



**KAPREALIAN ENGINEERING, INC.**  
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KEI-P89-0301.P4  
July 23, 1991

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

Attention: Mr. Ron Bock

RE: Work Plan/Proposal  
Unocal Service Station #6277  
15803 East 14th Street  
San Leandro, California

INTRODUCTION

1. Site Description and Background:

The subject site is presently used as a gasoline station. The site is characterized by gently sloping, southwest trending topography, and is located approximately three miles northeast of the present shoreline of San Francisco Bay. A Location Map, Site Vicinity Map, and Site Plans are attached to this work plan/proposal.

Kaprealian Engineering, Inc.'s (KEI) work at the site began when KEI was asked to drill two exploratory borings (designated as EB1 and EB2 on the attached Site Plan, Figure 3) at the site. The borings were drilled on March 6, 1989, at the request of Alameda County. The borings were installed in order to explore for the possible presence of soil contamination in the vicinity of the proposed pit for the new underground storage tanks. The borings were drilled to depths of 10.5 and 13.5 feet below grade. Water was encountered in the borings at depths of 11 to 12 feet. Samples were analyzed at Sequoia Analytical Laboratory in Redwood City, California. Samples collected from borings EB1 and EB2 were analyzed for total petroleum hydrocarbons (TPH) as gasoline, and benzene, toluene, xylenes and ethylbenzene (BTX&E). Analytical results of the soil samples collected from a depth of 5 feet below grade in the borings had TPH as gasoline levels ranging from non-detectable to 2.1 ppm, while the soil samples collected from 10 feet below grade had levels of TPH as gasoline ranging from 200 ppm to 620 ppm. Based on results of the preliminary investigation, KEI recommended that the contractor excavate the tank pit to a depth of approximately 13 feet. Results of the exploratory boring investigation are presented in KEI's report (KEI-P89-0301.R1) dated March 13, 1989. Soil sample

results from that report are summarized in Table 5. Exploratory boring locations are as shown on the attached Site Plan, Figure 3.

KEI returned to the site on March 13, 1989, when three underground storage tanks were removed from the site. The tanks consisted of two 10,000 gallon fuel storage tanks and one 550 gallon waste oil tank. The tanks were made of steel, each with a tar and wrap coating, and no apparent holes or cracks were observed in any of the tanks. Due to the tar coating and wrapping, very little of the actual tank walls could be observed. Water was encountered in the fuel tank pit at a depth of about 11 feet, thus prohibiting the collection of any soil samples from immediately beneath the tanks. Six soil samples, labeled SW1, SW2, SW3, SW4, SW5 and SW6, were collected from the sidewalls of the fuel tank pit at a depth approximately 1 foot above the water table, and one sample, labeled W01, was collected from beneath the waste oil tank at a depth of about 10 feet below grade.

Based on the subjective evidence observed in the field, it was decided to excavate additional soil from three of the four tank pit walls. (The fourth tank pit wall, adjacent to the existing building, was not recommended to be excavated at that time). On March 14, 1989 four trenches were dug to define the limits of additional soil excavation needed. Four soil samples were then collected at a depth below grade of about 10 feet, and are referred to as SW3(15), SW4/5(6), SW6(12) and SW7(14). Sample SW7(14) was collected from the sidewall of the waste oil tank pit. After the soil sampling was completed, approximately 5,000 gallons of ground water were pumped from the fuel tank pit on March 15, 1989. However, due to ongoing soil excavation, contaminated soil was falling into the water and a representative ground water sample could not be collected.

On March 17, 1989 KEI again returned to the site. Additional soil was excavated, approximately 2 feet laterally, from the fourth tank pit wall adjacent to the building. One additional sidewall soil sample, labeled SW1(2), was collected at a depth below grade of about 10 feet at the location identified on the attached Site Plan, Figure 2. Following soil sampling, an additional 1,000 gallons of ground water were pumped from the excavation and one water sample, labeled W1, was collected from the fuel tank pit.

On March 23, 1989, KEI returned to the site for pipe trench sampling. Six soil samples, labeled P1, P2, P3, P4, P5 and P6, were collected beneath the product lines at depths below grade of about 3 to 3.5 feet.

Soil samples were analyzed by Sequoia Analytical Laboratory in Redwood City, California. Samples from the fuel tank pit were analyzed for TPH as gasoline, and BTX&E. The samples from the waste oil tank pit (W01 and SW7{14}) were analyzed for TPH as gasoline, TPH as diesel, total oil and grease (TOG) and EPA method 8240 constituents.

The analytical results of the soil samples, collected from the fuel tank pit, indicated TPH as gasoline levels ranging from 24 ppm to 150 ppm for samples SW3(15), SW4/5(6) and SW6(12). Sample SW1, adjacent to the existing building, showed 3,500 ppm of TPH as gasoline; however, SW1(2), which was collected after excavating 2 feet of sidewall toward the building, showed 100 ppm of TPH as gasoline. Sample SW2 showed 390 ppm of TPH as gasoline. Samples SW3, SW4, SW5 and SW6 were not analyzed because their locations were excavated and new samples [SW3(15), SW4/5(6) and SW6(12)] were collected. Analytical results of the soil samples collected from the waste oil tank pit indicated 280 ppm of TOG for W01, and 41 ppm of TOG for SW7(14). Analytical results of the soil samples (P1 through P6) collected from pipe trenches indicated levels of TPH as gasoline ranging from 1.1 ppm to 6.8 ppm.

Analytical results of the water sample (W1) collected from the old fuel tank pit indicated 19,000 ppb of TPH as gasoline and 230 ppb of benzene. The analytical results for the water sample are summarized in Table 6, and soil samples in Table 5.

Based on the analytical results, KEI recommended the installation of four ground water monitoring wells. The details of the soil sampling activities are presented in KEI's report (KEI-P89-0301.R3) dated March 27, 1989.

On May 24, 1989, four two-inch diameter monitoring wells, designated as MW1 through MW4, were installed at the site (see attached Site Plan, Figure 1). The four wells were drilled and completed to total depths ranging from 24.5 to 25 feet. Ground water was encountered at depths ranging from 11 to 12 feet beneath the surface during drilling. The wells were developed on June 5, 1989, and initially sampled on June 6, 1989. Water and selected soil samples were analyzed at Sequoia Analytical Laboratory in Redwood City, California. Samples were analyzed for TPH as gasoline and BTX&E. In addition, the sample collected from monitoring well MW2 was

analyzed for TPH as diesel, TOG, and EPA method 8010 constituents.

