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ENVIRONMENTAL PROTECTION
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CAMBRIA

To:	Mr. Thomas Peacock
Company:	Alameda Co. Health Care Services Agency
Address:	1131 Harbor Bay Parkway, Suite 250
	Oakland, CA 94502
Phone:	
From:	Robert Foss
Phone:	(925) 973-3126
Pages:	12 (including cover page)
Date:	June 23, 2000
Re:	Subsurface Investigation Workplan
	Chevron SS #9-3322
	7225 Bancroft Ave., Oakland

Transmittal

Mr. Peacock:

Attached hereto you will find a copy of the Subsurface Investigation Workplan, dated June 22, 2000, that we discussed by phone on Wednesday. Chevron wishes to expedite this investigation so I will be contacting your office on Monday June 26th to discuss the proposal with the person you assign this to.

Cambria and Chevron look forward to working with your staff on this project. If you have any questions or require additional information, please contact me at (925) 973-3126. Thank you in advance for your attention to this matter.

Robert Foss

Robert Foss
Senior Project Manager

cc: Mr. Tom Bauhs, Chevron Products Company

CAMBRIA

June 22, 2000

Mr. Tom Peacock
Alameda County Health Care Services
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: **Subsurface Investigation Workplan**
Chevron Station #9-3322
7225 Bancroft Avenue, Oakland
Cambria Job No.31A-1806

Mr. Peacock:

As we discussed, Cambria Environmental Technology, Inc. (Cambria) has prepared this *Subsurface Investigation Workplan* on behalf of Chevron Products Company (Chevron). The objective of this investigation is to further define the extent and sources of hydrocarbons in soil and groundwater beneath the site. The site description, background, current conditions, and Cambria's proposed scope of work are presented below.

SITE DESCRIPTION

The site is an active service station, located on a parcel bordered by Bancroft Avenue to the northeast, Halliday Avenue to the southwest and 73rd Avenue to the southwest in Oakland (Figure 1). The area surrounding the site is primarily residential with the Eastmont Mall north across Bancroft Avenue. A Unocal service station is located across the intersection on the northern corner of Bancroft and 73rd Avenues. The site elevation is approximately 40 feet (ft) above mean sea level and the topography slopes gently westward toward San Francisco Bay, a distance of approximately 2 miles. The nearest surface water is Arroyo Viejo Creek approximately 1,300 ft south of the site. Chevron owns the site property and has operated a service station there from approximately 1961 to the present. The service station presently operates with three 10,000 gallon fuel underground storage tanks (USTs) and three dispenser islands. The 1981 single-walled fiberglass USTs are located along the southeastern property boundary.

The site is located within the East Bay Plain groundwater basin. Groundwater has historically occurred between 7.60 ft below ground surface (bgs) and 21.92 ft bgs and generally flows north to northwestward.

Oakland, CA
San Ramon, CA
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Suite 105
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SITE BACKGROUND

1981 UST Removal and Replacement: Chevron records indicate the current USTs were installed in 1981. These tanks represent at least the second generation of USTs at the site. No records of conditions encountered during these activities were located in Chevron's files.

August 1996 Product Line Removal and Replacement: All product piping at the site was removed and replaced. Records indicate that approximately 300 cubic yards of soil and pea gravel were excavated during line removal activities. Samples taken beneath the product lines and USTs contained up to 500 parts per million (ppm) TPHg and 4.2 ppm benzene at the middle pump island. All other samples were either below detection limits or contained minor concentrations.

January 1998 Well Installation: Gettler-Ryan Inc. installed 2-inch diameter wells MW-1, MW-2 and MW-3. Maximum TPHg and benzene concentrations were detected in MW-1 at 23 ppm and 0.053 ppm, respectively, in the sample collected at 15 ft bgs. Groundwater concentrations ranged up to 130,000 parts per billion (ppb) TPHg, 12,000 ppb benzene and 8,000 ppb MTBE. Since June 1999, well MW-1 has contained separate phase hydrocarbons (SPH) at a maximum thickness of 0.40 ft. A sample of the SPH from well MW-1 has been fingerprinted as pre-1992 leaded gasoline.

July 1998 Well Search: A search of California DWR records to identify domestic and municipal supply wells within a 0.5 mile radius of the sit was conducted in July 1998. Seven wells were located within the search area but none were identified as domestic or municipal wells.

