

# CAMBRIA

Mr. Amir K. Gholami  
Alameda County Health Care Services Agency  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502-6577

September 4, 2002

✓ R0173  
L. P. ... 9/10/02  
Alameda County  
SEP 10 2002  
Environmental Health

Re: **Subsurface Investigation, Soil Vapor Extraction  
Pilot Test Report, and Interim Remediation Work Plan**  
Shell-branded Service Station  
2120 Montana Street  
Oakland, California  
Incident #98995740  
Cambria Project # 244-0733



Dear Mr. Gholami:

Cambria Environmental Technology, Inc. (Cambria) is submitting this *Subsurface Investigation, Soil Vapor Extraction Pilot Test Report, and Interim Remediation Work Plan* on behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell). The scope of work for this investigation and pilot test were described in Cambria's March 25, 2002 *Subsurface Investigation and Pilot Test Work Plan*, and approved by the Alameda County Health Care Services Agency (ACHCSA) in a letter dated May 23, 2002. The objective of this investigation was to further define the extent of hydrocarbons and methyl tertiary butyl ether (MTBE) in soil and groundwater beneath the site and to determine the most practical remedial technology for the site. Presented below are summaries of the site background, the subsurface investigation, the soil vapor extraction (SVE) pilot test, and our conclusions and recommendations.

## SITE BACKGROUND

**Site Location:** This operating Shell-branded service station is located at the intersection of Montana Street and Fruitvale Avenue in Oakland, California (Figure 1). Commercial properties lie to the north and east of the site, and residential properties lie to the west. Montana Street, a freeway on-ramp, and Highway 580 are located south of the site.

**Site Lithology:** The site is underlain by interbedded sandy silt, silty sand, clayey sand and sand to the total depth explored of 28 feet below grade (fbg).

Oakland, CA  
San Ramon, CA  
Sonoma, CA

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**Groundwater Depth and Flow Direction:** Historically, groundwater depth has ranged from approximately 10.1 to 14.3 fbg, and groundwater flow direction has varied from southwest to northwest. A rose diagram of groundwater flow direction is included on Figure 2.

**1997 Dispenser/Turbine Sump Upgrades:** In November 1997, Paradiso Mechanical of San Leandro, California upgraded fuel-related equipment at the service station. Secondary containment was added to the three existing dispensers and to the turbine sumps above the underground storage tanks (USTs) (Figure 2). Soil samples D-1, D-2, and D-3 were collected from beneath the dispensers at a depth of approximately 5 fbg. Soil samples were not collected from beneath the associated piping since it was not exposed during upgrade activities. The maximum total petroleum hydrocarbons as gasoline (TPHg), benzene, MTBE (by EPA Method 8020) concentrations were reported in sample D-3 at 59 parts per million (ppm), 0.76 ppm, and 1.1 ppm, respectively.

**1999 Subsurface Investigation:** In October 1999, Cambria advanced soil borings SB-1 through SB-3. SB-1 was advanced to 16 fbg, and SB-2 and SB-3 were advanced to 20 fbg. The maximum detected hydrocarbon concentrations in soil were 54 ppm TPHg in boring SB-1 at 5.0 fbg, 0.019 ppm benzene in boring SB-2 at 15 fbg, and 0.24 ppm MTBE (by EPA Method 8260) in boring SB-2 at 10.0 fbg. The maximum reported hydrocarbon concentrations in groundwater were 2,380 parts per billion (ppb) TPHg in boring SB-3, 10.6 ppb benzene in SB-2, and 3,210 ppb MTBE (by EPA Method 8020) in SB-3.

**2001 Monitoring Well Installation:** In February 2001, Cambria installed three groundwater monitoring wells, MW-1 through MW-3. The maximum TPHg and MTBE concentrations of 10 ppm and 5.2 ppm, respectively, were detected in soil samples collected from monitoring well MW-2, located across Montana Street from the site. The maximum detected benzene concentration of 0.066 ppm was detected in soil samples collected from monitoring well MW-1.

**Groundwater Monitoring:** Quarterly groundwater monitoring has been conducted at the site since well installation in 2001. Tank backfill well TBW-N, one of four tank backfill wells at the site and the only tank backfill well which encounters groundwater, was added to the quarterly monitoring program in September 2001. Separate phase hydrocarbons (SPH) have been detected intermittently in monitoring well MW-1 as well as in tank backfill well TBW-N. Up to 4,450 ppb TPHg, 820 ppb benzene and 63,000 ppb MTBE have been reported in groundwater samples collected from well MW-2. No TPHg or benzene, and a maximum of 1.26 ppb MTBE has been detected in groundwater samples collected from well MW-3.

**Mobile Groundwater Extraction (GWE):** GWE from wells MW-1 and TBW-N using a vacuum truck began at the site in August 2001. GWE was conducted on a weekly basis through

November 2001, on a bi-weekly basis through December 2001, and has been conducted on a monthly basis since January 2002. The cumulative estimated mass of TPHg and MTBE removed by GWE to date at the site is 8.95 pounds and 5.48 pounds, respectively. Additionally, approximately 2.68 pounds of SPH have been removed from wells MW-1 and TBW-N through both manual bailing and GWE.

## INVESTIGATION PROCEDURES



Cambria installed one onsite and one offsite groundwater monitoring well to better define the hydrocarbon and MTBE plume at the site. Soil samples were collected for lithologic logging purposes to the total depth of the wells, and selected soil samples were submitted for chemical analyses.

Monitoring well locations are shown on Figure 2. Specific procedures for this investigation are summarized below. Analytical results for soil are summarized in Table 1, and certified laboratory reports are presented as Attachment A. Boring logs and Cambria's Standard Field Procedures for Monitoring Well Installation are presented as Attachments B and C, respectively. Copies of well permits are included as Attachment D. California Department of Water Resources (DWR) Well Completion Reports are included as Attachment E. Survey results are included as Attachment F.


**Drilling Date:** June 21, 2002.

**Drilling Company:** Gregg Drilling and Testing Inc. of Martinez, California (Gregg) (C-57 License #485165).

**Personnel Present:** Jason Gerke, Staff Geologist, Cambria.  
Bobby Deason, Gregg.  
Vincent Patry, Gregg.

**Permits:** Alameda County Public Works Agency Drilling Permits  
W02-0378 and W02-0379.  
City of Oakland Encroachment Permit # ENMI02180.  
City of Oakland Excavation Permit # 0200613 (Attachment D).

**Number of Wells:** Two: MW-4, and MW-5 (Figure 2).

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- Drilling Method:*** MW-4 was installed using a drill rig equipped with 10-inch diameter hollow-stem augers. MW-5 was installed using a drill rig equipped with 8-inch diameter hollow-stem augers.
- Soil Sampling Method:*** Soil samples were collected using a spilt-spoon sampler with brass sample tubes. Soil samples were collected at approximate 5-foot intervals from monitoring wells MW-4 and MW-5.
- Well Depths:*** Wells MW-4 and MW-5 were installed to 20.0 fbg (Attachment B).
- Sediment Lithology:*** Soils encountered in boring MW-4 consisted of a silty clay to approximately 7.5 fbg, underlain by interbedded sandy silt and silty sand to the total explored depth of 20 fbg. Soils encountered in boring MW-5 consisted of a silty sand to 9.6 fbg, underlain by a gravely sand to the total explored depth of 20 fbg. Boring logs are included as Attachment B.
- Groundwater Depths:*** Groundwater was first encountered during drilling at approximately 12 fbg in both borings.
- Well Materials:*** Groundwater monitoring well MW-4 was constructed of 4-inch diameter PVC, and monitoring well MW-5 was constructed of 2-inch diameter PVC. Both wells were screened with 15 feet of 0.010-inch machined slots. After each well was set, they were completed using a filter pack of Monterey #2/12 sand from the bottom of the boring to approximately 1 foot above the top of the screened casing, approximately 1 foot of bentonite above the filter pack, and Portland neat cement to 1 fbg. A flush-mounted, traffic-rated well box was installed to protect and complete each well to grade (Attachment B).
- Screened Interval:*** Wells MW-4 and MW-5 were screened from 5 to 20 fbg (Attachment B).
- Well Elevation Survey:*** The top of casing elevations and latitude/longitude of the wells were surveyed by Virgil Chavez Land Surveying of Vallejo, California on June 26, 2002 (Attachment F).

***Well Development and  
Sampling:***

Blaine Tech Services, Inc. of San Jose, California (Blaine) developed both new wells on July 10, 2002, and sampled the wells on July 16, 2002. Results were presented with the second quarter 2002 monitoring report.

***Chemical Analyses:***

Soil samples for chemical analysis were collected at approximate 5-foot intervals. The samples were analyzed by a State-certified laboratory for TPHg, benzene, toluene, ethylbenzene and xylenes (BTEX), and MTBE by EPA Method 8260B (Table 1 and Attachment A).

Groundwater in the new wells will be sampled by Blaine as part of the quarterly monitoring program for the site and analyzed by a State-certified laboratory for TPHg, BTEX and MTBE. Results will be included in forthcoming monitoring reports.

To characterize soil cuttings from the hollow-stem auger borings for disposal, four brass tubes of soil were collected, then composited and analyzed by the analytical laboratory for TPHg, BTEX and MTBE by Method 8260B and for total threshold limit concentration lead.

***Soil Handling:***


Soil cuttings produced from the borings were stockpiled on the site. The cuttings were transported to Forward Landfill in Manteca, California for disposal on July 12, 2002. Disposal confirmation is included in Attachment G.

**INVESTIGATION RESULTS**

No TPHg or BTEX was detected in soil samples collected from well MW-4. TPHg and benzene were detected only in well MW-5 in the soil samples collected from 9.0 fbg and 19.0 fbg at 1.3 ppm and 18 ppm, respectively. Benzene was detected only in boring MW-5 in soil samples collected from 9.0 fbg and 19.0 fbg at 0.0083 ppm and 0.0071 ppm, respectively. No MTBE was detected in any soil samples collected during this investigation. Soil analytical results are summarized in Table 1, and the certified laboratory analytical reports are presented in Attachment A.

## SVE PILOT TEST SUMMARY

The pilot test objective of the SVE activities at the subject site was to remove petroleum hydrocarbon mass and determine if extracted vapor concentrations would be sustained over a long period of time. Starting on June 24, 2002, Cambria performed long-term (5 day) SVE testing of existing tank backfill well TBW-E.



**SVE Test Procedures:** Due to anticipated high hydrocarbon vapor concentrations, an internal combustion engine (ICE) was used as the extraction and vapor abatement device during the SVE test. The ICE has an internal controller (Phoenix 1000 auto-fuel controller) that regulates the air-to-fuel ratio, allowing operation at the optimal extraction rate. 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, BTEX compound, and MTBE by EPA Method 8260B.

**SVE Testing Equipment:** The test was performed by connecting a Remediation Services International model V3 ICE to the test well for extracting soil vapor. 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 ICE inlet and vacuums, 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 1-liter tedlar bags. Magnehelic differential pressure gauges were used to monitor vacuum induced in nearby wells.

## SVE PILOT TEST RESULTS

The test data is summarized in Tables 2 and 3. Laboratory analytical results are included as Attachment H. Field data sheets are included as Attachment I. Details of the June 2002 test are presented below:

**June 24, 2002:** In the initial vapor sample collected at 11:45 hours, TPHg, benzene, and MTBE vapor concentrations were reported as 8,100, 72, and 130 parts per million by volume (ppmv), respectively. TPHg, benzene, and MTBE vapor concentrations were reported as 4,800, 28, and 32 ppmv, respectively, in the subsequent vapor sample collected at 15:00 hours. After ICE operation stabilized, the well airflow rate, as measured by the Phoenix controller, averaged

31.9 cubic feet per minute (cfm). The applied extraction well vacuum averaged 6.6 inches of water (inH<sub>2</sub>O), resulting from an average ICE inlet vacuum of 17.5 inches of mercury (inHg).

*June 25, 2002:* In the initial vapor sample collected at 14:00 hours, TPHg, benzene, and MTBE vapor concentrations were reported as 4,800, 28, and 32 ppmv, respectively. TPHg, benzene, and MTBE vapor concentrations were reported as 3,500, 20, and 18 ppmv, respectively, in the subsequent vapor sample collected at 21:30 hours. The well airflow rate averaged 45.5 cfm. The applied extraction well vacuum averaged 6.1 inH<sub>2</sub>O, resulting from an average ICE inlet vacuum of 19.6 inHg.

*June 26, 2002:* TPHg, benzene, and MTBE vapor concentrations were reported as 3,100, 17, and 16 ppmv, respectively, in the initial vapor sample collected at 10:30 hours. TPHg, benzene, and MTBE vapor concentrations were reported as 4,600, 25, and 23 ppmv, respectively, in the subsequent vapor sample collected at 18:20 hours. The well air flow rate averaged 55.5 cfm. The applied extraction well vacuum averaged 3.7 inH<sub>2</sub>O, resulting from an average ICE inlet vacuum of 20.6 inHg.

*June 27, 2002:* TPHg, benzene, and MTBE vapor concentrations were reported as 1,500, 9.7, and 9.3 ppmv, respectively, in the initial vapor sample collected at 11:00 hours. TPHg, benzene, and MTBE vapor concentrations were reported as 1,100, 6, and 6.8 ppmv, respectively, in the subsequent vapor sample collected at 19:00 hours. The well air flow rate averaged 55.1 cfm. The applied extraction well vacuum averaged 4.5 inH<sub>2</sub>O, resulting from an average ICE inlet vacuum of 20.7 inHg.

*June 28, 2002:* TPHg, benzene, and MTBE vapor concentrations were reported as 650, 5.4, and 5.6 ppmv, respectively, in the initial vapor sample collected at 8:00 hours. TPHg, benzene, and MTBE concentrations were reported as 1100, 6.4, and 6.5 ppmv, respectively, in the subsequent vapor sample collected at 12:30 hours. The well air flow rate averaged 51.4 cfm. The applied extraction well vacuum averaged 6.3 inH<sub>2</sub>O, based on an average ICE inlet vacuum of 21.3 inHg.

## **SVE PILOT TEST CONCLUSIONS**

Given the low permeability of the native soil relative to the UST complex backfill material, it is reasonable to assume that vapor extraction influence was limited mainly to the extent of the UST facility. Monitoring wells MW-3 and MW-4 and backfill wells TBW-N and TBW-W were used to measure vacuum influence from the vacuum applied to TBW-E. An effective radius of influence is typically identified where observed vacuum is approximately 1% of the applied vacuum. Observed vacuums in wells MW-3 and MW-4 were 0.7 % and 1.5 %, respectively, and are considered

ineffective or only slightly effective. Tank backfill well TBW-N is located approximately 32.5 feet from tank backfill well TBW-E. A maximum vacuum of 0.25 inH<sub>2</sub>O was measured in tank backfill well TBW-N, which equates to 19.5% of the applied vacuum. Tank backfill well TBW-W is located approximately 42 feet from tank backfill well TBW-E. A maximum vacuum of 0.14 inH<sub>2</sub>O was measured in tank backfill well TBW-W, which equates to 7.0% of the applied vacuum.

To determine the effective radius of influence, the applied vacuum was compared to the vacuum observed in these nearby wells. The theoretical radius of influence was estimated according to the steady-state radial distribution equation in *A Practical Approach to the Design, Operation, and Monitoring of In Situ Soil Venting Systems* (P.C. Johnson, C.C. Stanley, M.W. Kemblowski, D.L. Byers, and J.D. Colthart, Groundwater Monitoring and Review, Spring 1990). As shown in Table 2, the theoretical radius of vacuum influence within the UST facility extends to 114 feet, which also defines the limits of the UST facility. Outside the UST facility, the theoretical radius of vacuum influence extends from 54 to 84 feet.

Vapor extraction data from the SVE pilot test suggests vapor-phase recovery was effective from tank backfill well TBW-E. Initially, low airflow rates were obtained and low vacuums were applied during the test due to ICE limitations. Because the test well yielded considerably high TPHg and MTBE vapor concentrations, the ICE controller did not allow high airflow from the well due to these initially high vapor concentrations. The controller regulates an air-to-fuel ratio necessary to operate the ICE, and the high initial extracted vapor concentrations required considerable dilution air to keep the ICE at the appropriate air-to-fuel ratio. Given the high estimated permeability tank backfill material (pea gravel) within the UST facility, a higher airflow rate was anticipated to be extracted from the formation than the airflow rate achieved during the first day of the test. Operation during subsequent days produced higher airflow rates from the well as the vapor concentrations decreased, supporting the assumption of the availability of a high airflow rate from the UST facility.


Initial vapor concentrations were high, indicating the presence of source material within the UST facility available for recovery. Operation of the ICE over the 5-day test period resulted in an order of magnitude decrease in TPHg and MTBE vapor concentrations. Figure 3 illustrates the TPHg and MTBE vapor concentration decrease over the test period. Based on operating parameters and vapor sample analytical results collected throughout the week, the total TPHg, benzene and MTBE vapor-phase mass removal over the test period is estimated at 176, 0.99 and 1.92 pounds, respectively.

The estimated cumulative mass removal of TPHg, benzene and MTBE through mobile GWE from wells MW-1 and TBW-N conducted from August 2001 through July 2002 (21 events total) was approximately 9.0 pounds, 0.2 pounds and 5.5 pounds, respectively. In comparison with the SVE test results, this suggests that although GWE has been effective, vapor extraction from the tank



backfill is more effective in the short-term at removing TPHg, benzene and MTBE than GWE. However, GWE is needed to adequately address the remaining SPH and dissolved-phase TPHg, benzene and MTBE, and can potentially provide hydraulic control.

