GETTLER-RYAN INC.

WORK PLAN
FOR OFF-SITE MONITORING WELL INSTALLATION
at

Chevron Service Station #9-8139
16304 Foothill Boulevard
San Leandro, California

Report No. 346461.05-2

Prepared for:

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March 17, 2000

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INTRODUCTION

At the request of Chevron Products Company (Chevron), Gettler-Ryan Inc. (GR), has prepared this Work Plan for the installation of two off-site groundwater monitoring well to delineate the extent of methyl tertiary butyl ether (MtBE) impact downgradient of the site. The proposed work includes: preparing the site safety plan; obtaining the required encroachment and well installation permits; installing two off-site groundwater monitoring wells; surveying wellhead elevations; developing and sampling the newly installed wells; collecting and submitting selected soil and groundwater samples for laboratory analysis; arranging for Chevron's contractor to dispose of the waste materials; and preparing a report presenting the observations associated with the well installation. This work was requested by the Alameda County Health Care Services Agency (ACHCSA) in their letter dated January 25, 2000.

The scope of work proposed in this Work Plan is intended to comply with the State of California Water Resources Control Board's *Leaking Underground Fuel Tanks (LUFT) Manual* and *California Underground Storage Tank Regulations, 1994*, the Regional Water Quality Control Board's (RWQCB) *Tri-Regional Board Staff Recommendations for Preliminary Investigation and Evaluation of Underground Tank Sites*, and the ACHCSA guidelines.

SITE DESCRIPTION

General

The subject site is located on the eastern side of Foothill Boulevard approximately 0.1 mile south of Strang Avenue in San Leandro, California (Figure 1). The site is a Chevron service station currently redeveloped into a mini-market/gas station facility. The previous Chevron station facilities consisted of a station building, three gasoline underground storage tanks (USTs) and two dispenser islands. All previous Chevron station aboveground and underground facilities have been removed prior to the site reconstruction. A current site configuration includes a mini-market building located in the eastern corner of the site, two new gasoline USTs that share a common pit southwest of the mini-market building and service islands located in the central portion of the site. Pertinent former and current site features are shown on Figure 2.

Hayward fault zone ??

Geology and Hydrogeology

The subject site is located at the western edge of San Leandro Hills approximately 4 miles east of San Francisco Bay and approximately 1¼ mile south of Lake Chabot. The site is a relatively flat lot at an elevation of approximately 125 feet above mean sea level. Based on the boring logs from previous environmental investigations, the subject site is underlain by sandy clay with clayey and gravelly sand interbeds to the total depth explored of 41.5 feet below ground surface (bgs). Groundwater was encountered in the borings at depths ranging from 17 to 26 feet bgs and stabilized at depths ranging from 12 to 19 feet bgs. Based on the historical groundwater monitoring data, groundwater in the vicinity of the subject site flows to the south. The groundwater depth has fluctuated between 8.5 and 22.5 feet. The nearest surface water is San Lorenzo Creek located approximately 1 mile south of the subject site.

Previous Work

Eleven groundwater monitoring wells (on-site wells MW-1 through MW-7 and off-site wells MW-8 through MW-11) were installed at the subject site between 1989 and 1992 to monitor groundwater condition beneath the site and in its downgradient (southern) vicinity. Groundwater extraction well EW-1 was installed at the site in 1990 for groundwater remediation. In 1991, groundwater monitoring wells MW-5 and MW-4 were destroyed and extraction wells EW-2 and EW-3 were installed in the locations of the destroyed wells, respectively, to add in groundwater remediation. In 1998, on-site wells MW-1, MW-2, MW-3, MW-6, MW-7, and EW-1were destroyed, prior to the site redevelopment. Extraction wells EW-2 and EW-3 were retained for future use as monitoring wells.

