CAMBRIA

August 29, 2001

Mr. Barney Chan
Alameda County Health
Care Services Agency
1131 Harbor Bay Parkway
Alameda, California 94502

4017

SEP 04 2001

Re: **Site Conceptual Model and Pilot Test Report**
Shell-branded Service Station
610 Market Street
Oakland, California
Incident # 98995750
Cambria Project # 243-0594

Dear Mr. Chan:

As recommended in our February 18, 2000 *Additional Subsurface Investigation Work Plan* and stated in our May 5, 2001 *First Quarter 2001 Monitoring Report*, Cambria Environmental Technology, Inc. (Cambria) is submitting this *Site Conceptual Model and Pilot Test Report* on behalf of Equiva Services LLC. The site background, summaries of the site conceptual model, pilot test procedures and pilot test results, and our recommendations are presented below.

SITE BACKGROUND

Site Description: The site is a Shell-branded service station located on Market Street, between Sixth and Seventh Streets in Oakland, California. Currently, the site consists of a kiosk, three underground storage tanks (USTs), four dispenser islands and a drive-through car-wash facility. The area surrounding the site is primarily of commercial use (Figure 1).

Subsurface Conditions: The site is underlain primarily by silty sands to a total explored depth of 26 feet below grade (fbg). Groundwater depth onsite ranges from approximately 11 to 13 fbg.

1995 Site Renovation: In August 1995, Weiss Associates (Weiss) of Emeryville, California collected soil samples from beneath the gasoline dispensers and product piping locations during station renovation activities. The renovation activities included the replacement of the gasoline dispensers and some of the product piping. A total of approximately 48 cubic yards of soil were removed during the renovations, 15 cubic yards of which were over-excavated due to impact by petroleum hydrocarbons. The details and results of this investigation are summarized in the November 2, 1995 *Dispenser Replacement Sampling* report, prepared by Weiss.

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1998 Site Upgrade: In March 1998, site upgrades were performed by Paradiso Mechanical of San Leandro, California (Paradiso). Paradiso added secondary containment to the turbine sumps in the USTs. Cambria inspected the turbine sumps and UST area, and no field indications of petroleum hydrocarbons, such as staining or odor, were observed during the site visit. Based on the field observations, no soil sampling was performed during the site upgrade activities. The details of these activities are summarized in Cambria's *1998 Site Upgrade Inspection Report* dated March 30, 1998.

March 1998 Site Investigation: On March 31, 1998, Cambria conducted a subsurface investigation at the facility which included the installation of three soil borings onsite using a Geoprobe® direct push drill rig. Less than 2 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene and xylenes (BTEX), and methyl tertiary butyl ether (MTBE) were detected in analyzed soil samples from soil borings SB-A, SB-B, and SB-C. A maximum of 2,100 parts per billion (ppb) TPHg, 490 ppb benzene, and 14,000 ppb MTBE were detected in grab groundwater samples collected from soil borings SB-A and SB-B. Concentrations of TPHg, BTEX, and MTBE were below laboratory detection limits in the grab groundwater sample collected from soil boring SB-C. The details of this investigation are summarized in Cambria's *Subsurface Investigation Report*, dated July 1, 1998.

November 1998 Subsurface Investigation: On November 17, 1998, Cambria performed additional subsurface investigation activities which included the installation of three groundwater monitoring wells onsite (MW-1, MW-2, and MW-3). Up to 1,700 ppm TPHg, 8.3 ppm benzene, and 16 ppm MTBE were detected in the soil sample collected from the capillary fringe at a depth of 10.5 feet in MW-3. 8.3 ppm TPHg and 2.9 ppm MTBE were detected in the soil sample collected at a depth of 5.5 feet in MW-2. No benzene was detected in the analyzed soil samples collected from well MW-2. No TPHg, BTEX, or MTBE were detected in the analyzed soil samples collected from well MW-1. Groundwater monitoring began at the site in the fourth quarter 1998. The details of this investigation are summarized in Cambria's *Well Installation Report*, dated April 20, 1999.

Groundwater Monitoring: Quarterly groundwater monitoring has been ongoing at his site since the fourth quarter of 1998. Concentrations in well MW-1 have ranged from 965 ppb to 6,150 ppb TPHg, 20 ppb to 190 ppb benzene, and up to 110 ppb MTBE. Well MW-2 has contained concentrations ranging from below detection limits to 101 ppb TPHg, below detection limit to 183 ppb benzene, and 3,440 ppb to 15,000 ppb MTBE. Well MW-3 concentrations have ranged from 19,300 ppb to 44,500 ppb TPHg, 536 ppb to 1,200 ppb benzene, and 38,500 ppb to 610,000 ppb MTBE (confirmed by EPA method 8260). Presently, the extent of petroleum hydrocarbons in soil and groundwater is undefined at this site, particularly in the downgradient direction. The results of quarterly monitoring events are summarized in quarterly monitoring reports prepared by Cambria.

Mobile DVE Vacuum Extraction Treatment (DVE): From March to October 2000, Cambria coordinated mobile DVE from wells MW-2 and MW-3. DVE removes soil vapors and separate-phase hydrocarbons from the vadose zone and enhances groundwater removal from remediation or monitoring wells. Mobile DVE equipment consists of a dedicated extraction "stinger" installed in the extraction well, a vacuum truck, and a carbon vapor treatment system. Groundwater generated during mobile DVE is stored in the vacuum tank truck and transported offsite. Vapors extracted during mobile DVE are remediated by the carbon vapor treatment system. Due to low groundwater-extraction volumes and high rate of carbon breakthrough, mobile DVE was discontinued, and a DVE pilot test using an internal combustion engine (ICE) for vapor abatement was recommended.

SITE CONCEPTUAL MODEL (SCM) DEVELOPMENT

Using historical site information and the conduit study and sensitive receptor survey results described below, Cambria prepared an SCM for the site. The SCM is included in Attachment A.

Conduit Study

A utility conduit survey was conducted to determine the location of potential preferential pathways beneath the site vicinity. Conduit trenches are often back-filled with materials which are more permeable than the surrounding native soils, therefore providing a path of least resistance for petroleum hydrocarbon migration. The utility survey consisted of reviewing maps and plans acquired from the City of Oakland Engineering Department, East Bay Municipal Utility District (EBMUD) and Pacific Gas and Electric Company, and conducting a site visit to identify underground utilities in the vicinity. The identified locations of sanitary sewer, storm drain, electrical, water, natural gas, and electric utility lines are shown on Figure 2.

Utility survey results indicate that Market Street is underlain by two southward flowing, 10-inch diameter sanitary sewer pipes and a 30-inch, southward flowing storm drain, as well as water, gas and electrical lines (see Figure 2). A westward-flowing sanitary sewer line, and water, gas and electrical utility lines are located beneath 7th Street east of Market Street. An eastward-flowing storm drain and two eastward-flowing, 8-inch diameter sanitary sewer lines, as well as water, gas and electrical utility lines are located beneath 7th Street west of Telegraph Avenue.

Based on discussions with Debra Braxton of EBMUD, the water main pipes are typically buried to a depth of approximately 8.0 feet to the top of the pipe. Depth to water at the site has ranged from 10.0 to 15.4 fbg historically. Depths of the electrical and gas lines could not be determined from available information, but are typically shallow in depth and narrow in width. Telephone

lines, although not identified in the conduit study, are typically shallow as well. Therefore, water, electric, gas and telephone lines in the area are not likely to encounter groundwater at the site.

Flow line elevations of the sanitary sewer and storm drain lines in the vicinity range between 2.8 feet above mean sea level (amsl) and 12.1 feet amsl (see Figure 2). Historically, groundwater elevation at the site has ranged from 6.3 feet amsl to 9.8 feet amsl. Therefore, the sanitary sewer and storm drain lines identified may be, at least seasonally, deeper than the groundwater surface and may affect groundwater flow. However, the typical flow direction at the site is south to southwest, and the storm drain line identified southwest of the site has a flow line elevation of 12.1 feet amsl, which is above the typical groundwater elevation at the site. Based on this, groundwater would not be affected by the storm drain line located southwest of the site.

Sensitive Receptor Survey

To evaluate the presence of sensitive receptors in the vicinity of the site, Cambria attempted to identify wells and surface water bodies which may be impacted by subsurface conditions onsite.

To locate records of municipal and private wells in the site vicinity, well information for a ½-mile radius of the site was requested from the California Department of Water Resources (DWR). The DWR provided over 100 well completion report forms or equivalents, many of which included multiple wells. Forms were provided for one irrigation well, two unidentified wells, one cathodic protection well and one destroyed well (see Table 1 and Attachment B). Review of the location information indicates that only one well of unknown use, located approximately 2,600 feet southeast of the site, and one destroyed well, located approximately 1,700 feet northeast of the site, are within the ½-mile radius (see Figure 1). The remaining forms represent approximately 150 monitoring wells (including destroyed monitoring wells) which were not mapped by Cambria.

Based on a review of the USGS Oakland West Quadrangle topographic map, the nearest surface water body is the Inner Harbor of the San Francisco Bay, located approximately ½-mile south of the site. No other surface water bodies exist within the ½-mile survey radius.

PILOT TEST SUMMARY

Quarterly monitoring and mobile DVE data suggested that a DVE pilot test on well MW-3 and a soil vapor extraction (SVE) pilot test on tank backfill well T-1 might achieve favorable results. The objectives of the pilot tests were to evaluate the feasibility of each technology and to obtain system design data. The DVE remedial approach was selected for well MW-3 to assess enhanced

groundwater recovery through DVE and hydraulic control, as well as source area remediation through vapor extraction. Because the groundwater table has been historically below the bottom of the USTs, the SVE remedial approach was selected for backfill well T-1 to assess source area remediation through vapor extraction. Cambria notified the Bay Area Air Quality Management District of the test on March 19, 2001. On March 22, 2001, Cambria performed short-term DVE testing of existing monitoring well MW-3 and short-term SVE testing of backfill well T-1. Each well was tested for approximately 3 hours, at two different extraction rates.

assumes Tank pit is source. possible Shortcoming

DVE Pilot Test Procedures: Due to the high rate of carbon breakthrough noted during mobile DVE conducted at the site, an ICE was used for vapor abatement during the DVE pilot test. The ICE was set to operate at a constant revolutions-per-minute (rpm) rate to yield a constant vacuum and airflow rate. The rpm rate was then adjusted to observe the differences in operating conditions and yield of the formation. Throughout the DVE test, Cambria measured extracted groundwater volume, applied vacuum, air flow, vapor concentration, and groundwater drawdown and vacuum influence in nearby wells. Groundwater and vapor samples were collected and analyzed to estimate mass removal quantities. All samples were analyzed for TPHg, MTBE, BTEX by EPA Method 8260. Groundwater recharge data was also collected from well MW-3 at the end of the test.

SVE Pilot Test Procedures: Throughout the SVE test, Cambria measured applied vacuum, airflow, vapor concentration, and vacuum influence in nearby wells. Vapor samples were collected for laboratory analysis. All samples were analyzed for TPHg, MTBE and BTEX by EPA Method 8260.

Pilot Testing Equipment: The test was performed by connecting a Remediation Services International model V3 ICE to the test well for extracting groundwater and/or soil vapor. The ICE is equipped with a separator tank to partition the liquid and vapor streams. The ICE was powered by the extracted soil vapors, supplemented with liquid propane gas. By burning the extracted soil vapors as fuel, the ICE also served as a vapor abatement device. The ICE is equipped with a Phoenix 1000 controller, which measured applied vacuum and vapor extraction flow rates.

A Horiba model MEXA554JU organic vapor analyzer was used to field measure hydrocarbon concentrations in the vapor stream. A Thomas Industries model 907CDC18F vacuum pump was used to collect vapor samples in one-liter tedlar bags. Magnehelic differential pressure gauges were used to monitor vacuum induced in nearby wells. A 12-volt transfer pump, activated by liquid level switches, variably discharged water in the separator tank to an on-site storage tank. The discharged water volume was measured using a Great Palm Industries electronic digital meter. The groundwater sample was collected from well MW-3 using a disposable bailer and was stored for laboratory analysis in 40-milliliter volatile organic analytes vial preserved with hydrochloric acid.

A water-level indicator was used to periodically monitor groundwater drawdown in nearby wells and measure groundwater recharge in the extraction well.

PILOT TEST RESULTS

The DVE pilot test was started at 9:05 and stopped at 12:00 hours. The SVE test was started at 13:00 and stopped at 15:40 hours. The test data is presented in Tables 2 and 3. Laboratory analytical results are included as Attachment C. Field data sheets are included as Attachment D.

Well MW-3 Liquid-Phase Results:

- TPHg, benzene, and MTBE groundwater concentrations were reported as <20,000, <200, and 390,000 ppb, respectively, for the groundwater sample from well MW-3. This sample was collected at 13:20 hours.
- Extraction flow rates ranged from 0 gallons per minute (gpm) to 7.20 gpm, with an average of 2.19 gpm. Advanced Cleanup Technologies Inc (ACTI) was retained to off-haul and dispose of the groundwater extracted during the test. On March 22, 2001, ACTI picked up the 383 gallons of groundwater generated from the DVE test. All groundwater off-hauled by ACTI was recycled at the Martinez Refinery Corporation in Martinez, California.
- Based on the extracted groundwater volumes and the groundwater sample analytical results, the TPHg, benzene, and MTBE liquid-phase mass removal over the test period was estimated at 0.032, 0, and 1.25 pounds, respectively (Table 2).
- Monitoring well MW-2, located approximately 85 feet from well MW-3, was used to measure hydraulic influence. No groundwater drawdown was observed. Groundwater recharge data from well MW-3 was collected at the end of the test, for a period of eight minutes. The water column recovered approximately 76% over that period of time.

Groundwater extraction (GWE) data from the DVE pilot test suggests liquid-phase petroleum hydrocarbon recovery is feasible. A total of 383 gallons of groundwater was extracted over the three-hour test period, equating to 2.19 gallons per minute or 3,153 gallons per day. Based on the test data, maximum liquid-phase mass removal is projected at approximately 0.264 lbs/day for TPHg and 10.3 lbs/day for MTBE. Hydraulic influence was not observed at the closest available observation point approximately 85 feet from the extraction well. It does not appear that DVE enhanced groundwater recovery from the test well. Previous GWE data compared with the DVE test data did not show a significant difference.

Well MW-3 Vapor-Phase Results:

- TPHg, benzene, and MTBE vapor concentrations were reported as 2,800, 10, and 2,100 parts per million by volume (ppmv), respectively, in the first vapor sample collected from well MW-3 at 09:35 hours. TPHg, benzene, and MTBE concentrations were reported as 3,000, 10, and 2,600 ppmv, respectively, in the second vapor sample collected from well MW-3 at 10:45 hours.
- At 2,000 rpms, vapor extraction flow rates ranged from 2 cubic feet per minute (cfm) to 4 cfm, based on an applied vacuum of approximately 250 inches of water. At 1,500 rpms, vapor extraction flow rates ranged from 8 cfm to 22 cfm, based on an applied vacuum ranging from 87 to 270 inches of water.
- Based on these operating parameters and the vapor sample analytical results, the TPHg, benzene, and MTBE vapor-phase mass removal over both test periods was estimated at 1.26, 0.005, and 1.10 pounds, respectively.
- Backfill wells T-1 and T-2 were used to measure vacuum influence. Tank backfill well T-1 is located approximately 15 feet from well MW-3, and tank backfill well T-2 is located approximately 25 feet from well MW-3. No vacuum influence was observed. — Short circuiting?

Vapor extraction data from the DVE pilot test indicates vapor-phase petroleum hydrocarbon recovery is possible from well MW-3. Moderate airflow rates were obtained during the test at the lower rpm setting. Vacuum influence was not measurable in observation wells, which was expected given the low estimated permeability soil within the vicinity of the extraction well. The test well yielded relatively high TPHg and MTBE vapor concentrations. Based on the test data, maximum vapor-phase mass removal is projected at 21.2 pounds per day (lbs/day) for TPHg and 18.8 lbs/day for MTBE.

Tank Backfill Well T-1 Vapor-Phase Results:

- TPHg, benzene, and MTBE vapor concentrations were reported as 6,300, 42, and 4,400 ppmv, respectively, in the first vapor sample collected from backfill well T-1 at 13:05 hours. TPHg, benzene, and MTBE concentrations were reported as 5,000, 39, and 8,700 ppmv, respectively, in the second vapor sample collected from backfill well T-1 at 15:25 hours.
- At 1,750 rpms, vapor extraction flow rates were sustained at 3 cfm, based on an applied vacuum ranging from 5 to 15 inches of water. At 2,500 rpms, vapor extraction flow rates ranged from 3 to 10 cfm, based on an applied vacuum ranging from 3 to 21 inches of water.
- Based on these operating parameters and the vapor sample analytical results, the TPHg, benzene, and MTBE vapor-phase mass removal over both test periods was estimated at 0.703, 0.005, and 0.983 pounds, respectively.

- Monitoring well MW-3 and backfill well T-2 were used to measure vacuum influence. Well MW-3 is located approximately 15 feet from tank backfill well T-1, and tank backfill well T-2 is located approximately 30 feet from tank backfill well T-1. A maximum vacuum of 0.04 inches of water was measured in well MW-3. A maximum vacuum of 0.3 inches of water was measured in tank backfill well T-1.

Vapor extraction data from the SVE pilot test indicates vapor-phase petroleum hydrocarbon recovery is possible from backfill well T-1. Low airflow rates were obtained during the test. However, the test well yielded relatively high TPHg and MTBE vapor concentrations. The ICE controller restricted airflow from the well due to the high concentrations. The controller regulates an air to fuel ratio necessary to operate the ICE. The extracted vapor concentrations required considerable dilution air to keep the ICE at the appropriate air-to-fuel ratio. Given the high estimated permeability soil (pea gravel) within the UST facility, a higher airflow rate can be expected from the formation than the airflow rate obtained during the test. Observation of vacuum influence in backfill well T-2 verifies the high permeability and supports the assumption of the availability of a high airflow rate from the formation. Based on the test data, maximum vapor-phase mass removal is projected at 16 lbs/day for TPHg and 28.6 lbs/day for MTBE.

