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MAR 0 4 2002

February 27, 2002

Barney Chan
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: **Subsurface Investigation Work Plan**
Shell-branded Service Station
540 Hegenberger Road
Oakland, California
Incident #98995752
Cambria Project #244-0414

Dear Mr. Chan:

Cambria Environmental Technology, Inc. (Cambria) is submitting this *Subsurface Investigation Work Plan* on behalf of Equiva Services LLC in response to a correspondence dated January 4, 2002. As you requested, the work plan proposes to further define the onsite extent of hydrocarbon-impacted soil and groundwater. The site background and proposed scope of work are presented below.

SITE BACKGROUND

Location: This active Shell-branded service station is located on the southeast corner of the intersection at Hegenberger Road and Edes Avenue in Oakland, California (Figure 1). The site is surrounded by commercial property. The service station layout includes a station building, two dispenser islands, and a gasoline underground storage tank (UST) complex. (Figure 2).

August 1996 Piping Repair: On August 8, 1996, Cambria collected one soil sample beneath the piping at Dispenser 1, which was being repaired (Figure 2). In this sample, 3,400 milligrams per kilogram (mg/kg) of total petroleum hydrocarbons as gasoline (TPHg) were detected, 17 mg/kg of benzene were detected, and 720 mg/kg of methyl tert butyl ether (MTBE) were reported by EPA Method 8020.

1998 Station Upgrade: In January and February 1998, Paradiso Mechanical of San Leandro, California added secondary containment beneath the existing dispensers and submersible turbine pumps. Cambria collected soil sample beneath the dispensers. The maximum concentrations of hydrocarbons reported in soil were 340 mg/kg TPHg and 3.7 mg/kg benzene beneath the western dispenser-island. During the line tightness test on February 6, 1998, a leak in the piping between

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

the USTs and the western dispenser-island was discovered and repaired on the same day. No separate-phase hydrocarbons were observed during Cambria's February 7, 1998 site visit. Based on Cambria's February 6, 1998 telephone conversation with Barney Chan of the Alameda County Health Care Services Agency (ACHCSA), additional sampling in the area of the repaired piping was not required due to a planned soil and groundwater investigation at the site.

1998 Soil Borings: On March 6, 1998, Cambria advanced five onsite soil borings, SB-1 through SB-5 (Figure 2). Boring depths ranged from 12 to 20 feet below grade (fbg). The maximum TPHg, benzene, and MTBE concentrations in soil were reported 6 fbg in boring SB-5, at 3,400 mg/kg, 39 mg/kg, and 170 mg/kg, respectively. The maximum TPHg, benzene, and MTBE concentrations in groundwater were also reported in boring SB-5, at 200,000 micrograms per liter (µg/L), 11,000 µg/L, and 1,300,000 µg/L, respectively.

1998 Groundwater Monitoring Well Installation: On July 14 and 15, 1998, Cambria installed three groundwater monitoring wells and advanced one soil boring at the site (Figure 2). MW-1 was installed to 25 fbg in boring SB-A. MW-2 and MW-3 were installed to 20 fbg in borings SB-B and SB-C, respectively. SB-D was advanced to 16 fbg. The maximum concentrations of hydrocarbons reported in soil were 460 mg/kg TPHg, 4.7 mg/kg benzene, and 240 mg/kg MTBE in boring SB-D at a depth of 5.5 fbg. The maximum concentrations of hydrocarbons reported in groundwater were 190 µg/L benzene in well MW-3, and 31,000 µg/L MTBE by EPA Method 8020 in the southwestern tank backfill well. No TPHg was detected in any of the groundwater samples. Groundwater has been monitored onsite since August, 1998.

1999-2000 Interim Remediation Efforts: Beginning July 1999, Cambria coordinated weekly groundwater extraction events from selected site wells using a vacuum truck. In June of 2000, vacuum truck operations were optimized to include extraction and treatment of soil vapors in addition to dissolved-phase hydrocarbons (dual-phase vacuum extraction). Interim remediation efforts were discontinued in December 2000 because elements of the site conceptual model indicate that the site poses a low risk to environmental and human health.

Groundwater Depth and Flow Direction: Depth to groundwater has ranged from 5.3 to 9.6 fbg since groundwater monitoring was initiated in August of 1998. Historically, groundwater flow direction has ranged from north to northeast.

