KAPREALIAN ENGINEERING
INCORPORATED

May 25, 1993

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

RE: Unocal Service Station #6277
15803 E. 14th Street
San Leandro, California

Gentlemen:

Per the request of Mr. Dave Camille of Unocal Corporation, enclosed please find our report dated May 10, 1993, 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: Dave Camille, Unocal Corporation

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

KAPREALIAN ENGINEERING
INCORPORATED

KEI-P89-0301.R9
May 10, 1993

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

Attention: Mr. David J. Camille

RE: Continuing Soil and Ground Water Investigation
and Quarterly Report
Unocal Service Station #6277
15803 E. 14th Street
San Leandro, California

Dear Mr. Camille:

This report presents the results of Kaprealian Engineering, Inc's. (KEI) most recent soil and ground water investigation for the referenced site, in accordance with KEI's revised work plan/proposal (KEI-P89-0301.P4R) dated December 17, 1992. The purpose of the investigation was to further define the degree and extent of soil and ground water contamination at and in the vicinity of the site. This report also presents the results of the most recent quarter of ground water monitoring and sampling of the monitoring wells at the referenced site, per KEI's proposal (KEI-P89-0301.P4) dated July 23, 1991, and as modified in KEI's quarterly reports (KEI-P89-0303.QR11 and KEI-P89-0301.QR13) dated August 18, 1992, and March 11, 1993, respectively. The wells are currently monitored and sampled on a quarterly basis. This report covers the work performed by KEI from March through April of 1993. The scope of the work performed by KEI consisted of the following:

Coordination with regulatory agencies

Geologic logging of two borings for the installation of two monitoring wells

Soil sampling

Ground water monitoring, purging, and sampling

Laboratory analyses

Data analysis, interpretation, and report preparation

SITE DESCRIPTION AND BACKGROUND

The subject site currently contains a Unocal service station facility. The site is characterized by gently sloping, southwest

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trending topography, and is located approximately three miles northeast of the present shoreline of San Francisco Bay.

KEI's work at the site began on March 6, 1989, when KEI was retained by Unocal to drill two exploratory borings (designated as EB1 and EB2 on Figure 5) at the site. The borings were drilled at the request of Alameda County. The borings were installed in order to explore for the possible presence of soil contamination in the vicinity of the pit for the proposed new underground storage tanks. The borings were drilled to depths of 10.5 and 13.5 feet below grade. Ground water was encountered in the borings at depths of 11 to 12 feet below grade.

The soil samples were analyzed at Sequoia Analytical Laboratory in Redwood City, California. The samples collected from the exploratory borings EB1 and EB2 were analyzed for total petroleum hydrocarbons (TPH) as gasoline and benzene, toluene, xylenes, and ethylbenzene (BTX&E). The analytical results of the soil samples collected at a depth of 5 feet below grade in the two borings indicated TPH as gasoline concentrations ranging from non-detectable to 2.1 ppm. The analytical results of the soil samples collected at a depth of 10 feet below grade indicated TPH as gasoline concentrations ranging from 200 ppm to 620 ppm. The soil sample results are summarized in Table 4. Based on results of this preliminary investigation, KEI recommended that the contractor excavate the tank pit to a depth of approximately 13 feet below grade. Documentation of the exploratory boring installation procedures, sample collection techniques, and the analytical results are presented in KEI's report (KEI-P89-0301.R1) dated March 13, 1989.

KEI returned to the site on March 13, 1989, when three underground storage tanks were removed from the site. The tanks consisted of two 10,000 gallon gasoline storage tanks and one 550 gallon waste oil tank. The tanks were made of steel with a tar and wrap coating, and no apparent holes or cracks were observed in them. Due to the tar coating and wrapping, very little of the actual tank walls could be observed. Water was encountered in the fuel tank pit at a depth of about 11 feet 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 at depths of approximately 1 foot above the water table; and one soil sample, labeled WO1, was collected from beneath the waste oil tank at a depth of about 10 feet below grade.

Based on observations in the field, it was decided to excavate additional soil from three of the four tank pit sidewalls. The

fourth tank pit sidewall (adjacent to the existing building) was not excavated at that time. On March 14, 1989, four trenches were installed to define the limits of additional soil excavation needed. Four soil samples were then collected at depths of about 10 feet below grade, and are referred to as SW3(15), SW4/5(6), SW6(12), and SW7(14). Sample SW7(14) was collected from the sidewall of the waste oil tank pit. The soil sample point locations are shown on the attached Figure 3. After the soil sampling was completed, approximately 5,000 gallons of ground water were pumped from the fuel tank pit on March 15, 1989. However, due to ongoing soil excavation and contaminated soil falling into the water, a representative ground water sample could not be collected.

On March 17, 1989, KEI again returned to the site, when additional soil (approximately 2 feet laterally) was excavated from the fourth tank pit sidewall adjacent to the building. One additional sidewall soil sample, labeled SW1(2), was collected at a depth of about 10 feet below grade at the location identified on the attached Figure 3. Following soil sampling, an additional 1,000 gallons of ground water were pumped from the excavation and one water sample, labeled W1, was collected from the fuel tank pit.

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

The soil samples were analyzed at Sequoia Analytical Laboratory in Redwood City, California. The samples from the fuel tank pit were analyzed for TPH as gasoline and BTX&E. The samples from the waste oil tank pit [WO1 and SW7(14)] were analyzed for TPH as gasoline, TPH as diesel, total oil and grease (TOG), and EPA method 8240 constituents.

The analytical results of the soil samples collected from the fuel tank pit indicated TPH as gasoline concentrations ranging from 24 ppm to 150 ppm for samples SW3(15), SW4/5(6), and SW6(12). Sample SW1 (collected adjacent to the existing building) indicated 3,500 ppm of TPH as gasoline; however, sample SW1(2), which was collected after excavating 2 feet of sidewall toward the building, indicated TPH as gasoline at concentration of 100 ppm. The analytical sample SW2 indicated 390 ppm of TPH as gasoline. Samples SW3, SW4, SW5, and SW6 were not analyzed because their locations were excavated and new samples [SW3(15), SW4/5(6), and SW6(12)] were collected. The analytical results of the soil samples collected from the waste oil tank pit indicated 280 ppm of TOG for WO1 and 41 ppm of TOG for SW7(14). The analytical results of the soil samples (P1 through

P6) collected from the pipe trenches indicated concentrations of TPH as gasoline ranging from 1.1 ppm to 6.8 ppm.

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

Based on the analytical results, KEI recommended the installation of four ground water monitoring wells. Documentation of the tank and piping removal procedures, sample collection techniques, and the analytical results are presented in KEI's report (KEI-P89-0301.R3) dated March 27, 1989.

On May 24, 1989, four two-inch diameter monitoring wells, designated as MW1 through MW4 on the attached Figure 1, were installed at the site. The four wells were each drilled and completed to total depths ranging from 24.5 to 25 feet below grade. Ground water was encountered at depths ranging from 11 to 12 feet beneath the surface during drilling. The wells were developed on June 5, 1989, and were initially sampled on June 6, 1989. Water and selected soil samples were analyzed at Sequoia Analytical Laboratory in Redwood City, California. The samples were analyzed for TPH as gasoline and BTX&E. In addition, the sample collected from monitoring well MW2 (the well nearest to the waste oil tank) was analyzed for TPH as diesel, TOG, and EPA method 8010 constituents.

The analytical results of the soil samples collected from the borings of wells MW1 through MW4, indicated TPH as gasoline at concentrations ranging from non-detectable to 290 ppm. the analytical results of the soil sample collected from the boring of well MW2 at a depth of 5 feet below grade, indicated TOG at a concentration of 7,700 ppm. The analytical results of the water samples collected from monitoring wells MW1 through MW4 indicated TPH as gasoline at concentrations ranging from 32 ppb to 590 ppb. BTX&E was non-detectable in all of the water samples collected from the four monitoring wells. The results of the soil analyses are summarized in Table 4, and the results of the water analyses are summarized in Tables 2 and 3. Based on the analytical results, KEI recommended a monthly monitoring and quarterly sampling program for the site and additional excavation of contaminated soil in the vicinity of MW2. Documentation of the well installation procedures, sample collection techniques, and the analytical results are presented in KEI's report (KEI-P89-0301.R6) dated June 26, 1989.

The monitoring and sampling program was initiated in July of 1989, and the wells have been monitored monthly and sampled on a

quarterly basis since that date. In KEI's second quarterly report (KEI-P89-0301.QR2) dated January 16, 1990, KEI recommended the installation of one additional off-site monitoring well (located on the private property northwest of the Unocal site) in order to further define the extent of ground water contamination in the vicinity of the site.

On February 1, 1990, well MW2 was destroyed in preparation for additional excavation. Documentation of the well destruction procedure are presented in a letter report dated March 7, 1990.

In an attempt to remove as much of the contaminated soil as possible, KEI was present at the site on March 30, 1990, and April 3, 1990, to observe soil excavation in the vicinity of previously abandoned monitoring well MW2, as shown on the attached Figure 4. Soil was excavated to a depth corresponding to approximately 6 to 12 inches below the level of the ground water, which was encountered at a depth of about 11.5 feet below grade.

After additional excavation, four soil samples, labeled SW8A, SW9A, SW10A, and SW11A, were collected from the sidewalls of the excavation, each approximately 6 to 12 inches above ground water. Sample locations and the area excavated are as shown on the attached Figure 4. Soil excavation activities were terminated due to the close proximity of the former and new underground storage tank pits and the property line of the site. After sampling, approximately 9,400 gallons of water were pumped from the excavation.

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

The analytical results of soil sample SW9A indicated non-detectable concentrations of TPH as gasoline and TPH as diesel. The analytical results of soil samples SW8A, SW10A, and SW11A indicated concentrations of TPH as gasoline ranging from 140 ppm to 1,100 ppm, while concentrations of TPH as diesel ranged from non-detectable to 280 ppm. The analytical results also indicated non-detectable levels of EPA method 8010 constituents and TOG for all four samples, except for sample SW11A, which indicated a concentrations of TOG at 210 ppm. The results of the soil analyses are summarized in Table 5. Documentation of the excavation procedures, sample collection techniques, and the analytical results are presented in KEI's report (KEI-P89-0301.R7) dated May 2, 1990.

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

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

The analytical results of the soil samples collected from the boring of MW2A indicated non-detectable levels of TPH as gasoline and benzene in all analyzed samples, except in sample MW2A(10), which indicated a TPH as gasoline concentration of 10 ppm, with a benzene concentration of 0.12 ppm. Concentrations of TPH as diesel ranged from non-detectable to 4.8 ppm, with TOG concentrations ranging from 57 ppm to 1,300 ppm. All EPA method 8010 constituents were non-detectable, except for 110 ppb of 1,2-dichlorobenzene and 120 ppb of tetrachloroethene which were detected in sample MW2A(10). The analytical results of the water samples collected from monitoring wells MW1 through MW4 on March 15, 1991, indicated concentrations of TPH as gasoline ranging from 53 ppb to 160 ppb, with benzene concentrations at 21 ppb and 2.5 ppb, in wells MW1 and MW2A, respectively. Benzene was non-detectable in wells MW3 and MW4. Also, TPH as diesel, TOG, and EPA method 8010 constituents were non-detectable in well MW2A, except for cis-1,2-dichloroethene at 2.6 ppb, tetrachloroethene at 67 ppb, and trichloroethene at 8.2 ppb. The results of the soil analyses are summarized in Table 4, and the results of the water analyses are summarized in Tables 2 and 3.

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

KEI previously proposed that an additional monitoring well be installed on the private property located northwest of the site, in order to complete the delineation of the ground water contamination. However, after Unocal Corporation encountered delays in securing access to this private property, KEI recommended that the proposed well be installed at an alternate location in the sidewalk along East 14th Street. (see Figure 1).

Based on the apparent upgradient contamination detected in wells MW3 and MW4, KEI recommended conducting file reviews to determine whether there were any upgradient sources contributing to the contamination at the Unocal site. On December 10, 1991, a representative of KEI conducted a file review at the Regional Water Quality Control Board (RWQCB). This review focused on three sites with monitoring wells located within a half-mile of the Unocal station. The three sites had been previously identified during a well survey carried out by KEI, using data from the Alameda County Flood Control and Water Conservation District.

