PACIFIC
ENVIRONMENTAL
GROUP, INC.

June 26, 1996
Project 320-162.1B

Mr. Phil Briggs
Chevron Products Company
P.O. Box 5004
San Ramon, California 94583

Re: Former Signal Service Station 0800
800 Center Street at Eighth Street
Oakland, California

Dear Mr. Briggs:

This letter, prepared by Pacific Environmental Group, Inc. (PACIFIC) on behalf of Chevron Products Company (Chevron), presents a work plan to investigate soil and groundwater conditions at the site referenced above. The work plan is presented in accordance with a May 20, 1996 letter from the Alameda County Health Care Services Agency (ACHCSA) and a June 20, 1996 telephone conversation with Ms. Jennifer Eberle. During the June 20, 1996 conversation, it was agreed that the work plan for site remediation will be prepared subsequent to this investigation.

This work plan includes a discussion of site background, scope of work, and proposed field and analytical procedures (Attachment A).

SITE BACKGROUND

The site is located at the northeast corner of the intersection of Eighth Street and Center Street in Oakland, California. The former station building and the former pump islands remain at the site; however, the site is currently unoccupied. Land use near the site is commercial and residential.

The site was utilized as a retail service station from 1932 to the early 1970s. Station facilities included four 1,000-gallon fuel underground storage tanks (USTs), a waste oil tank, a product island, and associated piping. The USTs were reportedly removed from the site during 1973.

Previous Investigations

Previous investigations at the site have been conducted by Subsurface Consultants, Inc. (SCI), Groundwater Technology, Inc. (GTI) and PACIFIC. In August 1989, SCI installed and sampled five soil borings ranging in depth from 4.5 to 26 feet below ground surface (bgs). Temporary groundwater monitoring wells were installed in two of the five borings. In October 1995, GTI drilled three additional soil borings to a depth of 12 feet bgs, and four groundwater monitoring wells to a depth of 15 feet bgs. In March 1996, PACIFIC drilled 9 Geoprobe borings to depths ranging from 6 to 20 feet bgs.

A brief discussion of the findings of these investigations is summarized below:

- The lithology encountered during the site investigations has indicated that the site is underlain by soils consisting of sandy clay to sandy clayey silt.
- In August 1989, groundwater was encountered at depths of 11 to 13 feet bgs; in October 1995, groundwater was encountered at depths of 10 to 11 feet bgs; and in March 1996, groundwater was encountered at depths of approximately 6 feet bgs. Based on gauging data obtained from the groundwater monitoring wells, the groundwater flow direction at the site is toward the southwest at a gradient of 0.002 foot per foot.
- Analytical results of soils have indicated that petroleum hydrocarbon concentrations are present in the area adjacent to the former pump island and in the vicinity of the former USTs. Petroleum hydrocarbon concentrations in soils are generally highest at the 10 to 12 foot bgs interval. During the August 1989 soil and groundwater investigation, maximum total volatile hydrocarbons calculated in soils ranged from 950 parts per million (ppm) in Boring 3 to 31,000 ppm in Boring 2 (beneath the former USTs). Maximum benzene concentrations ranged from not detected in Boring 3 to 500 ppm in Boring 2. During the October 1995 investigation, maximum total petroleum hydrocarbons calculated as gasoline (TPH-g) concentrations in soils ranged from below detection limit in Wells MW-2, MW-3, MW-4, and SB-3, to 14,000 ppm in Well MW-1. Maximum benzene concentrations ranged from not detected in Wells MW-2, MW-4, and SB-3 to 120 ppm in

Well MW-1. During the March 1996 investigation, maximum total purgeable petroleum hydrocarbon (TPPH-g) and benzene concentrations in soils ranged from not detected in Boring P-8 to 13,000 and 41 ppm, respectively, in Boring P-3.

- Analytical results from the October 1995 investigation indicated that dissolved TPH-g concentrations in groundwater ranged from below the detection limit in Well MW-2 (in the southeastern corner of the site) to 170,000 parts per billion (ppb) in Well MW-1 (near the former UST). Benzene concentrations in the groundwater monitoring wells ranged from below detection limit in Well MW-2 to 19,000 ppb in Well MW-1. Groundwater analytical data from Borings P-1 through P-9 during the March 1996 investigation indicated that TPPH-g and benzene concentrations ranged from not detected in Boring P-9 to 800,000 and 13,000 ppb, respectively, in Boring P-2.

- Hydrocarbon concentrations in groundwater at the site are defined to the northwest, the southwest, and the southeast. Further delineation is necessary to the ~~north~~, northeast and west. + east

SCOPE OF WORK

To supplement the previous work at the site and to complete delineation of hydrocarbons in groundwater in the vicinity of the site, a total of three groundwater monitoring wells and one optional well are proposed to be installed during this investigation. The specific scope of work is detailed below.

- **Permitting.** Appropriate well permits will be obtained from the County of Alameda and the City of Oakland.

