CAMBRIA

November 30, 2000

Ms. eva chu
Alameda County Health Services Agency
1131 Harbor Bay Parkway, Suite 250
Oakland, California 94502-6700

Re: **Site Investigation Work Plan**
Shell-branded service station
8930 Bancroft Avenue
Oakland, California
Incident # 98995742
Cambria Project # 242-1408

Ms. chu:

Cambria Environmental Technology, Inc. (Cambria) is submitting this Site Investigation Work Plan on behalf of Equiva Services LLC (Equiva). In a letter dated October 2, 2000, the Alameda County Health Care Services Agency (ACHCSA) requested that Equiva submit a work plan for subsurface investigation in the downgradient direction from onsite monitoring MW-4 at the referenced site. The proposed scope of work includes the investigation of potential downgradient wells, installation of one soil boring and the completion of a site conceptual model (SCM). Summarized below are the site background and proposed scope of work.

BACKGROUND

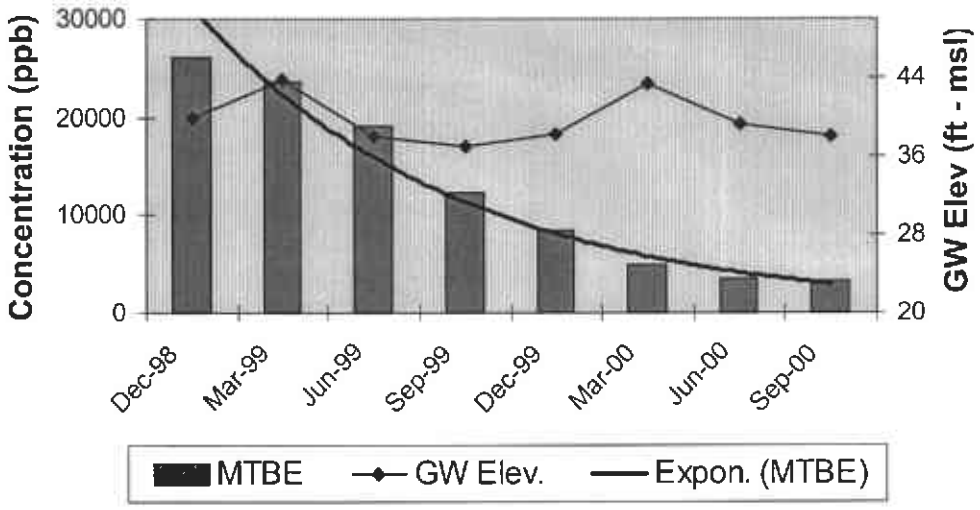
Location: The site is located at the southeast corner of the intersection of Bancroft Avenue and 90th Avenue in Oakland, California. The area surrounding the site is primarily of mixed commercial and residential use. The site is a Shell-branded service station with a station building, four dispenser islands, three USTs, and one hydraulic hoist.

Groundwater: Historically, groundwater depth onsite has ranged from approximately 7 feet below ground surface (ft bgs) to approximately 12 ft bgs. Six groundwater monitoring wells exist onsite which are monitored quarterly.

MTBE Concentrations in Monitoring well MW-4: Historically, MW-4 has contained the highest concentrations of MTBE in groundwater onsite. MTBE concentrations (by EPA Method 8260) in

MW-4 have ranged from 26,000 µg/L (parts per billion or ppb) in December 1998 to 3,300 µg/L in September 2000 and have decreased steadily over time. Groundwater extraction from MW-4 via the use of a vacuum truck was performed by Cambria from March until May 2000. The decreasing concentration of MTBE in MW-4 is illustrated in Figure A below.

Figure A
MTBE Concentrations in Groundwater
Well MW-4



Well Survey: Cambria performed a well survey to identify potential receptors within ½ mile of the site. This survey was performed using well/drilling logs provided by the California Department of Water Resources (DWR). The identified wells are listed in Table 1 and are shown on Figure 2. Based on the findings of the well survey, there may be up to five wells located in the downgradient direction which are of potential concern regarding the subject site. These wells have been identified as "irrigation/agricultural," "unknown," or "active water producing," yet the accuracy of the information provided by the DWR has not been verified at this time.

