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TO: Mr. Thomas Bauhs
Chevron Products Company
P.O. Box 6004
San Ramon CA 94583

DATE: February 1, 2001
PROJ. #: 345280.02-1
SUBJECT: Work Plan
Chevron Service Station #9-0290
1802 Webster Street
Alameda, California

FROM:
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Enclosed is a draft copy of the referenced Report. If you have any questions, please call me at (916) 631-1314.

Cc: Eva Chu Alameda County Environmental Health Services 1131 Harbor Bay Parkway, Suite 250 Alameda, CA 94502-6577

GETTLER - RYAN INC.

WORK PLAN FOR A LIMITED SUBSURFACE INVESTIGATION

at
Chevron Service Station #9-0290
1802 Webster Street
Alameda, California

GR Report No. 345280.02-1
Delta Project DG90290C/4C02

Prepared for:

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February 1, 2001

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at
Chevron Service Station #9-0290
1802 Webster Street
Alameda, California

Report No. 345280.02-1
Delta Project No.DG90290C/4C02

INTRODUCTION

At the request of Chevron Products Company (Chevron), Delta Environmental Consultants Inc. Network Associate Gettler-Ryan Inc. (GR) has prepared this Work Plan for a limited subsurface investigation at the subject site. This general scope of work was originally proposed in GR Report #345280.02-01, *Site Conceptual Model,* dated October 25 2000. A work plan for this scope of work was requested by the Alameda County Environmental Health Services (ACEHS) in a letter dated August 1, 2000. The purpose of this proposed work is to evaluate if utility trenches in the site vicinity are acting as a preferential conduit for hydrocarbon migration, and to obtain additional site specific data for a risk evaluation.

The proposed scope of work includes: updating the site safety plan; obtaining the required permits; hand-augering eight off-site borings within the utility trenches in Webster Street adjacent to the site; obtaining soil and grab groundwater samples from these borings; hand-augering three on-site borings and collecting unsaturated soil samples for use in a risk analysis; and perform a ½ -mile radius well survey; and organizing a report of the findings.

The scope of work described in this Work Plan is intended to comply with the State of California Water Resources Control Board's *Leaking Underground Fuel Tanks (LUFT) Manual,* the California Regional Water Quality Control Board (CRWQCB) *Tri-Regional Board Staff Recommendations for Preliminary Investigation and Evaluation of Underground Tank Sites*, and ACEHS guidelines.

SITE DESCRIPTION

The subject site is an operating service station located at the northeastern corner of the intersection of Webster Street and Buena Vista Avenue in Alameda, California (Figure 1). Site topography is flat at the elevation of approximately 12 feet above mean sea level. Four 10,000-gallon gasoline underground storage tanks (USTs) are located in the common pit in the southwestern portion of the site. A waste oil UST is located south of the station building. Two former waste oil USTs were located near the southeastern corner of the gasoline UST pit. Locations of the USTs and other pertinent site features are shown on Figure 2.

The site vicinity is used for residential, commercial, and transportation purposes. The subject site is bounded by an apartment complex to the east, Jack in The Box restaurant to the north, Webster Street to the west and Buena Vista Street to the south. One of the residential buildings at the apartment complex site is situated immediately southeast of the subject service station building. Another building is situated approximately 50 feet northeast of the subject site northern boundary. Single family houses and a 76 Service Station are located southeast and south of the subject site, respectively, across Buena Vista Avenue. A Jack in The Box restaurant building is located approximately 65 feet north of the subject property border. Commercial buildings (auto repair shop, Better Buy Liqueur Store, Fred's Wrenchhouse, KFC restaurant) and parking lots are located northwest, west, and southwest of the subject site, across Webster Street. The subject site vicinity is shown on Figure 2.

SUMMARY OF PREVIOUS ENVIRONMENTAL WORK

1981/1982 Leak Detection and Installation of Wells B-1 through B-6

The information discussed below was obtained from files provided by Chevron. Soil and groundwater analytical data are summarized in attached tables. Locations of the wells and borings are shown on Figure 2. Three subsurface investigations have been performed at the subject site.

