GETTLER-RYAN INC.

WORK PLAN FOR MONITORING WELL INSTALLATION

at

Chevron Service Station #9-0338
5500 Telegraph Avenue
Oakland, California

Report No. 346456.02-1

Prepared for:

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GETTLER-RYAN INC.

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INTRODUCTION

At the request of Chevron Products Company (Chevron), Gettler-Ryan Inc. (GR) has prepared this Work Plan for Monitoring Well Installation at the subject site (Figure 1). The work is being performed to further evaluate dissolved MtBE concentrations detected in groundwater beneath the site. This work is being proposed in response to a letter issued by Alameda County Health Care Services Agency (ACHCSA) dated December 17, 1998, requesting further investigation of dissolved MtBE concentrations in the vicinity of the former underground storage tank (UST) area.

The proposed scope of work includes: obtaining the necessary well installation permit from the ACHCSA; updating a site specific health and safety plan; drilling and constructing two groundwater monitoring wells; collecting soil samples for possible chemical analysis; developing and sampling the newly installed groundwater monitoring wells; submitting the soil and groundwater samples for chemical analysis; surveying the newly installed wells; arranging for Chevron's contractor to transport and properly dispose of drill cuttings and purge water; and preparing a report which presents the findings of the investigation.

The scope of work described in this report 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 California Regional Water Quality Control Board (CRWQCB) *Tri-Regional Board Staff Recommendations for*

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Preliminary Investigation and Evaluation of Underground Tank Sites, and ACHCSA guidelines.

SITE DESCRIPTION

The site is an active retail gasoline station located at the northeastern corner of Telegraph Avenue and 55th Street in Oakland, California. Current facilities consist of a station building, six dispenser islands, and two USTs that share a common excavation near the northern site boundary. Pertinent site features are shown on Figure 2.

PREVIOUS ENVIRONMENTAL WORK

To accommodate the proposed new station construction, GR observed Bay Area Exploration Inc. (BAEi) destroy well C-3 on June 30, 1998. The well was drilled out to a total depth of 33.5 feet below ground surface (bgs). Following the destruction of well C-3, GR collected a grab groundwater sample from the UST backfill well. This sample was analyzed for Total Petroleum Hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and methyl tert-butyl ether (MtBE). TPHg and BTEX compounds were not detected in this sample. However, MtBE (15,000 parts per billion, or ppb) concentrations were detected.

On July 22, 1998, GR removed three 10,000-gallon single-wall fiberglass gasoline USTs, one 1,000-gallon fiberglass waste oil UST, associated product lines and dispenser islands, three hydraulic hoists, and an oil/water separator. Six compliance soil samples were collected at the sidewall/groundwater interface of the gasoline UST pit at an approximate depth of 9 feet bgs. These samples were analyzed for TPHg, BTEX, MtBE, and total lead. TPHg were not detected in any of the sidewall samples. Benzene was detected in one sample at a concentration of 0.013 parts per million (ppm). MtBE concentrations were detected in five of the six samples at concentrations ranging from 0.21 to 0.74 ppm. Lead was detected in all six samples ranging in concentrations between 3.3 and 6.8 ppm.

Five soil samples (CT-1 through CT-5) were collected beneath the product lines at depths between 3.5 and 4 feet bgs. These samples were also analyzed for TPHg, BTEX, MtBE, and total lead. TPHg, benzene, or MtBE were not detected in any of these five soil samples. Lead was detected in two of the five samples collected at concentrations of 1.0 and 2.8 ppm.

One soil sample (CW-1) was collected beneath the waste oil UST at a depth of 9 feet bgs. Sample CW-1 was analyzed for TPHg, BTEX, MtBE, Total Petroleum Hydrocarbons as diesel (TPHd), Total Oil and Grease (TOG), Volatile Organic Compounds (VOCs), Semi-

volatile Organic Compounds (SVOCs), and the metals cadmium, chromium, lead, nickel, and zinc. TPHg, BTEX, MtBE, TPHd, VOCs, and SVOCs were not detected in the sample CW-1. However, TOG were detected at a concentration of 130 ppm. Lead was not detected in this sample.

