as diesel, TOG, and EPA method 8010 constituents.

Analytical results of the soil samples collected from the borings for monitoring well MW7 and from boring EB1 indicated levels of TPH as gasoline ranging from non-detectable up to 130 ppm, with benzene

levels ranging from non-detectable up to 0.51 ppm. In MW7, levels of TPH as diesel ranged from non-detectable up to 9.1 ppm, and TOG and all EPA method 8010 constituents were all non-detectable.

Analytical results of the ground water samples collected from monitoring wells MW2 through MW6 indicated non-detectable levels of TPH as gasoline and BTX&E. In MW7, TPH as gasoline was 3,000 ppb, benzene was 160 ppb, TPH as diesel was 540 ppb, while TOG and all EPA method 8010 constituents were non-detectable, except for 3.4 ppb of 1,2-dichloroethane. Results of the soil analyses are summarized in Table 3, and results of the water analyses are summarized in Table 2.

Documentation of well installation protocol, sample collection techniques, and analytical results are presented in KEI's report (KEI-P90-0806.R2) dated June 27, 1991. Based on the analytical results, KEI recommended the implementation of a modified monitoring and sampling program. All wells were recommended to be monitored monthly, wells MW2, MW5, and MW7 were recommended for quarterly sampling, and wells MW4 and MW6 were recommended for bi-annual sampling.

RECENT FIELD ACTIVITIES

The five wells (MW2, MW4, MW5, MW6, and MW7) were monitored three times, and wells MW2, MW5, and MW7 were sampled once, during the quarter, except for well MW5, which was sampled twice. During monitoring, the wells were checked for depth to water and presence of free product and sheen. No free product or sheen was noted in any of the wells during the quarter. Monitoring data are summarized in Table 1.

Water samples were collected from the wells on September 20, 1991. In addition, monitoring well MW5 was resampled on October 10, 1991. Prior to sampling, the wells were each purged of between 7 and 35 gallons by the use of a bailer. Samples were then collected using a clean Teflon bailer. Samples were decanted into clean VOA vials and/or one liter amber bottles, as appropriate, which were then sealed with Teflon-lined screw caps and stored in a cooler, on ice, until delivered to the State certified laboratory.

HYDROLOGY AND GEOLOGY

Based on water level data gathered on September 20, 1991, the ground water flow direction appeared to be toward the south-southwest, with a hydraulic gradient of approximately 0.08 to 0.125, which is virtually unchanged from the direction and gradient recorded on May 23, 1991. Water levels have continuously decreased during the quarter, showing a net decrease of between 1.23 and 1.83

feet in all wells since May 23, 1991. The measured depth to ground water at the site on September 20, 1991, ranged between 7.85 and 11.46 feet below grade.

Based on review of regional geologic maps (U.S. Geological Survey Open File Report 80-540 "Preliminary Geologic Map of the Hayward Quadrangle, Alameda and Contra Costa Counties, California" by Thomas W. Dibblee, Jr., 1980), the subject site is underlain directly by Quaternary alluvium. However, the site is situated closely adjacent to a geologic contact separating the alluvium materials from bedrock materials of the Upper Cretaceous marine Panoche formation (Kp). The Panoche Formation is described as typically consisting of gray clayey shale, with minor thin sandstone beds. Structurally, the Panoche Formation strikes northwesterly and locally dips toward the northeast. Also, the site is located approximately 1,600 feet northeast of the mapped trace of the East Chabot Fault, and approximately 1.2 miles northeast of the mapped trace of the active Hayward Fault.

Review of boring logs prepared by AGS for wells MW1 through MW6 and borings B7 through B11 indicate that mudstone, siltstone, and shale bedrock materials underlie the site at relatively shallow depths varying from approximately 3 to 12 feet below grade.

The ground water flow direction at the site, as previously determined by AGS, has apparently remained reasonably consistent from July 1988 through May 1990, and has been reported to be toward the southwest and south-southwest.

The results of our subsurface study indicate that the site is underlain by silt and/or clay soil materials to depths below grade of about 3 feet at EB1, and 4 feet at MW7. These soil materials are inturn underlain by bedrock materials consisting of highly sheared shale, which is generally moderately to highly weathered. It is unclear where ground water was encountered during drilling of MW7, but it may be in the range of about 17 feet below grade. However, about four hours after completion of the drilling, ground water was measured at about 13-1/4 feet below grade in the well, and eventually stabilized at 9.63 feet below grade on May 23, 1991.

ANALYTICAL RESULTS

Ground water samples were analyzed at Sequoia Analytical Laboratory in Concord, California, and were accompanied by properly executed Chain of Custody documentation. The samples were analyzed for TPH as gasoline using EPA method 5030 in conjunction with modified 8015, and benzene, toluene, xylenes and ethylbenzene (BTX&E) using EPA method 8020. In addition, the ground water samples collected from monitoring wells MW5 and MW7 were analyzed for TPH as diesel

using EPA method 3510 in conjunction with modified 8015; the ground water sample from well MW7 was also analyzed for TOG using Standard Method 5520B&F, and halogenated volatile organics using EPA method 8010. The ground water sample collected from well MW5 on October 10, 1991, was analyzed for TPH as diesel only.

Analytical results of the ground water samples collected from monitoring wells MW2 and MW5 on September 20, 1991, indicated non-detectable levels of TPH as gasoline and BTX&E. Analytical results of the ground water sample collected from monitoring well MW7 on September 20, 1991, indicated a level of TPH as gasoline at a concentration of 1,400 ppb, with a benzene level detected at a concentration of 160 ppb. On September 20, 1991, TPH as diesel was detected in wells MW5 and MW7 at concentrations of 450 ppb and 580 ppb, respectively. In monitoring well MW7, TOG and all EPA method 8010 constituents were non-detectable. The resample collected from well MW5 on October 10, 1991, showed a non-detectable level of TPH as diesel. Results of the analyses are summarized in Table 2. Copies of the analytical results and Chain of Custody documentation are attached to this report.

DISCUSSION AND RECOMMENDATIONS

As shown in the attached Table 2, ground water samples collected from monitoring well MW5 during the six most recent quarters of sampling (March 1990 through September 20, 1991) have shown non-detectable levels of TPH as gasoline and BTX&E. However, the TPH as diesel level detected on September 20, 1991, appeared to be inconsistent with the historical non-detectable levels of hydrocarbon constituents in well MW5. Therefore, KEI resampled well MW5 on October 10, 1991, and the analytical results showed a non-detectable level of TPH as diesel. Thus, the non-detectable levels of TPH as diesel detected in well MW5 on October 10, 1991, appears to be more representative of actual water quality in the vicinity of well MW5 than the detectable level of TPH as diesel found in this well on September 20, 1991.

Based on the analytical results collected and evaluated to date, and no evidence of free product or sheen in any of the wells, KEI recommends the continuation of the current monitoring and sampling program of the existing wells, per KEI's proposal (KEI-P90-0806.P1) dated January 9, 1991, and per report KEI-P90-0806.R2, dated June 27, 1991. In addition, KEI recommends continuing to analyze off-site well MW5 for TPH as diesel in order to verify the non-detectable level indicated on October 10, 1991.

