KAPREALIAN ENGINEERING
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April 3, 1992

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

3643

Attention: Ms. Cynthia Chapman

RE: Unocal Service Station #3135
845 - 66th Avenue
Oakland, California

Dear Ms. Chapman:

Per the request of Mr. Keith Bullock of Unocal Corporation, enclosed please find our report dated March 4, 1992, for the above referenced site.

If you should have any questions, please feel free to call our office at (510) 602-5100.

Sincerely,

Kaprealian Engineering, Inc.

Judy A. Dewey

jad\82

Enclosure

cc: Keith Bullock, Unocal Corporation

2401 Stanwell Drive, Suite 400
Concord, California 94520
Tel: 510.602.5100 Fax: 510.687.0602

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P.O. BOX 996 • BENICIA, CA 94510
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KEI-P88-1203.QR5
March 4, 1992

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

Attention: Mr. Keith Bullock

RE: Quarterly Report
Unocal Service Station #3135
845 - 66th Avenue
Oakland, California

Dear Mr. Bullock:

This report presents the results of the most recent quarter of monitoring and sampling of the monitoring wells at the referenced site by Kaprealian Engineering, Inc. (KEI), per KEI's proposal KEI-P88-1203.P4 dated April 22, 1991. The wells are currently monitored monthly and sampled on a quarterly basis. This report covers the work performed by KEI during December 1991 through February 1992.

SITE DESCRIPTION AND BACKGROUND

The subject site is presently used as a gasoline station. The vicinity of the site is characterized by gently sloping, southwest trending topography, and is located approximately 3,400 feet northeast of the present shoreline of San Leandro Bay and approximately 500 feet northwest of Lion Creek. A Location Map, Site Vicinity Map, and Site Plans are attached to this report.

Available historical data indicate that the subject site has been used as a service station from sometime prior to 1967. During 1967, the gasoline station, as it probably existed for approximately 20 years, was demolished and a more modern facility was constructed in its place. At this time, a strip of land (approximately 11 feet wide) along the northeasterly property line was dedicated to the Bay Area Rapid Transit District (BART), and a strip of land (approximately 40 feet wide) located along the southwesterly property line was added to the site. The station layout has not significantly changed since 1967, other than building modifications. The service station facilities, including the building, pump islands, and underground fuel storage tank locations, are indicated on the attached Site Plan, Figure 5, for both the station as it existed prior to 1967, and the station as it currently exists.

KEI's initial work at the site began on December 8, 1988, during modifications to the pump island located along San Leandro Street. Three soil samples were collected from undisturbed soil at depths ranging from 2 to 3 feet below grade. The samples were analyzed by Sequoia Analytical Laboratory in Redwood City, California, for total petroleum hydrocarbons (TPH) as gasoline, and benzene, toluene, xylenes, and ethylbenzene (BTX&E). Analytical results of the soil samples collected from beneath the pump island indicated non-detectable levels of all constituents for all three samples. Documentation of the sample collection techniques and the analytical results are presented in KEI's report (KEI-J88-1203.R1) dated December 16, 1988.

KEI returned to the site on November 29, 1989, when two 10,000 gallon underground gasoline storage tanks and one 280 gallon waste oil tank were removed from the site. The gasoline tanks and the waste oil tank were all made of steel, and no apparent cracks or holes were observed in any of the tanks.

Water was initially encountered in the fuel tank pit at a depth of approximately 10.5 feet below grade, thus prohibiting the collection of any soil samples from immediately beneath the tanks. Six soil samples, labeled SW1 through SW6, were collected from the sidewalls of the fuel tank pit (each approximately 18 to 30-inches above the water table). One soil sample, labeled WO1, was collected from beneath the waste oil tank at a depth of 8.5 feet below grade. The soil beneath the waste oil tank was then excavated until ground water was encountered. Two sidewall soil samples, labeled SWA and SWB, were collected from the waste oil tank pit sidewalls (each approximately 12-inches above the water table). Sample point locations are as shown on the attached Site Plan, Figure 4.

All soil samples were analyzed by Sequoia Analytical Laboratory in Redwood City, California. All of the fuel tank pit sidewall samples were analyzed for TPH as gasoline and BTX&E. Analytical results of the samples collected from the fuel tank pit showed TPH as gasoline levels ranging from non-detectable to 32 ppm, with benzene levels ranging from non-detectable to 1.2 ppm. The waste oil tank pit bottom and sidewall samples were analyzed for TPH as gasoline, BTX&E, TPH as diesel, total oil and grease (TOG), EPA method 8010 constituents, and the metals cadmium, chromium, lead, and zinc. Analytical results of the waste oil tank pit soil samples indicated less than 50 ppm of TOG, non-detectable levels of BTX&E, TPH as diesel, and EPA method 8010 constituents, and less than 5.0 ppm of TPH as gasoline for all three samples. Metal concentrations were as indicated in Table 5.

KEI collected 11 pipe trench samples, labeled D1 through D6 and P1 through P5, at depths ranging from 3.5 to 6 feet below grade on November 29, December 5, and December 29, 1989. Upon review of the analytical results for sample P2, KEI returned to the site on January 9, 1990, to collect additional soil samples. Following the trench excavation to a depth of 12 feet below grade, one sample [labeled P2(12)], was collected at a depth of 12 feet below grade, and two samples (labeled SWP2E and SWP2W) were collected at depths of 11 feet below grade from the easterly and westerly sidewalls of the trench adjacent to sample point location P2(12). KEI completed the pipe trench sampling on January 10, 1990, when two samples, (labeled P6 and P7), were collected at depths of 3 and 4 feet below grade, respectively. Pipe trench sample point locations are as shown on the attached Site Plan, Figure 3.

Analytical results of soil samples collected from the pipe trench indicated TPH as gasoline levels ranging from non-detectable to 15 ppm, with non-detectable to 0.13 ppm levels of benzene for all samples, except sample P2, which showed TPH as gasoline at 3,800 ppm and benzene at 6.1 ppm. Following the additional excavation in the area of sample point P2, analytical results of samples P2(12), SWP2E, and SWP2W indicated non-detectable levels of TPH as gasoline and benzene for samples P2(12) and SWP2W, while sample SWP2E showed TPH as gasoline at 20 ppm, with non-detectable levels of benzene. The analytical results of the soil samples are summarized in Table 5.

After the fuel tank pit soil sampling was completed, approximately 5,000 gallons of ground water were pumped from the fuel tank pit. On December 5, 1989, one water sample (labeled W1) was collected from the fuel tank pit. The water sample was analyzed for TPH as gasoline, BTX&E, and EPA method 8010 constituents. Analytical results of the water sample collected from the fuel tank pit indicated 7,900 ppb of TPH as gasoline, 850 ppb of benzene, and non-detectable levels of EPA method 8010 constituents. Analytical results of the water sample are summarized in Table 6. Documentation of the tank and piping removal procedures, sample collection techniques, and analytical results of the soil and water sampling activities are presented in KEI's report (KEI-J88-1203.R2) dated January 15, 1990.

Based on the analytical results, and in accordance with the guidelines established by the Regional Water Quality Control Board (RWQCB), KEI recommended the installation of three monitoring wells at the site to begin to define the extent of the soil and ground water contamination, and to determine the ground water flow direction.

On April 26 and 27, 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. During drilling, an attempt was made to install MW2 near the pump island; however, drill bit refusal was encountered, and MW2 was installed at the modified location (as indicated on the attached Site Plan, Figure 1). The earlier attempts to install well MW2 resulted in the drilling of two shallow exploratory borings, designated as EB1 and EB2 and as shown on the attached Site Plan, Figure 1. The exploratory borings were backfilled to the surface with neat cement.

The three monitoring wells were each drilled and completed to total depths ranging from 22 to 23 feet below grade. The exploratory borings were each drilled and/or sampled to depths of 8.5 and 10.5 feet below grade. Ground water was encountered at depths ranging from 9.5 to 14.5 feet beneath the surface during drilling. The wells were developed on May 3 and 4, 1990, and were initially sampled on May 11, 1990.

Water and selected soil samples were analyzed at Sequoia Analytical Laboratory in Redwood City, California, for TPH as gasoline and BTX&E. In addition, sample EB2(9), collected from boring EB2, was analyzed for TPH as diesel and TOG.

Analytical results of the soil samples collected from the borings for monitoring wells MW1 and MW3 indicated non-detectable levels of TPH as gasoline in all soil samples. Analytical results of the soil samples collected from the boring for monitoring well MW2 indicated levels of TPH as gasoline ranging from 2.2 ppm to 6.8 ppm. However, analytical results of the soil samples collected from boring EB2 indicated levels of TPH as gasoline ranging from 2,400 ppm to 12,000 ppm. In sample EB2(9), TPH as diesel was detected at 1,400 ppm, and TOG was detected at 7,000 ppm. Benzene was detected in all soil samples collected from MW1, MW2, and MW3, [except for samples MW2(10) and MW2(12)], at levels ranging from 0.0075 ppm to 0.012 ppm. Benzene was also detected in samples EB2(7) and EB2(9) at concentrations of 5.0 ppm and 84 ppm, respectively.

Analytical results of the ground water samples collected from monitoring wells MW1 and MW2 indicated levels of TPH as gasoline at 22,000 ppb and 65,000 ppb, respectively. Benzene was detected in samples MW1 and MW2 at levels of 590 ppb and 3,300 ppb, respectively. Analytical results of the ground water sample collected from monitoring well MW3 showed non-detectable levels of all constituents analyzed. The results of the soil analyses are summarized in Table 4, and the results of the water analyses are summarized in Table 2.

Based on the analytical results, KEI recommended the implementation of a monthly monitoring and quarterly sampling program. In addition, KEI recommended the installation of three additional monitoring wells to further define the extent of ground water contamination. Also, KEI recommended that additional soil excavation be conducted in the vicinity of borings EB1 and EB2 because of the level of the soil contamination detected in these borings. Documentation of the well installation procedures, sample collection techniques, and the analytical results are presented in KEI's report (KEI-P88-1203.R7) dated May 31, 1990.