Compliance soil samples were collected beneath the three hydraulic hoists and oil/water separator at depths of 9 feet bgs. Soil sample CT-3, collected beneath the oil/water separator, was analyzed for TPHg, BTEX, MtBE, TPHd, TOG, VOCs, SVOCs, Total Petroleum Hydrocarbons as hydraulic oil (TPHho), and the metals cadmium, chromium, lead, nickel, and zinc. BTEX, MtBE, VOCs, SVOCs, or lead were not detected in sample CT-3. However, TPHg (1.6 ppm), TPHd (2,000 ppm), TOG (2,600 ppm), and TPHho (2,800 ppm) were detected in this sample. TPHho were not detected in the soil samples CT-1 or CT-2, collected beneath the other two hydraulic hoists.

On August 7, 1998, approximately 1,500 gallons of groundwater removed from the new UST excavation during installation activities was transported by Intergrated Wastestream Management (IWM) to the McKittrick Treatment, Storage, and Disposal facility in McKittrick, California.

SCOPE OF WORK

To further delineate the dissolved MtBE concentrations beneath the site, GR proposes to install two groundwater monitoring wells at the locations shown on Figure 2. GR anticipates encountering groundwater at approximately 12 feet bgs. Field Methods and Procedures are included in Appendix A. To implement the proposed scope of work, GR proposes the following five tasks:

Task 1. Pre-field Activities

GR will update the site specific health and safety plan and obtain the necessary soil boring permits from the ACHCSA. Underground Service Alert (USA) will be notified a minimum of 48 hours in advance of the scheduled work. A private line locator will be contracted to locate subsurface utilities.

Task 2. Well Installation and Soil Borings

GR will install two soil borings at the locations shown on Figure 2. Each well boring will be hand-augered to 5 feet bgs to clear subsurface utilities. Drilling and well construction will be performed by Bay Area Exploration, Inc. (C57 #522125). A GR

geologist will monitor the drilling activities and prepare a log of each boring. Well borings will be drilled with 8-inch diameter hollow-stem augers to approximately 25 feet bgs. Soil samples for description and possible chemical analysis will be obtained from each boring at five-foot intervals, as a minimum. Sample handling procedures are described in Appendix A. Although the actual number of samples submitted for chemical analysis will depend on site conditions and field screening data, we anticipate a minimum of one unsaturated soil sample collected from each boring will be submitted for chemical analysis as described in Task 5.

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.

Groundwater monitoring wells will be constructed in the soil borings with 2-inch diameter Schedule 40 polyvinyl chloride (PVC) well casing and 0.02-inch machine slotted well screen, as shown on the Proposed Well Construction Detail (Figure 3). The wells will be constructed with 20 feet of well screen (approximately 5 to 25 feet bgs). Actual screen intervals will depend on the groundwater depth and lithologic conditions encountered during drilling.

Drill cuttings generated during drilling activities will be placed on and covered with plastic sheeting and stored at the site pending receipt of chemical analytical data for disposal. Soil samples from the drill cuttings will be collected for disposal characterization as described in Task 5. GR will arrange for Chevron's contractor IWM to properly dispose of the drill cuttings. Steam cleaning rinsate waste water will be transported by IWM to the McKittrick facility.

Task 3. Well Development and Sampling

Newly installed groundwater monitoring wells will be developed after being allowed to stand a minimum of 72 hours following completion. During development, the clarity of the discharged well water and selected groundwater parameters (pH, temperature, conductivity) will be monitored. When the clarity of the discharge water runs clear and the groundwater parameters have stabilized, a groundwater sample will be collected. Groundwater removed from the well during development and sampling will be transported by IWM to the McKittrick facility. Groundwater samples will be

analyzed as described in Task 5. Development and groundwater sampling procedures are described in Appendix A.

Task 4. Wellhead Survey

Following installation, the elevations of each top of well casing will be surveyed to MSL by Virgil Chavez Land Surveying (PLS #6323). Horizontal coordinates will also be measured.

Task 5. Laboratory Analyses

Soil and groundwater samples will be submitted for chemical analysis by Sequoia Analytical (ELAP #1271) in Walnut Creek, California. Selected soil and groundwater samples will be analyzed for TPHg, for gasoline constituents benzene, toluene, ethylbenzene, total xylenes (BTEX) and methyl tert-butyl ether (MtBE) by DHS LUFT methodology. The highest groundwater MtBE concentration will be confirmed by EPA Method 8260. The sample of the drill cuttings will be analyzed for TPHg and BTEX.