DISTRIBUTION

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

LIMITATIONS

Soil deposits and rock formations may vary in thickness, lithology, saturation, strength and other properties across any site. In addition, environmental changes, either naturally-occurring or artificially-induced, may cause changes in 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

Joel G. Greger
Certified Engineering Geologist

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

Timothy R. Ross
Project Manager

\cmd

Attachments: Tables 1, 2, 2a, 3, 4, 5 & 6
Location Map
Site Plans - Figures 1 through 7
Laboratory Results
Chain of Custody documentation

KEI-P90-0806.QR1
November 7, 1991

TABLE 1

SUMMARY OF MONITORING DATA

Well No.	Ground Water Elevation (feet)	Depth to Water (feet)	Product Thickness	Sheen	Water Purged (gallons)
(Monitored and Sampled on October 10, 1991)					
MW5	214.44	10.98	0	No	35
(Monitored and Sampled on September 20, 1991)					
MW2	221.62	7.85	0	No	10
MW4	217.58	10.50	0	No	0
MW5	214.62	10.80	0	No	29
MW6	230.77	8.61	0	No	0
MW7	220.20	11.46	0	No	7
(Monitored on August 21, 1991)					
MW2	222.05	7.42	0	No	0
MW4	218.03	10.05	0	No	0
MW5	215.11	10.31	0	No	0
MW6	231.02	8.36	0	No	0
MW7	220.62	11.04	0	No	0
(Monitored on July 20, 1991)					
MW2	222.23	7.24	0	No	0
MW4	218.13	9.95	0	No	0
MW5	215.20	10.22	0	No	0
MW6	231.37	8.01	0	No	0
MW7	220.96	10.70	0	No	0

Well	Well Cover Elevation* (feet)
MW2	229.47
MW4	228.08
MW5	225.42
MW6	239.38
MW7	231.66

* Elevations of top of well covers surveyed relative to Mean Sea Level.

KEI-P90-0806.QR2
November 7, 1991

TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Number	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
10/10/91	MW5	ND	--	--	--	--	--
9/20/91	MW2	--	ND	ND	ND	ND	ND
	MW5	450	ND	ND	ND	ND	ND
	MW7*	580	1,400	160	0.75	130	89
5/23/91	MW2	--	ND	ND	ND	ND	ND
	MW4	--	ND	ND	ND	ND	ND
	MW5	--	ND	ND	ND	ND	ND
	MW6	--	ND	ND	ND	ND	ND
	MW7**	540	3,000	160	1.2	120	25
Detection Limits		50	30	0.3	0.3	0.3	0.3

-- Indicates analysis not performed.

ND = Non-detectable.

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

** TOG and all EPA method 8010 constituents were non-detectable, except for 3.4 ppb of 1,2-dichloroethane.

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

KEI-P90-0806.QR2
November 7, 1991

TABLE 2a

WATER - MONITORING WELLS

(Data derived from AGS Report 18061-6, dated 4/19/91)

Sample	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
		(Collected in February 1991)			
MW2	280	2.6	<0.50	0.9	0.7
		(Collected in November 1990)			
MW2*	190	1.6	<0.50	0.8	0.7
MW4	<20	<0.50	<0.50	<0.50	<0.50
MW5*	<20	<0.50	<0.50	<0.50	<0.50
MW6	<20	<0.50	<0.50	<0.50	<0.50
		(Collected in August 1990)			
MW2*	630	13	1.0	10	7.2
MW4	<20	<0.50	<0.50	<0.50	<0.50
MW5*	<20	<0.50	<0.50	<0.50	<0.50
MW6	<20	<0.50	<0.50	<0.50	<0.50
		(Collected in May 1990)			
MW2	1,100	9.7	0.95	48	14
MW4	<20	<0.50	<0.50	<0.50	<0.50
MW5	<20	<0.50	<0.50	<0.50	<0.50
MW6	<20	<0.50	<0.50	<0.50	<0.50
		(Collected in March 1990)			
MW2*	420	5.0	<0.50	17	3.0
MW4	<20	<0.50	<0.50	<0.50	<0.50
MW5*	<20	<0.50	<0.50	<0.50	<0.50
MW6	<20	<0.50	<0.50	<0.50	<0.50
		(Collected in November 1989)			
MW2*	720	1.4	1.4	34	5.9
MW4	<20	<0.50	<0.50	<0.50	<0.50
MW5*	<20	<0.50	<0.50	0.63	<0.50
MW6	<20	<0.50	<0.50	<0.50	<0.50

KEI-P90-0806.QR2
November 7, 1991

TABLE 2a (Continued)

WATER - MONITORING WELLS

(Data derived from AGS Report 18061-6, dated 4/19/91)

Sample	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
			(Collected in August 1989)		
MW6	26	<0.50	<0.50	<0.50	<0.50
			(Collected in June 1989)		
MW1	WELL DESTROYED DURING TANK EXCAVATION				
MW2	550	2.7	1.9	34	10
MW3	WELL DESTROYED DURING TANK EXCAVATION				
MW4	<20	<0.50	<0.50	<0.50	<0.50
MW5	<20	0.83	<0.50	0.94	0.57
			(Collected in January 1989)		
MW1	410	6.5	10.4	44.2	11.8
MW2	4,040	103	673	527	78
MW3	WELL NOT SAMPLED - FLOATING PRODUCT				
			(Collected in October 1988)		
MW1	1,420	13.2	4.1	58.1	163.8
MW2	1,140	80	10	26.0	25
MW3	WELL NOT SAMPLED - FLOATING PRODUCT				
			(Collected in July 1988)		
MW1	540	6.1	82.7	180.3	35.6
MW2	1,080	72	139	157.0	33
MW3	7,800	385	640	2,258	369

* TOG and all EPA method 601 or 624 compounds were non-detectable.

< = Less than the reported limit of detection for the method of analysis used.

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

KEI-P90-0806.QR2
November 7, 1991

TABLE 3

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample Number	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
5/7/91	EB1(3)	3.0	--	1.8	ND	0.0066	0.12	0.050
	EB1(6.5)	6.5	--	33	0.16	0.13	3.6	0.73
	MW7(4.5)*	4.5	ND	ND	ND	0.013	0.013	ND
	MW7(10)*	10.0	3.1	19	0.048	0.0086	1.6	0.50
	MW7(13)*	13.0	9.1	130	0.51	0.25	2.5	1.9
Detection Limits			1.0	1.0	0.0050	0.0050	0.0050	0.0050

-- Indicates analysis not performed.

ND = Non-detectable.

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

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

KEI-P90-0806.QR2
November 7, 1991

TABLE 4

SOIL SAMPLES

(Data obtained from AGS Report 18061-1, dated 8/3/88 for MW1, MW2 and MW3, collected on 7/12-13/88)

Sample #	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
S-15-B1	15	3	0.06	0.56	1.21	0.24
S-5-B2	5	12	0.16	0.92	3.58	0.66
S-5-B3	5	79	0.83	6.63	26.12	3.81

(Data obtained from AGS Report 18061-3, dated 9/11/89 for MW4, MW5 and MW6, collected on 5/23-24/89 and 6/5/89)

Sample #	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
S-8.5-B4	8.5	<2.0	<0.050	<0.050	<0.050	<0.050
S-13.5-B4	13.5	<2.0	<0.050	<0.050	<0.050	<0.050
S-8.5-B5	8.5	<2.0	<0.050	<0.050	<0.050	<0.050
S-13.5-B5	13.5	2.4	<0.050	<0.050	<0.050	<0.050
S-8.5-B6	8.5	<2.0	<0.050	<0.050	<0.050	<0.050
S-13.5-B6	13.5	<2.0	<0.050	<0.050	<0.050	<0.050

NOTE: B1 in sample designation refers to MW1, etc.