2000 Site Investigation: On August 25 and September 5, 2000, Cambria drilled three offsite soil borings (SB-E, SB-F, SB-G) and installed one offsite groundwater monitoring well (MW-4). MTBE concentrations in soil samples collected during the investigation ranged from non-detect to 1.83 ppm. MTBE concentrations in groundwater samples collected from the borings ranged from 68.3 ppb (SB-F) to 58,400 ppb (SB-G).

PROPOSED SCOPE OF WORK

As requested by ACHCSA, Cambria proposes installing a monitoring well downgradient of the UST complex (Figure 2). The groundwater monitoring well will be used to monitor the effect of remediation from MW-1 and further evaluate groundwater flow direction and gradient. While possible, it is unlikely that this well will be used to for groundwater extraction purposes. We will continue to focus our remediation efforts on wells located within source areas, such as the tank backfill wells. The monitoring well will be constructed similarly to the other onsite monitoring wells (MW-1, MW-2, and MW-3) and as described in our standard field procedures for monitoring wells, included as Attachment A.

Upon ACHCSA approval of this work plan, Cambria will complete the following tasks:

Utility Location: Cambria will notify Underground Service Alert (USA) of our drilling activities. USA will have the utilities in the vicinity identified.

Permits: We will obtain the necessary permit from the Alameda County Public Works Agency for installation of one groundwater monitoring well.

Site Health and Safety Plan: We will prepare a comprehensive site specific safety plan to protect site workers. The plan will be kept onsite during field activities and signed by each site worker.

Monitoring Well Installation Activities: Using a hollow-stem auger rig, Cambria will install a 4-inch diameter well to approximately 20 fbg. Soil samples will be collected at 5-foot depth intervals for lithologic logging purposes. Selected soil samples will be submitted for chemical analysis based on field observations. Blaine Tech Services, of San Jose, California will develop the well following installation and at least 72 hours prior to sampling. Our standard field procedures for monitoring well installation are presented in Attachment A.

Laboratory Analyses: Soil samples from the boring will be analyzed for TPHg, benzene, toluene, ethylbenzene, xylenes, and MTBE by EPA Method 8260B.

Subsurface Investigation Report: After the analytical results are received, Cambria will prepare a report that, at a minimum, will contain:

- A summary of the site background and history;
- Descriptions of drilling and sampling activities;
- Well logs;
- Tabulated analytical results;
- A figure presenting the new well location;
- Analytical reports and chain-of-custody forms; and
- A discussion of hydrocarbon distribution.

CLOSING

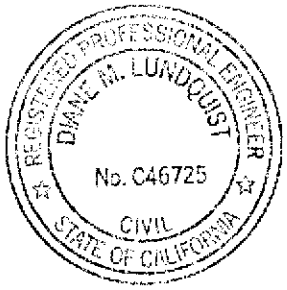
ACHCSA suggested in its January 4, 2002 letter that they do not believe continued sampling of the storm drain or canal is necessary. However, we wish to continue this quarterly sampling to monitor the condition of the nearest receptor.

Please call Diane Lundquist at (510) 420-3334 if you have any questions or comments. Thank you for your assistance.

Sincerely,
Cambria Environmental Technology, Inc.

Shannon Couch
Sr. Staff Geologist

Diane Lundquist
Principal Engineer



Figures: 1 - Vicinity/Area Well Survey Map
2 - Proposed Groundwater Monitoring Well Location

Attachment: A - Standard Field Procedures for Geoprobe Sampling and Monitoring Well Installation