Groundwater at the subject site has been monitored and sampled since December 1989. Historical sampling data indicate that on-site wells MW-3, MW-4/EW-3, MW-5/EW-2, and EW-1 have contained total petroleum hydrocarbons as gasoline (TPHg), benzene and methyl tertiary butyl ether (MtBE) at concentrations up to 51,000 parts per billion (ppb), 12,000 ppb and 13,000 ppb, respectively. Floating product (up to 1.3 feet) was present in well MW-5 between September 1990 and May 1991. Off-site wells MW-8 and MW-9 have contained TPHg, benzene, and MtBE at concentrations up to 17,000 ppb, 470 ppb, and 39,000 ppb, respectively. On-site wells MW-1, MW-2, MW-6, MW-7 and off-site wells MW-10 and MW-11 have never contained MtBE. Benzene was detected in these wells only on few occasions at low concentrations (up to 19 ppb). TPHg has never been detected in wells MW-6, MW-10 and MW-11, and has been detected sporadically at low concentrations (up to 100 ppb) in wells MW-1, MW-2 and MW-7.

PROPOSED SCOPE OF WORK

GR proposes to install two off-site groundwater monitoring wells (MW-12 and MW-13) to delineate the extent of MtBE impact downgradient of the site. GR Field Methods and Procedures are included in Appendix A. To implement this scope of work, GR proposes the following six specific tasks:

Task 1. Pre-Field Activities

Prepare the site-specific safety plan, and obtain the encroachment permit from the City of San Leandro, and the well installation permit from the Alameda County Public Works Agency. Notify Underground Service Alert (USA) a minimum of 48 hours prior to drilling. Contract with a private utility locator to clean boring locations.

Task 2. Well Installation

Install groundwater monitoring wells MW-12 and MW-13 in the location shown on Figure 2. Drilling and well construction activities will be performed by Bay Area Exploration Inc. (C57 #522125). A GR geologist will observe drilling, collect soil samples for chemical and physical analyses, describe the encountered soil, and prepare a log of the boring. The well boring will be advanced using 8-inch-diameter hollow-stem augers and truck-mounted drill rig.

Groundwater monitoring wells will be constructed of 2-inch-diameter Schedule 40 polyvinyl chloride (PVC) well casing and 0.01-inch machine slotted PVC well screen. The screened intervals will extend from approximately 5 feet bgs to 25 feet bgs. Proposed Well Construction Details are shown on Figure 3.

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. Screening data will be recorded on the boring logs.

Soil samples for description and possible chemical analysis will be obtained from the borings at five-foot intervals, as a minimum. Although the actual number of samples submitted for analysis will depend on site conditions and field screening data, we anticipate a minimum of one unsaturated sample from each boring will be submitted for analysis as described in Task 5.

Drill cuttings will be stockpiled at the site pending disposal. Stockpiled cuttings will be placed on and covered with plastic sheeting. Four soil samples from the drill cuttings will be collected for disposal characterization as described in Appendix A. These samples will be submitted to the laboratory for compositing into one sample, then analyzed as described in Task 5. Drill cuttings will be disposed of by Integrated Wastestream Management Inc. (IWM).

Task 3. Wellhead Survey

Following installation, the top of casing for wells MW-12 and MW-13 will be surveyed to mean sea level by a California-licensed surveyor. Wellhead elevations for wells EW-2 and EW-3 will be also surveyed at that time. Horizontal coordinates of well locations will be obtained at the same time.

Task 4. Well Development and Sampling

Newly installed groundwater monitoring wells MW-12 and MW-13 will be developed after being allowed to stand a minimum of 72 hours following installation. Wells MW-12 and MW-13 will be sampled after development and subsequently included in a quarterly monitoring and sampling program. Rinsate water and groundwater purged from the wells during development and sampling will be transported by IWM to McKittrick Waste Management. The groundwater samples will be analyzed as described in Task 5.

Task 5. Laboratory Analyses

All samples will be submitted to a California-certified Hazardous Materials Testing Laboratory. Soil and groundwater samples will be analyzed for TPHg, BTEX, and MTBE by EPA Methods 5030/8015/8020. Disposal characterization samples from the soil stockpile will be analyzed for TPHg, BTEX, and total lead.