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

KEI-P90-0806.QR2
November 7, 1991

TABLE 5

SOIL SAMPLES - TANK PIT EXCAVATION

(Data obtained from AGS Report 18061-4,
dated March 30, 1990)

Sample #	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	TOG
S-6-T1a	6	2,100	13	110	230	37	--
S-6-T1b	6	1,800	5.6	89	210	35	--
S-6-T2a	6	4,300	12	150	350	57	--
S-6-T2b	6	1,400	9.7	100	270	47	--
S-6-T2S	6	1,800	4.2	48	240	39	--
S-15-Tb1	15	<2.0	<0.050	0.056	0.15	<0.050	--
S-14-Tb2	14	<2.0	<0.050	<0.050	<0.050	<0.050	--
S-14-Tb3	14	<2.0	<0.050	<0.050	<0.050	<0.050	--
S-15-Tb4	15	8.9	<0.050	0.27	0.88	0.13	--
S-12-WF	12(?)	<2.0	<0.050	<0.050	<0.050	<0.050	--
S-0728-1A	*	<2.0	<0.050	<0.050	<0.050	<0.050	--
S-15-PIT	15	3.4	<0.050	<0.050	<0.050	<0.050	--
S-0803-1B	*	<2.0	<0.050	<0.050	<0.050	<0.050	--
S-0803-1W	**	<2.0	<0.050	<0.050	<0.050	<0.050	--
S-0711-WT1+	8	480	<1.0	12.0	74.0	15.0	1,300
S-0711-WT2+	8	87	<0.5	1.3	9.1	2.1	1,800
S-0719-1A/1B	11.5	<2.0	<0.050	<0.050	<0.050	<0.050	--
S-0724-1A/1B	12	<2.0	<0.050	<0.050	<0.050	<0.050	--
S-0628-WT1,2+	7	650	<2.0	8.0	26.0	3.0	19,000
S-0705-4A-4B+	7	110	0.026	0.110	0.480	0.065	1,200

-- Indicates analysis not performed.

* Floor of Excavation.

** Sidewall of Excavation.

+ VOC was non-detectable other than BTX&E, except in composite sample S-00628-WT1,2 which showed levels of various halogenated volatile organics ranging from non-detectable to 0.0078 ppm.

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

KEI-P90-0806.QR2
November 7, 1991

TABLE 6

SOIL SAMPLES FROM BORINGS B7 THROUGH B11

(Collected on November 17-18, 1989 - Data obtained from AGS Report 18061-5, dated July 3, 1990)

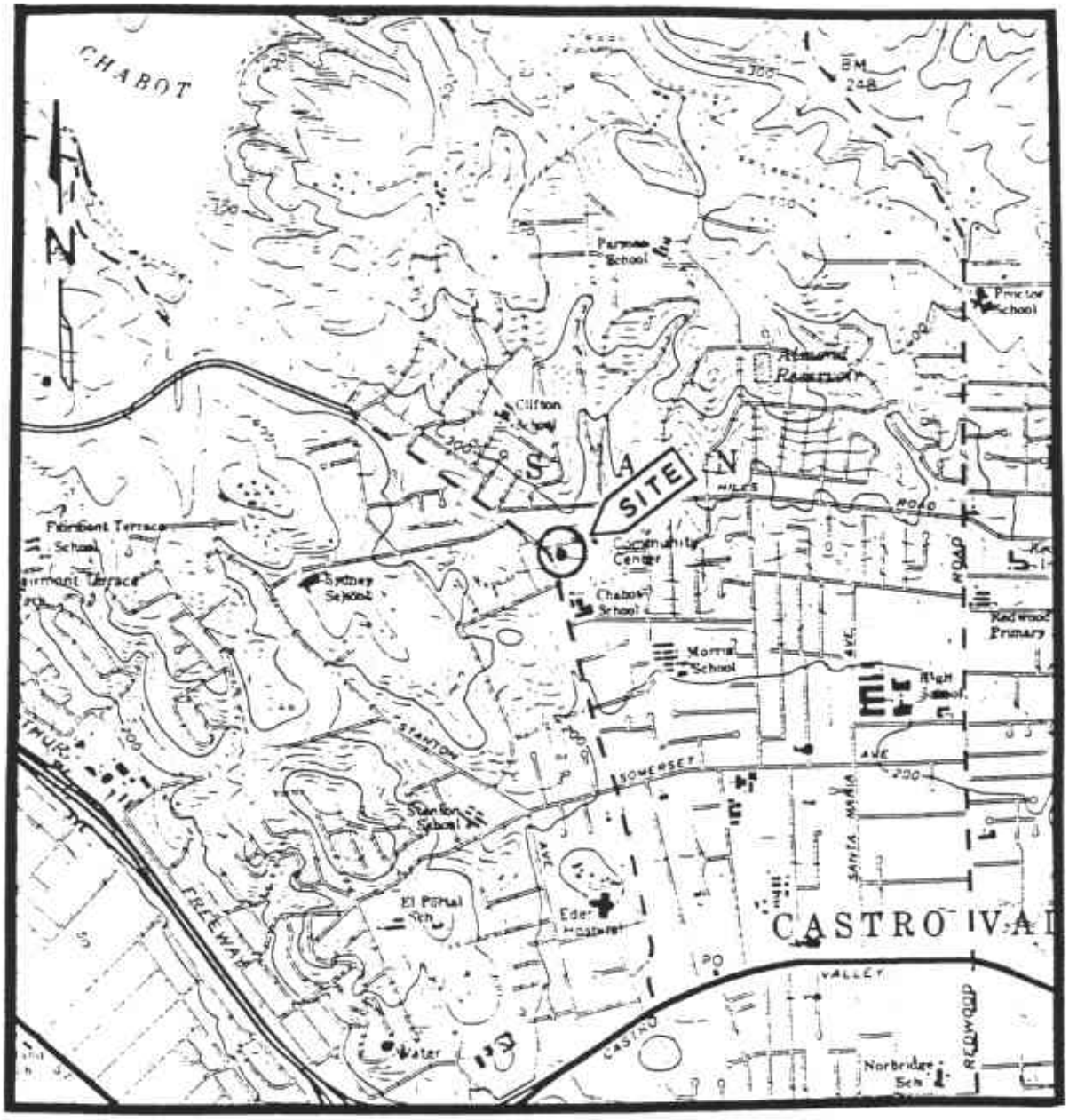
Sample #	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	TOG	EPA 8010
S-5.0-B7	5	<2	<0.050	<0.050	0.090	<0.050	--	--
S-10.0-B7	10	6.1	0.062	0.540	0.910	160	--	--
S-15.0-B7	15	--	--	--	--	--	--	ND
S-20.0-B7	20	--	--	--	--	--	--	ND
S-5.0-B8	5	--	--	--	--	--	--	ND
S-9.5-B8	9.5	200	0.340	0.910	23.0	4.1	--	--
S-10.0-B8	10	--	--	--	--	--	--	ND
S-15.0-B8	15	66	0.120	0.430	5.90	1.1	--	--
S-10.0-B9	10	86	1.1	0.670	3.70	2.0	--	--
S-17.0-B9	17	3.7	<0.050	0.092	0.130	0.076	--	--
S-10.0-B10	10	220	0.270	<0.050	16.0	5.6	--	--
S-19.5-B10	19.5	16	0.081	0.120	1.80	0.620	--	--
S-10.0-B11	10	45	0.074	0.330	3.10	1.2	<50	--
S-14.5-B11	14.5	--	--	--	--	--	--	ND
S-15.0-B11	15	3.4	<0.050	0.061	2.50	0.086	<50	--

-- Indicates analysis not performed.

ND = Non-detectable.