The Okada property, located at 16109 Ashland Avenue, contains three monitoring wells that were installed after an underground fuel storage tank removal project. This site is located approximately 1,000 feet southeast of the Unocal site. Based on reports prepared by Terra Vac of San Jose, California, as of March 1990, the ground water flow direction had been consistently to the west for the three previous quarters. In addition, TPH as gasoline had been detected in ground water at concentrations up to 280 ppb, and TPH as diesel at concentrations up to 1,100 ppb. Benzene had been detected at concentrations less than 0.5 ppb.

A former USA Petroleum station is located at 15120 Hesperian Boulevard, approximately 2,300 feet west of the Unocal site. Based on a letter report prepared by Aqua Engineers of San Ramon, California, and dated May 24, 1989, underground fuel storage tanks were removed in May 1989, and TPH as gasoline was detected in the soil samples at concentrations of up to 9,670 ppm.

The third site within a half-mile of the Unocal site that contains monitoring wells is reportedly owned by Kaufman and Broad, and is located at 1630-162nd Avenue, approximately 1,800 feet east-southeast of the Unocal site. No files were available at the RWQCB for this location.

Based on the west and northwest flow directions at the Okada property and the Unocal site, respectively, and the distances between the Okada property, the former USA Petroleum station, and the Unocal site, it appears unlikely that contamination from these sites has commingled.

KEI previously proposed the installation of an additional monitoring well in the sidewalk along East 14th Street, per KEI's proposal (KEI-P89-0301.P4) dated July 23, 1991. On February 10, 1992, a representative of KEI was on-site to supervise concrete coring at the proposed well location, and to hand dig the upper 5 feet of material to verify that no utilities were present. A concrete obstruction was encountered at a depth of about 2 feet below grade. On a second attempt 5 feet from the proposed location, the concrete obstruction was again encountered. KEI contacted the City of San Leandro inspectors and determined that the well cannot be completed at or near this location due to the presence of a storm drain and other underground utilities. KEI subsequently requested that Unocal reactivate the process of obtaining off-site permission for the originally proposed location on the private property located northwest of the Unocal site.

KEI previously recommended conducting file reviews on the Kaufman and Broad site in order to determine the sources contributing to the contamination at the Unocal site. On April 8, 1992, a representative of KEI conducted a file review at the Alameda County Health Care Services. The only document on file was a permit to operate an underground tank. As of April 1992, there was no ongoing subsurface investigation at the site. KEI also contacted Mr. Mike Bakaldin, the Haz-Mat coordinator for the City of San Leandro Fire Department on April 10, 1992. No files related to the Kaufman and Broad site were found within his jurisdiction.

Based on a letter dated May 6, 1992, from the Alameda County Health Care Services Agency (County) to Unocal regarding the subject site, KEI recommended the installation of an additional well (MW5) at a location shown on the attached Figure 1. The proposed location of well MW5 would satisfy the County's concern that a well be installed to the west and north of well MW2A.

Based on the analytical results collected and evaluated through July 1992, KEI recommended (in KEI's quarterly report KEI-P89-0301.QR11, dated August 18, 1992) the continuation of the ground water monitoring and sampling program of the existing wells. However, since no evidence of free product or sheen had been detected in any of the wells, and since a consistent northwesterly flow direction had been established at the site, KEI recommended that the frequency of monitoring of the wells be reduced from monthly to quarterly. In addition, based on consistent non-detectable concentrations of TOG in all ground water samples collected from MW2A since March 15, 1991, KEI recommended discontinuing the TOG analysis for this well.

As shown in Table 2, Sequoia Analytical Laboratory reported that the hydrocarbons detected in the ground water samples collected from wells MW3 and MW4 during the four quarters of sampling between January 13 and October 20, 1992, did not appear to be gasoline. The laboratory further reported that the hydrocarbons detected in wells MW3 and MW4 were "due to solvent peaks in the EPA 8010 range." The EPA method 8010 analyses performed on the ground water samples collected from all four wells during the two sampling events of July 20, and October 20, 1992, (see Table 3) confirmed the presence of several chlorinated solvents in the ground water. The highest concentrations of the chlorinated solvents were detected in Unocal's upgradient monitoring wells MW3 and MW4. Based on the northwesterly ground water flow direction at the Unocal site, it appeared that the source of the chlorinated solvent contamination detected in the ground water may be from an off-site source(s).

In order to determine potential sources of the chlorinated solvent contamination, KEI recommended (in KEI's report KEI-P89-0301.QR12 dated November 12, 1992) that the following tasks be conducted:

1. Conduct a site reconnaissance to determine whether any businesses that use solvents (dry cleaners, photo labs., etc.) are located upgradient (south, southeast, and east) of the Unocal site.

2. Review Unocal's historical General Arrangement Plans to determine whether any potential sources of solvent contamination may have previously existed in the vicinity of wells MW3 and MW4.

3. Review Unocal's real estate files to determine the previous uses of the site (prior to Unocal's occupation of the site). This task could also involve conducting a title search for the subject parcel.

4. Contact the Alameda County Health Care Services Agency (ACHCS) to obtain any information on known solvent contamination sources that may exist in the vicinity of the Unocal site.

In December 1992, a KEI representative visited the subject site to determine land use and the types of businesses in the area. The vicinity surrounding the site is a mixed commercial/residential area. East of the site, across the East 14th Street and 159th Avenue intersection, is a SpeeDee Oil Change shop, and to the southeast lies a closed auto repair shop that was formerly ABC Auto Repair. Various other businesses, including a sign shop and a recreational vehicle storage lot, are located to the southeast of

the Unocal site along East 14th Street. The Unocal site is surrounded on the southwest, west, and northwest by an apartment complex. To the northeast of the Unocal site, across E. 14th Street, is a vacant lot. The locations of these facilities in reference to the Unocal site are shown on the attached Figure 7.

KEI reviewed the Unocal real estate file and the available general arrangement plans for the subject site. The general arrangement plans did not show any potential on-site sources of chlorinated solvent contamination in the vicinity of wells MW3 and MW4. From reviewing the real estate file, it was determined that the existing service station facility was constructed on a vacant lot in late 1969. When the station was built, two underground fuel tanks and one waste oil tank were located to the southwest of the existing, original building and directly north of well MW3. In 1989, these tanks were removed and two underground fuel tanks were installed in a new excavation located northwest of the existing building between wells MW1 and MW2A. A new waste oil tank was installed in approximately the same location as the original waste oil tank. The locations of the existing and former underground storage tanks are shown on the attached Figure 4.

Unocal pre-construction photographs show a former Richfield service station located on the property now occupied by the SpeeDee Oil Change shop. Aerial photographs from the same period show one definite and possibly two auto wrecking yards located to the southeast of the site. The confirmed wrecking yard in the aerial photos was located behind the former ABC Auto Repair and appeared to be part of their operations. The other possible wrecking yard was located approximately 500 feet southeast of the subject site.

A file review was conducted at the ACHCS in order to obtain information on any known or potential contamination sources that may be located in the vicinity of the Unocal site. Four sites with existing or former underground storage tanks were located through the file review. These sites are as follows: 1.) Narou Properties, 1500 Thrush Avenue; 2.) ABC Auto Repair, 15960 East 14th Street; 3.) Petsas Property, 16035 East 14th Street, and; 4.) SpeeDee Oil Change, 15900 East 14th Street. Site locations in reference to the Unocal site are shown on the attached Figure 7.

1. Narou Properties, 1500 Thrush Avenue

   The Narou Properties site is the location of a former nursery and is located approximately 150 feet to the north of the Unocal site.

One 250-gallon gasoline tank was removed from the site in 1989. Three monitoring wells were subsequently installed and have shown non-detectable levels of TPH as gasoline and BTX&E for four out of five quarters. The ground water flow direction at the Narou Property Site has consistently been to the west, varying to the northwest. In addition to the fuel tank removal/investigation, surface soil samples were collected from 11 separate locations at the site and tested for TPH as motor oil and organochlorine pesticides by EPA method 8080. TPH as motor oil levels ranged from non-detectable to 146 ppm, and organochlorine pesticide levels ranged from 64 to 2,218 ppb. An 8-foot square area was subsequently excavated to depths of 1 to 2 feet where the highest concentration of organochlorine pesticide was detected.

2. ABC Auto Repair (Former Auto Wrecker), 15954 E. 14th Street

The former ABC Auto Repair facility is located approximately 350 feet east-southeast of the Unocal site. Two 250 gallon underground storage tanks were removed from in front of this facility in March 1992. TPH as gasoline concentrations ranged from non-detectable to 1,100 ppm in the soil samples collected from the tank pit excavation. A water sample collected from the excavation showed 10,000 ppb of TPH as gasoline. One down-gradient well was proposed at this site. The proposed location is based on the ground water flow direction at the Unocal site. No evidence of a subsurface investigation at the auto wrecking yard was found in the Alameda County file.

3. Petsas Property, 16035 E. 14th Street

The Petsas Property is a former service station and is located approximately 1,000 feet to the southeast of the Unocal site. On February 4, 1992, three underground tanks (two gasoline and one waste oil) were removed from the site. TPH as gasoline concentrations ranged from 0.72 to 1,300 ppm in the soil samples collected from the tank pit excavation. One soil sample collected from below the waste oil tank showed 54 ppm of TOG. A proposal has been submitted recommending overexcavation of contaminated soil areas and the installation of three monitoring wells.

4. Speedee Oil Change Shop (Former Richfield S/S), 15900 E. 14th Street

Alameda County has no record of any unauthorized releases or existing underground tanks at the SpeeDee Oil Change facility or former Richfield service station. Alameda County Hazardous

Materials Division has inspected the site and found no improper handling of hazardous materials taking place. KEI has contacted the Eden Consolidated Fire District in regard to underground storage tank removal at the former Richfield service station. Eden Consolidated records show that a tank closure permit was applied for on March 26, 1975, by Bay Excavators of Richmond, California. No information was available on the number, size, or contents of the underground tanks removed from the site, and no record of any field inspection by Eden Consolidated personnel was found.

In addition to possible site-specific sources of solvent contamination, the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), has identified regional chlorinated solvent contamination of the upper aquifer in the San Leandro area. Based upon information obtained from the report "Interim Groundwater Contamination Report for Central San Leandro" dated January 20, 1993, by Woodward-Clyde Consultants of Oakland, California, the DTSC is currently conducting investigations at three State Superfund sites in the San Leandro area, and will be conducting a regional Hydropunch ground water sampling program throughout the "San Leandro Plume" area. The Unocal site is located outside the study area (approximately 1/2-mile to the southeast).

In summary, based on the results of the site history research, site reconnaissance, and file review, and based upon the fact that no evidence of an on-site solvent source area in the vicinity of MW3 and MW4 is evident, there was no information indicating that the chlorinated solvents found in samples collected from upgradient wells MW3 and MW4 were emanating from the Unocal site. It appears that at least part of the chlorinated solvent contamination at the Unocal site could be due to an unidentified source located upgradient of the subject site, or is part of the regional chlorinated solvent contamination previously noted. As a result, KEI recommended that the EPA method 8010 analysis be continued for upgradient monitoring well MW3 on an annual basis, and be discontinued for wells MW1, MW2A, and MW4.

As previously noted, KEI recommended the installation of one additional downgradient well (MW5), as shown on the attached Figure 1. The proposed location of this well was changed twice due to access problems and the presence of underground utilities. At the request of the ACHCS, an additional monitoring well (MW6) was also proposed in the area to the northwest of the Unocal site, as shown on the attached Figure 1. The purpose of both wells was to further define the extent of the ground water contamination in the vicinity of the Unocal site.

RECENT FIELD ACTIVITIES - WELL INSTALLATION

On March 9, 1993, two additional two-inch diameter monitoring wells (designated as MW5 and MW6 on the attached Figure 1) were installed at the site. The wells were each drilled, constructed, and completed in accordance with the guidelines of the RWQCB and the California Well Standards (per Bulletin 74-90). The subsurface materials penetrated and details of the construction of the wells are described in the attached Boring Logs and Well Construction Diagrams, respectively.

The two wells were each drilled and completed to a total depth of 21 feet below grade. Ground water was encountered at a depth of 15.5 feet below grade in MW5, and 10 feet below grade in MW6. Soil samples were collected for laboratory analysis and for lithologic logging purposes at a maximum spacing of 5 foot intervals, at significant changes in lithology, at obvious areas of contamination, and at or within the soil/ground water interface, beginning at a depth of approximately 5 feet below grade and continuing until ground water was encountered. Soil sampling conducted below the ground water table was for lithologic logging purposes only. The undisturbed soil samples were collected by driving a California-modified split-spoon sampler (lined with brass liners) ahead of the drilling augers. The two-inch diameter brass liners holding the samples were sealed with aluminum foil, plastic caps and tape, labeled, and stored in a cooler, on ice, until delivery to a state-certified laboratory.

