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3-22-89

LETTER WORK PLAN
DELINEATION OF
GROUND-WATER CONTAMINATION
At
UNOCAL Station No. 5484
18950 Lake Chabot Road
Castro Valley, California

3-22-89

AGS Report No. 18061-3W

Prepared for

UNOCAL Corporation
2175 North California Boulevard
Suite 650
Walnut Creek, California 94596

by
Applied GeoSystems

Jon R. Luellen
Project Geologist

Glenn R. Dembroff
Senior Project Geologist

March 22, 1989

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

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March 22, 1989
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18061-3W

Mr. Rafat A. Shahid
Chief, Hazardous Materials Program
Alameda County Health Care Services Agency
80 Swan Way, Room 200
Oakland, California 94621

Subject: Letter Work Plan No. 18061-3W, Supplemental Subsurface Environmental Investigation at UNOCAL Service Station No. 5484, 18950 Lake Chabot Road, Castro Valley, California.

Mr. Shahid:

At the request of UNOCAL Corporation, and in response to your letter dated February 15, 1989, we are pleased to submit this work plan for conducting a supplemental subsurface investigation at the above-referenced site. In our opinion, the extent of the work described is necessary to evaluate the lateral and vertical extent of dissolved hydrocarbon contamination in ground-water adjacent to the site. The subject site is located on the southeast corner of the intersection of Lake Chabot Road and Quail Avenue in Castro Valley, California, as shown on the Site Vicinity Map (Plate P-1). The locations of the subsurface product tanks, existing and proposed monitoring wells, and other pertinent site features in the vicinity of the site are shown on the Proposed Monitoring-Well Location Map (Plate P-2).

Floating hydrocarbon product was first detected in onsite monitoring well MW-3 in October 1988. Additionally, it is our understanding, based on recent conversations with the current operators of this service station, that a release of product may also have occurred several years ago in the turbine area of one of the tanks. The possibility of the existence of hydrocarbon contamination of older age on the property was also discussed in Applied GeoSystems Report No. 18061-1 (dated August 30, 1988), based on the high relative dissolved concentrations of total xylene isomers measured in ground water in relation to benzene and other more volatile gasoline components. Previous work performed at the site by Applied GeoSystems is described in Report No. 18061-1, and our Letter Reports on Quarterly Ground-Water Monitoring, dated January 6 and February 9, 1989.

We propose to drill three offsite soil borings and install ground-water monitoring wells in each of the borings to further delineate the extent of soil and ground-water contamination. The locations for the proposed wells were selected based on the direction of ground-water flow in the area of the site, and the hydrogeologic conditions in the area of the site. Ground-water potentiometric surface maps constructed for the site indicate a flow direction of approximately south 38 degrees west to south 55 degrees west; the calculated ground-water gradient in the area of the site ranges from approximately 10.8 to 12.8 vertical feet per 100 feet in horizontal distance (see Applied GeoSystems reports dated January 6 and February 9, 1989).

With UNOCAL's authorization, Applied GeoSystems has contacted the adjacent property owners: the Hayward Area Recreation and Park District (HARPD), the owner of a private vacant lot, and the Alameda County Public Works Agency (ACPWA). These parties have been contacted in order to secure authorization and access to install the three offsite monitoring wells. To date, no authorizations have been received from either of the private property owners to install a well on the respective properties. The ACPWA has given written approval to install one monitoring well on the sidewalk east of Lake Chabot Road (see letter from ACPWA, dated March 17, 1989, attached). Copies of letters sent to these parties are available from UNOCAL.

On behalf of UNOCAL, Applied GeoSystems is working with a representative of the owner of the private vacant lot addressed at 18959 Lake Chabot Road to obtain authorization to install a monitoring well, proposed offsite well well MW-4, on that property, approximately 135 feet southwest of onsite well MW-3 (Plate P-2). The Alameda County Public Works Agency has denied authorization to install a well in the west edge of Lake Chabot Road in the event that permission cannot be obtained from the owner to construct a well on this property (see above-referenced letter). Proposed offsite well MW-5 will be located at the east-most edge of the sidewalk on the east side of Lake Chabot Road, approximately 40 feet south of onsite well MW-2. This well location has been approved by the ACPWA. These wells should provide information to evaluate the extent of dissolved hydrocarbon contamination, if any, south and southwest of the site.