On August 14, 1990, three additional two-inch diameter monitoring wells (designated as MW4, MW5, and MW6 on the attached Site Plan, Figure 1) were installed at the site. The three wells were each drilled and completed to total depths of 26 feet below grade, except for well MW4, which was completed at a depth of 25 feet below grade. Ground water was encountered at depths ranging from 13.5 to 16.5 feet beneath the surface during drilling. The new wells were developed on August 21, 1990, and all of the wells were sampled on August 28, 1990. Water from all wells, and selected soil samples from the borings for MW4, MW5, and MW6, were analyzed at Sequoia Analytical Laboratory in Concord, California, for TPH as gasoline and BTX&E. In addition, soil samples collected from the boring for monitoring well MW6, and water samples collected from monitoring well MW2 and MW6, were also analyzed for TPH as diesel and TOG.

The analytical results of the soil samples collected from the borings for wells MW4, MW5, and MW6 showed non-detectable levels of TPH as gasoline and benzene in all samples analyzed, except for MW6(10), MW6(12.5), and MW6(15.5), which showed levels of TPH as gasoline at 18 ppm, 160 ppm, and 2.5 ppm, respectively, and levels of benzene at 0.24 ppm, 3.4 ppm, and 0.43 ppm, respectively. In addition, TPH as diesel was detected only in samples MW6(10) and MW6(12.5), at levels of 5.1 ppm and 93 ppm, respectively. Also, TOG was detected in sample MW6(12.5) at a level of 200 ppm.

The analytical results of the water samples collected from monitoring wells MW3 and MW5 indicated non-detectable levels of TPH as gasoline and benzene. Levels of TPH as gasoline and benzene were detected in wells MW1, MW2, MW4, and MW6 at concentrations ranging from 1,700 ppb to 62,000 ppb for TPH as gasoline, with benzene concentrations ranging from 140 ppb to 2,600 ppb. Also, TPH as diesel was detected in wells MW2 and MW6 at levels of 3,100 ppb and 1,000 ppb, respectively. The results of the soil analyses are summarized in Table 3, and the results of the water analyses are summarized in Table 2.

Based on these results, KEI recommended that a Hydropunch study be performed at and in the vicinity of the site to aid in determining the extent of ground water contamination. Documentation of the well installation protocol, sample collection techniques, and the analytical results are presented in KEI's report (KEI-P88-1203.R8) dated September 24, 1990.

On January 19 and 20, 1991, CHIPS Environmental Consultants, Inc. (CEC) of Sunnyvale, California, conducted a ground water sampling study under the direction of KEI. Sampling methods and the analytical results are presented in the CEC report dated February 1991, and are summarized below.

Ground water samples were collected from seven locations (designated as P1 through P7 on the attached Site Vicinity Map). The ground water samples were collected from depths of about 14 to 17 feet below grade. After sample collection, the holes were grouted with a bentonite-cement mixture.

Ground water samples collected from the probe holes were analyzed at CEC's laboratory in Sunnyvale, California. The samples were analyzed for TPH as diesel, TPH as gasoline, and BTX&E.

The analytical results of the water samples collected from the sample probes P2 through P7 showed non-detectable levels of TPH as gasoline, BTX&E, and TPH as diesel, except for sample P2, which showed 0.6 ppb of xylenes. The analytical results of the water sample collected from probe P1 indicated a level of TPH as gasoline at 92 ppb, a level of benzene at 0.8 ppb, and a non-detectable level of TPH as diesel. Analytical results of the ground water samples are summarized in Table 7. Documentation of the sampling methods and analytical results are presented in KEI's report (KEI-P88-1203.R9) dated April 22, 1991.

As previously recommended, a representative of KEI was present at the site on March 12, 1991, to observe the excavation of contaminated soil in the immediate vicinity of the previously drilled exploratory borings EB1 and EB2. The excavation revealed two large concrete slabs (each approximately 13 feet long by 5.5 feet wide and 1 foot thick, which were located at depths of about 8.5 feet and 10 feet below grade). Inspection of the slab surfaces showed evidence of the previous boring attempts in this area (EB1 and EB2).

KEI returned to the site on March 19, 1991, to observe the removal of the above-mentioned concrete slabs. The removal had been scheduled to permit the installation of shoring along the northeasterly side of the 66th Avenue pump islands. The shoring was

necessary to avoid potential damage to the product piping, since this area had been overexcavated during the fuel tank replacement in November and December of 1989. Concrete removal and subsequent soil excavation to a depth of about 1 foot below ground water (which was encountered at a depth of approximately 11 feet below grade), confirmed the previous removal of underground fuel storage tanks from this area.

Also on March 19, 1990, KEI collected two soil samples, labeled SW1 and SW2, from the sidewalls of the former fuel tank pit excavation (at depths of 6 to 12 inches above ground water). Sample point locations are as shown on the attached Site Plan, Figure 2.

KEI returned to the site on March 21 and 22, 1991, to observe the continuing excavation of contaminated soil from the former fuel tank pit. On March 21, 1991, two soil samples, labeled SW3 and SW4, were collected from the sidewalls of the excavation, each approximately 6 to 12 inches above ground water level. On March 22, 1991, three soil samples, labeled SW5, SW6, and SW2(12), were collected from the sidewalls of the excavation (each approximately 6 to 12 inches above the level of the ground water). Sample point locations are as shown on the attached Site Plan, Figure 2.

KEI again returned to the site on April 3, 4, and 5, 1991. One soil sample, labeled SW5(7), was collected on April 3, one soil sample, labeled SW7, was collected on April 4, and three soil samples, labeled SW4(6), SW3(2), and SW10, were collected on April 5, 1991. All samples were collected from the excavation sidewalls (approximately 6 to 12 inches above the level of the ground water). Sample point locations are as indicated on the attached Site Plan, Figure 2.

On April 11, 1991, KEI collected four soil samples, labeled SW2(30), SW6(5), SW8, and SW9, from the sidewalls of the excavation (each approximately 6 to 12 inches above the level of the ground water). Sample point locations are as shown on the attached Site Plan, Figure 2.

On March 27, 1991, approximately 10,000 gallons of ground water were pumped prior to backfilling a portion of the excavation along the northeasterly side of 66th Avenue pump islands. An additional 10,000 gallons of ground water were pumped from the excavation after completion of the soil sampling activities on April 11, 1991.

All samples were analyzed by Sequoia Analytical Laboratory in Concord, California. All soil samples were analyzed for TPH as gasoline and BTX&E. In addition, all soil samples, except samples SW2(30) and SW6(5), were also analyzed for TOG.

Analytical results of the soil samples (SW1 and SW9) collected from the former fuel tank pit excavation indicated non-detectable levels of TPH as gasoline. Analytical results of soil samples SW2, SW2(12), SW3, SW4, SW5, and SW6, indicated levels of TPH as gasoline at 1,000 ppm, 2,400 ppm, 310 ppm, 1,400 ppm, 2,200 ppm, and 260 ppm, respectively. Analytical results of the final soil samples {SW1, SW2(30), SW3(2), SW4(6), SW5(7), SW6(5), SW7, SW8, SW9, and SW10} collected from the boundaries of the excavation (see the attached Site Plan, Figure 2) indicated levels of TPH as gasoline ranging from non-detectable to 53 ppm, except for samples SW2(30), SW8, and SW10, which indicated levels of TPH as gasoline at 340 ppm, 310 ppm, and 1,400 ppm, respectively. However, KEI was unable to further excavate laterally in the vicinity of sample point SW10 due to limited access (the product piping).

Analytical results of sidewall soil samples SW1, SW3, and SW6 through SW9, which were collected after the initial excavation, indicated non-detectable levels of TOG for all samples. Analytical results of sidewall soil samples SW2, SW4, SW5, and SW10, also collected after the initial excavation, indicated levels of TOG at concentrations of 58 ppm, 160 ppm, 85 ppm, and 60 ppm, respectively. However, the analytical results of soil samples collected after additional excavation at sample point locations SW2, SW4, and SW5 indicated non-detectable levels of TOG for all three samples. The results of the soil analyses are summarized in Table 9. The results of the excavation and soil sampling activities are presented in KEI's report (KEI-J88-1203.R10) dated April 26, 1991.

The review of site historical data indicated that borings EB1 and EB2 had been drilled in the area of the former underground fuel storage tank pit as it existed prior to 1967. The previous work at the site had shown that the site is underlain by artificial fill materials to a depth of about 7.5 feet below grade. This layer of fill, coupled with the drill bit refusal experienced at depths of about 8.5 and 10.5 feet below grade for borings EB1 and EB2, respectively, suggested that this area may have been filled with assorted refuse from the pre-1967 version of the station.

In all, approximately 2,000 cubic yards of contaminated soil have been removed from the area in the vicinity of the pre-1967 tank pit. All soil in the pre-1967 tank pit was excavated laterally until the sidewall soil samples indicated less than 100 ppm of both TPH as gasoline and TOG, except at sample point locations SW2(30), SW8, and SW10, where the excavation was terminated because the existing product piping prevented further excavation. In addition, soil was not excavated from the southwesterly end of the pre-1967 tank pit, due to its location between the existing pump islands located along 66th Avenue.

RECENT FIELD ACTIVITIES

The six wells (MW1 through MW6) were monitored three times and were sampled once during the quarter. During monitoring, the wells were checked for depth to water and presence of free product. During sampling, the wells were also checked for the presence of 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 February 7, 1992. Prior to sampling, the wells were each purged of between 10 and 15 gallons by the use of a surface pump. 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 February 7, 1992, the ground water flow direction appeared to be generally toward the north-northeast (ranging from due north to the east-northeast) at average gradients of about 0.002 to 0.005, which is relatively unchanged from the previous quarter. Water levels have fluctuated during the quarter, showing a net increase in all wells of 1.45 to 1.87 feet since November 5, 1991. The measured depth to ground water at the site on February 7, 1992, ranged between 8.00 and 10.82 feet below grade.