- **Well Installation.** Three groundwater monitoring wells (MW-5 through MW-7) are proposed to be drilled off-site. Wells MW-5 and MW-6 are proposed to be installed across Center Street to the west of the site. Well MW-7 is proposed to be installed off-site to the northeast. Well MW-8 is an optional well proposed to the north of the site. A boring will be drilled and soils will be analyzed in the field with a photo ionization detector; depending on field measurements, a well may be installed. Proposed well locations are shown on Figure 1.

- **Well Elevation Survey.** Wells MW-5 through MW-7 (and possibly MW-8) will be surveyed to mean sea level (MSL) by a state-licensed surveyor.
- **Well Development and Sampling.** Wells MW-5 through MW-7 (and possibly MW-8) will be developed prior to groundwater sampling. Collected groundwater samples will be submitted to a California State-certified laboratory for analysis of TPPH-g and benzene, toluene, ethylbenzene, and xylenes (BTEX compounds). Additionally, groundwater will be analyzed for several geochemical indicators of intrinsic biodegradation including dissolved oxygen, alkalinity, oxidation-reduction potential, sulfates, nitrates, and ferrous iron.

SCHEDULE

Upon approval of the work plan by Chevron and ACHCSA, PACIFIC will commence field work within two weeks after the acquisition of the necessary permits. Off-site access for the groundwater monitoring wells has been initiated. The report documenting the findings of the investigation is anticipated to be submitted to Chevron within six weeks after commencement of field work.

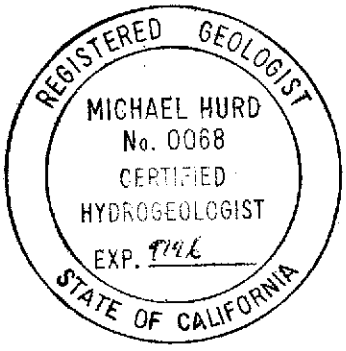
If you have any questions regarding the contents of this letter, please call.

Sincerely,

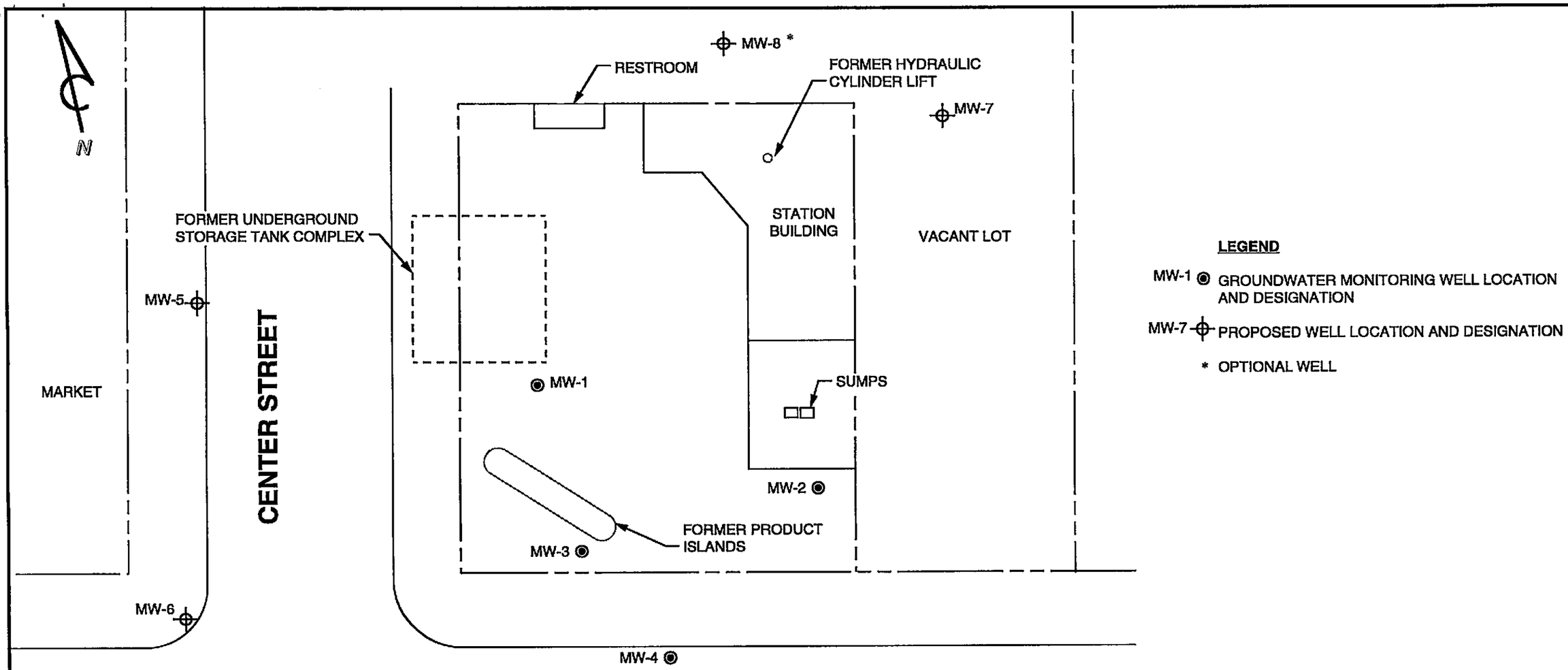
Pacific Environmental Group, Inc.