## RECOMMENDATIONS FOR REMEDIATION



The SVE pilot test field data indicated that source area remediation is viable through vapor extraction, but would likely be limited to the UST complex and a minimal area around the facility. However, Cambria does not recommend installing a permanent SVE system at this time because it appears that the 5-day SVE pilot test removed a large portion of the hydrocarbon mass available within the UST complex. Cambria does recommend installing underground SVE piping concurrent with the proposed GWE installation described below, in the event that future SVE from a fixed system is required. Cambria also recommends monitoring vapor concentrations in the UST facility to further assess the effectiveness of the SVE test and to determine if further SVE is warranted at the site. If vapor concentrations appear to increase (rebound), then Cambria may pursue follow-up SVE testing or remediation. Vapor concentration monitoring results will be provided in the quarterly monitoring reports.

Cambria also recommends installation of a fixed GWE system. The intent of the proposed GWE system is to hydraulically control TPHg, benzene and MTBE migration in groundwater at the site perimeter and in source areas, and to remove dissolved constituents of concern from groundwater. Conceptual design of the GWE system is described below.

**System Design:** Cambria will prepare engineering design drawings for permitting and GWE system construction. The system will be designed with capacity for easy expansion to additional wells, and to handle additional groundwater flow, if necessary. Depending on the results of future investigation and monitoring activities, additional pumping wells may be added. In addition, underground SVE piping will be installed in case it is needed for future SVE from a fixed system.

Data pertaining to anticipated groundwater flow rates has been collected during mobile GWE events currently conducted on a routine basis. Although these events do not serve as a formal pump test designed to calculate properties such as transmissivity and hydraulic conductivity, etc., sufficient data was gathered to allow for a reasonable estimation of system flow rates. The groundwater monitoring wells are anticipated to produce flows of approximately 2 gallons per minute.

**Pumping Locations:** The proposed GWE system design includes pumping from two existing wells (well MW-1 and tank backfill well TBW-N). Refer to Figure 2 for the location of these wells.

Well MW-1 was constructed using 2-inch diameter PVC casing installed to a depth of 28 fbg. MW-1 is screened from 13 to 28 fbg with 0.010-inch slotted perforation. Backfill well TBW-N was constructed using 4-inch diameter PVC casing screened its entire length to a final depth of 12.5 fbg.

Current depth to water in MW-1 is approximately 13 fbg, leaving a water column of approximately 15 feet. Approximately 1 foot of water column is present in well TBW-N seasonally.

**System Equipment:** Groundwater will be extracted from the wells using pneumatic submersible pumps due to the relatively low anticipated flow rates. Selection of pump makes and models will be determined as part of the final design. An air compressor will provide compressed air to drive the pneumatic pumps.

Extracted groundwater will be pumped from the wells into a storage tank, located in a remediation compound. The compound will be located at the northeast side of the site as shown in Figure 2. To prevent overflow of the storage tank, a float switch in the storage tank will shut off the system when the tank is full. Extracted groundwater will be pumped from the storage tank, using a transfer pump, through a particulate filter and then through a series of aqueous-phase carbon vessels prior to discharge to the local sanitary sewer. Flow meters, pressure gauges, and sample ports, will be installed to control and monitor system operation.

Power requirements for the system will be determined when design drawings are prepared. An electrical control panel with a programmable logic controller will interlock and operate the controls of the GWE system. A telephone autodialer will be installed to remotely notify Cambria of system shutdown events.

**Building Permits:** Cambria will submit engineered drawings and specifications to the City of Oakland for design review and issuance of applicable construction permits.

**Discharge Permitting:** Cambria anticipates discharging treated groundwater to the local sanitary sewer system, under the authorization of a East Bay Municipal Utility District (EBMUD) discharge permit. Cambria will submit the necessary permit application materials to EBMUD.



**Construction:** Cambria will issue engineered drawings, specifications, and a detailed scope of work to a Shell-preferred contractor for submittal of construction costs and schedule. The contractor will begin construction after Shell approves the construction cost and schedule. Cambria will provide oversight of construction activities included in the contractor's scope of work. The contractor will arrange all required inspections.

**Utility Location:** The contractor will notify Underground Service Alert of the construction activities. A private underground utility locator will be hired to locate the utilities in the vicinity of the trench excavations.



**Site Health and Safety Plan:** Cambria and the contractor will prepare comprehensive site safety plans to protect site workers. The plan will be kept onsite during field activities and will be reviewed and signed by each site worker.

**Start-up:** After inspection approval, Cambria will collect GWE system start-up samples and operational data as specified by sewer discharge permit. The samples will be transported to a State-approved analytical laboratory for the appropriate chemical analysis. The analytical results will be submitted to the EBMUD for review. Start-up of the GWE system will occur after receiving discharge approval from EBMUD. Copies of any start-up reports submitted to EBMUD will also be sent to the ACHCSA.

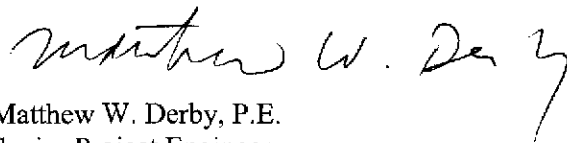
**CLOSING**

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

Sincerely,  
**Cambria Environmental Technology, Inc.**



Jacquelyn L. Jones  
Project Geologist



Matthew W. Derby, P.E.  
Senior Project Engineer



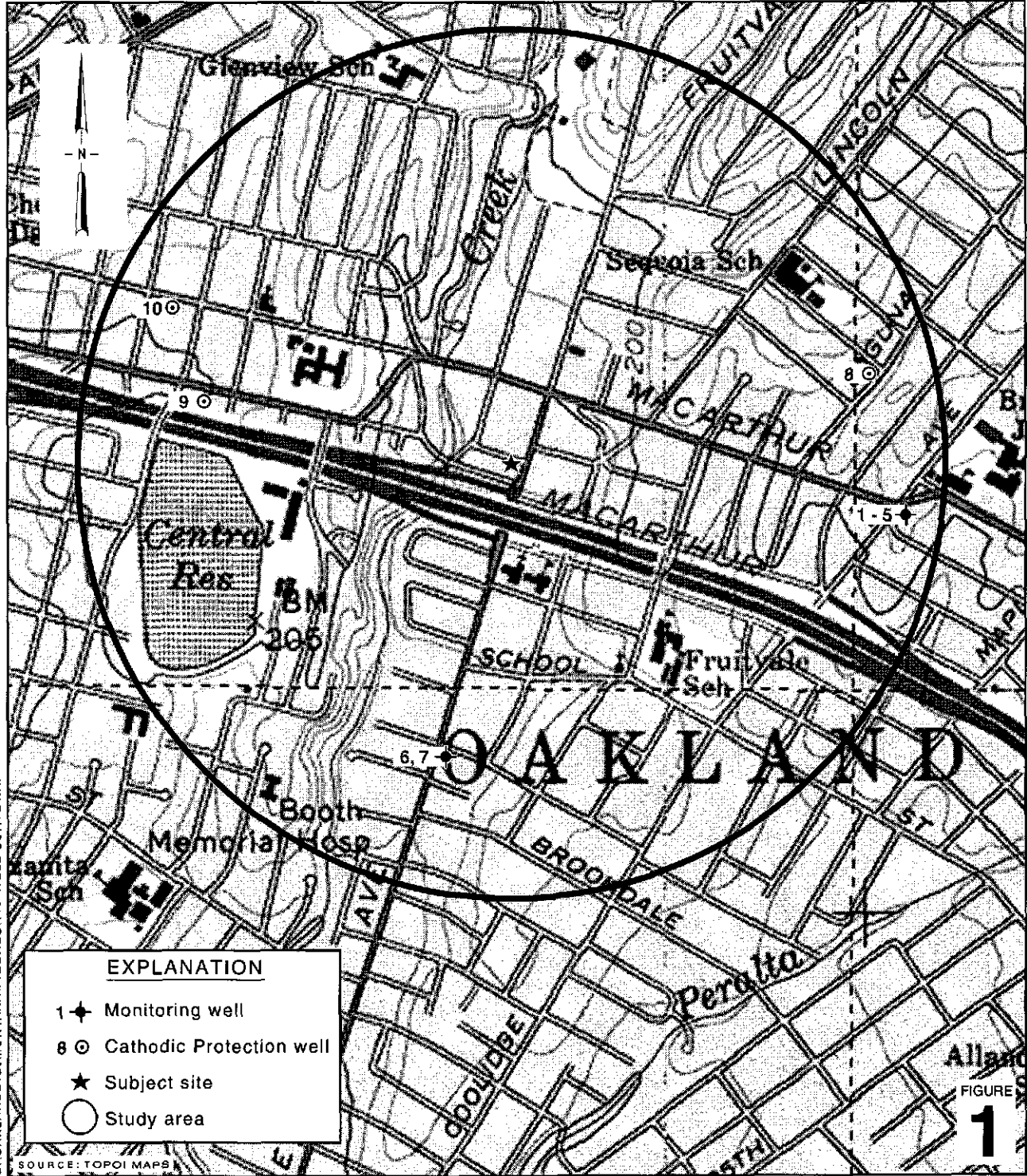
- Figures:
- 1 - Vicinity/Area Well Survey Map
  - 2 - Remediation System Layout
  - 3 - TPHg, Benzene and MTBE Vapor Concentration versus Time – Well TBW-E

- Tables:
- 1 - Soil Analytical Data
  - 2 - Soil Vapor Extraction Test – Mass Removal Data
  - 3 - Soil Vapor Extraction Test – Radius of Influence Data

- Attachments:
- A - Laboratory Analytical Reports for Soil Samples
  - B - Boring Logs and Well Completion Details
  - C - Standard Field Procedures for Monitoring Well Installation
  - D - Permits
  - E - DWR Well Completion Reports
  - F - Well Elevation Survey Results
  - G - Soil Disposal Confirmation
  - H - Laboratory Analytical Results for Vapor Samples
  - I - SVE Pilot Test Field Notes

cc: Karen Petryna, Shell Oil Products US, P.O. Box 7869, Burbank, CA 91510-7869

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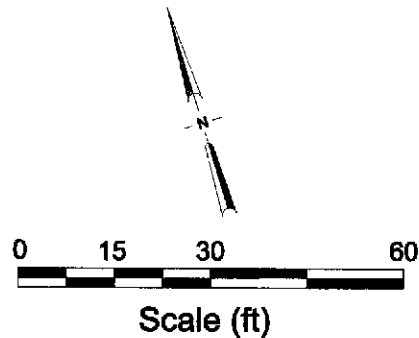
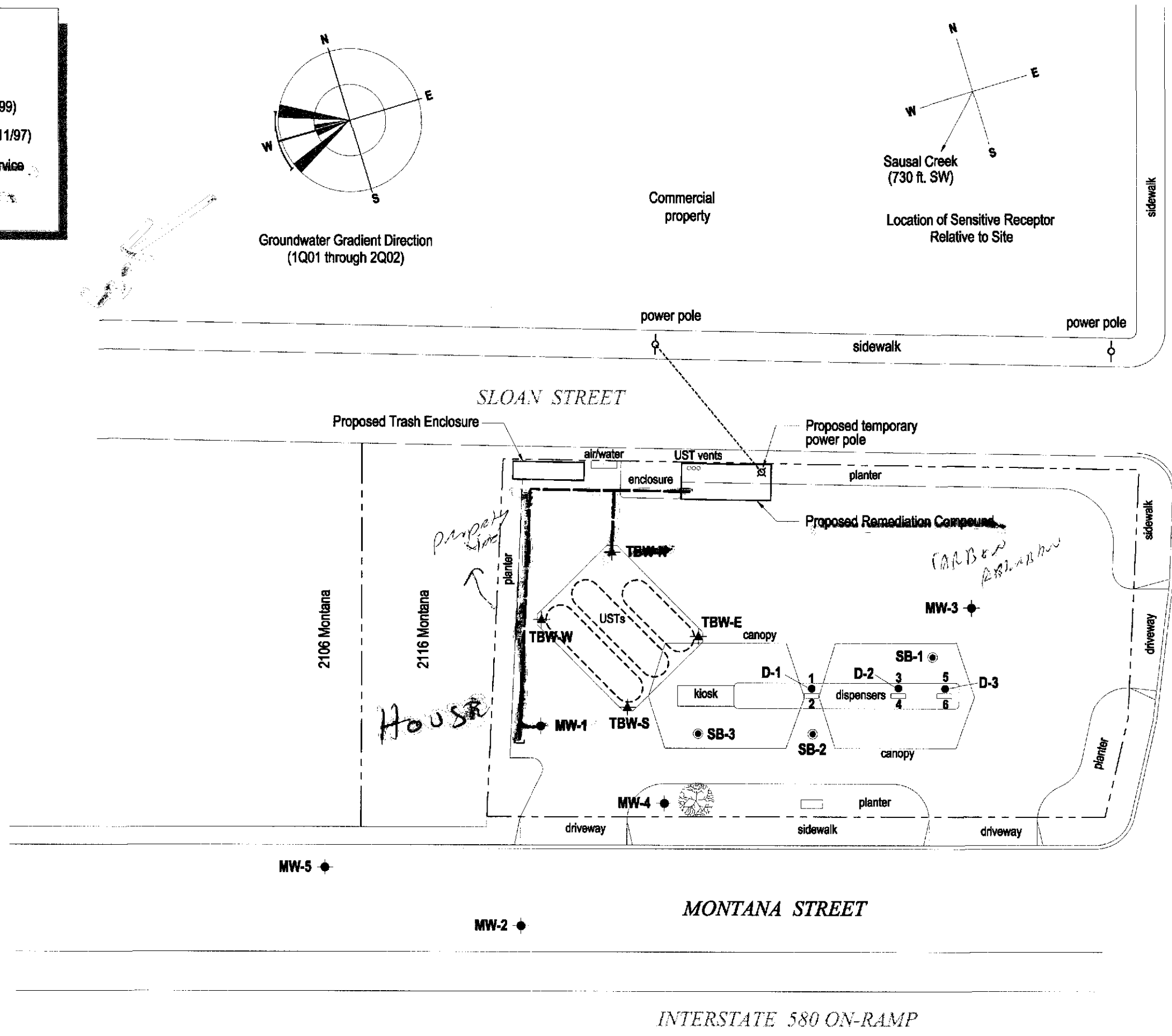
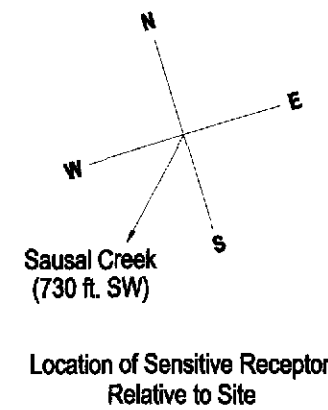
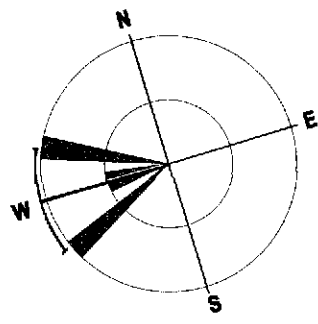
**Shell-branded Service Station**  
 2120 Montana Street  
 Oakland, California  
 Incident #98995740



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

Allard  
 FIGURE  
**1**

EXPLANATION	
MW-1	Monitoring well location
TBW-N	Tank backfill well location
SB-1	Cambria soil boring location (10/99)
D-1	Cambria soil sampling location (11/97)
- - - - -	Proposed overhead electrical service
- - - - -	Proposed trench/piping layout



Remediation System Layout

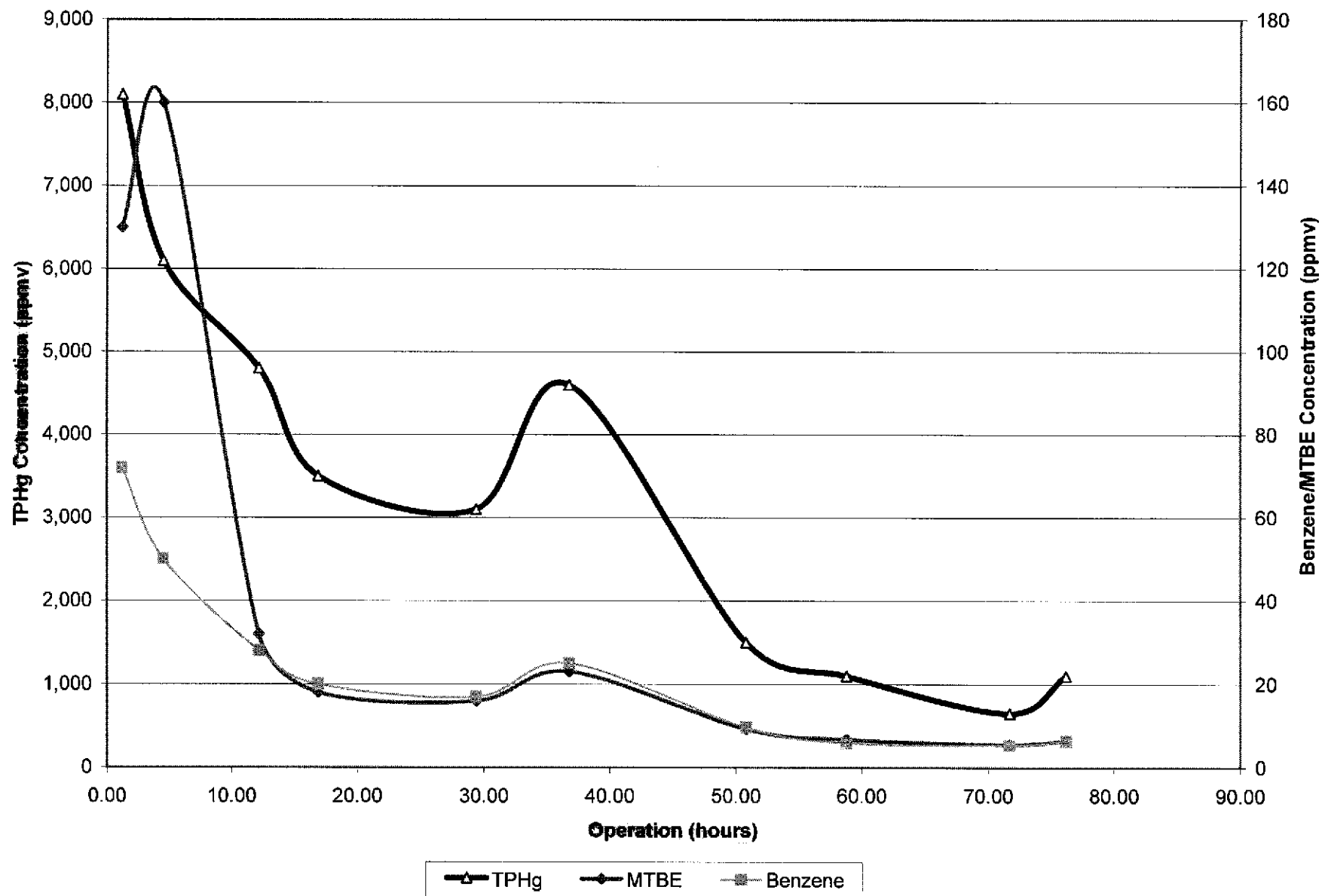


Shell-branded Service Station  
2120 Montana Street  
Oakland, California  
Incident #98995740