In response to a letter (dated August 1, 1990) from the Alameda County Health Care Services Agency, KEI evaluated the effects of possible tidal action on ground water levels at the subject site. On January 18, 1991, a representative of KEI was at the site for an approximate seven-hour period to monitor any changes in the ground water table elevation that might have been related to tidal effects. All six monitoring wells were monitored 13 times for depth to water. All monitoring data is presented as Table 8. The water table continuously decreased in each well during the seven-hour monitoring period (from 0.09 feet to 0.11 feet), which represents only a 0.02 feet differential. The constant decrease in the water table at the site may be related to tidal action; however, the near uniform decrease in the wells indicates that the ground water flow direction does not change appreciably in response to any tidal actions. Therefore KEI recommended that no further study be conducted at the site in relation to the possible effects of tidal actions.

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," 1979), the subject site is underlain by relatively unconsolidated alluvial deposits that are described as fine-grained alluvium (Qhaf) and that typically consist of clay and silt materials. In addition, the site is closely adjacent to a mapped geologic contact with Bay Mud (Qhbm) to the west.

Based on inspection of the tank pit excavation, the site is underlain by artificial fill materials to a depth of about 7.5 feet below grade. The fill materials are underlain by about 1.5 feet of highly expansive silty clay material that appears to inturn be underlain by light brown, sandy silt. This silt contains a trace of fine gravel and light brown, very fine-grained sand.

The results of our subsurface study from the borings for MW1, MW2, and MW3 indicated the site is underlain by artificial fill materials to depths of about 7 to 8 feet below grade. Locally, the fill materials extend to depths of at least 8.5 and 10.5 feet below grade in the vicinity of borings EB1 and EB2 (the maximum depth explored). The fill materials are generally underlain by a 1.5 to 2 foot thick bed of silt, which is inturn underlain by a persistent coarse-grained sequence of clayey to sandy gravel that is interbedded with clayey to silty sand to the maximum depth explored (23 feet below grade).

The results of our most recent subsurface study from the borings for MW4, MW5, and MW6 indicated that the site is underlain by artificial fill materials to depths of about 2.5 to 4.4 feet below grade. The fill materials are inturn underlain by silty clay materials to depths of about 8 to 12.7 feet below grade. This silty clay zone is inturn underlain by a coarse-grained zone composed of clayey gravel and/or clayey sand materials that extend to depths of about 12.1 to 14.3 feet below grade. This coarse-grained zone is inturn underlain by a clayey silt bed that varies from about 1 to 3 feet in thickness and that extend to depths of about 14.2 to 14.8 feet below grade in wells MW4 and MW5, and to about 17.3 feet below grade in MW6. The ground water table encountered during drilling activities was detected within or immediately below the silt bed. This relatively thin clayey silt bed is underlain by a generally thick sequence of silty to clayey sand and gravel lenses that extend to the maximum depth explored (26 feet below grade), except in the boring for well MW5, where a second clayey silt bed was encountered at depths below grade of about 15.6 to 19.5 feet. Also, a clay bed was encountered at approximately 24 feet below grade in MW5 that extends to the total depth drilled (26 feet below grade).

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, BTX&E using EPA method 8020, and TPH as diesel using EPA method 3510 in conjunction with modified 8015. The water samples collected from monitoring wells MW2 and MW6 were also analyzed for TOG using Standard Method 5520B&F.

Analytical results of the ground water samples collected from monitoring wells MW3 and MW5 indicated non-detectable levels of TPH as gasoline, TPH as diesel, and BTX&E, except for 0.94 ppb of xylenes and 0.36 ppb of ethylbenzene detected in MW5. TPH as diesel was also non-detectable in wells MW1 and MW6. Analytical results of the ground water samples collected from monitoring wells MW1, MW2, MW4, and MW6 indicated levels of TPH as gasoline at concentrations of 220 ppb, 11,000 ppb, 8,100 ppb, and 180 ppb, respectively, with levels of benzene at concentrations of 2.1 ppb, 1,400 ppb, 24 ppb, and 22 ppb, respectively. In monitoring wells MW2 and MW4, TPH as diesel was detected at concentrations of 2,300 ppb each. TOG was non-detectable in the ground water samples collected from wells MW2 and MW6. Concentrations of TPH as gasoline, benzene, and TPH as diesel detected in ground water samples collected on February 7, 1992, are shown on the attached Site Plan, Figure 1a. Results of the water analyses are summarized in Table 2. Copies of the analytical results and Chain of Custody documentation are attached to this report.

DISCUSSION AND RECOMMENDATIONS

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-P88-1203.P4) dated April 22, 1991. Based on the levels of TPH as diesel previously detected in monitoring wells MW1, MW2, MW4, and MW6, KEI also recommends that samples collected from all monitoring wells during the next quarter continue to be analyzed for TPH as diesel by EPA method 3510 in conjunction with modified 8015.

As previously reported, the analytical results of previous ground water sampling studies conducted at and in the vicinity of the site indicated that the extent of the ground water contamination appears to be between the boundaries of the subject service station site and the contamination limits defined by probes P3 through P7 in the Hydropunch study. Based on the analytical results of ground water samples collected from monitoring wells MW1 through MW6 on February

21, 1991, KEI recommended the installation of three off-site monitoring wells (to verify the non-detectable levels of hydrocarbon contamination that were found downgradient of the site in the Hydropunch study) and one on-site monitoring well in the vicinity of probe P1 (to verify the low level of ground water contamination previously detected in this probe). The proposed well locations are shown on the attached Site Vicinity Map.

KEI has obtained the necessary well installation permits; however, the required encroachment permits have not been obtained as of the date of this report. KEI understands that Unocal is actively pursuing the encroachment permits. The proposed wells will be installed as soon as all permits have been obtained. Once the extent of ground water contamination is verified (by the installation of the previously proposed monitoring wells), KEI will begin the design process for a ground water remediation system for the site.

DISTRIBUTION

A copy of this report should be sent to Ms. Cynthia Chapman of the Alameda County Health Care Services Agency, and to the RWQCB, 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.

for Thomas J. Berkins

Thomas J. Berkins
Senior Environmental Engineer

Don R. Braun
Certified Engineering Geologist

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

Timothy R. Ross
Project Manager

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Attachments: Tables 1 through 9
Location Map
Site Vicinity Map
Site Plans - Figures 1, 1a, 2, 3, 4 & 5
Laboratory Analyses
Chain of Custody documentation

KEI-P88-1203.QR5
March 4, 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 February 7, 1992)					
MW1	-5.38	10.56	0	No	10
MW2	-5.37	9.20	0	No	12
MW3	-4.70	8.00	0	No	13
MW4	-5.55	10.82	0	No	12
MW5	-5.37	9.98	0	No	14
MW6	-5.30	9.61	0	No	15
(Monitored on January 8, 1992)					
MW1	-6.06	11.24	0	--	0
MW2	-5.89	9.72	0	--	0
MW3	-5.19	8.49	0	--	0
MW4	-6.32	11.59	0	--	0
MW5	-5.93	10.54	0	--	0
MW6	-5.67	9.98	0	--	0
(Monitored on December 5, 1991)					
MW1	-6.98	12.16	0	--	0
MW2	-6.97	10.80	0	--	0
MW3	-6.73	10.03	0	--	0
MW4	-7.08	12.35	0	--	0
MW5	-7.02	11.63	0	--	0
MW6	-7.04	11.35	0	--	0

Well #	Surface Elevation* (feet)
MW1	5.18
MW2	3.83
MW3	3.30
MW4	5.27
MW5	4.61
MW6	4.31

-- Sheen determination was not performed.

* Elevations of the tops of the well covers were surveyed to Mean Sea Level (MSL).

KEI-P88-1203.QR5
March 4, 1992

TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Sample Number	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	TOG
(Collected on February 7, 1992)							
MW1	ND	220	2.1	ND	16	10	--
MW2	2,300	11,000	1,400	30	1,400	1,900	ND
MW3	ND	ND	ND	ND	ND	ND	--
MW4	2,300	8,100	24	4.9	3,200	1,800	--
MW5	ND	ND	ND	ND	0.94	0.36	--
MW6	ND	180	22	0.68	20	22	ND
(Collected on November 5, 1991)							
MW1	260	4,900	80	ND	160	150	--
MW2	3,900	110,000	4,200	200	8,600	3,400	78
MW3	ND	31	ND	ND	0.65	ND	--
MW4	7,700	140,000	320	ND	13,000	4,800	--
MW5	ND	ND	ND	ND	ND	ND	--
MW6	300	7,100	200	ND	580	190	ND
(Collected on August 5, 1991)							
MW1	200	1,200	95	6.2	80	230	--
MW2	4,200	33,000	2,900	190	7,900	3,400	ND
MW3	63	ND	ND	ND	ND	ND	--
MW4	6,200	37,000	310	70	9,700	3,600	--
MW5	ND	ND	ND	ND	ND	ND	--
MW6	130	860	130	11	150	92	ND
(Collected on February 21, 1991)							
MW1	690	26,000	280	39	1,900	1,200	--
MW2	7,000	3,400	160	61	490	200	ND
MW3	--	ND	ND	ND	0.64	ND	--
MW4	4,100	33,000	210	21	12,000	3,800	--
MW5	--	56	ND	ND	4.7	ND	--
MW6	160	750	77	14	140	23	ND
MWD**	--	740	74	12	140	33	--

KEI-P88-1203.QR5
March 4, 1992

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Sample Number	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	TOG
			(Collected on November 26, 1990)				
MW1	--	2,900	160	2.3	320	330	--
MW2	3,800	15,000	1,600	450	2,100	1,100	ND
MW3	--	ND	ND	ND	ND	ND	--
MW4	--	49,000	360	36	11,000	3,800	--
MW5	--	ND	ND	ND	ND	ND	--
MW6	320	4,800	1,000	200	650	340	ND
"MW7"**	--	4,000	800	120	440	250	--
			(Collected on August 28, 1990)				
MW1	--	1,700	140	1.4	150	180	--
MW2	3,100	27,000	2,600	1,300	3,000	1,900	ND
MW3	--	ND	ND	ND	0.70	ND	--
MW4	--	62,000	810	72	4,600	4,400	--
MW5	--	ND	ND	ND	1.2	ND	--
MW6	1,000	12,000	1,700	1,400	2,100	230	16
"MW7"*	--	2,600	180	3.0	270	810	--
			(Collected on May 11, 1990)				
MW1	--	22,000	590	42	3,600	1,200	--
MW2	--	65,000	3,300	3,300	12,000	4,100	--
MW3	--	ND	ND	ND	ND	ND	--
Detection Limits	50	30	0.30	0.30	0.30	0.30	5.0

ND = Non-detectable.