The analytical results of the soil samples collected from the borings for wells MW1, MW2, MW3 and MW4 showed levels of TPH as gasoline ranging from 2.3 ppm to 31 ppm, except in sample MW4(10), which showed a non-detectable level of TPH as gasoline, and in samples MW1(10) and MW2(5), which showed levels of 230 ppm and 290 ppm, respectively. The soil sample collected from MW2(5) also showed a TOG level of 7,700 ppm. The analytical results of water samples, collected from monitoring wells MW1 through MW4, showed non-detectable levels of BTX&E in all wells, and TPH as gasoline levels ranging from 32 ppb to 590 ppb. Documentation of the well installation, sampling techniques and sample results are provided in KEI's report (KEI-P89-0301.R6) dated June 26, 1989. Analytical results from that report are summarized in Tables 2, 2a and 5. Based on the analytical results, KEI recommended a monthly monitoring and quarterly sampling program for all of the wells and additional excavation of contaminated soil in the vicinity of MW2. The monitoring and sampling program was initiated in July, 1989, and the wells have been monitored on a monthly basis and sampled on a quarterly basis since that time. In KEI's second quarterly report (KEI-P89-0301.QR2) dated January 16, 1990, KEI recommended the installation of one additional off-site well (MW5) to further define the extent of ground water contamination at and in the vicinity of the site.

On February 1, 1990, well MW2 was destroyed in preparation for additional excavation in the vicinity of well MW2. Documentation of the well destruction is presented in a letter report dated March 7, 1990, addressed to Unocal Corporation.

In an attempt to remove as much of the contaminated soil as possible, KEI visited the site on March 30 and April 3, 1990 to observe soil excavation in the vicinity of previously abandoned monitoring well MW2, as indicated on the attached Site Plans, Figures 1 and 2. Soil was excavated to a grade corresponding to approximately 6 to 12 inches below the level of the ground water, which was encountered at a depth of about 11.5 feet below grade.

After excavation, four soil samples, labeled SW8A, SW9A, SW10A and SW11A, were collected from the sidewalls of the excavation, approximately 6 to 12 inches above ground water. Sample locations and the area excavated are as shown on the attached Site Plan, Figure 2. Soil excavation activities were terminated due to the close proximity of the former and new

underground storage tank pits and the property line of the site. After sampling, approximately 9,400 gallons of water were pumped from the excavation.

All samples were analyzed by Sequoia Analytical Laboratory in Redwood City, California. All soil samples were analyzed for TPH as gasoline, BTX&E, TPH as diesel, TOG, and EPA method 8010 constituents.

Analytical results of soil sample SW9A indicated non-detectable levels of TPH as gasoline and TPH as diesel. Analytical results of soil samples SW8A, SW10A and SW11A indicated levels of TPH as gasoline ranging from 140 ppm to 1,100 ppm, while levels of TPH as diesel ranged from non-detectable to 280 ppm. Analytical results also indicated non-detectable levels of EPA method 8010 constituents and TOG for all four samples, except for sample SW11A, which showed 210 ppm of TOG. Results of the soil analyses are summarized in Table 4. Details of the soil sampling activities are presented in KEI's report (KEI-P89-0301.R7) dated May 2, 1990.

On March 12, 1991, one two-inch diameter monitoring well (designated as MW2A on the attached Site Plan, Figure 1) was installed at the site. Well MW2A was installed in the vicinity of former well MW2 and is intended to be a replacement for well MW2, which was destroyed in preparation for adjacent soil excavation activities. The well was drilled and completed to a total depth of 25.5 feet. Ground water was encountered at a depth of about 14.8 feet beneath the surface during drilling. The surface of the new well cover and all previously existing well covers were surveyed by Kier & Wright of Pleasanton, California, to Mean Sea Level (MSL) and to a vertical accuracy of 0.01 feet. Well MW2A was developed on March 13, 1991 and all wells were sampled on March 15, 1991.

Water samples from all wells, and selected soil samples from the boring of MW2A, were analyzed at Sequoia Analytical Laboratory in Concord, California. The samples were analyzed for TPH as gasoline and BTX&E. In addition, the soil and water samples collected from MW2A were analyzed for TPH as diesel, TOG, and EPA method 8010 compounds.

Analytical results of the soil samples collected from boring MW2A indicated non-detectable levels of TPH as gasoline and benzene in all analyzed samples, except in sample MW2A(10), which had a TPH as gasoline level of 10 ppm, with a benzene level of 0.12 ppm. Levels of TPH as diesel ranged from non-detectable to 4.8 ppm with TOG levels ranging from 57 ppm to 1,300 ppm. Non-detectable levels of all EPA method 8010

constituents were encountered, except for 110 ppb of 1,2-dichlorobenzene and 120 ppb of tetrachloroethene in MW2A(10). Analytical results of the water samples collected from monitoring wells MW1 through MW4, on March 15, 1991, indicated levels of TPH as gasoline ranging from 53 ppb to 160 ppb with benzene levels at 21 ppb and 2.5 ppb in wells MW1 and MW2A. Benzene was non-detectable in wells MW3 and MW4. Also, TPH as diesel, TOG and EPA method 8010 constituents were non-detectable in well MW2A, except for cis-1,2-dichloroethene at 2.6 ppb, tetrachloroethene at 67 ppb and trichloroethene at 8.2 ppb. Results of the soil analyses are summarized in Table 3, and water analyses in Tables 2 and 2a.

Documentation of well installation, sample collection and analytical results are presented in KEI's report (KEI-P89-0301.R8) dated April 16, 1991. Based on the analytical results, KEI recommended continuation of the monthly monitoring and quarterly sampling program.

## 2. Hydrology and Regional Geology:

Based on the water level data gathered during the most recent quarter, ground water flow direction appeared to be toward the north on June 10, 1991, slightly changed from the north-northeast flow direction reported on March 15, 1991. The average hydraulic gradient at the site on June 10, 1991 was approximately 0.002. The measured depth to ground water at the site on June 10, 1991 ranged between 9.92 and 11.43 feet, as shown on Table 1.