RECOMMENDATIONS

Additional Subsurface Investigation

A January 21, 2000 letter from the Alameda County Health Care Sevices Agency requested a work plan to define the vertical and lateral extent of hydrocarbons originating from the site. In response to the request, Cambria submitted a February 18, 2000 *Additional Subsurface Investigation Work Plan* proposing the installation of two groundwater monitoring wells within 6th Street, southwest of the site. In the *Fourth Quarter 2000 Monitoring Report* and the *First Quarter 2001 Monitoring Report*, Cambria recommended an evaluation of whether the previously proposed downgradient monitoring wells were warranted based on the SCM, and DVE and SVE pilot test activities conducted at the site.

The sensitive receptor survey presented herein identified one well of unknown use located approximately ½-mile southeast of the site. The only surface water body identified is the Inner Harbor, located approximately ½-mile south of the site. The only conduit identified downgradient of the site which typically encounters groundwater is a southwestward-flowing, 10-inch diameter sanitary sewer line. Based on the SCM developed for the site using this information, there are no significant sensitive receptors in the vicinity of the site. Furthermore,

based on the proximity of the site to the San Francisco Bay, shallow-groundwater use is likely to be limited by total dissolved solid concentrations.

6th Street is approximately 60 feet in width, including the sidewalk adjacent to the site, and is underlain by several shallow utilities. Immediately south of 6th Street is an elevated off-ramp for State Highway 880. Because of this configuration, the furthest point downgradient of well MW-3 available for well installation without crossing Highway 880 would be approximately 55 feet southwest, which is not likely to provide significant plume definition. Based on the lack of sensitive receptors in the vicinity of the site and the unlikelihood of useful data being produced by monitoring wells located within 55 feet of well MW-3, we recommend not proceeding with the scope of work described in our February 18, 2000 work plan at this time. We do, however, recommend proceeding with a long-term SVE pilot test and weekly GWE as described below.

Recommend at least one downgradient well.

SVE Pilot Test

Although test results indicate chemical recovery by DVE is possible, recovery by DVE may be limited. The low estimated permeability soil limits groundwater production and hydraulic influence. Installation of a DVE system could cost as much as $150,000, contingent on permitting issues, availability of utilities, equipment fabrication, etc. Operation and maintenance of a DVE system could cost as much as $60,000 annually. Without the ability to process an adequate water volume and achieve hydraulic control over a significant area, the expected recovery does not justify the cost of a permanent DVE system.

The SVE pilot test field data indicates that source area remediation may be viable through vapor extraction. However, vapor-phase mass removal from well MW-3 appears to be limited by the low permeable soil. Additionally, it is not readily discernible if the vapor concentrations measured from backfill well T-1 would be sustained over a longer period of time. Installation of a SVE system could cost as much as $100,000, contingent on permitting issues, availability of utilities, equipment fabrication, etc. Operation and maintenance of a SVE system could cost as much as $45,000 annually.

To determine the viability of SVE as a remedial alternative and justify the cost of a SVE system, additional testing is necessary to determine if vapor concentrations in the vicinity of the UST facility would be sustained. Based on the test data and conclusions presented, Cambria recommends conducting a long-term (5-day) SVE test on backfill well T-1. The proposed long-term SVE test would be conducted using the same equipment, and employ a similar protocol as the short-term test. Operating parameters will be based on the short-term test data and field conditions.

If the affects UST/ piping or monitoring sensors.

Mobile GWE

Concurrent with SVE pilot test activities, we recommend conducting mobile GWE on a weekly basis beginning in August 2001. Groundwater will be extracted from well MW-3 and potentially well MW-2. Groundwater mass removal data will be presented in forthcoming quarterly monitoring reports, and continued GWE will be based on extracted groundwater volumes and groundwater concentration trends.

CLOSING

Please call Jacquelyn Jones at (510) 420-3316 if you have any questions.

Sincerely,
Cambria Environmental Technology, Inc.

Stephan A. Bork

for: Dan Lescure
Project Engineer

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

REGISTERED GEOLOGIST
STEPHAN A. BORK
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STATE OF CALIFORNIA

Figures: 1 - Area Well Survey
2 - Underground Utility Locations

Tables: 1 - Well Survey Results
2 - Groundwater Extraction – Mass Removal Data
3 - Vapor Extraction - Mass Removal Data

Attachments A - Site Conceptual Model
B - Well Driller's Report Forms
C - Analytical Results
D - Field Data Sheets

cc: Karen Petryna, Equiva Services LLC, P.O. Box 7869, Burbank, California 91501-7869
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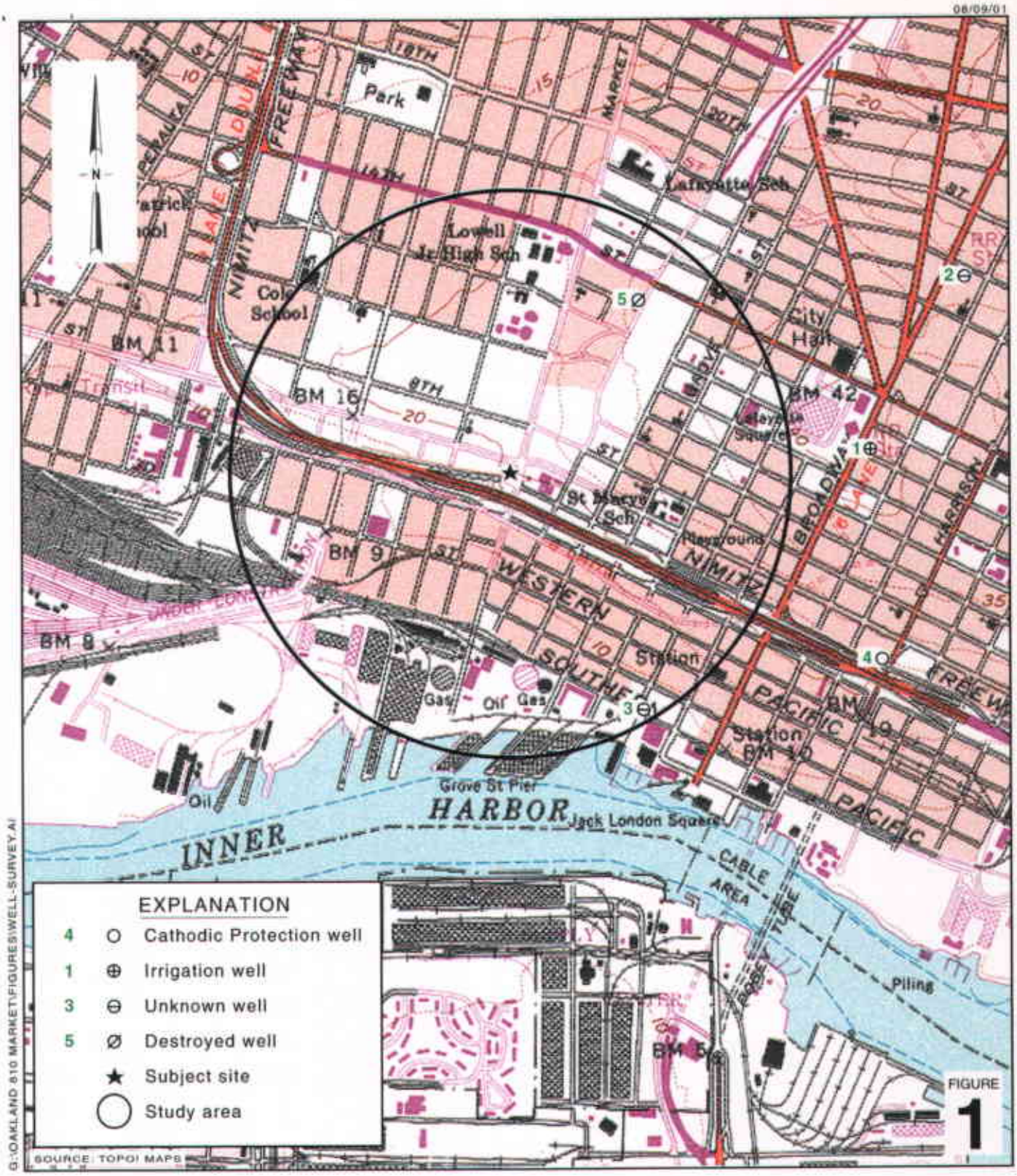

Shell-branded Service Station
610 Market Street
Oakland, California
Incident #98995750

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Area Well Survey

1/2 Mile Radius

05/29/01

Underground Utility Locations

0 20 40

Scale (ft)

EXPLANATION

MW-1	Monitoring well installed November 17, 1998
SB-B	Geoprobe boring drilled March 31, 1998
T1	Tank backfill well
	Storm Drain line
	Sanitary Sewer line
	Water Main
	Gas line
	Electrical line
	Flow direction
F.L. = 5.6	Flowline elevation, above mean sea level
MH	Manhole

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Shell-branded Service Station
610 Market Street
Oakland, California
Incident #98995750

FIGURE
2

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Table 1. Well Survey Results - Shell-branded Service Station, 610 Market Street, Oakland, California. Incident # 98995756

Map ID	Well ID	Installation Date	Owner	Use	Depth (fbg)	Screened Interval (fbg)	Sealed Interval (fbg)
1	1S/4W-3SF12	Sept. 23, 1990	Bramela Pacific, Inc	IRR	480	180-240, 300-340, 360-380, 430-470	0 to 90
2	1S/4W-35R	Unknown	Leamington Hotel	UNK	175	Unknown	Unkown
3	1S/4W-35N1	Feb. 2, 1955	Division of Highways	UNK	140	Unknown	Unkown
4	1S/4W-35Q	May 30, 1973	Pacific Gas and Electric	CATH	120	Unknown	0-90
5	1S/4W-35C7	Unknown	Unknown	DES	55	Unknown	0-55

Well information provided by the State of California Department of Water Resources

Notes and Abbreviations:

Map ID = Column number refers to map location on Figure 1
Well ID = California State well identification number as recorded by the Department of Water Resources in Sacramento, California
fbg = feet below grade
UNK = Unknown
CATH = Cathodic Protection
DES = Destroyed Well

Table 2: Groundwater Extraction - Mass Removal Data - Shell-branded Service Station, Incident #98995750, 610 Market Street, Oakland, California

Date Purged	Well ID	Volume Pumped (gal)	Cumulative Volume Pumped (gal)	Flow Rate (gpm)	TPPH Conc. (ppb)	TPPH Removed (lb)	TPPH Removed To Date (lb)	Benzene Conc. (ppb)	Benzene Removed (lb)	Benzene Removed to Date (lb)	MTBE Conc. (ppb)	MTBE Removed (lb)	MTBE Removed To Date (lb)
					TPPH			**Benzene**			**MTBE**		
03/22/01	MW-3	**Dual-phase Vacuum Extraction (DVE) Pilot test using a RSI V3 Internal Combustion Engine with Bioslurp Tank**											
9:05	(RPM=2,000)	0	0			0.000	0.000		0.000	0.000		0.000	0.000
9:10		13	13	2.60		0.001	0.001		0.000	0.000		0.042	0.042
9:15		13	26	2.60		0.001	0.002		0.000	0.000		0.042	0.085
9:20		29	55	5.80		0.002	0.005		0.000	0.000		0.094	0.179
9:35		18	73	1.20	**<20,000**	0.002	0.006	**<200**	0.000	0.000	**390,000**	0.059	0.238
9:50		37	110	2.47		0.003	0.009		0.000	0.000		0.120	0.358
10:05		36	146	2.40		0.003	0.012		0.000	0.000		0.117	0.475
10:35		55	201	1.83		0.005	0.017		0.000	0.000		0.179	0.654
10:45	(RPM=1,5000)	0	201	0.00		0.000	0.017		0.000	0.000		0.000	0.654
10:50		36	237	7.20		0.003	0.020		0.000	0.000		0.117	0.771
11:00		19	256	1.90		0.002	0.021		0.000	0.000		0.062	0.833
11:15		36	292	2.40		0.003	0.024		0.000	0.000		0.117	0.950
11:30		38	330	2.53		0.003	0.028		0.000	0.000		0.124	1.074
11:45		0	330	0.00		0.000	0.028		0.000	0.000		0.000	1.074
12:00		53	383	3.53		0.004	0.032		0.000	0.000		0.172	1.246
Total Gallons Extracted:			**383**		**Total Pounds Removed:**		**0.032**			**0.000**			**1.246**
					Total Gallons Removed:		**0.005**			**0.000**			**0.201**

Table 2: Groundwater Extraction - Mass Removal Data - Shell-branded Service Station, Incident #98995750, 610 Market Street, Oakland, California

					TPPH			Benzene			MTBE		
Date Purged	Well ID	Volume Pumped (gal)	Cumulative Volume Pumped (gal)	Flow Rate (gpm)	TPPH Conc. (ppb)	TPPH Removed (lb)	TPPH Removed To Date (lb)	Benzene Conc. (ppb)	Benzene Removed (lb)	Benzene Removed to Date (lb)	MTBE Conc. (ppb)	MTBE Removed (lb)	MTBE Removed To Date (lb)

Abbreviations & Notes:

TPPH = Total purgeable hydrocarbons as gasoline
MtBE = Methyl tert-butyl ether
µg/L = Micrograms per liter
ppb = Parts per billion, equivalent to µg/L
lb = Pound
SPH = Separate phase hydrocarbons
L = Liter
gal = Gallon
g = Gram
* = Groundwater volume pumped estimated; data not available
RPM = Revolutions per minute
Mass removed based on the formula: volume extracted (gal) x Concentration (µg/L) x (g/10^6µg) x (pound/453.6g) x (3.785 L/gal)
Volume removal data based on the formula: density (in gms/cc) x 9.339 (ccxlbs/gmsxgals)
TPPH and benzene analyzed by EPA Method 8015/8020
MTBE data in bold font analyzed by EPA Method 8260, all other MTBE analyzed by EPA Method 8020
Concentrations based on most recent groundwater monitoring results
If concentrations are below laboratory detection limits, one half the detection limit is used for mass removal calculations.
Groundwater extracted by vacuum trucks provided by ACTI; water disposed of at a Martinez refinery

Table 3: Vapor Extraction - Mass Removal Data - Shell-branded Service Station, Incident #98995750, 610 Market Street, Oakland, CA

Date	Well ID	Interval Hours of Operation (hours)	System Flow Rate (CFM)	Hydrocarbon Concentrations (Concentrations in ppmv) TPHg	Benzene	MTBE	TPHg Removal Rate (#/hour)	TPHg Cumulative TPHg Removed (#)	Benzene Removal Rate (#/hour)	Benzene Cumulative Benzene Removed (#)	MTBE Removal Rate (#/hour)	MTBE Cumulative MTBE Removed (#)
							TPHg		**Benzene**		**MTBE**	
03/22/01	MW-3	**Dual-phase Vacuum Extraction (DVE) Pilot Test using a RSI V3 Internal Combustion Engine with Bioslurp Tank**										
9:05	RPM=2000	0.000	3				0.112	0.000	0.000	0.000	0.086	0.000
9:10		0.083	3	1,642			0.112	0.009	0.000	0.000	0.086	0.007
9:15		0.083	3	18,600			0.112	0.019	0.000	0.000	0.086	0.014
9:20		0.083	3	14,120			0.112	0.028	0.000	0.000	0.086	0.021
9:35		0.250	3	**2,800**	**10**	**2,100**	0.112	0.056	0.000	0.000	0.086	0.043
9:50		0.250	4	9,350			0.150	0.093	0.000	0.000	0.115	0.072
10:05		0.250	3	12,820			0.112	0.122	0.000	0.000	0.086	0.093
10:35		0.500	2	7,160			0.075	0.159	0.000	0.001	0.057	0.122
10:45	RPM=1500	0.167	12	**3,000**	**10**	**2,600**	0.481	0.239	0.001	0.001	0.427	0.193
10:50		0.830	12	8,470			0.481	0.639	0.001	0.002	0.427	0.547
11:00		0.167	13	6,150			0.521	0.726	0.002	0.002	0.462	0.625
11:15		0.250	14	10,240			0.561	0.866	0.002	0.003	0.498	0.749
11:30		0.250	8	1,745			0.321	0.946	0.001	0.003	0.285	0.820
11:45		0.250	9	18,270			0.361	1.04	0.001	0.003	0.320	0.900
12:00		0.250	22	6,410			0.882	1.26	0.003	0.004	0.782	1.10
03/22/01	T-1	**Soil Vapor Extraction (SVE) Pilot Test using a RSI V3 Internal Combustion Engine**										
13:00	RPM=1750	0.000	3				0.253	0.000	0.002	0.000	0.181	0.000
13:05		0.083	3	**6,300**	**42**	**4,400**	0.253	0.021	0.002	0.000	0.181	0.015
13:10		0.083	3	36,620			0.253	0.042	0.002	0.000	0.181	0.030
13:15		0.083	3	34,870			0.253	0.063	0.002	0.000	0.181	0.045
13:30		0.250	3	35,250			0.253	0.126	0.002	0.001	0.181	0.090
13:45		0.250	3	35,820			0.253	0.189	0.002	0.001	0.181	0.135
14:00		0.250	3	34,480			0.253	0.252	0.002	0.002	0.181	0.180
14:15	RPM=2500	0.250	3	35,150			0.201	0.303	0.001	0.002	0.357	0.270

Table 3: Vapor Extraction - Mass Removal Data - Shell-branded Service Station, Incident #98995750, 610 Market Street, Oakland, CA

14:20	0.083	3	33,340			0.201	0.319	0.001	0.002	0.357	0.299
14:25	0.083	3	35,010			0.201	0.336	0.001	0.002	0.357	0.329
14:40	0.250	3	32,670			0.201	0.386	0.001	0.002	0.357	0.418
14:55	0.250	3	31,060			0.201	0.436	0.001	0.003	0.357	0.507
15:10	0.250	3	31,390			0.201	0.486	0.001	0.003	0.357	0.597
15:25	0.250	3	**5,000**	**39**	**8,700**	0.201	0.536	0.001	0.004	0.357	0.686
15:40	0.250	10	32,000			0.668	0.703	0.005	0.005	1.19	0.983
Total Pounds Removed:						**TPHg =**	**<1.961**	**Benzene =**	**<0.009**	**MTBE =**	**2.08**

Abbreviations and Notes:

CFM = Cubic feet per minute

TPHg = Total petroleum hydrocarbons as gasoline (C6-C12) by modified EPA Method 8015 in 1 liter tedlar bag samples

ppmv = Parts per million by volume

= Pounds

Bold = Sample concentrations from Lab analysis; Grayscale = field measured concentrations by a Horiba OVA

TPHG, Benzene, and MTBE analyzed by EPA Method 8015/8020 in 1 liter tedlar bag samples

TPHg / Benzene / MTBE removal rate = Rate based on Bay Area Air Quality Management District's Manual of Procedures for Soil Vapor Extraction dated July 17, 1991.
(Rate = Concentration (ppmv) x system flow rate (cfm) x (1lb-mole/386ft3) x molecular weight (86 lb/lb-mole for TPHg, 78 lb/lb-mole for benzene, 88 lb/lb-mole for MTBE) x 60 min/hour x 1/1,000,000)

Cumulative TPHg / Benzene / MTBE removal = Previous removal rate multiplied by the hour-interval of operation plus the previous total

ATTACHMENT A

Site Conceptual Model

SITE CONCEPTUAL MODEL
8/1/01
Cambria Environmental Technology, Inc.

