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

February 17, 1992

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

RE: Unocal Service Station #3072
2445 Castro Valley Blvd.
Castro Valley, California

Gentlemen:

Per the request of Ms. Penny Silzer of Unocal Corporation, enclosed please find our report dated January 20, 1992, for the above referenced site.

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

Sincerely,

Kaprealian Engineering, Inc.

Judy A. Dewey

jad\82

Enclosure

cc: Tina Berry, Unocal Corporation

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KEI-P89-1106.QR5
January 20, 1992

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

Attention: Ms. Penny Silzer

RE: Quarterly Report
Unocal Service Station #3072
2445 Castro Valley Boulevard
Castro Valley, California

Dear Ms. Silzer:

This report presents the results of the fifth quarter of monitoring and sampling of the monitoring wells at the referenced site by Kaprealian Engineering, Inc. (KEI), per proposal KEI-P89-1106.P3 dated June 11, 1990. The wells are currently monitored monthly and sampled on a quarterly basis. This report covers the work performed by KEI from October through December 1991.

SITE DESCRIPTION AND BACKGROUND

The subject site is presently used as a gasoline station and auto care facility. The subject site is situated on gently sloping, northeast trending topography, and is located near the base of the northeast flank of a series of low lying, northwest trending foothills separating Castro Valley from Hayward. The site is located at the southern corner of the intersection of Castro Valley Boulevard with Strobridge Avenue, and is situated approximately 1,200 feet southwest of an unnamed drainage. A Location Map and Site Plans are attached to this report.

KEI's initial work at the site began on November 14, 1989, when KEI collected soil samples following the removal of three fuel storage tanks (each tank had a capacity of 10,000 gallons and contained regular unleaded gasoline, super unleaded gasoline, and diesel fuel, respectively) and one 550 gallon waste oil tank at the referenced site. All of the tanks were made of steel. Two small holes were observed in the regular unleaded gasoline tank. Extensive pitting, but no holes, was observed in the super unleaded gasoline tank. The diesel tank had been treated and wrapped prior to installation, and therefore it was not possible to assess the condition of the tank at the time of removal. No apparent holes or

cracks were observed in the waste oil tank. Six soil samples (designated as A1, A2, B1, B2, C1, and C2) were collected from beneath the fuel storage tanks at depths of 13.5 feet below grade. The soil sample (WO1) under the waste oil tank was collected at a depth of 10.5 feet below grade.

All soil samples were analyzed by Sequoia Analytical Laboratory in Redwood City, California. The samples collected under the fuel storage tanks were analyzed for total petroleum hydrocarbons (TPH) as gasoline, and benzene, toluene, xylenes, and ethylbenzene (BTX&E). In addition, the two samples collected from under the diesel tank were analyzed for TPH as diesel. The soil sample collected from under the waste oil tank was analyzed for TPH as gasoline, BTX&E, TPH as diesel, total oil and grease (TOG), EPA method 8010 compounds, EPA method 8270 compounds, and the metals cadmium, chromium, lead, and zinc.

Analytical results of the soil samples collected from beneath the fuel tanks showed levels of TPH as gasoline ranging from non-detectable to 11 ppm, with non-detectable BTX&E concentrations in each case. TPH as diesel concentrations were non-detectable for the two samples collected beneath the diesel tank. Analytical results of the soil sample collected from beneath the waste oil tank showed TPH as gasoline at 5.9 ppm, metals ranging from non-detectable to 45 ppm, 55 ppb of 1,1-dichloroethene, and non-detectable levels of all other constituents analyzed. Analytical results are summarized in Table 9, and sample point locations are as shown on the attached Site Plan, Figure 2.

On November 16, 1989, KEI collected six sidewall soil samples (designated as SW1 through SW6) and a water sample (designated as W1) from the fuel tank pit. The tank pit water level was measured to be 11.5 feet below the ground surface. The sidewall soil samples were collected approximately 6 to 12-inches above the tank pit water level. All samples were analyzed for TPH as gasoline and BTX&E. Three of the six sidewall soil samples (labeled SW2, SW3, and SW4) and the water sample (labeled W1) were also analyzed for TPH as diesel. Analytical results of the soil samples collected from the fuel tank pit showed TPH as gasoline ranging from non-detectable to 29 ppm for four of the six samples, with samples SW1 and SW4 showing 140 ppm and 160 ppm, respectively. TPH as diesel levels were non-detectable for two of the sidewall samples, with sample SW4 showing 24 ppm. Analytical results of the water sample collected from the fuel tank pit showed 11,000 ppb of TPH as diesel, 26,000 ppb of TPH as gasoline, and 670 ppb of benzene. Analytical results of the soil samples are summarized in Table 9, and the analytical results of the water sample are summarized in Table 10. Sample point locations are as shown on the attached Site Plan, Figure 2.

On November 28, 1989, KEI returned to the site to meet with a representative of the Alameda County Health Care Services Agency (ACHCS) in order to clarify ACHCS' guidelines as applied to the subject site for fuel tank pit excavation and sampling. In response to the meeting, KEI submitted a Phase I work plan (KEI-P89-1106.P1) dated November 30, 1989, to define the extent of contamination in the vicinity of the tank pit. The work plan was approved by the ACHCS in a letter dated December 8, 1989.

On December 22, 1989, KEI returned to the site to collect additional sidewall soil samples from the fuel tank pit after further excavation. Soil was excavated from the north, east, and south sides of the pit. Sidewall soil samples, designated as SW1(17), SW2(17), SW7, SW8, SW9, SW10, SW11, and SW3(13), were collected at depths of approximately 9 or 11 feet below grade, and analyzed on-site by Mobile Chem Labs, Inc., of Lafayette, California (a State certified mobile laboratory). After excavation, TPH as gasoline was detected at concentrations of 1,500 ppm and 1,900 ppm on the northerly wall of the pit, at concentrations ranging from 3.0 ppm to 1,700 ppm on the easterly wall, and at 410 ppm on the southerly wall. Analytical results are summarized in Table 8, and sample point locations are as shown on the attached Site Plan, Figure 3.

Based on the analytical results, KEI recommended the installation of nine exploratory borings to further define the extent of the soil contamination. Documentation of soil sample collection techniques and analytical results are presented in KEI's work plan/proposal (KEI-P89-1106.P2) dated January 8, 1990.

On January 18 and 19, 1990, three two-inch diameter monitoring wells (designated as MW1, MW2, and MW3 on the attached Site Plan, Figure 1) were installed at the site. The monitoring wells were drilled and completed to total depths ranging from 22 to 30 feet below grade. Ground water was encountered at depths ranging from 9 to 20.5 feet beneath the surface during drilling. The wells were developed on January 22 and 23, 1990, and were initially sampled on March 22, 1990.