-- Indicates analysis not performed.

* "MW7" is a duplicate sample from MW1.

** "MW7" and MWD are duplicate samples from MW6.

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

KEI-P88-1203.QR5
March 4, 1992

TABLE 3

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on August 14, 1990)

Sample Number	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	TOG
MW4(14.5)	14.5	--	ND	ND	ND	ND	ND	--
MW5(13)	13.0	--	ND	ND	0.010	ND	ND	--
MW6(5)	5.0	ND	ND	ND	0.042	ND	ND	ND
MW6(10)	10.0	5.1	18	0.26	0.22	1.2	0.34	ND
MW6(12.5)	12.5	93	160	3.4	12	3.6	20	200
MW6(15.5)	15.5	ND	2.5	0.43	0.41	0.12	0.50	ND
Detection Limits		1.0	1.0	0.0050	0.0050	0.0050	0.0050	30

-- Indicates analysis not performed.

ND = Non-detectable.

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

KEI-P88-1203.QR5
March 4, 1992

TABLE 4

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on April 26 & 27, 1990)

Sample Number	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
MW1(5)	5	ND	0.012	0.16	ND	ND
MW1(10)	10	ND	0.0094	0.024	ND	ND
MW1(14)	14	ND	0.0075	0.031	ND	ND
MW2(5)	5	2.4	0.075	0.0071	ND	ND
MW2(10)	10	2.2	ND	0.017	0.018	0.0088
MW2(12)	12	6.8	ND	0.028	0.015	0.10
MW3(5)	5	ND	0.0094	0.048	ND	ND
MW3(10)	10	ND	0.0088	0.015	ND	ND
EB2(7)	7	2,400	5.0	16	230	62
EB2(9)*	9	12,000	84	12	860	360
Detection Limits		1.0	0.0050	0.0050	0.0050	0.0050

ND = Non-detectable.

* TPH as diesel was 1,400 ppm, and TOG was 7,000 ppm.

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

KEI-P88-1203.QR5
March 4, 1992

TABLE 5

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on November 29, and
December 5 & 29, 1989)

Sample	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
SW1	9.0	--	1.6	ND	ND	ND	ND
SW2	9.0	--	3.8	ND	ND	ND	ND
SW3	9.0	--	5.6	ND	ND	2.3	0.42
SW4	9.0	--	32	1.2	ND	1.0	2.1
SW5	9.0	--	4.8	0.20	ND	0.11	ND
SW6	8.0	--	ND	ND	ND	ND	ND
D1	3.5	--	ND	ND	ND	ND	ND
D2	3.5	--	1.5	0.08	ND	ND	ND
D3	3.5	--	6.6	0.14	ND	0.31	ND
D4	3.5	--	7.4	0.11	ND	0.1	ND
D5	3.5	--	1.9	ND	ND	ND	ND
D6	3.5	--	2.0	ND	0.17	0.25	ND
P1	6.0	--	15	0.086	ND	8.5	0.18
P2	5.5	--	3,800	6.1	290	750	140
P2(12)	12.0	--	ND	ND	ND	ND	ND
P3	5.0	--	11	0.13	ND	1.3	0.18
P4	4.5	--	1.4	ND	ND	0.23	ND
P5	4.5	--	ND	ND	ND	ND	ND
P6	3.0	--	ND	ND	ND	ND	ND
P7	4.0	--	ND	ND	ND	ND	ND
SWP2E	11.0	--	20	ND	0.16	3.1	0.50
SWP2W	11.0	--	ND	ND	ND	ND	ND
WO1*	8.5	ND	1.6	ND	ND	ND	ND

KEI-P88-1203.QR5
March 4, 1992

TABLE 5 (Continued)

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on November 29, and
December 5 & 29, 1989)

Sample	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
SWA**	9.5	ND	2.1	ND	ND	ND	ND
SWB***	9.5	ND	3.9	ND	ND	ND	ND
Detection Limits		1.0	1.0	0.05	0.1	0.1	0.1

* TOG was <50 ppm, and all EPA method 8010 constituents were non-detectable. Metal concentrations were as follows: cadmium was non-detectable, chromium was 20 ppm, lead was 75 ppm, and zinc was 65 ppm.

** TOG was <50 ppm, and all EPA method 8010 constituents were non-detectable. Metals concentrations were as follows: cadmium was non-detectable, chromium was 20 ppm, lead was 5.9 ppm, and zinc was 44 ppm.

*** TOG was <50 ppm, and all EPA method 8010 constituents were non-detectable. Metals concentrations were as follows: cadmium was non-detectable, chromium was 15 ppm, lead was 5.0 ppm, an zinc was 39 ppm.

-- Indicates analysis not performed.

ND = Non-detectable.

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

KEI-P88-1203.QR5
March 4, 1992

TABLE 6

SUMMARY OF LABORATORY ANALYSES
WATER

(Collected on December 5, 1989)

Sample #	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
W1*	7,900	850	150	720	ND
Detection Limits	30.0	0.30	0.30	0.30	0.30

* All EPA method 8010 constituents were non-detectable.

ND = Non-detectable.

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

KEI-P88-1203.QR5
March 4, 1992

TABLE 7

SUMMARY OF LABORATORY ANALYSES
WATER

(Collected on January 9 through 11, 1991 by CEC)

Sample	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
P1	15	ND	90.0	0.8	0.6	2.4	0.5
P2	15	ND	ND	ND	ND	0.6	ND
P3	16	ND	ND	ND	ND	ND	ND
P4	17	ND	ND	ND	ND	ND	ND
P5	14	ND	ND	ND	ND	ND	ND
P6	15	ND	ND	ND	ND	ND	ND
P7	14	ND	ND	ND	ND	ND	ND
Detection Limits		1,000	50.0	0.5	0.5	0.5	0.5

ND = Non-detectable.

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

KEI-P88-1203.QR5
March 4, 1992

TABLE 8

SUMMARY OF MONITORING DATA

(Conducted on January 18, 1991)

Well #	Time	Ground Water Elevation (feet)	Depth to Water (feet)
MW1	9:55 a.m.	-7.27	12.45
	10:22	-7.27	12.45
	10:34	-7.27	12.45
	10:55	-7.25	12.43
	11:29	-7.24	12.42
	11:57	-7.23	12.41
	12:29 p.m.	-7.21	12.39
	1:04	-7.21	12.39
	1:27	-7.21	12.39
	1:58	-7.20	12.38
	2:29	-7.18	12.36
	4:36	-7.19	12.37
	5:01	-7.19	12.37
MW2	9:37 a.m.	-7.21	11.04
	10:08	-7.20	11.03
	10:25	-7.20	11.03
	10:46	-7.18	11.01
	11:20	-7.17	11.00
	11:49	-7.15	10.98
	12:23 p.m.	-7.14	10.97
	12:55	-7.13	10.96
	1:18	-7.14	10.97
	1:50	-7.12	10.95
	2:22	-7.11	10.94
	4:24	-7.10	10.93
	4:53	-7.10	10.93
MW3	9:34 a.m.	-6.13	9.43
	10:04	-6.12	9.42
	10:23	-6.11	9.41
	10:43	-6.11	9.41
	11:18	-6.09	9.39
	11:47	-6.08	9.38
	12:21 p.m.	-6.07	9.37
	12:53	-6.06	9.36
	1:16	-6.06	9.36
	1:48	-6.05	9.35
	2:20	-6.04	9.34
	4:21	-6.02	9.32
	4:51	-6.02	9.32

KEI-P88-1203.QR5
March 4, 1992

TABLE 8 (Continued)

SUMMARY OF MONITORING DATA

(Conducted on January 18, 1991)

Well #	Time	Ground Water Elevation (feet)	Depth to Water (feet)
MW4	9:51	-7.31	12.58
	10:17	-7.31	12.58
	10:31	-7.31	12.58
	10:53	-7.30	12.57
	11:27	-7.28	12.55
	11:55	-7.27	12.54
	12:27 p.m.	-7.24	12.51
	1:01	-7.24	12.51
	1:25	-7.25	12.52
	1:56	-7.23	12.50
	2:28	-7.22	12.49
	4:34	-7.22	12.49
	4:59	-7.22	12.49
MW5	9:47 a.m.	-7.27	11.88
	10:14	-7.27	11.88
	10:29	-7.26	11.87
	10:50	-7.25	11.86
	11:25	-7.23	11.84
	11:53	-7.22	11.83
	12:25 p.m.	-7.20	11.81
	1:00	-7.20	11.81
	1:23	-7.20	11.81
	1:54	-7.19	11.80
	2:26	-7.17	11.78
	4:30	-7.17	11.78
	4:57	-7.17	11.78
MW6	9:42 a.m.	-7.24	11.55
	10:11	-7.23	11.54
	10:27	-7.22	11.53
	10:48	-7.21	11.52
	11:23	-7.19	11.50
	11:50	-7.18	11.49
	12:24 p.m.	-7.17	11.48
	12:57	-7.17	11.48
	1:21	-7.17	11.48
	1:53	-7.14	11.45
	2:23	-7.14	11.45
	4:26	-7.14	11.45
	4:55	-7.14	11.45