cc: Karen Petryna, Equiva Services LLC, P.O. Box 7869, Burbank CA 91510-7869

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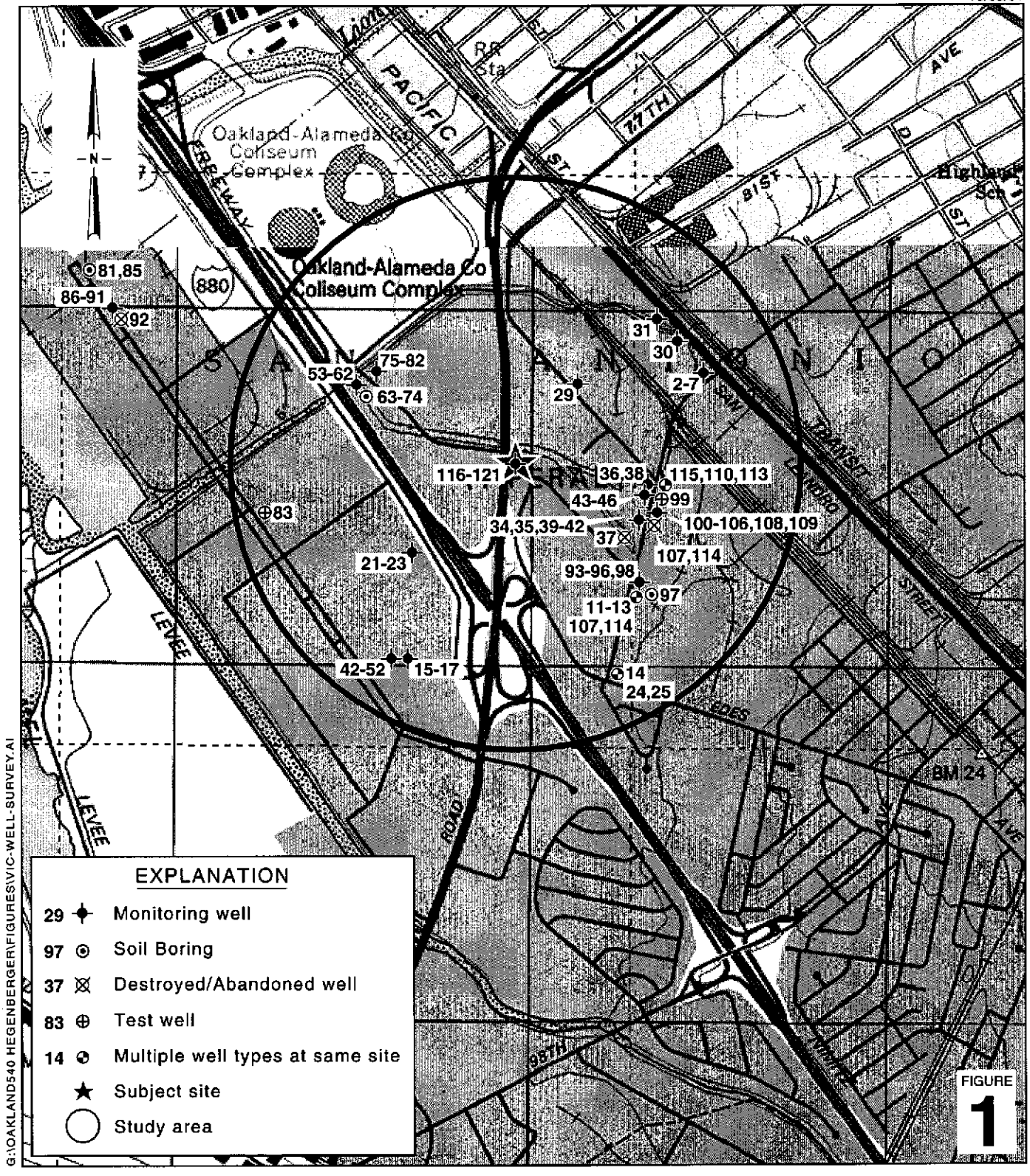