A hydrocarbon leak (approximately 50 gallons of gasoline) was documented at the subject site in 1981. Six groundwater monitoring wells (B-1 through B-6) were installed at the site in January 1982 by Kleinfelder & Associates (K&A) to evaluate the extent of hydrocarbon impact to groundwater. Groundwater was encountered at a depth ranging from 3.5 to 4.5 feet below ground surface (bgs). No soil or groundwater samples were collected for laboratory analysis however, groundwater samples were analyzed for volatile hydrocarbons using a combustible gas meter. Hydrocarbon vapor concentrations were detected in wells B-1 through B-4 at concentrations ranging from 100 to >1,000 parts per million (ppm). The 10,000-gallon regular gasoline UST was removed from service after a hole was found near the tank fill pipe.

1982 USTs Removal/Replacement, Installation of Wells A-1 and A-2, and Destruction of Well B-2

In 1982, the UST system was replaced. A gauge stick hole was observed in the bottom of the regular gasoline UST. Samples were not collected. New gasoline USTs were installed. In addition, a new diesel and two waste oil USTs were installed. Two backfill monitoring wells (A-1 and A-2) were installed at the time of UST replacement. Monitoring well B-2 was destroyed to accommodate the new UST installation.

1991 Diesel Release

On September 19, 1991, approximately 1,400 gallons of diesel were accidentally pumped into tank backfill well A-1 during UST testing activities. Product removal commenced immediately. Approximately 1,600 gallons of separate-phase hydrocarbons (SPH) were removed from well A-1. Additional 346 gallons of SPH were removed during a SPH recovery program conducted by Pacific Environmental Group Inc. (PEG) from September 1991 through July 1992. Laboratory analysis of the free product suggested that waste-oil must also have been inadvertently disposed of into well A-1. A groundwater sampling program was initiated in September 1991.

1993 Installation of Wells B-7 through B-9

In March 1993, one additional on-site groundwater monitoring well (B-8) and two off-site wells (B-7 and B-9) were installed by GTI to delineate the lateral extent of hydrocarbon impacted soil and groundwater at the site. Groundwater was encountered in borings B-7 through B-9 at 5 feet bgs. Soil samples collected from the borings at 5 feet bgs did not contain total petroleum hydrocarbons as gasoline (TPHg), total petroleum hydrocarbons as diesel (TPHd), or benzene, toluene, ethylbenzene or xylenes (BTEX

Waste Oil UST and Line Removal and Destruction of Wells A-2, B-3 and B-4

In April and May 1994, Touchstone Developments (TD) collected samples during removal of one 1,000 gallon waste oil UST, one 350-gallon waste oil UST and fuel product lines. Hydrocarbons were detected in soil beneath the 1,000-gallon waste oil UST (up to 440 ppm TPHg, 410 ppm TPHd, and 77 ppm, total oil and grease [TOG]), beneath the 350-gallon waste oil UST (1,200 ppm TPHg, 580 ppm TPHd, 580 ppm TOG, and 0.64 ppm benzene), and beneath the product piping (up to 4,900 ppm TPHg and 4.6 ppm benzene).

Volatile organic compounds (VOCs) or semivolatile organic compounds (SVOCs) were not detected in the samples collected from the waste oil UST excavations with the exception of TCE (0.017 ppm). Sample locations are shown on TD's Figure 2 and soil sample results are summarized in TD's Table 1 included in Appendix A. Approximately 700 cubic yards of soil were excavated from the waste oil tank pits and from beneath the product lines and removed from the site. Monitoring wells A-2, B-3 and B-4 were destroyed during UST removal activities.

1995 Installation of Wells B-10 through B-13

In March 1995, four additional on-site groundwater monitoring wells (B-10 through B-13) were installed at the site by GR to further assess the extent of hydrocarbons within subsurface. Groundwater was encountered at approximately 7 feet bgs in borings B-10, B-12 and B-13 and at 1 foot bgs in boring B-11. TPHg were detected in the soil samples collected from borings B-10 through B-12 at concentrations ranging from 69 ppm to 1,900 ppm, and were not detected in the soil sample from boring B-13. TPHd (1.1 ppm to 330 ppm) were detected in samples from all borings. Benzene (0.78 ppm) was detected in the soil sample collected from boring B-10, and was reported as not detected in samples collected from other borings, however, the detection limits were raised for the samples collected from borings B-11 and B-12. MtBE was detected in the soil samples collected from borings B-11 (17 ppm) and B-12 (8.2 ppm).