It is proposed that monitoring well MW-6 be located on the sidewalk east of Lake Chabot Road approximately 8 feet southwest of onsite well MW-3. This well should aid in evaluating the downgradient edge of the floating product plume.

Based on data from the existing onsite monitoring wells, ground-water is expected to be encountered in the borings at depths between approximately 15 and 25 feet below the ground surface. The soil borings and subsequent water samples should aid in the delineation of both soil and water contamination at the site.

The proposed work is recommended to evaluate the lateral and vertical extent of dissolved and floating hydrocarbon contamination near the site. The following tasks are proposed:

1) Acquire an encroachment permit from the Alameda County Public Works Agency to construct two 4-inch-diameter ground-water monitoring wells on the sidewalk east of Lake Chabot Road to the south and southwest of the subject site, and obtain authorizations from the adjacent property owner, if possible, to drill a boring and construct a 4-inch-diameter monitoring well on private property located to the southwest of Station No. 5484. A monitoring well installation permit will also be obtained from the Zone 7 Alameda County Flood Control and Water Conservation District prior to drilling and installing the monitoring wells. Prior to initiating field activities, Underground Service Alert will be contacted to delineate underground utilities in the vicinity of the site.

2) Prepare a Site Safety Plan for the work to be performed at the site.

3) Observe the drilling of three soil borings.

4) Collect and classify relatively undisturbed soil samples at 5-foot intervals from the surface to 10 feet deep and at 2.5-foot intervals between 10 feet and the base of each boring.

5) Measure subsurface hydrocarbon vapor concentrations in the borings by screening soil samples with a photoionization detector.

6) Submit at least two soil samples from each boring to a state-certified laboratory to be analyzed for total petroleum hydrocarbons (TPH) as gasoline, and the purgeable gasoline constituents benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) using modified Environmental Protection Agency (EPA) Methods 8015 and 8020. Samples selected for analysis will

include, at a minimum, those corresponding to the highest photoionization detector reading and the deepest unsaturated soil sample from each borehole.

7) Construct 4-inch-diameter, polyvinyl chloride (PVC)-cased monitoring wells in each of the three borings.

8) Develop and sample the new monitoring wells, sample the existing monitoring wells, and submit water samples from these wells to a state-certified laboratory to be analyzed for TPH as gasoline and BTEX using EPA Methods 8015 and 602.

9) Perform a sieve analysis of each type of sediment encountered in the zone to be screened in proposed monitoring well MW-6. Information obtained from this investigation will be used in designing future monitoring wells installed at the site, if necessary.

10) Survey the well head elevations to an established datum and measure water levels in the wells to evaluate the local ground-water gradient.

11) Interpret field and laboratory data to evaluate the extent of the contamination.

13) Prepare a report summarizing our findings, conclusions, and recommendations.

The borings will be drilled with a CME-75 (or equivalent) truck-mounted drill rig equipped with a 10-inch-diameter, hollow-stem augers. The augers will be steam-cleaned prior to drilling each boring to minimize the possibility of cross-contamination. Soil samples will be collected using a California-modified, split-spoon sampler lined with brass sleeves. The samples will be immediately sealed with aluminum foil, plastic caps, and airtight tape; labeled; and placed in iced storage for transport to the testing laboratory. A Chain of Custody Record will be initiated in the field by the geologist and accompany the soil samples from the field to the State-certified analytical laboratory.

The wells will be constructed of thread-jointed, polyvinyl chloride (PVC) casing. No chemical cements, glues, or solvents will be used in well construction. The bottom of the casing will have a threaded end-plug, and the top will have a water tight locking cap. The screened portion of the wells will consist of factory-perforated casing with 0.020-inch-wide slots. The well

screen will extend from the total depth of the borings to approximately 5 feet below the ground surface. Selection of this interval is based on evaluations of water-level data acquired since July 1988. The annular space around the screened portion of the well casing will be packed with washed No. 3 sand to approximately 1 foot above the perforations. A 1-foot-thick bentonite plug will be placed above the sand as a seal against cement entering the sand pack. The remaining annulus will be backfilled with a slurry of water and neat cement to approximately 1 foot below the ground surface. A locking, watertight utility box will be placed over each well head and sealed in place with concrete approximately flush with the surrounding ground surface. For any wells constructed within Lake Chabot Road, utility boxes incorporating a traffic-rated, steel lid will be used.