Samples were analyzed for TPH as gasoline by EPA method 5030 in conjunction with modified 8015, and BTX&E by EPA method 8020. Analytical results of the soil samples collected from the borings for monitoring wells MW1, MW2, and MW3 indicated non-detectable levels of TPH as gasoline and BTX&E in all soil samples, except for sample MW1(5), which showed 2.8 ppm of TPH as gasoline, 0.051 ppm of benzene, and 0.11 ppm of ethylbenzene. Analytical results of the ground water samples collected from monitoring wells MW2 and MW3 indicated non-detectable levels of TPH as gasoline and BTX&E. In well MW1, TPH as gasoline and benzene were detected at 32 ppb and 4.2 ppb, respectively. Analytical results of the soil samples

are summarized in Table 7, and results of the water samples are summarized in Table 2. Documentation of well installation procedures, sample collection techniques, and sample results are presented in KEI's report (KEI-J89-1106.R7) dated April 12, 1990.

On February 14, 1990, three soil samples, labeled P1, P2, and P3, were collected from the product pipe trenches at depths ranging from 2.5 to 4 feet below grade. The soil samples were analyzed for TPH as gasoline and BTX&E. Analytical results of samples collected from the pipe trench indicated levels of TPH as gasoline ranging from 6.0 ppm to 87 ppm, and benzene levels ranging from 0.23 ppm to 0.47 ppm. Results of the soil analyses are summarized in Table 6. Soil sample locations are shown on the attached Site Plan, Figure 4. Documentation of sample collection techniques and analytical results are presented in KEI's report (KEI-J89-1106.R5) dated March 6, 1990.

KEI returned to the site on March 9, 1990, when three sidewall soil samples, labeled SWB, SWC, and SWD, were collected from the sidewalls of the waste oil tank pit excavation at depths of 8 to 9 feet below grade. The waste oil tank pit had been excavated to a depth of 11 to 12 feet below grade. The soil samples were analyzed for TPH as gasoline, BTX&E, TPH as diesel, TOG, and EPA method 8010 compounds. Analytical results of the soil samples (SWB, SWC and SWD) collected from sidewalls of the waste oil tank pit indicated non-detectable levels of TOG and all EPA method 8010 constituents for each of the three samples. The analytical results indicated non-detectable levels of TPH as gasoline and BTX&E for samples SWC and SWD, while SWB showed 37 ppm of TPH as gasoline, with 0.10 ppm of benzene. TPH as diesel levels were non-detectable for sample SWC, and both SWB and SWD showed less than 10 ppm of TPH as diesel. Results of the soil samples are summarized in Table 5. Soil sample point locations are as shown on the attached Site Plan, Figure 5. Documentation of sample collection techniques and analytical results are presented in KEI's report (KEI-J89-1106.R6) dated April 13, 1990.

On April 24 and 25, 1990, the previously recommended exploratory borings (designated as EB1 through EB8 on the attached Site Plan, Figure 1) were drilled at the site. The eight borings were drilled and/or sampled to depths of 10.5 to 15 feet below grade. Ground water was encountered at depths of approximately 10 to 14 feet beneath the surface in each boring, except EB4, where ground water was not encountered. Drilling was generally stopped about 1 to 2 feet after intersecting the first water table, except for EB4, which was terminated at a depth of 14.5 feet below grade when ground water was not encountered. A water sample was collected from boring EB5 only. All borings were backfilled to the surface with neat cement.

Samples were analyzed at Sequoia Analytical Laboratory in Redwood City, California. Soil samples from all borings, and the water sample from EB5, were analyzed for TPH as gasoline using EPA method 5030 in conjunction with modified 8015, and BTX&E using EPA method 8020. The results of soil analyses are summarized in Table 4, and the results of the water analyses are summarized in Table 10.

Analytical results of the soil samples collected from the eight exploratory borings (EB1 through EB8) indicated non-detectable levels of TPH as gasoline in all samples, except EB1(9.5), EB4(14), EB6(5), EB7(5), and EB8(5), in which the levels ranged from 1.7 ppm to 5.0 ppm. Benzene was detected in all soil samples at levels ranging from 0.0053 ppm to 0.023 ppm. The analytical results of the water sample collected from boring EB5, immediately after drilling, indicated a level of TPH as gasoline at 5,900 ppb, with a level of benzene at 840 ppb.

Based on the analytical results, KEI recommended the installation of two additional monitoring wells to further define the extent of ground water contamination. In addition, KEI recommended the implementation of monthly monitoring and quarterly sampling of the existing monitoring wells. Results of the exploratory boring installation protocol and soil sampling activities are presented in KEI's report (KEI-J89-1106.R8) dated June 11, 1990.

On August 13, 1990, two additional two-inch diameter monitoring wells (designated as MW4 and MW5 on the attached Site Plan, Figure 1) were installed at the site. The two wells were drilled and completed to total depths ranging from 23.5 to 24 feet below grade. Ground water was encountered at depths ranging from 10 to 14.5 feet beneath the surface during drilling. The new wells (MW4 and MW5) were developed on August 20, 1990, and all wells were sampled on August 27, 1990.

Water samples from all wells (MW1 through MW5), and selected soil samples from the borings for wells MW4 and MW5, were analyzed at Sequoia Analytical Laboratory in Redwood City, California. The samples were analyzed for TPH as gasoline by EPA method 5030 in conjunction with modified 8015, and for BTX&E by EPA method 8020.

Analytical results of the soil samples collected from the borings for monitoring wells MW4 and MW5 indicated non-detectable levels of TPH as gasoline and BTX&E in all analyzed samples. The analytical results of the water samples collected from all of the wells showed non-detectable levels of TPH as gasoline in all wells. Benzene was detected in wells MW1, MW3, and MW4 at levels of 3.2 ppb, 1.1 ppb and 0.34 ppb, respectively. Results of the soil analyses are summarized in Table 3, and the results of the water analyses are summarized in Table 2. Documentation of well installation

procedures, sample collection techniques, and sample results are presented in KEI's report (KEI-P89-1106.R9) dated September 28, 1990. Based on the analytical results, KEI recommended the continuation of the monthly monitoring and quarterly sampling program.

RECENT FIELD ACTIVITIES

The five wells (MW1 through MW5) were monitored three times and sampled once during the quarter. During monitoring, the wells were checked for depth to water and for the presence of free product. The wells were also checked for the presence of sheen during sampling on December 20, 1991. 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 December 20, 1991. Prior to sampling, the wells were each purged of between 10 and 12 gallons by the use of a bailer. Samples were then collected by the use of 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 delivery to the State certified laboratory.

HYDROLOGY AND GEOLOGY

Based on the water level data gathered on December 20, 1991, the ground water flow direction appeared to be varying from a northwesterly flow direction at the northern portion of the site, to a westerly flow direction at the central portion of the site, to a southern flow direction at the southern portion of the site. These flow directions differ from the northeasterly flow direction at the central portion of the site as determined on September 25, 1991, but are generally similar in the northern and southern portions of the site. The average hydraulic gradient at the site on December 20, 1991, was approximately 0.007, except at the axis of the apparent ground water table "ridge", where the gradient was approximately 0.002. Water levels have fluctuated during the quarter, showing a net increase of 0.04 to 0.84 feet in wells MW1, MW3, and MW5, and a net decrease of 0.94 and 0.02 feet in wells MW2 and MW4, respectively, since September 25, 1991. The measured depth to ground water at the site on December 20, 1991, ranged between 6.04 and 9.69 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 Costs Counties, California" by T.W. Dibblee, Jr., 1980), the subject site is underlain by Quaternary-age alluvium. Mapped bedrock outcrops adjacent to the site include

the marine Panoche Formation (Kpc), which is described as a conglomerate generally composed of granite, diorite, quartzite and black chert cobbles in a sandstone matrix, and the Knoxville Formation (JKk), which is described as consisting of dark micaceous shale with minor thin sandstone.