Need to confirm "active water producing" well etc.

Conduit Study: Cambria performed a subsurface conduit study of the area adjacent to the site in order to determine whether or not underground utility trenches may be serving as preferential pathways for contaminant migration migrating from the site. Cambria obtained local utility maps from the City of Oakland Public Works Department which show storm sewer and sanitary sewer conduits and their flow line elevations (in relation to mean sea level- msl). Identified subsurface conduits are shown on Figure 1.

Based on the findings, adjacent sewer conduits exist at elevations which, at times, have been near or below the elevation of the groundwater onsite. These conduits have been identified at elevations of approximately 43 to 44 feet above mean sea level (msl). Groundwater elevations onsite have fluctuated over time from approximately 37 to 45 feet msl. Based on these elevations, it is possible groundwater has previously flowed in the pervious backfill of adjacent conduits during periods of higher groundwater elevations.

PROPOSED ACTIVITIES

To better characterize any potential risk associated with the subsurface conditions of the site, Cambria recommends the following:

- The wells identified during the well survey in the downgradient direction (wells 4, 5, 8, 28, and 29) from the site will be located and their current status determined. The wells may have been abandoned or are currently out of service.

- One soil boring will be advanced, and a grab groundwater sample collected, in the area across Bancroft Avenue from MW-4. This location has been predominantly downgradient of MW-4, based on quarterly monitoring data. This will help to determine whether or not any MTBE is migrating from the site. The proposed soil boring location is shown on Figure 1. Cambria's *Standard Field Procedures for Soil Borings* are included as Attachment A.

Based on the findings of the above proposed activities, Cambria will complete a Site Conceptual Model (SCM) for the site. The SCM will provide a better understanding of the overall risk associated with the site and will help guide any further activities performed.

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CLOSING

Upon approval by your office, Cambria will proceed the activities proposed herein.

We appreciate the opportunity to work with you on this project. Please call Troy Buggle at (510) 420-3333 if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc.

Troy A. Buggle
Project Scientist

Stephan Bork, C.E.G., C.H.G.
Associate Hydrogeologist

Figures: 1 - Site Plan
2 - Well Survey

Table: 1 - Well Survey

Attachments: A - Standard Field Procedures for Soil Borings

cc: Ms. Karen Petryna, Equiva Services LLC, P.O. Box 7869, Burbank, California 90749-6249
Alameda County Case Officer, Regional Water Quality Control Board-S.F. Bay Region, 1515 Clay Street. Suite 1400, Oakland, California 95827-3098
Sidhu Associates, 8930 Bancroft Ave., Oakland, CA 94605