January 1999 Well Installation: Gettler-Ryan Inc. installed 2-inch diameter wells MW-4 through MW-6 in January 1999 to further define the extent of hydrocarbons in soil and groundwater beneath the site. No hydrocarbons were detected in soil samples from any of the three wells. However, groundwater from MW-6, downgradient of MW-3, contained 14,000 ppb TPHg and 5,600 ppb benzene.

SITE CONDITIONS

Site Lithology: The site is primarily underlain by interbedded clay, silt and gravel. Fine grained materials consisting of clay to sandy clay exist between the surface and 11-15 ft. Clayey gravel grading to sandy gravel underlies the clay layer to approximately 34 ft bgs. A 5-ft thick silt unit was observed in wells MW-3, MW-4, MW-5 and MW-6 from 20-25 ft bgs , along the eastern half of the property. Currently, the top of the water table occurs within this silt zone in these wells.

Groundwater Depth: Historically, depth to groundwater beneath the site has varied from approximately 7.5 ft bgs (MW-2, 2/98) to a maximum depth of 21.92 ft bgs (MW-5, 10/99).

Groundwater Flow Direction and Gradient: Direction of groundwater flow has been calculated from north to northwest with an approximate average gradient of 0.08.

Hydrocarbon Concentrations in Groundwater: SPH has been observed on the water table in well MW-1 since June 1999 at an average accumulation of 0.36 ft. The highest dissolved hydrocarbon concentrations in groundwater was 370,000 ppb TPHg in well MW-1 in July 1998, prior to the occurrence of SPH. No hydrocarbons are detected in well MW-4, downgradient of MW-1. Currently, the highest dissolved hydrocarbons occur in well MW-3 at 28,200 ppb TPHg and 2,030 ppb benzene. The source of hydrocarbons in well MW-3 is currently unknown.

PROPOSED SCOPE OF WORK

To further define site conditions and investigate the source and extent of subsurface hydrocarbons, Cambria proposes to perform the following tasks.

Underground Utility Location: Cambria will contact Underground Service Alert and Alameda County Public Works to identify nearby utilities prior to conducting field activities. Additionally, Chevron's plans will be reviewed to identify onsite structures prior to conducting the investigation.

Site Health and Safety Plan: Cambria will prepare a site safety plan to protect site workers. The plan will be kept on site at all times and signed by all site workers.

Permits: Cambria will obtain the appropriate drilling permits from the Alameda County Public Works Agency Water Resources Section prior to beginning drilling/sampling activities.

Soil Borings and Sample Collection: Cambria proposes drilling 3 to 4 soil borings at locations shown on Figure 2 utilizing Geoprobe® direct push technology. The proposed boring locations are based on known site conditions, existing station facilities and predominant historic groundwater flow direction. Soil samples will be collected at approximately 4 ft intervals and at the watertable. The borings will extend approximately five feet into the water bearing zone to obtain groundwater samples for analysis. Grab groundwater samples will be collected from each soil boring using a clean disposal bailer. Proposed boring B-1 will be completed as monitoring well MW-7 using a small diameter pre-packed well. All soil and groundwater samples will be placed in an iced cooler and transported under chain of custody to a State-certified laboratory for analysis. Soil borings will be grouted to the surface with neat cement and their horizontal location will be measured in the field relative to a permanent onsite reference using a measuring wheel or tape. The well head elevation for well MW-7 will be surveyed with respect to mean sea level. Cambria's standard procedures for Geoprobe boring/well installation and soil and grab groundwater sampling are presented as Attachment A.

Chemical Analysis: Selected soil samples and groundwater samples will be analyzed for:

- TPHg as gasoline by modified EPA Method 8015,
- Benzene, toluene, ethyl benzene, xylene (BTEX), and MtBE by EPA Method 8020, and
- MtBE confirmation and other oxygenates by EPA Method 8260

Reporting: After the analytical results are received, a subsurface investigation report will be prepared that, at a minimum, will contain:

- A summary of the site background and history,
- Descriptions of the drilling and sampling methods,
- Tabulated analytical results,
- A figure illustrating sampling locations and subsurface utilities,
- Analytical reports and chain-of-custody forms and
- Conclusions and recommendations

SCHEDULE

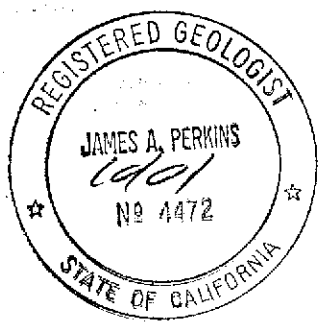
Cambria will perform the proposed activities following written approval of the work plan from the ACHCSA-EHS. A report documenting finding of the subsurface investigation will be submitted four to six weeks after completion of field activities. If you have any questions or comments please contact Robert Foss at (925) 973-3126.