Based on review of regional geologic maps (U.S. Geological Survey Professional Paper 943 "Flatland Deposits - Their Geology and Engineering Properties and Their Importance to Comprehensive Planning" by E.J. Helley and K.R. Lajoie, 1979), the subject site is underlain by Late Pleistocene alluvium (Qpa). The Late Pleistocene alluvium is described as typically consisting of weakly consolidated, poorly sorted, irregular interbedded clay, silt, sand, and gravel with a reported unknown maximum thickness, but is at least 150 feet thick. This alluvium is assumed to overlay bedrock and deformed older sedimentary deposits on the alluvial plain marginal to San Francisco Bay. In addition, the site is situated approximately 1,700 to 3,600 feet southwest of various mapped splays of the active Hayward Fault.

The results of our previous subsurface study indicates that the site is underlain by fill materials to a depth of about 2 to 5 feet below grade, which are in turn underlain by silty clay materials to the maximum depth explored (25 feet). The

results of our recent subsurface study indicate that at the vicinity of MW2A, the site is underlain by fill materials extending to a depth of about 5 feet below grade, which are in turn underlain by highly expansive clay materials to a depth of about 11.5, feet and further underlain by clay and silty clay materials to the maximum depth explored (25.5 feet).

#### PROPOSED FIELD WORK

##### PHASE II - DEFINING THE EXTENT OF SUBSURFACE CONTAMINATION

1. KEI proposes to install one two-inch diameter monitoring well, designated as MW5 on the attached Site Vicinity Map, using hollow-stem auger equipment. (MW5 was originally proposed to be installed on the private property northwest of the Unocal site. However, KEI understands that Unocal Corporation encountered difficulty in securing access to this private property.) Permits will be obtained from the Alameda County Flood Control District and the City of San Leandro, as necessary, prior to beginning work.

The well will be drilled about 10 feet into the saturated zone of the first encountered ground water unless a 5 foot thick clay aquitard is encountered first, at which time drilling will be terminated. Due to space limitations, a portable drill rig will be used to install this well.

2. Soil samples will be collected at a maximum spacing of 5 foot intervals, significant changes in lithology, at obvious areas of contamination, and at/or within the soil/ground water interface, beginning at a depth of about 4 to 5 feet below grade. Sampling for laboratory analyses and lithologic logging purposes will continue until the first water table is encountered. Sampling for lithologic logging purposes only will continue below the water table to the total depth drilled. Classification of soil will be done using the Unified Soils 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. Samples will be removed from the sampler and retained in brass liners. The liners will be sealed with aluminum foil, plastic caps and tape. They will be labeled and stored on ice for delivery to a state certified laboratory.

3. Finalized Boring Logs will be prepared from field logs and submitted to the Alameda County Flood Control District, and to the Regional Water Quality Control Board (RWQCB), San Francisco Bay Region.
4. Ground water is anticipated at approximately 10 to 11 feet below grade based on the ground water level found in the existing monitoring wells.

5. Well Construction:

Casing Type: Schedule 40 PVC, flush threaded joints, 0.010 inch factory slot, two-inch diameter. Screen to run from total depth of the well to approximately 5 feet above the depth of the first encountered ground water. Monterey sand (#2/16) will fill the annular space from total depth to 2 feet above the perforated casing interval. A two foot thick bentonite seal will be placed in the annular space on top of the sand pack. Neat cement grout will be placed on top of the bentonite seal to the surface.

The well casing will be secured with a waterproof cap and a padlock. A round, watertight, flush-mounted well cover will be concreted in place over the top of the casing.

6. Water levels will be measured with an electronic sounder. The well will be developed using a surface pump approximately one week after well completion. The well will be pumped until expelled water is clear and free of turbidity. Effluent generated during well development will be contained in DOT-approved drums and hauled from the site by a licensed hazardous materials hauler.

The elevation of the well cover over MW5 will be surveyed by a licensed land surveyor to MSL and to a vertical accuracy of 0.01 feet.

7. Ground Water Sampling:

The well will be purged with a surface bailer a minimum of four casing volumes prior to sampling and at least 72 hours after development. After recovery, samples will be collected using a clean Teflon bailer and promptly decanted into 40 ml VOA vials and/or one liter amber bottles, as appropriate. Vials and/or bottles will be sealed with Teflon-lined screw caps, labeled and stored on ice for delivery to a state certified laboratory. The sampling bailer will be cleaned with soap and a clean water rinse between uses.



All wells will be checked for free product and sheen (using an interface probe and/or paste tape) prior to development and sampling.

Properly executed Chain of Custody documentation will accompany all samples.

8. Laboratory Analyses:

Water and selected soil samples from MW5 will be analyzed by Sequoia Analytical Laboratory in either Concord or Redwood City, California, both state certified laboratories, for TPH as gasoline using EPA method 5030 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 soil and ground water.

9. Hydrology:

Ground water flow direction will be determined from the survey data and water table depths from both the new and existing wells. The flow direction will be shown on the Site Plan.

10. Ongoing Pumping, Monitoring and Sampling:

10.1 All monitoring wells will be monitored on a monthly basis. The elevation of the water table will be recorded, and any abnormal conditions noted during the inspection, including presence of product and sheen, will be documented.

10.2 Ground water from all monitoring wells will be purged, sampled and analyzed for TPH as gasoline and BTX&E on a quarterly basis. In addition, ground water from MW2A will be analyzed for TPH as diesel. Prior to sampling, water table elevation will be recorded as well as the presence of any free product.

10.3 Quarterly technical reports will be prepared and submitted that summarize the field activity, water sampling techniques and analyses, along with discussion and recommendations.

11. 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 Care Services Agency, 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.

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

Approved by:



Don R. Braun  
Certified Engineering Geologist

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



Timothy R. Ross  
Project Manager

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Attachments: Tables 1, 2, 2a, 3, 4, 5 & 6  
Location Map  
Site Vicinity Map  
Site Plans - Figures 1, 2 & 3  
Typical Well Completion Diagram

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TABLE 1

SUMMARY OF MONITORING DATA

<u>Well No.</u>	<u>Ground Water Elevation (feet)</u>	<u>Depth to Water (feet)</u>	<u>Product Thickness (feet)</u>	<u>Sheen</u>	<u>Water Purged (gallons)</u>
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(Monitored and Sampled on June 10, 1991)

MW1	22.24	10.51	0	No	25
MW2	22.35	11.43	0	No	20
MW3	22.55	10.01	0	No	15
MW4	22.40	9.92	0	No	15

(Monitored on May 6, 1991)

MW1	21.73	11.02	0	No	0
MW2	22.38	11.40	0	No	22
MW3	21.92	10.64	0	No	0
MW4	21.82	10.50	0	No	0

(Monitored on April 15, 1991)

MW1	22.39	10.36	0	No	0
MW2	22.49	11.29	0	No	0
MW3	22.69	9.87	0	No	0
MW4	22.62	9.70	0	No	0

<u>Well #</u>	<u>Surface Elevation* (feet)</u>
MW1	32.75
MW2	33.78
MW3	32.56
MW4	32.32

\* Elevations of tops of well covers surveyed relative to MSL by Kier & Wright of Pleasanton, California.