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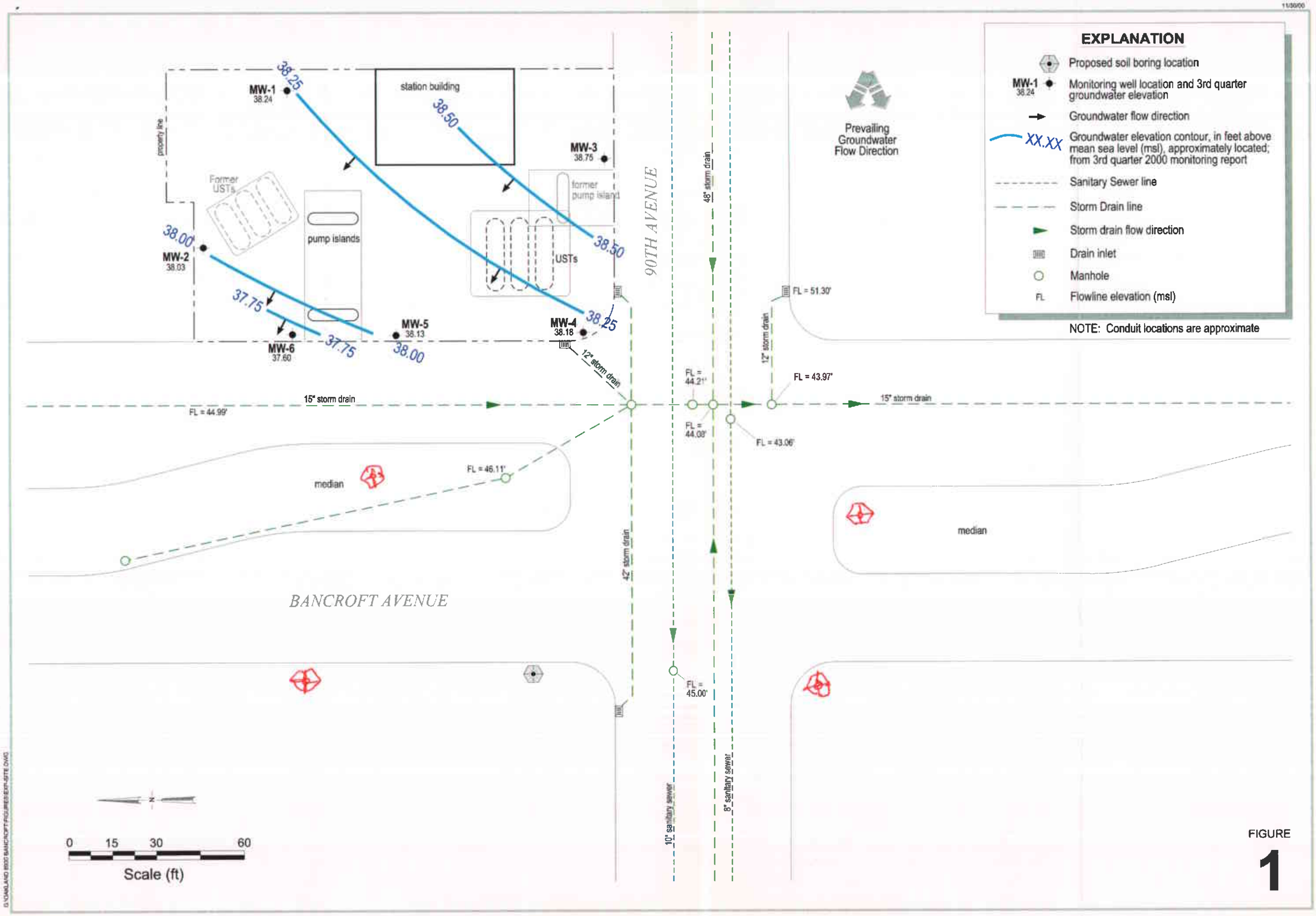
Site Plan



Shell-branded Service Station
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FIGURE
1