Task 6. Report Preparation

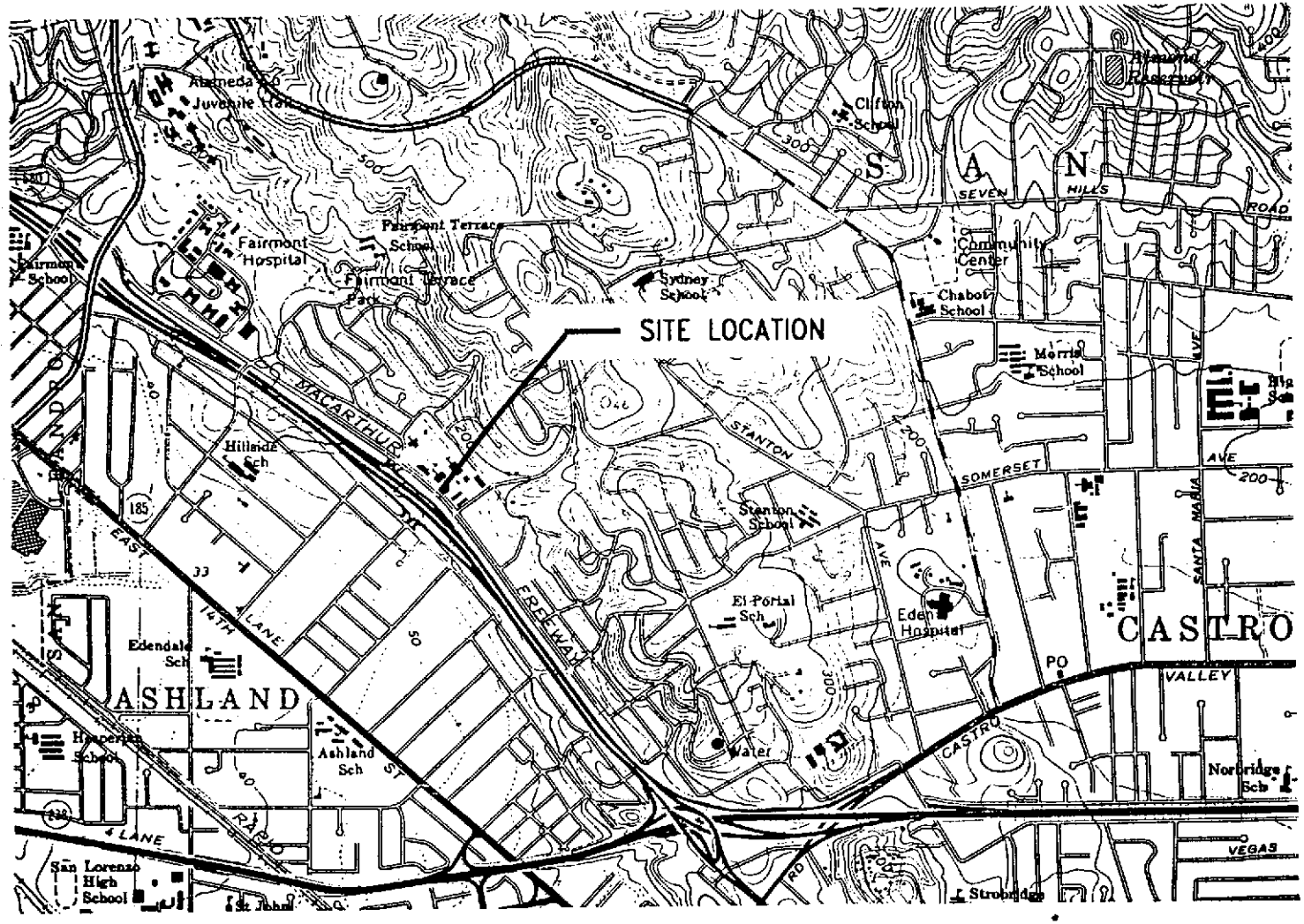
Following receipt and analysis of all data, a report will be prepared which summarizes the procedures and the results associated with this well installation. This report will be submitted to Chevron for their use and distribution.