KEI-P88-1203.QR5
March 4, 1992

TABLE 9

SUMMARY OF LABORATORY ANALYSES
SOIL - FUEL TANK PIT
PRE-1967

Date	Sample	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	TOG
3/19/91	SW1	10.5	ND	ND	ND	ND	ND	ND
3/19/91	SW2	11.0	1,000	14	65	98	19	58
3/22/91	SW2(12)	11.0	2,400	38	180	280	54	ND
4/11/91	SW2(30)	11.0	340	1.6	1.2	21	9.9	--
3/21/91	SW3	10.5	310	3.3	4.8	26	6.5	ND
4/05/91	SW3(2)	10.5	5.3	ND	ND	0.14	0.13	ND
3/21/91	SW4	10.5	1,400	14	41	110	30	160
4/05/91	SW4(6)	10.5	53	0.023	1.4	4.1	0.85	ND
3/22/91	SW5	10.5	2,200	28	140	260	52	85
4/03/91	SW5(7)	10.5	29	0.44	0.052	2.8	0.89	ND
3/22/91	SW6	10.5	260	3.6	7.5	29	7.2	ND
4/11/91	SW6(5)	10.5	44	0.34	0.32	2.5	1.1	--
4/04/91	SW7	11.0	2.5	0.41	0.0070	0.018	0.15	ND
4/11/91	SW8	11.0	310	1.9	2.9	8.1	2.8	ND
4/11/91	SW9	11.0	ND	0.17	ND	0.0052	0.0062	ND
4/05/91	SW10	11.0	1,400	18	130	200	36	60
Detection Limits			1.0	0.0050	0.0050	0.0050	0.0050	30

-- Indicates analysis not performed.

ND = Non-detectable.

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

KAPREALIAN ENGINEERING, INC.
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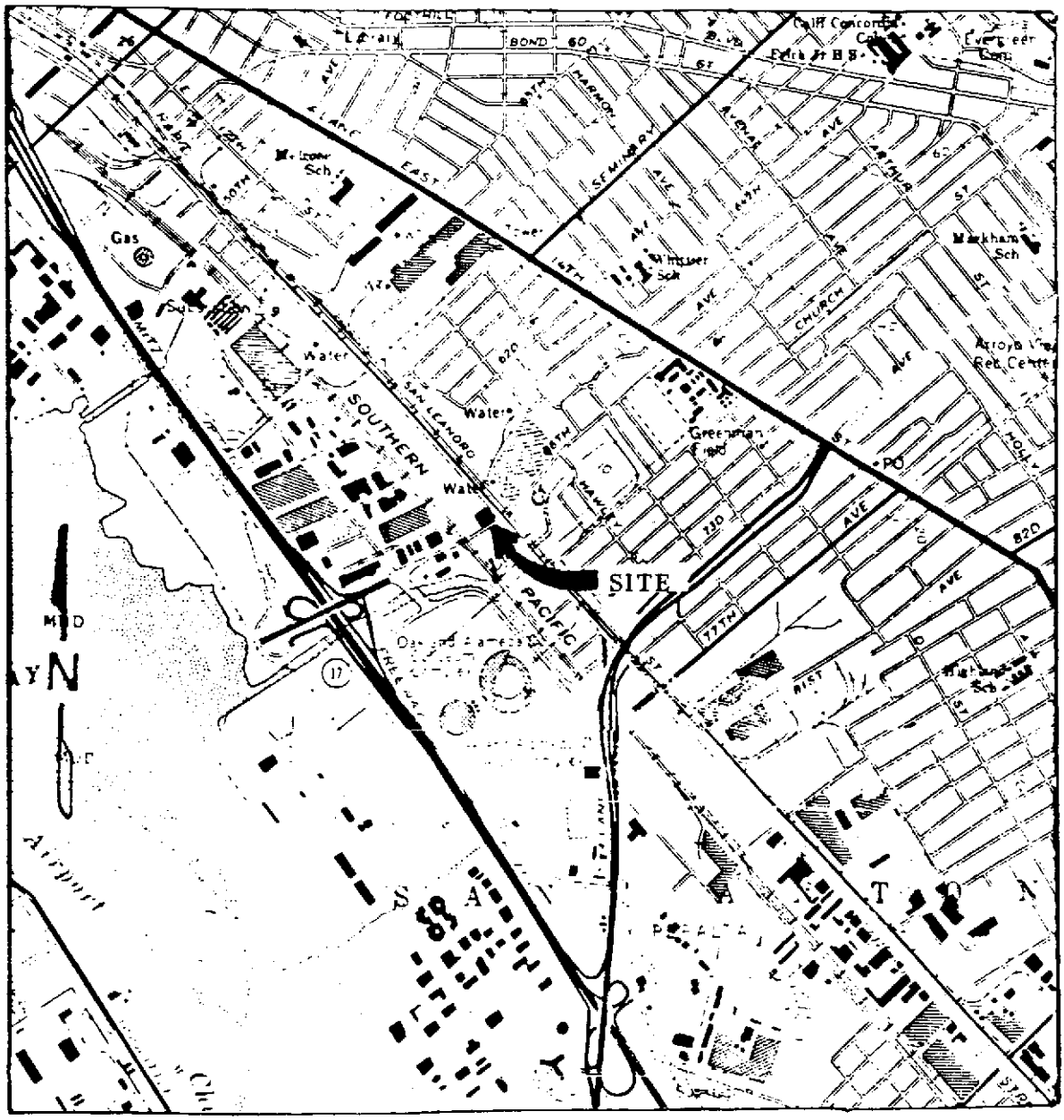

LOCATION MAP

Unocal S/S #3135
845-66th Avenue
Oakland, CA

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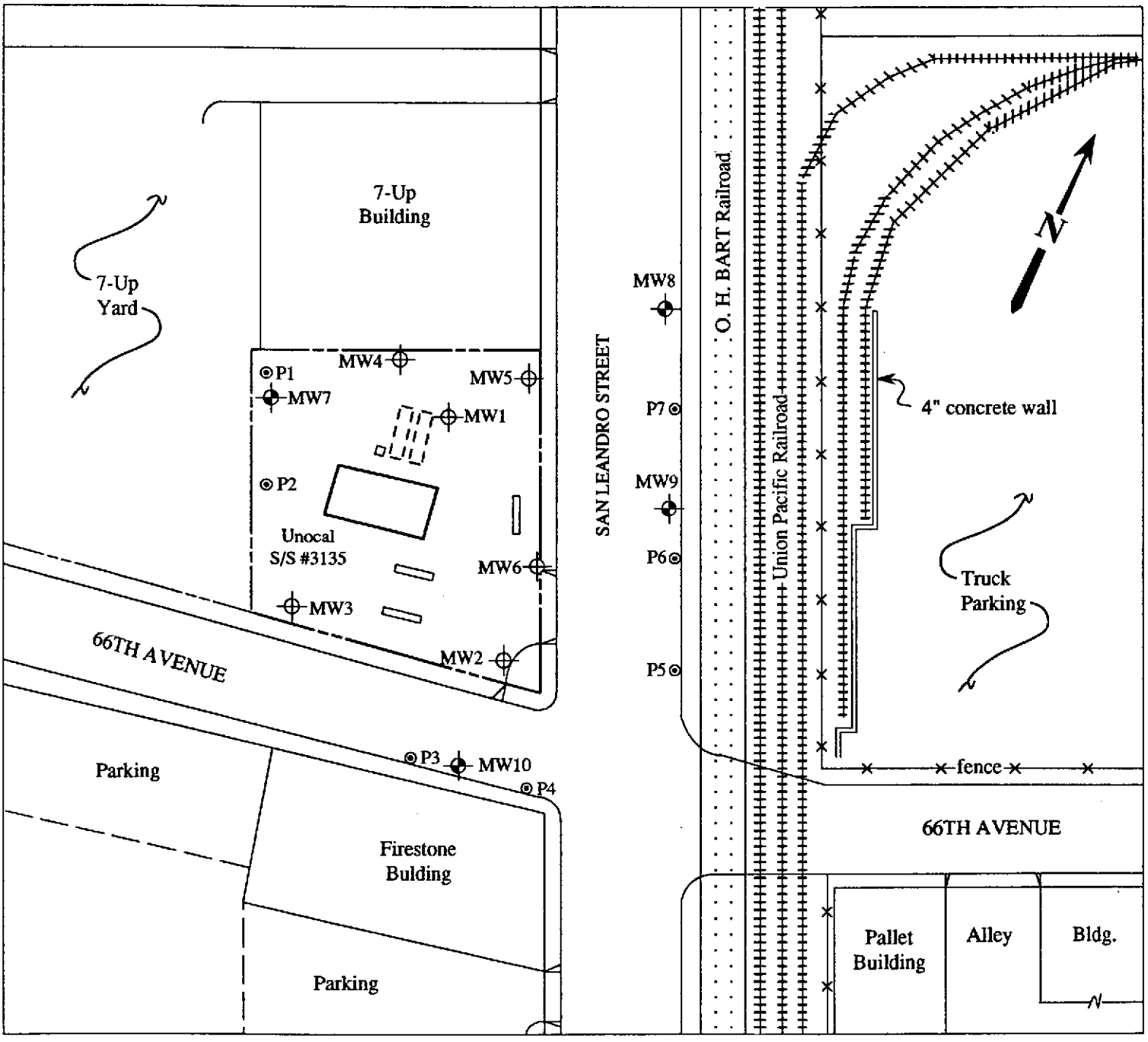

SITE VICINITY MAP

LEGEND

- Monitoring well (existing)
- Monitoring well (proposed)
- Ground water sample point location