Groundwater Monitoring and Sampling

Groundwater monitoring and sampling of site wells began in September 1991. Summary of groundwater monitoring and sampling data is presented in Blaine Tech Services, Inc. (Blaine Tech) table included in Appendix B. Historically, depth to groundwater beneath the site has ranged from 2 to 8 feet bgs. Groundwater flowed to the southeast prior to January 1993. Recently, the flow direction has been fluctuating between northeast and northwest. The gradient has ranged from 0.006 to 0.02

The groundwater sampling data indicate that groundwater beneath the site has been impacted by hydrocarbons at concentrations up to 40,000 parts per billion (ppb) of TPHg, 4,900 ppb of benzene, 88,000 ppb of MtBE, 22,000 ppb of TPHd, 8,000 ppb of TOG, and 68,400 ppb of motor oil. The highest dissolved hydrocarbon concentrations have been present in the vicinity of the service islands. Hydrocarbons have not been detected in off-site wells except once (low concentrations).

SPH have been present in wells A-1 and A-2 (up to 1.58 feet just after accidental diesel release), and on few occasions in wells B-3 and B-4 (up to 0.01 feet). SPH have been removed from the wells by bailing and use of absorbent pads. During the November 1999 monitoring event well A-1 contained 0.04 feet of SPH.

Hydrocarbons concentrations in on-site wells have been decreasing, with the exception of well B-6. TPHg (655 ppb) was detected in this well in November 1998 after several quarters with nondetectable results. A TPHd concentration in this well has been increasing. Well B-6 also contains an elevated concentration of MtBE compared to nearest wells in the downgradient direction.

The May 1999 sampling data confirmed that groundwater beneath the site is not impacted by VOCs or SVOCs. Concentrations of metals in groundwater beneath the site were nondetectable (cadmium and lead), below maximum contaminant levels (MCLs) for drinking water (zinc) or only slightly above MCLs (chromium and nickel).

GEOLOGY AND HYDROGEOLOGY

The subject site is located on Alameda Island at the northeastern shore of San Francisco Bay, approximately 1/4 mile south of the Oakland Inner Harbor and 1½ mile north of San Francisco Bay. As mapped by E.J. Helley and others (1979, *Flatland Deposits of the San Francisco Bay Region, California: U.S. Geological Survey Professional Paper 943)*, soil in the site vicinity consists of Holocene-age estuarine deposits consisting of unconsolidated dark plastic carbonaceous clay and silty clay (Bay Mud) overlying Pleistocene-age beach and dune sand deposits consisting of loose well sorted fine to medium sand (Merrit Sand). The nearest surface waters are the Oakland Inner Harbor and San Francisco Bay.

Historical groundwater monitoring data indicate that the shallow groundwater depth beneath the site has ranged from 2 to 8 feet bgs, and groundwater flow direction has fluctuated between southeast, northeast, and northwest. The gradient has ranged from 0.006 to 0.02. The boring logs from previous drilling indicate that the subject site is primarily underlain by fine sand to silty sand to the total depth explored of 18 feet bgs.

PROPOSED SCOPE OF WORK

To further delineate the extent of the plume to the north of the site and evaluate if the utility trenches act as preferential pathways for plume migration, GR proposes to collect grab groundwater samples from the utility trenches adjacent to the western property boundary. Soil samples will also be collected from several borings adjacent to the existing station building for use in a Risk-Based Corrective Action (RBCA) analysis. A well survey will be performed to ascertain if potential receptors exist in the vicinity. GR Field Methods and Procedures are included in Appendix A. To complete this proposed scope of work, GR proposes the following six tasks.

Task 1. Pre-Field Activities

GR will update the site-specific safety plan. A soil boring permit will be obtained from Alameda County Public Works Department, and an encroachment permit will be obtained from the City of Alameda. Underground Service Alert (USA) will be notified a minimum of 48 hours prior to drilling.