The wells will be developed prior to water sampling by swabbing, surge pumping, or other suitable method. The wells will be allowed to settle for a minimum of 72 hours between development and purging. Following development, the liquid in the ground-water monitoring wells will be subjectively analyzed for evidence of hydrocarbon contamination. If floating hydrocarbon product is detected, an oil/water interface probe will be used to evaluate the thickness of the product, and the well will not be purged. If floating product is not observed, the well will be purged of at least four well volumes of liquid. The temperature, pH, and conductivity will also be checked for stabilization before collecting a water sample for laboratory analysis. The wells will be allowed to equilibrate to at least 80 percent of static conditions prior to collecting ground-water samples by using a Teflon bailer cleaned with distilled water and Alconox. The samples will then be decanted into laboratory-cleaned glass volatile organic analysis vials with Teflon-lined lids, labeled, and immediately placed in iced storage. A Chain of Custody Record will be initiated by the geologist in the field and will accompany the samples to a State-certified analytical laboratory. A copy of the Chain of Custody Record will be included in our final report.

Water generated from the purging operation (and previous well development) will be stored temporarily at UNOCAL Station No. 5484 in appropriately labeled, Department of Transportation-approved 17E waste-liquid, 55-gallon drums. These drums will remain onsite, pending laboratory analyses, and will remain the responsibility of UNOCAL Corporation.

Laboratory analyses will be performed at Applied GeoSystems' state-certified laboratory (Certification No. 153). Detection limits suitable for the tests requested will be stated on the laboratory analysis reports. All field and analytical work will be carried out under the supervision of a Registered or Certified Engineering Geologist. The results of the analyses will be evaluated to determine the extent of soil and ground-water contamination, if any, in offsite areas near the property. Following receipt of the laboratory results, a report will be prepared summarizing the previous work at the site and Applied GeoSystems' field and laboratory procedures, well construction details, laboratory results, conclusions, and recommendations for further work.

We trust that this letter meets with your requirements. Please do not hesitate to call if you have any questions or comments.

Sincerely,
Applied GeoSystems

Jon R. Luellen
Project Geologist

Glenn R. Dembroff
Senior Project Geologist

Enclosures: Site Vicinity Map, Plate P-1
Proposed Monitoring Well Location Map, Plate P-2

cc: Tim Ross, UNOCAL

Source: U.S. Geological Survey
7.5-Minute Quadrangle
Hayward, California
Photorevised 1980