Each well casing was installed with a watertight cap and padlock. A round, watertight, flush-mounted well cover was cemented in place over each well casing. The surface of each well cover was surveyed by Kier and Wright of Pleasanton, California, to MSL and to a vertical accuracy of 0.01 feet.

The new wells were developed on March 10, 1993. Prior to development, the wells were checked for the depth to the water table (by the use of an electronic sounder) and the presence of free product (by the use of an interface probe or paste tape). No free product was noted in either of the two wells. After recording the monitoring data, the new wells (MW5 and MW6) were each purged (by the use of a surface pump) of 80 and 85 gallons of water, respectively, until the evacuated water was clear and free of visible suspended sediment. Monitoring and well development data are summarized in Table 1.

RECENT FIELD ACTIVITIES - MONITORING AND SAMPLING

The four previously existing monitoring wells (MW1, MW2A, MW3, and MW4) were monitored and sampled once during the quarter. Prior to sampling, the wells were checked for depth to water and the presence of free product or a sheen. No free product or sheen was noted in any of the wells during the quarter. The monitoring data are summarized in Table 1.

Water samples were collected from the previously existing wells (MW1 through MW4) on April 2, 1993. Prior to sampling, the wells were each purged of between 9 and 10 gallons of water by the use of a surface pump. The samples were collected by the use of a clean Teflon bailer. The samples were decanted into clean VOA vials and/or one-liter amber bottles, as appropriate, which were then sealed with Teflon-lined screw caps, labeled, and stored in a cooler, on ice, until delivery to a state-certified laboratory.

The new wells (MW5 and MW6) were also sampled on April 2, 1993. Prior to sampling, monitoring data were collected, and the wells were each purged of between 9 and 9.5 gallons of water. The samples were collected, handled, and delivered to a state-certified laboratory as previously described.

ANALYTICAL RESULTS

Water samples from all of the wells, and selected soil samples from the borings for MW5 and MW6, were analyzed at Sequoia Analytical Laboratory. All samples analyzed were accompanied by properly executed Chain of Custody documentation. The samples were analyzed for TPH as gasoline by EPA method 5030/modified 8015, TPH as diesel by EPA method 3510/modified 8015, and BTX&E by EPA method 8020. In addition, water samples and selected soil samples from monitoring wells MW5 and MW6 were analyzed for EPA method 8010 constituents.

The concentrations of TPH as gasoline and benzene detected in the ground water samples collected on April 2, 1993, are shown on the attached Figure 2. The results of the soil analyses are summarized in Table 4, and the results of the water analyses are summarized in Tables 2 and 3. Copies of the laboratory analyses and the Chain of Custody documentation are attached to this report.

HYDROLOGY AND GEOLOGY

The measured depth to ground water at the site on April 2, 1993, ranged between 6.48 and 10.99 feet below grade. The water levels in all of the previously existing wells have shown net increases ranging from 0.03 to 0.17 feet since January 29, 1993. Based on

the water level data gathered on April 2, 1993, the ground water flow direction appeared predominantly to be to the north, as shown on the attached Figure 1. The flow direction reported this quarter is relatively similar to the flow direction reported in the previous six quarters. The average hydraulic gradient at the site on April 2, 1993, was approximately 0.001.

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

Based on the results of our subsurface studies, the site is underlain by fill materials to a depth of about 1 to 5 feet below grade. The fill is in turn underlain by alluvium to the maximum depth explored (25.5 feet below grade). The alluvium underlying the site consists predominantly of clay and silty clay, with lesser amounts of sandy or clayey gravel. Clayey silt layers were also encountered at a depth of 18 to 21 feet below grade in MW5, and at a depth of 10 to 13 feet and 20 feet below grade in MW6.

Water Well Survey

As previously reported, a detailed review of available information on producing water wells and ground water monitoring wells adjacent to the subject site was performed by KEI in August of 1991. The well survey focused on the area within a one-half mile radius of the subject site, and is based upon data obtained from the Alameda County Flood Control and Water Conservation District. The information reviewed revealed the presence of 15 producing wells within the study area. All of the located producing wells are designated as irrigation wells and have depths ranging from 20 to 440 feet below grade. Three sites with existing monitoring wells were located within the study area; the closest one is approximately 1,000 feet from the subject site. The Alameda County Flood Control and Water Conservation District records suggest that the status of many of the irrigation wells is unknown. No producing wells that could possibly influence the ground water flow direction at the subject site were located during the survey. Wells located

LIMITATIONS

Soil deposits and rock formations may vary in thickness, lithology, saturation, strength and other properties across any site. In addition, environmental changes, either naturally-occurring or artificially-induced, may cause changes in the extent and concentration of any contaminants. Our studies assume that the field and laboratory data are reasonably representative of the site as a whole, and assume that subsurface conditions are reasonably conducive to interpolation and extrapolation.

The results of this study are based on the data obtained from the field and laboratory analyses obtained from a state-certified laboratory. We have analyzed this data using what we believe to be currently applicable engineering techniques and principles in the Northern California region. We make no warranty, either expressed or implied, regarding the above, including laboratory analyses, except that our services have been performed in accordance with generally accepted professional principles and practices existing for such work.

Should you have any questions regarding this report, please do not hesitate to call us at (510) 602-5100.

Sincerely,

Kaprealian Engineering, Inc.

Thomas J. Berkins
Senior Environmental Engineer

Joel G. Greger, C.E.G.
Senior Engineering Geologist

License No. 1633
Exp. Date 6/30/94

Robert H. Kezerian
Project Engineer

/bp

Attachments: Tables 1 through 8
Location Map
Figures 1 through 7
Boring Logs
Well Construction Diagrams
Laboratory Analyses
Chain of Custody documentation

KEI-P89-0301.R9
May 10, 1993

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 April 2, 1993)					
MW1	22.67	10.08	0	No	10
MW2A	22.79	10.99	0	No	10
MW3	22.92	9.64	0	No	9.5
MW4	22.87	9.45	0	No	9
MW5	22.66	7.08	0	No	9.5
MW6	22.76	6.48	0	No	9
(Monitored and Developed on March 10, 1993)					
MW5	22.48	7.26	0	--	80
MW6	22.56	6.68	0	--	85

Well #	Surface Elevation* (feet)
MW1	32.75
MW2A	33.78
MW3	32.56
MW4	32.32
MW5	29.74
MW6	29.24

-- Indicates analysis was not performed.

* The elevations of the tops of the well covers have been surveyed relative to MSL (elevation = 31.65).

KEI-P89-0301.R9
May 10, 1993

TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Well #	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
4/02/93	MW1	ND	690	94	0.73	39	5.3
	MW2A	ND	120	7.2	ND	1.2	5.8
	MW3	ND	130♦	ND	ND	ND	ND
	MW4	ND	110♦	ND	ND	ND	ND
	MW5	ND	65♦	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND	ND
1/29/93	MW1	ND	740♦♦	69	ND	43	3.8
	MW2A	ND	66♦	1.4	ND	ND	ND
	MW3	ND	130♦	0.84	ND	ND	ND
	MW4	ND	130♦	0.95	ND	ND	ND
10/20/92	MW1	ND	720	110	1.4	110	18
	MW2A	ND	96	2.8	ND	1.6	1.8
	MW3	ND	180♦	ND	ND	ND	ND
	MW4	ND	110♦	ND	ND	ND	ND
7/20/92	MW1	62+	630	100	2.8	52	6.3
	MW2A	ND	99	8.6	ND	0.95	2.4
	MW3	ND	120♦	ND	ND	ND	ND
	MW4	ND	80♦	ND	ND	ND	ND
4/23/92	MW1	--	530	100	7.9	60	4.6
	MW2A	ND	190	15	ND	2.0	15
	MW3	--	150♦	1.6	ND	ND	ND
	MW4	--	120♦	ND	ND	ND	ND
1/13/92	MW1	--	450	240	4.6	73	8.6
	MW2A	ND	160	11	2.0	5.9	10
	MW3	--	120♦	ND	ND	ND	ND
	MW4	--	58♦	ND	ND	ND	ND
9/10/91	MW1	--	280	38	3.1	22	4.1
	MW2A	65	180	8.7	0.93	13	15
	MW3	--	170	ND	ND	ND	ND
	MW4	--	56	ND	ND	ND	ND
6/10/91	MW1	--	310	1.5	ND	0.31	ND
	MW2A	100	54	1.2	ND	0.69	ND
	MW3	--	160	0.65	ND	ND	ND
	MW4	--	64	ND	ND	ND	ND

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Sample Well #	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
3/15/91	MW1	--	110	21	ND	8.4	ND
	MW2A	ND	160	2.5	ND	51	ND
	MW3	--	150	ND	ND	0.45	ND
	MW4	--	53	ND	ND	ND	ND
12/14/90	MW1	--	450	150	6.8	49	0.28
	MW3	--	150	ND	ND	ND	ND
	MW4	--	54	ND	ND	ND	ND
9/19/90	MW1	--	140	ND	ND	3.5	ND
	MW3	--	74	0.74	ND	ND	ND
	MW4	--	61	ND	ND	ND	ND
6/25/90	MW1	--	310	10	0.89	2.1	0.37
	MW3	--	190	1.5	0.68	5.3	ND
	MW4	--	66	ND	ND	ND	ND
3/29/90	MW1	--	320	12	1.6	3.5	0.31
	MW3	--	85	ND	ND	ND	ND
	MW4	--	120	0.39	ND	ND	ND
12/12/89	MW1	--	340	100	13	44	3.4
	MW2	1,700	660	220	6.6	36	13
	MW3	--	120	6.7	0.64	1.5	0.46
	MW4	--	97	4.6	ND	ND	ND
9/13/89	MW1	--	550	32	17	52	3.4
	MW2	ND	170	2.0	0.38	9.5	ND
	MW3	--	76	ND	ND	ND	ND
	MW4	--	77	ND	ND	ND	ND
6/06/89	MW1	--	590	ND	ND	ND	ND
	MW2	ND	77	ND	ND	ND	ND
	MW3	--	32	ND	ND	ND	ND
	MW4	--	37	ND	ND	ND	ND

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

♦ Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be gasoline.

♦♦ Sequoia Analytical Laboratory reported that the hydrocarbons detected appeared to be a gasoline and non-gasoline mixture.

\+ Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be diesel.

-- Indicates analysis was not performed.

ND = Non-detectable.

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

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TABLE 3

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	Tetra-chloroethene	Trichloro-ethene	1,2-Dichloro-ethane	Cis-1,2-dichloro-ethene	TOG (ppm)
4/02/93	MW5	190	ND	ND	ND	--
	MW6	71	ND	ND	ND	--
1/29/93	MW1	300	ND	ND	ND	--
	MW2A	140	10	ND	ND	--
	MW3	980	ND	ND	ND	--
	MW4	950	ND	ND	ND	--
10/20/92	MW1	230	22	ND	16	--
	MW2A	64	11	ND	ND	--
	MW3	1,100	20	ND	ND	--
	MW4	360	17	ND	ND	--
7/20/92	MW1	200	7.4	ND	ND	--
	MW2A	35	7.2	ND	4.8	ND
	MW3	1,400	25	ND	ND	--
	MW4	440	11	ND	ND	--
4/23/92	MW2A	17	5.6	ND	1.9	ND
1/13/92	MW2A*	33	ND	ND	2.1	ND
6/10/91	MW2A	150	10	ND	ND	ND
3/15/91	MW2A	67	8.2	ND	2.6	ND
12/12/89	MW2	30	9.0	ND	ND	1.2
9/13/89	MW2	18	6.1	4.2	1.2	<50
6/06/89	MW2	110	4.4	2.8	ND	ND

NOTE: All EPA method 8010 constituents were non-detectable in all of the ground water samples, except as indicated.

* 1,1,2-Trichloroethane was also detected at a level of 9.9 ppb.

ND = Non-detectable.

-- Indicates analysis was not performed.