Task 6. Report Preparation

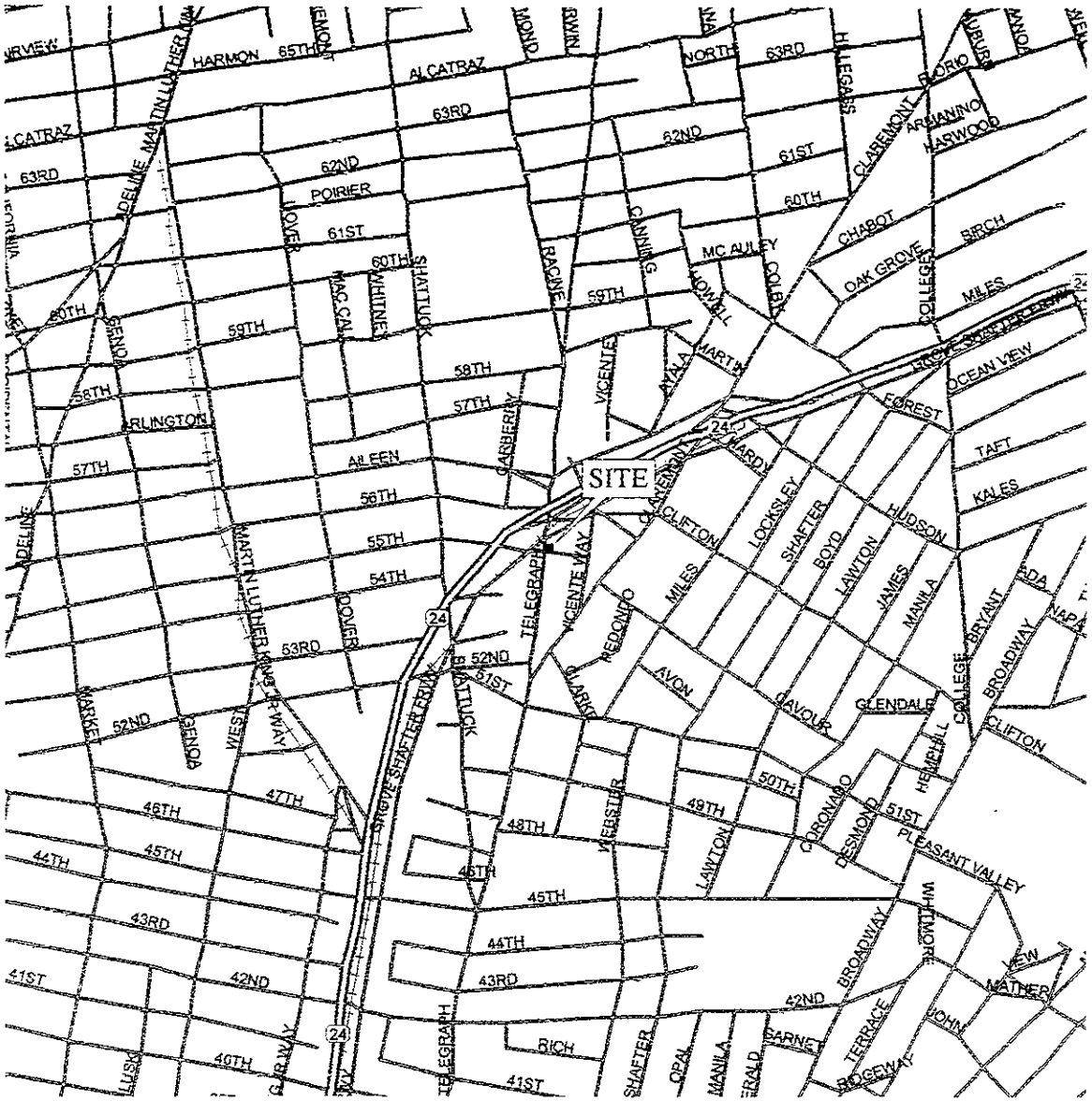
Following receipt and analysis of all data, a report will be prepared which summarizes the procedures and findings associated with this investigation. This report will be submitted to Chevron for their use and distribution.