In addition, the site is situated approximately 3,000 feet northeast of the mapped trace of the active Hayward Fault; 1,900 feet southwest of the concealed mapped trace of the East Chabot Fault; and 1,800 feet northeast of the mapped trace (northern terminous?) of the West Chabot Fault.

As exposed in the underground tank pit excavation, the earth materials at the subject site consist of artificial fill materials at the surface. These fill materials are typically 1 to 2 feet thick, and locally vary up to a maximum of about 9 feet at the original east wall of the pit excavation (prior to additional excavation). These fill materials are inturn underlain by dark gray, silty clay soil materials, which are about 2.5 feet thick. These soil materials are underlain by greenish-brown to yellowish-brown, highly weathered to slightly weathered shale, which varies from soft to moderately hard with abundant fractures (both clay healed and relatively open).

The results of the drilling activities at the site indicated that bedrock materials underlying the site are composed of brown and gray shale, which is slightly to highly weathered. The depth to the bedrock materials appears to vary considerably at the site, from about 5 to 6 feet below grade in the vicinity of well MW1 and boring EB2, to about 21.5 feet below grade in the vicinity of well MW2, to greater than 22 feet below grade in the vicinity of well MW3 (the maximum depth explored). However, bedrock commonly underlies that site at a depth of about 8 to 10 feet below grade, as encountered in the majority of the borings at the site and as exposed in the old tank pit excavation.

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 BTX&E using EPA method 8020. Also, samples from MW4 and MW5 were analyzed for TPH as diesel using EPA method 3510 in conjunction with modified 8015.

Analytical results of the ground water samples collected from monitoring wells MW1 through MW5 indicated non-detectable levels of TPH as gasoline and BTX&E. Also, in monitoring wells MW4 and MW5,

TPH as diesel was non-detectable. 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

In the past four quarters, TPH as gasoline has been non-detectable in all wells, with the exception of 44 ppb of TPH as gasoline detected in MW4 on March 11, 1991. Benzene has been non-detectable in all wells for the four previous quarters, with the exception of three occurrences of levels below 1 ppb (the maximum contaminant level for drinking water as set forth by the California Department of Health Services). BTX&E has been non-detectable in all wells in the two previous quarters. Based on these sample results, KEI recommends a modification to the current monitoring and sampling program as set forth in KEI's proposal (KEI-P89-1106.P3) dated June 11, 1990. KEI recommends that the frequency of monitoring for all wells be reduced from monthly to quarterly, and that the sampling frequency of all wells be reduced from quarterly to semi-annually. KEI also recommends continuing TPH as diesel analyses for water samples collected from wells MW4 and MW5. If the analytical results of the water samples collected during the next round of sampling are similar to the previous results, KEI will recommend that the monitoring and sampling program be terminated and that Unocal file for site closure.

DISTRIBUTION

A copy of this report should be sent to the ACHCS, and to the Regional Water Quality Control Board, San Francisco Bay Region.

LIMITATIONS

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

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Attachments: Tables 1 through 10
Location Map
Site Plans - Figures 1 through 5
Laboratory Analyses
Chain of Custody documentation

KEI-P89-1106.QR5
January 20, 1992

TABLE 1

SUMMARY OF MONITORING DATA

Well No.	Ground Water Elevation (feet)	Depth to Water (feet)	Product Thickness (feet)	Sheen	Water Purged (gallons)
(Monitored and Sampled on December 20, 1991)					
MW1	172.08	8.99	0	No	11
MW2	172.59	9.69	0	No	10
MW3	172.47	6.04	0	No	10
MW4	172.78	6.47	0	No	10
MW5	172.19	6.83	0	No	12
(Monitored on November 20, 1991)					
MW1	172.31	8.76	0	--	0
MW2	173.67	8.61	0	--	0
MW3	172.22	6.29	0	--	0
MW4	172.71	6.54	0	--	0
MW5	172.29	6.73	0	--	0
(Monitored on October 22, 1991)					
MW1	171.89	9.18	0	--	0
MW2	173.46	8.82	0	--	0
MW3	171.92	6.59	0	--	0
MW4	172.75	6.50	0	--	0
MW5	171.87	7.15	0	--	0

Well #	Surface Elevation* (feet)
MW1	181.07
MW2	182.28
MW3	178.51
MW4	179.25
MW5	179.02

-- Sheen determination not performed.

* The elevation of the top of the well covers have been surveyed to Mean Sea Level (MSL).

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TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Number	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
12/20/91	MW1	--	ND	ND	ND	ND	ND
	MW2	--	ND	ND	ND	ND	ND
	MW3	--	ND	ND	ND	ND	ND
	MW4	ND	ND	ND	ND	ND	ND
	MW5	ND	ND	ND	ND	ND	ND
9/25/91	MW1	--	ND	ND	ND	ND	ND
	MW2	--	ND	ND	ND	ND	ND
	MW3	--	ND	ND	ND	ND	ND
	MW4	ND	ND	ND	ND	ND	ND
	MW5	ND	ND	ND	ND	ND	ND
6/12/91	MW1	--	ND	0.66	ND	ND	ND
	MW2	--	ND	ND	0.46	0.44	ND
	MW3	--	ND	ND	ND	ND	ND
	MW4	--	ND	ND	ND	0.48	ND
	MW5	--	ND	ND	ND	0.32	ND
3/11/91	MW1	--	ND	0.90	ND	ND	ND
	MW2	--	ND	ND	ND	ND	ND
	MW3	--	ND	ND	ND	ND	ND
	MW4	--	44	0.74	ND	0.15	3.2
	MW5	--	ND	ND	ND	ND	ND
12/12/90	MW1	--	34	1.6	ND	ND	ND
	MW2	--	ND	ND	ND	ND	ND
	MW3	--	ND	ND	ND	ND	ND
	MW4	--	ND	0.73	ND	ND	ND
	MW5	--	ND	ND	ND	ND	ND
8/27/90	MW1	--	ND	3.2	ND	ND	ND
	MW2	--	ND	ND	ND	ND	ND
	MW3	--	ND	1.1	0.50	0.89	0.54
	MW4	--	ND	0.34	ND	ND	ND
	MW5	--	ND	ND	ND	ND	ND
3/22/90	MW1	--	32	4.2	ND	1.1	0.36
	MW2	--	ND	ND	ND	ND	ND
	MW3	--	ND	ND	ND	ND	ND
	MW4*	--	ND	ND	ND	ND	ND
Detection Limits		50	30	0.30	0.30	0.30	0.30

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

-- Indicates analysis not performed.

ND = Non-detectable.

* Sample MW4 is a duplicate of sample MW2 (only on the date indicated).