Task 2. Off-Site Soil Borings

GR will hand-auger eight off-site soil borings at the locations shown of Figure 2. The borings will be advanced into groundwater. A GR geologist will prepare a boring log for each borehole. Based on historical monitoring data from the site, groundwater is expected to be encountered at approximately 6 feet bgs. The borings will be advanced with a 3-inch-diameter hand auger. Soil samples for logging purposes and potential chemical analysis will be collected at 3 foot intervals with a hand-driven soil sampling device. Once groundwater is encountered, a disposable bailer will be used to collect a grab groundwater sample, to be analyzed as described below in Task 5. On completion the borings will be backfilled with neat cement to approximately 1 foot below surface grade, then completed as required by the encroachment permit conditions.

Soil from each sampled interval will be screened in the field for the presence of volatile organic compounds using a photoionization detector (PID). These data will be collected for reconnaissance purposes only, and will not be used as verification of the presence or absence of petroleum hydrocarbons. PID reading will be recorded on the boring log.

Cuttings will be stockpiled at the site pending disposal. Four discrete samples will be collected from the stockpile. These samples will be submitted to the laboratory for compositing into one sample, and then analyzed as described in Task 5. On receipt of the analytical data, Chevron's contractor Integrated Wastestream Management (IWM) will remove the stockpiled soil from the site for disposal.

Task 3. On-Site Soil Borings

Three on-site soil borings will be advanced at the locations shown on Figure 2. These borings will be advanced as described above in Task 2 to a depth of approximately 5.5 feet bgs.

Soil samples will be collected and screened in the manner described above from depths of 2 feet and 5 feet bgs. These samples will be analyzed as described in Task 4. On completion, the borings will be backfilled with neat cement then capped with concrete.

Task 4. Laboratory Analyses

Selected soil and groundwater samples will be submitted for chemical analyses to a California state-certified Hazardous Material Testing Laboratory. Grab groundwater samples will be analyzed for TPHg and TPHd by EPA Method 8015 (Modified), Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) and MtBE by EPA Method 8020. EPA Method 8260 will be used to confirm any MTBE detected by Method 8020. Samples will be subjected to a silica gel cleanup prior to analysis for TPHd.

Soil samples will be analyzed for TPHg, TPHd with silica gel, BTEX, and MTBE with confirmation as described above. In addition, at least one soil sample from one of the on-site borings will be analyzed for bulk density, moisture content, porosity, permeability, pH, grain size and total organic content.

Samples from the stockpile will be analyzed for TPHg, TPHd, BTEX and total lead.

Task 5. Well Search

GR will perform a search of the Department of Water Resources files for records of wells installed within ½ mile of the site. Locations of the identified wells will be plotted on a map, and information on the location, use, and year of installation will be presented in the report.