FIGURE 2

Q:\OAKLAND 2120 MONTANA\FIGURE\REMEDIATION\SYSTEM LAYOUT.DWG

**Figure 3**  
**TPHg, Benzene & MTBE Vapor Concentration vs Time**  
**Well TBW-E**



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**Table 1. Soil Analytical Data - Shell-branded Service Station - 2120 Montana Street, Oakland, California**

Incident # 98995740

Sample ID	Date	Depth (feet below grade)	TPHg	MTBE	Benzene	Toluene (ppm)	Ethylbenzene	Xylenes
MW-4-5.5	June 21, 2002	5.5	<1.0	<0.5	<0.005	<0.005	<0.005	<0.005
MW-4-9.0	June 21, 2002	9.0	<1.0	<0.5	<0.005	<0.005	<0.005	<0.005
MW-4-13.5	June 21, 2002	13.5	<1.0	<0.5	<0.005	<0.005	<0.005	<0.005
MW-5-5.5	June 21, 2002	5.5	<1.0	<0.5	<0.005	<0.005	<0.005	<0.005
MW-5-9.0	June 21, 2002	9.0	<b>1.3</b>	<0.5	<b>0.0083</b>	<0.005	<0.005	<0.005
MW-5-19.0	June 21, 2002	<b>19.0</b>	<b>18</b>	<0.5	<b>0.0071</b>	<0.005	<b>0.014</b>	<b>0.019</b>

**Notes and Abbreviations:**

TPHg = Total petroleum hydrocarbons as gasoline, analyzed by EPA Method 8260B

MTBE = Methyl tert-butyl ether, analyzed by EPA Method 8260B

Benzene, ethylbenzene, toluene, xylenes, analyzed by EPA Method 8260B

ppm = parts per million

<X = Below laboratory detection limit of X



**Table 2: Soil Vapor Extraction Test - Mass Removal Data - Shell-branded Service Station, Incident #98995740  
2120 Montana St., Oakland, CA**

Date	Hour Meter (hours)	Cumulative Operation (hours)	System Flow Rate (CFM)	Hydrocarbon Concentrations			TPHg		Benzene		MTBE		
				TPHg	Benzene	MTBE	TPHg Removal Rate (#/hour)	Cumulative TPHg Removed (#)	Benzene Removal Rate (#/hour)	Cumulative Benzene Removed (#)	MTBE Removal Rate (#/hour)	Cumulative MTBE Removed (#)	
				(Concentrations in ppmv)									
6/24/2002													
	10:30	268.1	0.00	0				0.000	0.000	0.000	0.000	0.000	0.000
	10:45	268.35	0.25	0	5,230			0.000	0.000	0.000	0.000	0.000	0.000
	11:00	268.6	0.50	0	8,620			0.000	0.000	0.000	0.000	0.000	0.000
	11:15	268.8	0.70	2	8,940			0.217	0.043	0.002	0.000	0.004	0.001
	11:30	269.1	1.00	4	6,070			0.433	0.173	0.003	0.001	0.007	0.003
	11:45	269.3	1.20	4	8,100	72	130	0.433	0.260	0.003	0.002	0.007	0.004
	12:00	269.6	1.50	8	6,010			0.866	0.520	0.007	0.004	0.014	0.009
	12:30	270.1	2.00	15	4,660			1.62	1.33	0.013	0.011	0.027	0.022
	1:00	270.6	2.50	17	8,740			1.84	2.25	0.015	0.018	0.030	0.037
	1:30	271.1	3.00	21	2,610			1.71	3.11	0.013	0.025	0.000	0.037
	2:00	271.6	3.50	29	3,240			2.36	4.29	0.018	0.033	0.063	0.069
	2:30	272.1	4.00	42	3,950			3.42	6.00	0.025	0.046	0.092	0.115
	3:00	272.6	4.50	64	6,100	50	160	5.22	8.61	0.039	0.065	0.140	0.185
	3:30	273.1	5.00	80				6.52	11.9	0.048	0.090	0.175	0.272
	5:48	275.35	7.25	67				5.46	24.2	0.041	0.181	0.147	0.602
6/25/2002													
	5:18	279.6	11.50	67				5.46	47.4	0.041	0.354	0.147	1.23
	1:15	279.6	11.50	0				0.000	47.4	0.000	0.354	0.000	1.23
	1:30	279.8	11.70	12	1,502			0.770	47.5	0.004	0.355	0.005	1.23
	2:00	280.3	12.20	34	4,800	28	32	2.18	48.6	0.012	0.360	0.015	1.23
	2:15	280.6	12.50	45	2,100			2.89	49.5	0.015	0.365	0.020	1.24
	6:15	284.6	16.50	45				2.11	57.9	0.011	0.409	0.011	1.28
	9:30	285	16.90	26	3,500	20	18	1.22	58.4	0.006	0.411	0.006	1.29
	9:45	285.2	17.10	75				3.51	59.1	0.018	0.415	0.018	1.29

**Table 2: Soil Vapor Extraction Test - Mass Removal Data - Shell-branded Service Station, Incident #98995740**  
 2120 Montana St., Oakland, CA

Date	Hour Meter (hours)	Cumulative Operation (hours)	System Flow Rate (CFM)	Hydrocarbon Concentrations			TPHg		Benzene		MTBE		
				TPHg	Benzene	MTBE	TPHg Removal Rate (#/hour)	Cumulative TPHg Removed (#)	Benzene Removal Rate (#/hour)	Cumulative Benzene Removed (#)	MTBE Removal Rate (#/hour)	Cumulative MTBE Removed (#)	
				(Concentrations in ppmv)									
6/26/2002	10:00	285.5	17.40	60				2.81	60.0	0.015	0.419	0.015	1.29
	9:10	296.6	28.50	53				2.20	84.3	0.011	0.540	0.012	1.42
	9:40	297.1	29.00	51				2.11	85.4	0.011	0.546	0.011	1.43
	10:15	297.1	29.00	0				0.000	85.4	0.000	0.546	0.000	1.43
	10:30	297.5	29.40	48	3,100	17	16	1.99	86.2	0.010	0.550	0.011	1.43
	11:00	297.9	29.80	57	722			2.36	87.1	0.012	0.554	0.012	1.44
	11:30	298.4	30.30	57	698			2.36	88.3	0.012	0.560	0.012	1.44
	12:00	298.9	30.80	57	548			2.36	89.5	0.012	0.566	0.012	1.45
	12:30	299.4	31.30	58	534			2.40	90.7	0.012	0.572	0.013	1.46
	1:00	299.9	31.80	59	433			3.63	92.5	0.018	0.581	0.019	1.47
	2:00	300.6	32.50	59	413			3.63	95.0	0.018	0.593	0.019	1.48
	4:25	303.1	35.00	57	0			3.51	104	0.017	0.637	0.018	1.52
	6:20	304.9	36.80	55	4,600	25	23	3.38	110	0.017	0.667	0.017	1.56
6/27/2002	7:25	318	49.90	55				3.38	154	0.017	0.885	0.017	1.78
	10:06	318	49.90	0				0.00	154	0.000	0.885	0.000	1.78
	11:00	318.9	50.80	55	1,500	9.7	9.3	1.103	155	0.006	0.891	0.007	1.79
	11:30	319.4	51.30	55	306			1.103	156	0.006	0.894	0.007	1.79
	12:00	319.9	51.80	55	263			1.103	156	0.006	0.897	0.007	1.80
	12:30	320.4	52.30	56	268			1.123	157	0.007	0.901	0.007	1.80
	1:00	320.9	52.80	56	273			1.123	157	0.007	0.904	0.007	1.80
	1:30	321.4	53.30	57	264			0.838	158	0.004	0.906	0.005	1.81
	2:00	321.9	53.80	57	263			0.838	158	0.004	0.908	0.005	1.81
	2:30	322.4	54.30	55	228			0.809	159	0.004	0.910	0.005	1.81

**Table 2: Soil Vapor Extraction Test - Mass Removal Data - Shell-branded Service Station, Incident #98995740**  
 2120 Montana St., Oakland, CA

Date	Hour Meter (hours)	Cumulative Operation (hours)	System Flow Rate (CFM)	Hydrocarbon Concentrations			TPHg		Benzene		MTBE				
				TPHg	Benzene	MTBE	TPHg Removal Rate (#/hour)	Cumulative TPHg Removed (#)	Benzene Removal Rate (#/hour)	Cumulative Benzene Removed (#)	MTBE Removal Rate (#/hour)	Cumulative MTBE Removed (#)			
				(Concentrations in ppmv)											
	3:00	322.9	54.80	51	231					0.750	159	0.004	0.912	0.005	1.81
	7:00	326.9	58.80	55	<b>1,100</b>	<b>6</b>	<b>6.8</b>			0.809	162	0.004	0.928	0.005	1.83
	7:30	327.2	59.10	54	268					0.794	163	0.004	0.929	0.005	1.83
6/28/2002															
	7:50	339.6	71.50	50	213					0.735	172	0.004	0.974	0.005	1.89
	8:00	339.8	71.70	49	<b>650</b>	<b>5.4</b>	<b>5.6</b>			0.426	172	0.003	0.975	0.004	1.89
	10:00	341.8	73.70	50	184					0.434	173	0.003	0.981	0.004	1.90
	10:30	342.3	74.20	50	176					0.434	173	0.003	0.983	0.004	1.90
	11:00	342.8	74.70	50	168					0.735	173	0.004	0.985	0.004	1.90
	11:30	343.3	75.20	51	173					0.750	174	0.004	0.987	0.005	1.91
	12:00	343.8	75.70	51	171					0.750	174	0.004	0.989	0.005	1.91
	12:30	344.3	76.20	52	<b>1,100</b>	<b>6.4</b>	<b>6.5</b>			0.765	174	0.004	0.991	0.005	1.91
	1:00	344.8	76.70	53	163					0.779	175	0.004	0.993	0.005	1.91
	2:00	345.6	77.50	53	165					0.779	175	0.004	0.996	0.005	1.92
	2:30	346.1	78.00	56	161					0.823	176	0.004	0.998	0.005	1.92
<b>Total Pounds Removed:</b>							<b>TPHg =</b>	<b>176</b>	<b>Benzene =</b>	<b>0.998</b>	<b>MTBE =</b>	<b>1.92</b>			

**Table 2: Soil Vapor Extraction Test - Mass Removal Data - Shell-branded Service Station, Incident #98995740  
2120 Montana St., Oakland, CA**

Date	Hour Meter (hours)	Cumulative Operation (hours)	System Flow Rate (CFM)	Hydrocarbon Concentrations			<u>TPHg</u>		<u>Benzene</u>		<u>MTBE</u>	
				TPHg (Concentrations in ppmv)	Benzene	MTBE	TPHg	Cumulative	Benzene	Cumulative	MTBE	Cumulative
							Removal Rate (#/hour)	TPHg Removed (#)	Removal Rate (#/hour)	Benzene Removed (#)	Removal Rate (#/hour)	MTBE Removed (#)

**Abbreviations and Notes:**

Vapor extracted from well TBW-E during 5-day SVE test conducted between 6/24/02 and 6/28/02.

CFM = Cubic feet per minute                      ppmv = Parts per million by volume                      # = Pounds

First day well concentrations didnot allow automated well valve to open much casuing flow to be below measuring capability.

Flow estimated at 2 cfm based on measured well vacuum and well valve position.

**Bold** = Sample concentrations from Lab analysis; Non-**Bold** = field measured concentrations by a Horiba OVA

TPHG, Benzene, and MTBE analyzed by EPA Method 8015/8020/8260 respectively from 1 liter tedlar bag samples

Second through fifth day benzene concetrations assumed to be 10% of the TPHg concentration.

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.

$$\text{(Rate = Concentration (ppmv) x system flow rate (cfm) x (1lb-mole/386ft}^3\text{) x molecular weight (86 lb/lb-mole for TPHg, 78 lb/lb-mole for benzene, 88 lb/lb-mole for MTBE) x 60 min/hour x 1/1,000,000)}$$

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

**Table 3: Soil Vapor Extraction Test - Radius of Influence Data -**

Shell-branded Service Station, Incident #98995740  
2120 Montana St., Oakland, CA

Extraction Well	Monitoring Wells	Rw (ft)	r (ft)	Pw ("H2O gauge)	Pw(abs) (psia)	P( r) ("H2O gauge)	P( r) (psia)	Ri <sup>1</sup> (ft)	P( r)/P(w) (%)
TBW-E	TBW-N	0.167	32.5	1.3	14.649	0.25	14.687	114.2	19.2%
	MW-4	0.167	52	1.4	14.645	0.01	14.696	54.2	0.7%
	TBW-W	0.167	42	2	14.624	0.14	14.691	63.7	7.0%
	MW-3	0.083	76	1.3	14.649	0.02	14.695	84.6	1.5%

<sup>1</sup> Based on the steady-state radial pressure distribution equation from "A Practical Approach to the Design, Operation, and Monitoring of In Situ Soil Venting Systems", P.C. Johnson, C.C. Stanley, M.W. Kemblowski, D.L. Byers, and J.D. Cothart, Groundwater Monitoring and Review, Spring 1990:

$$Ri = [Rw] / [r/Rw]^{1/2} \{ [1 - (Patm/Pw)^2] / [(P(r)/Pw)^2 - 1] \}^{1/2}$$

Rw = Radius of Extraction Well (feet)

r = Distance of monitoring well from extraction well (feet)

Psia = Pounds per square inch absolute

Pw = Absolute pressure applied at extraction well (psia or inches of water column)

P( r) = Absolute pressure at monitoring well (psia or inches of water column)

Patm = Absolute atmospheric pressure (14.696 psia)

Ri = Radius of Influence (feet)

**ATTACHMENT A**

Laboratory Analytical Reports for Soil Samples



Report Number : 27088

Date : 7/2/2002

Jacquelyn Jones  
Cambria Environmental Technology, Inc.  
1144 65th Street, Suite B  
Oakland, CA 94608

Subject : 6 Soil Samples  
Project Name : 2120 Montana Street-OAKLAND  
Project Number : 244-0733  
P.O. Number : 98905740

Dear Ms. Jones,

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,

A handwritten signature in black ink that reads "Joel Kiff". The signature is written in a cursive style with a large, looping initial "J".

Joel Kiff



Report Number : 27088

Date : 7/2/2002

Project Name :

Project Number :N

Jacquelyn Jones  
Cambria Environmental Technology, Inc.  
1144 65th Street, Suite B  
Oakland, CA 94608

Subject : 6 Soil Samples  
Project Name : 2120 Montana Street-OAKLAND  
Project Number : 244-0733  
P.O. Number : 98905740

Dear Ms. Jones,

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,

A handwritten signature in black ink that reads "Joel Kiff". The signature is written in a cursive style with a large initial "J".

