

August 25, 1999
BEI Job No. 99066

Ms. Kathy Hirsch
East Bay Asian Local Development Corporation
310 8th Street, Suite 200
Oakland, CA 94607

**Subject: Subsurface Investigation
Vacant Parcel
1409-1417 12th Street
Oakland, California**

Dear Ms. Hirsch:

Blymyer Engineers, Inc. is pleased to provide this letter report on the subsurface investigation completed at the subject site. All work was performed in general accordance with our proposal dated July 13, 1999.

1.0 Introduction

1.1 Background

Blymyer Engineers understands that East Bay Asian Local Development Corporation (EBALDC) is considering purchase of the subject site for subdivision and construction of three new single-family residential units. EBALDC indicated that a small service station operated on the property until approximately 1959. EBALDC also indicated that only gasoline was stored and dispensed at the service station. At the time this work was performed, no information had been obtained that would indicate the exact location of the former underground storage tanks (USTs) or associated fuel islands at the property. EBALDC indicated that it had arranged for a magnetometer survey to be performed, which revealed no magnetic anomalies indicative of buried USTs. Blymyer Engineers was retained to perform a subsurface investigation to determine if soil or groundwater contamination from the former gasoline USTs exists at the property.

1.2 Site Conditions

The property is located in a predominantly residential area in the western portion of the city of Oakland, Alameda County, California (Figure 1). The property is located approximately 1 mile southeast of San Francisco Bay and 1 mile north of the Oakland Inner Harbor at an elevation of approximately 17 feet above mean sea level. Portions of the site are paved with asphalt and the remainder of the site is covered by grass and soil (Figure 2). Three mounds of soil up to 2 feet high were located in the southeast portion of the site.



1.3 Scope of Work

Blymyer Engineers completed the following scope of work for this project:

- Prepared a site-specific health and safety plan
- Obtained permits from Alameda County Public Works Agency to install five soil bores using Geoprobe sampling equipment
- Drilled five soil bores to a depth of 16 feet below ground surface (bgs)
- Field screened soil samples for volatile organic vapors with a photoionization detector (PID)
- Collected two soil samples and one grab groundwater sample from each soil bore for laboratory analysis
- Backfilled soil bores with cement grout upon completion
- Prepared a final report

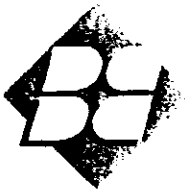
2.0 Environmental Setting

2.1 Regional Geology and Hydrogeology

The site is located in the gently sloping East Bay Plain of the San Francisco Bay Area. The San Francisco Bay Area is a region dominated by northwest trending topography, enclosed in the Coast Range Province of California. The topography of the region reflects activity of a major fault system that includes the San Andreas Fault Zone on the west side of San Francisco Bay and the Hayward Fault at the base of the Berkeley Hills on the east side of the Bay. Rock types in the region range from Jurassic age sedimentary, metamorphic, and plutonic basement to Quaternary alluvium (Norris and Webb, *Geology of California*, 1990).

The site is located on an area of Merritt Sand, a beach or near-shore deposit of fine-grained, silty, clayey sand, with lenses of sandy clay and clay. To the east, the area of Merritt Sand grades laterally with the Temescal Formation, which is alluvium derived from the Franciscan rocks of the nearby Berkeley and Oakland Hills. The Alameda Formation is found beneath all of these formations. The Merritt Sand formation is poorly graded, yellowish-brown to dark yellowish-orange and consists of "quartz and feldspar, some magnetite, flakes of white chert from the Claremont, minor amounts of sandstone, shale, hornblende, pyroxene, and biotite" (Radbruch, *Areal and Engineering Geology of the Oakland West Quadrangle, California*: U.S. Geological Survey Miscellaneous Geologic Investigations, Map I-239, scale 1:24,000, 1957).

The site is located in a "Merritt Sand Outcrop" groundwater subarea, which has a maximum thickness of 65 feet, and the local gradient is directed toward the west to southwest (Hickenbottom and Muir, *Geohydrology and Groundwater Quality Overview of the East Bay Plain Area, Alameda County, California*, 205(J) Report, 1988).



2.2 Climate

The East Bay Plain exhibits a Mediterranean-type climate with cool, wet winters and warmer, dry summers. Mean annual precipitation in Oakland is 25.42 inches. Mean monthly rainfall is 4.03 inches in January and 0.05 inches in August. Mean maximum temperatures are 54.5 degrees Fahrenheit (°F) in January and 70.6°F in July; mean minimum temperatures are 43.4°F in January and 56.8°F in July; average temperatures are 49°F in January and 63.7°F in July (National Oceanic and Atmospheric Administration, *Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days 1961-1990*, 1990).

3.0 Data Collection

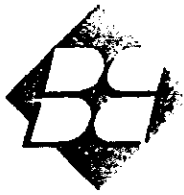
3.1 Soil and Grab Groundwater Sample Collection

On August 12, 1999, five 1.75-inch-diameter soil bores, B1 through B5 (Figure 2), were advanced under the supervision of a Blymyer Engineers geologist by Gregg Drilling using Geoprobe® sampling equipment. A drilling permit was obtained from the Alameda County Public Works Agency (ACPWA) and is included in Appendix A. Soil samples were collected continuously in 4-foot lengths, for field observation, and two soil samples from each bore were collected for laboratory analysis. Groundwater was initially encountered in all bores between approximately 10½ to 13½ feet bgs, and stabilized at approximately 11 feet bgs. The soil bores were advanced to 16 feet bgs, in order to obtain grab groundwater samples. Soil samples were field-screened for organic vapors using a PID and lithologically described using the Unified Soil Classification System. The soil descriptions and PID results are shown in the soil bore logs, which are included as Appendix B.