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 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

Implementation of the proposed scope of work will commence upon receipt of regulatory approval.



Source: Street Atlas USA, Delorme (1995).

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VICINITY MAP
Chevron Service Station No. 9-0338
5500 Telegraph Avenue
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FIGURE
1

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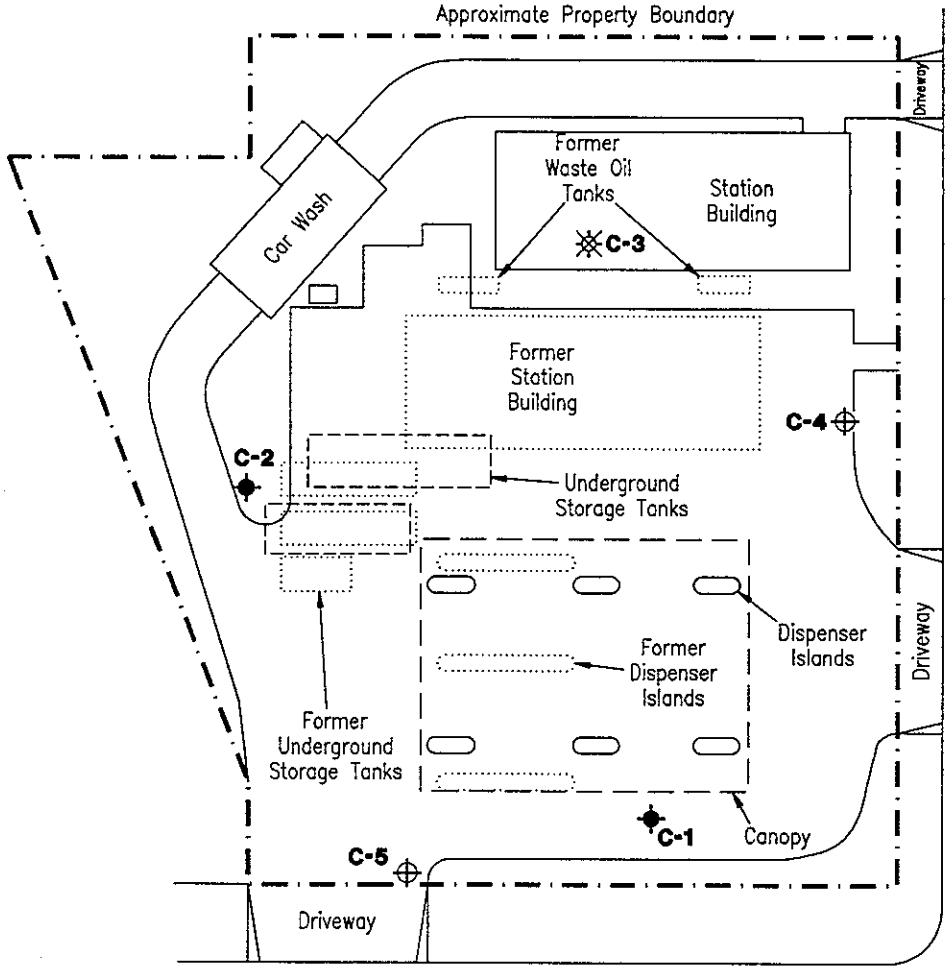
346456		01/99	



EXPLANATION:

- Proposed Groundwater Monitoring Well
- Groundwater Monitoring Well
- Destroyed Groundwater Monitoring Well (06/30/98)

N

0 40

Scale in Feet

Source: Figure Modified From Drawing Provided By Chevron.