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

KEI-P89-1106.QR5
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TABLE 3

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample Number	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
8/13/90	MW4(5)	5.0	ND	ND	ND	ND	ND
	MW5(9.5)	9.5	ND	ND	ND	ND	ND
	MW5(13.5)	13.5	ND	ND	ND	ND	ND
Detection Limits			1.0	0.0050	0.0050	0.0050	0.0050

ND = Non-detectable.

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

KEI-P89-1106.QR5
January 20, 1992

TABLE 4

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample Number	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
4/24/90	EB1(5)	ND	0.0063	0.042	0.011	ND
&	EB1(9.5)	4.9	0.0078	0.24	0.11	0.028
4/25/90	EB1(13.5)	ND	0.0087	0.048	ND	ND
	EB2(5)	ND	0.0053	0.020	0.013	0.0068
	EB2(10)	ND	0.0059	0.026	0.013	0.0050
	EB3(5)	ND	0.0069	0.031	0.017	ND
	EB3(9)	ND	0.0093	0.023	ND	ND
	EB4(5)	ND	0.0091	0.034	ND	ND
	EB4(10)	ND	0.0090	0.27	ND	ND
	EB4(14)	1.7	0.0079	0.43	ND	ND
	EB5(5)	ND	0.0095	0.015	ND	ND
	EB6(5)	5.0	0.066	0.021	0.11	0.032
	EB6(10)	ND	0.0086	0.060	0.014	0.0052
	EB6(13)	ND	0.0080	0.16	0.24	0.0092
	EB7(5)	3.0	0.040	0.056	0.073	0.034
	EB7(9.5)	ND	0.0081	0.078	0.025	0.015
	EB7(13.5)	ND	0.0054	0.085	0.012	ND
	EB8(5)	2.7	0.023	0.067	0.078	0.013
	EB8(10)	ND	0.0072	0.056	0.019	0.0050
Detection Limits		1.0	0.0050	0.0050	0.0050	0.0050

ND = Non-detectable.

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

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TABLE 5

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
3/09/90	SWB*	8.0	<10	37	0.10	0.10	0.74	0.25
	SWC*	9.0	ND	ND	ND	ND	ND	ND
	SWD*	9.0	<10	ND	ND	ND	ND	ND
Detection Limits			1.0	1.0	0.05	0.1	0.1	0.1

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

ND = Non-detectable.

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

KEI-P89-1106.QR5
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TABLE 6

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
2/14/90	P1	4.0	87	0.33	0.17	10	2.3
	P2	2.5	6.0	0.23	ND	0.33	0.11
	P3	3.0	10	0.47	0.11	1.1	0.32
Detection Limits			1.0	0.05	0.1	0.1	0.1

ND = Non-detectable.

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

KEI-P89-1106.QR5
January 20, 1992

TABLE 7

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample Number	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
1/18/90	MW1(5)	5.0	2.8	0.051	ND	ND	0.11
	MW1(6.5)	6.5	ND	ND	ND	ND	ND
	MW1(10.0)	10.0	ND	ND	ND	ND	ND
	MW2(5)	5.0	ND	ND	ND	ND	ND
	MW2(6.5)	6.5	ND	ND	ND	ND	ND
	MW2(9.0)	9.0	ND	ND	ND	ND	ND
	MW2(10)	10.0	ND	ND	ND	ND	ND
	MW2(15)	15.0	ND	ND	ND	ND	ND
	MW2(16.5)	16.5	ND	ND	ND	ND	ND
	MW2(20)	20.0	ND	ND	ND	ND	ND
	MW3(5)	5.0	ND	ND	ND	ND	ND
	MW3(6.5)	6.5	ND	ND	ND	ND	ND
	MW3(9)	9.0	ND	ND	ND	ND	ND
Detection Limits			1.0	0.05	0.1	0.1	0.1

ND = Non-detectable.

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

KEI-P89-1106.QR5
January 20, 1992

TABLE 8

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
12/22/89	SW1(17)	11	ND	1,900	14	24	120	28
	SW2(17)	11	ND	1,500	17	29	92	23
	SW7	9	ND	1,700	16	33	110	26
	SW8	9	ND	200	2.6	0.9	7.7	5.0
	SW3(13)	9	ND	690	11	11	28	11
	SW9	9	ND	3.0	0.2	0.1	0.1	ND
	SW10	9	ND	500	4.0	5.9	22	6.9
	SW4(11)	9	ND	410	2.7	3.9	19	3.8
Detection Limits			1.0	1.0	0.1	0.1	0.1	0.1

ND = Non-detectable.

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

KEI-P89-1106.QR5
January 20, 1992

TABLE 9

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
11/14/89	A1	13.5	ND	2.4	ND	ND	ND	ND
&	A2	13.5	ND	ND	ND	ND	ND	ND
11/16/89	B1	13.5	--	1.9	ND	ND	ND	ND
	B2	13.5	--	11	ND	ND	ND	ND
	C1	13.5	--	1.5	ND	ND	ND	ND
	C2	13.5	--	7.5	ND	ND	ND	ND
	SW1	10.5	--	140	0.31	0.12	3.0	0.88
	SW2	10.5	ND	ND	ND	ND	ND	ND
	SW3	10.5	ND	ND	ND	ND	ND	ND
	SW4	9.5	24	160	0.33	6.4	30	9.4
	SW5	9.5	--	3.5	0.06	0.27	0.76	0.19
	SW6	10	--	29	0.12	0.21	2.0	0.58
	WO1(11)*	11	ND	5.9	ND	ND	ND	ND
Detection Limits			1.0	1.0	0.05	0.1	0.1	0.1

ND = Non-detectable.

-- Indicates analysis not performed.

* TOG and all EPA method 8270 constituents were non-detectable. All EPA method 8010 constituents were non-detectable, except 1,1-dichloroethene at 55 ppb. Metal concentrations were as follows: cadmium was detected at 2.5 ppm, chromium at 39 ppm, lead at 1.1 ppm, and zinc at 45 ppm.