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

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

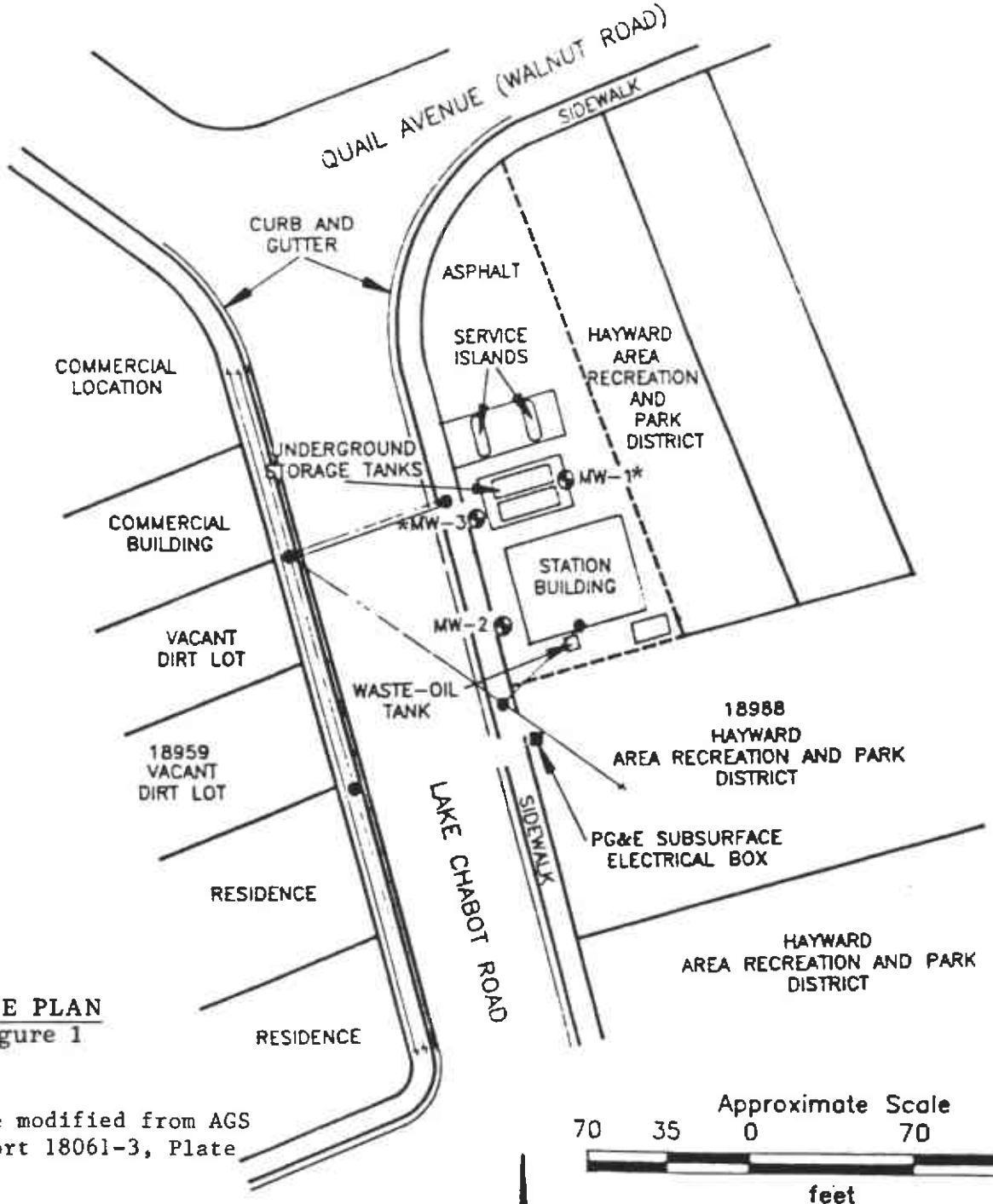


LOCATION MAP

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

Unocal S/S #5484
18950 Lake Chabot Road
Castro Valley, CA

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



SITE PLAN
Figure 1

Base modified from AGS report 18061-3, Plate P-1

Approximate Scale
70 35 0 70 140
feet

● = Existing monitoring well location

—— = Overhead power/telephone line

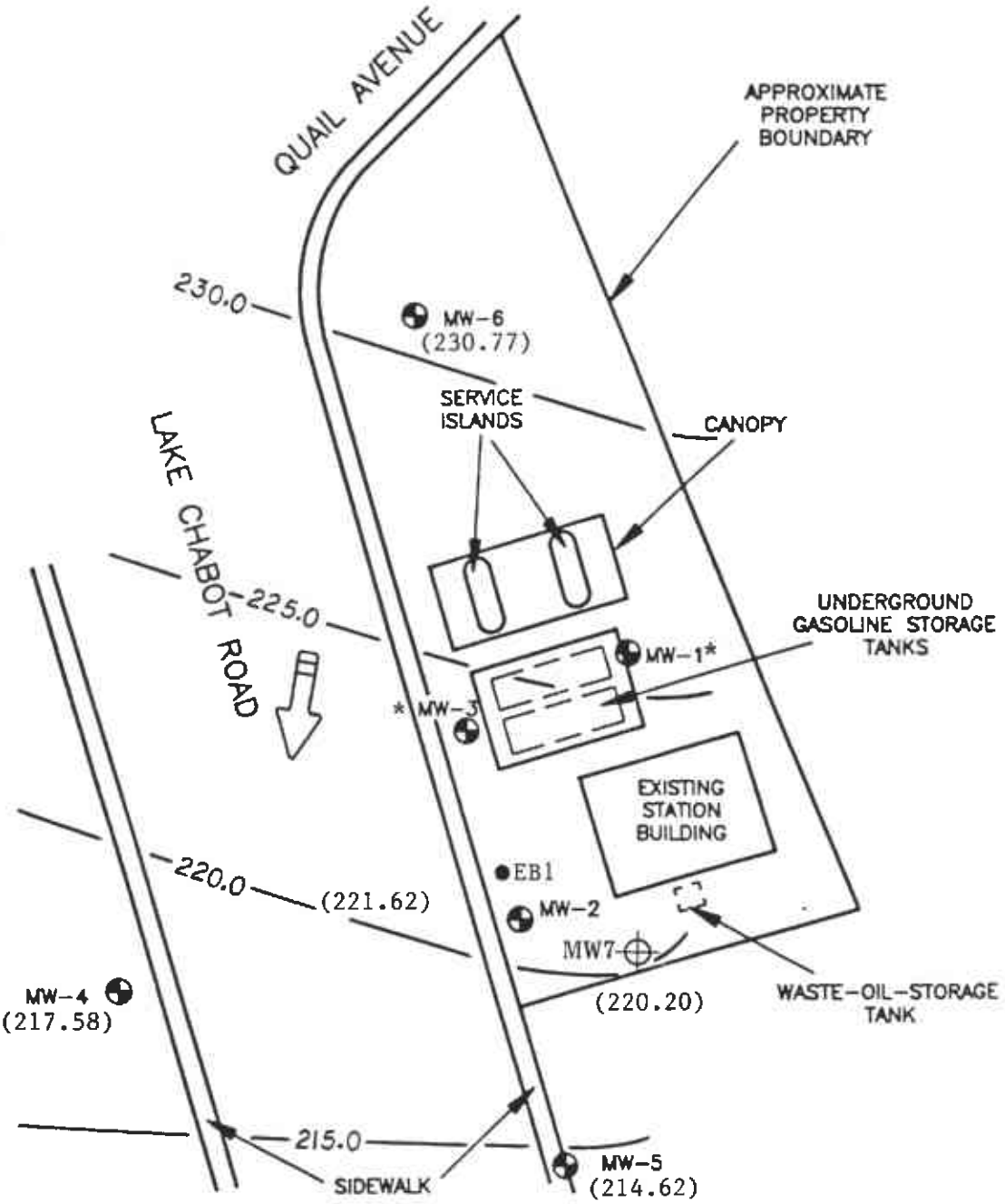
● = Poles

* Wells MW-1 and MW-3 were destroyed

N

Unocal S/S #5484
18950 Lake Chabot Road
Castro Valley, CA

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