N

Approximate Scale

2000 1000 0 2000 4000

feet

Applied GeoSystems

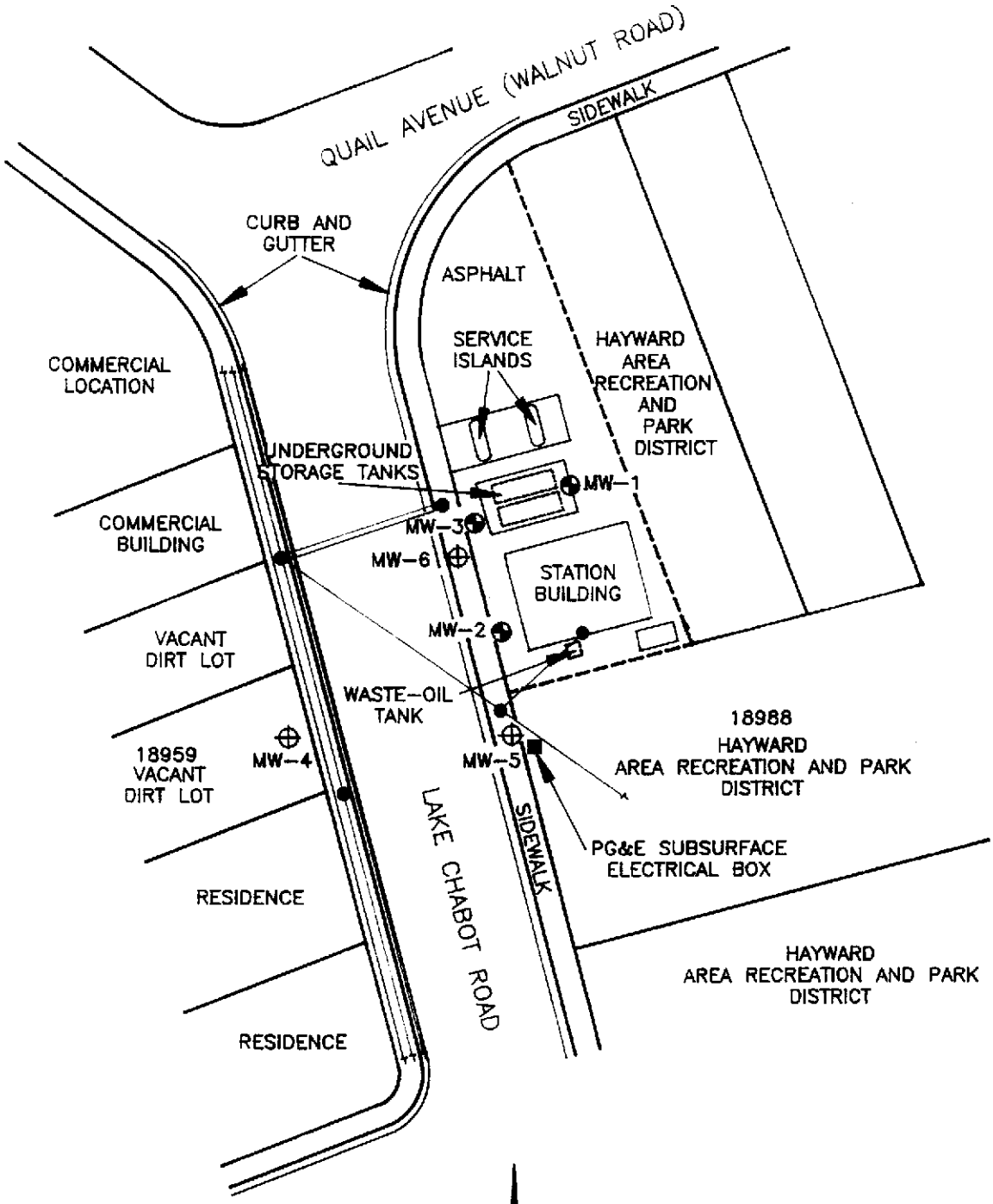
41255 Mission Blvd Suite B Fremont, CA 94539 (415) 651-7866

PROJECT NO. 18061-3W

SITE VICINITY MAP
UNOCAL Station No. 5484
18950 Lake Chabot Road
Castro Valley, California

PLATE

P - 1



MW-3 ⊕ = Existing monitoring well location

MW-6 ⊕ = Proposed monitoring well location

——— = Overhead power/telephone line

● = Poles

Source: Modified from plan supplied by Alameda County Assessors Office

N

Approximate Scale

70 35 0 70 140

feet

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PROJECT NO. 18061-3W

PROPOSED MONITORING WELL LOCATION MAP
UNOCAL Station No. 5484
18950 Lake Chabot Road
Castro Valley, California

PLATE

P - 2

COUNTY OF ALAMEDA
PUBLIC WORKS AGENCY
399 Elmhurst Street • Hayward, CA 94544-1395
(415) 670-5480

March 17, 1989

Lake Chabot Road

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539

Attn: Jon R. Luellen

Re: Application for Road Encroachment Permit for monitoring wells at Lake Chabot Road.

Mr. Luellen:

Reference is made to your correspondence dated March 2, 1989. Your proposal was reviewed and inspected, and the following comments were made:

1. We do not see the need for well no.6 to be installed within the roadway area. Please reconsider the location of this well.

2. Well no.5 can be installed behind the sidewalk area, in line with the PG&E box or can be installed at the east most edge of the sidewalk. (within the county road right-of-way)