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

KEI-P89-1106.QR5
January 20, 1992

TABLE 10

SUMMARY OF LABORATORY ANALYSES
WATER

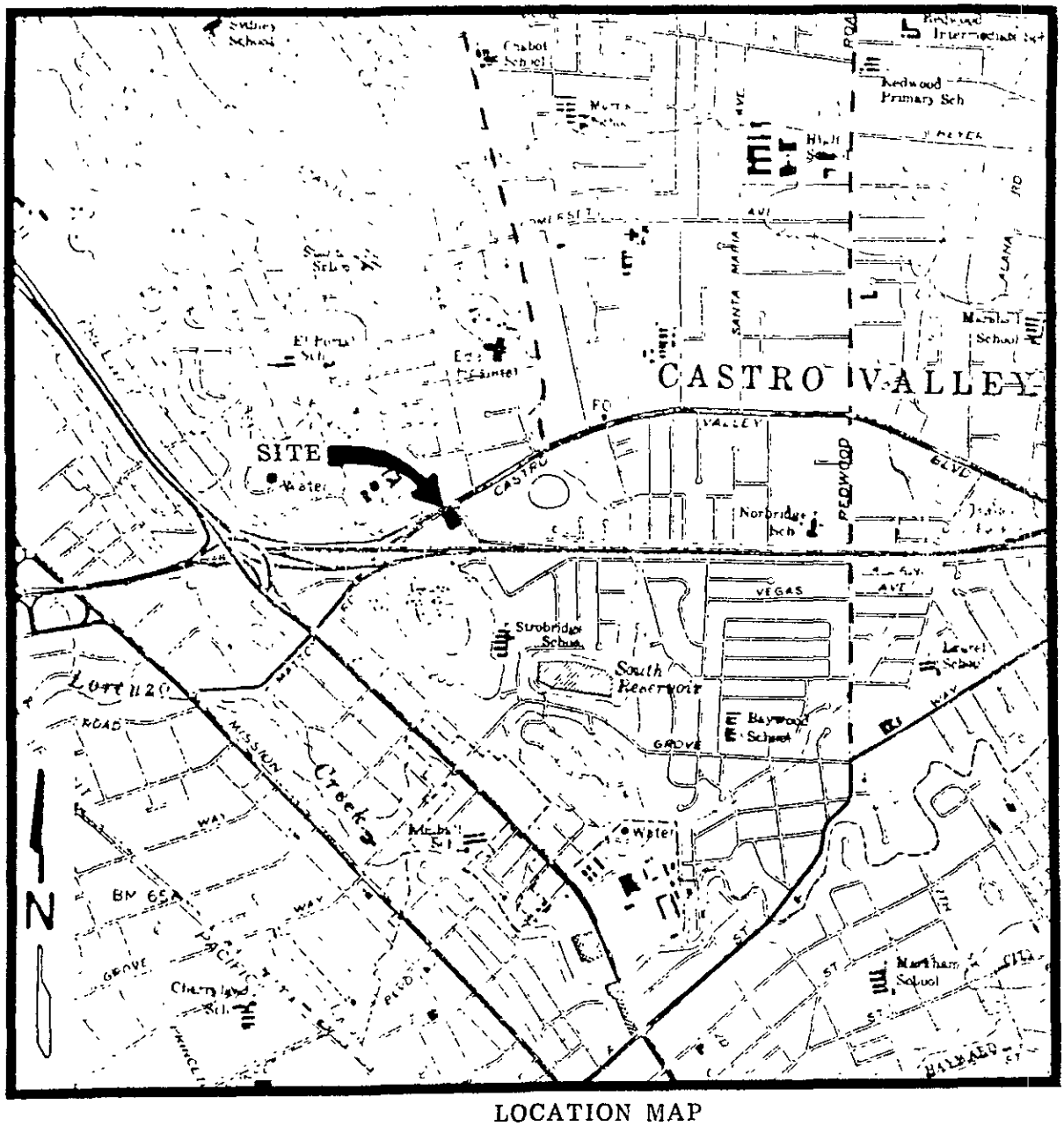
Date	Sample Number	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
11/16/89	W1	11,000	26,000	670	1,100	9,100	120
4/25/90	EB5	--	5,900	840	34	73	100
Detection Limits		50	30	0.30	0.30	0.30	0.30

-- Indicates analysis not performed.

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

NOTE: Water samples from EB6 were collected during drilling. The results of the analyses may not be representative of formation water; they should be used for information purposes only.

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



LOCATION MAP

Unocal S/S #3072
2445 Castro Valley Boulevard
Castro Valley, CA

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
PO. BOX 996 • BENICIA, CA 94510
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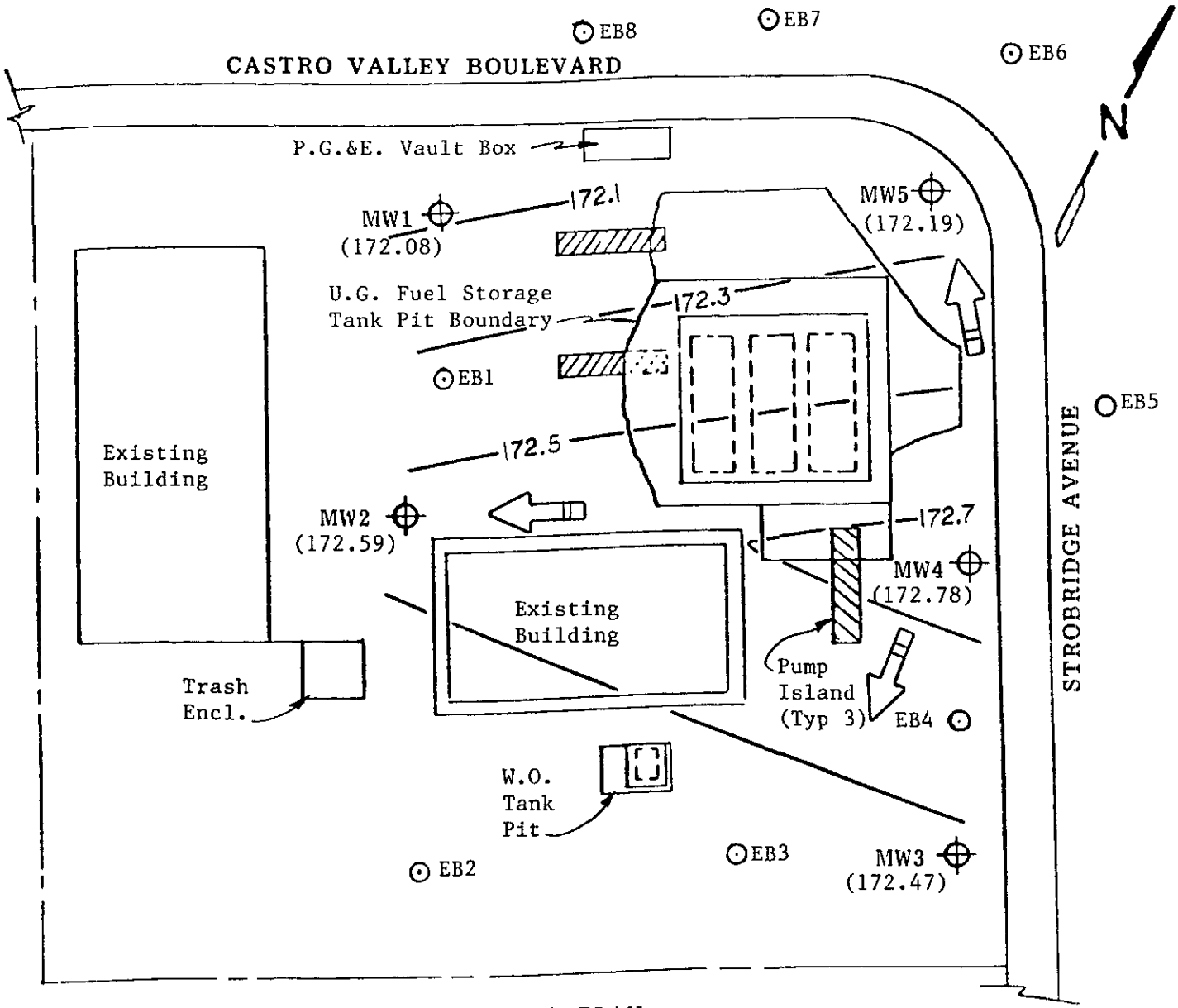