Site Address:	610 Market Street	**Incident Number:**	98995750
City:	Oakland, CA	**Regulator:**	Alameda County Health Care Services Agency

Item	Evaluation Criteria	Comments/Discussion
1	**Hydrocarbon Source**	
1.1	Identify/Describe Release Source and Volume (if known)	During site renovation activities in August 1995, Weiss Associates collected soil samples beneath gasoline dispensers and product piping locations. Up to 2,700 ppm TPHg and 0.70 ppm benzene were detected in soil samples collected from beneath the center dispenser island. Based on these results, an Underground Storage Tank (UST) Unauthorized Release/Contaminated Site Report was submitted to the RWQCB on August 14, 1995. The volume of release is unknown.
1.2	Discuss Steps Taken to Stop Release	During renovation, the gasoline dispensers and product piping lines were replaced, and a total of 48 cubic yards of soil were excavated and disposed. Fifteen of the forty-eight cubic yards were hydrocarbon bearing soils that were overexcavated as directed by the Alameda County Health Care Services Agency (ACHCSA).
2	**Site Characterization**	
2.1	Current Site Use/Status	The site is an active Shell-branded service station located on Market Street between 6th and 7th Streets in Oakland, California. Currently, the site consists of three USTs, four dispenser islands and a drive-through car wash facility. The area surrounding the site is primarily of commercial use.
2.2	Soil Definition Status	TPHg, BTEX and MTBE in soil are defined northeast of the USTs and dispensers by non-detections in boring SB-C and well MW-1. TPHg, BTEX and MTBE have not been defined south or east of the USTs and dispensers.
2.3	Separate-Phase Hydrocarbon Definition Status	No SPH has been detected at the site.
2.4	Groundwater Definition Status (BTEX)	The lateral extent of BTEX has been defined upgradient of the site by non-detection in grab-groundwater samples collected from boring SB-C and groundwater samples collected from well MW-1. The lateral extent of BTEX has not been defined in the crossgradient and downgradient directions, as BTEX has been detected in borings SB-A and SB-B, and in wells MW-2 and MW-3.

Item	Evaluation Criteria	Comments/Discussion
2.5	BTEX Plume Stability and Concentration Trends	Based on quarterly monitoring since December 1998, the BTEX plume appears to be stable to increasing in wells MW-1 through MW-3.
2.6	Groundwater Definition Status (MTBE)	The lateral extent of MTBE has been defined upgradient of the site by non-detection in boring SB-C and in well MW-1. The lateral extent of MTBE has not been defined in the downgradient direction, as MTBE has been detected in borings SB-A and SB-B, and in wells MW-2 and and MW-3.
2.7	MTBE Plume Stability and Concentration Trends	Based on periodic monitoring since December 1998, MTBE concentrations appear to be stable to decreasing in MW-1 and MW-2. MTBE concentrations in MW-3 appear to be stable to increasing.
2.8	Groundwater Flow Direction, Depth Trends and Gradient Trends	Groundwater flow ranges from south to southwest at a gradient of approximately 0.006 ft/ft. Depth to groundwater in onsite wells has ranged from approximately 10-15 fbg.
2.9	Stratigraphy and Hydrogeology	The site is underlain primarily by sand to approximately 8 fbg and then silty sand to the total explored depth of 26 fbg.
2.10	Preferential Pathways Analysis	An August 2001conduit study indicated that Market Street is underlain by water mains, gas lines, an electrical line, a storm drain and two sanitary sewer lines. 7th Street is underlain by gas, water and electrical utilities, and a sanitary sewer immediately northeast of the site. 6th Street is underlain by a water line, a storm drain and a sanitary sewer. Depths to water, gas and electric utility lines are typically less than 5 fbg. Based on flow line elevations of the sanitary sewer and storm drain lines between 2.8 and 12.1 feet above mean sea level (amsl), and onsite groundwater elevations between 6.3 and 9.8 feet amsl, groundwater beneath the site encounters the sanitary sewer and storm drain utility lines, at least seasonally. However, the typical flow direction at the site is south to southwest, and the storm drain line identified southwest of the site has a flow line elevation of 12.1 feet amsl, which is above the typical groundwater elevation at the site. Based on this data, it is unlikely groundwater flow is significantly affected by underground utilities in the vicinity of the site.
2.11	Other Pertinent Issues	
3	**Remediation Status**	

Item	Evaluation Criteria	Comments/Discussion
3.1	Remedial Actions Taken	From March to October 2000, Cambria coordinated mobile Dual -Phase Vacuum Extraction Treatment (DVE) from wells MW-2 and MW-3. DVE includes both groundwater and vapor extraction. Due to low water-extraction volumes, DVE was discontinued. In March 2001, Cambria conducted a DVE pilot test using an IC engine on well MW-3 and a short-term SVE pilot test on a tank backfill well onsite to remediate hydrocarbons at the site.
3.2	Area Remediated	Remediation has focused on groundwater in the vicinity of wells MW-2 and MW-3.
3.3	Remediation Effectiveness	During DVE activities, approximately 6,300 gallons of groundwater were extracted, and approximately 35 pounds of TPHg, 0.2 pounds of benzene and 15 pounds of MTBE were removed.
4	**Well and Sensitive Receptor Survey**	
4.1	Designated Beneficial Water Use	Municipal and domestic water supply, industrial process water supply, industrial service water supply, and agricultural water supply (RWQCB- SFBR basin plan).
4.2	Shallow Groundwater Use	Shallow wells within a half-mile radius of the site are associated with groundwater monitoring. Other shallow groundwater use is unknown.
4.3	Deep Groundwater Use	The deepest well within a half-mile radius is a 140 foot deep well of unknown use located approximately 2,600 feet southeast of the site. Deep groundwater use is unknown.
4.4	Well Survey Results	In August 2001, Cambria requested Well Driller's Report forms from the DWR to find potential receptors within a 1/2-mile radius of the site. The DWR forms reviewed identified one well of unknown use located approximately 2,600 feet southeast of the site and one destroyed well located approximately 1,700 feet northeast of the site.
4.5	Likelihood of Impact to Wells	Unlikely, given that the potential receptor wells identified are located approximately 1/2-mile up- and cross-gradient of the site.
4.6	Likelihood of Impact to Surface Water	The closest surface body of water is Oakland Inner Harbor, located approximately 1/2-mile southwest of the site. Based on this information, impact to surface water from the site is unlikely due to the relatively large distance.
5	**Risk Assessment**	

Item	Evaluation Criteria	Comments/Discussion
5.1	Site Conceptual Exposure Model (current and future uses)	The site is an active Shell-branded service station surrounded by primarily commercial property. Benzene is considered to be the most sensitive chemical of concern at the site. The current BTEX plume lies beneath the southern portion of the site and extends downgradient under 6th Street. The highest benzene concentrations in soil and groundwater exist downgradient of the USTs.
5.2	Exposure Pathways	Potentially complete exposure pathways include onsite commercial occupant inhalation of vapors from impacted soil and groundwater, and dermal exposure, particle inhalation and ingestion of impacted soil by onsite construction workers.
5.3	Risk Assessment Status	No formal risk assessment has been performed for the site.
5.4	Identified Human Exceedances	NA
5.5	Identified Ecological Exceedances	NA

Item	Evaluation Criteria	Comments/Discussion

Attached:

Known Environmental Documents for Site
Historical soil sampling locations and results
Groundwater Elevation Contour Map (6/01)
Grab groundwater analytical data (3/98)
Historical groundwater sampling data
Soil boring/well logs
Well survey map and table (8/01)

Environmental Documents Available to Cambria Environmental		
Date	Title/Subject	Company
08/14/95	Underground Storage Tank Unauthorized Release/Contaminated Site Report	Weiss Associates
11/02/95	Dispenser Replacement Sampling	Weiss Associates
03/09/95	98 Upgrades Project	Cambria Environmental
07/30/96	Approval letter for July 19, 1996 Weiss Associates *Preliminary Site Assessment Work Plan*	ACHCSA
07/01/98	Subsurface Investigation	Cambria Environmental
08/03/98	Work Plan request letter	ACHCSA
09/15/98	Additional Investigation Work Plan	Cambria Environmental
09/23/98	Work Plan approval letter with stipulations	ACHCSA
10/06/98	Work Plan	Cambria Environmental
11/30/98	1998 Upgrade Inspection Report	Cambria Environmental
04/20/99	Well Installation Report	Cambria Environmental
01/21/00	Work Plan request letter	ACHCSA
02/18/00	Additional Subsurface Investigation Work Plan	Cambria Environmental
03/02/00	Work Plan approval letter	ACHCSA
11/30/00	Site Investigation Work Plan	Cambria Environmental

WELL CONCENTRATIONS
Shell-branded Service Station
610 Market Street
Oakland, CA
WIC #204-5508-5702

Well ID	Date	TPPH (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE 8020 (ug/L)	MTBE 8260 (ug/L)	TOC (MSL)	Depth to Water (ft.)	GW Elevation (MSL)
MW-1	12/17/1998	2,200	20	<10	110	420	<50	NA	21.70	13.71	7.99
MW-1	03/09/1999	4,320	25.8	<10.0	338	474	<100	NA	21.70	13.03	8.67
MW-1	06/16/1999	6,150	107	84.0	615	1,050	<250	NA	21.70	13.82	7.88
MW-1	09/29/1999	3,440	97.3	58.7	433	578	89.1	NA	21.70	14.45	7.25
MW-1	12/22/1999	1,370	34.5	4.38	196	49.1	29.3	NA	21.70	15.39	6.31
MW-1	03/21/2000	2,550	10.3	3.36	164	312	65.6	NA	21.70	11.94	9.76
MW-1	06/20/2000	4,770	64.3	18.6	387	732	51.3	NA	21.70	13.15	8.55
MW-1	09/21/2000	7,490	350	229	690	1,490	160	NA	21.70	13.65	8.05
MW-1	11/30/2000	5,410	420	168	494	1,170	167	NA	21.70	14.20	7.50
MW-1	03/06/2001	965	25.7	9.14	13.3	9.12	<25.0	NA	21.70	12.99	8.71
MW-1	**06/28/2001**	**5,900**	**190**	**71**	**360**	**910**	**NA**	**110**	**21.70**	**13.98**	**7.72**
MW-2	12/17/1998	<5,000	<50	<50	<50	<50	11,000	NA	19.61	12.07	7.54
MW-2	03/09/1999	<250	5.20	<2.50	<2.50	<2.50	9,870	NA	19.61	11.46	8.15
MW-2	06/16/1999	<50.0	0.569	<0.500	<0.500	<0.500	3,440	NA	19.61	12.26	7.35
MW-2	09/29/1999	58.6	2.51	0.978	<0.500	<0.500	3,930	NA	19.61	12.51	7.10
MW-2	12/22/1999	<2,000	50.4	<20.0	<20.0	<20.0	15,000	NA	19.61	13.40	6.21
MW-2	03/21/2000	<5,000	94.7	<50.0	<50.0	<50.0	13,900	NA	19.61	10.36	9.25
MW-2	06/20/2000	101	5.95	<0.500	<0.500	0.552	7,670	NA	19.61	11.12	8.49
MW-2	09/21/2000	<2,000	<20.0	<20.0	<20.0	<20.0	4,460	NA	19.61	11.95	7.66
MW-2	11/30/2000	81.1	4.46	0.924	0.841	3.23	3,450	NA	19.61	12.48	7.13
MW-2	03/06/2001	<500	183	<5.00	<5.00	<5.00	14,000	NA	19.61	11.10	8.51
MW-2	**06/28/2001**	**<1,000**	**<10**	**<10**	**<10**	**<10**	[redacted]	[redacted]	**19.61**	**12.40**	**7.21**
MW-3	12/17/1998	30,000	890	110	2,100	4,300	42,000	43,000	19.05	11.65	7.40
MW-3	03/09/1999	22,700	536	<200	1,030	1,510	35,400	38,500	19.05	11.03	8.02

WELL CONCENTRATIONS
Shell-branded Service Station
610 Market Street
Oakland, CA
WIC #204-5508-5702

Well ID	Date	TPPH (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE 8020 (ug/L)	MTBE 8260 (ug/L)	TOC (MSL)	Depth to Water (ft.)	GW Elevation (MSL)
MW-3	06/16/1999	19,300	625	129	805	1,210	42,400	51,600	19.05	11.89	7.16
MW-3	09/29/1999	20,200	727	155	1,000	1,180	84,100	136,000a	19.05	12.35	6.70
MW-3	12/22/1999	44,500	767	64.4	1,810	2,090	191,000	186,000a	19.05	13.45	5.60
MW-3	03/21/2000	<25,000	466	<250	727	2,280	126,000	155,000	19.05	10.00	9.05
MW-3	06/20/2000	16,200	1,140	98.8	1,140	1,410	579,000	376,000a	19.05	11.15	7.90
MW-3	09/21/2000	<50,000	712	<500	520	795	293,000	298,000	19.05	11.58	7.47
MW-3	11/30/2000	18,000	1,050	124	1,120	2,010	543,000a	403,000a	19.05	12.10	6.95
MW-3	03/06/2001	19,900	1,290	115	1,450	1,760	706,000	149,000	19.05	11.00	8.05
MW-3	**06/28/2001**	**<50,000**	**1,200**	**<250**	**1,100**	**1,300**	**NA**	**610,000**	**19.05**	**11.96**	**7.09**

Abbreviations:

TPPH = Total petroleum hydrocarbons as gasoline by EPA Method 8260B; prior to June 28, 2001 analyzed by EPA Method 8015

BTEX = benzene, toluene, ethylbenzene, xylenes by EPA Method 8260B; prior to June 28, 2001 analyzed by EPA Method 8020

MTBE = methyl-tertiary-butyl ether

TOC = Top of Casing Elevation

GW = Groundwater

ug/L = parts per billion

msl = Mean sea level

ft = Feet

<n = Below detection limit

NA = Not applicable

Notes:

Wells MW-1, MW-2, and MW-3 surveyed December 9, 1998 by Virgil Chavez Land Surveying of Vallejo, California.

a = Sample was analyzed outside the EPA recommended holding time.