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SITE PLAN
Chevron Service Station No. 9-0338
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FIGURE
2

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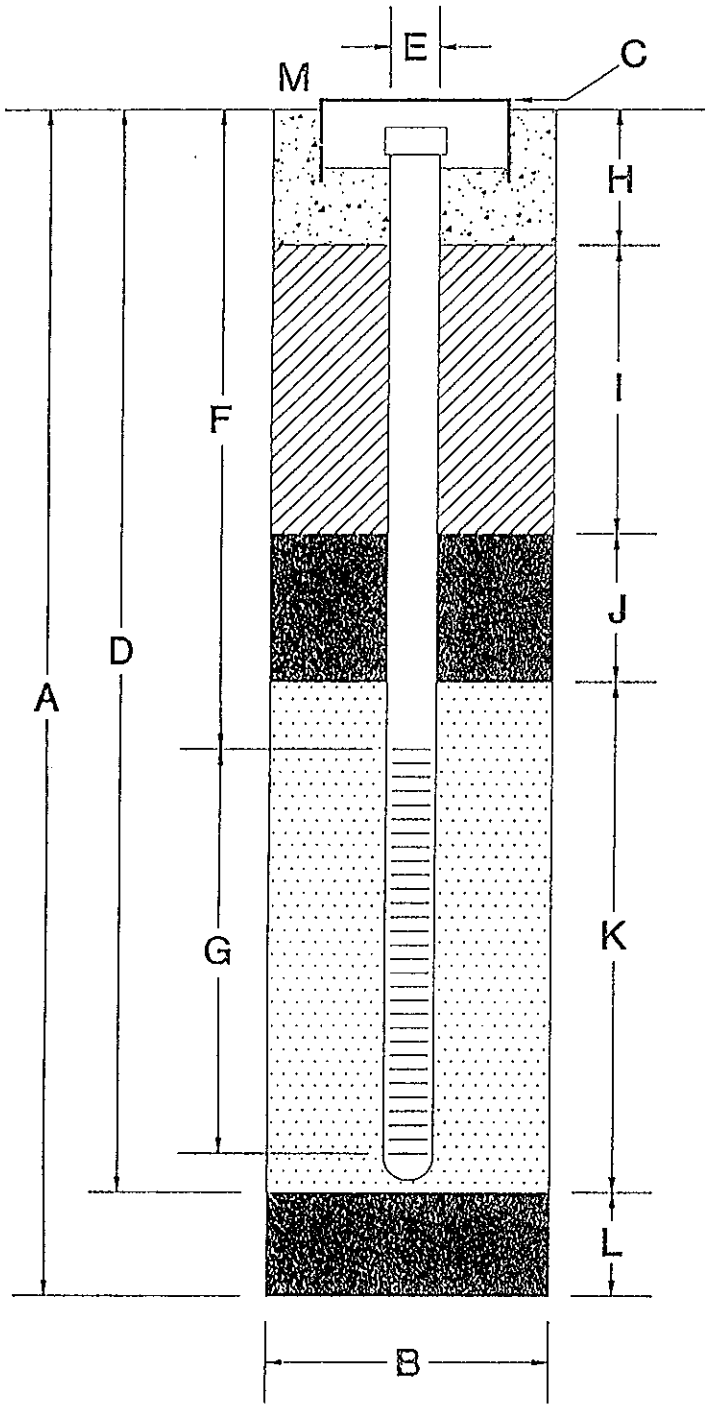
WELL CONSTRUCTION DETAIL



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 Type Machine Slotted
Perforation Size 0.02 in.

H Surface Seal From 0 to 0.5 ft.
Seal Material Concrete

I Backfill From 0.5 to 3.0 ft.
Backfill Material Neat Cement

J Seal From 3.0 to 4.0 ft.
Seal Material Bentonite

K Gravel Pack From 4.0 to 25 ft.
Pack Material Lonestar #3 sand

L Bottom Seal None ft.
Seal Material _____

M Traffic rated vault box, locking well cap, and lock

PROPOSED WELL CONSTRUCTION

Chevron Station #9-0338
5500 Telegraph Avenue
Oakland, California

Note: Depths Measured From Initial Ground Surface.

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FIGURE # 3

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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 (revised January 16, 1995) 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 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. A plastic cap is placed over the end of the sample tube that will not be saved for chemical analyses. The PID probe is placed through a hole in the cap, and the concentrations of organic vapors in the headspace between the plastic cap and the soil is recorded. PID screening results are recorded on the boring log 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 adjacent to the entire screened interval. A bentonite 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. After the wells have been developed, groundwater samples are collected. Well development and sampling is performed by Gettler-Ryan Inc. of Dublin, California.

Storing and Sampling of Drill Cuttings

Drill cuttings are stockpiled on plastic sheeting and samples are collected and analyzed 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.