KAPREALIAN ENGINEERING
INCORPORATED

December 19, 1995

Alameda County Health Care Services
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Attention: Ms. Jennifer Eberle

RE: Unocal Service Station #1871
96 MacArthur Blvd.
Oakland, California

Dear Ms. Eberle:

Per the request of Mr. Robert A. Boust of Unocal Corporation, enclosed please find our work plan/proposal dated December 7, 1995, 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
Executive Secretary

jad\82

Enclosure

cc: Robert A. Boust, Unocal Corporation

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

KAPREALIAN ENGINEERING
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KEI-P94-0601.P2
December 7, 1995

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

Attention: Mr. Robert A. Boust

RE: Work Plan/Proposal
Unocal Service Station #1871
96 MacArthur Boulevard
Oakland, California

Dear Mr. Boust:

INTRODUCTION

Per your request, and in response to a letter to Unocal from the Alameda County Health Care Services (ACHCS) Agency dated November 2, 1995, Kaprealian Engineering, Inc. (KEI) recommends the installation of two additional monitoring wells and two exploratory borings. The purpose of the additional wells and borings is to further define the extent of soil and ground water contamination. Site background information is included in KEI's report (KEI-P94-0601.R1) dated September 13, 1994. The most recent and historical ground water monitoring and sampling data is included in MPDS Services, Inc's. report (MPDS-UN1871-09) dated November 20, 1995.

PROPOSED FIELD WORK

INSTALLATION OF MONITORING WELLS AND EXPLORATORY BORINGS

1. KEI proposes the installation of two additional two-inch diameter monitoring wells and two exploratory borings, designated as MW4, MW5, EB1, and EB2, respectively, on the attached Figure 1, using hollow-stem auger equipment. Permits will be obtained from the Zone 7 Water Agency, as necessary, prior to beginning work.

   The monitoring wells will be drilled about 10 feet into the saturated zone of the first encountered ground water. If a clay aquitard of at least 5 feet in thickness is encountered beneath the water table, drilling will be halted and the well will be constructed so as to terminate within the aquitard. The exploratory borings will be drilled approximately 2 feet into the saturated zone of the first encountered ground water, at which time drilling will be terminated. Ground water is anticipated at approximately 11 to 15 feet below grade, based

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on the ground water levels measured in the existing wells in October 1995.

2. Soil samples will be collected 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 about 4 to 5 feet below grade. Sample intervals will be chosen so that an accurate profile of the subsurface soil conditions can be determined. Sampling for laboratory analyses and lithologic logging purposes will continue until the first water table is encountered. Sampling for lithologic logging purposes only will continue below the water table to the total depth drilled. Classification of soil will be done using the Unified Soils Classification System (USCS) by KEI's field geologist. Samples will be collected in a California-modified split-spoon sampler lined with two-inch diameter brass liners. The sampler will be advanced ahead of the drilling augers at designated depths by dropping a 140 pound hammer 30 inches. Blow counts will be recorded. Samples will be removed from the sampler and retained in the brass liners. The liners will then be sealed with Teflon-lined plastic caps and placed in individually sealed plastic bags. They will be labeled and stored in a cooler, on crushed ice or "blue ice," for delivery to a state-certified laboratory. Properly executed Chain of Custody documentation will accompany all soil samples.

3. During drilling operations, all soil materials will be stored on-site in DOT-approved, 55-gallon drums, or else covered by visqueen. Each drum (if used) will be properly labeled and will include, at a minimum, the date, the well or boring that soil materials were obtained from and the phone number at Unocal.

4. Finalized Boring Logs will be prepared from the field logs and submitted to the Zone 7 Water Agency, the ACHCS, and the Regional Water Quality Control Board (RWQCB), San Francisco Bay Region.

5. <u>Well Construction</u>:

   The well casings will consist of two-inch diameter schedule 40 PVC with flush threaded joints and 0.010 inch factory slot. The screen will extend from the total depth of the well to approximately 5 feet above the depth of the first encountered ground water. Monterey sand (#2/12) will fill the annular space from total depth to 2 feet above the perforated casing interval. A 2-foot thick bentonite seal will be placed in the annular space on top of the sand pack. Neat cement grout will

be placed on top of the bentonite seal to the surface. A Proposed Well Construction Diagram is attached to this proposal.