Task 6. Report Preparation

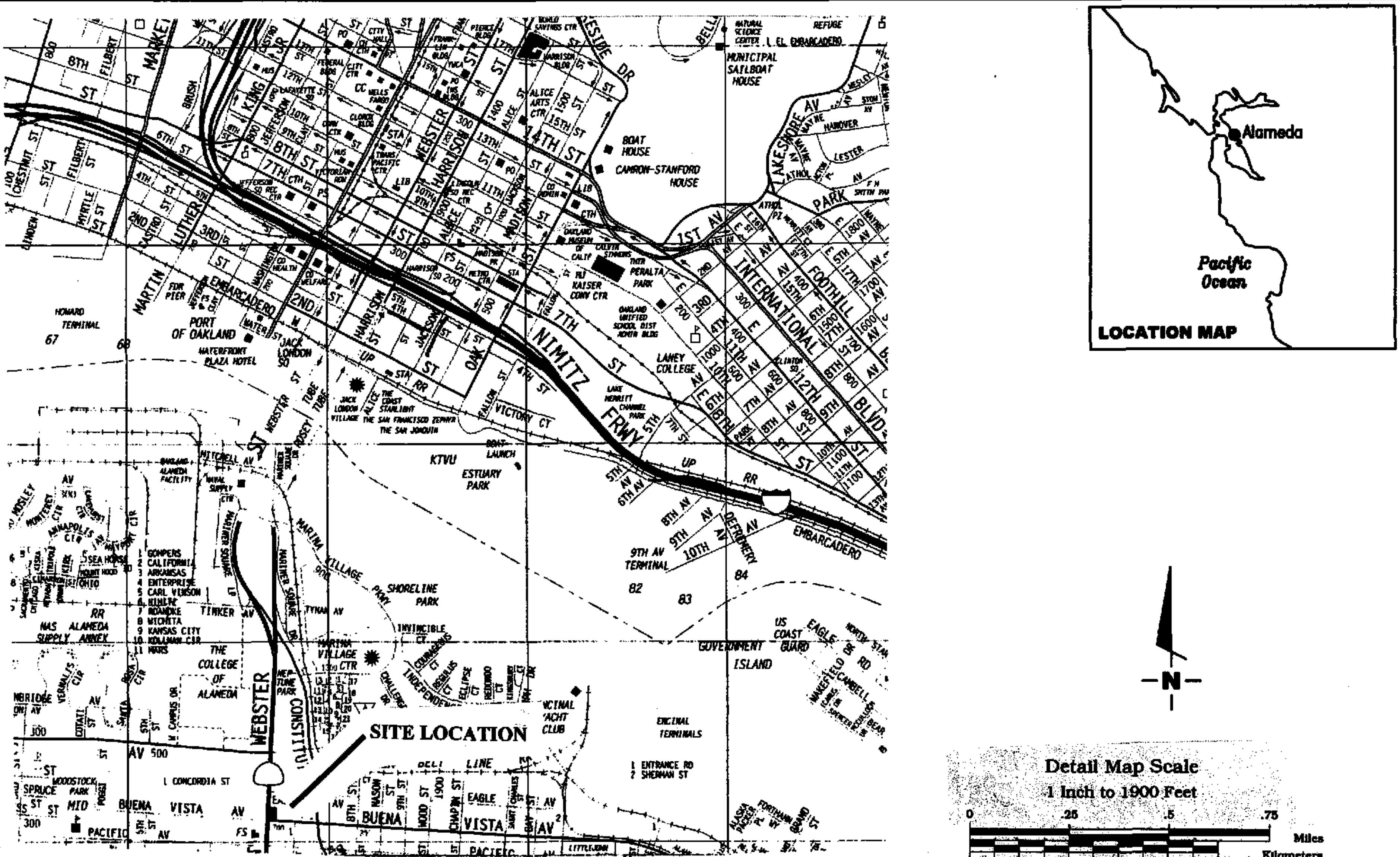
Following receipt and analysis of all data, a report will be prepared which summarizes the procedures and findings associated with this investigation. This report will be submitted to Chevron for their use and distribution.

PROJECT STAFF

Mr. Stephen J. Carter, a Registered Geologist in the State of California (R.G. No. 5577) will provide technical oversight and review of the work. Mr. Greg A. Gurss, Senior Project Manager, will supervise implementation of field and office operations. GR employs a staff of geologists, engineers, and technicians who will assist with the project.

SCHEDULE

Chevron will initiate the encroachment permit process immediately. Upon receipt of regulatory approval, GR will obtain the soil boring permit and schedule the field work. The report will be submitted approximately 60 days after completion of field activities.



Source: Thomas Brothers Maps Pg 649, F 7, 1999

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VICINITY MAP
Chevron Service Station No. 9-0290
1802 Webster Street
Alameda, California