Joel Kiff





Report Number : 27088

Date : 7/2/2002

Project Name : 2120 Montana Street-OAKLAND

Project Number : 244-0733

Sample : MW-4-5.5

Matrix : Soil

Lab Number : 27088-01

Sample Date :6/21/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.005	0.005	mg/Kg	EPA 8260B	6/27/2002
Toluene	< 0.005	0.005	mg/Kg	EPA 8260B	6/27/2002
Ethylbenzene	< 0.005	0.005	mg/Kg	EPA 8260B	6/27/2002
Total Xylenes	< 0.005	0.005	mg/Kg	EPA 8260B	6/27/2002
Methyl-t-butyl ether (MTBE)	< 0.5	0.5	mg/Kg	EPA 8260B	6/27/2002
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	6/27/2002
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	6/27/2002
4-Bromofluorobenzene (Surr)	106		% Recovery	EPA 8260B	6/27/2002

Sample : MW-4-9.0

Matrix : Soil

Lab Number : 27088-02

Sample Date :6/21/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.005	0.005	mg/Kg	EPA 8260B	6/28/2002
Toluene	< 0.005	0.005	mg/Kg	EPA 8260B	6/28/2002
Ethylbenzene	< 0.005	0.005	mg/Kg	EPA 8260B	6/28/2002
Total Xylenes	< 0.005	0.005	mg/Kg	EPA 8260B	6/28/2002
Methyl-t-butyl ether (MTBE)	< 0.5	0.5	mg/Kg	EPA 8260B	6/28/2002
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	6/28/2002
Toluene - d8 (Surr)	99.2		% Recovery	EPA 8260B	6/28/2002
4-Bromofluorobenzene (Surr)	103		% Recovery	EPA 8260B	6/28/2002

Approved By:  \_\_\_\_\_  
Joel Kiff



Report Number : 27088

Date : 7/2/2002

Project Name : 2120 Montana Street-OAKLAND

Project Number : 244-0733

Sample : MW-4-13.5

Matrix : Soil

Lab Number : 27088-03

Sample Date :6/21/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.005	0.005	mg/Kg	EPA 8260B	7/1/2002
Toluene	< 0.005	0.005	mg/Kg	EPA 8260B	7/1/2002
Ethylbenzene	< 0.005	0.005	mg/Kg	EPA 8260B	7/1/2002
Total Xylenes	< 0.005	0.005	mg/Kg	EPA 8260B	7/1/2002
Methyl-t-butyl ether (MTBE)	< 0.5	0.5	mg/Kg	EPA 8260B	7/1/2002
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	7/1/2002
Toluene - d8 (Surr)	99.9		% Recovery	EPA 8260B	7/1/2002
4-Bromofluorobenzene (Surr)	99.9		% Recovery	EPA 8260B	7/1/2002

Sample : MW-5-5.5

Matrix : Soil

Lab Number : 27088-04

Sample Date :6/21/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.005	0.005	mg/Kg	EPA 8260B	6/28/2002
Toluene	< 0.005	0.005	mg/Kg	EPA 8260B	6/28/2002
Ethylbenzene	< 0.005	0.005	mg/Kg	EPA 8260B	6/28/2002
Total Xylenes	< 0.005	0.005	mg/Kg	EPA 8260B	6/28/2002
Methyl-t-butyl ether (MTBE)	< 0.5	0.5	mg/Kg	EPA 8260B	6/28/2002
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	6/28/2002
Toluene - d8 (Surr)	99.0		% Recovery	EPA 8260B	6/28/2002
4-Bromofluorobenzene (Surr)	104		% Recovery	EPA 8260B	6/28/2002

Approved By:  Joel Kiff



Report Number : 27088

Date : 7/2/2002

Project Name : 2120 Montana Street-OAKLAND

Project Number : 244-0733

Sample : MW-5-9.0

Matrix : Soil

Lab Number : 27088-05

Sample Date :6/21/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	<b>0.0083</b>	0.005	mg/Kg	EPA 8260B	6/30/2002
<b>Toluene</b>	<b>&lt; 0.005</b>	0.005	mg/Kg	EPA 8260B	6/30/2002
<b>Ethylbenzene</b>	<b>&lt; 0.005</b>	0.005	mg/Kg	EPA 8260B	6/30/2002
<b>Total Xylenes</b>	<b>&lt; 0.005</b>	0.005	mg/Kg	EPA 8260B	6/30/2002
<b>Methyl-t-butyl ether (MTBE)</b>	<b>&lt; 0.5</b>	0.5	mg/Kg	EPA 8260B	6/30/2002
<b>TPH as Gasoline</b>	<b>1.3</b>	1.0	mg/Kg	EPA 8260B	6/30/2002
Toluene - d8 (Surr)	98.3		% Recovery	EPA 8260B	6/30/2002
4-Bromofluorobenzene (Surr)	103		% Recovery	EPA 8260B	6/30/2002

Sample : MW-5-19.0

Matrix : Soil

Lab Number : 27088-06

Sample Date :6/21/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	<b>0.0071</b>	0.005	mg/Kg	EPA 8260B	6/28/2002
<b>Toluene</b>	<b>&lt; 0.005</b>	0.005	mg/Kg	EPA 8260B	6/28/2002
<b>Ethylbenzene</b>	<b>0.014</b>	0.005	mg/Kg	EPA 8260B	6/28/2002
<b>Total Xylenes</b>	<b>0.019</b>	0.005	mg/Kg	EPA 8260B	6/28/2002
<b>Methyl-t-butyl ether (MTBE)</b>	<b>&lt; 0.5</b>	0.5	mg/Kg	EPA 8260B	6/28/2002
<b>TPH as Gasoline</b>	<b>18</b>	1.0	mg/Kg	EPA 8260B	6/28/2002
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	6/28/2002
4-Bromofluorobenzene (Surr)	99.7		% Recovery	EPA 8260B	6/28/2002

Approved By:  Joel Kiff

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

Report Number : 27088

Date : 7/2/2002

**QC Report : Method Blank Data**

Project Name : **2120 Montana Street-OAKLAND**

Project Number : **244-0733**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.005	0.005	mg/Kg	EPA 8260B	6/26/2002
Toluene	< 0.005	0.005	mg/Kg	EPA 8260B	6/26/2002
Ethylbenzene	< 0.005	0.005	mg/Kg	EPA 8260B	6/26/2002
Total Xylenes	< 0.005	0.005	mg/Kg	EPA 8260B	6/26/2002
Methyl-t-butyl ether (MTBE)	< 0.5	0.5	mg/Kg	EPA 8260B	6/26/2002
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	6/26/2002
Toluene - d8 (Surr)	100		%	EPA 8260B	6/26/2002
4-Bromofluorobenzene (Surr)	99.4		%	EPA 8260B	6/26/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
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KIFF ANALYTICAL, LLC

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

Approved By:  \_\_\_\_\_  
Joel Kiff

Report Number : 27088

Date : 7/2/2002

QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : 2120 Montana

Project Number : 244-0733

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
Benzene	27088-01	<0.0050	0.0398	0.0398	0.0302	0.0355	mg/Kg	EPA 8260B	6/27/02	75.9	89.0	15.9	70-130	25
Toluene	27088-01	<0.0050	0.0398	0.0398	0.0287	0.0340	mg/Kg	EPA 8260B	6/27/02	72.1	85.3	16.7	70-130	25
Tert-Butanol	27088-01	<0.0050	0.199	0.199	0.156	0.167	mg/Kg	EPA 8260B	6/27/02	78.3	83.6	6.56	70-130	25
Methyl-t-Butyl Ether	27088-01	<0.0050	0.0398	0.0398	0.0416	0.0351	mg/Kg	EPA 8260B	6/27/02	105	88.2	17.2	70-130	25

KIFF ANALYTICAL, LLC

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

Approved By:  Joel Kiff

Report Number : 27088

Date : 7/2/2002

**QC Report : Laboratory Control Sample (LCS)**

Project Name : **2120 Montana**

Project Number : **244-0733**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	0.0395	mg/Kg	EPA 8260B	6/27/02	93.2	70-130
Toluene	0.0395	mg/Kg	EPA 8260B	6/27/02	91.4	70-130
Tert-Butanol	0.198	mg/Kg	EPA 8260B	6/27/02	95.3	70-130
Methyl-t-Butyl Ether	0.0395	mg/Kg	EPA 8260B	6/27/02	85.9	70-130

KIFF ANALYTICAL, LLC

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

Approved By:

  
Joel Kiff

# SHELL Chain Of Custody Record

720 Olive Drive, Suite D

Davis, CA 95616

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

Shell Project Manager to be Invoiced:

- SCIENCE & ENGINEERING
- TECHNICAL SERVICES
- O&E HOUSTON

Karen Petryna

27088

LABORATORY NUMBER						
9	8	9	0	5	7	4
LABORATORY NAME						

DATE: 6/21/02

PAGE: 1 of 1

SAMPLING COMPANY: <b>Cambria Environmental Technology</b>		LOC CODE: <b>CETO</b>	SITE ADDRESS (Street and City): <b>2120 Montana Street - OAKLAND</b>		CLOSAL ID NO.: <b>T0600101805</b>
ADDRESS: <b>1144-65TH Street, Oakland, CA 94608</b>			EDF DELIVERABLE TO (Responsible Party or Designee): <b>shelloaklandef@cambria-env.com</b>	PHONE NO.:	CONSULTANT PROJECT NO.: <b>244-0733</b>
PROJECT CONTACT (Hardcopy or PDF Report to): <b>Jacquelyn Jones</b>			SAMPLER NAME(S) (P/N): <b>Jason K. Gerke</b>		
TELEPHONE: <b>510-420-3316</b>	FAX: <b>510-420-9170</b>	E-MAIL: <b>jones@cambria-env.com</b>			
TURNAROUND TIME (BUSINESS DAYS): <input checked="" type="checkbox"/> 10 DAYS <input type="checkbox"/> 5 DAYS <input type="checkbox"/> 72 HOURS <input type="checkbox"/> 48 HOURS <input type="checkbox"/> 24 HOURS <input type="checkbox"/> LESS THAN 24 HOURS			REQUESTED ANALYSIS		

LA - RWQCB REPORT FORMAT  UST AGENCY:

GC/MS MTBE CONFIRMATION: HIGHEST \_\_\_\_\_ HIGHEST per BORING \_\_\_\_\_ ALL \_\_\_\_\_

SPECIAL INSTRUCTIONS OR NOTES: CHECK BOX IF EDD IS NOT NEEDED

cc lab report to: jgerke@cambria-env.com

TPH - Gas, Purgeable	BTEX	MTBE (8021B - 5ppb RL)	MTBE (8260B - 0.5ppb RL)	Oxygenates (S) by (8260B)	Ethanol (8260B)	Methanol	EDB & 1,2-DCA (8260B)	EPA 5035 Extraction for Volatiles	VOCs Halogenated/Aromatic (8021B)	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 (48- )	TPH - Diesel, Extractable (8015m)	MTBE (8260B) Confirmation, See Note	FIELD NOTES: Container/Preservative or PID Readings or Laboratory Notes
																		TEMPERATURE ON RECEIPT C°
																		HOLD -01
																		-02
																		-03
																		-04
																		-05
																		-06

Field Sample Identification	SAMPLING		MATRIX	NO. OF CONT.
	DATE	TIME		
MW-4-5.5	6/21/02	855	Soil	1
MW-4-9.0		940		1
MW-4-13.5		905		1
MW-5-5.5		1100		1
MW-5-9.0		1105		1
MW-5-19.0		1110		1

Relinquished by: (Signature) <i>John Little</i>	Received by: (Signature) "Secure Location"	Date: 6/21/02	Time: 1240
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature) <i>John Little / Kiff Analytical</i>	Date: 062102	Time: 1240

C&G Graphic (714) 888-9702

# SHELL Chain Of Custody Record

720 Olive Drive, Suite D  
 Davis, CA 95616

(530) 287-4800 (530) 297-4803 fax

Shell Project Manager to be Invoiced:

SURFACE ENGINEERING Karen Petryna  
 TECHNICAL SERVICES  
 O&M - HOUSTON

9	8	9	0	5	7	4	0
---	---	---	---	---	---	---	---

DATE: 6/21/02

PAGE: 1 of 1

SERVING COMPANY: <b>Cambria Environmental Technology</b> ADDRESS: 1144-85TH Street, Oakland, CA 94608 PROJECT CONTACT (Name and POC Report to): Jacquelyn Jones TELEPHONE: 510-420-3316 FAX: 510-420-9170 E-MAIL: jjones@cambria-env.com	LOG CODE: <b>CETO</b>	SITE ADDRESS (Street and City): <b>2120 Montana Street - OAKLAND</b> EDP DELIVERABLE TO (Responsible Party or Design): shalbakdandedf@cambria-env.com SALES REPRESENTATIVE (Name): Jason K. Gerke	GLOBAL ID NO.: <b>T0600101805</b> CONSULTANT PROJECT NO.: 244-0733
---	--------------------------	--	---

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

LA - RWQCB REPORT FORMAT  UST AGENCY:

OCMS MTBE CONFIRMATION: HIGHEST \_\_\_\_\_ HIGHEST per BORING \_\_\_\_\_ ALL \_\_\_\_\_

SPECIAL INSTRUCTIONS OR NOTES: CHECK BOX IF EDD IS NOT NEEDED

### REQUESTED ANALYSIS

Field Sample Identification	SAMPLING		MATRIX	NO. OF CONT.	TPH - Gas, Purgeable	BTEX	MTBE (8021B - 5ppb RL)	MTBE (8021B - 0.5ppb RL)	Oxygenates (S) by (8020B)	Ethanol (8220B)	Methanol	EDB & 1,2-DCA (8020C)	EPA 5025 Extraction for Volatiles	VOCs Halogenated/Aromatic (8021B)	TPH (718-7)	Vapor VOCs BTEX / MTBE (70-15)	Vapor VOCs Full List (70-15)	Vapor TPH (ASTM 3415m)	Vapor Fixed Gases (ASTM D1946)	Test for Disposal (4B- )	TPH - Dissol, Extractable (8015m)	MTBE (8020B) Confirmation, See Note	TEMPERATURE ON RECEIPT OF
	DATE	TIME																					
MW-4-5.5	6/21/02	855	Soil	1		X	X	X															
MW-4-9.0		900		1		X	X	X															
MW-4-13.5		905		1		X	X	X															
MW-5-5.5		1100		1		X	X	X															
MW-5-9.0		1105		1		X	X	X															
MW-5-19.0		1110		1		X	X	X															

Relinquished by: (Signature) <i>[Signature]</i>	Received by: (Signature) "Severe Location"	Date: 6/21/02	Time: 12:40
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

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

10/18/00 Revision

QAC Sample No. (714) 888-0702

002

CAMBRIA

06/24/2002 08:42 FAX 510 420 9170



## **ATTACHMENT B**

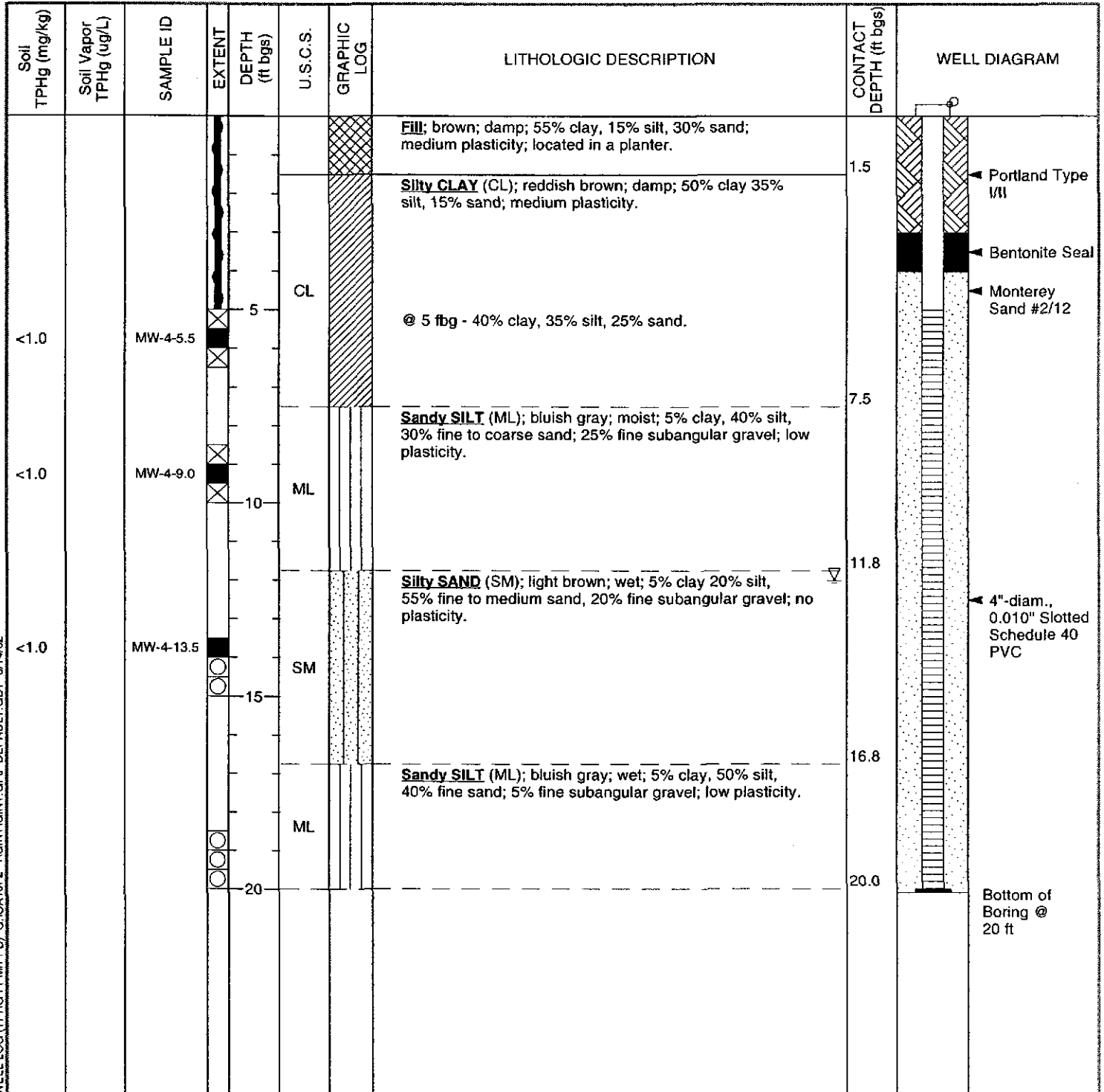
Boring Logs and Well Completion Details



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

# BORING/WELL LOG

CLIENT NAME	Shell Oil Products US	BORING/WELL NAME	MW-4
JOB/SITE NAME	2120 Montana Street, Oakland	DRILLING STARTED	21-Jun-02
LOCATION	2120 Montana Street, Oakland	DRILLING COMPLETED	21-Jun-02
PROJECT NUMBER	244-0733	WELL DEVELOPMENT DATE (YIELD)	NA
DRILLER	Gregg Drilling	GROUND SURFACE ELEVATION	160.38 ft above msl
DRILLING METHOD	Hollow-stem auger	TOP OF CASING ELEVATION	160.09 ft above msl
BORING DIAMETER	10"	SCREENED INTERVAL	5 to 20 ft bgs
LOGGED BY	J. Gerke	DEPTH TO WATER (First Encountered)	12.0 ft (21-Jun-02) ▽
REVIEWED BY	M. Derby, PE# 55475	DEPTH TO WATER (Static)	NA ▽
REMARKS	Hand augered to 5'. Located in the west end of the planter along Montana Street.		