PROJECT STAFF

Ms. Barbara Sieminski, a Registered Geologist in the State of California (R.G. No. 6676), will provide technical oversight and review of the work. Mr. Greg Gurss, Project Manager, will supervise and direct field and office operations. GR employs a staff of geologist, engineers, and technicians who will assist with the project.

SCHEDULE

Implementation of the proposed scope of work will commence upon receipt of regulatory approval and a well installation permit.



Base Map: USGS Topographic Map

FIGURE 1

Gettler - Ryan Inc.
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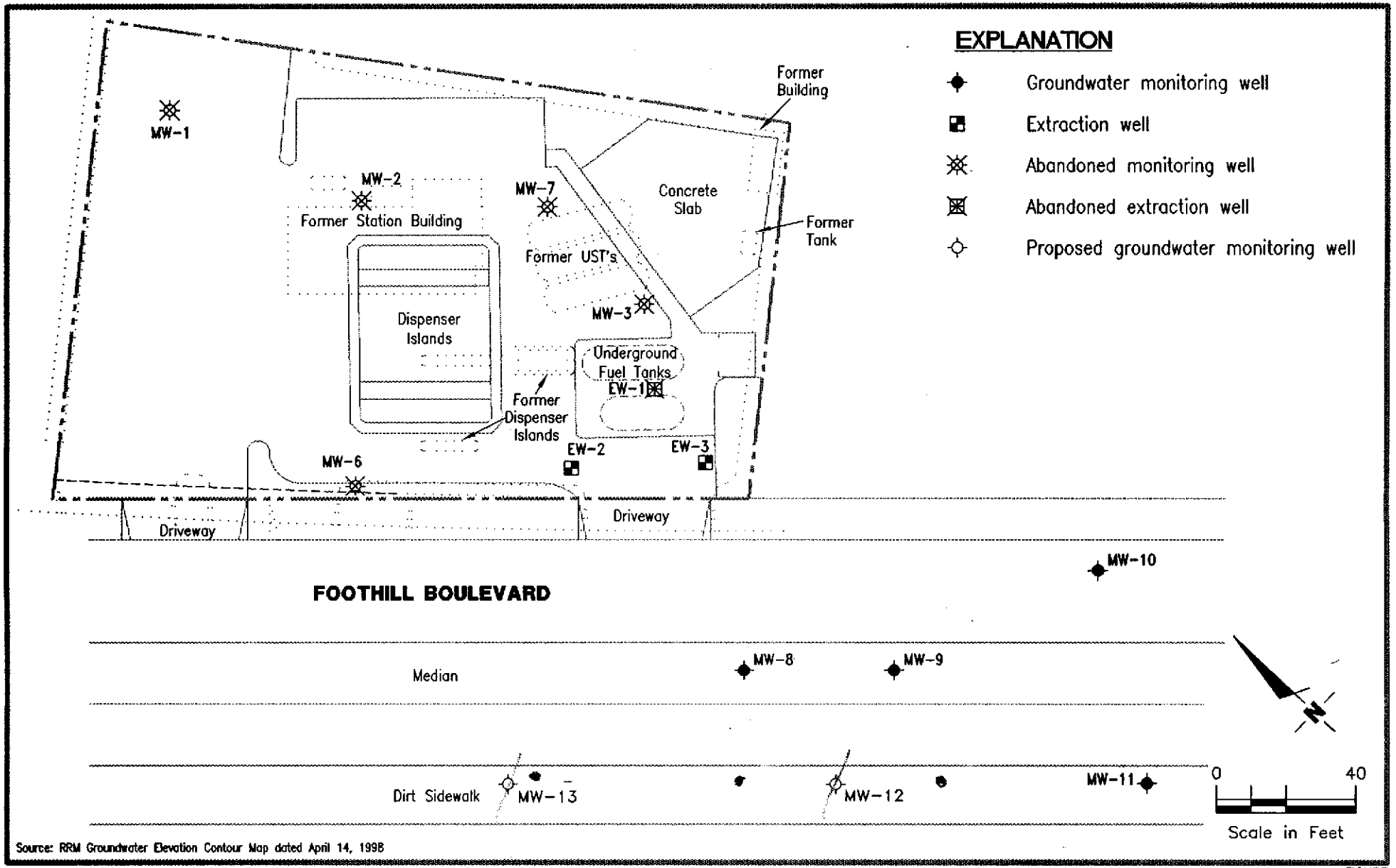
Dublin, CA 94568