0 80 160
Approx. scale feet

Unocal Service Station #3135
865 - 66th Avenue
Oakland, CA

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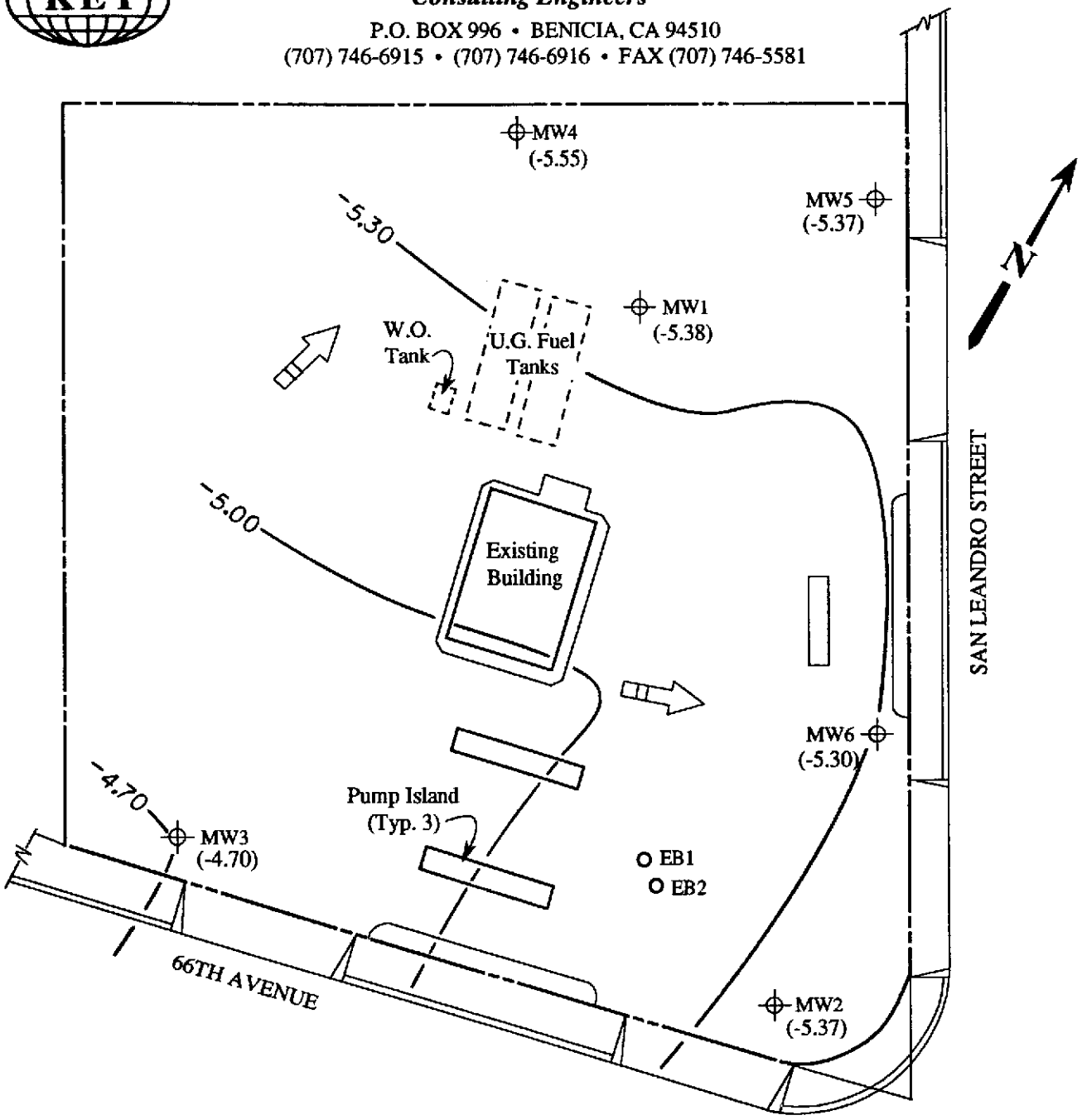

SITE PLAN
Figure 1

LEGEND

- Monitoring well
- Exploratory boring
- Direction of ground water flow
- ( ) Ground water elevation in feet above Mean Sea Level on 2/7/92
- Contours of ground water elevation

0 30 60
Approx. scale feet

Unocal Service Station #3135
845 - 66th Avenue
Oakland, CA

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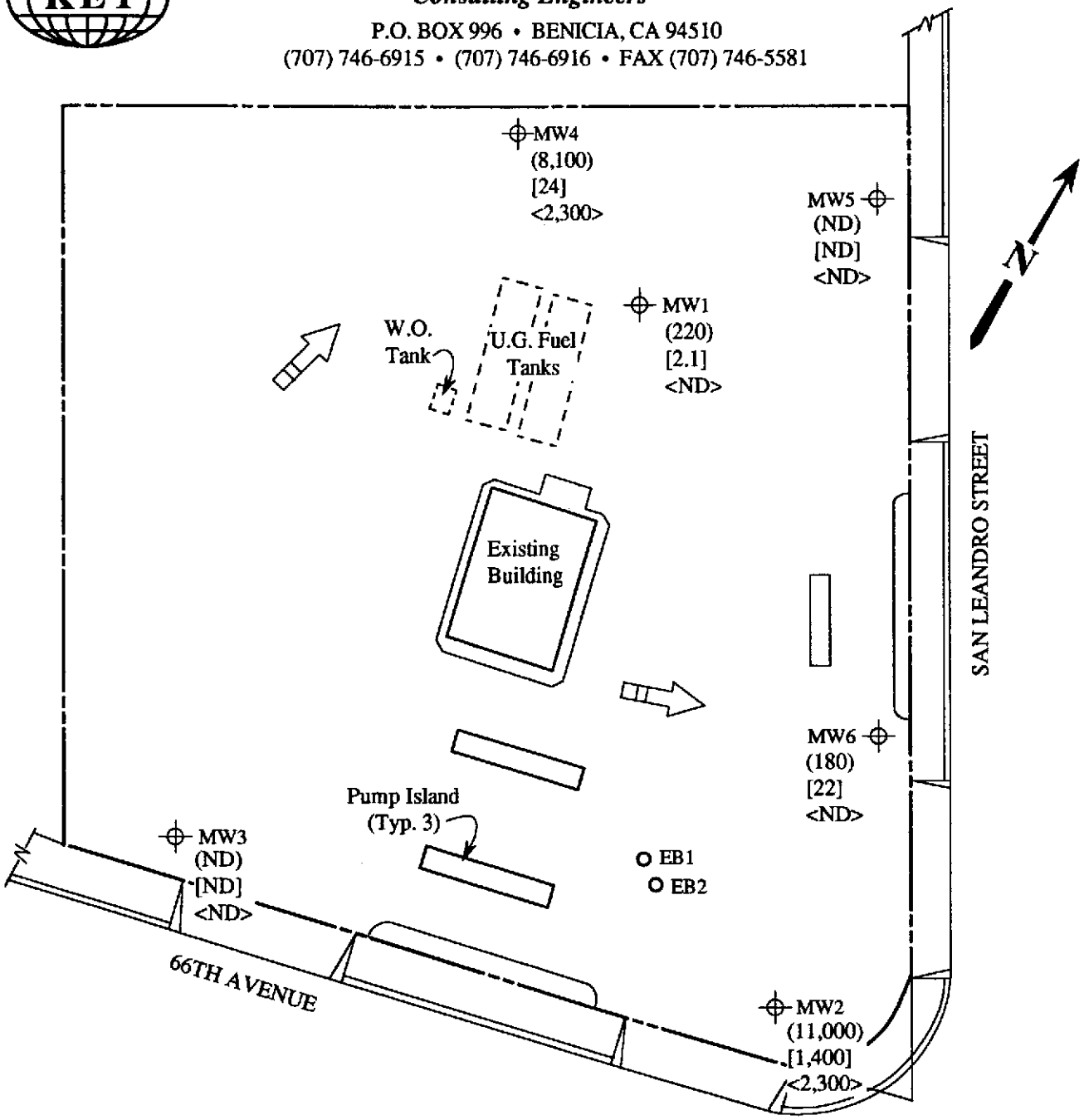

SITE PLAN

Figure 1a
(Samples collected on 2/7/92)

LEGEND

- Monitoring well
- Exploratory boring
- Direction of ground water flow
- ( ) Concentration of TPH as gasoline in ppb
- [ ] Concentration of benzene in ppb
- < > Concentration of TPH as diesel in ppb
- ND = Non-detectable