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TABLE 2

SUMMARY OF LABORATORY ANALYSES  
 WATER *Units - PPb unless otherwise indicated*

<u>Date</u>	<u>Sample Well #</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethyl-benzene</u>
6/10/91	MW1	--	310	1.5	ND	0.31	ND
	MW2A	100	54	1.2	ND	0.69	ND
	MW3	--	160	0.65	ND	ND	ND
	MW4	--	64	ND	ND	ND	ND
3/15/91	MW1	--	110	21	ND	8.4	ND
	MW2A	ND	160	2.5	ND	51	ND
	MW3	--	150	ND	ND	0.45	ND
	MW4	--	53	ND	ND	ND	ND
12/14/90	MW1	--	450	150	6.8	49	0.28
	MW3	--	150	ND	ND	ND	ND
	MW4	--	54	ND	ND	ND	ND
9/19/90	MW1	--	140	ND	ND	3.5	ND
	MW3	--	74	0.74	ND	ND	ND
	MW4	--	61	ND	ND	ND	ND
6/25/90	MW1	--	310	10	0.89	2.1	0.37
	MW3	--	190	1.5	0.68	5.3	ND
	MW4	--	66	ND	ND	ND	ND
3/29/90	MW1	--	320	12	1.6	3.5	0.31
	MW3	--	85	ND	ND	ND	ND
	MW4	--	120	0.39	ND	ND	ND
12/12/89	MW1	--	340	100	13	44	3.4
	MW2	1,700	660	220	6.6	36	13
	MW3	--	120	6.7	0.64	1.5	0.46
	MW4	--	97	4.6	ND	ND	ND
9/13/89	MW1	--	550	32	17	52	3.4
	MW2	ND	170	2.0	0.38	9.5	ND
	MW3	--	76	ND	ND	ND	ND
	MW4	--	77	ND	ND	ND	ND

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TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES  
WATER

<u>Date</u>	<u>Sample Well #</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethyl-benzene</u>
6/06/89	MW1	--	590	ND	ND	ND	ND
	MW2	ND	77	ND	ND	ND	ND
	MW3	--	32	ND	ND	ND	ND
	MW4	--	37	ND	ND	ND	ND
Detection Limits		50	30	0.3	0.3	0.3	0.3

NOTE: Well MW2 was destroyed on February 1, 1990.

ND = Non-detectable.

-- Indicates analyses not performed.

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

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TABLE 2a  
SUMMARY OF LABORATORY ANALYSES  
WATER

<u>Sample Well #</u>	<u>Date</u>	<u>Tetra- chloro- ethene</u>	<u>Tri- chloro- ethene</u>	<u>1,2-Di- chloro- ethane</u>	<u>Total 1,2-dichloro- ethene</u>	<u>TOG (ppm)</u>
MW2A	6/10/91	150	10	ND	ND	ND
MW2A	3/15/91	67	8.2	ND	2.6*	ND
MW2	12/12/89	30	9.0	ND	ND	1.2
MW2	9/13/89	18	6.1	4.2	1.2	<50
MW2	6/06/89	110	4.4	2.8	ND	ND

\* Reported as cis-1,2-dichloroethene. Trans-1,2-dichloroethene was non-detectable.

ND = Non-detectable.

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

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TABLE 3  
SUMMARY OF LABORATORY ANALYSES  
SOIL

<u>Date</u>	<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>	<u>TOG</u>
3/12/91	MW2A(5)*	5	4.8	ND	ND	ND	ND	ND	1,300
	MW2A(10)*	10	2.4	10	0.12	0.17	1.6	0.14	260
	MW2A(14.5)*	14.5	ND	ND	ND	0.0080	0.036	ND	57
Detection Limits			1.0	1.0	0.0050	0.0050	0.0050	0.0050	30

\* All EPA method 8010 constituents were non-detectable, except for 0.110 ppm of 1,2-dichlorobenzene, and 0.120 ppm of tetrachloroethene detected in sample MW2A(10).

ND = Non-detectable.

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



TABLE 4  
SUMMARY OF LABORATORY ANALYSES  
SOIL

<u>Date</u>	<u>Sample</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>
4/03/90	SW8A*	10.5	62	260	1.4	8.0	40	7.0
	SW9A*	10.5	ND	ND	0.017	0.041	0.033	0.0092
	SW10A*	10.5	ND	140	0.085	0.12	5.0	1.4
	SW11A**	10.5	280	1,100	8.0	43	230	37
Detection Limits			1.0	1.0	0.0050	0.0050	0.0050	0.0050

\* TOG and all EPA method 8010 constituents were non-detectable for these samples.

\*\* TOG showed 210 ppm, while all EPA method 8010 constituents were non-detectable.

ND = Non-detectable.

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

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TABLE 5  
 SUMMARY OF LABORATORY ANALYSES  
 SOIL

<u>Date</u>	<u>Sample Number</u>	<u>Depth (feet)</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethyl benzene</u>
3/06/89	EB1(5)	5	2.1	ND	0.11	ND	0.14
	EB1(10)	10	200	2.3	7.7	5.7	33
	EB2(5)	5	ND	ND	ND	ND	ND
	EB2(10)	10	620	2.2	20	13	78
3/13/89	SW1	10	3,500	22	280	600	100
3/14/89	SW1(2)	10	100	1.3	6.6	16	2.9
	& SW2	10	390	40	4.3	71	10
3/17/89	SW3(15)	10	60	1.6	2.9	7.8	1.5
	SW4/5(6)	10	24	2.6	1.7	2.7	0.56
	SW6(12)	10	150	3.1	6.2	5.6	3.6
	SW7(14)*	10	ND	0.3	ND	ND	ND
	P1	3	2.3	ND	0.15	ND	ND
	P2	3	1.5	ND	0.31	ND	ND
	P3	3	1.1	ND	0.1	ND	ND
	P4	3	5.6	ND	0.15	0.39	ND
	P5	3	6.8	0.15	0.58	0.55	0.12
	P6	3.5	5.5	0.06	0.18	0.15	ND
	WO1**	10	15	ND	ND	0.21	0.88
5/24/89	MW1(5)	5	2.3	0.08	ND	0.62	ND
	MW1(10)	10	290	1.0	11	48	8.8
	MW2(5)***	5	230	13	1.7	3.2	1.5
	MW2(10)+	10	31	1.2	1.0	5.5	1.1
	MW3(5)	5	3.2	0.29	0.1	0.7	ND
	MW3(10)	10	4.6	ND	ND	0.44	0.3
	MW4(5)	5	3.1	ND	0.11	ND	ND
	MW4(10)	10	ND	ND	ND	ND	ND