UNDERGROUND STORAGE TANK UNAUTHORIZED RELEASE (LEAK) / CONTAMINATION SITE REPORT

EMERGENCY ☐ YES ☒ NO

HAS STATE OFFICE OF EMERGENCY SERVICES REPORT BEEN FILED ? ☐ YES ☒ NO

FOR LOCAL AGENCY USE ONLY
I HEREBY CERTIFY THAT I HAVE DISTRIBUTED THIS INFORMATION ACCORDING TO THE DISTRIBUTION SHOWN ON THE INSTRUCTION SHEET ON THE BACK PAGE OF THIS FORM.
SIGNED _____ DATE _____

REPORT DATE: 08 14 95 | CASE #:

REPORTED BY
- NAME OF INDIVIDUAL FILING REPORT: Faith Morris Daverin
- PHONE: (510) 450-6000
- SIGNATURE: Faith Morris Daverin
- REPRESENTING: ☒ OWNER/OPERATOR ☐ REGIONAL BOARD ☐ LOCAL AGENCY ☐ OTHER
- COMPANY OR AGENCY NAME: Weiss Associates
- ADDRESS: 5500 Shellmound Street (STREET) Emeryville (CITY) CA (STATE) 94608 (ZIP)

RESPONSIBLE PARTY
- NAME: Shell Oil Products Company ☐ UNKNOWN
- CONTACT PERSON: Dan Kirk
- PHONE: (510) 675-6168
- ADDRESS: P.O. Box 4023 (STREET) Concord (CITY) CA (STATE) 94524 (ZIP)

SITE LOCATION
- FACILITY NAME (IF APPLICABLE): Shell Service Station WIC#204-5508-5702
- OPERATOR:
- PHONE: ( )
- ADDRESS: 610 Market Street (STREET) Oakland (CITY) CA (COUNTY) (ZIP)
- CROSS STREET: Market Street and 7th Street

IMPLEMENTING AGENCIES
- LOCAL AGENCY / AGENCY NAME: Alameda Co. Health Care Service Agency
- CONTACT PERSON: Brian Oliva
- PHONE: (510)567-6787
- REGIONAL BOARD: San Francisco Bay
- CONTACT PERSON: Kevin Graves
- PHONE: (510)286-1255

SUBSTANCES INVOLVED
- (1) NAME: Gasoline — QUANTITY LOST (GALLONS): _____ ☐ UNKNOWN
- (2) ☐ UNKNOWN

DISCOVERY/ABATEMENT
- DATE DISCOVERED: 08 14 95
- HOW DISCOVERED: ☐ INVENTORY CONTROL ☐ SUBSURFACE MONITORING ☐ NUISANCE CONDITIONS ☐ TANK TEST ☐ TANK REMOVAL ☒ OTHER Dispenser Upgrade
- DATE DISCHARGE BEGAN: ☒ UNKNOWN
- HAS DISCHARGE BEEN STOPPED ? ☐ YES ☐ NO IF YES, DATE
- METHOD USED TO STOP DISCHARGE (CHECK ALL THAT APPLY): ☐ REMOVE CONTENTS ☐ CLOSE TANK & REMOVE ☐ REPAIR PIPING ☐ REPAIR TANK ☐ CLOSE TANK & FILL IN PLACE ☐ CHANGE PROCEDURE ☐ REPLACE TANK ☒ OTHER Dispensers and Piping Replaced

SOURCE/CAUSE
- SOURCE OF DISCHARGE: ☐ TANK LEAK ☒ UNKNOWN ☐ PIPING LEAK ☐ OTHER
- CAUSE(S): ☐ OVERFILL ☐ RUPTURE/FAILURE ☐ SPILL ☐ CORROSION ☒ UNKNOWN ☐ OTHER

CASE TYPE
CHECK ONE ONLY: ☐ UNDETERMINED ☒ SOIL ONLY ☐ GROUNDWATER ☐ DRINKING WATER - (CHECK ONLY IF WATER WELLS HAVE ACTUALLY BEEN AFFECTED)

CURRENT STATUS
CHECK ONE ONLY:
- ☐ NO ACTION TAKEN
- ☐ LEAK BEING CONFIRMED
- ☐ REMEDIATION PLAN
- ☐ PRELIMINARY SITE ASSESSMENT WORKPLAN SUBMITTED
- ☐ PRELIMINARY SITE ASSESSMENT UNDERWAY
- ☒ CASE CLOSED (CLEANUP COMPLETED OR UNNECESSARY)
- ☐ POLLUTION CHARACTERIZATION
- ☐ POST CLEANUP MONITORING IN PROGRESS
- ☐ CLEANUP UNDERWAY

REMEDIAL ACTION
CHECK APPROPRIATE ACTION(S) (SEE BACK FOR DETAILS):
- ☐ CAP SITE (CD)
- ☐ CONTAINMENT BARRIER (CB)
- ☐ VACUUM EXTRACT (VE)
- ☐ EXCAVATE & DISPOSE (ED)
- ☐ EXCAVATE & TREAT (ET)
- ☐ NO ACTION REQUIRED (NA)
- ☒ OTHER (OT) See Comments
- ☐ REMOVE FREE PRODUCT (FP)
- ☐ PUMP & TREAT GROUNDWATER (GT)
- ☐ TREATMENT AT HOOKUP (HU)
- ☐ ENHANCED BIO DEGRADATION (IT)
- ☐ REPLACE SUPPLY (RS)
- ☐ VENT SOIL (VS)

COMMENTS
During the dispenser upgrade, soil staining and hydrocarbon odors were observed. Weiss Associates overexcavated soil in the areas of the staining and hydrocarbon odors. Confirmation samples collected from the overexcavated areas confirmed the removal of the majority of hydrocarbon impacted soil.

HSC 05 (8/90)

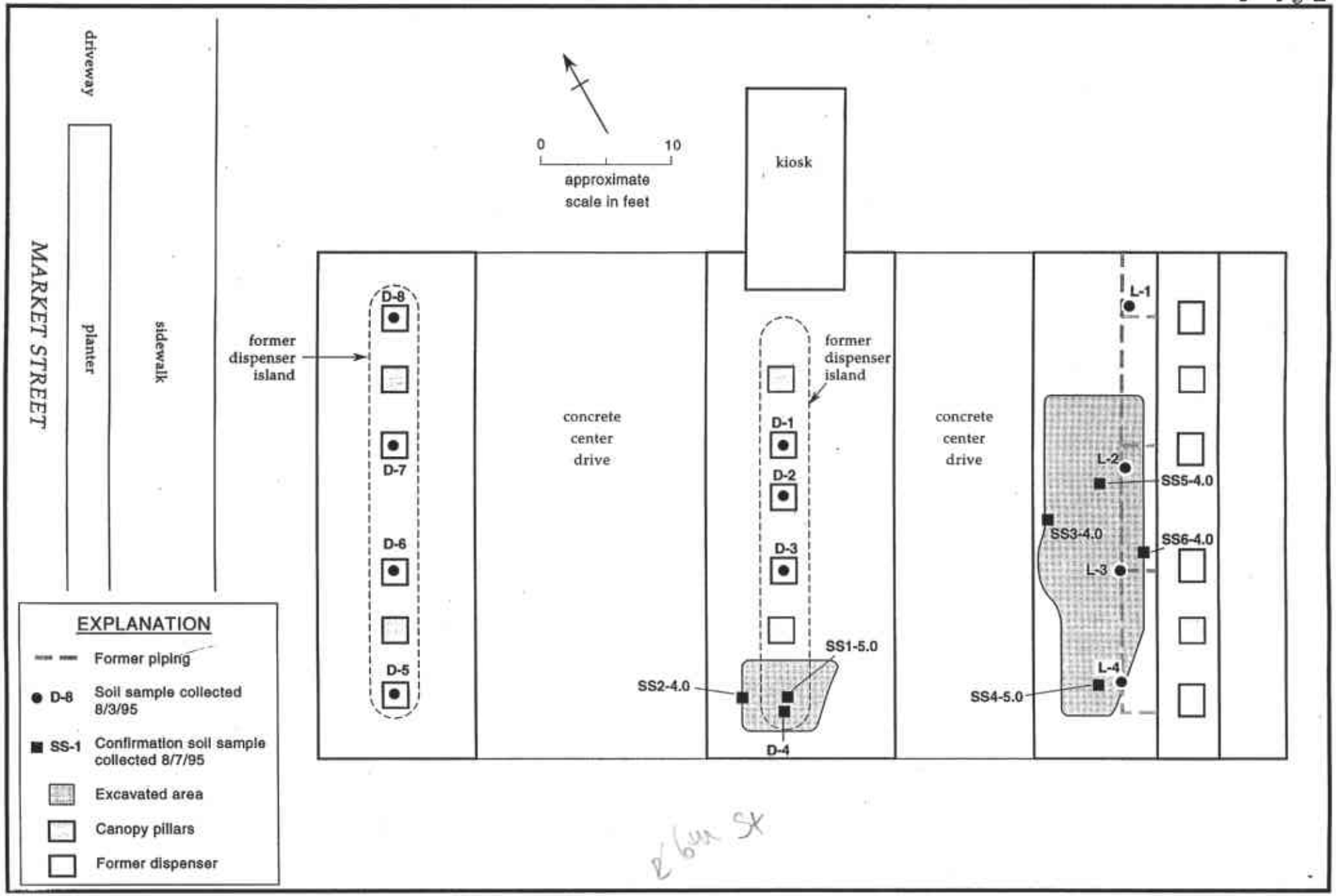

Figure 3. Soil Sample Locations - August 3 and 7, 1995 - Shell Service Station WIC# 204-5508-5702 - 610 Market Street, Oakland, California

Table 1. Analytic Results for Soil - Petroleum Hydrocarbons - Shell Service Station, WIC #204-5508-5702, 610 Market Street, Oakland, California

Sample ID	Date Sampled	Sample Depth (ft)	TPH-G	POG	B	T	E	X
			<---------- parts per million (ppm) ---------->					
Initial Soil Samples:								
D-1	08/03/95	2.5	2,700	---	<5.0	130	46	320
D-2	08/03/95	2.5	66	---	<0.050	0.11	0.36	1.9
D-3	08/03/95	2.5	76	---	0.70	4.7	0.79	8.7
D-4	08/03/95	2.5	7.7	---	<0.010	0.017	0.043	0.082
D-5	08/03/95	2.5	33	---	<0.025	0.16	0.10	3.0
D-6	08/03/95	2.5	1,400	---	<5.0	<5.0	<5.0	4.2
D-7	08/03/95	2.5	1,600	---	<2.0	<2.0	3.4	25
D-8	08/03/95	2.5	<1.0	---	<0.005	<0.0072	<0.005	<0.025
L-1	08/03/95	2.5	<1.0	---	<0.005	<0.005	<0.005	<0.005
L-2	08/03/95	2.5	2.2	---	<0.005	0.036	0.0068	<0.064
L-3	08/03/95	2.5	<1.0	---	<0.005	<0.005	<0.005	<0.005
L-4	08/03/95	2.5	<1.0	---	<0.005	<0.005	<0.005	<0.005
Confirmation Soil Samples:								
SS-1	08/07/95	5.0	<1.0	<50	<0.005	<0.005	<0.005	<0.005
SS-2	08/07/95	4.0	<1.0	<50	<0.005	<0.005	<0.005	<0.005
SS-3	08/07/95	4.0	<1.0	<50	<0.005	<0.005	<0.005	<0.005
SS-4	08/07/95	5.0	2.0	220	<0.005	0.0057	0.0076	0.019
SS-5	08/07/95	5.0	10	260	<0.005	<0.005	0.034	0.086
SS-6	08/07/95	4.0	28	170	<0.012	<0.012	<0.029	<0.084

Abbreviations

TPH-G = Total petroleum hydrocarbons as gasoline by Modified EPA Method 8015
POG = Non-Polar Petroleum Oil and Grease by EPA Method 5520 E&F
B = Benzene by EPA Method 8020
T = Toluene by EPA Method 8020
E = Ethylbenzene by EPA Method 8020
X = Xylenes by EPA Method 8020
--- = Not Analyzed
--- = not analyzed

Analytical Laboratory:

Sequoia Analytical of Redwood City, California

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Weiss Associates

Table 2. Analytic Results for Soil VOCs, SVOCs, and Various Metals - Shell Service Station, WIC #204-5508-5702, 610 Market Street, Oakland, California

Sample ID	Date Sampled	Sample Depth (ft)	VOCs	SVOCs	Cd	Cr	Pb	Ni	Zn
			<—	—	parts per million (ppm)	—	—	—	—>
Confirmation Soil Samples:									
SS-1	08/07/95	5.0	ND	ND	<0.050	52	<5.0	39	26
SS-2	08/07/95	4.0	ND	ND	<0.050	36	<5.0	16	11
SS-3	08/07/95	4.0	ND	ND	<0.050	36	10	24	31
SS-4	08/07/95	5.0	ND	ND	<0.050	34	110	21	110
SS-5	08/07/95	5.0	ND	ND	2.9	38	290	25	320
SS-6	08/07/95	4.0	ND	ND	0.86	35	400	22	260

<u>Abbreviations</u>

VOCs = Volatile Organic Compounds by EPA Method 8240
SVOCs = Semi-Volatile Organic Compounds by EPA Method 8240
Cd = Cadmium by EPA Method 6010
Cr = Chromium by EPA Method 6010
Pb = Lead by EPA Method 6010
Ni = Nickel by EPA Method 6010
Zn = Zinc by EPA Method 6010
ND = Not detected between detection limit of 0.02 and 0.05 ppm
<n = Not detected at laboratory detection limit of n ppm

<u>Analytical Laboratory:</u>

Sequoia Analytical of Redwood City, California

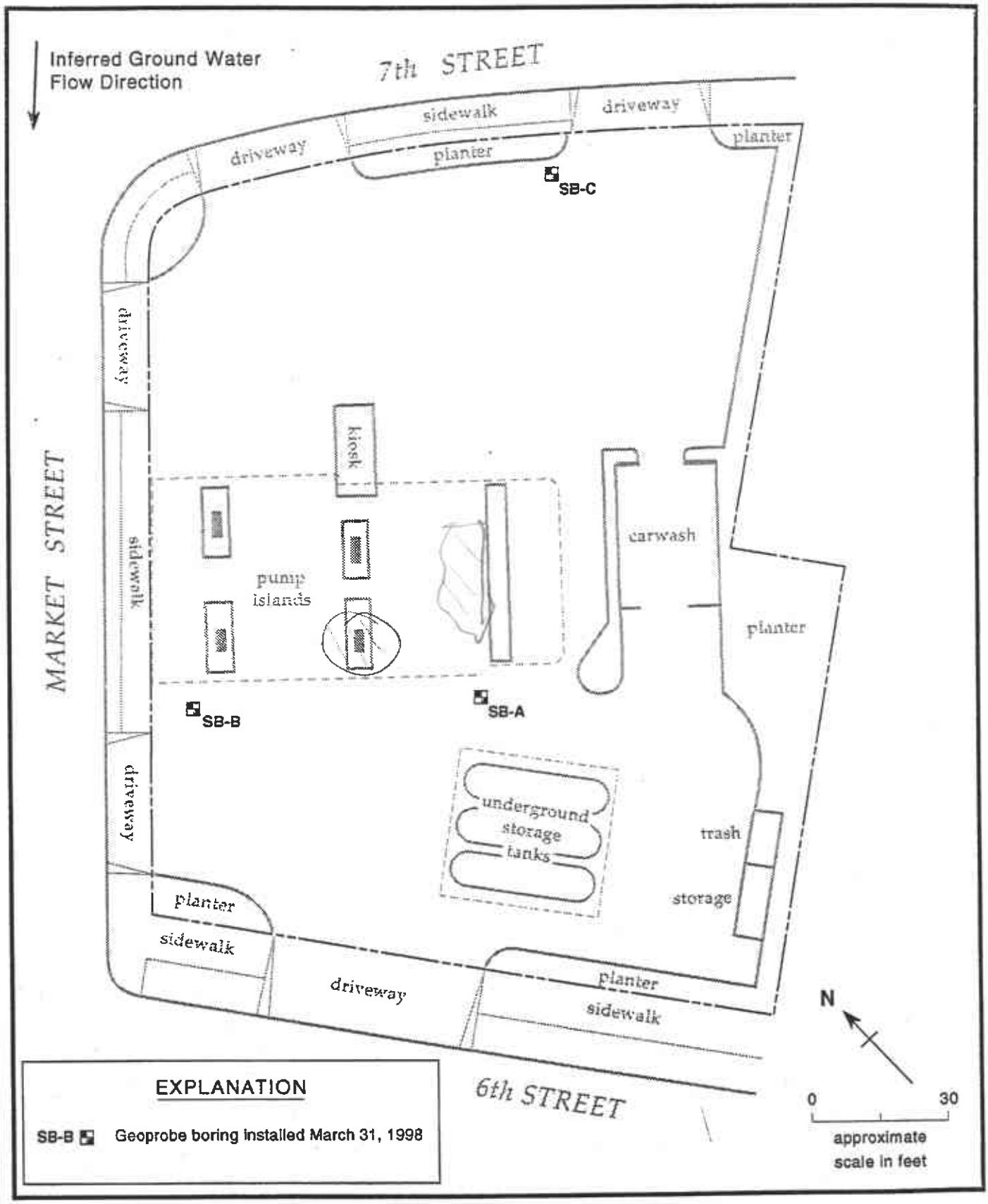


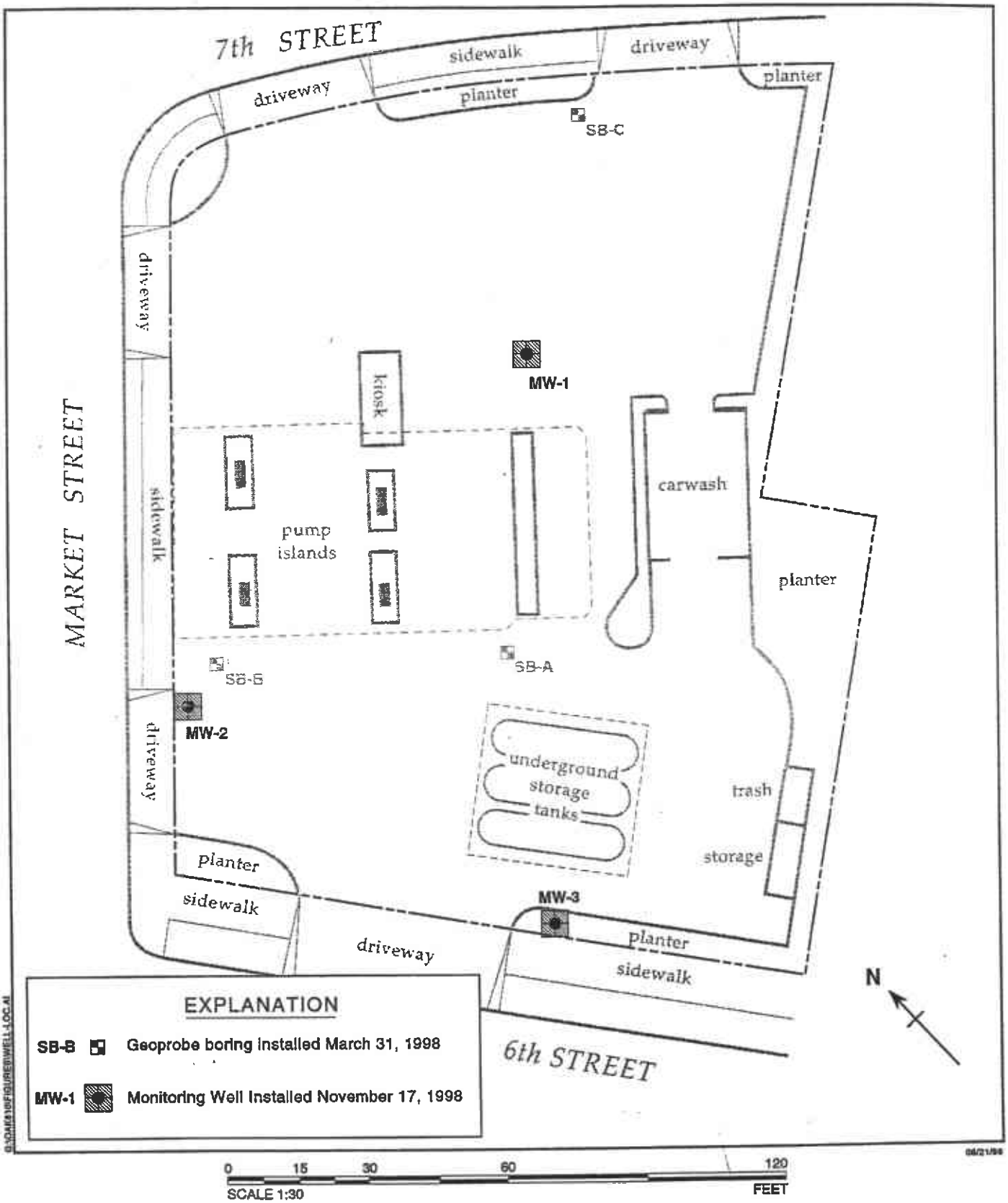
Figure 1. Geoprobe Boring Locations - March 31, 1998 - Shell Service Station WIC# 204-5508-5702, 610 Market Street, Oakland, California