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

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May 10, 1993

TABLE 4

SUMMARY OF LABORATORY ANALYSES
SOIL

Sample Number	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	TOG
(Collected on March 6, 1989)							
EB1(5)	--	2.1	ND	0.11	ND	0.14	--
EB1(10)	--	200	2.3	7.7	5.7	33	--
EB2(5)	--	ND	ND	ND	ND	ND	--
EB2(10)	--	620	2.2	20	13	78	--
(Collected on May 24, 1989)							
MW1(5)	--	2.3	0.08	ND	0.62	ND	--
MW1(10)	--	290	1.0	11	48	8.8	--
MW2(5)*	ND	230	13	1.7	3.2	1.5	7,700
MW2(10)*	ND	31	1.2	1.0	5.5	1.1	38
MW3(5)	--	3.2	0.29	0.1	0.7	ND	--
MW3(10)	--	4.6	ND	ND	0.44	0.3	--
MW4(5)	--	3.1	ND	0.11	ND	ND	--
MW4(10)	--	ND	ND	ND	ND	ND	--
(Collected on March 12, 1991)							
MW2A(5)+	4.8	ND	ND	ND	ND	ND	1,300
MW2A(10)**	2.4	10	0.12	0.17	1.6	0.14	260
MW2A(14.5)+	ND	ND	0.0080	0.036	ND	57	
(Collected on March 9, 1993)							
MW5(5)+	27♦	ND	ND	ND	0.058	0.0068	--
MW5(9)++	ND	ND	ND	ND	ND	ND	--
MW5(15)++	ND	ND	ND	ND	ND	ND	--
MW6(5)+	1.9	ND	ND	ND	ND	ND	--
MW6(9.5)+	9.1	ND	ND	ND	ND	ND	--

TABLE 4 (Continued)

SUMMARY OF LABORATORY ANALYSES
SOIL

NOTE: The soil samples were collected at the depths below grade indicated in the ( ) of the respective sample number.

* All EPA method 8010 constituents were non-detectable, except for trichloroethene, which was detected in samples MW2(5) and MW2(10) concentrations of 63 ppb and 65 ppb, respectively.

** All EPA method 8010 constituents were non-detectable, except for 110 ppb of 1,2-dichlorobenzene and 120 ppb of tetrachloroethene detected in sample MW2A(10).

♦ Sequoia Analytical Laboratory reported that the hydrocarbons detected appeared to be a diesel and non-diesel mixture.

\+ All EPA method 8010 constituents were non-detectable.

++ All EPA method 8010 constituents were non-detectable, except for tetrachloroethene, which was detected in samples MW5(9) and MW5(15) at concentrations of 42 ppb and 93 ppb, respectively.

-- Indicates analysis was not performed.

ND = Non-detectable.

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

KEI-P89-0301.R9
May 10, 1993

TABLE 5

SUMMARY OF LABORATORY ANALYSES
SOIL

Date	Sample	Depth (feet)	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene
3/13/89	SW1	10.0	--	3,500	22	280	600	10
3/14/89	SW1(2)	10.0	--	100	1.3	6.6	16	2.9
&	SW2	10.0	--	390	40	4.3	71	10
3/17/89	SW3(15)	10.0	--	60	1.6	2.9	7.8	1.5
	SW4/5(6)	10.0	--	24	2.6	1.7	2.7	0.56
	SW6(12)	10.0	--	150	3.1	6.2	5.6	3.6
	SW7(14)+	10.0	6.2	ND	0.3	ND	ND	ND
	P1	3.0	--	2.3	ND	0.15	ND	ND
	P2	3.0	--	1.5	ND	0.31	ND	ND
	P3	3.0	--	1.1	ND	0.1	ND	ND
	P4	3.0	--	5.6	ND	0.15	0.39	ND
	P5	3.0	--	6.8	0.15	0.58	0.55	0.12
	P6	3.5	--	5.5	0.06	0.18	0.15	ND
	WO1++	10.0	ND	15	ND	ND	0.21	0.88
4/03/90	SW8A*	10.5	62	260	1.4	8.0	40	7.0
	SW9A*	10.5	ND	ND	0.017	0.041	0.033	0.0092
	SW10A*	10.5	ND	140	0.085	0.12	5.0	1.4
	SW11A**	10.5	280	1,100	8.0	43	230	37

\+ TOG was detected at 41 ppm; all EPA method 8240 constituents were non-detectable, except as noted above.

++ TOG was detected at 280 ppm; all EPA method 8240 constituents were non-detectable, except as noted above.

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

** TOG was detected at 210 ppm; all EPA method 8010 constituents were non-detectable.

-- Indicates analysis was not performed.

ND = Non-detectable.

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

KEI-P89-0301.R9
May 10, 1993

TABLE 6

SUMMARY OF LABORATORY ANALYSES
WATER

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

ND = Non-detectable.

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

TABLE 7

PRODUCTION WELLS LOCATED WITHIN STUDY AREA

Survey No.	State No.	Date Drilled	Owner	Use	Depth (feet)	Location
1	35,2W,6K1	8/49	Lee Dugan	Irrigation	148	Corner of E.14th and 159th Avenue
2	35,2W,6J1	1910	Manuel Rose	Irrigation	52	16053 Ashland Avenue
3	35,2W,6R2	10/47	Okada Brothers, Inc.	Irrigation	440	16109 Ashland Avenue
4	35,2W,6G2	--	Harwood	Irrigation	--	1584 Oriole
5	35,2W,6H2	1927	Magnaini	Abandoned (Not destroyed)	40	1570 Mond Avenue
6	35,2W,6H1	1924	Mary Welsh	Irrigation	32	1575 159th Avenue
7	35,2W,6K2	1957	Walsh	Irrigation	15	877 Mooney Avenue at Connolly
8	35,2W,6Q2	1952	T. D. Sexton	Irrigation	15	825 Jan Court
9	35,2W,6R1	1940	J. Fildelgo	Irrigation	70	16239 Ashland Avenue
10	35,2W,6R4	10/90	Okada Brothers Nursery	Irrigation	304	16100 Bertrero Avenue
11	35,2W,6B1	1957	Allen	Irrigation	40	1571 152nd Avenue

TABLE 7 (Continued)

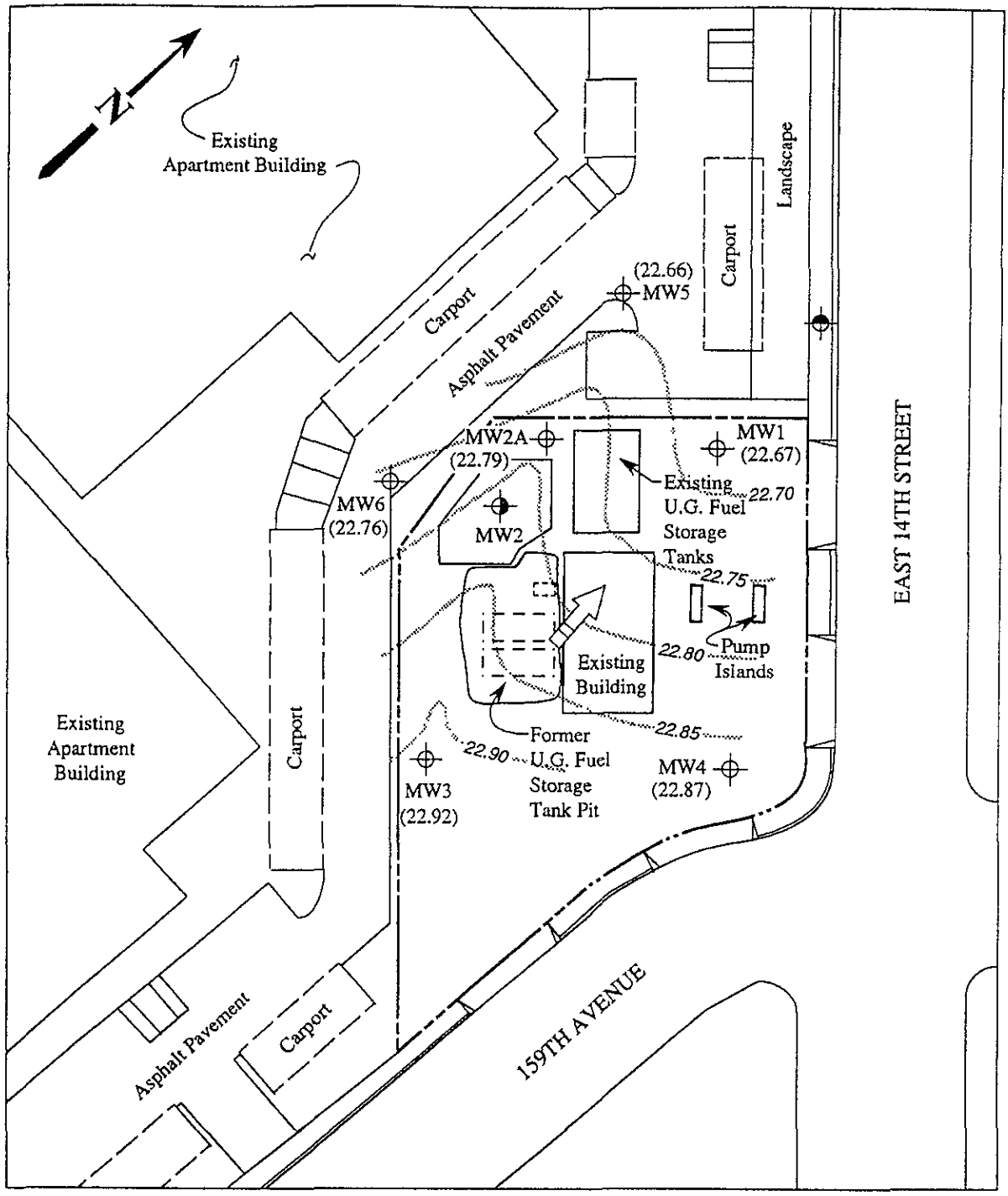
PRODUCTION WELLS LOCATED WITHIN STUDY AREA

Survey No.	State No.	Date Drilled	Owner	Use	Depth (feet)	Location
12	35,2W,6B4	--	Paul Fearon	Irrigation	30	1573 153rd Avenue
13	35,2W,6C2	1954	Fredin	Irrigation	25	1479 151st Avenue
14	35,2W,6P2	1958	F. Chimente	Irrigation	20	15508 Wegner Street
15	35,2W,5N3	1939	Namura Nursery	Irrigation	50	1501 163rd Avenue

TABLE 8

SITES WITH ONE OR MORE MONITORING WELLS WITHIN STUDY AREA

Survey No.	State No.	Owner	Location	Depth to Ground Water at Site (feet)
1	35,2W,6J4-5	Okada Property	16109 Ashland Avenue	5
2	35,2W,5M3-4	Kaufman & Broad	1630 162nd Avenue	14-16
3	35,2W,6E7-11	Shell Oil	15120 Hesperian Boulevard	9-11
	35,2W,6E12-17	Westfield, Inc.	15120 Hesperian Boulevard	9-11



LEGEND

- Monitoring well (existing)
- Monitoring well (previously attempted)
- Monitoring well (destroyed February 1, 1990)
- ( ) Ground water elevation in feet above Mean Sea Level
- Direction of ground water flow
- Contours of ground water elevation