KEI-P89-0301.P4  
July 23, 1991

TABLE 5 (Continued)

SUMMARY OF LABORATORY ANALYSES  
SOIL

- \* TPH as diesel was 6.2 ppm; TOG was at 41 ppm; all 8240 constituents are non-detectable, except as noted above.
- \*\* TPH as diesel was non-detectable; TOG was at 280 ppm; all 8240 constituents are non-detectable, except as noted above.
- \*\*\* TPH as diesel was non-detectable, TOG was 7,700 ppm, and trichloroethene at 0.063 ppm.
- + TPH as diesel was non-detectable, TOG was 38 ppm, and trichloroethene at 0.065 ppm.

ND = Non-detectable.

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

KEI-P89-0301.P4  
July 23, 1991

TABLE 6

SUMMARY OF LABORATORY ANALYSES  
WATER

<u>Date</u>	<u>Sample Well #</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethylbenzene</u>
3/17/89	W1	19,000	230	79	1,300	ND

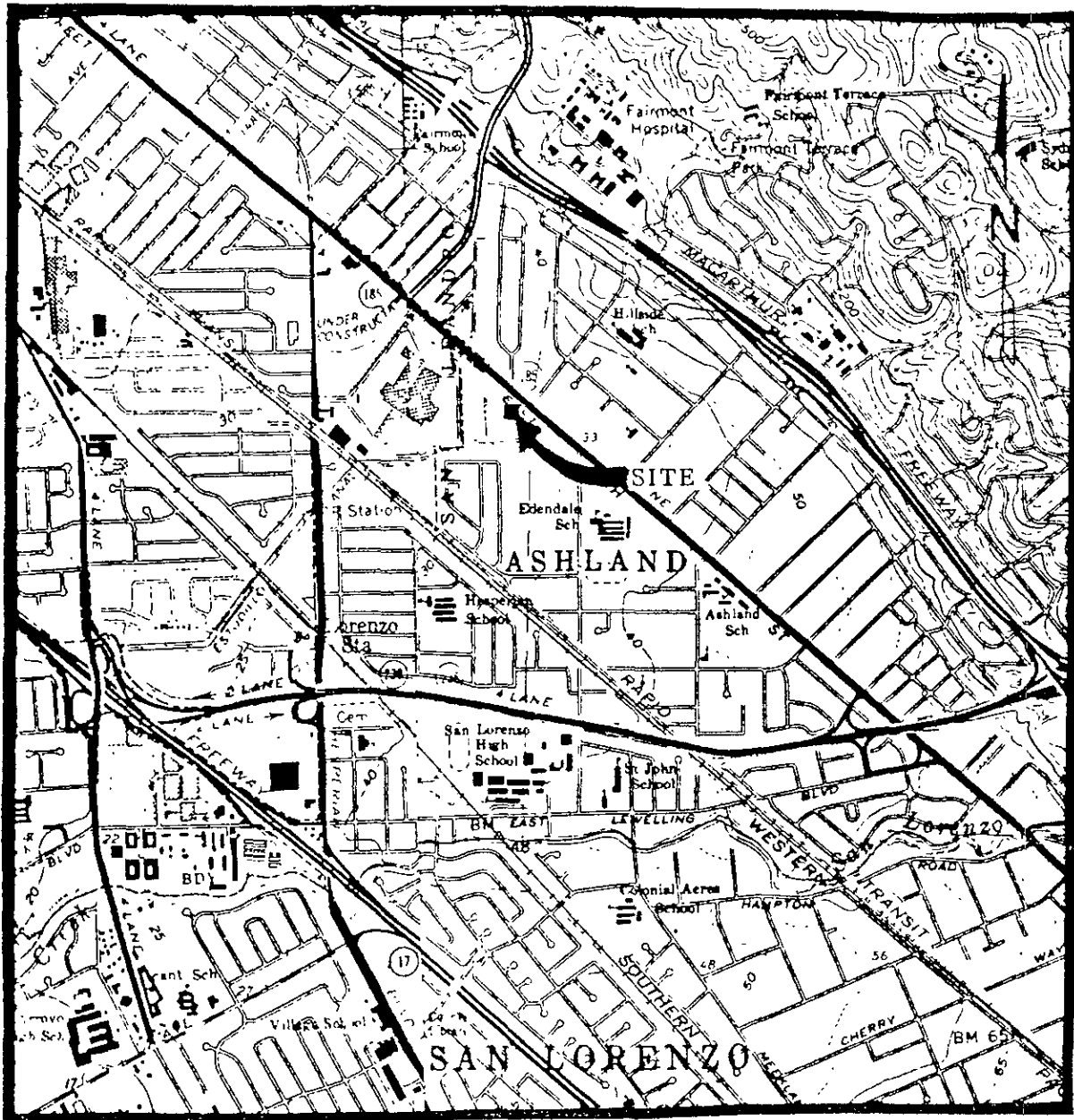
ND = Non-detectable.