Petroleum odors and elevated PID readings (up to 3,079 parts per million) were noted, primarily at depths close to the groundwater table, in bores B2, B3, and B5. A noticeable turpentine odor was detected in bore B3.

A temporary PVC well screen was placed in each soil bore in order to collect grab groundwater samples for laboratory analysis. After collection of the groundwater samples, all soil bores were grouted to grade surface with cement grout. The soil cuttings from the advancement of the soil bores were contained in labeled, DOT-approved, 5-gallon pails. Decontamination water was also contained in a labeled, DOT-approved, 5-gallon pail for later disposal. The pails were stored on-site for later disposal by the client.

All samples were collected in accordance with Blymyer Engineers Standard Operating Procedure No. 4, *Soil and Grab Groundwater Sampling Using Hydraulically-Driven Sampling Equipment, Revision No. 1*, dated September 1, 1994 (Appendix C).



3.2 Soil and Grab Groundwater Sample Analytical Methods and Results

All soil and grab groundwater samples were analyzed by McCampbell Analytical, Inc., a California-certified laboratory, on a 5-day turnaround time. All soil and grab groundwater samples were analyzed for Total Petroleum Hydrocarbons (TPH) as gasoline by modified EPA Method 8015, and benzene, toluene, ethylbenzene, and total xylenes (BTEX) and methyl *tert*-butyl ether (MTBE) by EPA Method 8020. In addition, all of the soil samples and three of the grab groundwater samples (GW-3, GW-4, and GW-5) were analyzed for total lead using EPA Methods 6010 and 239.2. Groundwater samples GW-1 and GW-2 were not analyzed for total lead because the samples were collected in vials containing hydrochloric acid preservative. Groundwater sample GW-5 was also analyzed for Volatile Organic Compounds (VOCs) by EPA Method 8260.

Analytical results for the soil and grab groundwater samples are summarized in Tables I and II, respectively, and copies of the laboratory reports are included as Appendix D.

4.0 Data Interpretation

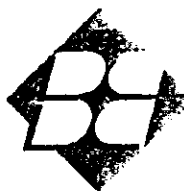
4.1 Site Geology and Hydrogeology

Native sediment was encountered in all bores, and generally consisted of dark brown silty sand grading to orange-brown silty sand. The silty sand was interspersed with thin layers of clayey sand, sandy clay, and silty clay in the southeastern portion of the site (bores B1 and B2). Refer to the soil bore logs in Appendix B for detailed lithologic descriptions.

Groundwater was initially encountered in all bores between approximately 10½ to 13½ feet bgs, and stabilized at approximately 11 feet bgs. A site-specific groundwater flow direction could not be determined using the data acquired during this investigation, but groundwater is known to generally flow to the west to southwest, towards San Francisco Bay, in the vicinity of the site.

4.2 Discussion of Soil Sample Analytical Results

TPH as gasoline at concentrations up to 1,500 milligrams per kilogram (mg/kg) and BTEX compounds at concentrations up to 120 mg/kg were detected in soil samples from bores B3 and B5. The highest concentrations were detected just above the groundwater table at a depth of 10.5 to 11.5 feet bgs. MTBE was not detected in any of the soil samples above the method reporting limit. The reporting limit was elevated in soil samples B3-11.5 and B5-10.5 due to a dilution factor necessitated by the elevated TPH as gasoline and BTEX concentrations in the samples. Lead was detected in all of the soil samples, except B1-5, at concentrations ranging from 3.1 mg/kg to 8.7 mg/kg. These lead concentrations are indicative of background levels, and would not pose a risk to residential occupants of the property.



4.3 Discussion of Grab Groundwater Sample Analytical Results

TPH as gasoline at concentrations up to 110,000 micrograms per liter ($\mu\text{g/L}$), benzene up to 5,800 $\mu\text{g/L}$, toluene up to 16,000 $\mu\text{g/L}$, ethylbenzene up to 3,100 $\mu\text{g/L}$, and total xylenes up to 18,000 $\mu\text{g/L}$ were detected in groundwater samples GW-2 through GW-5. The detected BTEX concentrations in groundwater samples GW-2, GW-3, and GW-5 greatly exceeded the respective California Maximum Contaminant Levels (MCLs) for drinking water. The laboratory noted the presence of a "lighter than water immiscible sheen" in groundwater samples GW-3 and GW-5. MTBE was not detected in any of the groundwater samples above the method reporting limit, but again the reporting limit was elevated in groundwater samples GW-2, GW-3, and GW-5 due to the necessary dilution factor. Lead was not detected in any of the groundwater samples analyzed above the reporting limit of 0.005 milligrams per liter (mg/L).

* ^{volatile organic compounds} The following VOCs were detected in groundwater sample GW-5 by EPA Method 8260: Benzene (5,400 $\mu\text{g/L}$), 1,2-dichloroethane (1,2-DCA, 500 $\mu\text{g/L}$), ethylbenzene (3,800 $\mu\text{g/L}$), n-propylbenzene (550 $\mu\text{g/L}$), toluene (18,000 $\mu\text{g/L}$), 1,2,4-trimethylbenzene (4,900 $\mu\text{g/L}$), 1,3,5-trimethylbenzene (1,100 $\mu\text{g/L}$), and total xylenes (23,000 $\mu\text{g/L}$). All of these compounds are known constituents of gasoline. The concentrations of BTEX compounds were similar to those detected by EPA Method 8020. The detected concentration of 1,2-DCA greatly exceeded the California MCL for drinking water of 0.5 $\mu\text{g/L}$.