0 60 120

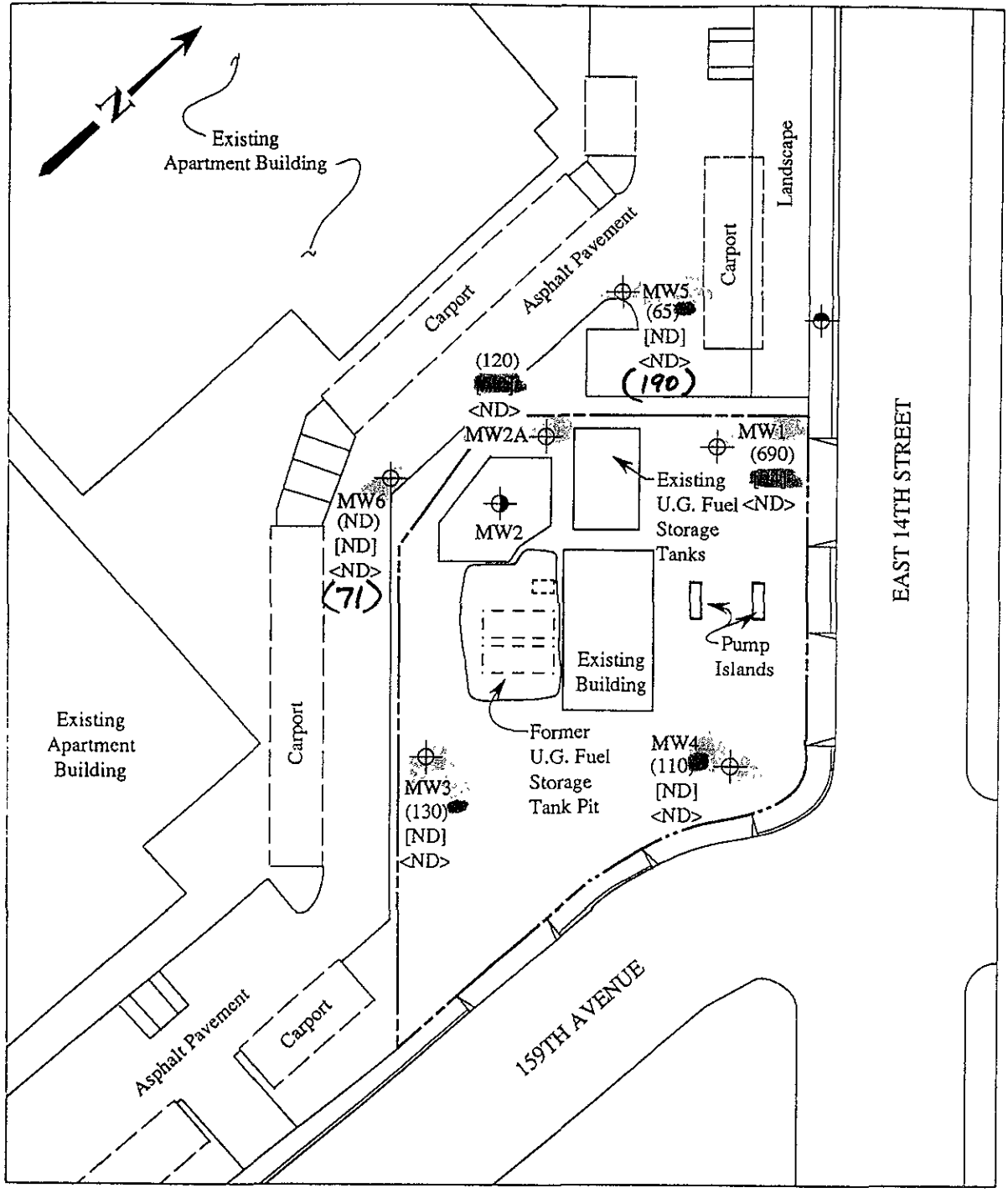
Approx. scale feet

POTENTIOMETRIC SURFACE MAP FOR THE APRIL 2, 1993 MONITORING EVENT

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #6277
15803 E. 14TH STREET
SAN LEANDRO, CA

FIGURE
1



LEGEND

- Monitoring well (existing)
- Monitoring well (previously attempted)
- Monitoring well (destroyed February1, 1990)
- ( ) Concentration of TPH as gasoline in ppb
- [ ] [illegible]
- < > Concentration of TPH as diesel in ppb

( ) perchloroethylene

ND = Non-detectable

The lab reported that the hydrocarbons detected did not appear to be gasoline.

0 60 120

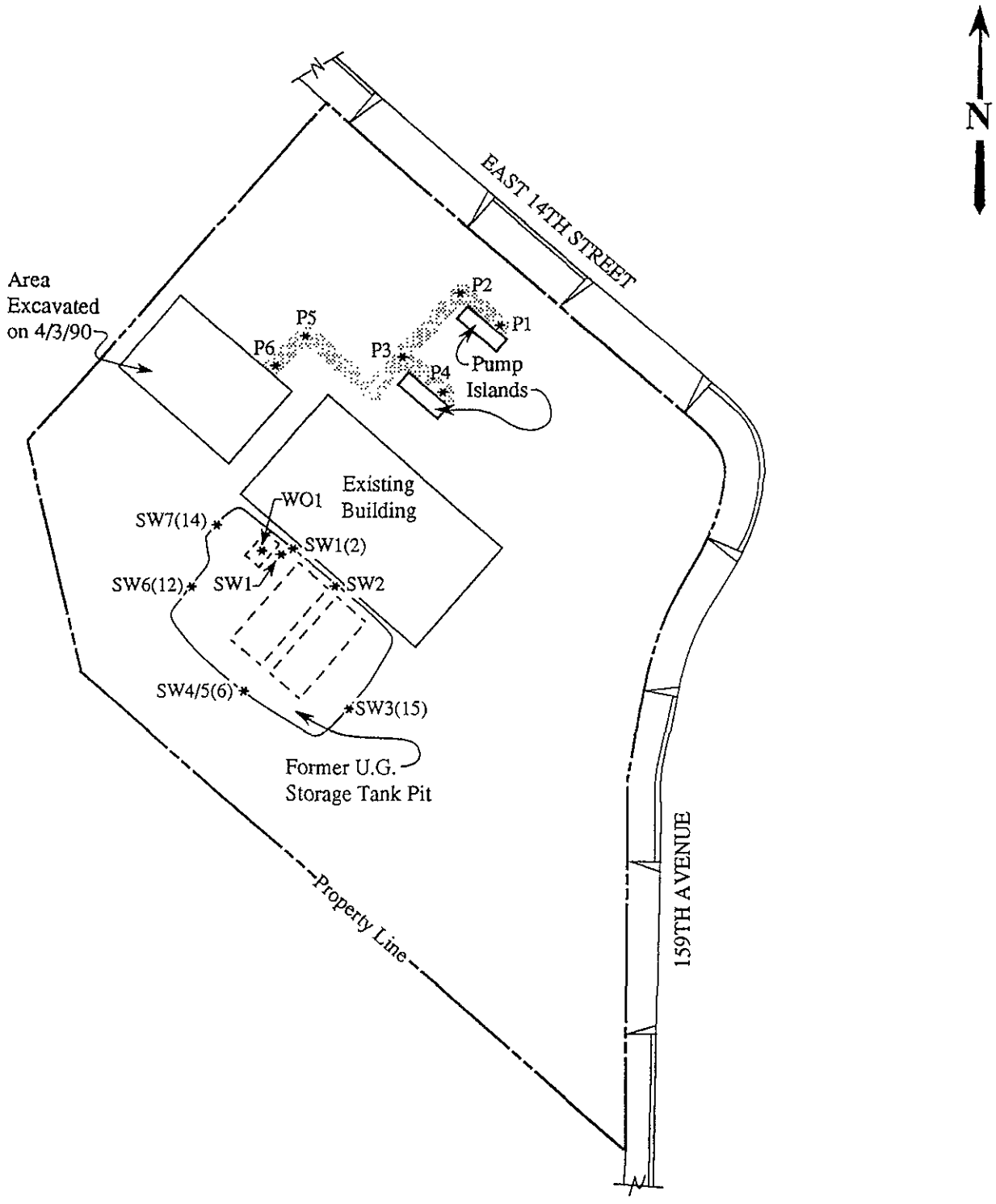
Approx. scale feet

PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUND WATER ON APRIL 2, 1993

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #6277
15803 E. 14TH STREET
SAN LEANDRO, CA

FIGURE
2



LEGEND

* Sample point location

0 40 80

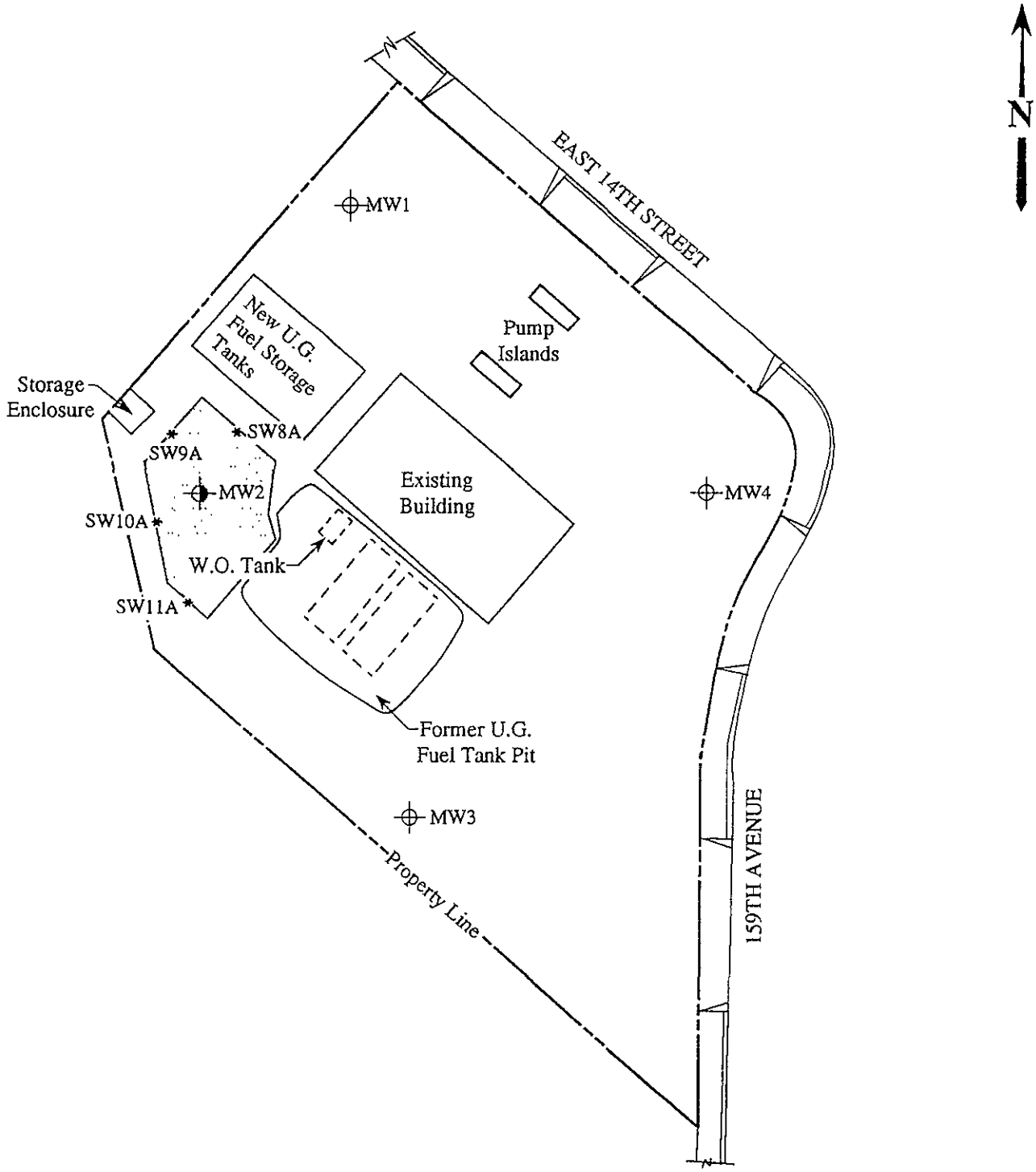
Approx. scale feet

SAMPLE POINT LOCATION MAP

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #6277
15803 EAST 14TH STREET
SAN LEANDRO, CA

FIGURE
3



LEGEND

- Monitoring well (existing)
- Monitoring well (destroyed February1, 1990)
- Area of excavation
- * Sample point location