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FIGURE 1

0 1/8 1/4 1/2 1
SCALE 1:1/4 MILES

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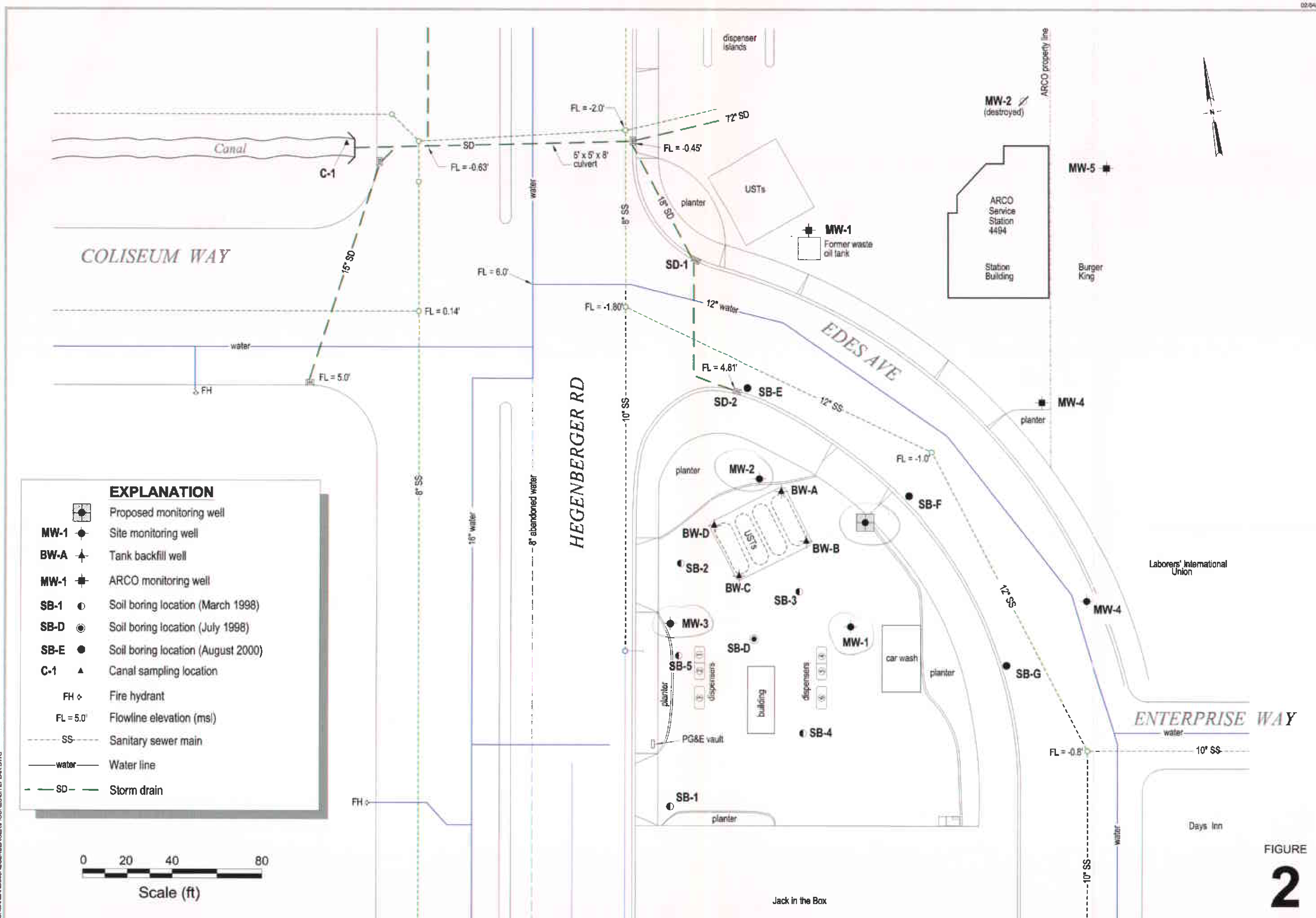
Vicinity / Area Well Survey Map
(1/2-Mile Radius)



Proposed Groundwater Monitoring Well Location

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Shell-branded Service Station
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FIGURE
2

ATTACHMENT A

Standard Field Procedures for Geoprobe Sampling and Monitoring Well Installation

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STANDARD FIELD PROCEDURES FOR INSTALLATION OF MONITORING WELLS

This document presents standard field methods for drilling and sampling soil borings and installing, developing and sampling ground water monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

SOIL BORINGS

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor or staining, and to collect samples for analysis at a State-certified laboratory. All borings are logged using the Unified Soil Classification System by a trained geologist working under the supervision of a California Registered Geologist (RG).

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or direct-push technologies such as the Geoprobe®. Soil samples are collected at least every five ft to characterize the subsurface sediments and for possible chemical analysis. Additional soil samples are collected near the water table and at lithologic changes. Samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments at the bottom of the borehole.

Drilling and sampling equipment is steam-cleaned 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 Analysis

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon tape and plastic end caps. 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

One of the remaining tubes is partially emptied leaving about one-third of the soil in the tube. The tube is capped with plastic end caps and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable volatile vapor analyzer measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. Volatile vapor analyzer measurements are used along with the field observations, odors, stratigraphy and ground water depth to select soil samples for analysis.

Water Sampling

Water samples, if they are collected from the boring, are either collected using a driven Hydropunch® type sampler or are collected from the open borehole using bailers. 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. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may 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.

MONITORING WELL INSTALLATION, DEVELOPMENT AND SAMPLING

Well Construction and Surveying

Ground water monitoring wells are installed 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 ft below and 5 ft 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 ft thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. 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 ft 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. 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 is 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.

Ground Water Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of ground water are purged prior to sampling. Purging continues until ground water pH, conductivity, and temperature have stabilized. Ground water samples are collected using bailers or pumps and 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. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.