The well casings will be secured with a waterproof cap and a padlock. A round, watertight, flush-mounted well cover will be concreted in place over the top of each casing. The elevations of the well casings will be surveyed by a licensed land surveyor to Mean Sea Level and to a vertical accuracy of 0.01 foot.

6. The wells will be developed approximately one week after well completion. Prior to development, the wells will be checked for depth to the water table and the presence of free product. After recording the monitoring data, the wells will be developed using a surge block and a centrifugal pump. Effluent generated during well development will be contained in DOT-approved drums and hauled from the site by a licensed hazardous materials hauler.

7. Ground Water Sampling - Monitoring Wells (Performed by MPDS Services, Inc.):

The monitoring wells will be checked for free product and the presence of a sheen prior to sampling.

The wells will be purged (using a pump or bailer) of a minimum of four casing volumes prior to sampling and at least 72 hours after development. During purging operations, the field parameters pH, temperature, and electrical conductivity will be measured and recorded in the field notes. Once the field parameters are observed to stabilize and a minimum of approximately four casing volumes have been removed from each well, water samples will then be collected using a clean Teflon bailer and promptly decanted into 40 ml VOA vials and/or one-liter amber bottles, as appropriate. The vials and/or bottles will then be sealed with Teflon-lined screw caps, labeled and stored, on ice, for delivery to a state-certified laboratory. The sampling bailer will be cleaned with non-phosphate soap and clean water rinses between uses.

Properly executed Chain of Custody documentation will accompany all water samples.

8. Ground Water Sampling:

During drilling operations, if ground water is encountered, ground water grab samples will be collected from each borehole using a clean Teflon bailer. The samples will be decanted

into clean VOA vials and/or one-liter amber bottles, as appropriate, which will then be sealed with Teflon-lined screw caps and stored in a cooler, on ice, until delivery to the state-certified laboratory. The sampling bailer will be cleaned with non-phosphate soap and water rinses between uses. Properly executed Chain of Custody documentation will accompany all water samples.

9. Borehole Sealing:

After completion of ground water sampling, exploratory borings EB1 and EB2 will be fully sealed using either neat cement grout or 11-sack cement/sand slurry (in accordance with the grout mixing guidelines presented in the California Well Standards, Bulletin 74-90, dated June 1991). Grout will be placed from the bentonite plug up to the surface in one continuous pour. The upper 1 to 2 feet of grout may contain a hardening agent to allow for a reduced curing time.

10. Laboratory Analyses:

Water and selected soil samples collected from all of the borings for wells MW4 and MW5, and exploratory borings EB1 and EB2, will be analyzed by Sequoia Analytical Laboratory, a state-certified laboratory, for total petroleum hydrocarbons (TPH) as gasoline by EPA method 5030/modified 8015, and benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA method 8020. In addition, the water and selected soil samples collected from MW4, EB1, and EB2 will also be analyzed for TPH as diesel by EPA methods 3550/modified 8015 (soil) and 3510/modified 8015 (water), total oil and grease (TOG) by Standard Methods 5520B&F (water) and 5520E&F (soil), and for EPA method 8010 and 8270 constituents. Lastly, the water samples collected from all of the monitoring wells will be analyzed for methyl tert butyl ether (MTBE) by EPA method 8020.

The analytical results will be presented in tabular form, showing the sample depths, and results. The analytical results will be used to delineate the vertical and lateral extent of the contaminants in soil and ground water.

11. Hydrology:

The ground water flow direction and ground water gradient will be determined from the water level elevations measured in both the new and existing monitoring wells. The flow direction will be shown on the Site Plan.

12. Conclusions:

Conclusions and results of this work will be described in a technical report. The technical report will be submitted to the ACHCS and the RWQCB, San Francisco Bay Region.

LIMITATIONS

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

If you have any questions regarding this work plan/proposal, please do not hesitate to call me at (510) 602-5100.

Sincerely,

Kaprealian Engineering, Inc.