SITE PLAN
Figure 2

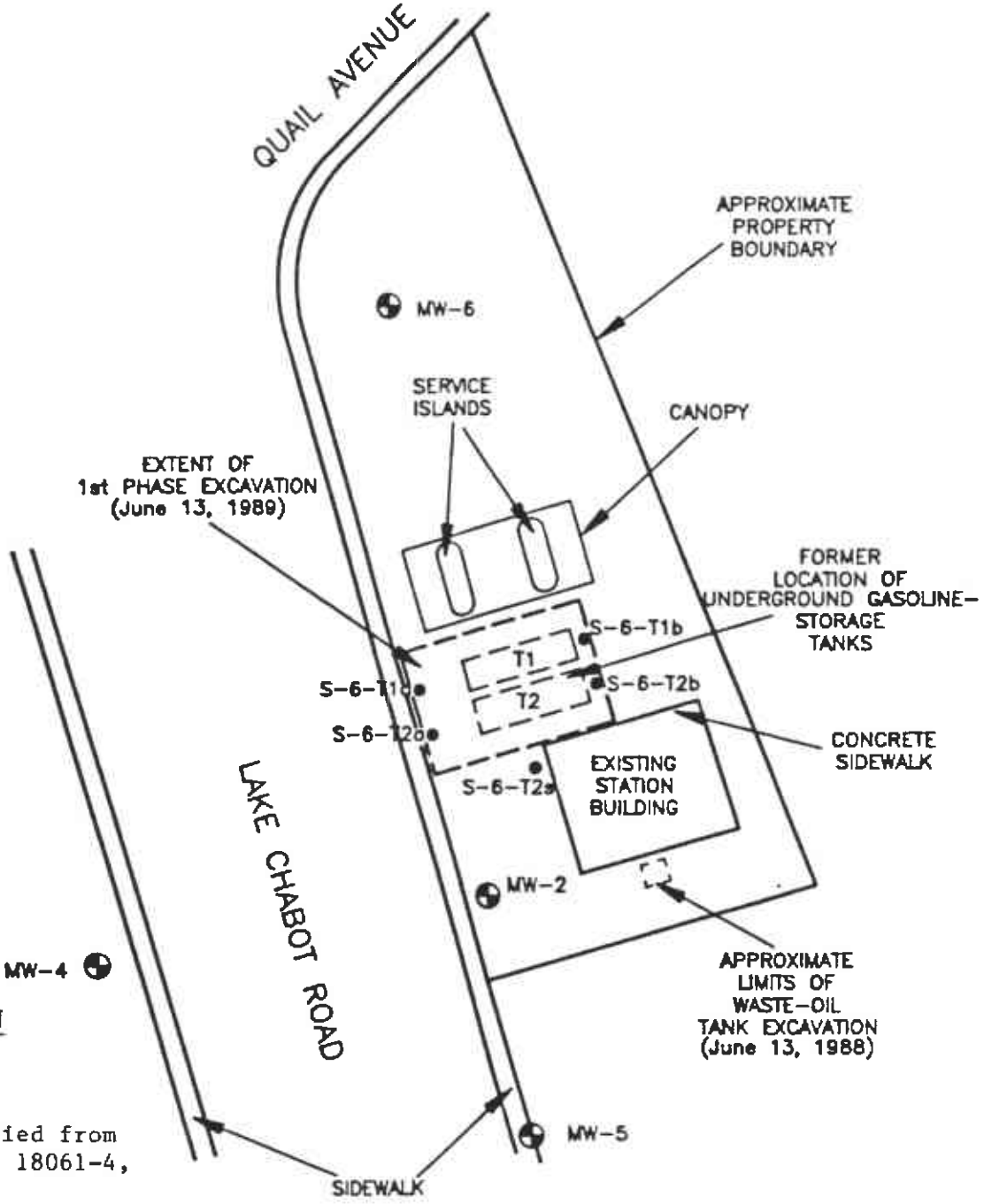
Base modified from AGS report 18061-4, Plate P-2

Approximate Scale
40 20 0 40 80
feet

- ⊕ Monitoring well (by KEI)
- ● Exploratory boring (by KEI)
- ◓ Monitoring well (by AGS)
- ( ) Elevation of ground water table in feet above Mean Sea Level on 9/20/91
- ⇨ Direction of ground water flow
- * Wells MW-1 and MW-3 were destroyed

Unocal S/S #5484
18950 Lake Chabot Road
Castro Valley, CA

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



SITE PLAN
Figure 3

Base modified from AGS report 18061-4, Plate, P-3

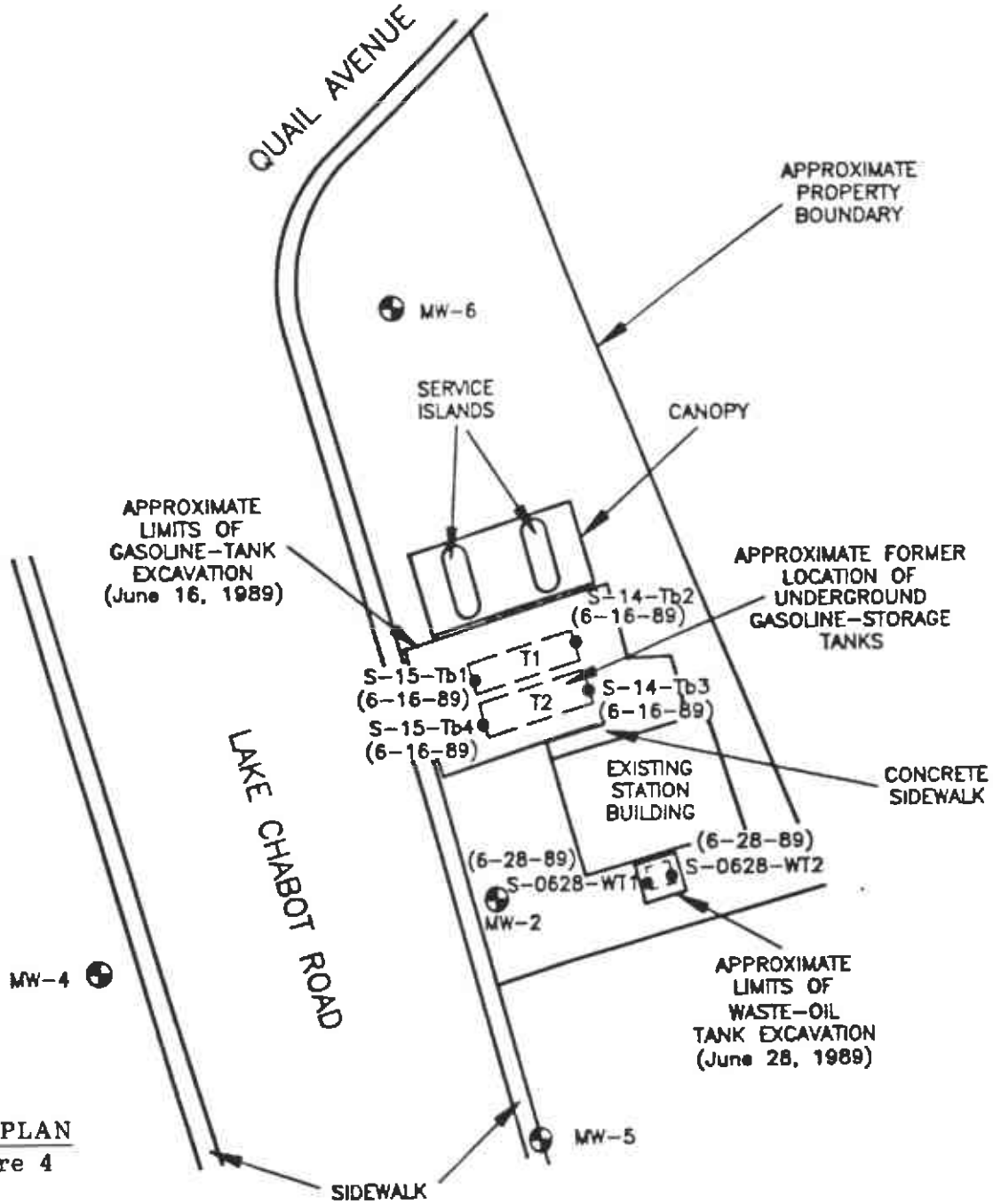
---------- = Sidewalls of excavation
S-6-T2s● = Soil sample point
└→ = Sample depth
MW-6 ⊕ = Monitoring well