Table 1. Soil Analytical Data - Shell Service Station, WIC # 204-5508-5702, 610 Market Street, Oakland, California

Sample ID	Date Sampled	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
		← (concentrations in mg/Kg) →					
SB-A-13.5'	3/31/98	1.3	0.063	<0.0050	<0.0050	<0.0050	1.8
SB-B-10.0'	3/31/98	<1.0	<0.0050	0.0051	<0.0050	<0.0050	1.3
SB-C-6.5'	3/31/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025
SB-C-10.0'	3/31/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025

Abbreviations and Notes:

TPHg = Total petroleum hydrocarbons as gasoline by modified EPA Method 8015
Benzene, toluene, ethylbenzene, and total xylenes by EPA Method 8020
MTBE = Methyl tert-butyl ether by EPA Method 8020
mg/Kg = Milligrams per kilogram
<n = Below detection limit of n mg/Kg



Shell-branded Service Station
610 Market Street
Oakland, California

CAMBRIA

Monitoring Well Locations
WIC #204-5508-5702
Figure No. 1

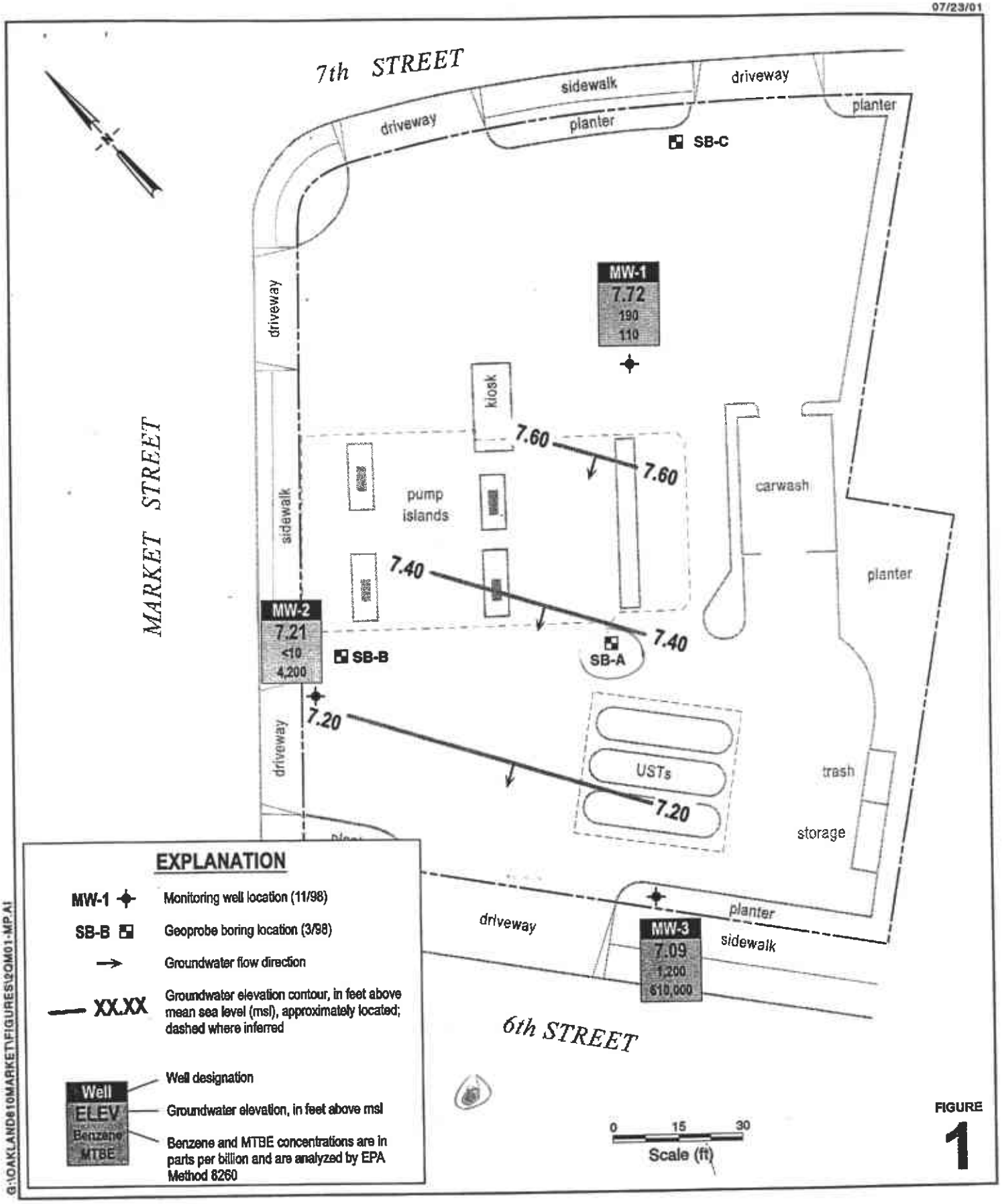
Table 1. Soil Analytical Data - Shell Service Station, WIC # 204-5508-5702, 610 Market Street, Oakland, California

Sample ID	Depth (ft)	Date Sampled	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
			← (concentrations in mg/Kg) →					
MW-1 5.5	5.5	11/17/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025
MW-1 9.5	9.5	11/17/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.025
MW-2 5.5	5.5	11/17/98	8.3	<0.0050	0.016	0.010	0.14	2.9
MW-2 10.5	10.5	11/17/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	2.0
MW-3 5.5	5.5	11/17/98	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	0.032
MW-3 10.5	10.5	11/17/98	1,700	8.3	11	<1.2	19	16

Abbreviations and Notes:

TPHg = Total petroleum hydrocarbons as gasoline by modified EPA Method 8015
Benzene, toluene, ethylbenzene, and total xylenes by EPA Method 8020
MTBE = Methyl tert-butyl ether by EPA Method 8020
mg/Kg = Milligrams per kilogram, which is equivalent to parts per million (ppm)
<n = Below detection limit of n mg/Kg

07/23/01



G:\OAKLAND\610MARKET\FIGURES\2QM01-MP.AI

FIGURE
1

Shell-branded Service Station
610 Market Street
Oakland, California
Incident #98995750

CAMBRIA

Groundwater Elevation Contour Map

June 28, 2001

Table 2. Analytic Data for Ground Water - Shell Service Station, WIC # 204-5508-5702, 610 Market Street, Oakland, California

Sample ID	Date Sampled	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
		← (concentrations in µg/L) →					
SB-A	3/31/98	2,100	490	<10	<10	19	11,000 (14,000)
SB-B	3/31/98	120	5.8	<0.50	<0.50	<0.50	5,300 (6,200)
SB-C	3/31/98	<50	<0.50	<0.50	<0.50	<0.50	<2.5

Abbreviations and Notes:

TPHg = Total petroleum hydrocarbons as gasoline by modified EPA Method 8015
Benzene, toluene, ethylbenzene, and total xylenes by EPA Method 8020
MTBE = Methyl tert-butyl ether by EPA Method 8020. Result in parentheses indicates MTBE by EPA Method 8260
µg/L = Micrograms per liter
<n = Below detection limit of n µg/L

BORING LOG

Client: Shell Oil Products Company

Project No: 240-0594 Phase Task 2

Boring ID SB-A

Location 610 Market Street, Oakland

Surface Elev. NA ft.

Page 1 of 1

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
				Asphalt
				Silty SAND: (SM); brown; loose; dry; 15% silt, 85% fine to medium sand; moderate estimated permeability.
5				
10				grey; damp; 15% silt, 85% fine sand.
15				
20				
25				
30				

TPHg (ppm) | Graphic Log | Boring Completion Graphics | Depth (feet) | Additional Comments

0, 5, 10, 15, 20, 25, 30

Water encountered @ 14 ft.

Bottom of boring @ 16 ft.

Driller Gregg Drilling

Logged By Aubrey Cool

Water-Bearing Zones NA

Drilling Started 3/31/98

Drilling Completed 3/31/98

Grout Type Portland Type I/II

Notes: See site map.

BOR 24594 3/31/98

Cambria Environmental Technology, Inc.

BORING LOG

Client: Shell Oil Products Company

Project No: 240-0594 Phase Task 2

Boring ID SB-8

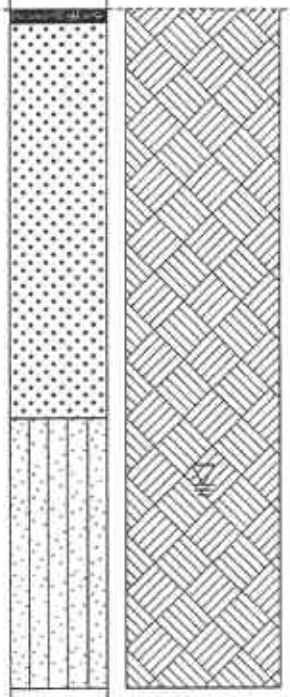
Location 610 Market Street, Oakland

Surface Elev. NA ft.

Page 1 of 1

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			
				Asphalt
				SAND: (SW); brown to grey; loose; moist; 5% silt, 95% fine to medium sand; high estimated permeability.
				brown; damp; 10% silt, 90% fine to medium sand; moderate estimated permeability.
5				
				grey.
10				Silty SAND: (SM); grey; loose; wet; 15% silt, 85% fine sand; moderate estimated permeability.
				brown to grey; 15% silt, 85% fine to medium sand.
15				
20				
25				
30				

TPHg (ppm) | Graphic Log | Boring Completion Graphics



Depth (feet)	Additional Comments
0	
5	
10	Water encountered @ 10.5 ft.
15	Bottom of boring @ 15 ft.
20	
25	
30	

Driller Gregg Drilling

Logged By Aubrey Cool

Water-Bearing Zones NA

Drilling Started 3/31/98

Drilling Completed 3/31/98

Grout Type Portland Type I/II

Notes: See site map.

BOR 24594 3/31/98

BORING LOG

Client: Shell Oil Products Company

Project No: 240-0594 Phase Task 2

Boring ID SB-C

Location 610 Market Street, Oakland

Surface Elev. NA ft.

Page 1 of 1

Depth (feet)	Blow Count	Sample	Interval	Lithologic Description
0	Ground Surface			Asphalt
				SAND; (SW); brown; loose; damp; 10% silt, 90% fine to medium sand; moderate to high estimated permeability.
5				Silty SAND; (SM); brown; loose; moist; 15% silt, 85% fine to medium sand; moderate to high estimated permeability. wet.
10				moist; 20% silt, 80% fine sand; moderate estimated permeability.
15				
20				no recovery.
25				
30				

TPHg (ppm) | Graphic Log | Boring Completion Graphics

Depth (feet)	Additional Comments
0	
5	
10	Water encountered @ 7 ft.
15	
20	
25	Bottom of boring @ 26 ft.
30	

Driller Gregg Drilling

Logged By Aubrey Cool

Water-Bearing Zones NA

Drilling Started 3/31/98

Drilling Completed 3/31/98

Grout Type Portland Type I/II

Notes: See site map.

BOR 24594 3/31/98

Cambria Environmental Technology, Inc.

Cambria Environmental Technology, Inc.
1144 - 65th St.
Oakland, CA 94608
Telephone: (510) 420-0700
Fax: (510) 420-9170

BORING/WELL LOG

CLIENT NAME	Equilon Enterprises LLC	**BORING/WELL NAME**	MW-1
JOB/SITE NAME	Shell-Branded Service Station	**DRILLING STARTED**	17-Nov-98
LOCATION	610 Market, Oakland CA	**DRILLING COMPLETED**	17-Nov-98
PROJECT NUMBER	240-0594	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	21.70 ft
DRILLING METHOD	Hollow-stem auger	**TOP OF CASING ELEVATION**	NA
BORING DIAMETER	10.25"	**SCREENED INTERVAL**	5 to 25 ft bgs
LOGGED BY	B. Busch	**DEPTH TO WATER (First Encountered)**	10.0 ft (17-Nov-98)
REVIEWED BY		**DEPTH TO WATER (Static)**	NA
REMARKS	Hand augered to 5' bgs.		

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
								ASPHALT.	0.5	Portland Type I/II Cement
								SAND; (SW); brown; medium dense; damp; 10% silt, 90% sand; no plasticity; moderate estimated permeability.		Bentonite Seal
						SW				Monterey Sand #2/16
0			MW1 - 5.5		5					
									7.5	
								Silty SAND; (SM); brown, grey; medium dense; damp; 20% silt, 80% sand; no plasticity; moderate estimated permeability.		
								11/17/98 ▽		
1.6			MW1 - 9.5		10	SM				
					15			@ 15' - 15% silt, 85% sand.	15.0	4"-diam., 0.010" Slotted Schedule 40 PVC
58			MW1 - 16.0							
NT			MW1 - 19.5		20	SM				
0.3			MW1 - 24.0		25				25.0	Bottom of Boring @ 25 ft

WELL LOG (PID) G:\OAK610\GINTOAK610.GPJ DEFAULT.GDT 12/21/98

Cambria Environmental Technology, Inc.
1144 - 65th St.
Oakland, CA 94608
Telephone: (510) 420-0700
Fax: (510) 420-9170

BORING/WELL LOG

CLIENT NAME	Equilon Enterprises LLC	**BORING/WELL NAME**	MW-2
JOB/SITE NAME	Shell-Branded Service Station	**DRILLING STARTED**	17-Nov-98
LOCATION	610 Market, Oakland CA	**DRILLING COMPLETED**	17-Nov-98
PROJECT NUMBER	240-0594	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	19.61 ft
DRILLING METHOD	Hollow-stem auger	**TOP OF CASING ELEVATION**	NA
BORING DIAMETER	10.25"	**SCREENED INTERVAL**	5 to 20.5 ft bgs
LOGGED BY	B. Busch	**DEPTH TO WATER (First Encountered)**	10.0 ft (17-Nov-98)
REVIEWED BY		**DEPTH TO WATER (Static)**	NA

REMARKS Hand augered to 5' bgs.

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
								ASPHALT	0.5	Portland Type I/II Cement
						SW		SAND; (SW); brown to grey; loose; damp; 5% silt, 95% sand; no plasticity; high estimated permeability.		Bentonite Seal
1.0			MW2 - 5.5		5					Monterey Sand #2/16
								Silty SAND; (SM); grey; loose; moist; 15% silt, 85% fine grained sand; no plasticity; moderate estimated permeability.	7.5	
								11/17/98 ▽		
11.0			MW2 - 10.5		10	SM				4"-diam., 0.010" Slotted Schedule 40 PVC
					15			@ 15' - 15% silt, 85% fine to medium grained sand.	15.0	
3.0			MW2 - 15.5			SM				
								SAND; (SW); brown; loose; wet; 10% silt, 90% sand; no plasticity; high estimated permeability.	17.5	
						SW				
1.0			MW2 - 19.5		20				20.5	Bottom of Boring @ 20.5 ft

WELL LOG (PID) G:\OAK610\GINT\OAK610.GPJ DEFAULT.GDT 12/21/98

Cambria Environmental Technology, Inc.
1144 - 65th St.
Oakland, CA 94608
Telephone: (510) 420-0700
Fax: (510) 420-9170

BORING/WELL LOG

CLIENT NAME	Equilon Enterprises LLC	**BORING/WELL NAME**	MW-3
JOB/SITE NAME	Shell-Branded Service Station	**DRILLING STARTED**	17-Nov-98
LOCATION	610 Market, Oakland CA	**DRILLING COMPLETED**	17-Nov-98
PROJECT NUMBER	240-0594	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	19.05 ft
DRILLING METHOD	Hollow-stem auger	**TOP OF CASING ELEVATION**	NA
BORING DIAMETER	10.25"	**SCREENED INTERVAL**	5 to 20.5 ft bgs
LOGGED BY	B. Busch	**DEPTH TO WATER (First Encountered)**	10.0 ft (17-Nov-98)
REVIEWED BY		**DEPTH TO WATER (Static)**	NA
REMARKS	Hand augered to 5' bgs.		