0 40 80

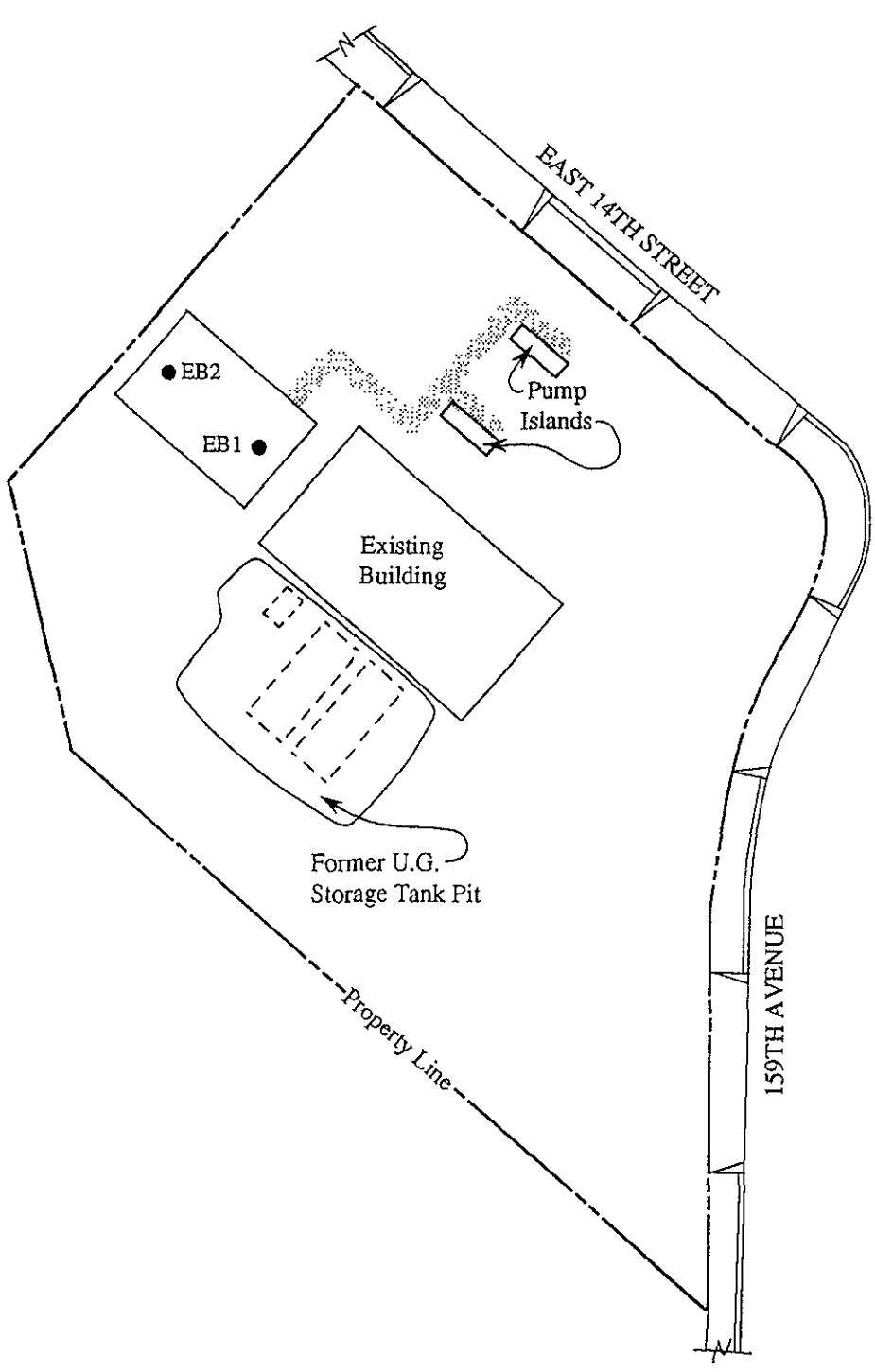
Approx. scale feet

SAMPLE POINT LOCATION MAP

KAPREALIAN ENGINEERING INCORPORATED

UNOCAL SERVICE STATION #6277
15803 EAST 14TH STREET
SAN LEANDRO, CA

FIGURE
4



LEGEND

● Exploratory boring

0 40 80

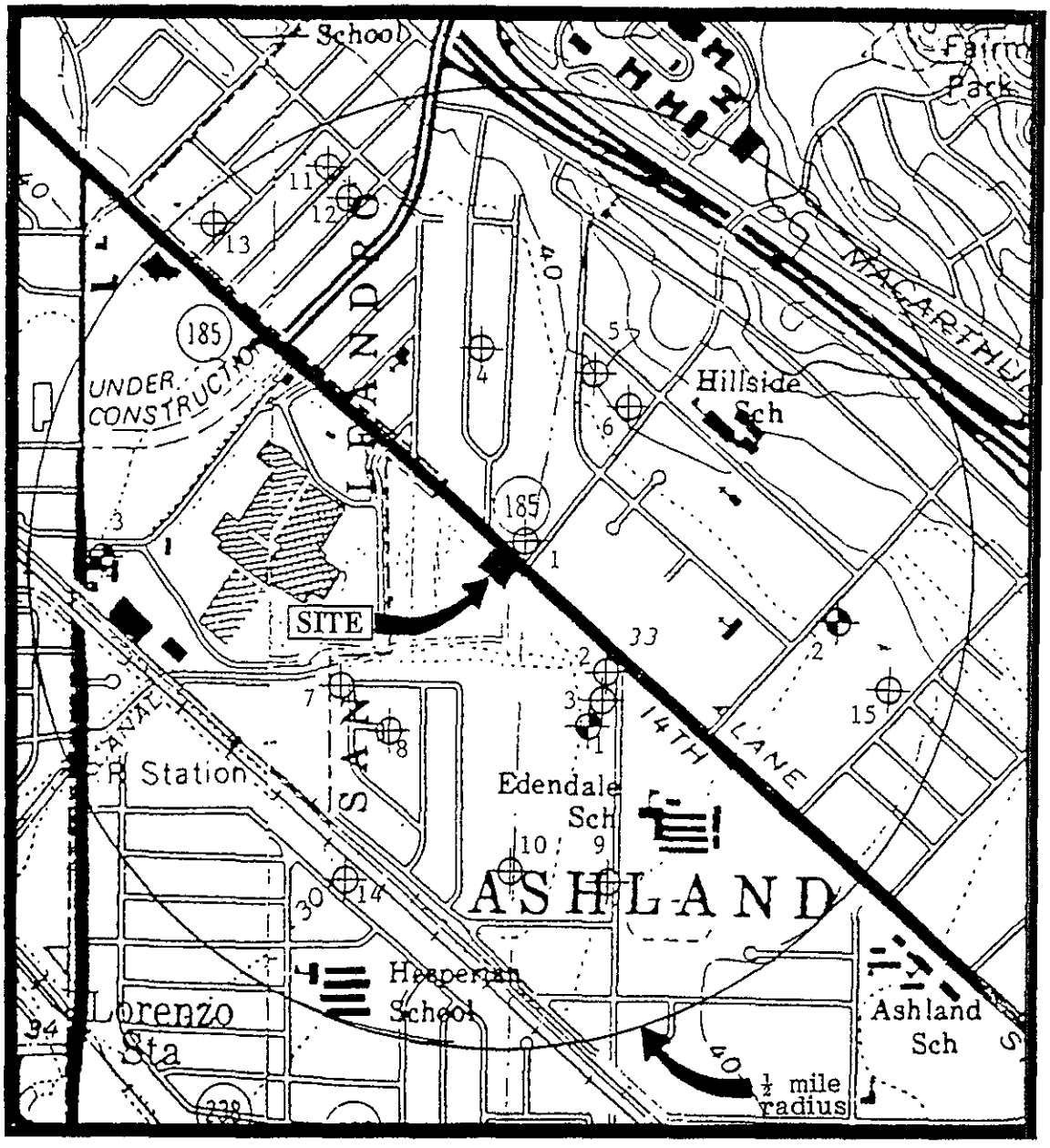
Approx. scale feet

EXPLORATORY BORING LOCATION MAP

KAPREALIAN ENGINEERING
INCORPORATED

UNOCAL SERVICE STATION #6277
15803 EAST 14TH STREET
SAN LEANDRO, CA

FIGURE
5



LEGEND

- Approximate well location (located from A.C.F.C.D. data)
- Site with one or more monitoring wells

0 1000 2000

Approx. scale feet

LOCATION MAP FOR WELL SURVEY		
KAPREALIAN ENGINEERING INCORPORATED	UNOCAL SERVICE STATION #6277 15803 EAST 14TH STREET SAN LEANDRO, CALIFORNIA	FIGURE 6

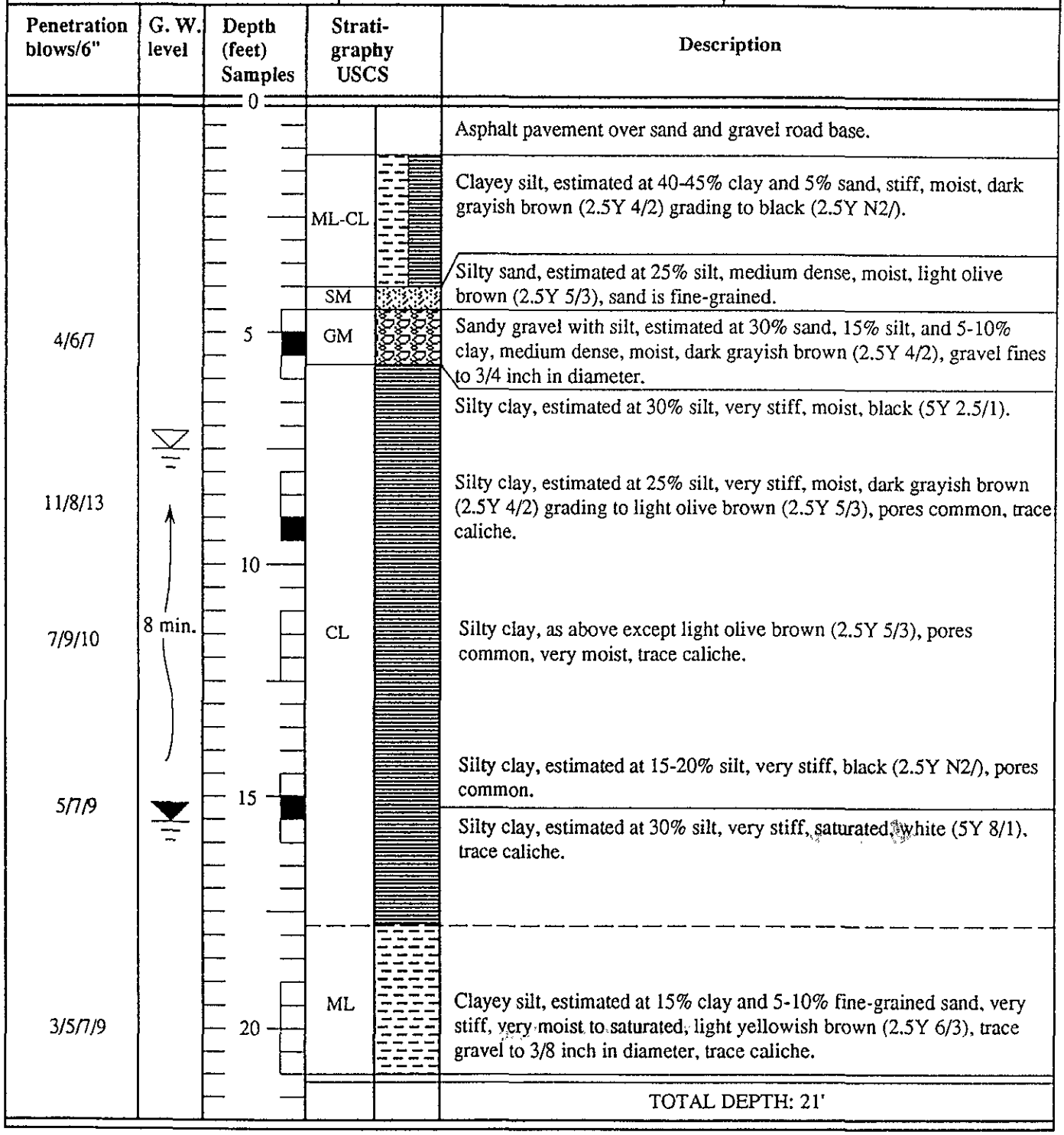
KAPREALIAN ENGINEERING
INCORPORATED

MAJOR DIVISIONS	SYMBOLS	TYPICAL SOIL DESCRIPTIONS
GRAVELS (More than 1/2 of coarse fraction > No. 4 sieve size)	GW	Well graded gravels or gravel - sand mixtures, little or no fines
	GP	Poorly graded gravels or gravel - sand mixtures, little or no fines
	GM	Silty gravels, gravel - sand - silt mixtures
	GC	Clayey gravels, gravel - sand - clay mixtures
SANDS (More than 1/2 of coarse fraction < No. 4 sieve size)	SW	Well graded sands or gravelly sands, little or no fines
	SP	Poorly graded sands or gravelly sands, little or no fines
	SM	Silty sands, sand - silt mixtures
	SC	Clayey sands, sand - clay mixtures
SILTS & CLAYS LL < 50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity
SILTS & CLAYS LL > 50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
	CH	Inorganic clays of high plasticity, fat clays
	OH	Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS	Pt	Peat and other highly organic soils
DUAL (TRANSITION) SOILS	Soil characterisitics are transitional between the soil classifications listed above	

CLASSIFICATION CHART (Unified Soil Classification System)