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



**KAPREALIAN ENGINEERING, INC.**  
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LOCATION MAP

Unocal S/S #6277  
15803 E. 14th Street  
San Leandro, CA

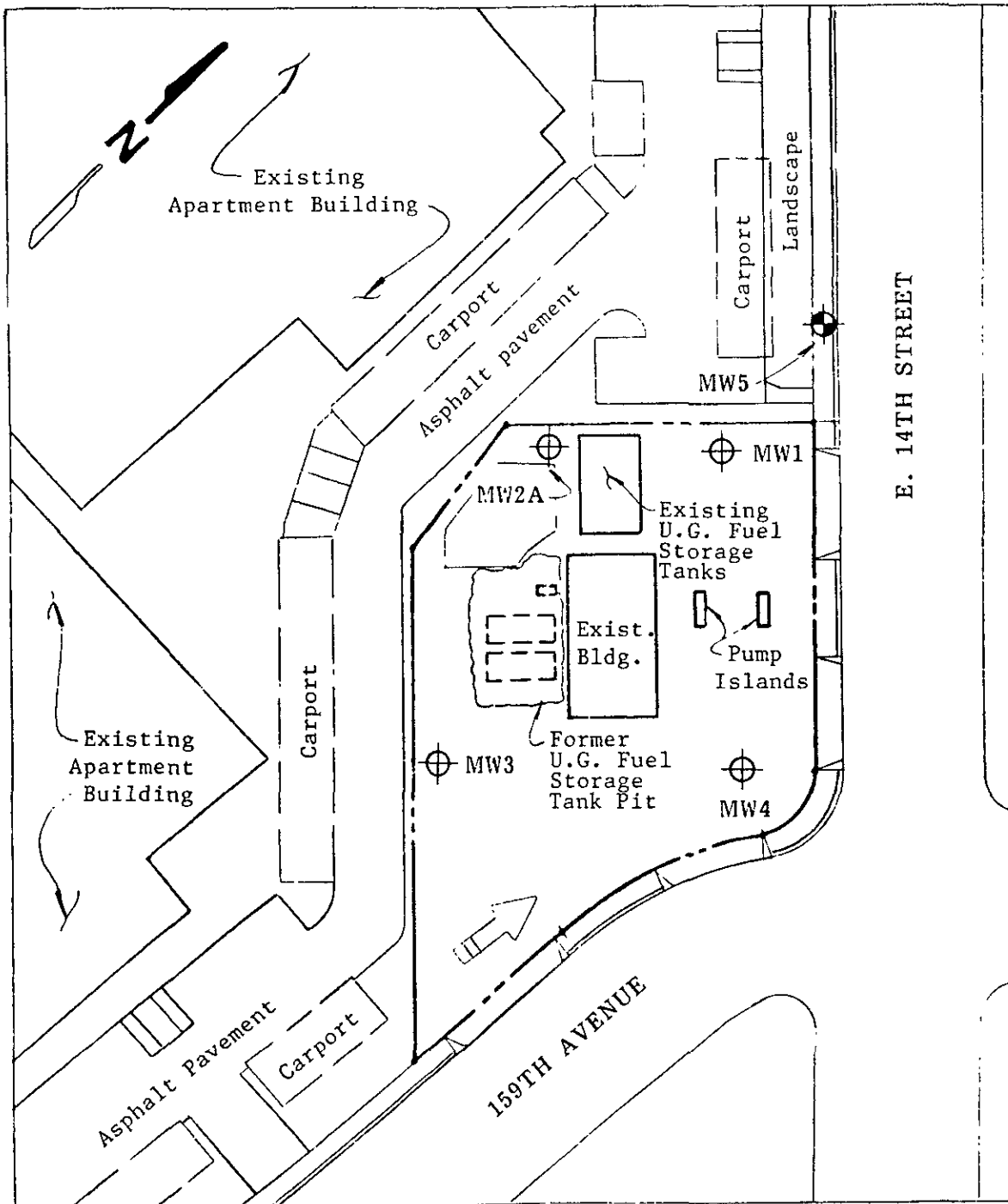


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SITE VICINITY MAP

LEGEND

- Monitoring well (existing)
- Monitoring well (proposed)
- Direction of ground water flow

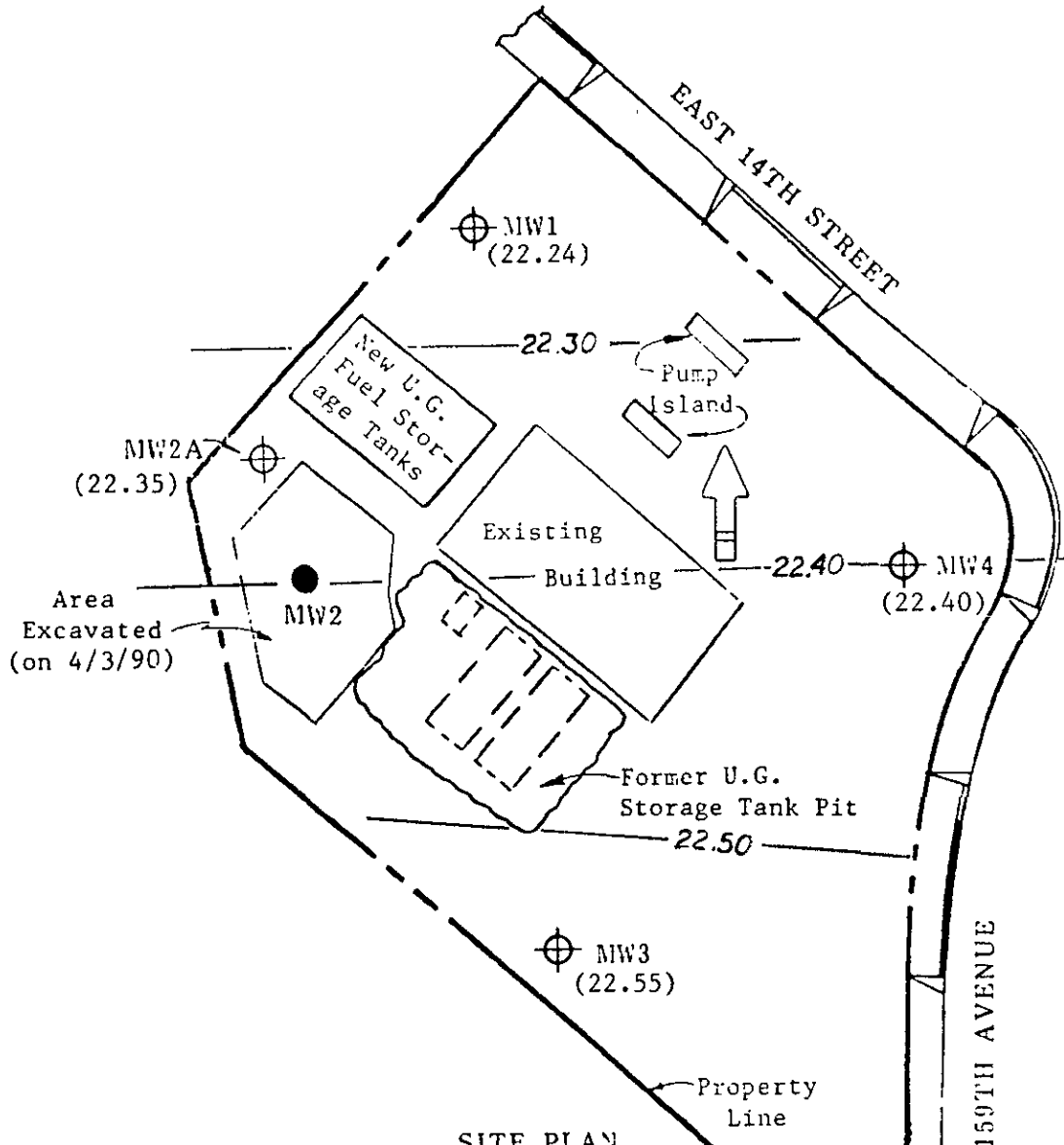
0                      60                      120  
Approx. scale                      feet