0 30 60
Approx. scale feet

Unocal Service Station #3135
845 - 66th Avenue
Oakland, CA

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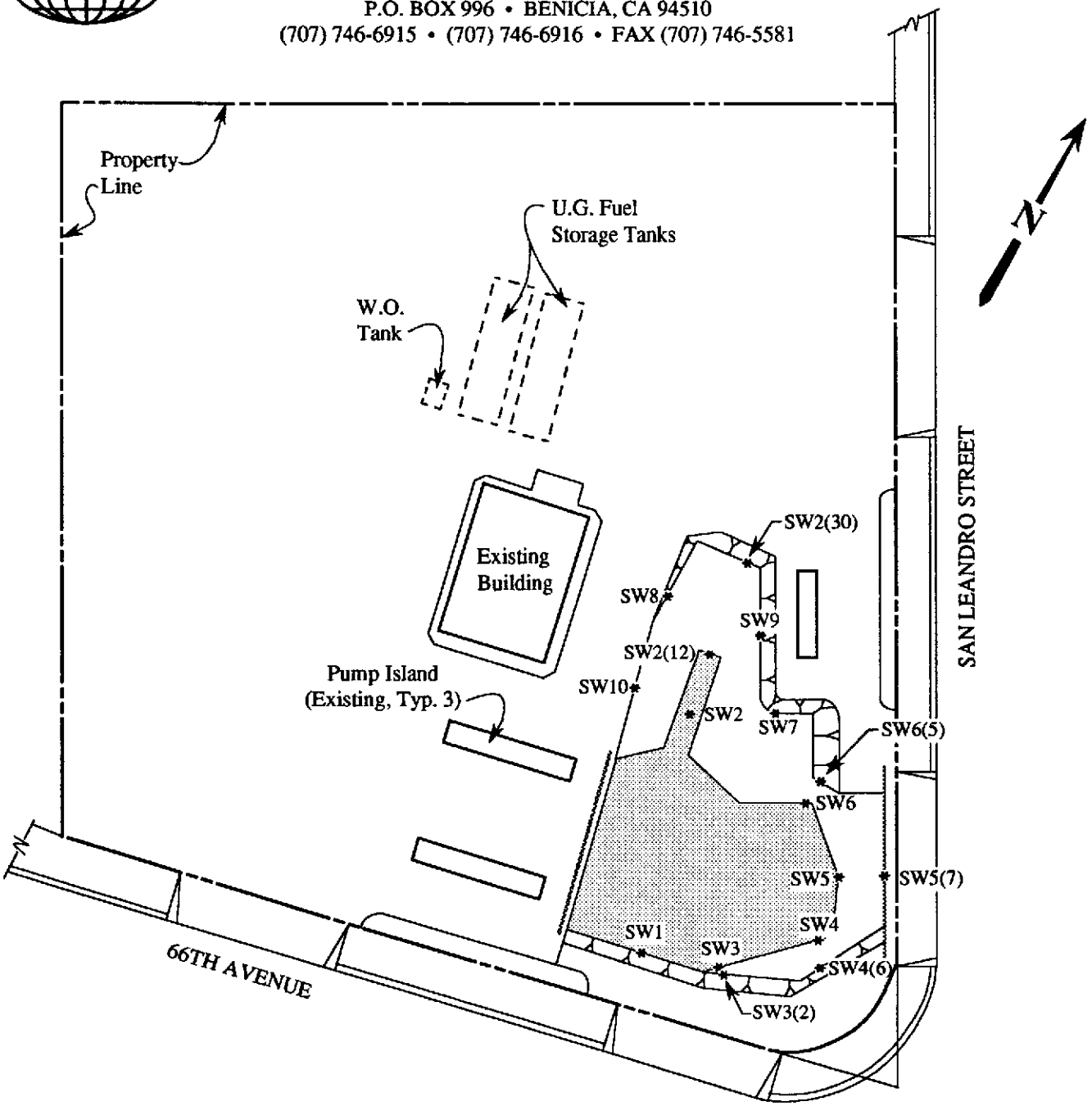

SITE PLAN
Figure 2

LEGEND

- * Sample Point Location
- Intermediate excavation boundary
- Shoring

0 30 60
Approx. scale feet

Unocal Service Station #3135
845 - 66th Avenue
Oakland, CA

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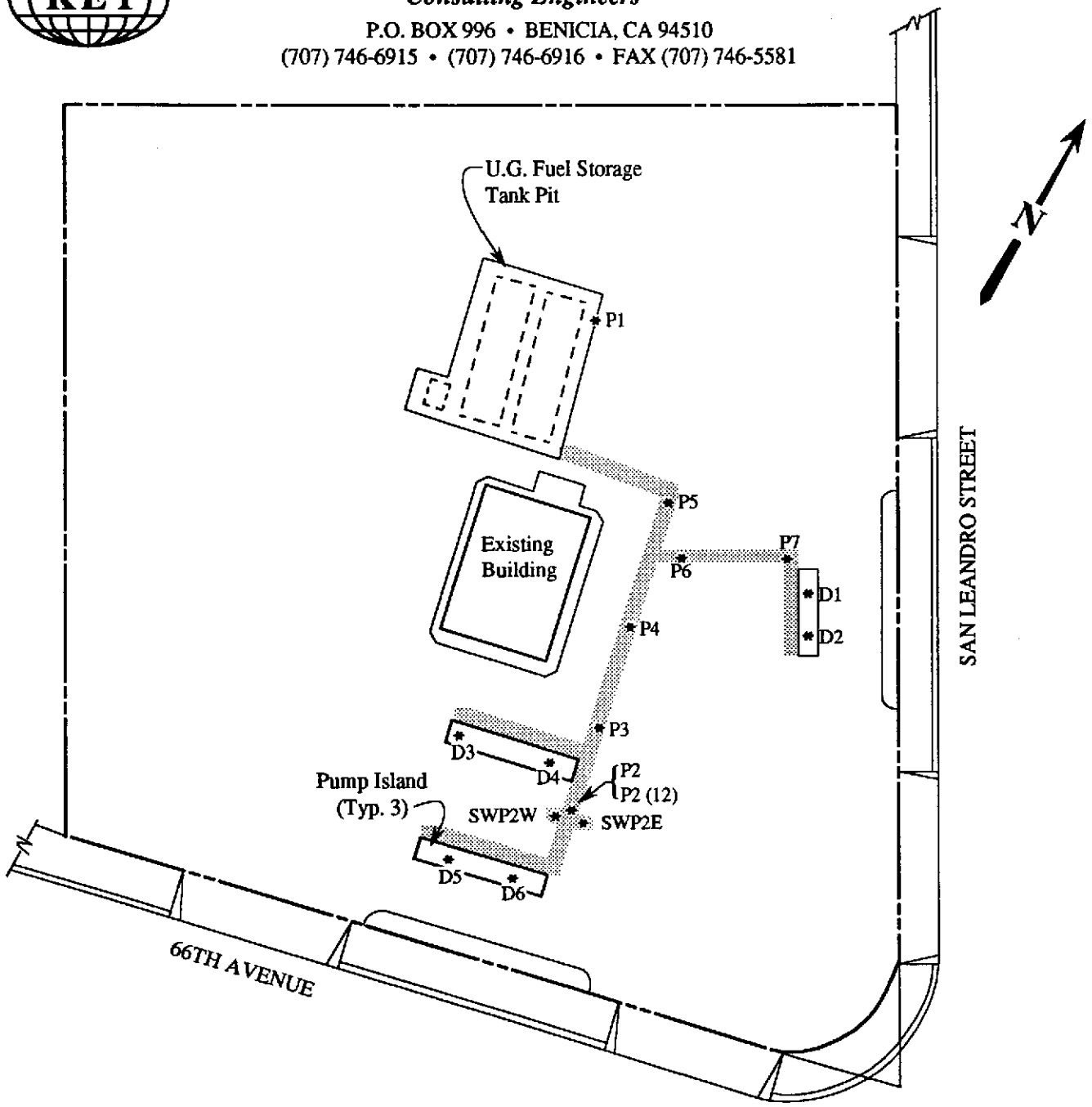

SITE PLAN
Figure 3

LEGEND

* Sample point location

0 30 60
Approx. scale feet

Unocal Service Station #3135
845 - 66th Avenue
Oakland, CA

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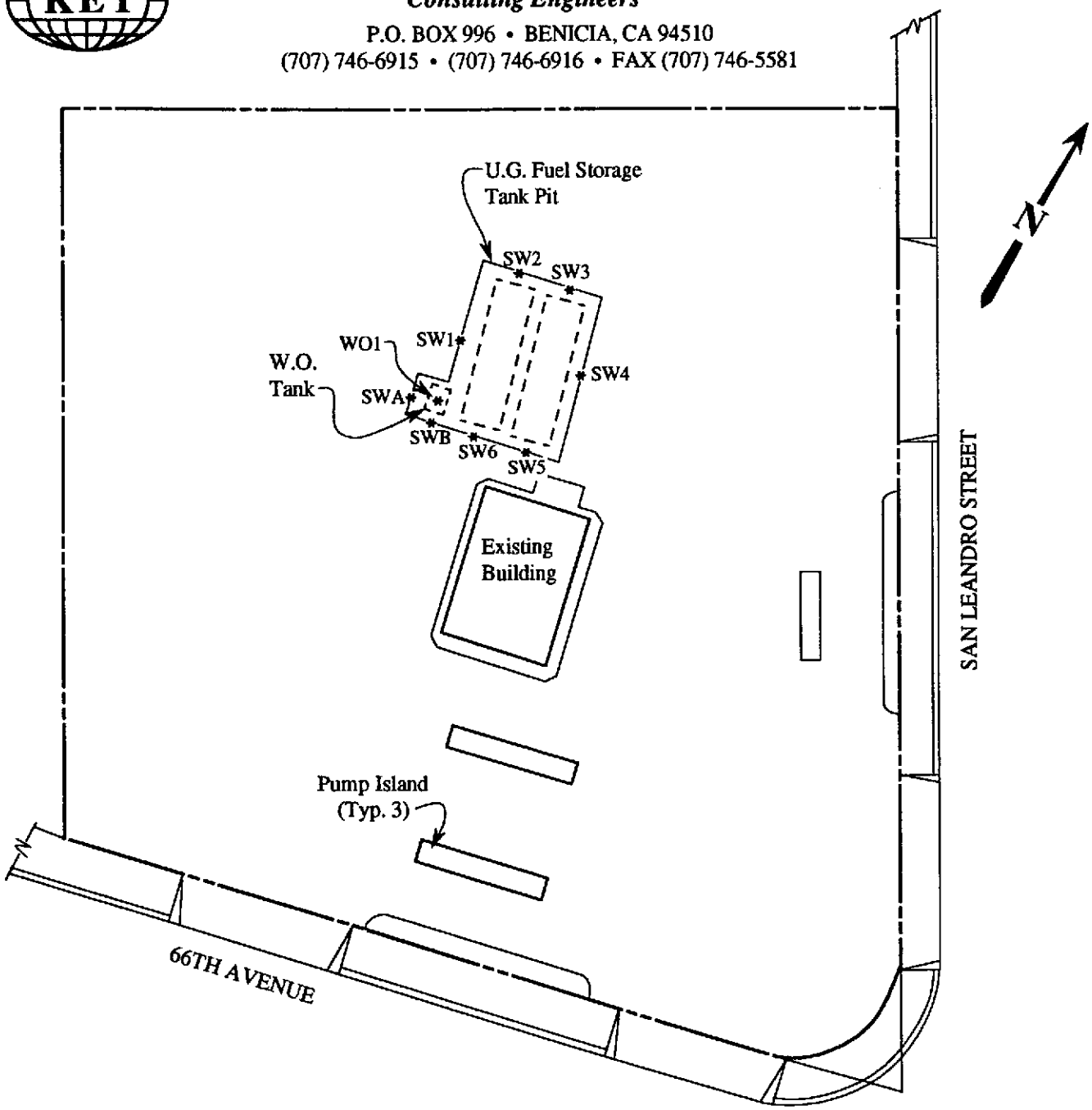