SITE PLAN
Figure 1

LEGEND

- Monitoring Well
- Exploratory Boring
- Ground Water Flow Direction
- ( ) Ground Water Elevation in feet above Mean Sea Level on 12/20/91
- Contours of Ground Water Elevation

30 0 30
Approx. Scale feet

Unocal Service Station #3072
2445 Castro Valley Blvd.
Castro Valley, California

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P.O. BOX 996 • BENICIA, CA 94510
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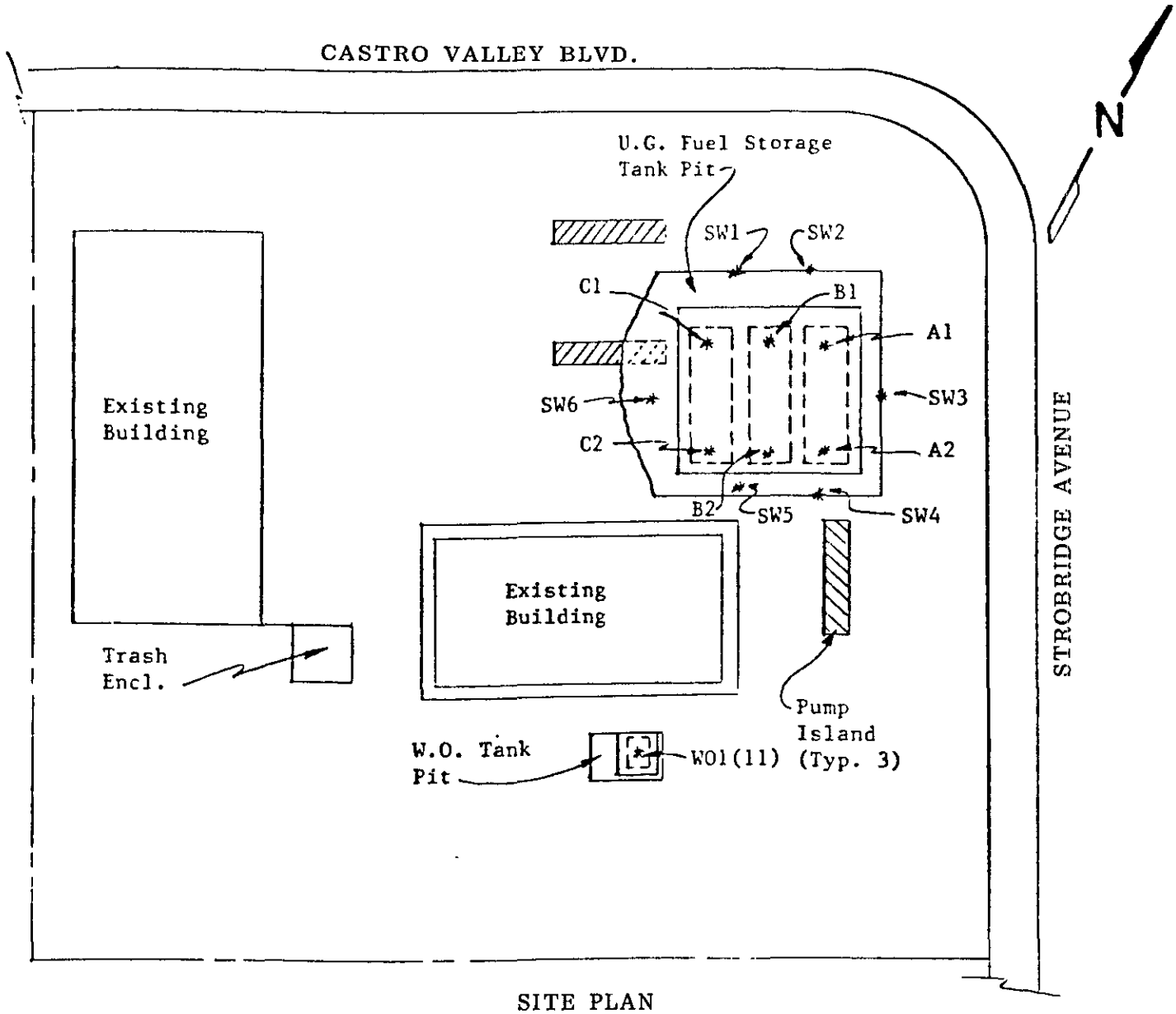