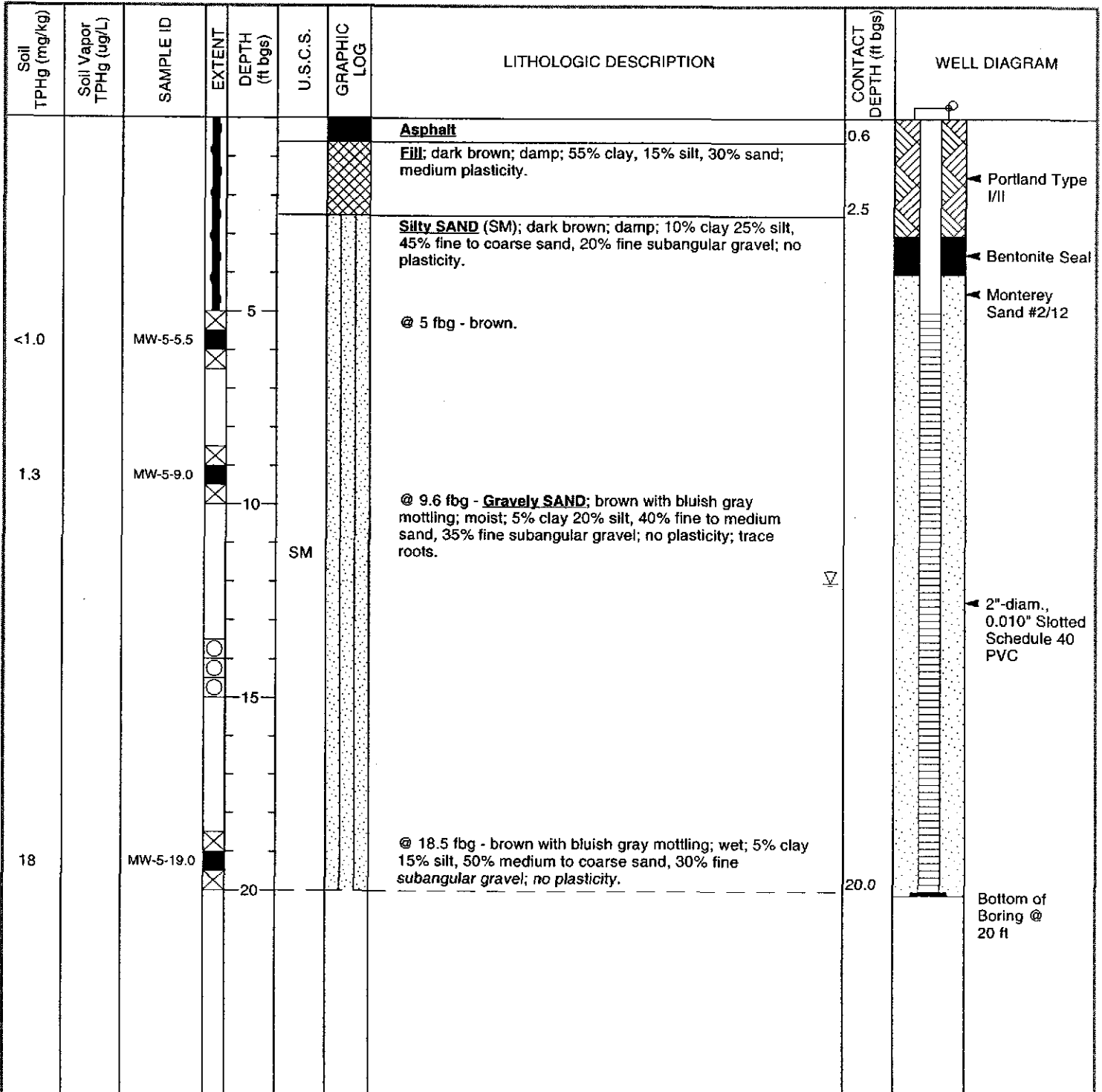
WELL LOG (TPHG PPM/PPB) G:\QA\19F2-1\GINT\GINT.GPJ\_DEFAULT.GDT 8/14/02



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

# BORING/WELL LOG

CLIENT NAME	Shell Oil Products US	BORING/WELL NAME	MW-5
JOB/SITE NAME	2120 Montana Street, Oakland	DRILLING STARTED	21-Jun-02
LOCATION	2120 Montana Street, Oakland	DRILLING COMPLETED	21-Jun-02
PROJECT NUMBER	244-0733	WELL DEVELOPMENT DATE (YIELD)	NA
DRILLER	Gregg Drilling	GROUND SURFACE ELEVATION	158.42 ft above msl
DRILLING METHOD	Hollow-stem auger	TOP OF CASING ELEVATION	158.25 ft above msl
BORING DIAMETER	8"	SCREENED INTERVAL	5 to 20 ft bgs
LOGGED BY	J. Gerke	DEPTH TO WATER (First Encountered)	12.0 ft (21-Jun-02)
REVIEWED BY	M. Derby, PE# 55475	DEPTH TO WATER (Static)	NA
REMARKS	Hand augered to 5'. Located in west bound lane of Montana Street, 45 west of site property line.		



WELL LOG (TPHG PPM/PPB) G:\QA19F2-1\GINT\GINT.GPJ\_DEFAULT.GDT 8/14/02

## **ATTACHMENT C**

**Standard Field Procedures for Monitoring Well Installation**

# CAMBRIA

## STANDARD FIELD PROCEDURES FOR MONITORING WELL INSTALLATION

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

### SOIL BORINGS

#### Objectives

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

#### Soil Boring and Sampling

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

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

#### Sample Analysis

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

#### Field Screening

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

# CAMBRIA

## **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 groundwater samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

## **Grouting**

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.

## **MONITORING WELL INSTALLATION, DEVELOPMENT AND SAMPLING**

### **Well Construction and Surveying**

Groundwater monitoring wells are installed to monitor groundwater quality and determine the groundwater elevation, flow direction and gradient. Well depths and screen lengths are based on groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 feet below and 5 feet above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three feet thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two feet above the well screen. A two feet thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I,II cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security.

The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

# CAMBRIA

## Well Development

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

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

## Groundwater Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of groundwater are purged prior to sampling. Purging continues until groundwater pH, conductivity, and temperature have stabilized. Groundwater samples are collected using bailers or pumps and are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

## Waste Handling and Disposal

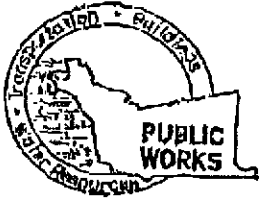
Soil cuttings from drilling activities are usually stockpiled onsite and covered by plastic sheeting. At least three individual soil samples are collected from the stockpiles and composited at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples in addition to any analytes required by the receiving disposal facility. Soil cuttings are transported by licensed waste haulers and disposed in secure, licensed facilities based on the composite analytic results.

Groundwater removed during development and sampling is typically 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. Upon receipt of analytic results, the water is either pumped out using a vacuum truck for transport to a licensed 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.

**ATTACHMENT D**

**Permits**





# ALAMEDA COUNTY PUBLIC WORKS AGENCY

**WATER RESOURCES SECTION**  
195 R. MILBURN ST. HAYWARD CA, 94544-1395  
PHONE (510) 670-6643 James Yoo  
FAX (510) 781-1939

APPLICANTS PLEASE ATTACH A SITE MAP FOR ALL DRILLING PERMIT APPLICATIONS  
DESTRUCTION OF WELLS OVER 45 FEET REQUIRES A SEPARATE PERMIT APPLICATION

## DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 2120 Montana Street  
Oakland, CA

FOR OFFICE USE

PERMIT NUMBER W2-0378  
WELL NUMBER \_\_\_\_\_  
APN \_\_\_\_\_

CLIENT  
Name Shell Oil Products US  
Address P.O. Box 9859 Phone 554-645-9306  
City Oakland, CA Zip 94612

### PERMIT CONDITIONS

Circled Permit Requirements Apply

APPLICANT  
Name Cambria Environmental Technology  
Address 1144 Elm Street Phone 510-432-9120  
City Oakland, CA Zip 94608

#### A. GENERAL

1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources-Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date.

#### TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	<input type="checkbox"/>	General	<input type="checkbox"/>
Water Supply	<input type="checkbox"/>	Contamination	<input type="checkbox"/>
Monitoring	<input checked="" type="checkbox"/>	Well Destruction	<input type="checkbox"/>

#### B. WATER SUPPLY WELLS

1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 30 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

#### PROPOSED WATER SUPPLY WELL USE

New Domestic	<input type="checkbox"/>	Replacement Domestic	<input type="checkbox"/>
Municipal	<input type="checkbox"/>	Irrigation	<input type="checkbox"/>
Industrial	<input type="checkbox"/>	Other	<input type="checkbox"/>

#### C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS

1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

#### DRILLING METHOD:

Mud Rotary	<input type="checkbox"/>	Air Rotary	<input type="checkbox"/>	Auger	<input checked="" type="checkbox"/>
Cable	<input type="checkbox"/>	Other	<input type="checkbox"/>		

#### D. GEOTECHNICAL

Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

DRILLER'S NAME Gregg Dalling - Testing  
DRILLER'S LICENSE NO. C-57-485165

#### E. CATHODIC

Fill hole annular zone with concrete placed by tremie.

#### WELL PROJECTS

Drill Hole Diameter	<u>10"</u> in.	Maximum Depth	<u>30</u> ft.
Casing Diameter	<u>4"</u> in.	Owner's Well Number	<u>MW-4</u>
Surface Seal Depth	<u>5'</u> ft.		

#### F. WELL DESTRUCTION

Send a map of work site. A separate permit is required for wells deeper than 45 feet.

#### G. SPECIAL CONDITIONS

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

#### GEOTECHNICAL PROJECTS

Number of Borings	_____	Maximum Depth	_____ ft.
Hole Diameter	_____ in.		

ESTIMATED STARTING DATE 5/2/02  
ESTIMATED COMPLETION DATE 5/8/02

APPROVED

DATE

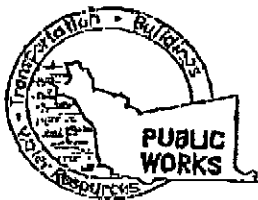
I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-6K.

APPLICANT'S SIGNATURE Jason Gerke DATE 4/5/02

PLEASE PRINT NAME Jason Gerke

REV. 3-04-02

APPROVED [Signature] DATE 4-9-02



# ALAMEDA COUNTY PUBLIC WORKS AGENCY

## WATER RESOURCES SECTION

399 ELMHURST ST. HAYWARD CA. 94544-1395

PHONE (510) 670-6633 Janet Yoo

FAX (510) 782-1939

APPLICANTS: PLEASE ATTACH A SITE MAP FOR ALL DRILLING PERMIT APPLICATIONS  
DESTRUCTION OF WELLS OVER 45 FEET REQUIRES A SEPARATE PERMIT APPLICATION

### DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 2120 Martana Street  
Oakland, CA

FOR OFFICE USE

PERMIT NUMBER W02-0379  
WELL NUMBER \_\_\_\_\_  
APN \_\_\_\_\_

CLIENT Name Shell Oil Products U.S.  
Address P.O. Box 7867 Phone 510-645-9806  
City Burbank, CA Zip 91510

PERMIT CONDITIONS  
Circled Permit Requirements Apply

APPLICANT Name Gambria Environmental Tech.  
Address 144 63rd Street Phone 510-420-9170  
City Oakland, CA Zip 94608

#### A. GENERAL

1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date.

#### B. WATER SUPPLY WELLS

1. Minimum surface seal thickness is two inches of cement grout placed by trowel.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

#### C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS

1. Minimum surface seal thickness is two inches of cement grout placed by trowel.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

#### D. GEOTECHNICAL

Backfill bore hole by trowel with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

#### E. CATHODIC

Fill hole anodic zone with concrete placed by trowel.

#### F. WELL DESTRUCTION

Send a map of work site. A separate permit is required for wells deeper than 45 feet.

#### G. SPECIAL CONDITIONS SP#1-Attached.

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

#### TYPE OF PROJECT

- |                     |                                     |                            |                          |
|---------------------|-------------------------------------|----------------------------|--------------------------|
| Well Construction   | <input checked="" type="checkbox"/> | Geotechnical Investigation |                          |
| Cathodic Protection | <input type="checkbox"/>            | General                    | <input type="checkbox"/> |
| Water Supply        | <input type="checkbox"/>            | Contamination              | <input type="checkbox"/> |
| Monitoring          | <input checked="" type="checkbox"/> | Well Destruction           | <input type="checkbox"/> |

#### PROPOSED WATER SUPPLY WELL USE

- |              |                          |                        |                          |
|--------------|--------------------------|------------------------|--------------------------|
| New Domestic | <input type="checkbox"/> | Replenishment Domestic | <input type="checkbox"/> |
| Municipal    | <input type="checkbox"/> | Irrigation             | <input type="checkbox"/> |
| Industrial   | <input type="checkbox"/> | Other                  | <input type="checkbox"/> |

#### DRILLING METHOD:

- |            |                          |            |                          |       |                                     |
|------------|--------------------------|------------|--------------------------|-------|-------------------------------------|
| Mud Rotary | <input type="checkbox"/> | Air Rotary | <input type="checkbox"/> | Auger | <input checked="" type="checkbox"/> |
| Cable      | <input type="checkbox"/> | Other      | <input type="checkbox"/> |       |                                     |

DRILLER'S NAME: Gregg Drilling & Testing

DRILLER'S LICENSE NO. CST-485165

#### WELL PROJECTS

Drill Hole Diameter	<u>6"</u> in.	Maximum Depth	<u>30</u> ft.	Owner's Well Number	<u>MW-5</u>
Casing Diameter	<u>4"</u> in.				
Surface Seal Depth	<u>5'</u> ft.				

#### GEOTECHNICAL PROJECTS

Number of Borings	_____	Maximum Depth	_____ ft.
Hole Diameter	_____ in.		

ESTIMATED STARTING DATE 5/2/02

ESTIMATED COMPLETION DATE 6/8/02

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-6R.

APPLICANT'S SIGNATURE Jason Gerke DATE 4/15/02

PLEASE PRINT NAME Jason Gerke

Rev. 3-04-02

APPROVED \_\_\_\_\_

DATE 4/30/02

Job Site 2120 MONTANA ST

Parcel# 026 -0834-022-01

Appl# X0200613

Descr

Permit Issued 06/17/02

Work Type EXCAVATION-PRIVATE P

USA #

Util Co Job #  
Util Fund #:

Acctg#:

Applicant

Phone#

Lic#

--License Classes--

Owner EQUILON ENTERPRISES LLC

Contractor GREGG DRILLING & TESTING, INC. X

(510)313-5800 485165 C57

Arch/Engr

Agent

Applic Addr 950 HOWE RD, MARTINEZ, CA., 94553

\$250.00 TOTAL FEES PAID AT ISSUANCE

\$45.00 Applic \$205.00 Permit

\$.00 Process \$.00 Rec Mgmt

\$.00 Gen Plan \$.00 Invstg

\$.00 Other

ADDRESS:

DIST:

CITY OF OAKLAND

Date: 06/17/02 Amt Paid: \$250.00  
By: ANL Register R03 Receipt# 071856



Applic#\* ENM102180 Type: 1

Date Filed: 05/31/02

Disposition:

NUMBER STREET NAME SUFFIX\* SUITE ASSESSOR PARCEL#

Site addr: 1) 2120 MONTANA ST 026 -0834-022-01  
2)  
3)

Prcl Cond: Cond Aprvl: Viol:

Proj Descr: ENCROACH ONTO MONTANA STREET WITH TWO MONITORING WELLS  
\*\*\*\*\*routed to calvin 06/07/02\*\*\*\*\*

Insp Div: ENG-SVCS Dist:

Track:

Owner: EQUILON ENTERPRISES LLC

\_\_Lic#\_\_ \_\_Phone#\_\_ Applicant

Contractor:

Arch/Engr: CAMBRIA ENVIRONMENTAL TECH

( )420-0700

Agent: JASON GERKE

( )420-0700 X

Applicant Addr: 1144-65TH STREET STE #B

No Fee:

City/State: OAKLAND, CA

Zip: 94608

Wrkrs Comp\*

Other Related Applic#s:

F3=Ext F23=Dsc F24=Com

**ATTACHMENT E**





DWR Well Completion Reports

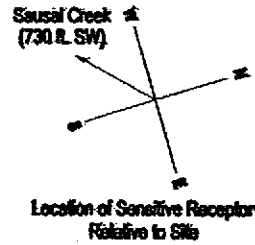
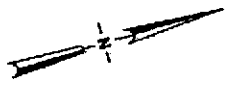
**CONFIDENTIAL**

STATE OF CALIFORNIA DWR  
WELL COMPLETION REPORT  
(WELL LOGS)

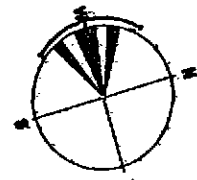
**REMOVED**

### EXPLANATION

- MW-1  Monitoring well location
- TBW-N  Tank backfill well location.
- SB-1  Cambria soil boring location (10/99)
- D-1  Cambria soil sampling location (11/97)



Commercial property



Scale (ft)

FIGURE

# 2

INTERSTATE 580 ON-RAMP

MONTANA STREET

SLOAN STREET

FRUITVALE AVENUE

MW-5

2106 Montana

2116 Montana

MW-2

MW-1

TBW-S

TBW-W

TBW-N

MW-4

SB-3

SB-2

SB-2

D-2

SB-1

MW-3

TBW-E

driveway

sidewalk

driveway

planter

planter

canopy

canopy

driveway

sidewalk

planter

driveway

enclosure

sidewalk

sidewalk

S:\OAKLAND\STATION\ANALYSIS\WELL-LOC-F-08.DWG

**Shell-branded Service Station**  
 2120 Montana Street  
 Oakland, California  
 Incident #98995740



C A M B R I A

**Monitoring Well  
Location Map**

**CONFIDENTIAL**

STATE OF CALIFORNIA DWR  
WELL COMPLETION REPORT  
(WELL LOGS)