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
								TOPSOIL.	1.0	Portland Type I/II Cement
								Silty SAND: (SM); grey; loose; damp; 15% silt, 85% sand; no plasticity; moderate estimated permeability.		Bentonite Seal
					5					Monterey Sand #2/16
12.0			MW3 - 5.5			SM				
					10			11/17/98 ▽		
204			MW3 - 10.5							
					15			@ 15' - wet.	15.0	4"-diam., 0.010" Slotted Schedule 40 PVC
15.0			MW3 - 15.5			SM				
17.0			MW3 - 19.5		20				20.0	Bottom of Boring @ 20.5 ft

WELL LOG (PID) G:\OAK610\GINT\OAK610.GPJ DEFAULT.GDT 12/21/98

Table 4. Well Survey Results - Shell-branded Service Station, 610 Market Street, Oakland, California. Incident # 98995756

Map ID	Well ID	Installation Date	Owner	Use	Depth (fbg)	Screened Interval (fbg)	Sealed Interval (fbg)
1	1S/4W-3SF12	Sept. 23, 1990	Bramela Pacific, Inc	IRR	480	180-240, 300-340, 360-380, 430-470	0 to 90
2	1S/4W-35R	Unknown	Leamington Hotel	UNK	175	Unknown	Unkown
3	1S/4W-35N1	Feb. 2, 1955	Division of Highways	UNK	140	Unknown	Unkown
4	1S/4W-35Q	May 30, 1973	Pacific Gas and Electric	CATH	120	Unknown	0-90
5	1S/4W-35C7	Unknown	Unknown	DES	55	Unknown	0-55

Well information provided by the State of California Department of Water Resources

Notes and Abbreviations:

Map ID = Column number refers to map location on Figure 1
Well ID = California State well identification number as recorded by the Department of Water Resources in Sacramento, California
fbg = feet below grade
UNK = Unknown
CATH = Cathodic Protection
DES = Destroyed Well

ATTACHMENT B

Well Driller's Report Forms

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

GEO-HYDRO-DATA

INCORPORATED

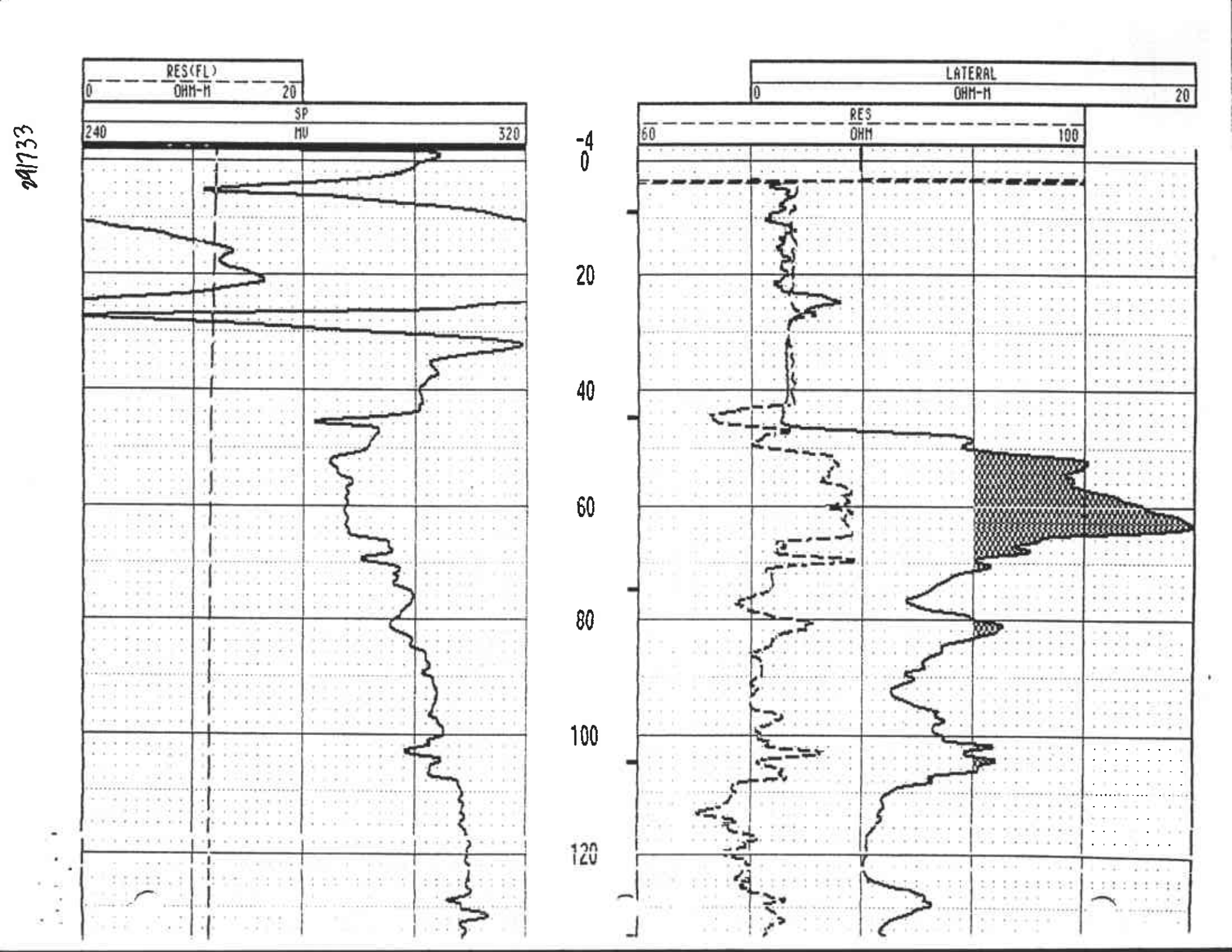
GROUNDWATER LOG

COMPANY	: BRAMLEA PACIFIC						
WELL	: 1						
LOCATION/FIELD	: OAKLAND						
COUNTY	: ALAMEDA						
STATE	: CALIFORNIA,U.S.A.						
SECTION	: N/A	TOWNSHIP	: N/A	RANGE	: N/A		
DATE	: 09/14/90	PERMANENT DATUM	: G.L.	ELEVATIONS			
DEPTH DRILLER	: 400 FEET	ELEV. PERM. DATUM	: N/A	KB	: N/A		
LOG BOTTOM	: 400.00	LOG MEASURED FROM	: G.L.	DF	: N/A		
LOG TOP	: -2.30	DRL MEASURED FROM	: G.L.	GL	: N/A		
CASING DRILLER	: 50	LOGGING UNIT	: 2				
CASING TYPE	: STEEL	FIELD OFFICE	: STOCKTON,CA				
CASING THICKNESS	: .125	RECORDED BY	: D SHANHOLTZR				
BIT SIZE	: 6.75	BOREHOLE FLUID	: CLAY/GEL	FILE	: ORIGINAL		
MAGNETIC DECL.	: -	RM	: -	TYPE	: 9041A		
MATRIX DENSITY	: -	RM TEMPERATURE	: -	LOG	: 0		
FLUID DENSITY	: -	MATRIX DELTA T	: -	PLOT	: GHD 4		
NEUTRON MATRIX	: N/A	FLUID DELTA T	: -	THRESH	: 300		

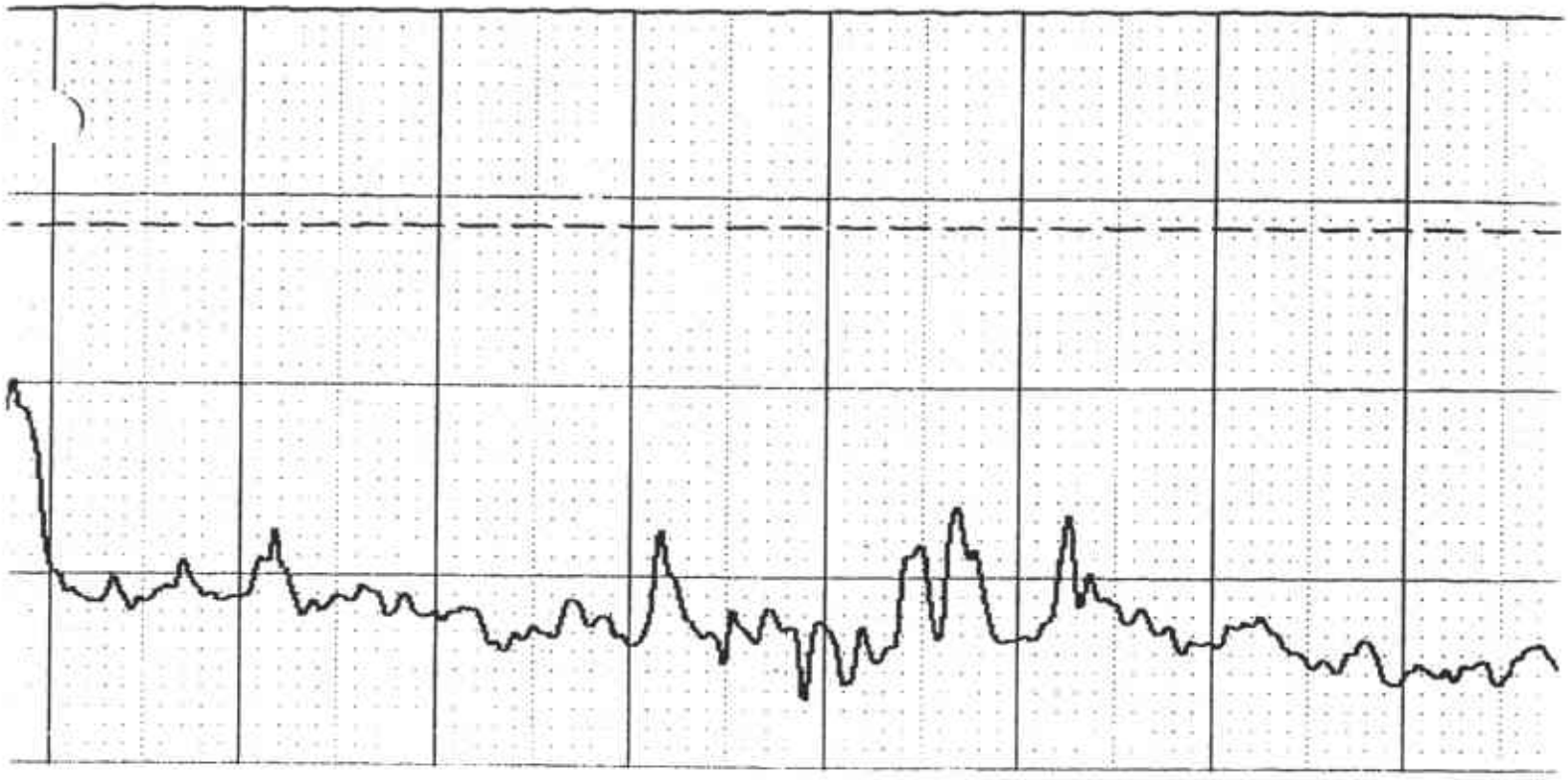
OTHER SERVICES:
INVOICE-
7283
300 PPM

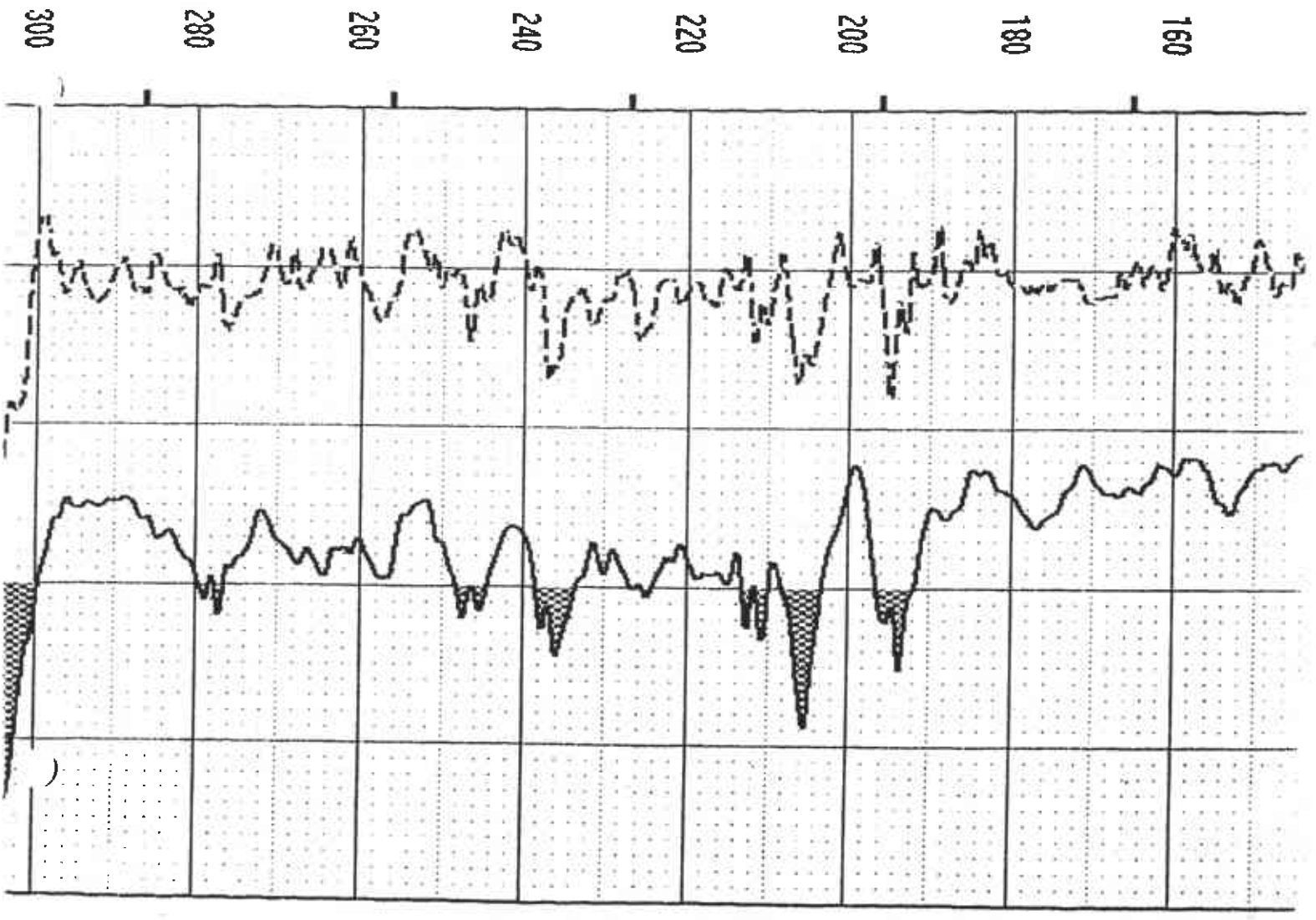
REMARKS :

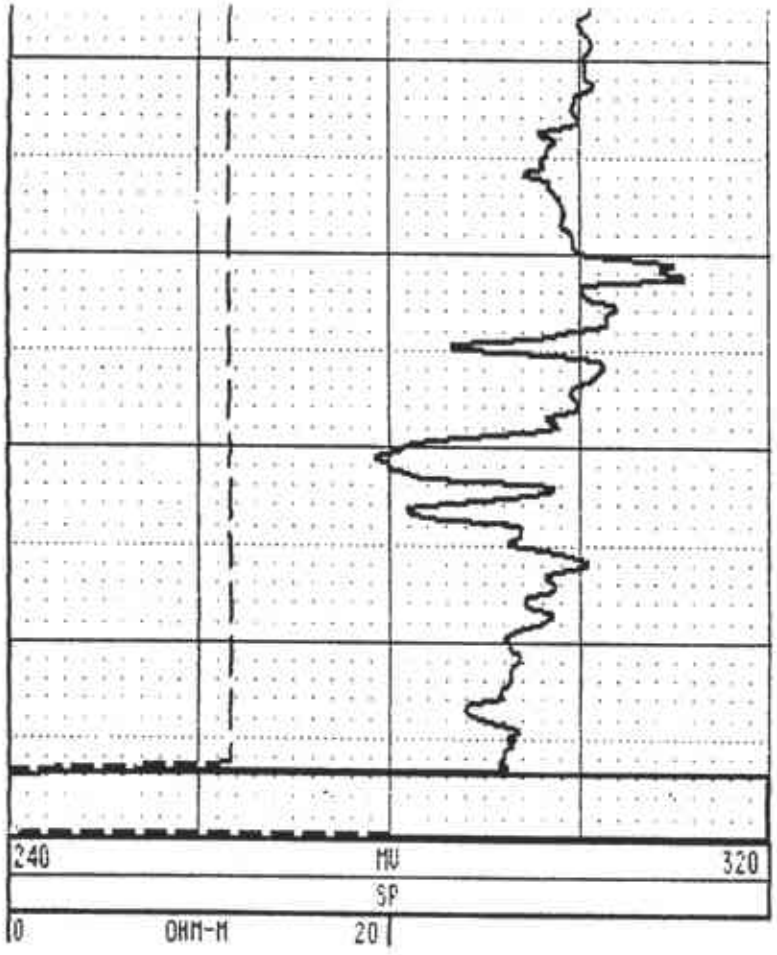
DRILLED BY GLENN MARTEL AND SON DRILLING,PITTSBURG,CA.WITNESSED-DRILLER
WATER QUALITY-