SITE PLAN
Figure 2

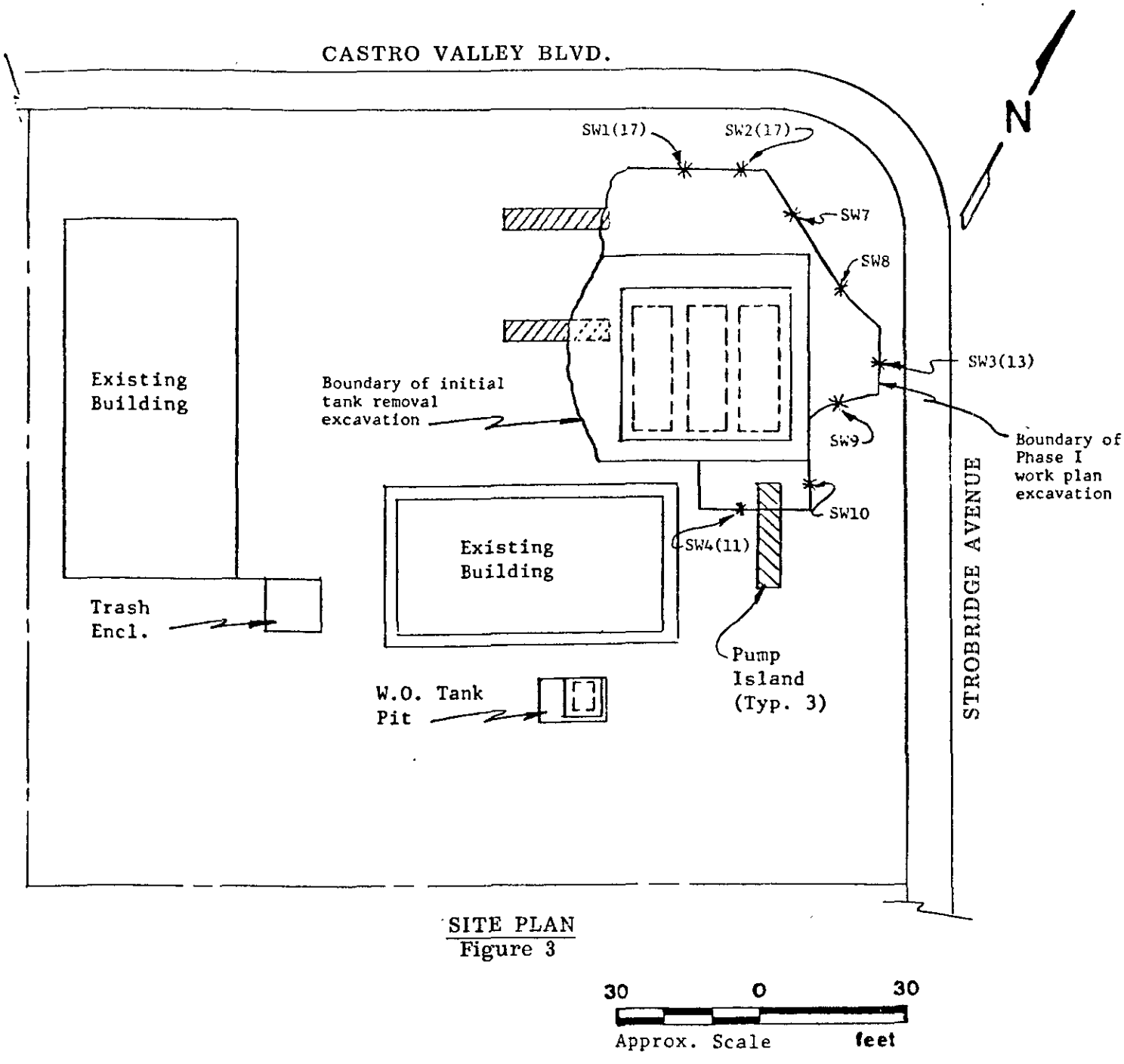
30 0 30
Approx. Scale feet

LEGEND

* Sample Point Location

Unocal S/S #3072
2445 Castro Valley Blvd.
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



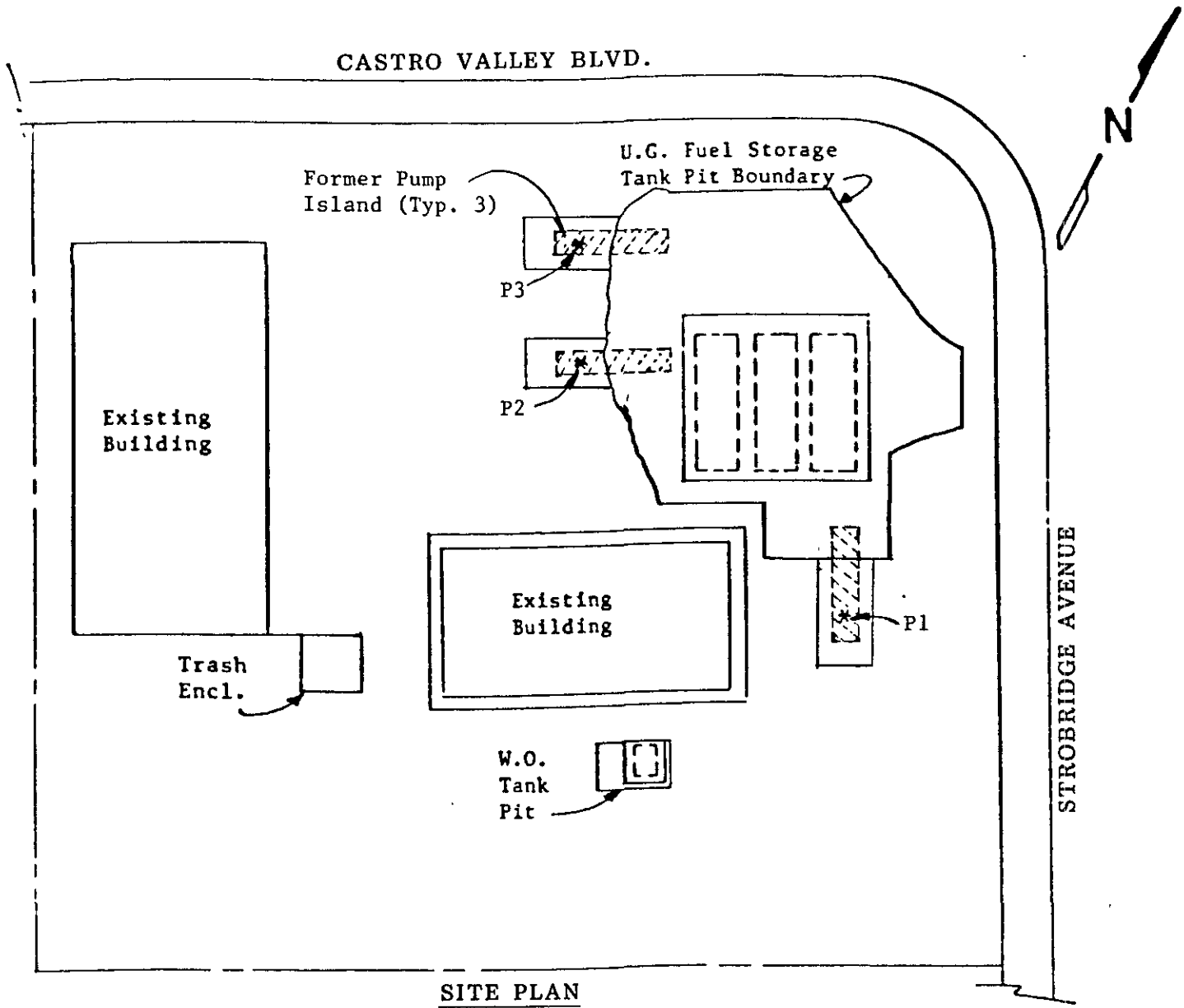
SITE PLAN
Figure 3

LEGEND

* Sample Point Location

Unocal S/S #3072
2445 Castro Valley Blvd.
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 4