**REMOVED**

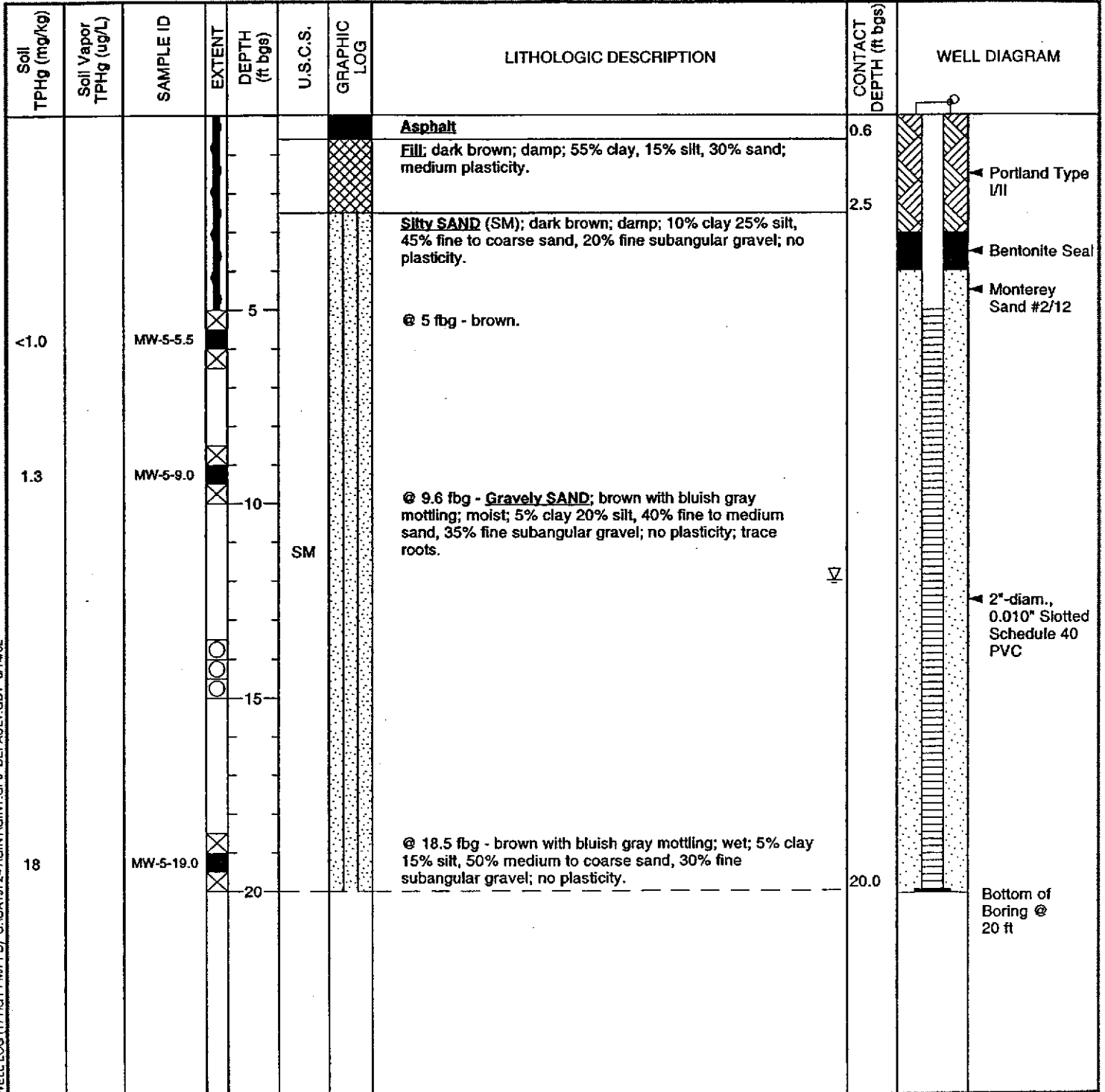




Cambria Environmental Technology, Inc.  
 1144 - 65th St.  
 Oakland, CA 94608  
 Telephone: (510) 420-0700  
 Fax: (510) 420-9170

# BORING/WELL LOG

CLIENT NAME	Shell Oil Products US	BORING/WELL NAME	MW-5
JOB/SITE NAME	2120 Montana Street, Oakland	DRILLING STARTED	21-Jun-02
LOCATION	2120 Montana Street, Oakland	DRILLING COMPLETED	21-Jun-02
PROJECT NUMBER	244-0733	WELL DEVELOPMENT DATE (YIELD)	NA
DRILLER	Gregg Drilling	GROUND SURFACE ELEVATION	158.42 ft above msl
DRILLING METHOD	Hollow-stem auger	TOP OF CASING ELEVATION	158.25 ft above msl
BORING DIAMETER	8"	SCREENED INTERVAL	5 to 20 ft bgs
LOGGED BY	J. Gerke	DEPTH TO WATER (First Encountered)	12.0 ft (21-Jun-02)
REVIEWED BY	M. Derby, PE# 55475	DEPTH TO WATER (Static)	NA
REMARKS	Hand augered to 5'. Located in west bound lane of Montana Street, 45 west of site property line.		



WELL LOG (TPHG, PPMPPB) C:\QA19F2-1\GINT\GINT\_GRP\_DEFAULT.GDT 8/14/02

**ATTACHMENT F**

Well Elevation Survey Results

**Virgil Chavez Land Surveying**

312 Georgia Street, Suite 225  
Vallejo, California 94590-5907  
(707) 553-2476 • Fax (707) 553-8698

July 9, 2002  
Project No.: 1903-42

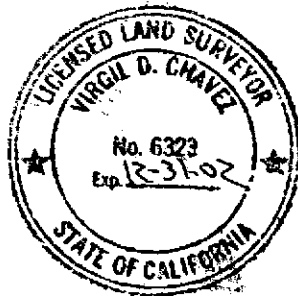
Jason Gerke  
Cambria Environmental  
1144 -65<sup>th</sup> Street, Suite C  
Oakland, CA 94608

Subject: Monitoring Well Survey  
Shell Service Station  
2120 Montana Street  
Oakland, CA

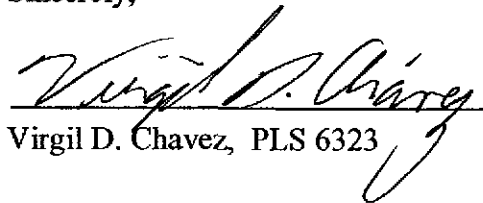
Dear Jason:

This is to confirm that we have proceeded at your request to survey the new ground water monitoring wells located at the above referenced location. The survey was completed on June 26, 2002. The benchmark for this survey was a City of Oakland Benchmark, being a disk monument at approximate centerline of easterly southwest of Fruitvale and Montana Streets. The latitude, longitude and coordinates are for top of casings and are based on the California State Coordinate System, Zone III (NAD83).  
Benchmark Elevation 157.127 feet (NGVD 29).

<u>Latitude</u>	<u>Longitude</u>	<u>Northing</u>	<u>Easting</u>	<u>Elev.</u>	<u>Desc.</u>
37.7990725	-122.2172249	2117974.19	6065540.58	160.38	RIM MW-4
				160.09	TOC MW-4
				158.42	RIM MW-5
37.7990841	-122.2175812	2117980.29	6065437.73	158.25	TOC MW-5



Sincerely,

  
Virgil D. Chavez, PLS 6323

**ATTACHMENT G**

Soil Disposal Confirmation



Hazardous Waste Hauler (Registration #2843)

8896 Elder Creek Rd. • Sacramento, CA 95828 • FAX (916) 381-1573

## Disposal Confirmation

Request for Transportation Received: 07/09/02

### Consultant Information

Company: Cambria  
 Contact: Gerke, Jason K.  
 Phone: 510-420-3320  
 Fax: 510-420-9170

### Site Information

Station #: \_\_\_\_\_  
 Street Address: 2120 Montana St.  
 City, State, ZIP: Oakland, CA 94602

Customer: Shell Oil Company RESA-0023-LDC  
 RIPR #: 13375  
 SAP # / Location: 135675  
 Incident #: 98995740  
 Location / WIC #: 2045508-0208  
 Environmental Engineer: Petryna, Karen E.  
 Fax: \_\_\_\_\_

Material Description: Soil stockpile  
 Estimated Quantity: 4 Yards  
 Service Requested Date: 07/17/02

Disposal Facility: Forward Landfill  
 Contact: Joe Griffith  
 Phone: 800-204-4242  
 Approval #: 2138  
 Date of Disposal: 07/12/02  
 Actual Tonnage: 1.02 Tons

Transporter: Manley & Sons Trucking, Inc.  
 Contact: Glenell Forbes  
 Phone: 916 381-6864  
 Fax: 916 381-1573  
 Invoice: 50234  
 Date of Invoice: 07/18/02

Fax To: Consultant Cc: Tim Dazey Shell

## **ATTACHMENT H**

Laboratory Analytical Results for Vapor Samples



Report Number : 27144

Date : 6/26/02

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

Subject : 2 Air Samples  
Project Name : 2120 MONTANA ST, OAKLAND  
Project Number : 244-0733  
P.O. Number : 98995740

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,

A handwritten signature in black ink that reads "Joel Kiff". The signature is written in a cursive style with a large initial "J".

Joel Kiff



Report Number : 27144

Date : 6/26/02

Project Name : 2120 MONTANA ST, OAKLAND

Project Number : 244-0733

Sample : V1

Matrix : Air

Lab Number : 27144-01

Sample Date :6/24/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	72	2.0	ppmv	EPA 8260B	6/26/02
Toluene	79	2.0	ppmv	EPA 8260B	6/26/02
Ethylbenzene	30	2.0	ppmv	EPA 8260B	6/26/02
Total Xylenes	70	2.0	ppmv	EPA 8260B	6/26/02
Methyl-t-butyl ether	130	4.0	ppmv	EPA 8260B	6/26/02
TPH as Gasoline	8100	200	ppmv	EPA 8260B	6/26/02
Toluene - d8 (Surr)	98.3		% Recovery	EPA 8260B	6/26/02
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	6/26/02


Sample : V2

Matrix : Air

Lab Number : 27144-02

Sample Date :6/24/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	50	2.0	ppmv	EPA 8260B	6/25/02
Toluene	160	2.0	ppmv	EPA 8260B	6/25/02
Ethylbenzene	42	2.0	ppmv	EPA 8260B	6/25/02
Total Xylenes	170	2.0	ppmv	EPA 8260B	6/25/02
Methyl-t-butyl ether	160	4.0	ppmv	EPA 8260B	6/25/02
TPH as Gasoline	6100	200	ppmv	EPA 8260B	6/25/02
Toluene - d8 (Surr)	99.6		% Recovery	EPA 8260B	6/25/02
4-Bromofluorobenzene (Surr)	104		% Recovery	EPA 8260B	6/25/02

Approved By:  Joel Kiff



720 Olive Drive, Suite D  
 Davis, CA 95616

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

Shell Project Manager to be Involved:

- SCIENCE & ENGINEERING
- TECHNICAL SERVICES
- OGMT-HOUSTON

KAREN PETRYNA

27144

98995740

DATE: 6-24-02

PAGE: 1 of 1

SAMPLING COMPANY: <b>CARISMA</b>	LOG CODE:	SITE ADDRESS (Street and City): <b>2120 MONTANA ST, OAKLAND</b>	GLOBAL ID NO.:
ADDRESS: <b>6262 HOLUS ST, OAKLAND</b>	EDF DELIVERABLE TO (Responsible Party or Designee):	PHONE NO.:	CONSULTANT PROJECT NO.: <b>244-0733</b>
PROJECT CONTACT (Hardcopy or PDF Report to): <b>DAN LESCHKE</b>	SAMPLER NAME(S) (Print): <b>DAN LESCHKE</b>		
TELEPHONE: <b>510 376 0787</b>	FAX: <b>510 450 8295</b>	EMAIL: <b>DLESCHKE@CARISMA-ENV.COM</b>	

TURNAROUND TIME (BUSINESS DAYS): <input type="checkbox"/> 10 DAYS <input type="checkbox"/> 5 DAYS <input checked="" type="checkbox"/> 72 HOURS <input type="checkbox"/> 48 HOURS <input type="checkbox"/> 24 HOURS <input type="checkbox"/> LESS THAN 24 HOURS	<b>REQUESTED ANALYSIS</b>																		
<input type="checkbox"/> LA - RWQCB REPORT FORMAT <input type="checkbox"/> UST AGENCY:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">TPH - Gas, Purgeable</td><td style="width: 5%;">BTEX</td><td style="width: 5%;">MTBE (8021B - 5ppb RL)</td><td style="width: 5%;">MTBE (8260B - 0.5ppb RL)</td><td style="width: 5%;">Oxygenates (S) by (8260B)</td><td style="width: 5%;">Ethanol (8260B)</td><td style="width: 5%;">Methanol</td><td style="width: 5%;">EDB &amp; 1,2-DCA (8200B)</td><td style="width: 5%;">EPA 6035 Extraction for Volatiles</td><td style="width: 5%;">VOCs Halogenated/Aromatic (8021B)</td><td style="width: 5%;">TRPH (418.1)</td><td style="width: 5%;">Vapor VOCs BTEX / MTBE (TO-15)</td><td style="width: 5%;">Vapor VOCs Full List (TO-15)</td><td style="width: 5%;">Vapor TPH (ASTM 3416m)</td><td style="width: 5%;">Vapor Fixed Gases (ASTM D1946)</td><td style="width: 5%;">Test for Disposal ( 4B - )</td><td style="width: 5%;">TPH - Diesel, Extractable (8015m)</td><td style="width: 5%;">MTBE (8200B) Confirmation, See Note</td> </tr> </table>	TPH - Gas, Purgeable	BTEX	MTBE (8021B - 5ppb RL)	MTBE (8260B - 0.5ppb RL)	Oxygenates (S) by (8260B)	Ethanol (8260B)	Methanol	EDB & 1,2-DCA (8200B)	EPA 6035 Extraction for Volatiles	VOCs Halogenated/Aromatic (8021B)	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 - )	TPH - Diesel, Extractable (8015m)	MTBE (8200B) Confirmation, See Note
TPH - Gas, Purgeable		BTEX	MTBE (8021B - 5ppb RL)	MTBE (8260B - 0.5ppb RL)	Oxygenates (S) by (8260B)	Ethanol (8260B)	Methanol	EDB & 1,2-DCA (8200B)	EPA 6035 Extraction for Volatiles	VOCs Halogenated/Aromatic (8021B)	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 - )	TPH - Diesel, Extractable (8015m)	MTBE (8200B) Confirmation, See Note	
GC/MS MTBE CONFIRMATION: HIGHEST _____ HIGHEST per BORING _____ ALL _____																			
SPECIAL INSTRUCTIONS OR NOTES: CHECK BOX IF EDD IS <u>NOT</u> NEEDED <input type="checkbox"/>																			

**FIELD NOTES:**  
 Container/Preservative or PID Readings or Laboratory Notes

Field Sample Identification	SAMPLING		MATRIX	NO. OF CONT.	TPH - Gas, Purgeable	BTEX	MTBE (8021B - 5ppb RL)	MTBE (8260B - 0.5ppb RL)	Oxygenates (S) by (8260B)	Ethanol (8260B)	Methanol	EDB & 1,2-DCA (8200B)	EPA 6035 Extraction for Volatiles	VOCs Halogenated/Aromatic (8021B)	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 - )	TPH - Diesel, Extractable (8015m)	MTBE (8200B) Confirmation, See Note	TEMPERATURE ON RECEIPT °C
	DATE	TIME																					
V1	6/24/02	11:45	AIR	1	X	X	X																TEOLAN 15K -01
V2	6/24/02	5:00	AIR	1	X	X	X																-02

Relinquished by: (Signature) <i>[Signature]</i>	Received by: (Signature) <b>"SECURED LOCATION"</b>	Date: <b>6/24/02</b>	Time: <b>4:30 PM</b>
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature) <i>John Cuthbert / Kiff Analytical</i>	Date: <b>062502</b>	Time: <b>1220</b>

C&C Graphic (714) 858-9702



Report Number : 27172

Date : 6/27/02

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

Subject : 2 Air Samples  
Project Name : 2120 MONTANA ST, OAKLAND  
Project Number : 244-0733  
P.O. Number : 98995740

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,

A handwritten signature in black ink that reads "Joel Kiff". The signature is written in a cursive style with a large initial "J".