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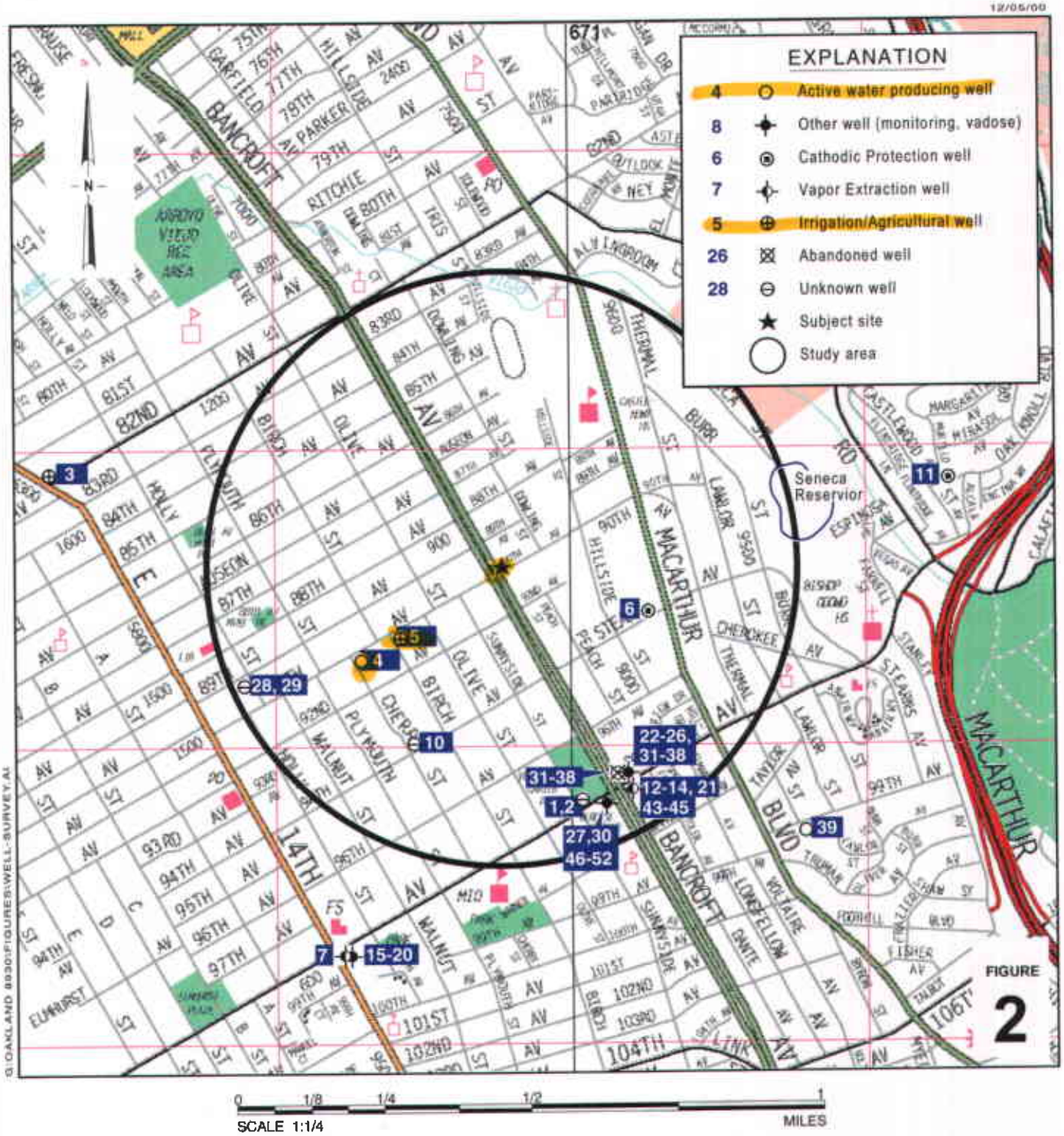

FIGURE 2

Shell-branded Service Station
8930 Bancroft Avenue
Oakland, California
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Well Survey Map
(1/2 Mile Radius)

Table 1. Well Survey - Shell-branded Service Station, Incident #98995742, 8930 Bancroft Avenue, Oakland, California.