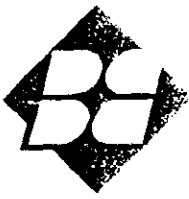
5.0 Conclusions and Recommendations

Based upon the presence of significant concentrations of TPH as gasoline and BTEX in soil and groundwater at the site, a reportable release of gasoline-range petroleum hydrocarbons has occurred. The soil bores do not appear to have intersected the former UST excavation or other potential source areas at the site. Petroleum contamination appears to be widespread in groundwater over the northern half of the site, but fairly well constrained on-site to the south and southwest (cross- to downgradient with respect to the anticipated groundwater flow direction). The concentrations of TPH as gasoline and BTEX in soil are likely attributable to adsorption of residual floating product or dissolved hydrocarbons to soil in contact with a seasonally fluctuating water table. The lack of detectable concentrations of MTBE would suggest that the gasoline release occurred prior to the 1980's, when MTBE first came into use as a fuel oxygenate.

Blymyer Engineers recommends that a copy of this report be submitted to the property owner and the following regulatory agency having jurisdiction over this release:

Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

* Turns into a gas
nearly EASY. Passes down




6.0 Limitations

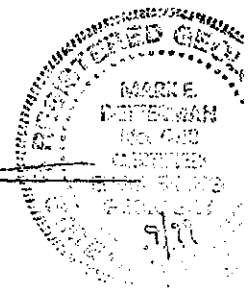
Services performed by Blymyer Engineers, Inc. have been provided in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar localities, at the time the work was performed. The scope of work for the project was conducted within the limitations prescribed by the client. This report is not meant to represent a legal opinion. No other warranty, expressed or implied, is made. This report was prepared for the sole use of the client.

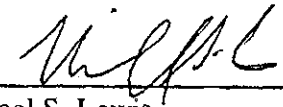
Blymyer Engineers appreciates this opportunity to provide you with environmental consulting services. Please call Mark Detterman at (510) 521-3773 with any questions or comments regarding this letter report.

Sincerely,

Blymyer Engineers, Inc.

By: 
Mark E. Detterman, C.E.G. 1788
Senior Geologist



And: 
Michael S. Lewis
Vice President, Technical Services

Enclosures: Table I: Summary of Soil Sample Analytical Results
Table II: Summary of Groundwater Sample Analytical Results

Figure 1: Site Location Map
Figure 2: Site Plan

Appendix A: Alameda County Public Works Agency Drilling Permit
Appendix B: Soil Bore Logs
Appendix C: Standard Operating Procedure No. 4, *Soil and Grab Groundwater Sampling Using Hydraulically-Driven Sampling Equipment, Revision No. 1*, dated September 1, 1994
Appendix D: Laboratory Report, McCampbell Analytical, Inc.

Table I. Summary of Soil Sample Analytical Results
BEI Job No. 99066, East Bay Asian Local Development Corp.
1409 to 1417 12th Street, Oakland, California

Sample I.D.	Sample Date	Modified EPA Method 8015	Modified EPA Method 8020					EPA Method 6010
		TPH as Gasoline (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	MTBE (mg/kg)	Lead (mg/kg)
B1-5	8/12/99	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05	<3.0
B1-10.5	8/12/99	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05	3.3
B2-5.5	8/12/99	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05	5.8
B2-11	8/12/99	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05	3.1
B3-5	8/12/99	<1.0	0.007	<0.5	0.007	0.027	<0.05	4.7
B3-11.5	8/12/99	1,100	2.0	19	17	88	<2	6.9
B4-5	8/12/99	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05	8.7
B4-10	8/12/99	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05	3.2
B5-7.5	8/12/99	9.4	0.029	0.023	0.10	0.54	<0.05	5.3
B5-10.5	8/12/99	1,500	5.9	37	22	120	<2	7.1

Notes:

- EPA = Environmental Protection Agency
- TPH = Total Petroleum Hydrocarbons
- mg/kg = milligrams per kilogram (parts per million)
- <x = Not detected above the listed detection limit
- B1-10.5 = Soil sample from well MW-1 at a depth of 10.5 feet

Bold results indicate concentrations over the listed method detection limit.