N

Approximate Scale
40 20 0 40 80
feet

Unocal S/S #5484
18950 Lake Chabot Road
Castro Valley, CA

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



SITE PLAN
Figure 4

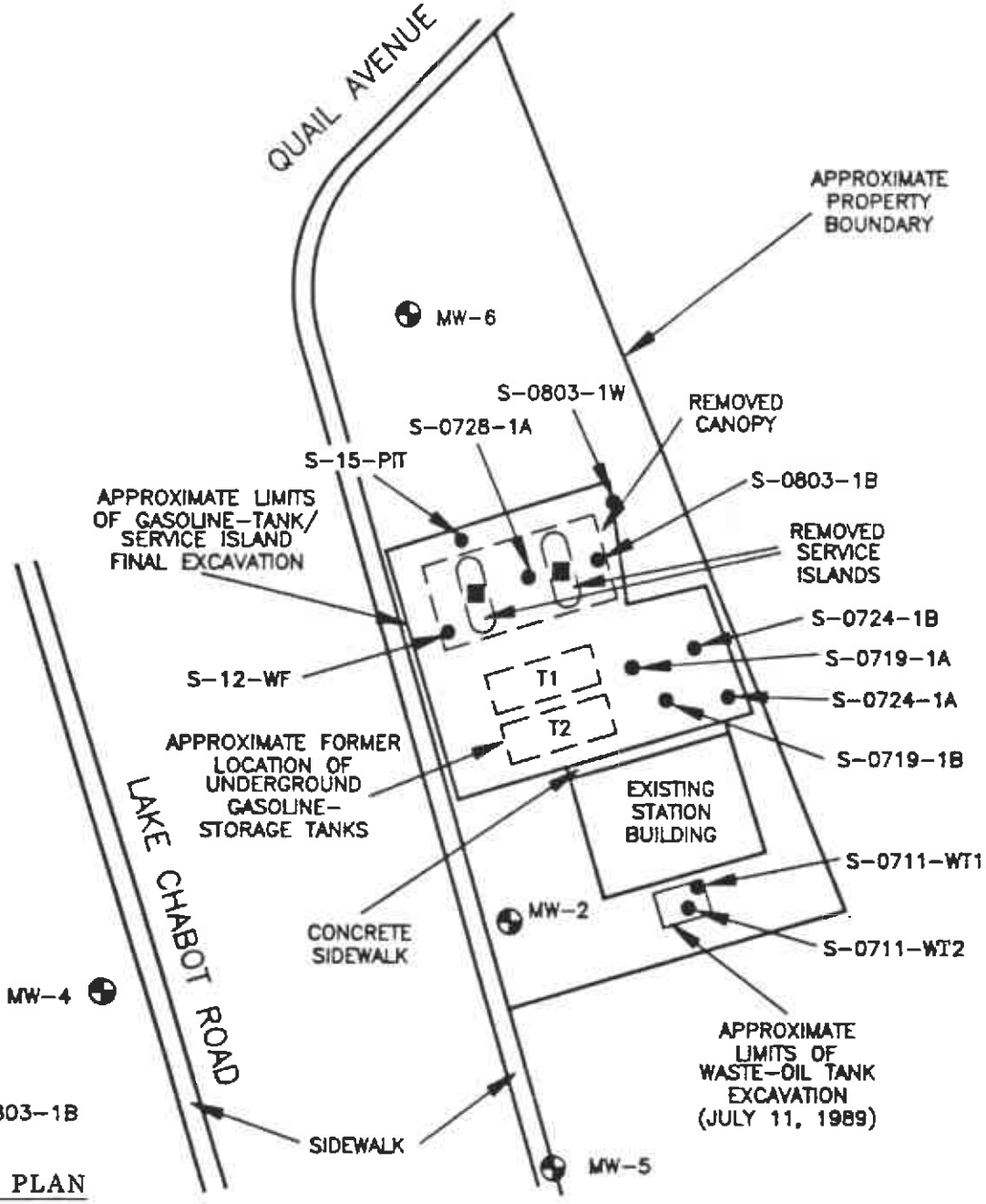
Base modified from AGS report 18061-4, Plate P-4

S-15-Tb4 ● = Soil sample point
└→ = Sample depth
MW-6 ⊕ = Monitoring well

Approximate Scale
40 20 0 40 80
feet

Unocal S/S #5484
18950 Lake Chabot Road
Castro Valley, CA

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



SITE PLAN
Figure 5

Base modified from AGS report 18061-4, Plate P-6

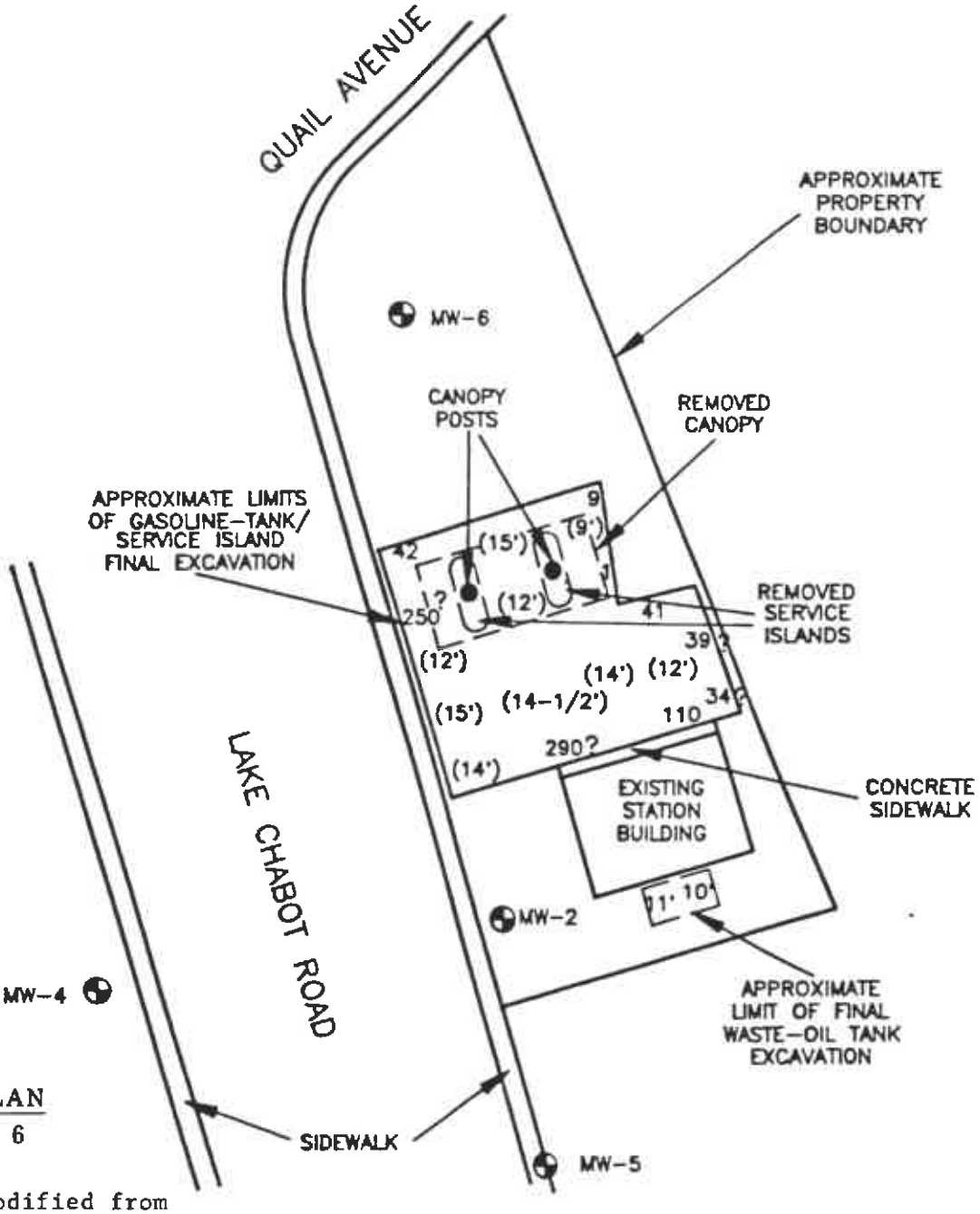
S-0803-1B ● = Soil sample point
■ = Canopy posts
MW-6 ⊕ = Monitoring well