Unocal S/S #6277  
15803 E. 14th Street  
San Leandro, CA








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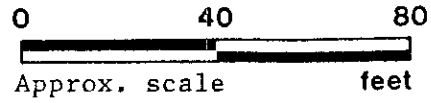
P.O. BOX 996 • BENICIA, CA 94510  
(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581



**SITE PLAN**  
Figure 1

**LEGEND**

-  Monitoring well
-  Monitoring well (destroyed 2/1/90)
-  ( ) Water table elevation in feet above Mean Sea Level on 6/10/91
-  Contours of water table elevation
-  Ground water flow direction



Unocal S/S #6277  
15803 E. 14th Street  
San Leandro, CA

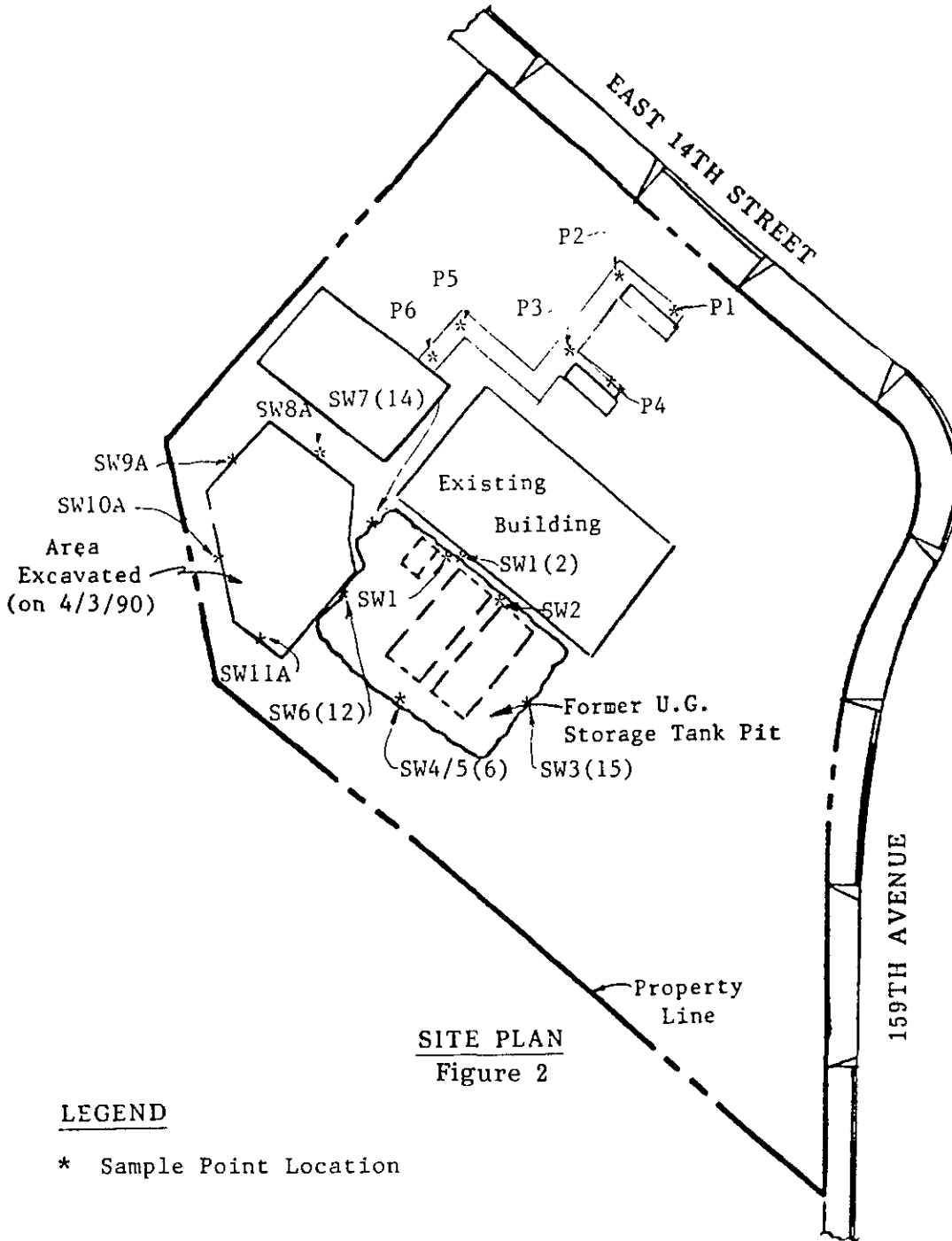


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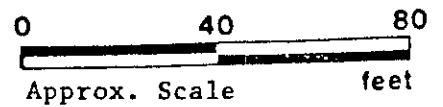
(707) 746-695 • (707) 746-6916 • FAX (707) 746-5581