Sincerely,
Cambria Environmental Technology, Inc.

Robert Foss

Robert Foss
Senior Project Manager

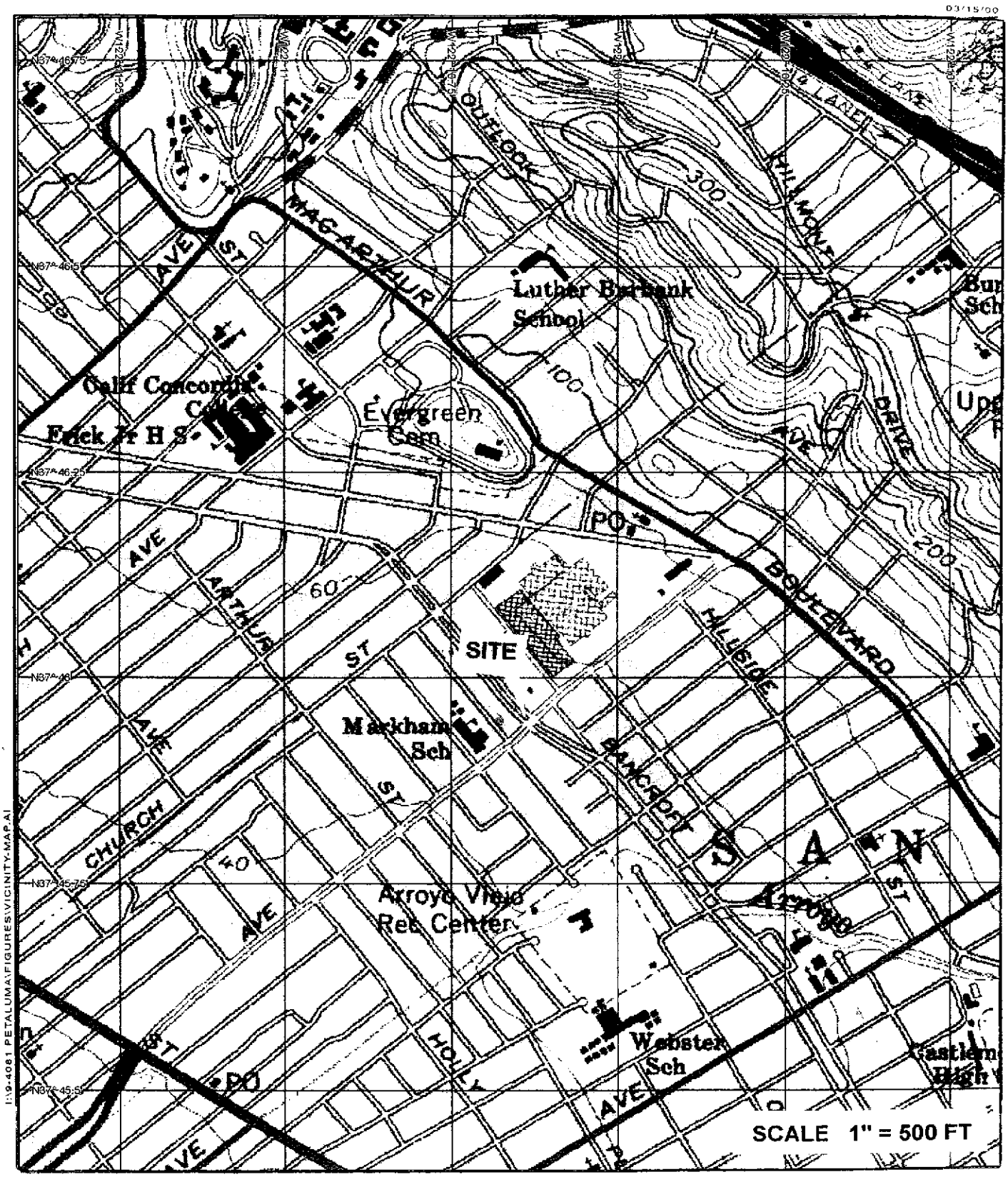
James Perkins, R.G.
Principal Remediation Manager



cc: Mr. Tom Bauhs, Chevron Products Company

Figures: 1 - Site Vicinity Map
2 - Site Plan with Proposed Groprobe Boring Locations