N

Approximate Scale
40 20 0 40 80
feet

Unocal S/S #5484
18950 Lake Chabot Road
Castro Valley, CA

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P.O. BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX (707) 746-5581



SITE PLAN
Figure 6

Base modified from AGS report 18061-4, Plate P-7

(15') = Approximate depth of excavation in feet

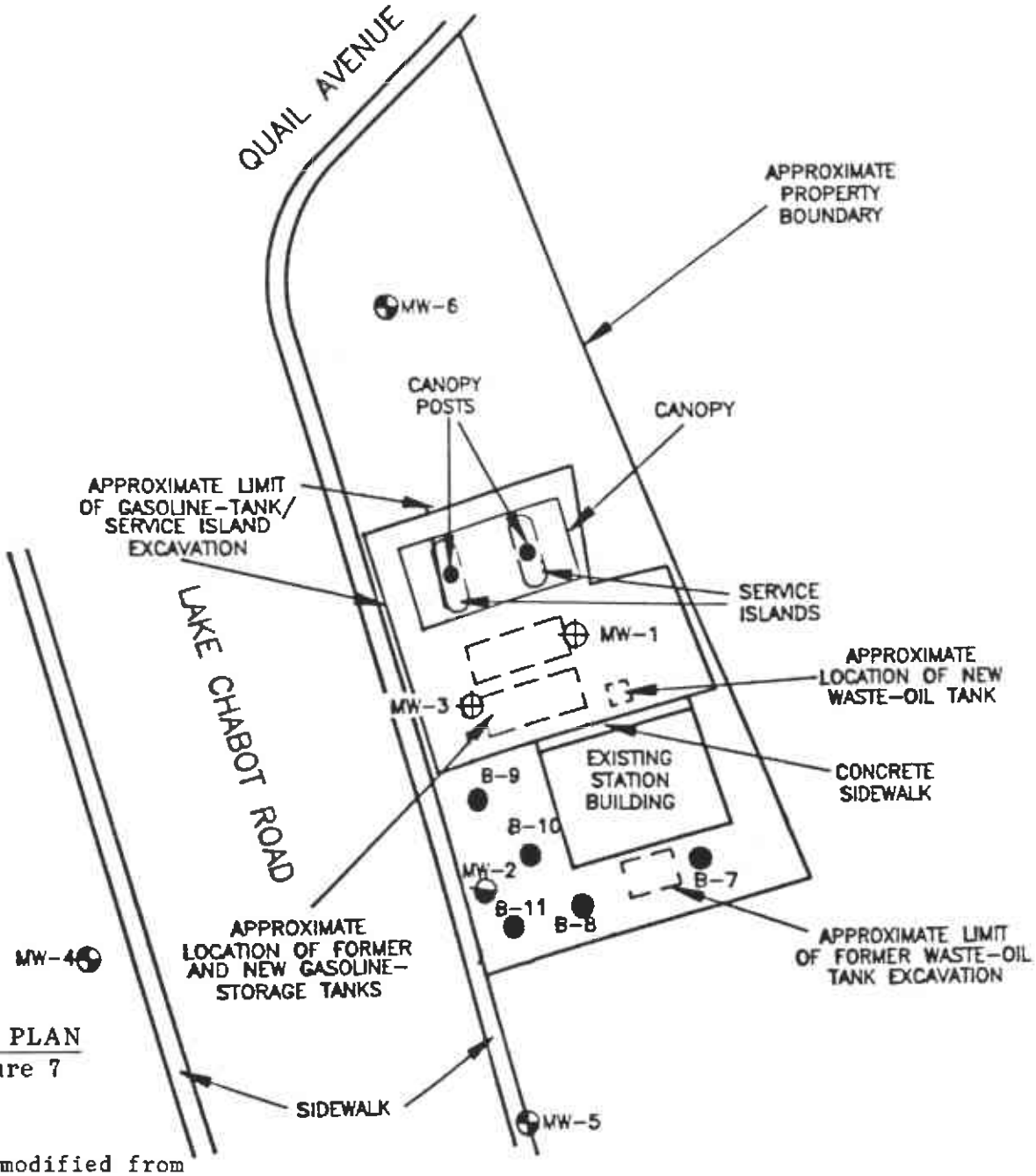
290 = OVM reading in sidewall of excavation in ppm

#-6 = Monitoring well

Approximate Scale
40 20 0 40 80
feet

Unocal S/S #5484
18950 Lake Chabot Road
Castro Valley, CA

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
PO BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581



SITE PLAN
Figure 7

Base modified from AGS report 18061-5, Plate P-9

Approximate Scale
40 20 0 40 80
feet

B-12 ● = Soil boring
MW-6 ◔ = Monitoring well installed by Applied GeoSystems (1989)
MW-2 ◒ = Monitoring well installed by Applied GeoSystems (1988)
MW-3 ⊕ = Former monitoring well installed by Applied GeoSystems (1988)

Unocal S/S #5484
18950 Lake Chabot Road
Castro Valley, CA

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9066 • FAX (510) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Castro Valley, 18950 Lake Chabot Rd.	Sampled:	Oct 10, 1991
P.O. Box 996	Matrix Descript:	Water, MW-5	Received:	Oct 10, 1991
Benicia, CA 94510	Analysis Method:	EPA 3510/8015	Extracted:	Oct 10, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	110-0447	Analyzed:	Oct 11, 1991
			Reported:	Oct 17, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons µg/L (ppb)
110-0447	MW-5	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

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9066 • FAX (510) 686-9689

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

Client Project ID: Unocal, Castro Valley, 18950 Lake Chabot Rd.
QC Sample Group: 110-0447
Reported: Oct 17, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Diesel
Method:	EPA8015
Analyst:	A. Tuzon
Reporting Units:	ug/L
Date Analyzed:	Oct 10, 1991
QC Sample #:	BLK100891
Sample Conc.:	N.D.
Spike Conc. Added:	300
Conc. Matrix Spike:	260
Matrix Spike % Recovery:	85
Conc. Matrix Spike Dup.:	250
Matrix Spike Duplicate % Recovery:	83
Relative % Difference:	2.4

Laboratory blank contained the following analytes: None Detected

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9066 • FAX (510) 686-9689

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

Client Project ID: Unocal, Castro Valley, 18950 Lake Chabot Rd.
QC Sample Group: 110-0447
Reported: Oct 17, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA8015	EPA8015
Analyst:	A. Tuzon	A. Tuzon
Reporting Units:	ug/L	ug/L
Date Analyzed:	Oct 10, 1991	Oct 10, 1991
Sample #:	110-0447	110-0448
Surrogate % Recovery:	130	100

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: JOE

WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal / Castro Valley
18950 Lake Chabot Rd.