BORING LOG

Project No. KEI-P89-0301	**Boring Diameter** 9" **Casing Diameter** 2"	**Logged By** JGG W.W. CEG 1633
Project Name Unocal S/S #6277 15803 E. 14th Street, San Leandro	**Well Cover Elevation**	**Date Drilled** 3/9/93
Boring No. MW5	**Drilling Method** Hollow-stem Auger	**Drilling Company** West Hazmat



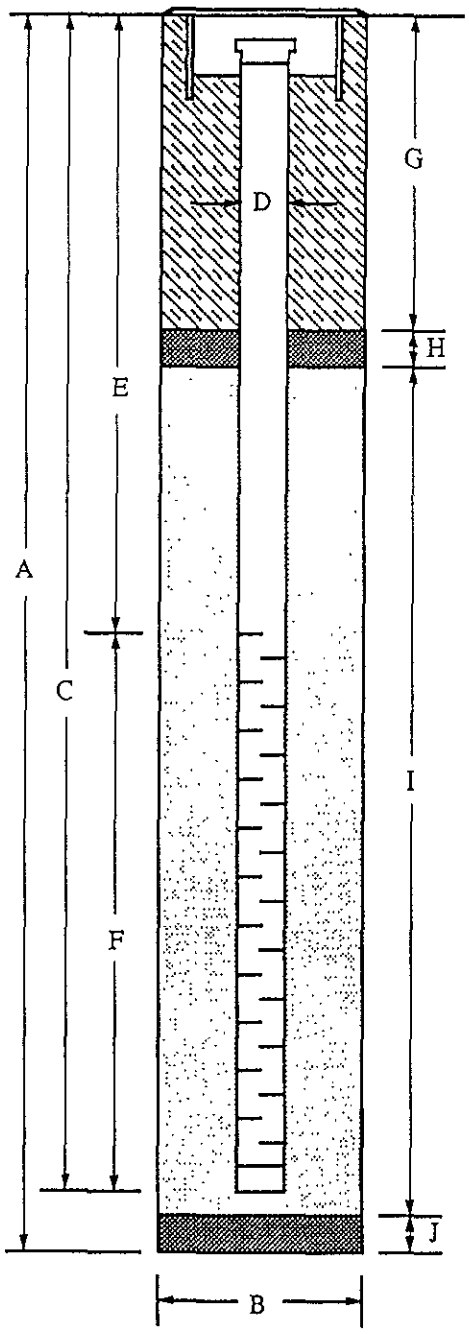
WELL CONSTRUCTION DIAGRAM

PROJECT NAME: Unocal #6277, 15803 E. 14th Street, San Leandro **WELL NO.:** MW5

PROJECT NUMBER: KEI-P89-0301

WELL PERMIT NO.: 93084 (Zone 7 Alameda Co.)

Flush-mounted Well Cover



A. Total Depth : 21'

B. Boring Diameter: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 21'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 4'

F. Perforated Length: 17'

Perforation Type: Machined Slot

Perforation Size: 0.010"

G. Surface Seal: 2'

Seal Material: Concrete

H. Seal: 1'

Seal Material: Bentonite

I. Filter Pack: 18'

Pack Material: RMC Lonestar Sand

Size: #2/12

J. Bottom Seal: None

Seal Material: N/A

BORING LOG

Project No. KEI-P89-0301	**Boring Diameter** 9" **Casing Diameter** 2"	**Logged By** JGG W.W. CEG 1633
Project Name Unocal S/S #6277 15803 E. 14th Street, San Leandro	**Well Cover Elevation**	**Date Drilled** 3/9/93
Boring No. MW6	**Drilling Method** Hollow-stem Auger	**Drilling Company** West Hazmat

Penetration blows/6"	G. W. level	Depth (feet) Samples	Strati-graphy USCS	Description
		0		Asphalt pavement over sand and road base.
			ML-CL	Clayey silt, estimated at 40% clay, 5% sand, and trace gravel to 3/8 inch in diameter, stiff, moist, dark grayish brown (2.5Y 4/2).
			SM	Silty sand, estimated at 25% silt, medium dense, moist, light olive brown (2.5Y 5/3), sand is fine-grained.
			GC	Clayey gravel, estimated at 25% clay, 10-15% silt, and 10-15% sand, medium dense, dark greenish gray (5GY 4/1), subangular gravel to 1 inch in diameter.
4/6/6		5	GM	Silty gravel, estimated at 30% sand, 15% silt, and 5% clay, medium dense, moist, olive gray (5Y 5/2), gravel to 3/4 inch in diameter.
			CL	Silty clay, estimated at 15% silt, stiff, moist, very dark gray (10YR 3/1), pores common.
6/9/11/10	initial	10		Silty clay, estimated at 20% silt, very stiff, moist, dark grayish brown (2.5Y 4/2), trace pores.
			ML	Clayey silt, estimated at 15-20% clay and 5% fine-grained sand, very stiff, very moist to saturated, light olive brown (2.5Y 5/3), trace pores and caliche.
			CL	Silty clay, estimated at 20% silt and trace sand, stiff, very moist, dark gray (10YR 4/1), trace caliche.
4/6/7/10		15		Silty clay, as above except white (10YR 8/1), pores are saturated, caliche common.
				Silty clay, estimated at 30-35% silt and 10% caliche, stiff, very moist, light gray (2.5Y 7/2).
3/5/6/12		20	ML	Clayey silt, estimated at 15% clay and 5-10% fine-grained sand, very stiff, very moist to saturated, light olive brown (2.5Y 5/3).
				TOTAL DEPTH: 21'

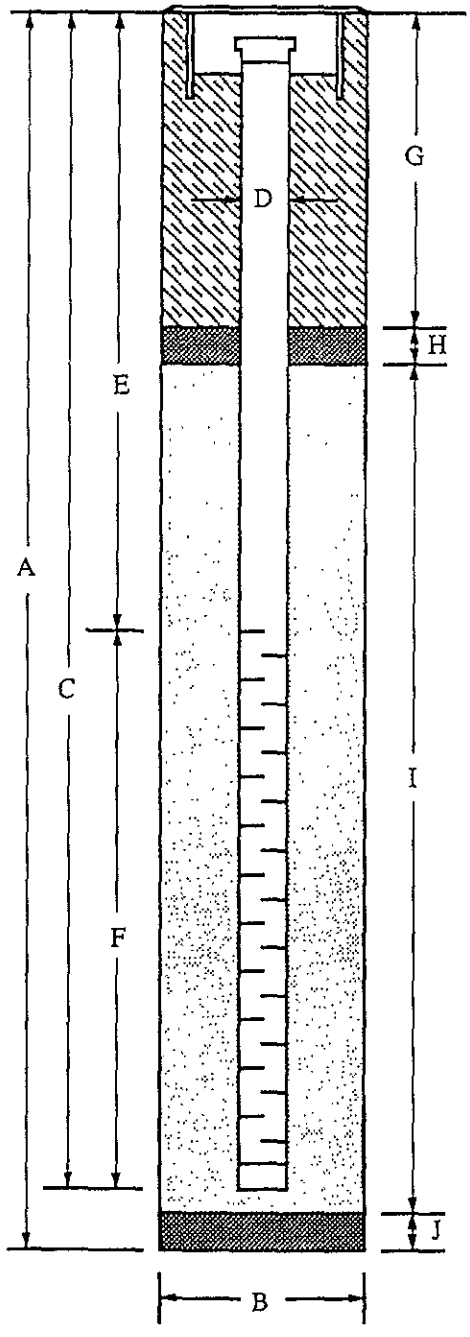
WELL CONSTRUCTION DIAGRAM

PROJECT NAME: Unocal #6277, 15803 E. 14th Street, San Leandro **WELL NO.:** MW6

PROJECT NUMBER: KEI-P89-0301

WELL PERMIT NO.: 93084

Flush-mounted Well Cover



A. Total Depth : 21'

B. Boring Diameter: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 19'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 4'

F. Perforated Length: 15'

Perforation Type: Machined Slot

Perforation Size: 0.010"

G. Surface Seal: 2'

Seal Material: Concrete

H. Seal: 1'

Seal Material: Bentonite

I. Filter Pack: 16'

Pack Material: RMC Lonestar Sand

Size: #2/12

J. Bottom Seal: 2'

Seal Material: Bentonite

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal #6277, 15803 E. 14th St.,	San Leandro	Sampled:	Apr 2, 1993
2401 Stanwell Dr., Ste. 400	Sample Matrix:	Water		Received:	Apr 2, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020		Reported:	Apr 15, 1993
Attention: Mardo Kaprealian, P.E.	First Sample #:	304-0165			

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 304-0165 MW-1	Sample I.D. 304-0166 MW-2	Sample I.D. 304-0167 MW-3*	Sample I.D. 304-0168 MW-4*	Sample I.D. 304-0169 MW-5*	Sample I.D. 304-0170 MW-6
Purgeable Hydrocarbons	50	690	120	130	110	65	N.D.
Benzene	0.5	94	7.2	N.D.	N.D.	N.D.	N.D.
Toluene	0.5	0.73	N.D.	N.D.	N.D.	N.D.	N.D.
Ethyl Benzene	0.5	5.3	5.8	N.D.	N.D.	N.D.	N.D.
Total Xylenes	0.5	39	1.2	N.D.	N.D.	N.D.	N.D.
Chromatogram Pattern:		Gasoline	Gasoline	Discrete Peak	Discrete Peak	Discrete Peak	--

Quality Control Data

Report Limit Multiplication Factor:	2.0	1.0	1.0	1.0	1.0	1.0
Date Analyzed:	4/6/93	4/6/93	4/6/93	4/6/93	4/6/93	4/6/93
Instrument Identification:	HP-4	HP-4	HP-2	HP-2	HP-2	HP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	93	100	105	101	103	104

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

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Project Manager

Please Note: *This sample does not appear to contain Gasoline.
Discrete Peak appears to be an unidentified peak in the EPA 8010 range.

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal #6277, 15803 E. 14th St., San Leandro	Sampled:	Apr 2, 1993
2401 Stanwell Dr., Ste. 400	Sample Matrix:	Water	Received:	Apr 2, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Reported:	Apr 15, 1993
Attention: Mardo Kaprealian, P.E.	First Sample #:	Matrix Blank		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. Matrix Blank
Purgeable Hydrocarbons	50	
Benzene	0.5	
Toluene	0.5	
Ethyl Benzene	0.5	
Total Xylenes	0.5	

Chromatogram Pattern:

Quality Control Data

Report Limit Multiplication Factor:	1.0
Date Analyzed:	4/6/93
Instrument Identification:	HP-4
Surrogate Recovery, %: (QC Limits = 70-130%)	102

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

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Project Manager

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal #6277, 15803 E. 14th St.,		Sampled:	Apr 2, 1993
2401 Stanwell Dr., Ste. 400	Sample Matrix:	Water	San Leandro	Received:	Apr 2, 1993
Concord, CA 94520	Analysis Method:	EPA 3510/3520/8015		Reported:	Apr 15, 1993
Attention: Mardo Kaprealian, P.E.	First Sample #:	304-0165			

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 304-0165 MW-1	Sample I.D. 304-0166 MW-2	Sample I.D. 304-0167 MW-3	Sample I.D. 304-0168 MW-4	Sample I.D. 304-0169 MW-5	Sample I.D. 304-0170 MW-6
Extractable Hydrocarbons	50	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chromatogram Pattern:		--	--	--	--	--	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0	1.0
Date Extracted:	4/9/93	4/9/93	4/9/93	4/9/93	4/9/93	4/9/93
Date Analyzed:	4/12/93	4/14/93	4/14/93	4/14/93	4/14/93	4/14/93
Instrument Identification:	HP-3A	HP-3A	HP-3A	HP-3A	HP-3A	HP-3A

Extractable Hydrocarbons are quantitated against a fresh diesel standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal #6277, 15803 E. 14th St.,		Sampled:	Apr 2, 1993
2401 Stanwell Dr., Ste. 400	Sample Descript:	Water, MW-5	San Leandro	Received:	Apr 2, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8010		Analyzed:	Apr 7, 1993
Attention: Mardo Kaprealian, P.E.	Lab Number:	304-0169		Reported:	Apr 15, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	10	N.D.
Bromoform	10	N.D.
Bromomethane	20	N.D.
Carbon tetrachloride	10	N.D.
Chlorobenzene	10	N.D.
Chloroethane	20	N.D.
2-Chloroethylvinyl ether	20	N.D.
Chloroform	10	N.D.
Chloromethane	20	N.D.
Dibromochloromethane	10	N.D.
1,3-Dichlorobenzene	10	N.D.
1,4-Dichlorobenzene	10	N.D.
1,2-Dichlorobenzene	10	N.D.
1,1-Dichloroethane	10	N.D.
1,2-Dichloroethane	10	N.D.
1,1-Dichloroethene	10	N.D.
cis-1,2-Dichloroethene	10	N.D.
trans-1,2-Dichloroethene	10	N.D.
1,2-Dichloropropane	10	N.D.
cis-1,3-Dichloropropene	10	N.D.
trans-1,3-Dichloropropene	10	N.D.
Methylene chloride	100	N.D.
1,1,2,2-Tetrachloroethane	10	N.D.
Tetrachloroethene	10	190
1,1,1-Trichloroethane	10	N.D.
1,1,2-Trichloroethane	10	N.D.
Trichloroethene	10	N.D.
Trichlorofluoromethane	10	N.D.
Vinyl chloride	20	N.D.

Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

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Engineering, Inc.	Client Project ID:	Unocal #6277, 15803 E. 14th St.,		Sampled:	Apr 2, 1993
well Dr., Ste. 400	Sample Descript:	Water, MW-6	San Leandro	Received:	Apr 2, 1993
CA 94520	Analysis Method:	EPA 5030/8010		Analyzed:	Apr 8, 1993
Mardo Kaprealian, P.E.	Lab Number:	304-0170		Reported:	Apr 15, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

	Detection Limit µg/L		Sample Results µg/L
loromethane	2.5		N.D.
n	2.5		N.D.
hane	5.0		N.D.
rachloride	2.5		N.D.
zene	2.5		N.D.
ne	5.0		N.D.
nylvinyl ether	5.0		N.D.
a	2.5		N.D.
nane	5.0		N.D.
loromethane	2.5		N.D.
obenzene	2.5		N.D.
obenzene	2.5		N.D.
obenzene	2.5		N.D.
oethane	2.5		N.D.
oethane	2.5		N.D.
oethene	2.5		N.D.
hloroethene	2.5		N.D.
ichloroethene	2.5		N.D.
opropane	2.5		N.D.
hloropropene	2.5		N.D.
ichloropropene	2.5		N.D.
chloride	25		N.D.
achloroethane	2.5		N.D.
oethene	2.5		71
oroethane	2.5		N.D.
oroethane	2.5		N.D.
nene	2.5		N.D.
oromethane	2.5		N.D.
de	5.0		N.D.

rted as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors
ional sample dilution, detection limits for this sample have been raised.

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Kaprealian Engineering, Inc.
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal #6277, 15803 E. 14th St., San Leandro
QC Sample Group: 3040165-170
Reported: Apr 15, 1993

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8015	EPA 8015	EPA 8015	EPA 8015	EPA 8015	EPA 8015	EPA 8015
Analyst:	K. Wimer	K. Wimer	K. Wimer	K. Wimer	K. Wimer	K. Wimer	K. Wimer
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Apr 12, 1993	Apr 14, 1993	Apr 14, 1993	Apr 14, 1993	Apr 14, 1993	Apr 14, 1993	Apr 14, 1993
Sample #:	304-0165	304-0166	304-0167	304-0168	304-0169	304-0170	Matrix Blank
Surrogate % Recovery:	94	97	92	107	89	102	95

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Project Manager

% 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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Client Project ID: Unocal #6277, 15803 E. 14th St., San Leandro

n, P.E. QC Sample Group: 3040165-170 Reported: Apr 16, 1993

QUALITY CONTROL DATA REPORT

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owing analytes: None Detected

% 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

3040165.KEI <11>

Relinquished by: (Signature)	Received by: (Signature)	3. Did any samples received for analysis have head space? N
Relinquished by: (Signature)	Received by: (Signature)	4. Were samples in appropriate containers and properly packaged? Y
Date/Time	Date/Time	Signature / Title / Date 4/14/93

2401 Stanwell Drive, Suite 400
Concord, California 94520
Tel: 510 602 5100 Fax: 510 687 0602

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Kaprealian Engineering, Inc.	*Client Project ID:*	*Unocal #6277, 15803 E. 14th Street,* San Leandro	*Sampled:*	Mar 9, 1993
2401 Stanwell Dr., Ste. 400	Sample Matrix:	Soil	Received:	Mar 10, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Reported:	Mar 22, 1993
Attention: Mardo Kaprealian, P.E.	*First Sample #:*	303-0326		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit mg/kg	Sample I.D. 303-0326 MW5-(5)	Sample I.D. 303-0327 MW5-(9)	Sample I.D. 303-0328 MW5-(15)	Sample I.D. 303-0329 MW6-(5)	Sample I.D. 303-0330 MW6-(9.5)	Sample I.D. Matrix Blank
Purgeable Hydrocarbons	1.0	N.D.	N.D.	N.D.	N.D.	N.D.	
Benzene	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	
Toluene	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	
Ethyl Benzene	0.005	0.0068	N.D.	N.D.	N.D.	N.D.	
Total Xylenes	0.005	0.058	N.D.	N.D.	N.D.	N.D.	
Chromatogram Pattern:		--	--	--	--	--	

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0	1.0
Date Analyzed:	3/11/93	3/11/93	3/11/93	3/11/93	3/11/93	3/11/93
Instrument Identification:	HP-4	HP-4	HP-4	HP-4	HP-4	HP-4
Surrogate Recovery, %: (QC Limits = 70-130%)	102	103	101	103	104	104

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

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Project Manager

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal #6277, 15803 E. 14th Street, San Leandro	Sampled:	Mar 9, 1993
2401 Stanwell Dr., Ste. 400	Sample Descript:	Soil, MW5-(5)	Received:	Mar 10, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8010	Analyzed:	Mar 18, 1993
Attention: Mardo Kaprealian, P.E.	Lab Number:	303-0326	Reported:	Mar 22, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	5.0	N.D.
Bromomethane	10	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	10	N.D.
2-Chloroethylvinyl ether	10	N.D.
Chloroform	5.0	N.D.
Chloromethane	10	N.D.
Dibromochloromethane	5.0	N.D.
1,3-Dichlorobenzene	5.0	N.D.
1,4-Dichlorobenzene	5.0	N.D.
1,2-Dichlorobenzene	5.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
cis-1,2-Dichloroethene	5.0	N.D.
trans-1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	50	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	5.0	N.D.
Vinyl chloride	10	N.D.

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

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Project Manager

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal #6277, 15803 E. 14th Street, San Leandro	Sampled:	Mar 9, 1993
2401 Stanwell Dr., Ste. 400	Sample Descript:	Soil, MW5-(15)	Received:	Mar 10, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8010	Analyzed:	Mar 18, 1993
Attention: Mardo Kaprealian, P.E.	Lab Number:	303-0328	Reported:	Mar 22, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	5.0	N.D.
Bromomethane	10	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	10	N.D.
2-Chloroethylvinyl ether	10	N.D.
Chloroform	5.0	N.D.
Chloromethane	10	N.D.
Dibromochloromethane	5.0	N.D.
1,3-Dichlorobenzene	5.0	N.D.
1,4-Dichlorobenzene	5.0	N.D.
1,2-Dichlorobenzene	5.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
cis-1,2-Dichloroethene	5.0	N.D.
trans-1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	50	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	93
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	5.0	N.D.
Vinyl chloride	10	N.D.

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

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Scott A. Chieffo
Project Manager

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal #6277, 15803 E. 14th Street, San Leandro	Sampled:	Mar 9, 1993
2401 Stanwell Dr., Ste. 400	Sample Descript:	Soil, MW6-(5)	Received:	Mar 10, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8010	Analyzed:	Mar 18, 1993
Attention: Mardo Kaprealian, P.E.	Lab Number:	303-0329	Reported:	Mar 22, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	5.0	N.D.
Bromomethane	10	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	10	N.D.
2-Chloroethylvinyl ether	10	N.D.
Chloroform	5.0	N.D.
Chloromethane	10	N.D.
Dibromochloromethane	5.0	N.D.
1,3-Dichlorobenzene	5.0	N.D.
1,4-Dichlorobenzene	5.0	N.D.
1,2-Dichlorobenzene	5.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
cis-1,2-Dichloroethene	5.0	N.D.
trans-1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	50	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	5.0	N.D.
Vinyl chloride	10	N.D.

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

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

SEQUOIA ANALYTICAL

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

Kapreallan Engineering, Inc.	Client Project ID:	Unocal #6277, 15803 E. 14th Street,	Sampled:	Mar 9, 1993
2401 Stanwell Dr., Ste. 400	Sample Descript:	Soil, MW6-(9.5) San Leandro	Received:	Mar 10, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8010	Analyzed:	Mar 18, 1993
Attention: Mardo Kapreallan, P.E.	Lab Number:	303-0330	Reported:	Mar 22, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	5.0	N.D.
Bromomethane	10	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	10	N.D.
2-Chloroethylvinyl ether	10	N.D.
Chloroform	5.0	N.D.
Chloromethane	10	N.D.
Dibromochloromethane	5.0	N.D.
1,3-Dichlorobenzene	5.0	N.D.
1,4-Dichlorobenzene	5.0	N.D.
1,2-Dichlorobenzene	5.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
cis-1,2-Dichloroethene	5.0	N.D.
trans-1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	50	N.D.
,1,2,2-Tetrachloroethane	5.0	N.D.
etrachloroethene	5.0	N.D.
,1,1-Trichloroethane	5.0	N.D.
1,2-Trichloroethane	5.0	N.D.
richloroethene	5.0	N.D.
richlorofluoromethane	5.0	N.D.
nyl chloride	10	N.D.

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

UOIA ANALYTICAL

A. Chieffo
t Manager

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Kaprealian Engineering, Inc.
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal #6277, 15803 E. 14th Street, San Leandro
QC Sample Group: 3030326-330
Reported: Mar 22, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes	Diesel
Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015
Analyst:	A.T.	A.T.	A.T.	A.T.	K.Wimer
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	Mar 11, 1993	Mar 11, 1993	Mar 11, 1993	Mar 11, 1993	Mar 22, 1993
QC Sample #:	303-0333	303-0333	303-0333	303-0333	303-0330
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.40	0.40	0.40	1.2	10
Conc. Matrix Spike:	0.39	0.39	0.40	1.4	9.2
Matrix Spike % Recovery:	98	98	100	114	92
Conc. Matrix Spike Dup.:	0.39	0.39	0.40	1.3	9.1
Matrix Spike Duplicate % Recovery:	98	98	100	108	91
Relative % Difference:	0.0	0.0	0.0	5.2	1.1

Laboratory blank contained the following analytes: None Detected

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

% 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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2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Mardo Kapreallan, P.E.

Client Project ID: Unocal #6277, 15803 E. 14th Street, San Leandro
QC Sample Group: 3030326-330
Reported: Mar 22, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloroethene	Trichloro-ethene	Chloro-benzene
Method:	EPA 8010	EPA 8010	EPA 8010
Analyst:	K.Nill	K.Nill	K.Nill
Reporting Units:	µg/kg	µg/kg	µg/kg
Date Analyzed:	Mar 18, 1993	Mar 18, 1993	Mar 18, 1993
QC Sample #:	303-0569	303-0569	303-0569
Sample Conc.:	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10
Conc. Matrix Spike:	11	11	9.6
Matrix Spike % Recovery:	110	110	96
Conc. Matrix Spike Dup.:	11	10	8.9
Matrix Spike Duplicate % Recovery:	110	100	89
Relative % Difference:	0.0	9.5	7.6

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.
Laboratory Blank contained the following analytes: None detected.

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

% Recovery:	$\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}}$	x 100
Relative % Difference:	$\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}}$	x 100

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Concord, CA 94520
Attention: Mardo Kaprealian, P.E.

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QC Sample Group: 3030326-330
Reported: Mar 22, 1993

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8015	EPA 8015	EPA 8015	EPA 8015	EPA 8015	EPA 8015
Analyst:	K. Wimer	K. Wimer	K. Wimer	K. Wimer	K. Wimer	K. Wimer
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	Mar 19, 1993	Mar 18, 1993	Mar 18, 1993	Mar 19, 1993	Mar 18, 1993	Mar 22, 1993
Sample #:	303-0326	303-0327	303-0328	303-0329	303-0330	Matrix Blank
Surrogate % Recovery:	96	80	87	91	89	97

SEQUOIA ANALYTICAL

Scott A. Chieffo
Project Manager

% 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