Location	Well ID	Installation Date	Owner	Use	Depth (ft bgs)	Screened Interval (ft bgs)	Sealed Interval (ft bgs)
Well Locations provided by the State of California Water Resources Department							
1	2S/3W-23C1	Unknown	Auto Lite	Unk	120	Unknown	Unknown
2	Unknown	Unknown	Auto Lite	Unk	Unk	Unknown	Unknown
3	2S/3W-15K1	May 24, 1977	Alphense B. Perkins	Prod	Unk	Unknown	Unknown
4	2S/3W-14N1	June 1, 1977	Hueko Mills	Prod	50	20-50	0-20
5	2S/3W-14N2	October 5, 1977	Mr. Grambs	Prod	60	20-60	Unknown
6	2S/3W-14Q1	May 5, 1976	Pacific Gas & Electric	C.P.	120	Unknown	0-95
7	2S/3W-23E1	May 14, 1991	Arco Oil	Vap	9.8	4.8-9.8	0-4
8	2S/3W-20C9	October 17, 1990	Unocal Oil	Mon	46	26-46	0-22
9	2S/3W-20C10	October 17, 1990	Unocal Oil	Mon	45	25-45	0-20
10	2S/3W-23D1	April 26, 1976	Pacific Gas & Electric	Unk	120	Unknown	0-95
11	2S/3W-14J1	January 23, 1976	Pacific Gas & Electric	C.P.	120	Unknown	0-95
12	2S/3W-23C19	March 26, 1992	B. P. Oil	Vap	16.6	9-16.6	0-8
13	2S/3W-23C20	March 26, 1992	B. P. Oil	Vap	16.5	9-16.5	0-8
14	2S/3W-23C21	March 26, 1992	B. P. Oil	Vap	16.5	9-16.5	0-8
15	2S/3W23E8	January 21, 1993	Arco Oil	Mon	28.5	8.5-28.5	0-7
16	2S/3W-23E7	January 20, 1993	Arco Oil	Mon	29	9-29	0-7
17	2S/3W-23E3	July 8,1992	Arco Oil	Mon	24	9-24	0-8
18	2S/3W-23E4	July 7, 1992	Arco Oil	Mon	24	8-24	0-7
19	2S/3W-23E5	July 7, 1992	Arco Oil	Mon	24	9-24	0-7
20	2S/3W-23E6	July 8, 1992	Arco Oil	Mon	24	9-24	0-8
21	2S/3W-23C8	January 23, 1990	Unocal Oil	Mon	42	22-42	0-20
22	2S/3W-23C4	Unknown	Unocal Oil	Mon	32	7-32	0-6.5

Table 1. Well Survey - Shell-branded Service Station, Incident #98995742, 8930 Bancroft Avenue, Oakland, California.

Location	Well ID	Installation Date	Owner	Use	Depth (ft bgs)	Screened Interval (ft bgs)	Sealed Interval (ft bgs)
23	2S/3W-23C5	Unknown	Unocal Oil	Mon	30	5-30	0-4
24	2S/3W-23C6	Unknown	Unocal Oil	Mon	30	5-30	0-4
25	2S/3W-23C7	Unknown	Unocal Oil	Mon	33	7-33	0-6
26	2S/3W-23C22	August 12, 1991	Unocal Corp.	Mon	36	26-36	0-24.5
27	2S/3W-23B13	February 28, 1991	BP Oil Company	Mon	40	20-40	0-18
28	2S/3W-15R1	March 4, 1993	Pacific Bell	Unk	25	10-25	0-8.5
29	2S/3W-15R2	March 4, 1993	Pacific Bell	Unk	24	9-24	0-7
30	2S/3W-23B12	March 1, 1991	BP Oil Company	Mon	35	20-35	0-18
31	2S/3W-23C11	January 18, 1990	Unocal Oil	Mon	30	20-33	0-18
32	2S/3W-23C12	January 18, 1990	Unocal Oil	Mon	18	8-18	0-7
33	2S/3W-23C13	January 18, 1990	Unocal Oil	Mon	30	19-33	0-18
34	2S/3W-23C14	January 17, 1990	Unocal Oil	Mon	29	20-29	0-18
35	2S/3W-23C15	January 19, 1990	Unocal Oil	Mon	13	8-13	0-6.5
36	2S/3W-23C16	January 24, 1990	Unocal Oil	Mon	7	2-7	0-2
37	2S/3W-23C17	January 24, 1990	Unocal Oil	Mon	5	2-5	0-1.9
38	2S/3W-23C18	January 23, 1990	Unocal Oil	Mon	42	22-42	0-20
39	2S/3W-23B1	June 13, 1977	Mrs. Bennett	Prod	75	40-67	0-20
40	2S/3W-14J	Unknown	Union Water Co.	Unk	206	Unknown	Unknown
41	Unknown	Unknown	Union Water Co.	Unk	214	Unknown	Unknown
42	Unknown	Unknown	Union Water Co.	Unk	362	Unknown	Unknown
43	2S/3W-23B2	May 6, 1988	Mobile Oil Corp.	Mon	29	10-29	0-9
44	2S/3W-23B3	May 6, 1988	Mobile Oil Corp.	Mon	32	12-32	0-10
45	2S/3W-23B4	May 6, 1988	Mobile Oil Corp.	Mon	34	14-34	0-11.5