Joel Kiff



Report Number : 27172

Date : 6/27/02

Project Name : 2120 MONTANA ST, OAKLAND

Project Number : 244-0733

Sample : V3

Matrix : Air

Lab Number : 27172-01

Sample Date :6/25/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	<b>28</b>	1.0	ppmv	EPA 8260B	6/27/02
<b>Toluene</b>	<b>100</b>	1.0	ppmv	EPA 8260B	6/27/02
<b>Ethylbenzene</b>	<b>18</b>	1.0	ppmv	EPA 8260B	6/27/02
<b>Total Xylenes</b>	<b>85</b>	1.0	ppmv	EPA 8260B	6/27/02
<b>Methyl-t-butyl ether</b>	<b>32</b>	2.0	ppmv	EPA 8260B	6/27/02
<b>TPH as Gasoline</b>	<b>4800</b>	100	ppmv	EPA 8260B	6/27/02
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	6/27/02
4-Bromofluorobenzene (Surr)	100		% Recovery	EPA 8260B	6/27/02

Sample : V4

Matrix : Air

Lab Number : 27172-02

Sample Date :6/25/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	<b>20</b>	1.0	ppmv	EPA 8260B	6/27/02
<b>Toluene</b>	<b>93</b>	1.0	ppmv	EPA 8260B	6/27/02
<b>Ethylbenzene</b>	<b>16</b>	1.0	ppmv	EPA 8260B	6/27/02
<b>Total Xylenes</b>	<b>77</b>	1.0	ppmv	EPA 8260B	6/27/02
<b>Methyl-t-butyl ether</b>	<b>18</b>	2.0	ppmv	EPA 8260B	6/27/02
<b>TPH as Gasoline</b>	<b>3500</b>	100	ppmv	EPA 8260B	6/27/02
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	6/27/02
4-Bromofluorobenzene (Surr)	97.9		% Recovery	EPA 8260B	6/27/02

Approved By:  Joel Kiff

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

**SHELL CHAIN OF CUSTODY RECORD**

720 Olive Drive, Suite D  
Davis, CA 95616

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

Shell Project Manager to be Invoiced:  
 SCIENCE & ENGINEERING  
 TECHNICAL SERVICES  
 OILFIELD SERVICES  
 KAREN PETRYNA  
 27172

98995740

DATE: 6/25/02  
PAGE: 1 of 1

SAMPLING COMPANY: **CAMBIA** LOG CODE: \_\_\_\_\_ SITE ADDRESS (Street and City): **2120 MONTANA ST, OAKLAND** GLOBAL ID NO.: \_\_\_\_\_  
 ADDRESS: **6262 HOLUS ST, OAKLAND** EDF DELIVERABLE TO (Responsible Party or Designer): \_\_\_\_\_ PHONE NO.: \_\_\_\_\_ EMAIL: \_\_\_\_\_ CONSULTANT PROJECT NO.: **244-0733**  
 PROJECT CONTACT (Hardcopy or PDF Report to): **DAN LESCHKE** SAMPLER NAME(S) (Print): **DAN LESCHKE**  
 TELEPHONE: **510 514 0787** FAX: **510 460 8295** EMAIL: **DLESCHKE@CAMBIA-ENV.COM**

TURNAROUND TIME (BUSINESS DAYS):  
 10 DAYS  5 DAYS  72 HOURS  48 HOURS  24 HOURS  LESS THAN 24 HOURS  
 LA - RWQCB REPORT FORMAT  UST AGENCY: **AETCSA**  
 GC/MS MTBE CONFIRMATION: HIGHEST \_\_\_\_\_ HIGHEST per BORING \_\_\_\_\_ ALL \_\_\_\_\_  
 SPECIAL INSTRUCTIONS OR NOTES: CHECK BOX IF EDD IS NOT NEEDED

REQUESTED ANALYSIS											FIELD NOTES: Container/Preservative or PID Readings or Laboratory Notes						
TPH - Gas, Purgeable	BTEX	MTBE (8021B - 5 ppb RL)	MTBE (8280B - 0.5 ppb RL)	Oxygenates (5) by (8280B)	Ethanol (8280B)	Methanol	EDB & 1,2-DCA (8280B)	EPA 6036 Extraction for Volatiles	VOCs Halogenated/Aromatic (8021B)	TPPH (418.1)		Vapor VOCs BTEX/MTBE (70-16)	Vapor VOCs Full List (70-15)	Vapor TPH (ASTM 3416m)	Vapor Fused Gases (ASTM D1946)	Test for Disposal (4B- )	TPH - Diesel, Extractable (8016m)

Field Sample Identification	SAMPLING		MATRIX	NO. OF CONT.	TPH - Gas, Purgeable	BTEX	MTBE (8021B - 5 ppb RL)	MTBE (8280B - 0.5 ppb RL)	Oxygenates (5) by (8280B)	Ethanol (8280B)	Methanol	EDB & 1,2-DCA (8280B)	EPA 6036 Extraction for Volatiles	VOCs Halogenated/Aromatic (8021B)	TPPH (418.1)	Vapor VOCs BTEX/MTBE (70-16)	Vapor VOCs Full List (70-15)	Vapor TPH (ASTM 3416m)	Vapor Fused Gases (ASTM D1946)	Test for Disposal (4B- )	TPH - Diesel, Extractable (8016m)	MTBE (8280B) Confirmation, See Note	TEMPERATURE ON RECEIPT °C
	DATE	TIME																					
V3	6/25	2:00	AW	1	X	X	X																TECHNICAL - 01
V4	6/25	9:45	AW	1	X	X	X																" " - 02

Requested by: (Signature) **Dan Leschke** Received by: (Signature) **SECORAN LOCATION** Date: **6/25/02** Time: **2:30 PM**  
 Requested by: (Signature) \_\_\_\_\_ Received by: (Signature) \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Requested by: (Signature) \_\_\_\_\_ Received by: (Signature) **John Curiale/Kiff Analytical** Date: **062602** Time: **1139**

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

C&C Graphs (714) 896-9702

10/18/00 Revision



Report Number : 27192

Date : 6/28/2002

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

Subject : 2 Air Samples  
Project Name : 2120 MONTANA ST., OAKLAND  
Project Number : 244-0773  
P.O. Number : 98995740

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,

A handwritten signature in black ink that reads "Joel Kiff". The signature is written in a cursive style with a large initial "J".

Joel Kiff



Report Number : 27192

Date : 6/28/2002

Project Name : 2120 MONTANA ST., OAKLAND

Project Number : 244-0773

Sample : V5

Matrix : Air

Lab Number : 27192-01

Sample Date :6/26/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	17	1.0	ppmv	EPA 8260B	6/28/2002
Toluene	93	1.0	ppmv	EPA 8260B	6/28/2002
Ethylbenzene	15	1.0	ppmv	EPA 8260B	6/28/2002
Total Xylenes	75	1.0	ppmv	EPA 8260B	6/28/2002
Methyl-t-butyl ether	16	2.0	ppmv	EPA 8260B	6/28/2002
TPH as Gasoline	3100	100	ppmv	EPA 8260B	6/28/2002
Toluene - d8 (Surr)	103		% Recovery	EPA 8260B	6/28/2002
4-Bromofluorobenzene (Surr)	99.5		% Recovery	EPA 8260B	6/28/2002

Sample : V6

Matrix : Air

Lab Number : 27192-02

Sample Date :6/26/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	25	1.0	ppmv	EPA 8260B	6/28/2002
Toluene	160	1.0	ppmv	EPA 8260B	6/28/2002
Ethylbenzene	26	1.0	ppmv	EPA 8260B	6/28/2002
Total Xylenes	130	1.0	ppmv	EPA 8260B	6/28/2002
Methyl-t-butyl ether	23	2.0	ppmv	EPA 8260B	6/28/2002
TPH as Gasoline	4600	100	ppmv	EPA 8260B	6/28/2002
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	6/28/2002
4-Bromofluorobenzene (Surr)	98.7		% Recovery	EPA 8260B	6/28/2002

Approved By:  Joel Kiff

720 Olive Drive, Suite D  
Davis, CA 95616

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

Shell Project Manager to be invoiced:

- SCIENCE & ENGINEERING
- TECHNICAL SERVICES
- CRM/ HOUSTON

KAREN PETRYNA

27192

98995746

DATE: 6/26/02

PAGE: 1 of 1

SAMPLING COMPANY: <b>CAMBRIA</b>		LOG CODE: <b>CETO</b>	SITE ADDRESS (Street and City): <b>2120 Montona St., Oakland</b>		GLOBAL ID NO.:
ADDRESS: <b>62122 Hollis St., Emeryville, CA</b>		SOP DELIVERABLE TO (Responsible Party or Design):		PHONE NO.:	EMAIL:
PROJECT CONTACT (Hardcopy or PDF Report to): <b>DAN LESCHUE</b>		CONSULTANT PROJECT NO.:		<b>244-0713</b>	
TELEPHONE: <b>510 316 0787</b>	FAX: <b>910 490 8295</b>	E-MAIL: <b>D.Leschue@Cambria-env.com</b>			
TURNAROUND TIME (BUSINESS DAYS): <input type="checkbox"/> 10 DAYS <input type="checkbox"/> 5 DAYS <input checked="" type="checkbox"/> 72 HOURS <input type="checkbox"/> 48 HOURS <input type="checkbox"/> 24 HOURS <input type="checkbox"/> LESS THAN 24 HOURS		SAMPLER NAME(S) (Print): <b>KEVIN DOLAN</b>			

<input type="checkbox"/> LA - RWQCB REPORT FORMAT <input checked="" type="checkbox"/> LIST AGENCY: <b>ACHCSA</b>		<b>REQUESTED ANALYSIS</b>				<b>FIELD NOTES:</b> Container/Preservative or PID Readings or Laboratory Notes
GC/MS MTBE CONFIRMATION: HIGHEST _____ HIGHEST per BORING _____ ALL _____		TPH - Gas, Purgeable	BTEX	MTBE (8021B - 5ppb RL)	MTBE (8260B - 0.5ppb RL)	
SPECIAL INSTRUCTIONS OR NOTES: CHECK BOX IF EDD IS NOT NEEDED <input type="checkbox"/>		Oxygenates (S) by (8260B)	Ethanol (8260B)	Methanol	EDB & 1,2-DCA (8260B)	
		EPA 5035 Extraction for Volatiles	VOCs Halogenated/Aromatic (8021B)	TRPH (418.1)	Vapor VOCs BTEX/MTBE (TO-15)	

Field Sample Identification	SAMPLING		MATRIX	NO. OF CONT.	TPH - Gas, Purgeable	BTEX	MTBE (8021B - 5ppb RL)	MTBE (8260B - 0.5ppb RL)	Oxygenates (S) by (8260B)	Ethanol (8260B)	Methanol	EDB & 1,2-DCA (8260B)	EPA 5035 Extraction for Volatiles	VOCs Halogenated/Aromatic (8021B)	TRPH (418.1)	Vapor VOCs BTEX/MTBE (TO-15)	Vapor VOCs Full List (TO-15)	Vapor TPH (ASTM 9410m)	Vapor Fused Gases (ASTM D1946)	Test for Disposal (48-)	TPH - Diesel, Extractable (9015m)	MTBE (8260B) Confirmation, See Note	TEMPERATURE ON RECEIPT °C	
	DATE	TIME																						
V5	6/26	1030	AIR	1	X	X	X																	
V6	6/26	1800	AIR	1	X	X	X																	

Relinquished by: (Signature) <i>Kevin Dolan</i>	Received by: (Signature) <i>"Secured location"</i>	Date: 6/27/02	Time: 8:30 AM
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature) <i>Harold Brown</i>	Date: 062702	Time: 1220

C&G Graphic (714) 898-8702



Report Number : 27241

Date : 7/1/02

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

Subject : 4 Air Samples  
Project Name : 2120 MONTANA ST., OAKLAND, CA  
Project Number : 244-0773  
P.O. Number : 98995740

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





Report Number : 27241

Date : 7/1/02

Project Name : 2120 MONTANA ST., OAKLAND, CA

Project Number : 244-0773

Sample : V7

Matrix : Air

Lab Number : 27241-01

Sample Date :6/27/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	9.7	0.10	ppmv	EPA 8260B	6/29/02
Toluene	59	0.50	ppmv	EPA 8260B	6/30/02
Ethylbenzene	11	0.10	ppmv	EPA 8260B	6/29/02
Total Xylenes	53	0.10	ppmv	EPA 8260B	6/29/02
Methyl-t-butyl ether	9.3	0.20	ppmv	EPA 8260B	6/29/02
TPH as Gasoline	1500	50	ppmv	EPA 8260B	6/30/02
Toluene - d8 (Surr)	93.5		% Recovery	EPA 8260B	6/29/02
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	6/29/02

Sample : V8

Matrix : Air

Lab Number : 27241-02

Sample Date :6/27/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	6.0	0.10	ppmv	EPA 8260B	6/29/02
Toluene	50	0.25	ppmv	EPA 8260B	6/30/02
Ethylbenzene	8.5	0.10	ppmv	EPA 8260B	6/29/02
Total Xylenes	46	0.10	ppmv	EPA 8260B	6/29/02
Methyl-t-butyl ether	6.8	0.20	ppmv	EPA 8260B	6/29/02
TPH as Gasoline	1100	25	ppmv	EPA 8260B	6/30/02
Toluene - d8 (Surr)	95.2		% Recovery	EPA 8260B	6/29/02
4-Bromofluorobenzene (Surr)	100		% Recovery	EPA 8260B	6/29/02

Approved By:  Joel Kiff



Report Number : 27241

Date : 7/1/02

Project Name : 2120 MONTANA ST., OAKLAND, CA

Project Number : 244-0773

Sample : V9

Matrix : Air

Lab Number : 27241-03

Sample Date :6/28/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	5.4	0.10	ppmv	EPA 8260B	6/29/02
Toluene	34	0.25	ppmv	EPA 8260B	6/30/02
Ethylbenzene	7.9	0.10	ppmv	EPA 8260B	6/29/02
Total Xylenes	43	0.10	ppmv	EPA 8260B	6/29/02
Methyl-t-butyl ether	5.6	0.20	ppmv	EPA 8260B	6/29/02
TPH as Gasoline	650	25	ppmv	EPA 8260B	6/30/02
Toluene - d8 (Surr)	96.6		% Recovery	EPA 8260B	6/29/02
4-Bromofluorobenzene (Surr)	100		% Recovery	EPA 8260B	6/29/02

Sample : V10

Matrix : Air

Lab Number : 27241-04

Sample Date :6/28/02

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	6.4	0.10	ppmv	EPA 8260B	6/29/02
Toluene	51	0.33	ppmv	EPA 8260B	6/30/02
Ethylbenzene	9.8	0.10	ppmv	EPA 8260B	6/29/02
Total Xylenes	54	0.10	ppmv	EPA 8260B	6/29/02
Methyl-t-butyl ether	6.5	0.20	ppmv	EPA 8260B	6/29/02
TPH as Gasoline	1100	33	ppmv	EPA 8260B	6/30/02
Toluene - d8 (Surr)	95.8		% Recovery	EPA 8260B	6/29/02
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	6/29/02

Approved By:  Joel Kiff

SMALL CLAIM OF CUSTODY RECORD

720 Olive Drive, Suite D

Davis, CA 95616

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

Shell Project Manager to be Invoiced:  
 SCIENCE & ENGINEERING  
 TECHNICAL SERVICES  
 CAMP HOUSTON  
 Denis Brown  
 27241

9 8 9 9 5 7 4 0

DATE: 6/28/02  
 PAGE: 1 of 1

SAMPLING COMPANY: **CAMBERIA** LOG CODE: **CETO** SITE ADDRESS (Street and City): **2120 Montara St., Oakland, CA** GLOBAL ID NO.:  
 ADDRESS: **6262 Hollis St. Emeryville, CA** EDF DELIVERABLE TO (Responsible Party or Designee): PHONE NO.: EMAIL:  
 PROJECT CONTACT (Hardcopy or PDF Report to): **DAN LESCURE** CONSULTANT PROJECT NO.: **244-0773**  
 TELEPHONE: **510 376 0787** FAX: **510 450 8295** EMAIL: **DLESURE@CAMBERIA-ENV.COM** SAMPLER NAME(S) (Print): **Kevin Dolan**

TURNAROUND TIME (BUSINESS DAYS):  
 10 DAYS  5 DAYS  72 HOURS  48 HOURS  24 HOURS  LESS THAN 24 HOURS  
 LA - RWQCB REPORT FORMAT  DUST AGENCY: **ACTCSA**  
 GC/MS MTBE CONFIRMATION: HIGHEST \_\_\_\_\_ HIGHEST per BORING \_\_\_\_\_ ALL \_\_\_\_\_  
 SPECIAL INSTRUCTIONS OR NOTES: CHECK BOX IF EDO IS NOT NEEDED

REQUESTED ANALYSIS

TPH - Gas, Purgeable	MTBE (6021B - 6ppb RL)	Oxygenates (S) by (6260B)	Ethanol (6260B)	Methanol	EDB & 1,2-DCA (6260B)	EPA 6053 Extraction for Volatiles	VOCs Halogenated/Aromatics (6021B)	TRPH (416.1)	Vapor VOCs BTEX/MTBE (TO-15)	Vapor VOCs Full List (TO-15)	Vapor TPH (ASTM 3416m)	Vapor Fixed Gases (ASTM D1946)	Test for Disposal (40-)	TPH - Diesel, Extractable (6016m)	MTBE (6260B) Confirmation; See Note	FIELD NOTES: Containment/Preservative or PID Readings or Laboratory Notes
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Field Sample Identification	SAMPLING		MATRIX	NO. OF CONT.	TPH - Gas, Purgeable	BTEX	MTBE (6021B - 6ppb RL)	MTBE (6260B - 0.5ppb RL)	Oxygenates (S) by (6260B)	Ethanol (6260B)	Methanol	EDB & 1,2-DCA (6260B)	EPA 6053 Extraction for Volatiles	VOCs Halogenated/Aromatics (6021B)	TRPH (416.1)	Vapor VOCs BTEX/MTBE (TO-15)	Vapor VOCs Full List (TO-15)	Vapor TPH (ASTM 3416m)	Vapor Fixed Gases (ASTM D1946)	Test for Disposal (40-)	TPH - Diesel, Extractable (6016m)	MTBE (6260B) Confirmation; See Note	TEMPERATURE ON RECEIPT °
	DATE	TIME																					
V7	6/27	1100	VA	1	X	X	X																-01
V8	6/27	1900	VA	1	X	X	X																-02
V9	6/28	800	VA	1	X	X	X																-03
V10	6/28	1230	VA	1	X	X	X																-04