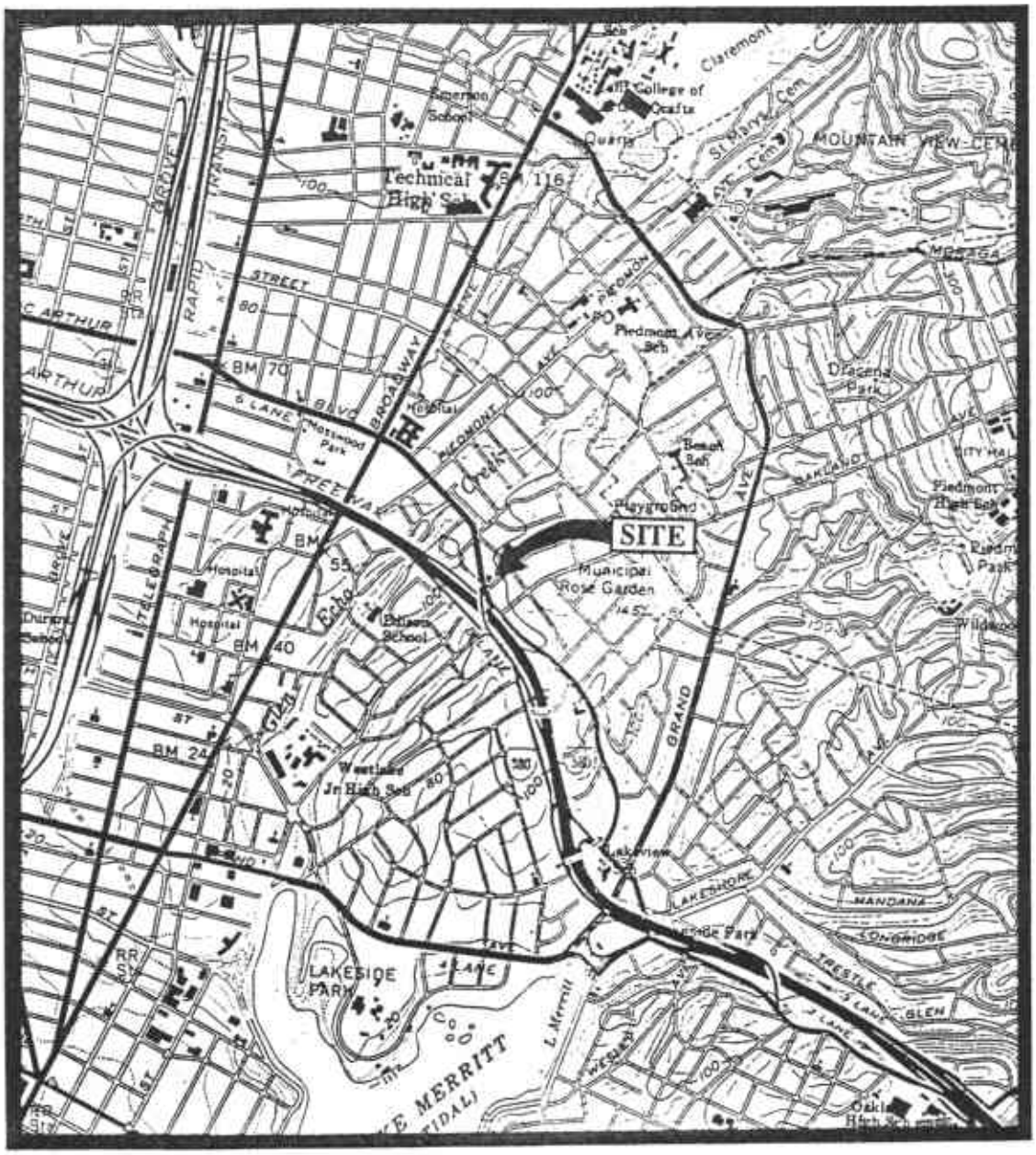
Joel G. Greger, C.E.G.
Senior Engineering Geologist

License No. EG 1633
Exp. Date 8/31/96

Thomas J. Berkins
Project Manager

/jad

Attachments: Location Map
Figure 1
Proposed Well Construction Diagram



Base modified from 7.5 minute U.S.G.S.
Oakland East and West Quadrangles
(both photorevised 1980)