VICINITY MAP
Chevron Service Station No. 9-8139
16304 Foothill Boulevard
San Leandro, California

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
346461		01/00	



Source: RRM Groundwater Elevation Contour Map dated April 14, 1998

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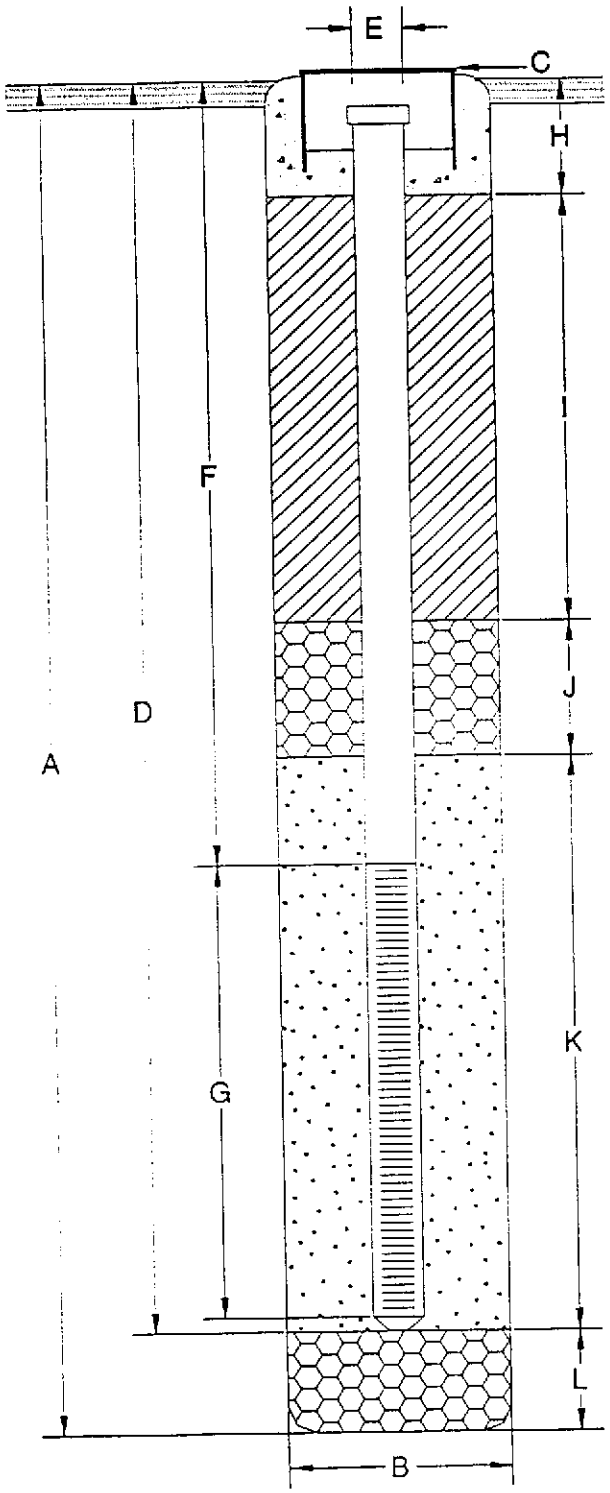
SITE PLAN
Chevron Service Station No. 9-8139
16304 Foothill Boulevard
San Leandro, California

FIGURE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
346461.02		03/00	

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 25 ft.

B Diameter of Boring 8 in.
Drilling Method Hollow-stem auger

C Top of Box Elevation ____ ft.
☐ Referenced to Mean Sea Level
☐ Referenced to Project-Datum

D Casing Length 25 ft.
Material Schedule 40 PVC

E Casing Diameter 2 in.

F Depth to Top Perforations 5 ft.