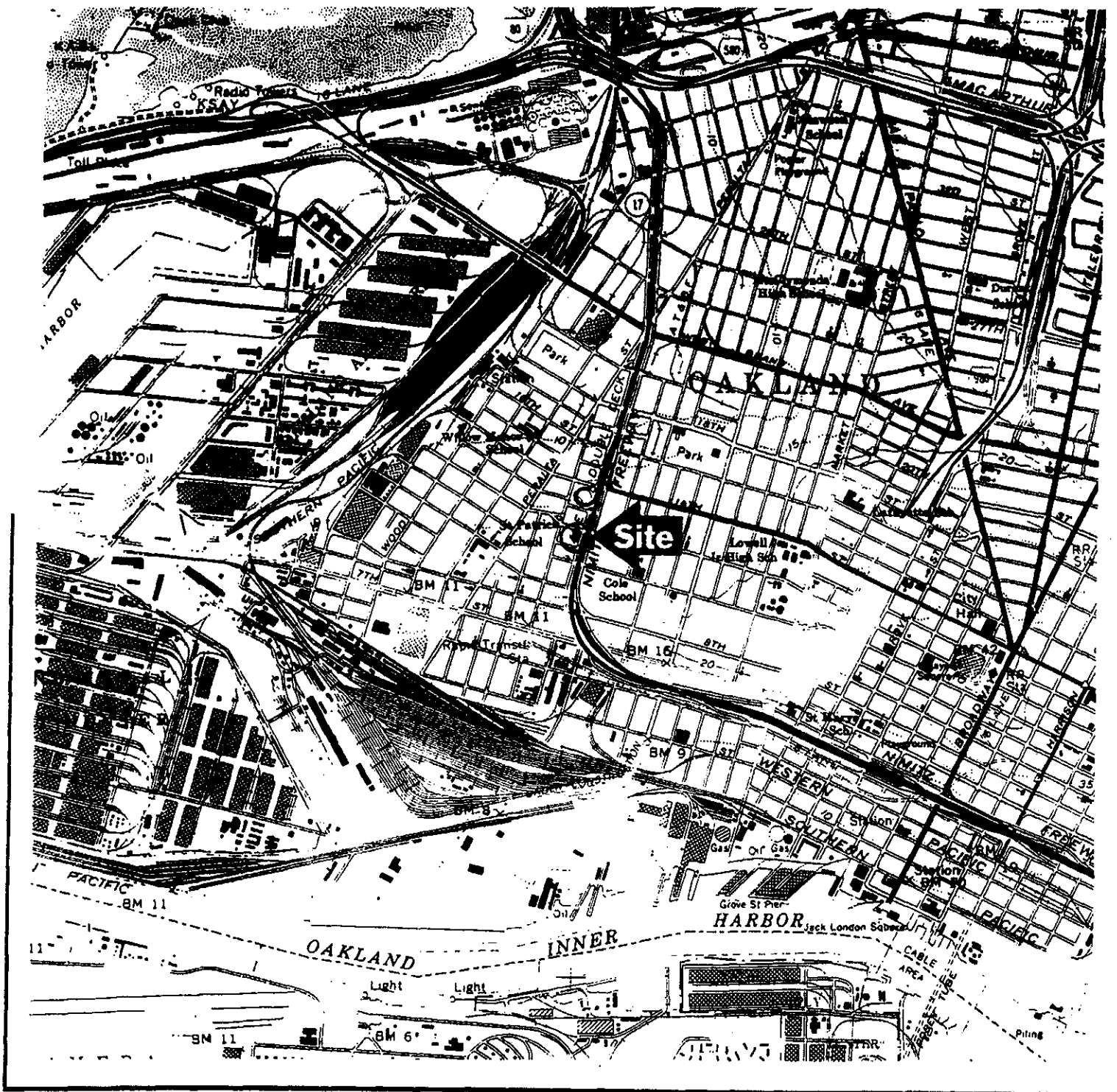
**Table II, Summary of Groundwater Sample Analytical Results
BEI Job No. 99066, East Bay Asian Local Development Corp.
1407 to 1417 12th Street, Oakland, California**

Sample I.D.	Sample Date	Modified EPA Method 8015	EPA Method 8020					EPA Method 239.2
		TPH as Gasoline ($\mu\text{g/L}$)	Benzene ($\mu\text{g/L}$)	Toluene ($\mu\text{g/L}$)	Ethylbenzene ($\mu\text{g/L}$)	Total Xylenes ($\mu\text{g/L}$)	MTBE ($\mu\text{g/L}$)	Lead (mg/L)
GW-1	8/12/99	<50	<0.5	<0.5	<0.5	<0.5	<5	NA
GW-2	8/12/99	31,000	320	690	2,400	4,000	<480	NA
GW-3	8/12/99	95,000	3,700	10,000	2,800	14,000	<200	<0.005
GW-4	8/12/99	<50	1.5	4.4	0.67	3.4	<5	<0.005
GW-5	8/12/99	110,000	5,800	16,000	3,100	18,000	<1,300	<0.005
MCL/AL^a	N/A	N/A	1	150	700	1,750	^b	removed

Notes:



- EPA = Environmental Protection Agency
- TPH = Total Petroleum Hydrocarbons
- $\mu\text{g/L}$ = micrograms per liter (parts per billion)
- NA = Not analyzed
- MCL/AL = Maximum Contaminant Level or Action Level (California Drinking Water)
- N/A = Not applicable
- <x = Not detected above the listed detection limit
- ^a = Information obtained from *Compilation of Federal and State Drinking Water Standards and Criteria*, June 1997, Quality Assurance Technical Document No. 3, State of California Department of Water Resources.
- ^b = Information obtained from Cal EPA Memo, dated March 9, 1999; Secondary MCL = 5 $\mu\text{g/L}$; Public Health Goal = 13 $\mu\text{g/L}$; Drinking Water Advisory Level = 20 to 40 $\mu\text{g/L}$

Bold results indicate concentrations over the listed method detection limit.
Shaded results indicate concentrations over the respective MCL.



UNITED STATES GEOLOGICAL SURVEY 7.5' QUAD. 'OAKLAND EAST, CA' PHOTOREVISED 1980. ED 1959.