Mark Sullivan
Project Engineer

Michael Hurd
Senior Geologist
CHG 0068



Attachments: Figure 1 - Site Map
Attachment A - Proposed Field and Laboratory Procedures



SOURCE: MAP BY GROUNDWATER TECHNOLOGY; DATED: 3-7-95

PACIFIC ENVIRONMENTAL GROUP, INC.

SCALE
0 20 40 FEET

FORMER SIGNAL SERVICE STATION S0800
800 Center Street at 8th Street
Oakland, California

SITE MAP

FIGURE:
1
PROJECT:
320-162.1B

ATTACHMENT A

PROPOSED FIELD AND LABORATORY PROCEDURES

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PROPOSED FIELD AND LABORATORY PROCEDURES

Exploratory Drilling

The soil borings will be drilled using 8-inch hollow-stem auger drilling equipment to a depth of approximately 50 feet below ground surface (or deeper depending on field conditions) and logged by a Pacific Environmental Group, Inc. geologist using the Unified Soil Classification System and standard geologic techniques. **Soil samples for logging will be collected at 5-foot depth intervals** using a California-modified split-spoon sampler. The sampler will be driven a maximum of 18 inches using a 140-pound hammer with a 30-inch drop. **All soil samples for chemical analysis will be retained in brass liners, capped** with Teflon® squares and plastic end caps, and sealed in clean zip-lock bags. The samples will be placed on ice for transport to the laboratory accompanied by chain-of-custody documentation. All down-hole drilling and sampling equipment will be steam-cleaned following the completion of the soil borings. Down-hole sampling equipment will be washed in a tri-sodium phosphate solution between samples.

Monitoring Well Construction

After drilling to the proposed depth and obtaining the appropriate soil samples, the soil boring will be converted to a groundwater monitoring well with the installation of 2-inch diameter flush-threaded Schedule 40 PVC casings. The monitoring well will be constructed by placing approximately 10 feet of 0.020-inch factory-slotted screen into the saturated zone and extending approximately 5 feet bgs above the saturated zone. Solid casing will then be placed on the top of the screened casing to the ground surface. An RMC 2 x 12 sand will be placed in the annular space and will extend 2 feet above the screened interval. A 2 foot thick bentonite seal will be placed on top of the sand pack. The remainder of the well will be grouted with neat cement to ground surface. A locking water-tight cap and a protective vault box will be installed on the monitoring wells. The boring logs for the wells will show well construction details.

Monitoring Well Development and Sampling

Well development procedures consist of purging a minimum of ten casing volumes of groundwater (unless the well is dewatered) from the well. The well screen will be surged

along the full screen length with a surge block. During the purging, the well will be monitored for temperature, pH, and electrical conductivity (EC). A well will be considered "developed" when the temperature, pH, and EC parameters have stabilized.

Sampling procedures consist of purging the well of approximately three casing volumes of water (or until dry), during which time temperature, pH, and electrical conductivity will be monitored to indicate that a representative sample will be taken. Dissolved oxygen and oxidation reduction potential will be measured before and after purging. After purging, the water levels of the wells will be allowed to restabilize. Groundwater samples will then be collected using a Teflon bailer, placed into appropriate EPA-approved containers, labeled, logged onto chain-of-custody documents, and transported on ice to a California State-certified laboratory.

Organic Vapor Procedures

Soil samples collected at 5-foot depth intervals during drilling will be analyzed in the field for ionizable organic compounds using the HNU Model PI-101 (or equivalent) photo-ionization detector (PID) with a 10.2 eV lamp. The test procedure will involve measuring approximately 30 grams from an undisturbed soil sample, placing this subsample in a clean glass jar, and sealing the jar with aluminum foil secured under a ring-type threaded lid. The jar will be warmed for approximately 20 minutes (in the sun), then the foil will be pierced and the head-space within the jar will be tested for total organic vapor, measured in parts per million as benzene (ppm; volume/volume). The instrument will be calibrated prior to drilling using a 100-ppm isobutylene standard (in air) and a sensitivity factor of 55 which relates the photo-ionization potential of benzene to that of isobutylene at 100 ppm. The results of the field testing will be noted on the boring logs. PID readings are useful for indicating relative levels of contamination, but cannot be used to evaluate hydrocarbon levels with the confidence of laboratory analyses.

Laboratory Procedures

Selected soil and groundwater samples will be analyzed for the presence of total petroleum hydrocarbons calculated as gasoline, benzene, toluene, ethylbenzene, and xylenes (BTEX compounds) using modified EPA Methods 8015 and 8020. Groundwater samples will also be analyzed for alkalinity, sulfate, ferrous iron, and nitrates. Additionally, a minimum of two soil samples from the wellbores will be analyzed for Fractional Organic Compounds according to the Walkley-Black Procedure, and physical parameters of the soil will be measured including bulk density, porosity, and water content. All analyses will be performed by a California State-certified laboratory.