Attachments: A - Standard Field Procedures for Geoprobe® Sampling and Pre-Packed Well Installation



Chevron Service Station 9-3322

7225 Bancroft Avenue
Oakland, California

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Vicinity Map

FIGURE
1

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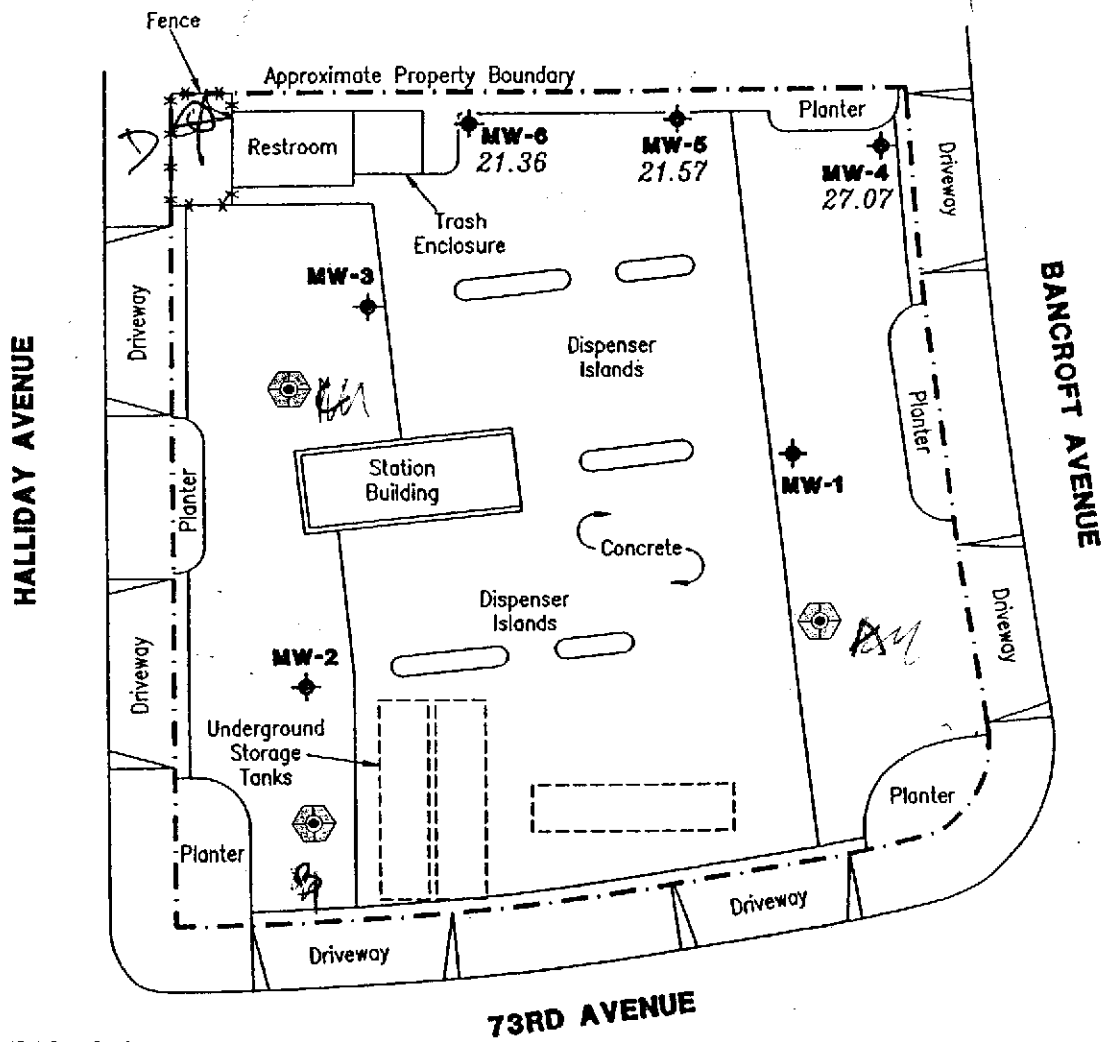

Source: Figure Modified From Drawing Provided By Chevron And Survey Provided By Virgil Chavez Land Surveying.