 <p>BLMYER ENGINEERS, INC.</p>	<p>0 1000 2000</p> <p>SCALE IN FEET</p> 	<p>SITE LOCATION MAP EAST BAY ASIAN LOCAL DEVELOPMENT CORP. 1409 - 1417 12th ST. OAKLAND, CA</p>	<p>FIGURE 1</p>
<p>BEI JOB NO. 99066</p>	<p>DATE 8-17-99</p>		

RESIDENTIAL

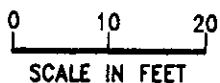
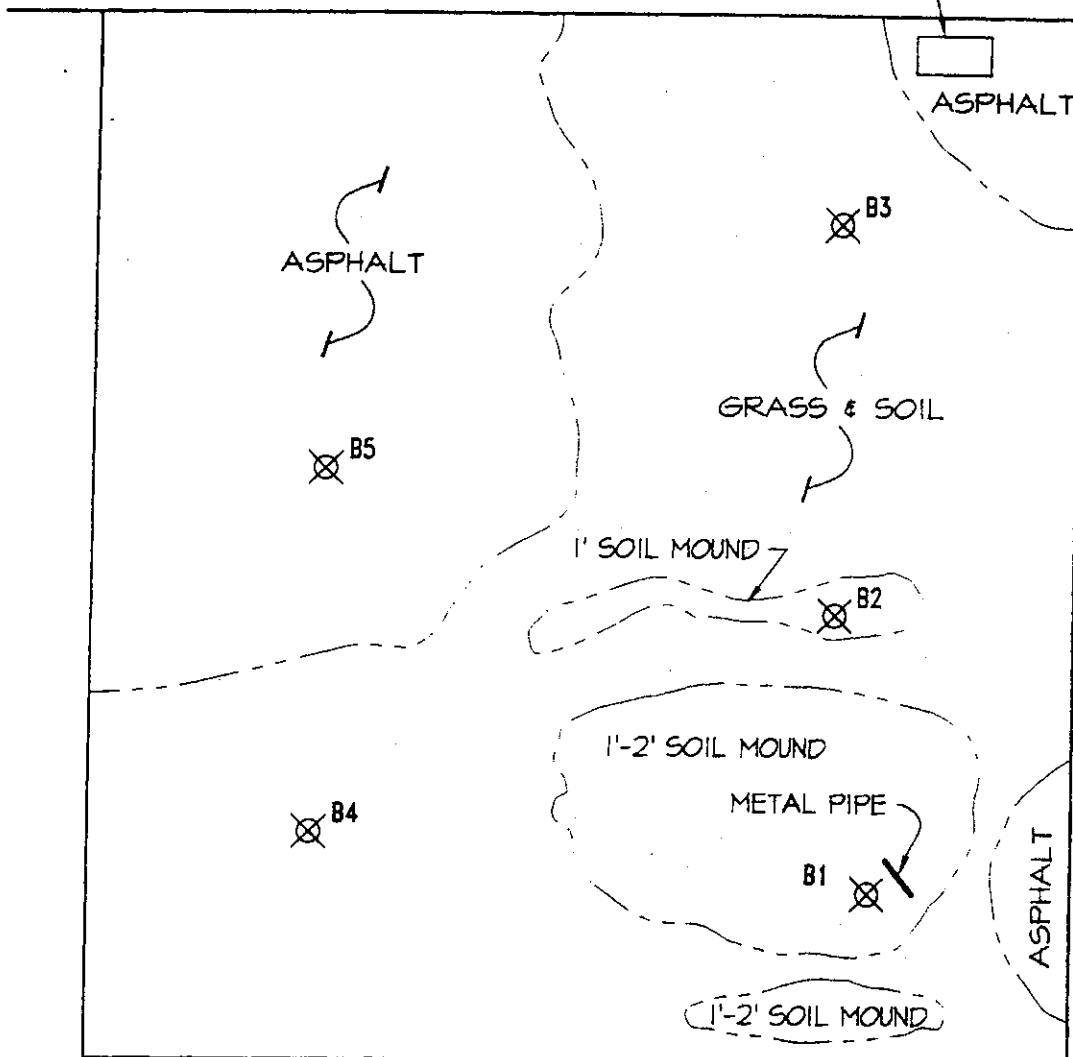


12TH STREET

CONCRETE SIGN BASE

RESIDENTIAL

MANDELLA PARKWAY



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BLYMYER
ENGINEERS, INC.

BEI JOB NO.
99066

DATE
8-18-99

LEGEND



B1

GEOPROBE BORE
LOCATION

SITE PLAN

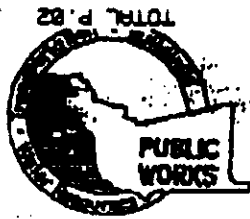
EAST BAY ASIAN LOCAL
DEVELOPMENT CORP.
1409 to 1417 12TH ST., OAKLAND, CA

FIGURE

2

Appendix A

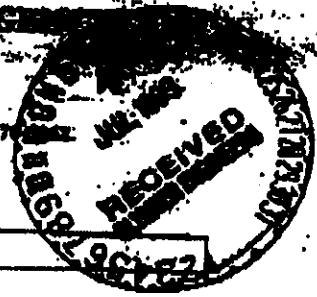
Alameda County Public Works Agency Drilling Permit



ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION

321 TURNER COURT, SUITE 304, HAYWARD, CA 94545-2481
PHONE (510) 678-6575 ANDREAS GODFREY FAX (510) 678-6575
(510) 678-6748 ALVIN KAN



DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT EAST BAY ASIAN DEVELOPMENT CORP.
1409 Thru 1417 12th Street
Oakland CA 94607

PERMIT NUMBER 99WR483
WELL NUMBER _____
APN _____

California Coordinates Source _____ ft. Accuracy ± _____ ft.
CCN _____ ft. CCE _____ ft.
APN _____

PERMIT CONDITIONS

Circled Permit Requirements Apply

CLIENT (KATHY HIRSCH)
Name EAST BAY ASIAN LOCAL DEVELOPMENT CORP
Address 310 8th St, Ste 209 Phone 510-287-5353 ext 822
City Oakland, CA Zip 94607

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 work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

APPLICANT
Name Blymeyer Engineers Attn: Mark Dettnerman
or (Leanne Hudson) Fax 510-265-2594
Address 1829 Clement Ave. Phone 510-521-9773
City Alameda, CA Zip 94501

B. WATER SUPPLY WELLS

1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
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.