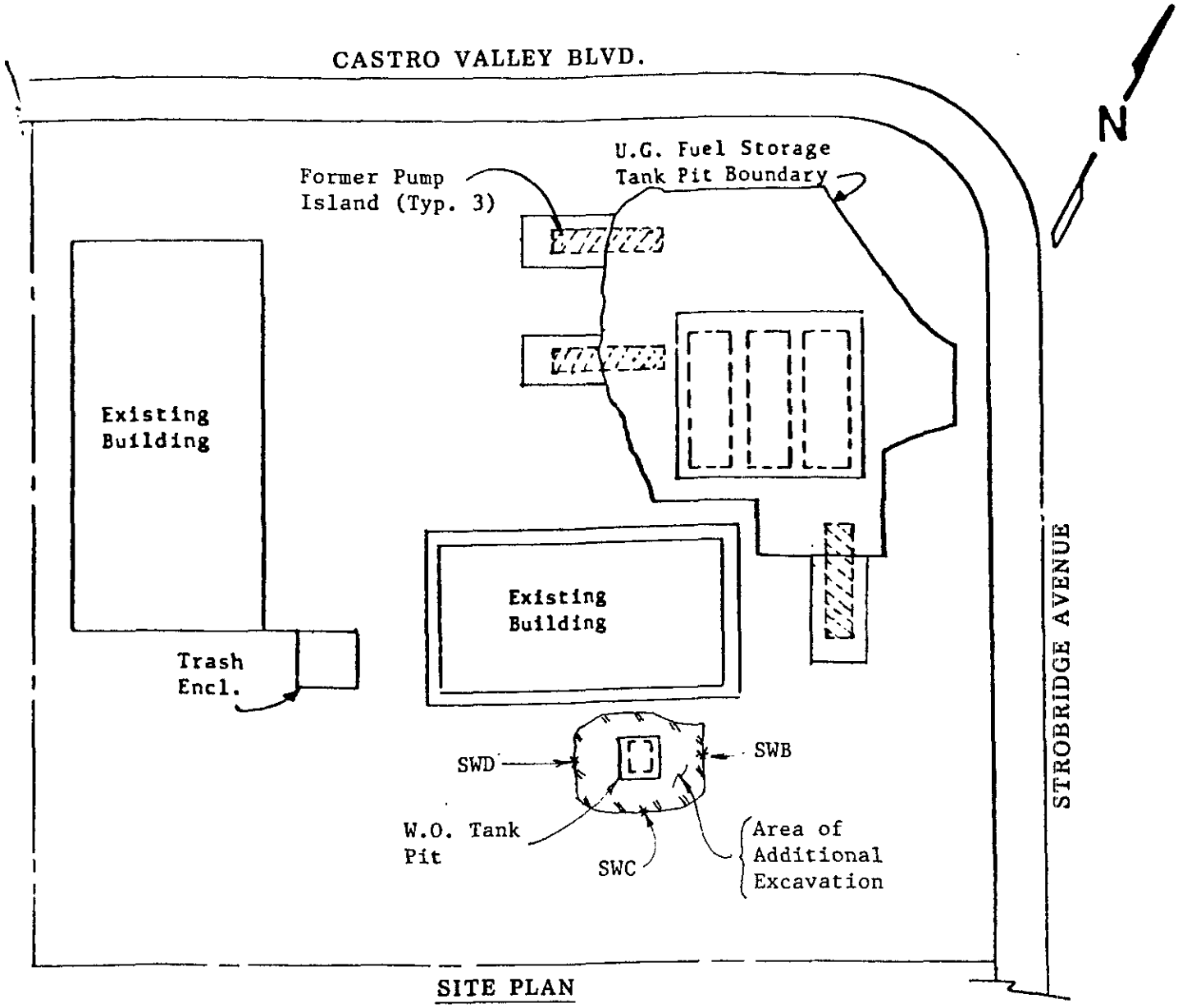
LEGEND

* Sample Point Location

30 0 30
Approx. Scale feet

Unocal S/S #3072
2445 Castro Valley Blvd.
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 5

LEGEND

* Sample Point Location

30 0 30
Approx. Scale feet

Unocal S/S #3072
2445 Castro Valley Blvd.
Castro Valley, CA

SEQUOIA ANALYTICAL

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal #3072, 2445 Castro Valley Blvd.		Sampled:	Dec 20, 1991
P.O. Box 996	Matrix Descript:	Water	Castro Valley	Received:	Dec 20, 1991
Benlcia, CA 94510	Analysis Method:	EPA 5030/8015/8020		Analyzed:	Dec 27, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	112-0880		Reported:	Jan 6, 1992

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)
112-0880	MW1	N.D.	N.D.	N.D.	N.D.	N.D.
112-0881	MW2	N.D.	N.D.	N.D.	N.D.	N.D.
112-0882	MW3	N.D.	N.D.	N.D.	N.D.	N.D.
112-0883	MW4	N.D.	N.D.	N.D.	N.D.	N.D.
112-0884	MW5	N.D.	N.D.	N.D.	N.D.	N.D.
Method Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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

Kaprealian Engineering, Inc.	Client Project ID:	Unocal #3072, 2445 Castro Valley Blvd.		Sampled:	Dec 20, 1991
P.O. Box 996	Matrix Descript:	Water	Castro Valley	Received:	Dec 20, 1991
Benicia, CA 94510	Analysis Method:	EPA 3510/8015		Extracted:	Dec 26, 1991
Attention: Mardo Kaprealian, P.E.	First Sample #:	112-0883		Analyzed:	Dec 30, 1991
				Reported:	Jan 6, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons µg/L (ppb)
112-0883	MW4	N.D.
112-0884	MW5	N.D.

Method Detection Limits:	**50**

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.

SEQUOIA ANALYTICAL

Belinda C. Vega
Laboratory Director

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

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

Client Project ID: Unocal #3072, 2445 Castro Valley Blvd., Castro Valley
QC Sample Group: 112880-884
Reported: Jan 6, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes	Diesel
Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA8015
Analyst:	R.H.	R.H.	R.H.	R.H.	A. Tuzon
Reporting Units:	ug/L	ug/L	ug/L	ug/L	ug/L
Date Analyzed:	Dec 27, 1991	Dec 27, 1991	Dec 27, 1991	Dec 27, 1991	Dec 30, 1991
QC Sample #:	Matrix Blank	Matrix Blank	Matrix Blank	Matrix Blank	Matrix Blank
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	20	20	20	60	300
Conc. Matrix Spike:	23	23	23	69	240
Matrix Spike % Recovery:	115	115	115	115	81
Conc. Matrix Spike Dup.:	23	22	23	69	230
Matrix Spike Duplicate % Recovery:	115	110	115	115	79
Relative % Difference:	0.0	4.4	0.0	0.0	2.0

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

Client Project ID: Unocal #3072, 2445 Castro Valley Blvd., Castro Valley

QC Sample Group: 1120880-884

Reported: Jan 6, 1992

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015
Analyst:	R.H.	R.H.	R.H.	R.H.	R.H.	R.H.	A.T.
Reporting Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Date Analyzed:	Dec 27, 1991	Dec 27, 1991	Dec 27, 1991	Dec 27, 1991	Dec 27, 1991	Dec 27, 1991	Dec 30, 1991
Sample #:	112-0880	112-0881	112-0882	112-0883	112-0884	Blank	112-0883
Surrogate % Recovery:	100	96	97	97	97	110	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) 686-9600 • FAX (510) 686-9689

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

Client Project ID: Unocal #3072, 2445 Castro Valley Blvd., Castro Valley
QC Sample Group: 1120880-884
Reported: Jan 6, 1992

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8015	EPA 8015
Analyst:	A.T.	A.T.
Reporting Units:	ug/L	ug/L
Date Analyzed:	Dec 30, 1991	Dec 30, 1991
Sample #:	112-0884	Blank
Surrogate % Recovery:	120	120

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: [signature]

WITNESSING AGENCY:

SITE NAME & ADDRESS: UNOCAL #3072/CASTRO VALLEY
2445 CASTRO VALLEY BLVD.

ANALYSES REQUESTED: 8015 M / BTEX / 8010

TURN AROUND TIME: 48 HR

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	8015 M	BTEX	8010	REMARKS
MW1	12-20-94			X	X		2		X	X		1120880 AB
MW2	12-20-94			X	X		2		X	X		881
MW3	12-20-94			X	X		2		X	X		882
MW4	12-20-94			X	X		3		X	X	X	883 AC
MW5	12-20-94			X	X		3		X	X	X	884

Relinquished by: (Signature) [signature] (KEI) — Date/Time 12-20-94/17:45 — Received by: (Signature) [signature]

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

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

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

The following MUST BE completed by the laboratory accepting samp for analysis:

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

[signature] — Signature — SC — Title — 12/20 — Date