EXPLANATION

MW-1 ✦ Monitoring well location

Proposed Geoprobe Boring Location

N

0 15 30

Scale (ft)

FIGURE

2

I:\9-4061\FIGURES\WELL-LOC.DWG

Chevron Service Station 9-3322

7225 Bancroft Avenue
Oakland, California

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Site Plan with Proposed Geoprobe Boring Locations

ATTACHMENT A

Standard Field Procedures for Geoprobe Sampling and Pre-Packed Well Installation

STANDARD FIELD PROCEDURES FOR GEOPROBE® SAMPLING AND PRE-PACKED WELL INSTALLATION

This document describes Cambria Environmental Technology's standard field methods for GeoProbe® soil and ground water sampling and pre-packed well installation. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor odor or staining, estimate ground water depth and quality, and to submit samples for chemical analysis.

Soil Classification/Logging

All soil samples are classified according to the Unified Soil Classification System by a trained geologist or engineer working under the supervision of a California Registered Geologist (RG), Certified Engineering Geologist (CEG), or Professional Engineer (PE). The following soil properties are noted for each soil sample:

- Principal and secondary grain size category (i.e., sand, silt, clay or gravel)
- Approximate percentage of each grain size category,
- Color,
- Approximate water or separate-phase hydrocarbon saturation percentage,
- Observed odor and/or discoloration,
- Other significant observations (i.e., cementation, presence of marker horizons, mineralogy), and
- Estimated permeability.

Soil Sampling

GeoProbe® soil samples are collected from borings using hydraulic push technologies. A minimum of one and one half ft of the soil column is collected for every five ft of drilled depth. Additional soil samples can be collected near the water table and at lithologic changes. Samples are collected using samplers lined with polyethylene or brass tubes driven into undisturbed sediments at the bottom of the borehole. The ground surface immediately adjacent to the boring is used as a datum to measure sample depth. The horizontal location of each boring is measured in the field relative to a permanent on-site reference using a measuring wheel or tape measure.

Drilling equipment is steam-cleaned or washed prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Storage, Handling and Transport

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon® tape and plastic end caps and sealed in an individual zip-lock bag. Soil samples are labeled and stored at or below 4°C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

Field Screening

After a soil sample has been collected, soil from the remaining tubing is placed inside a sealed plastic bag and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a photoionization detector measures volatile hydrocarbon vapor concentrations in the bag's headspace, extracting the vapor through a slit in the plastic bag. The measurements are used along with the field observations, odors, stratigraphy and ground water depth to select soil samples for laboratory analysis.

Grab Ground Water Sampling

Ground water samples are collected from the open borehole using bailers, by advancing disposable Tygon® tubing into the borehole and extracting ground water using a diaphragm pump, or by using a hydro-punch style sampler with a bailer or tubing. The ground water samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory.

Duplicates and Blanks

Blind duplicate water samples are usually collected only for monitoring well sampling programs, at a rate of one blind sample for every 10 wells sampled. Laboratory-supplied trip blanks accompany samples collected for all sampling programs to check for cross-contamination caused by sample handling and transport. These trip blanks are analyzed if the internal laboratory quality assurance/quality control (QA/QC) blanks contain the suspected field contaminants. An equipment blank may also be analyzed if non-dedicated sampling equipment is used.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe. When required by local regulations, the borings are abandoned using chipped or pellitized bentonite.

Pre-Packed Well Installation and Surveying

Ground water monitoring wells are installed in soil borings to monitor ground water quality and determine the ground water elevation, flow direction and gradient. Well depths and screen lengths are based on ground water depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy, and State and local

regulatory guidelines. Well screens typically extend 10 to 15 feet below and 5 feet above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three feet thick.

Prior to well installation, a 2-inch rod casing with an expendable point is advanced to the desired depth. The 3-foot length pre-packed filter sections are then threaded together with the associated PVC riser and placed through the 2-inch rod casing. The pre-packed well is comprised of sand filter media housed by a stainless steel exterior and schedule-80 PVC screen inner core that is coupled together to create the desired filtered well length. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two ft above the well screen. A two feet thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I, II cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface using concrete. A stovepipe may be installed between the well-head and the vault cap for additional security. The well top-of-casing elevation is surveyed with respect to mean sea level and the well may be surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

Well Development

Wells are generally developed using a combination of ground water surging and extraction. Surging agitates the ground water and dislodges fine sediments from the sand pack. After about ten minutes of surging, ground water is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of ground water are extracted and the sediment volume in the ground water is negligible. This process usually occurs prior to installing the sanitary surface seal to ensure sand pack stabilization. If development occurs after surface seal installation, then development occurs 24 to 72 hours after seal installation to ensure that the Portland cement has set up correctly.

All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.