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"/>

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.

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"/>

D. GEOTECHNICAL

Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings

DRILLING METHOD:

Mud Rotary	<input type="checkbox"/>	Air Rotary	<input type="checkbox"/>	Auger	<input type="checkbox"/>
Cable	<input type="checkbox"/>	Other	<input checked="" type="checkbox"/>	<u>Geoprobe or direct - push soil bores</u>	

E. CATHODIC

Fill hole above anode zone with concrete placed by tremie.

DRILLER'S LICENSE NO. CS7# 485165

F. WELL DESTRUCTION

See attached.

C. SPECIAL CONDITIONS

Signature

APPROVED

DATE 8-4-99

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 13-65

APPLICANT'S SIGNATURE Mark Dettnerman DATE 8/3/99
















Appendix B

Soil Bore Logs






KEY TO BOREWELL CONSTRUCTION LOGS




UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		TYPICAL NAMES			
COARSE GRAINED SOILS <small>MORE THAN HALF IS LARGER THAN NO. 200 SIEVE</small>	GRAVEL <small>MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE</small>	CLEAN GRAVEL WITH LESS THAN 5% FINES	GW  GP  GM  GC 	WELL GRADED GRAVEL, GRAVEL-SAND MIXTURES POORLY GRADED GRAVEL, GRAVEL-SAND MIXTURES SILTY GRAVEL, GRAVEL-SAND-SILT MIXTURES CLAYEY GRAVEL, GRAVEL-SAND-CLAY MIXTURES	
		GRAVEL WITH OVER 12% FINES	SW  SP  SM  SC 	WELL GRADED SAND, GRAVELLY SAND POORLY GRADED SAND, GRAVELLY SAND SILTY SAND, SAND-SILT MIXTURES CLAYEY SAND, SAND-CLAY MIXTURES	
		SAND <small>MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE</small>	SILT AND CLAY <small>LIQUID LIMIT LESS THAN 50</small>	ML  CL  OL 	INORGANIC SILT, ROCK FLOUR, SANDY OR CLAYEY SILT OF LOW PLASTICITY INORGANIC CLAY OF LOW TO MEDIUM PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAY (LEAN) ORGANIC SILT AND ORGANIC SILTY CLAY OF LOW PLASTICITY
				SILT AND CLAY <small>LIQUID LIMIT GREATER THAN 50</small>	MH  CH  OH 
	PT 				PEAT AND OTHER HIGHLY ORGANIC SOILS

FILL MATERIALS

C		CONCRETE
F		FILL
A		ASPHALT

WELL CONSTRUCTION MATERIALS

CEMENT GROUT	
BENTONITE	
FILTER SAND	

SEE ABOVE FOR CONCRETE SYMBOL

SOIL CONSISTENCY FROM DRIVE SAMPLER

NON-COHESIVE SOILS*		COHESIVE SOILS*		UNCONFINED COMPRESSIVE STRENGTH TONS/FT.²
SANDS & GRAVELS	BLOWS PER FOOT	SILTS AND CLAYS	BLOWS PER FOOT	
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 1/4
LOOSE	4 - 10	SOFT	2 - 4	1/4 - 1/2
MED. DENSE	10 - 30	MEDIUM STIFF	4 - 8	1/2 - 1
DENSE	30 - 50	STIFF	8 - 16	1 - 2
VERY DENSE	OVER 50	VERY STIFF	16 - 32	2 - 4
		HARD	OVER 32	OVER 4

* STANDARD PENETRATION RESISTANCE IS THE NUMBER OF BLOWS REQUIRED TO DRIVE A 2-INCH O.D. (1-3/8-INCH I.D.) SPLIT BARREL SAMPLER 12 INCHES USING A 140-POUND HAMMER FALLING FREELY THROUGH 30 INCHES. THE SAMPLER IS DRIVEN 18 INCHES AND THE NUMBER OF BLOWS ARE RECORDED FOR EACH 6-INCH INTERVAL. THE SUMMATION OF THE FINAL TWO INTERVALS IS THE STANDARD PENETRATION RESISTANCE.

SAMPLE INTERVAL SYMBOLS

 CORED/RECOVERED	 CORED/RECOVERED/SAMPLED/ANALYZED
 CORED/NO RECOVERY	N/A NON APPLICABLE/NOT AVAILABLE
 CORED/RECOVERED/SAMPLED	

BLYMYER

ENGINEERS, INC.

SOIL BORE LOG: B3

Job No.: 89088
 Client: East Bay Asian Local Development Corp.
 Site: 12th and Mandella Parkway
 Oakland, California
 Date Drilled: 8/12/99
 Logged By: M. Detterman

Drilling Company: Gregg Drilling
 Driller: David Pruett/David Pearson
 Drilling Equipment: Geoprobe
 Sample Method: Continuous Sleeve
 Bore Diameter: 1.75 in.
 Total Depth: 18 ft.