FIGURE
1

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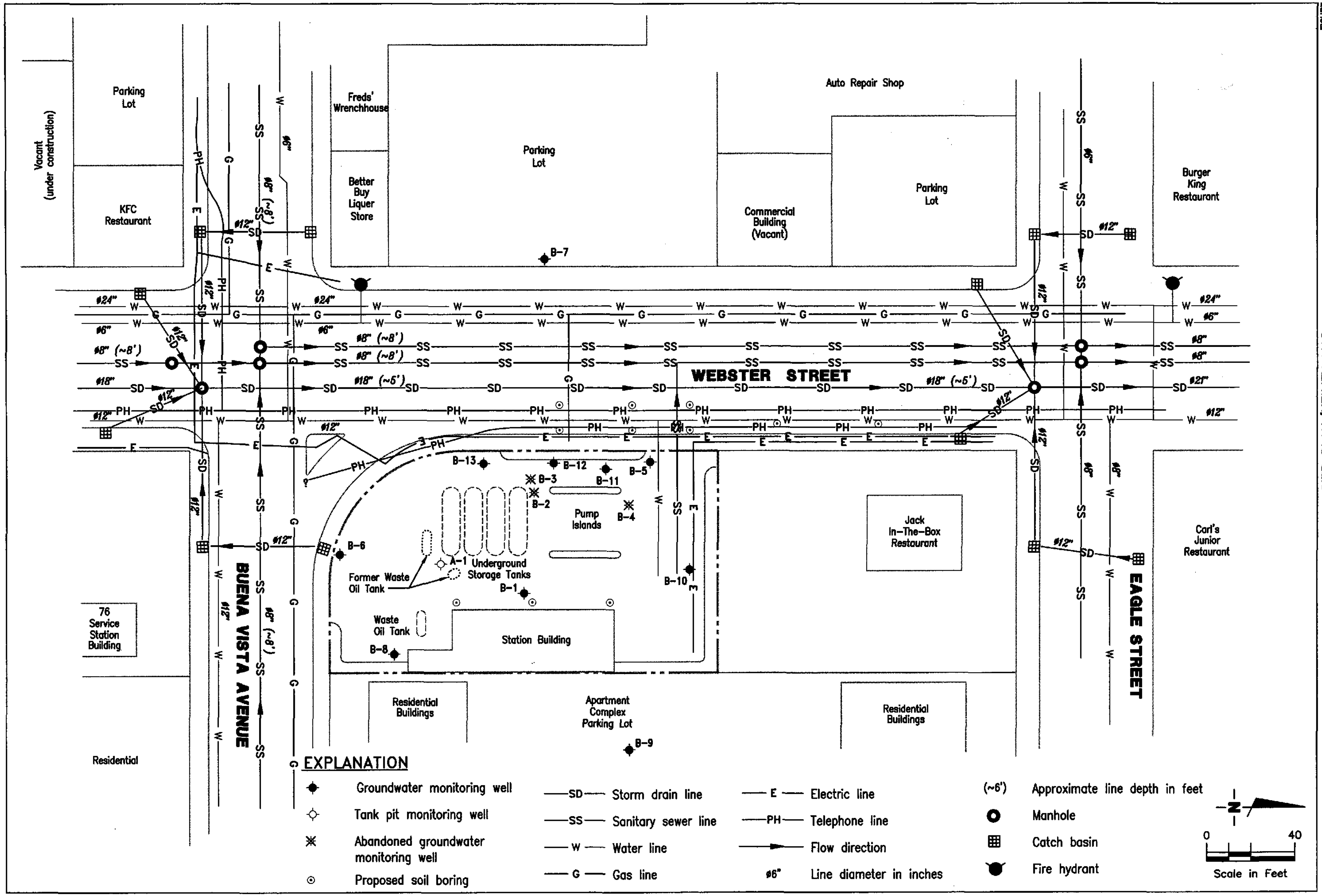

SITE PLAN/UTILITY MAP
Chevron Service Station No. 9-0290
1802 Webster Street
Alameda, California

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DATE 03/00
REVISED DATE

FIGURE 2

APPENDIX A

GR FIELD METHODS AND PROCEDURES

GETTLER-RYAN INC.

FIELD METHODS AND PROCEDURES

Site Safety Plan

Field work performed by Gettler-Ryan Inc. (GR) is conducted in accordance with GR's Health and Safety Plan and the Site Safety Plan. GR personnel and subcontractors who perform work at the site are briefed on the contents of these plans prior to initiating site work. The GR geologist or engineer at the site when the work is performed acts as the Site Safety Officer. GR utilizes a photoionization detector (PID) to monitor ambient conditions as part of the Health and Safety Plan.