SITE PLAN  
Figure 2

### LEGEND

\* Sample Point Location



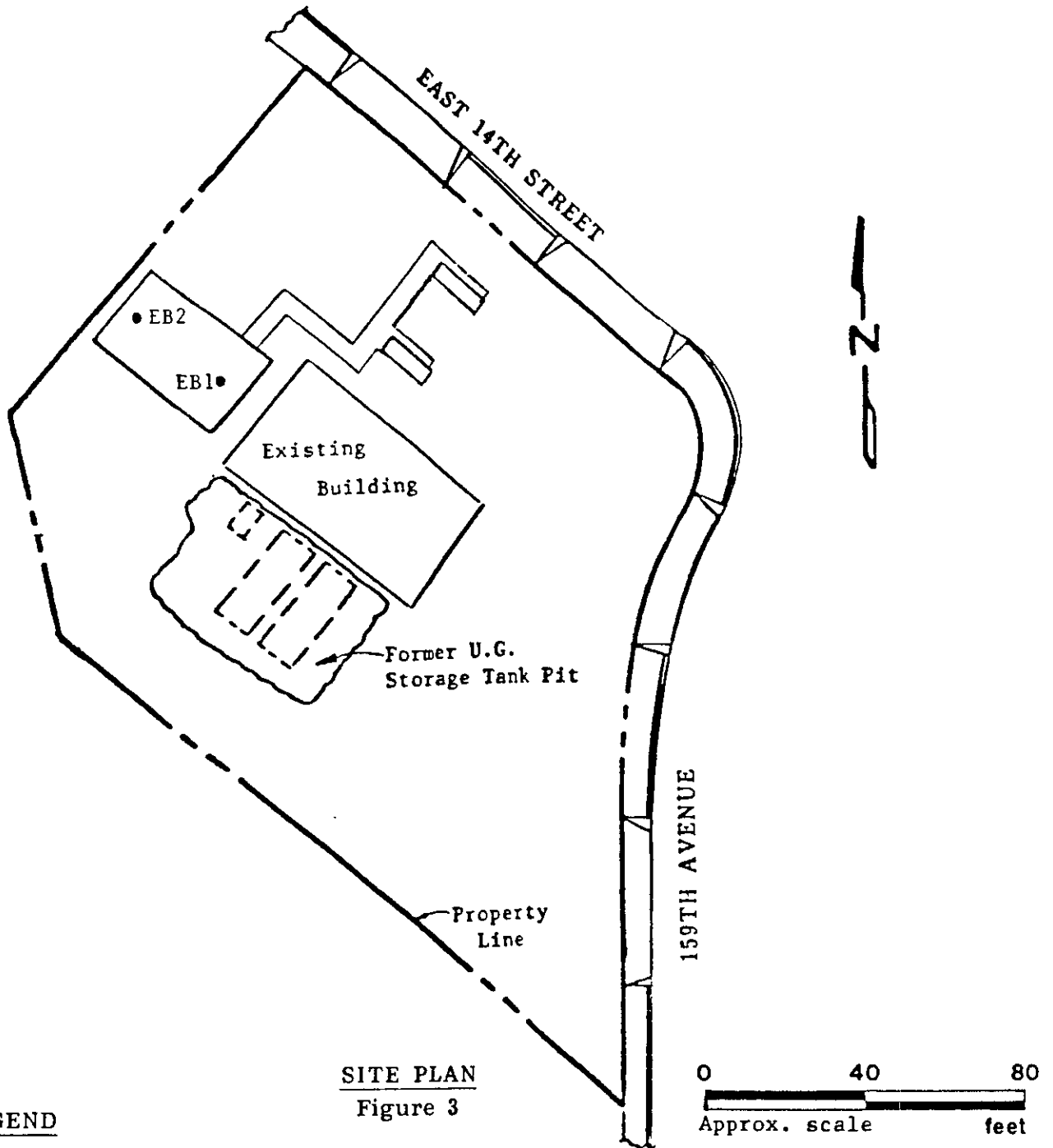
Unocal Service Station #6277  
15803 East 14th Street  
San Leandro, California





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SITE PLAN  
Figure 3

LEGEND

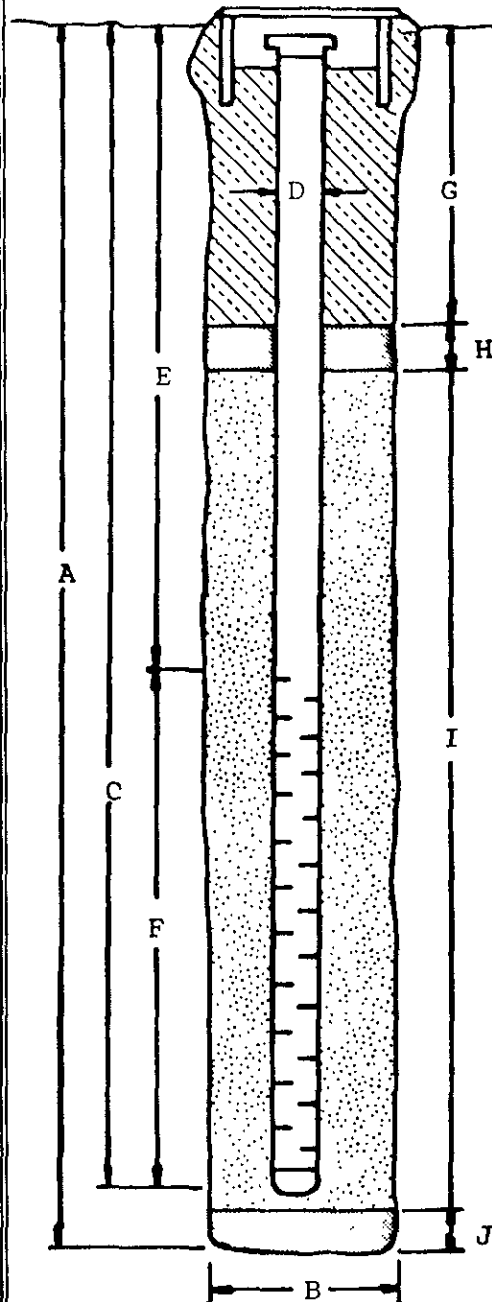
- Exploratory boring

Unocal S/S #6277  
15803 East 14th Street  
San Leandro, CA

**WELL COMPLETION DIAGRAM  
(SCHEMATIC)**

Flush-mounted Well Cover

WELL DETAILS\*



1. Well will be terminated 10 to 15 feet into first ground water unless a five foot thick aquitard is encountered below the water table, in which case the aquitard will be backfilled with bentonite pellets and the well terminated at the top of this aquitard [A].
2. Boring diameter [B] is 9 inches for 2 inch wells and 12 inches for 4 inch wells.
3. Perforated interval [F] will extend from bottom of casing to five feet above first ground water table (unless water <5 feet deep).
4. Schedule 40, PVC casing, 2 inch in diameter [D], will be used [C]. Screen is 0.020 or 0.010 inch factory machined slots, depending on filter pack grain size.
5. Filter pack will be placed from bottom of casing to two feet above perforated interval [I]. (Bottom seal [J] is not installed unless required.) Two feet of bentonite [H] will be placed above the filter pack. Concrete grout [G] will be placed from top of bentonite seal to the surface (unless modified due to shallow water). Blank casing [E] will extend from the top of the perforated casing to the top of the hole.
6. The well will be installed with a waterproof cap, padlock and a flush-mounted well cover.

\* See text for additional information.