Initial Water Depth: ∇ 11.0 ft.
 Stabilized Water Depth: ∇ 10.7 ft.

Depth (ft.)	Blows/6 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION			Unified Soil Classification	Graphic Log	Water Depth
0				Light brown Silty SAND ; fine to medium grained; with 10% 1/2-inch angular rock; dry			SM		
				Medium-brown Silty SAND ; fine to medium grained; damp; gradational contact with overlaying unit			SM		
		17		Orange-brown Silty SAND ; as above; damp			SM		
5				Medium-brown Silty SAND ; as above			SM		
				Orange-brown Silty SAND ; as above			SM		
10		3079		Very moist; noticeable turpentine odor					∇ 10.7 11.0
				Light green Silty SAND ; otherwise as above; very moist gradationally dryer 12.5 to 13 feet					
		2686		Poor recovery 12 to 18 feet; mixed orange-brown with vertical green stained veining, odor, solid dark green by approximately 14.5 feet			SM		
15				Bore terminated at 18 feet					
20									
25									
30									



BLMYER

ENGINEERS, INC.

SOIL BORE LOG: B3

Job No.: 99088

Client: East Bay Asian Local Development Corp.

Site: 12th and Mandella Parkway
Oakland, California

Date Drilled: 8/12/99

Logged By: M. Detterman

Drilling Company: Gregg Drilling

Driller: David Pruett/David Pearson

Drilling Equipment: Geoprobe

Sample Method: Continuous Sleeve

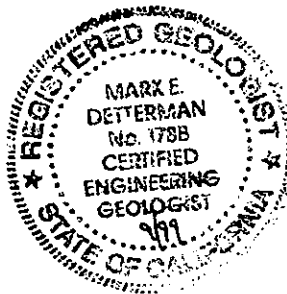
Bore Diameter: 1.75 in.

Total Depth: 18 ft.

Initial Water Depth: 11.0 ft.

Stabilized Water Depth: 10.7 ft.

Depth (ft.)	Blows/8 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION			Unified Soil Classification	Graphic Log	Water Depth
0				Light brown Silty SAND ; fine to medium grained; with 10% 1/2-inch angular rock; dry	SM				
				Medium-brown Silty SAND ; fine to medium grained; damp; gradational contact with overlying unit	SM				
		17		Orange-brown Silty SAND ; as above; damp	SM				
5				Medium-brown Silty SAND ; as above	SM				
				Orange-brown Silty SAND ; as above	SM				
10		3079		Very moist; noticeable turpentine odor				10.7	
				Light green Silty SAND ; otherwise as above; very moist gradationally dryer 12.5 to 13 feet					
		2686		Poor recovery 12 to 18 feet; mixed orange-brown with vertical green stained veining, odor, solid dark green by approximately 14.5 feet	SM				
15				Bore terminated at 18 feet					
20									
25									
30									

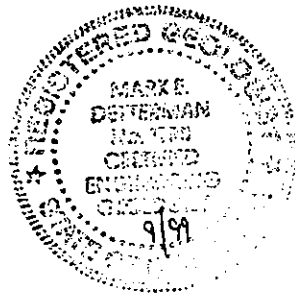


Job No.: 99088
 Client: East Bay Asian Local Development Corp.
 Site: 12th and Mandella Parkway
 Oakland, California
 Date Drilled: 8/12/99
 Logged By: M. Detterman

Drilling Company: Gregg Drilling
 Driller: David Pruett/David Pearson
 Drilling Equipment: Geoprobe
 Sample Method: Continuous Sleeve
 Bore Diameter: 1.75 in.
 Total Depth: 18 ft.

Initial Water Depth: ∇ 11.5 ft.
 Stabilized Water Depth: ∇

Depth (ft.)	Blows/8 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION		
				Unified Soil Classification	Graphic Log	Water Depth
0						
				Light brown Silty SAND ; fine to medium grained with 10% 1/2-inch angular rock; dry	SM	
				Grades Dark brown to black Silty SAND ; fine to medium grained; damp	SM	
5		31		Medium-brown Silty SAND ; as above; damp	SM	
				Light brown Silty SAND ; as above	SM	
				Gradational to Light orange-brown Silty SAND ; as above	SM	∇ 11.5'
10		27		Very moist zone at 11.5 feet		
				Mottled Orange-brown with light Grey Silty SAND ; as above; wet		
15		29				
				Bore terminated at 18 feet		
20						
25						
30						



BLMYER ENGINEERS, INC.

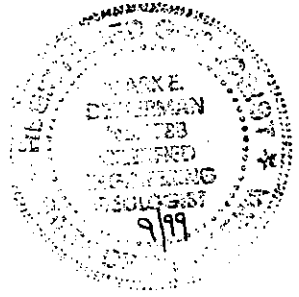
SOIL BORE LOG: B5

Job No.: 98088
 Client: East Bay Asian Local Development Corp.
 Site: 12th and Mandella Parkway
 Oakland, California
 Date Drilled: 8/12/88
 Logged By: M. Detterman

Drilling Company: Gregg Drilling
 Driller: David Pruett/David Pearson
 Drilling Equipment: Geoprobe
 Sample Method: Continuous Sleeve
 Bore Diameter: 1.75 in.
 Total Depth: 18 ft.