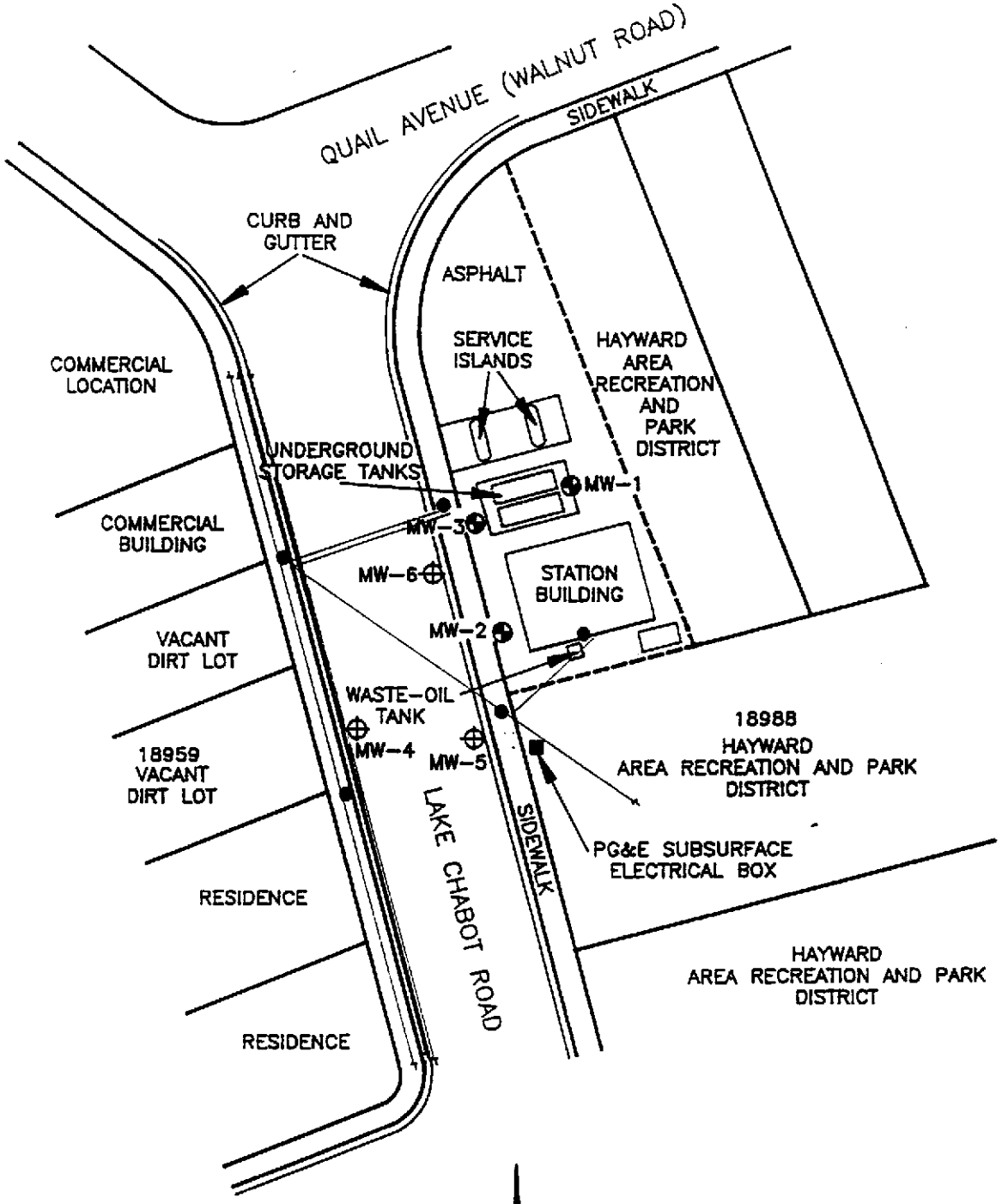
3. The proposed location of well no.4 is not acceptable due to traffic problems and worker's safety. We recommend that you get the owner's permission of 18959 Lake Chabot Road to install your well within their property.

Coordinate all your proposal with Underground Service Alert (U.S.A) at 800-642-2444. If you have questions regarding these comments please call me at (415) 670-5574.

Very truly yours,

CARLO T. SENDAYDIEGO
Permit Specialist

cts



MW-3 ⊕ = Existing monitoring well location

MW-6 ⊕ = Proposed monitoring well location

_____ = Overhead power/telephone line

● = Poles

Source: Modified from plan supplied by Alameda County Assessors Office

N

Approximate Scale

70 35 0 70 140

feet

Applied GeoSystems

PROJECT NO. 18061-3W

AMENDED PROPOSED MONITORING WELL LOCATION MAP
UNOCAL Station No. 5484
18950 Lake Chabot Road
Castro Valley, California

PLATE

P - 1