ANALYSES REQUESTED: TPHD

TURN AROUND TIME: 24 hrs.

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	REMARKS
MW-5	10/10/91	10:00 A.M.		✓	✓		1	MW	1100447

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Joe Jenian	10/10/91	10-10-91 16:30
K. Marcus	10-10-91 7:55 P	
	10/10/91 2130	
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? 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

Signature _____ Title _____ Date 10-10

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9066 • FAX (510) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal #5484/Castro Valley/	Sampled:	Sep 20, 1991
P.O. Box 996	Matrix Descript:	Water 18950 Lake Chabot Road	Received:	Sep 23, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Sep 27, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	109-1833 AB	Reported:	Oct 15, 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)
109-1833	MW2	N.D.	N.D.	N.D.	N.D.	N.D.
109-1834	MW5	N.D.	N.D.	N.D.	N.D.	N.D.
109-1835	MW7	1,400	160	0.75	89	130
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

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL
1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9066 • FAX (510) 686-9689

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

Client Project ID: Unocal #5484/Castro Valley/ 18950 Lake Chabot Road
QC Sample Group: 1091833-1835
Reported: Oct 15, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8015/8020	EPA 8015/8020	PA 8015/802	PA 8015/802	EPA 8015	EPA 8015
Analyst:	R.Halsne	R.Halsne	R.Halsne	R.Halsne	A. Tuzon	A. Tuzon
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Sep 27, 1991	Sep 27, 1991	Sep 27, 1991	Sep 27, 1991	Sep 25, 1991	Sep 25, 1991
Sample #:	109-1833	109-1834	109-1835	Blank	109-1834	Blank
Surrogate % Recovery:	96	99	85	150	150	130

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9066 • FAX (510) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal #5484/Castro Valley/	Sampled:	Sep 20, 1991
P.O. Box 996	Matrix Descript:	Water 18950 Lake Chabot Road	Received:	Sep 23, 1991
Benicia, CA 94510	Analysis Method:	EPA 3510/8015	Extracted:	Sep 25, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	109-1834 C	Analyzed:	Sep 30, 1991
			Reported:	Oct 15, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons µg/L (ppb)
109-1834	MW5	450
109-1835	MW7	580

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

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9066 • FAX (510) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal #5484/Castro Valley/	Sampled:	Sep 20, 1991
P.O. Box 996	Matrix Descript:	Water 18950 Lake Chabot Road	Received:	Sep 23, 1991
Benicia, CA 94510	Analysis Method:	SM 5520 B&F (Gravimetric)	Extracted:	Sep 26, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	109-1835 D	Analyzed:	Sep 30, 1991
			Reported:	Oct 15, 1991

TOTAL RECOVERABLE PETROLEUM OIL

Sample Number	Sample Description	Oil & Grease mg/L (ppm)
109-1835	MW7	N.D.

Detection Limits:	5.0

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

1091833.KEI <6>

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9066 • FAX (510) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal #5484/Castro Valley/	Sampled:	Sep 20, 1991
P.O. Box 996	Sample Descript:	Water, MW7 18950 Lake Chabot Road	Received:	Sep 23, 1991
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Oct 3, 1991
Attention: Mardo Kaprealian, P.E.	Lab Number:	109-1835 EF	Reported:	Oct 15, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

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

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9066 • FAX (510) 686-9689

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

Client Project ID: Unocal #5484/Castro Valley/
18950 Lake Chabot Road

QC Sample Group: 1091833-1835

Reported: Oct 15, 1991

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8010	EPA 8010
Analyst:	EH	EH
Reporting Units:	ug/L	ug/L
Date Analyzed:		
Sample #:	109-1835	Blank
Surrogate #1 % Recovery:	160	118
Surrogate #2 % Recovery:	91	89

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9066 • FAX (510) 686-9689

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

Client Project ID: Unocal #5484/Castro Valley/
18950 Lake Chabot Road
QC Sample Group: 1091833-1835

Reported: Oct 15, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Diesel	Oil & Grease	Benzene	Toluene	EthylBenzene	Xylenes
Method:	EPA 8015	SM 5520 B&F	PA 8015/802	PA 8015/802	PA 8015/802	PA 8015/8020
Analyst:	A. Tuzon	D. Newcomb	R. Halsne	R. Halsne	R. Halsne	R. Halsne
Reporting Units:	µg\L	mg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Sep 27, 1991	Sep 27, 1991	Sep 27, 1991	Sep 27, 1991	Sep 27, 1991	Sep 27, 1991
QC Sample #:	Blk092491	matrix blank	matrix blank	matrix blank	matrix blank	matrix blank
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	300	100	20	20	20	60
Conc. Matrix Spike:	240	97	24	20	24	76
Matrix Spike % Recovery:	80	97	120	100	120	130
Conc. Matrix Spike Dup.:	250	98	25	21	26	80
Matrix Spike Duplicate % Recovery:	82	98	120	100	130	130
Relative % Difference:	4.1	1	4.0	4.9	8.0	5.1

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9066 • FAX (510) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal #5484/Castro Valley/ 18950 Lake Chabot Road	
P.O. Box 996	Method (units):	EPA 8010/8020 (µg/L purged)	Q.C. Sample Dates
Benicia, CA 94510	Analyst(s):	M. Nuguyen	
Attention: Mardo Kaprealian, P.E.	QC Sample #:	B11400491ms/msd	Analyzed: Oct 3, 1991
			Reported: Oct 15, 1991

QUALITY CONTROL DATA REPORT

Analyte	Sample Conc.	Spike Conc. Added	Conc. Matrix Spike	Matrix Spike % Recovery	Conc. Matrix Spike Duplicate	Matrix Spike Duplicate % Recovery	Relative % Difference
1,1-Dichloro-ethene	N.D.	10	12	120	13	130	7.7
Trichloroethene	N.D.	10	13	130	14	140	7.1
Benzene	N.D.	10	9.7	97	11	110	3.0
Toluene	N.D.	10	8.8	88	9.3	93	5.5
Chlorobenzene	N.D.	10	9.6	96	9.7	97	1.0

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER	SITE NAME & ADDRESS	ANALYSES REQUESTED	TURN AROUND TIME:
(signature)	UNOCAL #5484/CASTRO VALLEY 18950 LAKE CHABOT ROAD		REGULAR
WITNESSING AGENCY			[redacted]

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPH-G	BTEX	TPH-D	TOG (5520 E&F)	8010			REMARKS
MW2	9/20			X	X		2		X	X						1091833 AB
MW5	"			X	X		3		X	X	X					1091834 A-C
MW7	"			X	X		6		X	X	X	X	X			1091835 A-F

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
(signature) (KEI)	9/20/91	AERO #715
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	9/20/91 1830	(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? 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

(signature)	Analyst	26 Sept 91
Signature	Title	Date