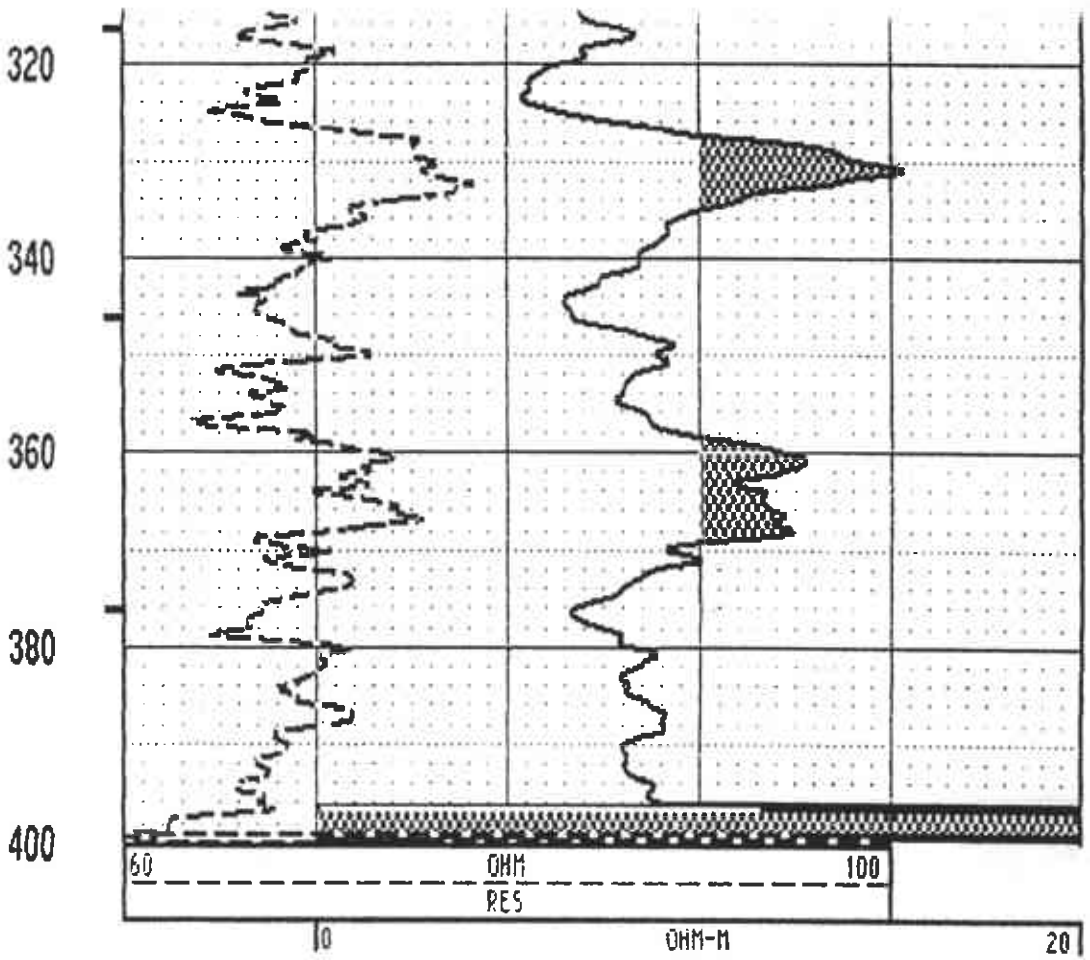

RES(FL)
0
OHM-M
20
SP
240
MV
320
LATERAL
0
OHM-M
20
RES
60
OHM
100
-4
0
20
40
60
80
100
120

291733









RES(FL)

LATERAL

15/4W-35 R

01-803

Job #810. Leamington Hotel, 19th. & Franklin Oakland, California.

LOG OF WELL.

Basement excavation			18 feet
Dry sand	18	to 24	"
Water sand	24	" 30	"
Gray clay	30	" 32	"
Dirty water gravel	32	" 37	"
Cement gravel	37	" 46	"
Brown sand	46	" 47	"
Yellow clay	47	" 75	"
Cement gravel	75	" 85	"
Yellow brittle clay	85	" 101	"
Cement gravel & sand	101	" 117	"
Yellow clay	117	" 119	"
Sediment, different colors	119	" 124	"
Dark blue clay	124	" 129	"
Light blue clay	129	" 143	"
Hard yellow sandy clay	143	" 153	"
Small gravel & sand	153	" 158	"
Blue sediment	158	" 165	"
Peat	165	" 168	"
Blue sand	168	" 173	"
Blue clay	173	" 175	"

32 feet of 12 inch No. 16 R. H. Collar Casing
175 feet of 10 inch No. 14 R. H. Double Casing
18 feet of machine perforations.

Well Tests 30 g.p.m.

Water tests 24.02 gr. per U.S.Gal.

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

REGION 2

COUNTY Alameda

NEAR Oakland

DIVISION OF WATER RESOURCES

DEPARTMENT OF PUBLIC WORKS

STATE OF CALIFORNIA

WELL LOG

BASIN

DWR No. 1S/4W-35N1 MD

OTHER Nos.

01-802

LOCATION Foot of Clay Street, Oakland

Test hole No. 67

OWNER Division of Highways ADDRESS

DRILLED BY ADDRESS

DRILLING METHOD GRAVEL PACKED DATE COMPLETED

SIZE OF CASING DEPTH STRUCK WATER AT

PERFORATIONS SIZE No.

WATER LEVEL BEFORE PERFORATING AFTER

TEST DATA: DISCHARGE G. P. M DRAWDOWN FT. HOURS RUN

OTHER DATA AVAILABLE: WATER LEVEL RECORD ANALYSIS

SURFACE ELEV. + 10.0 DATUM Mean Lower Low Tide SOURCE OF INFORMATION Div. of Hwys, Sacramento

DEPTH	ELEV. OF BOTTOM OF STRATUM	MATERIAL	THICKNESS	SP. YIELD %
+ 10.0 to	-2	Fill (silty sand and clay)		
- 2	-18	No recovery - medium silty sand indicated by bailer		
-18	-43	Med. fine sand and silty sand		
-43	-59	Silty clay with coarse round sand grains		
-59	-63	Silty sand		
-63	-75	Clay, little fine sand and silty clay		
-75	-85	Silty clay and sand		
-85	-107	Silty clay, little sand		
-107	-125	Coarse sand and fine gravel; fine silty sand and clay		
-125	-134	Fine silty sand and silty clay		
-134	-140.0	Mottled clay		
		Bottom of boring		
		At elev. -18 water at elev. 0.0		
		" -42 " " +5.0		
		-66 +6.5		
		-88 +6.5		
		-110 +6.5		
		-128 +1.6		

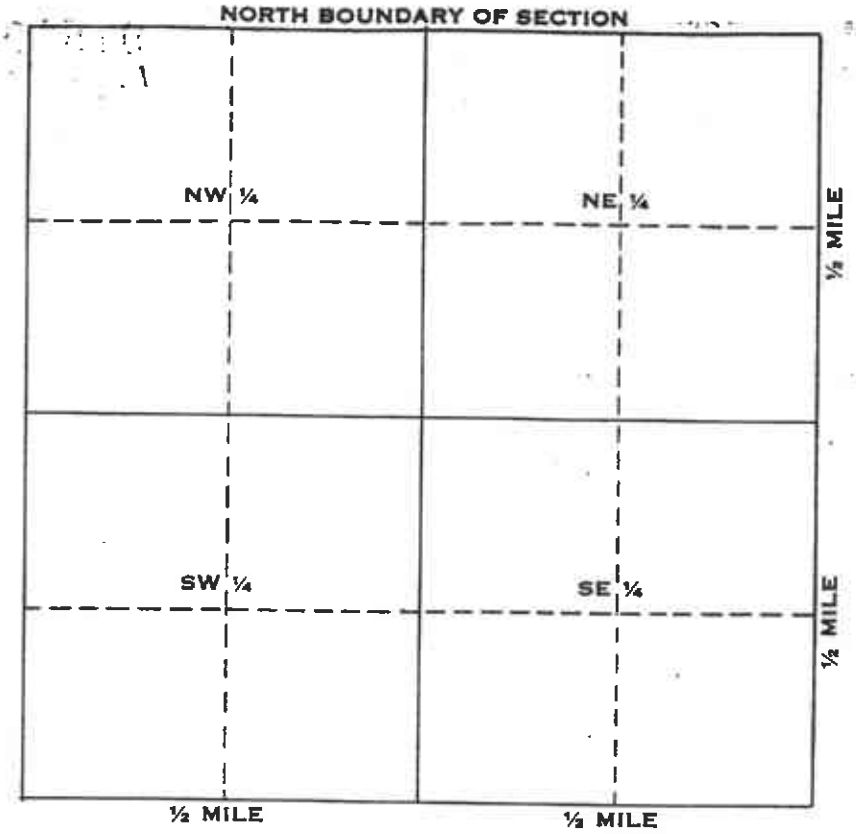
FOR FIELD COPIES USE ALTERNATE LINES

LOG OBTAINED BY Kretsinger from Mr. Root, Mtl's & Research Dept., Div. Hwys. Sac. DATE 2/4/55 SHEET 1 OF

FORM 263

WELL LOCATION SKETCH

9510

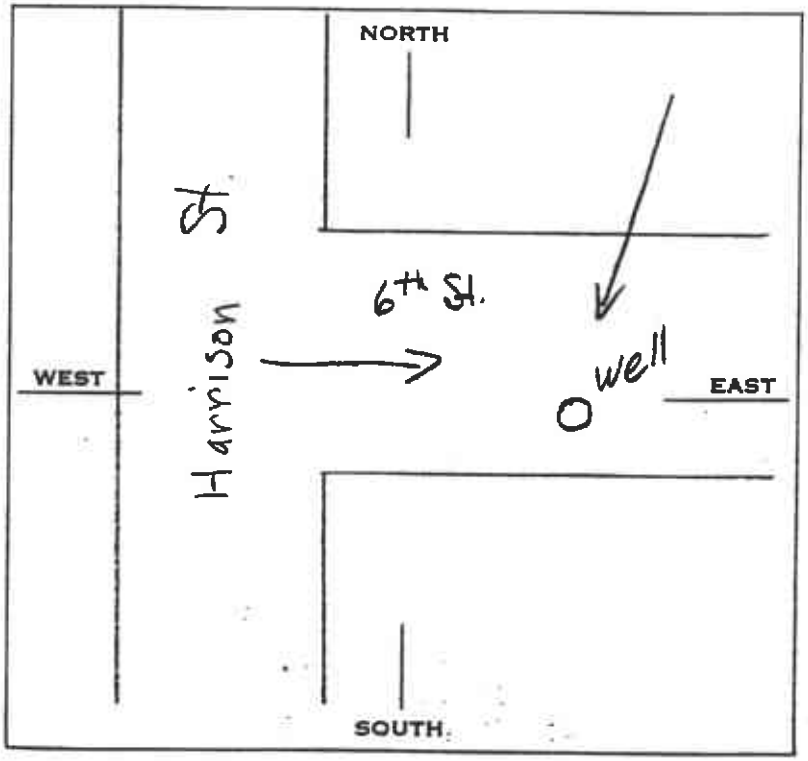


A. Location of well in sectionized areas.
Sketch roads, railroads, streams, or other features as necessary.

Township 1 N/S

Range 4 E/W

Section No. 35



B. Location of well in areas not sectionized.
Sketch roads, railroads, streams, or other features as necessary.
Indicate distances.

01-468T

James P. Bowers, PE
R. William Rudolph, Jr., PE

in
Add

1S/4W 35C7

1S/4W 35C7

July 16, 1990
SCI 430.007

Mr. John Esposito
Bramalea Pacific
1221 Broadway, Suite 1800
Oakland, California 94612

Well Destruction Report
Well Number 2 (SCI designation)
Permit No. 90225
13th and Jefferson Streets
Oakland, California

Dear Mr. Esposito:

This letter describes the methods and materials used to destroy a well near 13th and Jefferson Streets in Oakland, California. Subsurface Consultants, Inc. (SCI) encountered the well during excavation of gasoline contaminated soils at the site. The top of the well was encountered approximately 7 feet below street grade.

The well was located approximately 70 feet north of 13th Street and 63 feet west of Jefferson Street in Oakland, California, as shown on the attached Site Plan, Plate 1. The well consisted of an 8-inch-diameter steel casing positioned inside a 14-inch-diameter steel casing. The 14-inch casing was observed to be very corroded and appeared much older than the 8-inch casing. The 14-inch casing was in direct contact with native soils. The annulus between the 8 and 14 inch casings had been filled with sand. The well extended approximately 55 feet below the adjacent street grades. The top of the well was clogged with bricks and oily debris. Groundwater was encountered approximately 25 feet below street grade. A sample of the well water was obtained by SCI prior to well destruction and analytically tested. Analytical test results are summarized below.

Lic # C57 344590
DeLucchi 118

Subsurface Consultants, Inc.
171 12th Street • Suite 201 • Oakland, California 94607 • Telephone 415-268-0461 • FAX 415-268-0137

01-468T 1S/4W-35C7

Table 1. CONTAMINANT CONCENTRATIONS IN WELL 2 WATER

Sample	TEH[1] mg/L[5]	O&G[2] mg/L	Benzene ug/L[6]	Other[3] VOCs ug/L	PNAs[4] ug/L
Well 2	ND[7]	50	6	ND	ND

1 TEH = Total Extractable Hydrocarbons, EPA 8015/3550
2 O&G = Oil and Grease, Method SMWW 503E
3 VOCs = Volatile Organic Compounds: EPA Methods 601 and 602
4 PNAs = Polynuclear Aromatic Hydrocarbons
5 mg/L = milligrams per liter or parts per million (ppm)
6 ug/L = micrograms per liter or parts per billion (ppb)
7 ND = None detected at concentrations above detection limits. See analytical test reports for detection limits

The analytical results indicate that the well water contained low concentrations of oil and grease and benzene, a soluble constituent of gasoline. The well is situated in an area where gasoline contamination is present. The benzene is likely the result of this problem.

Initially, the 8-inch casing was removed utilizing a hoisting cable. Next, an 18-inch steel casing was driven into the ground around the outside of the remaining 14 inch well casing. The corroded 14-inch casing was subsequently drilled out using cable-tool drilling equipment. Cement grout was then pumped into the 18-inch casing using tremmie methods, displacing the water upwards. The tremmie pipe and the 18-inch casing remained below the grout/water interface so that a continuous column of grout was constructed. Approximately 8 cubic yards of neat cement grout (11 sacks of cement per cubic yard) were pumped into the well.

The water and drilling cuttings from the well were placed into a steel waste storage bin. The material was removed from the site under manifest by Hydro Tech, Inc. to the Valley Rock Disposal facility in Orland, California, which exclusively handles the disposal of drilling cuttings. Prior to disposal, a variety of chemical analyses were performed on the cuttings. The results are summarized below.

01-488T
1S/4W-35C 7

Table 2. CONTAMINANT CONCENTRATIONS IN DRILLING CUTTINGS

Sample	TEH[1] mg/kg[6]	O&G[2] mg/kg	Title 26 Metals mg/kg	BTXE[3] ug/kg[7]	Semi VOC's[4] ug/kg	PCB's[5] ug/kg
Cuttings	ND	180	ND	ND	ND	ND

1 TEH = Total Extractable Hydrocarbons, EPA 8015/3550
2 O&G = Oil and Grease, Method SMWW 503E
3 BTXE = Benzene, Toluene, Xylene, Ethylbenzene
4 Semi-VOC's = Semi Volatile Organics, EPA 8270
5 PCB's = Polychlorinatedbiphenyls, EPA 8270
6 mg/kg = milligrams per kilogram or parts per million (ppm)
7 ug/kg = micrograms per kilogram or parts per billion (ppb)
8 ND = None detected at concentration above detection limits. See analytical test reports for detection limits

Groundwater monitoring wells have been constructed down-gradient of Well 2 as part of an assessment evaluating gasoline contamination. It is anticipated that groundwater remediation in the area will be required, and will be initiated in the near future.

If you have any questions regarding abandonment of this well, please call.

Yours very truly,

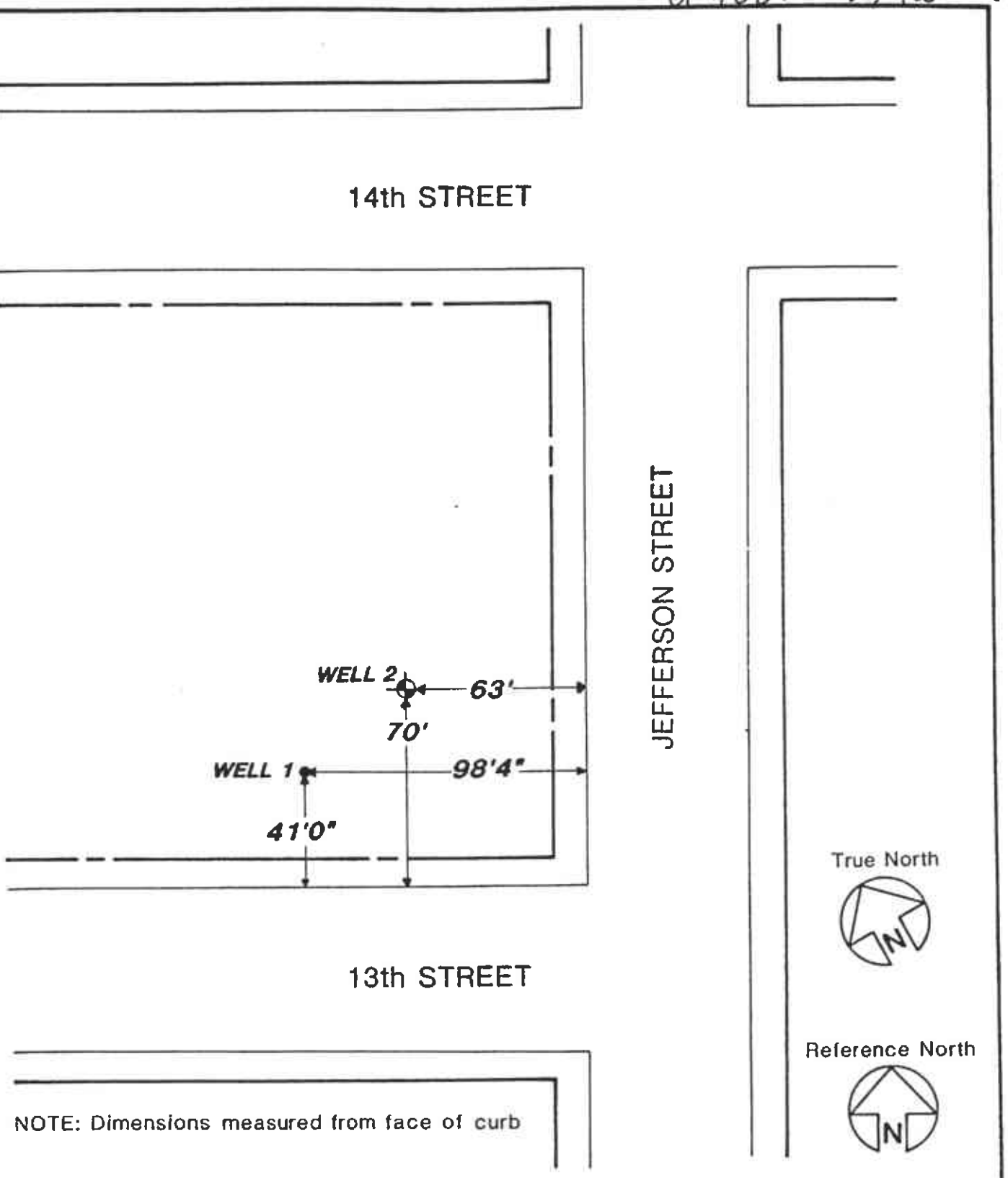
Subsurface Consultants, Inc.