Relinquished by (Signature): <i>Kevin Dolan</i>	Received by (Signature): "Secured location"	Date: 6/28/02	Time: 8:40
Relinquished by (Signature): _____	Received by (Signature): _____	Date: _____	Time: _____
Relinquished by (Signature): _____	Received by (Signature): <i>John Cuthbert/Kiff Analytical</i>	Date: 062802	Time: 1145

C&C Graphics (714) 898-9702

**ATTACHMENT I**

SVE Pilot Test Field Notes

WAMES SHEL  
(910) 930 9234 PH  
(910) 371 6946 FX

**SVE Test Scope of Work  
2120 Montana St, Oakland  
June 24 thru 28, 2002**

**A. Pre-Field Tasks**

- |  |   |
|--|---|
| <del>X</del> Develop objective and protocol        | <del>X</del> Reserve and check equipment operation        |
| <del>X</del> Schedule                              | <del>X</del> Develop field forms                          |
| <del>X</del> MDI notification (min. 10 days prior) | <del>X</del> Prep background info (maps, well info, etc)  |
| <del>X</del> Notify station manager                | <del>X</del> Pre-field meeting w/ test team (6/17/02)     |
| <del>X</del> BAAQMD notification                   | <del>X</del> Site visit to assess logistics and wellheads |
| <del>X</del> Notify Kiff                           | <del>X</del> <b>HEALTH &amp; SAFETY PLAN</b>              |

**B. Equipment List**

- |  |  |
|--|--|
| <del>X</del> SVE Field Forms                         | <del>X</del> TSI Veloci-calc (the good one!)                         |
| <del>X</del> Water Level Indicator                   | <del>X</del> Horiba (calibrated)                                     |
| <del>X</del> Measuring Wheel and Tape Measure        | <del>X</del> Vacuum pump w/knockout                                  |
| <input type="checkbox"/> Calculator                  | <del>X</del> Tedlar bags   |
| <del>X</del> Pens and Pencils                        | <del>X</del> SVE wellhead fittings                                   |
| <del>X</del> Watch (Digital)                         | <del>X</del> 2" cam-lock hose/fittings                               |
| <del>X</del> Site Map                                | <del>X</del> Wellhead fittings to monitor vacuum influence.          |
| <del>X</del> Well Dimensions (dia., TD, DTW, screen) | <del>X</del> Magnahelics, Digital Vacuum gauges                      |
| <del>X</del> Cell Phone                              | <del>X</del> Traffic Control (cones, barricades, caution tape, etc.) |
| <del>X</del> V3 IC Engine (Shell's VR unit at MRC)   |  |
| <del>X</del> Propane Tanks                           |  |

**C. SVE Testing - Monday, June 24, 2002**

Objective of testing on day 1 is to set-up, conduct short-term (less than 2 hour) tests on backfill well TBW-S, and then conduct a long-term (24-hour) test on TBW-S based on operating parameters yielded from the short-term tests. Dan will be there on Monday morning to help set up and go over the testing procedures.

Short-term testing will consist of extracting at a minimum of 3 vacuum levels. Monitor vacuum, flow, and influent HC concentration at each vacuum level. The vacuum is adjusted on the ICE by varying the RPM setting (1500 RPM, 1750 RPM, 2000 RPM). Determine optimal operating conditions.

Long-term testing will consist of operating the ICE to extract from TBW-S for the remainder of the week, at the vacuum from the short-term test that yielded the highest flow rate. Monitor applied vacuum, flow, influent HC, well HC, and vacuum influence. Specific tasks are as follows:

1. Check in with station manager. Provide MDI Job Receipt.
2. Set up traffic control where applicable.
3. Set-up equipment.
4. Synchronize watches w/ on-site workers
5. Take initial DTW measurements in monitoring wells. Note if well screens are submerged.
6. Measure distances between wells.
7. Start short-term testing. 30 to 60 minutes per step. Collect data every 15 minutes.
8. Collect vapor sample at the beginning of test (label "V1").
9. Start long-term testing. Collect data every 30 minutes. Measure ROI using all TBW wells and MW-1 (if not submerged).
10. Collect vapor samples at end of day (label "V2").
11. Leave ICE running overnight. Verify adequate propane. Secure equipment.
12. Contact Dan at critical times and end of day.

DAILY FIELD REPORT

Project Name: <b>SHELL - OAKLAND</b>	Cambria Mgr: <b>J. JONES</b>	Field Person: <b>DAN</b>
Project Number: <b>244-0733</b>	Date: <b>06-24-02</b>	Site Address: <b>2120 MONTANA ST. OAKLAND, CA</b>
General Tasks: <b>SHORT-TERM SVE TESTING OF TSN-E LONG-TERM SVE TESTING OF TSN-E (DAY 1)</b>		

Time	Activity/Comments	Code	Hours
<b>5:30 AM</b>	<b>ON-SITE. DISCUSS SITE ACTIVITIES W/ STATION ATTENDANT; PROVIDE MDI JOB RECEIPT. SET-UP EQUIPMENT. COLLECT STATIC DM.</b>		
	<b>MW-1 = 12.91' DP = 12.48' THICKNESS = 0.43' SCREEN SUBMERGED MW-2 = 12.13 MW-3 = 11.39 MW-4 = 13.16 MW-5 = 12.43 TSN-B = 12.5</b>		
<b>0:30 AM</b>	<b>START TEST. (STEP). ICE REQUIRES MOUNT-UP TIME.</b>		
<b>0:45 AM</b>	<b>ATTEMPTED TO OPEN WELL VALVE TO 125 TO GET TO OPT. OP. SUNK SYSTEM SHUTDOWN. WELL VAPOR TOO HIGH/RELT. RESTART SYSTEM.</b>		
<b>1:45 AM</b>	<b>COLLECT FIRST VAPOR SAMPLE (V1) FROM SYSTEM/TSN-E SYSTEM IS SLOW TO OPEN WELL VALVE DUE TO HIGH VAPOR CONCENTRATIONS. ABANDON (FOR NOW) STEP TESTS. OP. @ 2:00 PM UNTIL WELL VALVE OPENS/VAPOR CONC. DECREASES.</b>		
<b>1:20 PM</b>	<b>CHECK DOI GAUGES FOR ACCURACY. SWITCH IN OTHER GAUGES. GAUGES APPEAR TO BE OK.</b>		
<b>3:00 PM</b>	<b>NOTE: WELLHEAD V2 IS ONE DECIMAL PLACE OFF. SHOULD BE 1.4 @ 2.0 INHD, NOT 0.14 @ 0.20 INHD. COLLECT VAPOR SAMPLE "V2" FROM SYSTEM/TSN-E. FLOW &amp; V2 HAVE GONE UP AS VAPOR CONC. HAS DECREASED AS ANTICIPATED. PICK-UP MONITORING EQUIPMENT &amp; MATERIALS. SECURE ICE &amp; PROPANE.</b>		
<b>7:30 PM</b>	<b>OFF-SITE. WILL RETURN W/ MORE LOGS</b>		

1107 MW-3 & MW-4.

CAMBRIA

SVE TEST DATA FORM

Site Address: 2170 WATSON ST., CAMBRIA  
 Project No. 144-0133  
 Incident No. 98995740

Date: JUNE 14, 2002  
 Technician: DAN  
 Project Mgr: JAGUERN

**WATER**

Time (hh:mm)	Hour Meter (hrs)	Eng Vac (In Hg)	Well Vac (In H2O)	Dilution Flow (cfm)	Fuel Flow (cfm)	Well Flow (cfm)	Influent Vapor (ppmv)	Effluent Vapor (ppmv)	Wellhead Vac (InH2O)	LPG level (%full)	Radius of Influence				WELL VALVE	
											TBW-N (InH2O)	MW-3 (InH2O)	TBW-W (InH2O)	MW-4 (InH2O)		
<del>10:30</del>																
10:30	268.1	21.4	0	85	2.4	0	—	—	0.60*	100	INITIAL	ON DATA	WARM-UP	ICE	2000 RPM	
10:45	268.35	17.8	0	94	1.6	0	5230		0.60*	100	0	0	0	0	88	
	— OPENED WELL VALVE TO 125. ENGINE SHUTDOWN. RESTART.															
11:00	269.6	20.6	0	75	2.2	0	8620		0.13	100	0.1	0	0	0	49	
11:15	269.8	17.5	2	91	1.7	2	8940		0.14	100	0.2	0	0.1	0.005	90	
11:30	269.1	17.4	1	89	1.8	4	6070		0.16	100	0.2	0	0.1	0.005	94	
11:45	269.3	17.5	5	86	1.8	4	8020		0.15	100	0.2	0	0.1	0.015	96	SAMPLE "V1"
12:00	269.6	17.2	3	82	1.8	8	6010		0.16	100	0.2	0	0.1	0.01	102	
12:30	270.1	17.3	2	82	1.9	15	4660		0.14	100	0.2	0.01	0.1	0.015	112	
1:00	270.6	17.3	3	77	1.9	17	8740		0.13	80	0.25	0	0.1	0.02	123	
1:30	271.1	17.4	4	72	2.1	21	2610		0.13	50	0.15	0	0.1	0.01	137	
2:00	271.6	17.4	5	64	2.0	29	3240		0.11	50	0.25	0.01	0.1	0.01	155	QC FOR SAMPLES
2:10									0.14	50	0.1		0.11			
2:30	272.1	17.4	6	51	1.9	42	<del>1555</del> 8950		0.14	40	0.1	0.01	0.11	0		
3:00	272.6	17.3	12	31	1.9	64	1584		0.20	30 (3)	0.16	0.01	0.14	0	249	SAMPLE "V2"
3																
3:30	273.1	17.4	20	11	1.8	90									289	
4:45	275.36	19.2	12	10	2.0	67									211	

NOTES:

→ OPS - ONE DECIMAL PLACE OFF

100 (2 NEW TANKS)

SVE TEST DATA FORM

Site Address: 2120 MONTANA ST, CAMBRID  
 Project No. 244-0733  
 Incident No. 99995740

Date: 6-29-02  
 Technician: DM  
 Project Mgr: JACQUELIN

Time (hh:mm)	Hour Meter (hrs)	Eng Vac (In Hg)	Well Vac (In H2O)	Dilution Flow (cfm)	Fuel Flow (cfm)	Well Flow (cfm)	Influent Vapor (ppmv)	Effluent Vapor (ppmv)	Wellhead Vac (InH2O)	LPG level (%full)	Radius of influence				WELL VALUE				
											TBW-N (InH2O)	TBW-E (InH2O)	TBW-W (InH2O)	MW-1 (InH2O)					
1:15	279.6																		
1:30	279.8	19.5	5	67	2.2	12	1502		0.6	100							89		
2:00	280.3	17.1	7	59	2.2	24	2100		1.4	100							170 SAMPLE "V3"		
2:15	282.6	17.0	9	51	2.2	45				100							194		
9:00	284.0																		
9:30	285.0	20.5	2	44	2.1	26				100								119 ING 250	
9:45	285.2	19.6	11	0	2.1	75				100								250 SAMPLE "V4"	
10:00		20.4	7	11	2.1	60			6	100								191	
6/26																			
9:10	296.6	21.3	3	33	2.3	53												163	
9:40	297.1	21.1	5	10	2.2	51												166	

NOTES: SHUTDOWN DUE TO LOW LPG & /O2 CONDENSATE



## SVE TEST DATA FORM

Site Address: 2120 Montana St. Oakland  
 Project No. 244-0733  
 Incident No. 99995740

Date: 6.26.02  
 Technician: Kevin  
 Project Mgr: Jaguel

Time (hh:mm)	Hour Meter (hrs)	Eng Vac (In Hg)	Well Vac (In H2O)	Dilution Flow (cfm)	Fuel Flow (cfm)	Well Flow (cfm)	Influent Vapor (ppmv)	Effluent Vapor (ppmv)	Wellhead Vac (InH2O)	LPG level (%full)	Radius of Influence				Well Valve		
											TBW-N (InH2O)	TBW-E (InH2O)	TBW-W (InH2O)	MW-1 (InH2O)			
10:15	297.1																
10:30	297.5	20.6	1	19	2.2	49	747		5.8	100							↓ 155 Sample 15" 1030
11:00	297.9	20.6	5	11	2.2	57	722		0.9	100							182
11:30	298.4	20.5	4	11	2.2	57	698		1.1	100							183
12:00	298.9	20.5	4	10	2.3	57	548		1.0	100							183
12:30	299.4	20.3	4	11	2.2	58	539		1.1								182
			4 ↓														
1:00	299.9	20.6	58	11	2.2	59	433		1.0	100							175
1:30																	
2:00	300.6	20.3	3	11	2.4	59	413		1.0								175
2:30																	
4:25	303.1	20.7	4	11	2.3	57		0	1.1	100							169
6:20	304.9	20.9	4	10	2.4	55			0.809	100							163 "16"

NOTES: SYS on at arrival - unit running w/ dilution drain - water knock out open from 6/25 pm  
 TO shutdown @ 9:45 For station fuel delivery - shut valve @ restrict.  
 SHUT down @ 1:15 - hrs - 300.1 - Reason - Engine stall - Re start @ 1:30  
 OFFSITE 2:30 (301.0 hrs) to refuel + recharge sample pump.

\* Put second propane tank online @ 6:30 pm -

6/27/02 → SYS OFF → OUT OF LPG  
 3:18 hrs.

SVE TEST DATA FORM

Site Address: 2120 Monahan St. Oakland  
 Project No. 244-0733  
 Incident No. 98995740

Date: 6/27/02  
 Technician: E. Delan  
 Project Mgr: Sageelyn

Time (hh:mm)	Hour Meter (hrs)	Eng Vac (In Hg)	Well Vac (In H2O)	Dilution Flow (cfm)	Fuel Flow (cfm)	Well Flow (cfm)	Influent Vapor (ppmv)	Effluent Vapor (ppmv)	Wellhead Vac (InH2O)	LPG level (%full)	Radius of Influence				Well Valve	
											TBW-N (InH2O)	TBW-E (InH2O)	TBW-W (InH2O)	MW-3 (InH2O)		
1006	318.0															
1100	318.9	21.0	5	11	2.4	55	258	0	1.3	100						174
1130	319.4	20.8	4	10	2.3	55	306		0.9	100	100%	0	0.08	0	172	
1200	319.9	20.6	5	10	2.4	55	263		0.9		0.08	0	0.08	0	171	
1230	320.4	20.7	5	11	2.3	56	268		0.9	100	0.08	0	0.08	0	170	
100	320.9	20.6	4	11	2.3	56	273				0.08	0	0.08	0	172	
130	321.4	20.7	5	11	2.5	57	264		0.8		0.08	0	0.08	0	172	
200	321.9	20.9	4	11	2.5	57	263	0	0.8		0.09	0	0.08	0	172	
230	322.4	20.8	4	11	2.4	55	228		0.7		0	0	0	0	173	
300	322.9	20.5	4	11	2.4	56	251		0.7		0.07	0	0.06	0	173	
700	326.9	20.6	5	11	2.4	55	218		0.8		- NOT	in PLACE -			172	
7:07	w/ SYS STALL @ 7:07 RE START @ 7:16															
730	324.2	20.9	4	11	2.3	54	268		0.7		- NOT	in PLACE -			168	

NOTES: 7:30 Arrive to site → SYS OFF → out of propane → Take tanks to be filled - on site 10:00 w/ 4 Full tanks → Start engine 1006 (start ok) Lv. site 1015 to Return Truck to office -  
 \* 2:30 Switch man. gauges on wells - Put 2nd Propane tank on line (1 Full - 1 1/4 Full)  
 \* 3:00 OFF site - to office  
 \* 7:00 Take SYS sample - VB - Change out Propane tanks & Put 2 tanks - full - on line - take OFF 2 Cambria tanks - one almost empty - one 1/3 Full (est) → SYS STALL @ 7:08 AFTER propane c/out - restart @ 7:16 ✓ ok

## SVE TEST DATA FORM

Site Address: 2120 Montana St. Oakland  
 Project No. 244-DT33  
 Incident No. 98995740

Date: 6/28/02  
 Technician: K. Dolan  
 Project Mgr: \_\_\_\_\_

Time (hh:mm)	Hour Meter (hrs)	Eng Vac (In Hg)	Well Vac (In H2O)	Dilution Flow (cfm)	Fuel Flow (cfm)	Well Flow (cfm)	Influent Vapor (ppmv)	Effluent Vapor (ppmv)	Wellhead Vac (InH2O)	LPG level (%full)	Radius of Influence					
											TBW-N (InH2O)	TBW-E (InH2O)	TBW-W (InH2O)	MW-3 (InH2O)		
7:50	339.6	21.6	6	11	2.4	50	213		0.9		- not in place					156
800	339.8	21.6	6	11	2.4	49	223		0.8							156
1000	341.8	21.5	6	11	2.4	50	184		0.6							158
1030	342.3	21.6	7	11	2.5	50	176	0	0.6							158
1100	342.8	21.5	7	11	2.4	50	168		0.7		0	0	0	0		158
1130	343.3	21.4	7	11	2.5	51	173		0.6		0	0	0	0		158
1200	343.8	21.3	6	11	2.5	51	171		0.6		0.02	0	0.04	0		158
1230	344.3	21.3	7	11	2.4	52	168		0.6		0.15	0.25	0.35	0.38		158
100	344.8	21.1	7	11	2.5	53	163		0.6		0.11	0	0	0.48		163
125	- engine stall - out of propane - change tanks -															
137	- re-start engine - 345.2 hrs -															
200	345.6	20.9	3	12	2.5	53	165		0.5							164
230	346.1	20.8	7	11	2.5	56	161		0.5							166
257	346.2	-	STOP	-												

-V9-  
 use this for  
 P(L) # in graph →

-V10-

NOTES: \* 7:50 AM → SYS running on arrival → take round of readings - Propane approx 1/4 full (both tanks)  
 take V8 vapor sample to office -  
 \* Back on site 9:50 - unit running -  
 \* KIFF Pump sample 1230 V10 → same COC as V7-V9.