G Perforated Length 20 ft.
Perforated interval from 5 to 25 ft.
Perforation Size 0.01 in.

H Surface Seal from 0 to 1 ft.
Seal Material concrete

I Backfill from 1 to 3 ft.
Seal Material neat cement

J Seal from 3 to 4 ft.
Seal Material bentonite

K Gravel Pack from 4 to 25 ft.
Pack Material Lonestar #2/12

L Bottom Seal none ft.
Seal Material ____

M Vault box with waterproof locking cap and lock

Note: Depths measured from initial ground surface

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Dublin, CA 94568

Former Chevron Service Station #9-8139
16304 Foothill Boulevard
San Leandro, California

FIGURE **3**

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
346461.05		Mar-00		

APPENDIX A

GR FIELD METHODS AND PROCEDURES

GETTLER - RYAN
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 of these plans contents 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

Exploratory 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 exploratory soil boring with a split-barrel sampler or other appropriate sampling device fitted with clean brass 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 soil is 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 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. Samples are selected for chemical analysis based on:

a. depth relative to underground storage tanks and existing ground surface
b. depth relative to known or suspected groundwater
c. presence or absence of contaminant migration pathways
d. presence or absence of discoloration or staining
e. presence or absence of obvious gasoline hydrocarbon odors
f. 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.

Stockpile Sampling

Stockpile samples consist of four individual sample liners collected from each 100 cubic yards (yd^3) of stockpiled soil material. Four arbitrary points on the stockpiled material are chosen, and discrete soil sample is collected at each of these points. Each discrete stockpile sample is collected by removing the upper 3 to 6 inches of soil, and then driving the stainless steel or brass tube into the stockpiled material with a wooden mallet or hand driven soil sampling device. The sample tubes are then covered on both ends with teflon sheeting or aluminum foil, capped, labeled, placed in the

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.

Construction of Monitoring Wells

Monitoring wells are constructed in the exploratory 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 cap. A lock is placed on the well cap to prevent vandalism and unintentional introduction of materials into the well.

Storing and Sampling of Drill Cuttings

Drill cuttings are stockpiled on plastic sheeting or stored in drums depending on site conditions and regulatory requirements. Stockpile samples are collected and analyzed on the basis of one composite sample per 50 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 then driving the stainless 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.

Wellhead Survey

The top of the newly-installed well casing is surveyed by a California-licensed Land Surveyor to mean sea level (MSL).

Well Development

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

Groundwater Monitoring and Sampling

Decontamination Procedures

All physical parameter measuring and sampling equipment are decontaminated prior to sample collection using Alconox or equivalent detergent followed by steam cleaning with deionized water. During field sampling, equipment placed in a well are decontaminated before purging or sampling the next well by cleaning with Alconox or equivalent detergent followed by steam cleaning with deionized water.

Water-Level Measurements

Prior to sampling each well, the static water level is measured using an electric sounder and/or calibrated portable oil-water interface probe. Both static water-level and separate-phase product thickness are measured to the nearest ± 0.01 foot. The presence of separate-phase product is confirmed using a clean, acrylic or polyvinylchloride (PVC) bailer, measured to the nearest ± 0.01 foot with a decimal scale tape. The monofilament line used to lower the bailer is replaced between borings with new line to preclude the possibility of cross-contamination. Field observations (e.g. product color, turbidity, water color, odors, etc.) are noted. Water-levels are measured in wells with known or suspected lowest dissolved chemical concentrations to the highest dissolved concentrations.

Sample Collection and Labeling

A temporary PVC screen is installed in the boring to facilitate a grab groundwater sample collection. Samples of groundwater are collected from the surface of the water in each well or boring using the teflon bailer or a pump. The water samples are then gently poured into laboratory-cleaned containers and sealed with teflon-lined caps, and inspected for air bubbles to check for headspace. The samples are then labeled by an adhesive label, noted in permanent ink, and promptly placed in an ice storage. A Chain-of-Custody Record is initiated and updated throughout handling of the samples, and accompanies the samples to the laboratory certified by the State of California for analyses requested.