SITE PLAN
Figure 4

LEGEND

* Sample point location

0 30 60
Approx. scale feet

Unocal Service Station #3135
845 - 66th Avenue
Oakland, CA

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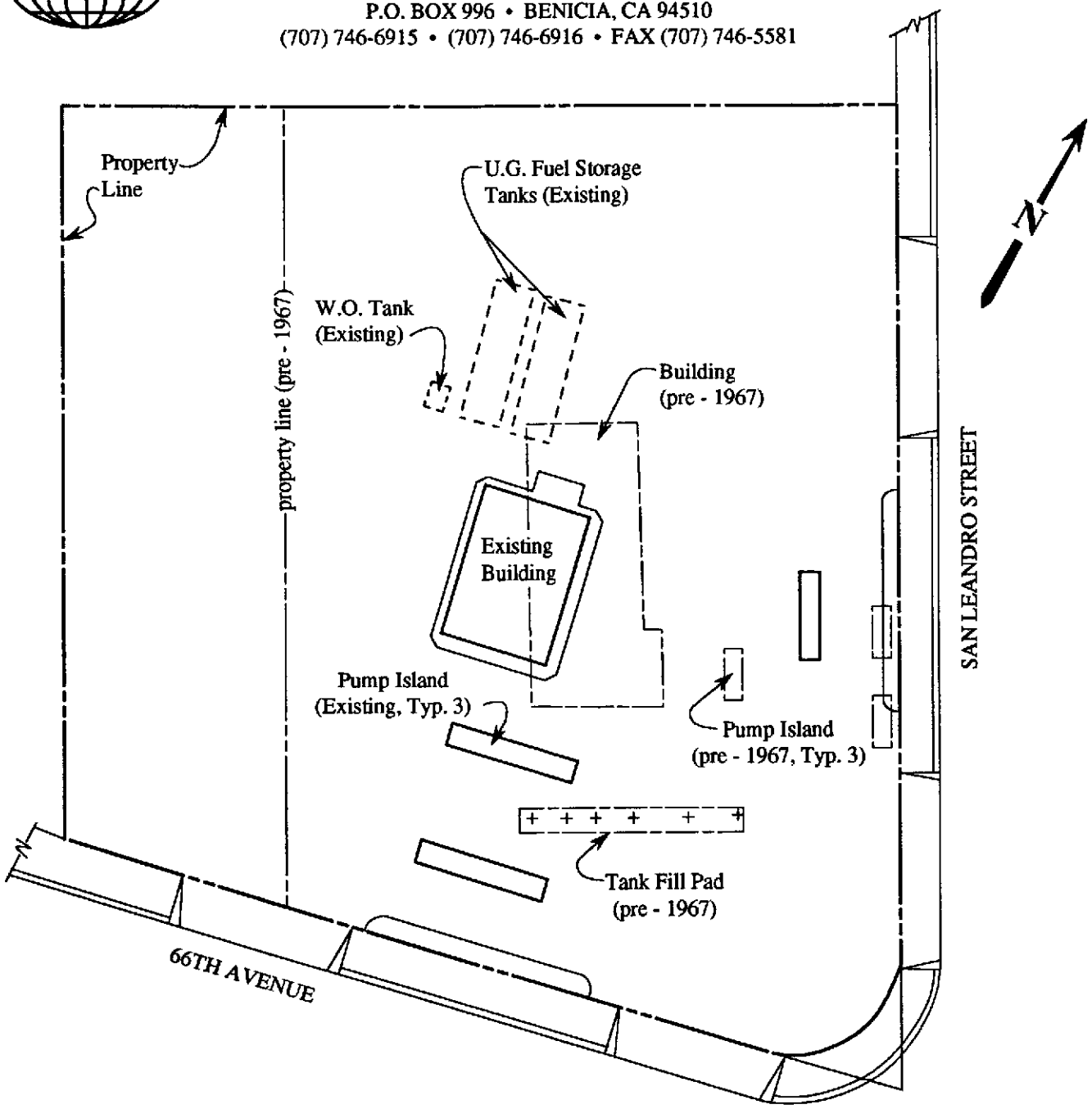

SITE PLAN
Figure 5

0 30 60
Approx. scale feet

Unocal Service Station #3135
845 - 66th Avenue
Oakland, 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/ 845 66th St., Oakland	Sampled:	Feb 7, 1992
P.O. Box 996	Matrix Descript:	Water	Received:	Feb 7, 1992
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Feb 11, 1992
Attention: Mardo Kaprealian, P.E.	First Sample #:	202-0341	Reported:	Feb 25, 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)
202-0341	MW1	220	2.1	N.D.	10	16
202-0342	MW2	11,000	1,400	30	1,900	1,400
202-0343	MW3	N.D.	N.D.	N.D.	N.D.	N.D.
202-0344	MW4	8,100	24	4.9	1,800	3,200
202-0345	MW5	N.D.	N.D.	N.D.	0.36	0.94
202-0346	MW6	180	22	0.68	22	20
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) 686-9066 • FAX (510) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal/ 845 66th St., Oakland	Sampled:	Feb 7, 1992
P.O. Box 996	Matrix Descript:	Water	Received:	Feb 7, 1992
Benicia, CA 94510	Analysis Method:	EPA 3510/8015	Extracted:	Feb 14, 1992
Attention: Mardo Kaprealian, P.E.	First Sample #:	202-0341	Analyzed:	Feb 22, 1992
			Reported:	Feb 25, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons µg/L (ppb)
202-0341	MW1	N.D.
202-0342	MW2	2,300
202-0343	MW3	N.D.
202-0344	MW4	2,300
202-0345	MW5	N.D.
202-0346	MW6	N.D.

Method Detection Limits:	**50**

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

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal/ 845 66th St., Oakland	Sampled:	Feb 7, 1992
P.O. Box 996	Matrix Descript:	Water	Received:	Feb 7, 1992
Benicia, CA 94510	Analysis Method:	SM 5520 B&F (Gravimetric)	Extracted:	Feb 10, 1992
Attention: Mardo Kaprealian, P.E.	First Sample #:	202-0342	Analyzed:	Feb 12, 1992
			Reported:	Feb 25, 1992

TOTAL RECOVERABLE PETROLEUM OIL

Sample Number	Sample Description	Oil & Grease mg/L (ppm)
202-0342	MW2	N.D.
202-0346	MW6	N.D.

Detection Limits:	**5.0**

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

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

Client Project ID: Unocal/ 845 66th St., Oakland
QC Sample Group: 2020341-0346
Reported: Feb 25, 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 8015/8020
Analyst:	K.E.	K.E.	K.E.	K.E.	K.E.	K.E.	K.E.
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Feb 11, 1992	Feb 11, 1992	Feb 11, 1992	Feb 11, 1992	Feb 11, 1992	Feb 11, 1992	Feb 11, 1992
Sample #:	202-0341	202-0342	202-0343	202-0344	202-0345	202-0346	Blank
Surrogate % Recovery:	110	98	110	100	110	110	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

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Benicia, CA 94510
Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal/ 845 66th St., Oakland
QC Sample Group: 2020341-0346
Reported: Feb 25, 1992

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8015	EPA 8015	EPA 8015	EPA 8015	EPA 8015	EPA 8015	EPA 8015
Analyst:	A. Tuzon	A. Tuzon	A. Tuzon	A. Tuzon	A. Tuzon	A. Tuzon	A. Tuzon
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Feb 22, 1992	Feb 22, 1992	Feb 22, 1992	Feb 22, 1992	Feb 22, 1992	Feb 22, 1992	Feb 22, 1992
Sample #:	202-0341	202-0342	202-0343	202-0344	202-0345	202-0346	Blank
Surrogate % Recovery:	110	110	110	110	110	120	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

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QC Sample Group: 2020341-0346
Reported: Feb 25, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes	Diesel	Oil and Grease
Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA8015	SM5520
Analyst:	K.E./K.N./J.F.	K.E./K.N./J.F.	K.E./K.N./J.F.	K.E./K.N./J.F.	A. Tuzon	D. Newcomb
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
Date Analyzed:	Feb 11, 1992	Feb 11, 1992	Feb 11, 1992	Feb 11, 1992	Feb 22, 1992	Feb 12, 1992
QC Sample #:	Matrix Blank	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:	20	20	20	60	300	100
Conc. Matrix Spike:	24	25	25	82	240	85
Matrix Spike % Recovery:	120	125	125	136	81	85
Conc. Matrix Spike Dup.:	20	21	21	68	250	93
Matrix Spike Duplicate % Recovery:	100	105	105	113	84	93
Relative % Difference:	18	17	17	18	4.0	9.0

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

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER	SITE NAME & ADDRESS	ANALYSES REQUESTED	TURN AROUND TIME:
RAY (KEI)	UNOCAL OAKLAND 845 66TH Street		REGULAR
WITNESSING AGENCY			

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPHG	BTXE	TPHD	TOG (5520)	B+F (S.C.)			REMARKS
MW1	2.7			x	x		2 VOA 1 AMB		X	X	X					2020341AC
MW2	"			x	x		2 VOA 2 AMB		X	X	X	X				342AD
MW3	"			x	x		2 VOA 1 AMB		X	X	X					343AC
MW4	"			x	x		4		X	X	X					344AC
MW5	"			x	x		4		X	X	X					345AC
MW6	"			x	x		2 VOA 2 AMB		X	X	X	X				346AD

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Ray (KEI)	2-7-92	K. Walker 2:20 p
Relinquished by: (Signature) K. Walker	Date/Time 12:00 PM 2/10/92	Received by: (Signature) [signature]
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)

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

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

KW — Signature | log-in — Title | 2/7/92 — Date