0 2000 4000

Approx. scale feet

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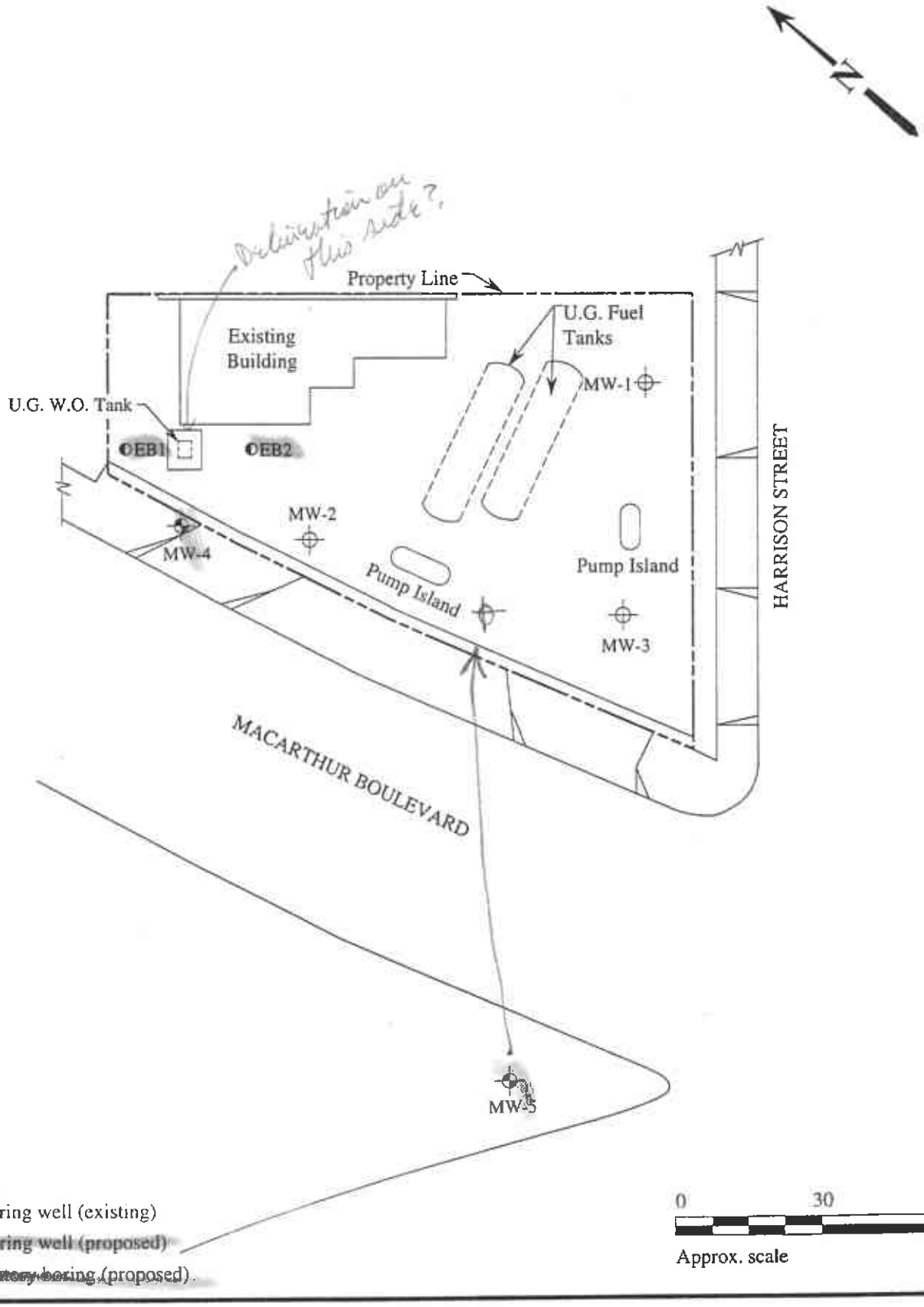
UNOCAL SERVICE STATION # 1871
96 MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

LOCATION MAP



SITE PLAN

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OAKLAND, CALIFORNIA

FIGURE
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