Collection of Soil Samples

Soil borings are drilled by a California-licensed well driller. A GR geologist is present to observe the drilling, collect soil samples for description, physical testing, and chemical analysis, and prepare a log of the exploratory soil boring. Soil samples are collected from the soil boring with a split-barrel sampling device fitted with 2-inch-diameter, clean brass tube or stainless steel liners. The sampling device is driven approximately 18 inches with a 140-pound hammer falling 30 inches. The number of blows required to advance the sampler each successive 6 inches is recorded on the boring log. The encountered soils are described using the Unified Soil Classification System (ASTM 2488-84) and the Munsell Soil Color Chart.

After removal from the sampling device, soil samples for chemical analysis are covered on both ends with teflon sheeting or aluminum foil, capped, labeled, and place in a cooler with blue ice for preservation. A chain-of-custody form is initiated in the field and accompanies the selected soil samples to the analytical laboratory. Samples are selected for chemical analysis based in part on:

a. depth relative to underground storage tanks and existing ground surface
b. depth relative to known or suspected groundwater
c. depth relative to areas of known hydrocarbon impact at the site
d. presence or absence of contaminant migration pathways
e. presence or absence of discoloration or staining
f. presence or absence of obvious gasoline hydrocarbon odors
g. presence or absence of organic vapors detected by headspace analysis

Field Screening of Soil Samples

A PID is used to perform head-space analysis in the field for the presence of organic vapors from the soil sample. This test procedure involves removing some soil from one of the sample tubes not retained for chemical analysis and immediately covering the end of the tube with a plastic cap. The PID probe is inserted into the headspace inside the tube through a hole in the plastic cap. Head-space screening results are recorded on the boring log. Head-space screening procedures are performed and results recorded as reconnaissance data. GR does not consider field screening techniques to be verification of the presence or absence of hydrocarbons.

Construction of Monitoring Wells

Monitoring wells are constructed in the exploratory soil borings with Schedule 40 polyvinyl chloride (PVC) casing. All joints are thread-joined; no glues, cements, or solvents are used in well construction. The screened interval is constructed of machine-slotted PVC well screen which generally extends from the total well depth to a point above the groundwater. An appropriately-sized sorted sand is placed in the annular space adjacent to the entire screened interval. A bentonite transition seal is placed in the annular space above the sand, and the remaining annular space is sealed with neat cement or cement grout.

Wellheads are protected with water-resistant traffic-rated vault boxes placed flush with the ground surface. The top of the well casing is sealed with a locking waterproof cap. A lock is placed on the well cap to prevent vandalism and unintentional introduction of materials into the well.

Measurement of Water Levels

The top of the newly-installed well casing is surveyed by a California-licensed Land Surveyor to mean sea level (MSL). Depth-to-groundwater in the well is measured from the top of the well casing with an electronic water-level indicator. Depth-to-groundwater is measured to the nearest 0.01-foot, and referenced to MSL.

Well Development and Sampling

The purpose of well development is to improve hydraulic communication between the well and the surrounding aquifer. Prior to development, each well is monitored for the presence of floating product and the depth-to-water is recorded. Wells are then developed by alternately surging the well with a vented surge block, then purging the well with a pump or bailer to remove accumulated sediments and draw groundwater into the well. Development continues until the groundwater parameters (temperature, pH, and conductivity) have stabilized.

Storing and Sampling of Drill Cuttings

Drill cuttings are stockpiled on and covered with plastic sheeting and samples are collected and analyzed for disposal classification on the basis of one composite sample per 100 cubic yards of soil. Stockpile samples are composed of four discrete soil samples, each collected from an arbitrary location on the stockpile. The four discrete samples are then composited in the laboratory prior to analysis.

Each discrete stockpile sample is collected by removing the upper 3 to 6 inches of soil, and them driving the stainless steel or brass sample tube into the stockpiled material with a hand, mallet, or drive sampler. The sample tubes are then covered on both ends with teflon sheeting or aluminum foil, capped, labeled, and placed in a cooler with blue ice for preservation. A chain-of-custody form is initiated in the field and accompanies the selected soil samples to the analytical laboratory. Stockpiled soils are covered with plastic sheeting after completion of sampling.