Table 1. Well Survey - Shell-branded Service Station, Incident #98995742, 8930 Bancroft Avenue, Oakland, California.

Location	Well ID	Installation Date	Owner	Use	Depth (ft bgs)	Screened Interval (ft bgs)	Sealed Interval (ft bgs)
46	2S/3W-23B5	June 5, 1990	BP Oil Company	Mon	35	15-35	0-18
47	2S/3W-23B6	June 5, 1990	BP Oil Company	Mon	40	20-40	0-18
48	2S/3W-23B7	June 6, 1990	BP Oil Company	Mon	35	15-35	0-18
49	2S/3W-23B8	June 6, 1990	BP Oil Company	Mon	35	15-35	0-18
50	2S/3W-23B9	June 5, 1990	BP Oil Company	Mon	40	15-40	0-15
51	2S/3W-23B10	February 27, 1991	BP Oil Company	Mon	45	20-45	0-18
52	2S/3W-23B11	February 28, 1991	BP Oil Company	Mon	35	20-35	0-18

Abbreviations & Notes:

Location = Column number referes to map location on Figure 1.
Well ID = California State well identification number as recorded by the Department of Water Resources in Sacramento, California.
Mon = Monitoring well.
Unk = Unknown.
Invs = Exploratory boring only, no well constructed.
Prod = Production well.
C.P. = Cathodic Protection Well
Vap = Vapor Extraction Well

ATTACHMENT A

Standard Field Procedures for Soil Borings

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STANDARD FIELD PROCEDURES FOR SOIL BORINGS

This document describes Cambria Environmental Technology's standard field methods for drilling and sampling soil borings. 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) or a Certified Engineering Geologist (CEG). 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 product saturation percentage,
- Observed odor and/or discoloration,
- Other significant observations (i.e. cementation, presence of marker horizons, mineralogy), and
- Estimated permeability.

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or hydraulic push technologies. At least one and one half ft of the soil column is collected for every five ft of drilled depth. 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 beyond the bottom of the borehole. The vertical location of each soil sample is determined by measuring the distance from the middle of the soil sample tube to the end of the drive rod used to advance the split barrel sampler. All sample depths use the ground surface immediately adjacent to the boring as a datum. The horizontal location of each boring is measured in the field from an onsite permanent reference using a measuring wheel or tape measure.

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 Storage, Handling and Transport

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 photoionization detector (PID) measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. PID 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.

Duplicates and Blanks

Blind duplicate water samples are collected 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 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.

Waste Handling and Disposal

Soil cuttings from drilling activities are usually stockpiled onsite on top of and covered by plastic sheeting. At least four individual soil samples are collected from the stockpiles for later compositing at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples. Soil cuttings are transported by licenced waste haulers and disposed in secure, licenced facilities based on the composite analytic results.

Ground water removed during sampling and/or rinsate generated during decontamination procedures are stored onsite in sealed 55 gallon drums. Each drum is labeled with the drum number, date of generation, suspected contents, generator identification and consultant contact. Disposal of the water is based on the analytic results for the well samples. The water is either pumped out using a vacuum truck for transport to a licenced waste treatment/disposal facility or the individual drums are picked up and transported to the waste facility where the drum contents are removed and appropriately disposed.