Sean O Carson

Sean O. Carson
Civil Engineer 45074 (expires 3/31/94)

SOC:JPB:RWR:nf

01-468T 1S/4W-35C?



NOTE: Dimensions measured from face of curb

APPROXIMATE SCALE (feet)

0 50 100

WELL LOCATIONS

Subsurface Consultants

13th & JEFFERSON ST. - OAKLAND, CA

JOB NUMBER	DATE	APPROVED
430.007	11/10/88	

PLATE 1

ATTACHMENT C

Analytical Results

KIFF ANALYTICAL LLC

Report Number : 19721
Date : 4/9/2001

Dan Lescure
Cambria Environmental Technology Inc
6262 Hollis Street
Emeryville, CA 94608

Subject : 1 Water Sample and 4 Air Samples
Project Name : 610 Market Street, Oakland
Project Number : 243-0594-007
P.O. Number : Incident #98995750

Dear Mr. Lescure,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

Joel Kiff

KIFF ANALYTICAL LLC

Report Number : 19721
Date : 4/9/2001

Project Name : **610 Market Street, Oakland**
Project Number : **243-0594-007**

Sample : **V3A** Matrix : Air Lab Number : 19721-01
Sample Date :3/22/2001

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**10**	1.0	ppmv	EPA 8260B	3/24/2001
Toluene	**< 1.0**	1.0	ppmv	EPA 8260B	3/24/2001
Ethylbenzene	**4.9**	1.0	ppmv	EPA 8260B	3/24/2001
Total Xylenes	**6.9**	1.0	ppmv	EPA 8260B	3/24/2001
Methyl-t-butyl ether	**2100**	10	ppmv	EPA 8260B	3/25/2001
TPH as Gasoline	**2800**	100	ppmv	EPA 8260B	3/24/2001
Toluene - d8 (Surr)	98.8		% Recovery	EPA 8260B	3/24/2001
4-Bromofluorobenzene (Surr)	96.1		% Recovery	EPA 8260B	3/24/2001

Sample : **V3B** Matrix : Air Lab Number : 19721-02
Sample Date :3/22/2001

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**10**	5.0	ppmv	EPA 8260B	3/25/2001
Toluene	**< 5.0**	5.0	ppmv	EPA 8260B	3/25/2001
Ethylbenzene	**7.0**	5.0	ppmv	EPA 8260B	3/25/2001
Total Xylenes	**8.0**	5.0	ppmv	EPA 8260B	3/25/2001
Methyl-t-butyl ether	**2600**	20	ppmv	EPA 8260B	3/24/2001
TPH as Gasoline	**3000**	500	ppmv	EPA 8260B	3/25/2001
Toluene - d8 (Surr)	99.7		% Recovery	EPA 8260B	3/25/2001
4-Bromofluorobenzene (Surr)	97.9		% Recovery	EPA 8260B	3/25/2001

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 19721

Date : 4/9/2001

Project Name : **610 Market Street, Oakland**

Project Number : **243-0594-007**

Sample : **T1A** Matrix : Air Lab Number : 19721-03

Sample Date :3/22/2001

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**42**	10	ppmv	EPA 8260B	3/26/2001
Toluene	**< 10**	10	ppmv	EPA 8260B	3/26/2001
Ethylbenzene	**< 10**	10	ppmv	EPA 8260B	3/26/2001
Total Xylenes	**< 10**	10	ppmv	EPA 8260B	3/26/2001
Methyl-t-butyl ether	**4400**	40	ppmv	EPA 8260B	3/24/2001
TPH as Gasoline	**6300**	1000	ppmv	EPA 8260B	3/26/2001
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	3/26/2001
4-Bromofluorobenzene (Surr)	97.3		% Recovery	EPA 8260B	3/26/2001

Sample : **T1B** Matrix : Air Lab Number : 19721-04

Sample Date :3/22/2001

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**39**	10	ppmv	EPA 8260B	3/25/2001
Toluene	**< 10**	10	ppmv	EPA 8260B	3/25/2001
Ethylbenzene	**< 10**	10	ppmv	EPA 8260B	3/25/2001
Total Xylenes	**< 10**	10	ppmv	EPA 8260B	3/25/2001
Methyl-t-butyl ether	**8700**	200	ppmv	EPA 8260B	3/24/2001
TPH as Gasoline	**5000**	1000	ppmv	EPA 8260B	3/25/2001
Toluene - d8 (Surr)	99.4		% Recovery	EPA 8260B	3/25/2001
4-Bromofluorobenzene (Surr)	96.9		% Recovery	EPA 8260B	3/25/2001

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 19721
Date : 4/9/2001

Project Name : **610 Market Street, Oakland**
Project Number : **243-0594-007**

Sample : **GW3** Matrix : Water Lab Number : 19721-05
Sample Date :3/22/2001

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 200**	200	ug/L	EPA 8260B	3/28/2001
Toluene	**< 200**	200	ug/L	EPA 8260B	3/28/2001
Ethylbenzene	**< 200**	200	ug/L	EPA 8260B	3/28/2001
Total Xylenes	**480**	200	ug/L	EPA 8260B	3/28/2001
Methyl-t-butyl ether (MTBE)	**390000**	1000	ug/L	EPA 8260B	3/29/2001
TPH as Gasoline	**< 20000**	20000	ug/L	EPA 8260B	3/28/2001
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	3/28/2001
4-Bromofluorobenzene (Surr)	96.9		% Recovery	EPA 8260B	3/28/2001

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 19721

Date : 4/9/2001

Project Name : **610 Market Street,**

Project Number : **243-0594-007**

Quality Control Data - Method Blank

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	3/29/2001
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	3/29/2001
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	3/29/2001
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	3/29/2001
Methyl-t-butyl ether (MTBE)	**< 0.50**	0.50	ug/L	EPA 8260B	3/29/2001
TPH as Gasoline	**< 50**	50	ug/L	EPA 8260B	3/29/2001
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	3/29/2001
4-Bromofluorobenzene (Surr)	99.2		% Recovery	EPA 8260B	3/29/2001

Approved By: Joel Kiff

Report Number : 19721

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 4/9/2001

Project Name : **610 Market Street,**

Project Number : **243-0594-007**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Spike Recovery Data														
Benzene	19747-02	<0.50	24.8	25.0	20.1	20.2	ug/L	EPA 8260B	3/29/2001	81.1	80.8	0.321	70-130	25
Toluene	19747-02	<0.50	24.8	25.0	21.2	21.2	ug/L	EPA 8260B	3/29/2001	85.6	84.7	1.03	70-130	25
Tert-Butanol	19747-02	<5.0	24.8	25.0	29.9	30.5	ug/L	EPA 8260B	3/29/2001	121	122	0.955	70-130	25
Methyl-t-Butyl Ether	19747-02	10	24.8	25.0	31.1	31.6	ug/L	EPA 8260B	3/29/2001	83.9	84.9	1.25	70-130	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 19721

Date : 4/9/2001

QC Report : Laboratory Control Sample (LCS)

Project Name : **610 Market Street,**

Project Number : **243-0594-007**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	19.2	ug/L	EPA 8260B	3/29/2001	97.6	70-130
Toluene	19.2	ug/L	EPA 8260B	3/29/2001	97.4	70-130
Tert-Butanol	96.2	ug/L	EPA 8260B	3/29/2001	99.6	70-130
Methyl-t-Butyl Ether	19.2	ug/L	EPA 8260B	3/29/2001	104	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL

720 Olive Drive, Suite D

Davis, CA 95616

(530) 297-4800 (530) 297-4803 fax

EQUIVA Services LLC Chain Of Custody Record 14121

Equiva Project Manager to be invoiced: Karen Petryna

☑ SCIENCE & ENGINEERING ☐ TECHNICAL SERVICES ☐ CRMT HOUSTON

INCIDENT NUMBER (S&E ONLY): 9 8 9 9 6 7 5 0

SAP or CRMT NUMBER (TS/CRMT):

DATE: 3/22/01

PAGE: 1 of 1

CONSULTANT COMPANY: Cambria Environmental Technology Inc

ADDRESS: 6262 Hollis Street

CITY: Emeryville

TELEPHONE: (510)450-1988 FAX: (510)450-8295 E-MAIL: dlescure@cambria-env.com

SITE ADDRESS (Street and City): 610 Market Street, Oakland

PROJECT CONTACT (Report to): Dan Lescure

CONSULTANT PROJECT NO.: 243-0594 - 007

SAMPLER NAME(S) (Print): Jimmy Couch

LAB USE ONLY

TURNAROUND TIME (BUSINESS DAYS): ☐ 10 DAYS ☐ 5 DAYS ☐ 72 HOURS ☑ 48 HOURS ☐ 24 HOURS ☐ LESS THAN 24 HOURS

☐ LA - RWQCB REPORT FORMAT ☑ UST AGENCY: _____

GC/MS MTBE CONFIRMATION: HIGHEST _____ HIGHEST per BORING _____ ALL _____

SPECIAL INSTRUCTIONS OR NOTES: TEMPERATURE ON RECEIPT C°

Standard TAT, noting 72-hour hold time on air samples.

REQUESTED ANALYSIS

LAB USE ONLY	Field Sample Identification	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	TPH - Purgeable (8015m)	TPH - Extractable (8015m)	BTEX / MTBE (8021B)	BTEX / MTBE + Oxygenates (8260B)	VOCs Full List + Oxygenates (8260B)	MTBE (8260B) Confirmation, See Note	EPA 5035 Extraction for Volatiles	VOCs Halogenated/Aromatic (8021B)	Ethanol, Methanol (8015B)	Metals (Specify)	TRPH (418.1)	Vapor VOCs BTEX / MTBE (TO-15)	Vapor VOCs Full List (TO-15)	Vapor TPH (ASTM 3416m)	Vapor Fixed Gases (ASTM D1946)	Test for Disposal (4B-)	TPHg/BTEX/MTBE (8260B)				FIELD NOTES: Container/Preservative or PID Readings or Laboratory Notes	
	V3A	3/22/01	9:45	Air	1												X		X							Tedlar Bag	01
	V3B	3/22/01	10:45	Air	1												X		X							Tedlar Bag	02
	T1A	3/22/01	1:05	Air	1												X		X							Tedlar Bag	03
	T1B	3/22/01	3:25	Air	1												X		X							Tedlar Bag	04
	GW3	3/22/01	9:30	H2O	4																	X				VOA	05

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature) Harold Brown Staff Analyst	Date: 03 23 01	Time: 0930

DISTRIBUTION: White with final report, Green to File, Yellow and Pink to Client

10/23/00 Revision

ATTACHMENT D

Field Data Sheets

CAMBRIA

VAPOR EXTRACTION TEST DATA FORM

Project Name: 610 Market Street, Oakland
Project Number: 243-0594-007
Technicians:
Date: 7/22/01
Project Address: 610 Market Street, Oakland
Equipment: RSI Inc V3 Internal Combustion Engine
Well Notes:

Extraction Well	Time Interval (min)	Stinger depth (fbg)	Vacuum (in H2O)	~~Air~~ WELL Flow (cfm)	PID (ppm)	Lab Bag (ID)	Ext H2O Volume (gal)	DTW (fbg) (voas)	Influence Pt 1 (DTW)	Influence Pt 2 (~~In H2O~~)	Influence Pt 3 (~~DTW~~)	Recharge (Time)	Recharge (DTW)
STARTING TIME:										[illegible]	In H2O	0	19.2
MW3	RPM=	2000							MW2(90')	T1 11.5	T2 9.5	5	19.3
905	0		1020	3			013	10.87	11.6	10.61	DRY	10	18.55
~~910~~ →	5		22	16	1642	V3A		GW3		10.85	0	15	18.11
915	10	18	22	18	18600		026		11.18	10.85		20	18.01
920	15	18	22	58	14120		055		11.18	10.85		25	17.9
935	30	18	22	58	13840	SAMPLE	073		11.18	10.85		30	17.75
950	45	17	22	4	9350		110		11.18	10.85		35	17.65
1005	60	17	252	3	12820		146		—	10.85	0	40	17.55
[illegible]	90	16	250	2	7160		201		—	10.85	0	45	17.43
												50	17.32
MW3	RPM:	1500								VAC		55	17.25
10:45	0	16	270	12	9720	SAMPLE	201	16		0	0	60	17.15
10:50	5	16	267	12	8470		237			0	0	65	17.1
11:00	10	16	271	13	6150		256			0	0	70	17.05
11:15	15	16	269	14	10240		292			.1	0	75	16.95
11:30	30	15	87	8	1745	V3B	330			0	0	80	16.87
11:45	45	15	178	9	18270		330			0	0	85	16.12
12:00	60	15	195	22	6410		383					90	16.74
12:15	90											120	16.28
												150	15.85
												180	15.43

Margin notes: [illegible] @ 5 MIN. ; RE-START 11:30

NOTES:

• [illegible] RPM up. WELL VAC [illegible] 3 → 70 [illegible]	210	15.12
	270	14.51
	330	14.04
	390	13.63
	350	13.33
	410	13.05
	470	12.87
	530	

CAMBRIA

VAPOR EXTRACTION TEST DATA FORM

Project Name: 610 Market Street, Oakland
Project Number: 243-0594 -007
Technicians:

Date: 3/22/01
Project Address: 610 Market Street, Oakland
Equipment: RSI Inc V3 Internal Combustion Engine

Well Notes:

Extraction Well	Time Interval (min)	Stinger depth (fbg)	Vacuum (in H2O)	WELL Air Flow (cfm)	PID (ppm)	Lab Bag (ID)	Ext H2O Volume (gal)	DTW (fbg) (voas)	Influence Pt 1 (DTW)	Influence Pt 2 (in H2O)	Influence Pt 3 (DTW)	Recharge (Time)	Recharge (DTW)
STARTING TIME:													
T1		RPM	1750						MW3	T2	MW2		
1:00	0	0	5	0			0						
1:05	5	↓	5	0	4470	T1A	↓						
1:10	10		13	0	36620				.04	.2			
1:15	15		15	0	34870	SAMPLE			.04	.2			
1:30	30		10	0	35250				.03	.3			
1:45	45		12	0	35820				.02	.2			
2:00	60		9	0	34480				.02	.2			
2:15	90		9	0	35150				.02	.2			
T1		RPM	2500										
2:15	0	0	10	0	34990				.02	.1			
2:20	5	↓	16	0	33340				.03	.1			
2:25	10		14	0	35010				.02	.1			
2:40	15		17	0	32670				.02	.1			
2:55	30		20	0	31060	T1B			.02	0			
3:10	45		21	0	31390				.02	0			
3:25	60		21	0	30020				0.02	0			
3:40	90		21	10	32000				0.02	0			

NOTES:

TEST #1 – DILUTION AIR FLOW @ 70 SCFM FUEL FLOW @ 0.5 CFM
TEST #2 – " " " " 110 SCFM " " " 1.0 CFM

CONV HOT – ICE OPENS DILUTION TO CONTR 60% HIGH CONC: LOW WELL FLOW

@ 3:40 OPENED WELL DILUTION VALVE. WELL FLOW UP. VAC DOWN. RPM ~ SAME.

8.73

	MW3A	MW3B	T1A	T1B
Time	9:10	10:40	1:00	2:15
Hour Meter	29	30.5	32.3	33.7
Controller Hours				
RPM	2000	1500	1750	2500
Oil Pressure	45	42	45	45
Water temp	170	170	175	175
Controller Volt	13.3	13.3	13.3	13.3
Manifold Vac	22 Hg	22 Hg	22 Hg	22 Hg
Air Flow	62	35	72	110
Fuel Flow	2.4	1.6	2.3	1.0
Well Flow	0	13	0	0
Inlet Temp	766	742	350	1117
Outlet Temp	840	839	550	1227
Air Valve	71	39	73	130
Fuel Valve	76	56	69	42
Well Valve	40	64	0	82
Well Vac	123	270	7	16
Exhaust ppm	5	3	15	243
Propane%	55%	53%	52%	52%