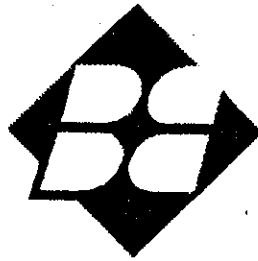
Initial Water Depth: ∇ 10.5 ft.
 Stabilized Water Depth: ∇

Depth (ft.)	Blows/8 in.	P.I.D. (ppm)	Sample Intervals	LITHOLOGIC DESCRIPTION		
				Unified Soil Classification	Graphic Log	Water Depth
0				Light brown Silty SAND ; fine to medium grained with minor 1/2-inch asphalt bits; dry		
	0			SM		
	30			Dark-brown Silty SAND ; fine to medium grained; damp		
				SM		
				Grades Medium-brown Silty SAND ; fine to medium grained; damp		
				SM		
5				Grades light Orange-brown Silty SAND ; as above		
				SM		
	70			Light green Silty SAND ; as above; moist to wet		
				SM		
				Dark green Silty SAND ; as above; noticeable odor		
				SM		
	1975			Orange-brown Silty SAND ; as above		
				SM		
10				Dark green Silty SAND ; as above; zones of very moist sand		
	840			SM		∇ 10.5'
				Mottled Orange-brown and dark green Silty SAND ; as above; very moist		
				SM		
15				Dark green Silty SAND ; as above; very odorous		
	150			SM		
				Bore terminated at 18 feet		
20						
25						
30						



Appendix C

Standard Operating Procedure No. 4



BLYMYER
ENGINEERS, INC.

Standard Operating Procedure No. 4

***Soil and Grab Groundwater Sampling Using
Hydraulically-Driven Sampling Equipment***

Revision No. 1

Approved By:

Michael Lewis
Quality Assurance/Quality Control Officer
Blymyer Engineers, Inc.

9/1/94

Date

Table of Contents

1.0	Introduction and Summary	1
2.0	Equipment and Materials	1
3.0	Typical Procedures	3
4.0	Quality Assurance and Quality Control	6
5.0	Documentation	7
6.0	Decontamination	9
7.0	Investigation-Derived Waste	10
8.0	Borehole Abandonment	10
9.0	References	10

Attachments:

Boring and Well Construction Log
Drum Inventory Sheet

Appendix D

Laboratory Report, McCampbell Analytical, Inc.

PLYMYER

ENGINEERS, INC.

1829 Clement Avenue
Alameda, CA 94501 (415) 521-3773



16326 ZBE11

CHAIN OF CUSTODY RECORD

PAGE 1 OF 2

JOB #		PROJECT NAME/LOCATION												FORWARD TIME <u>5/round</u> DAYS	
99066		ESALI												REMARKS:	
SAMPLER(S) SIGNATURE														<p>Highest of B2 ^{MD} transformation to be confirmed w/ EPA 8260 / soil sample only.</p>	
Mark Jetterson															
DATE	TIME	COMP	GRAB	SAMPLE NAME/LOCATION	# OF CONTAINERS	TPH AS GASOLINE + BTX (MDD EPA 8015/8020)	TPH AS DIESEL (MDD EPA 8015)	VOC (EPA 124/8/240)	SMB-VOC (EPA 635/8020)	TPH (EPA 418.1)	BTX (EPA 8020/402)	Pb (606/742)			
8/12/99	900		Y	B1-5	1 clean	X						X	17229		
	915			B1-10.5		X						X	17230		
	930			B1-15									17231*		
	1030			B2-5.5		X						X	17232	17240	
	1100			B2-11		X						X	17233	17241	
	1120			B3-5		X						X	17234		
	1145			B3-11.5		X						X	17235		
	1230			B3-15.5		X						X	17236		
	200			B4-5		X						X	17237		
	220			B4-10		X						X	17238		
	300			B5-5.5		X						X	17239*		
	310			B5-7.5		X						X			
	320			B5-10.5		X						X			
REQUESTED BY: Mark Jetterson				RESULTS AND IMPONCE TO: Mark Jetterson / E Plymyer Eng.											
RELINQUISHED BY: (SIGNATURE)		DATE / TIME		RECEIVED BY: (SIGNATURE)		RELINQUISHED BY: (SIGNATURE)		DATE / TIME		RECEIVED BY: (SIGNATURE)					
Mark Jetterson		8/13/99 11:55 PM		E Swank 2623		E Swank 2623									
RELINQUISHED BY: (SIGNATURE)		DATE / TIME		RECEIVED FOR LABORATORY BY: (SIGNATURE)		DATE / TIME		REMARKS:		PRESERVATION APPROPRIATE CONTAINERS		WAST ODS METALS OTHER			
E Swank 2623		8/13/99 2:00 PM		W. SWAN (CMA)		8/13/99 2:00		ICE / GOOD CONDITION / HEAD SPACE ABSENT		PRESERVATION APPROPRIATE CONTAINERS					

WHITE: Accompany Sample

YELLOW: BEI, After Lab Signs

PINK: Original Sampler

REMARKS: ICE / GOOD CONDITION / HEAD SPACE ABSENT PRESERVATION APPROPRIATE CONTAINERS WAST ODS METALS OTHER

sent BY: McCampbell Analytical

925 788 4612

AUG-19-99 11:58AM

Page 2

BLMYER

ENGINEERS, INC.

1829 Clement Avenue

Alameda, CA 94501 (510) 521-3773

FAX (510) 865-2594



16326 ZB#11

CHAIN OF CUSTODY RECORD

PAGE 2 OF 2

JOB #		PROJECT NAME/LOCATION				# OF CONTAINERS	TPH AS GASOLINE + BTLE + (AAD EPA 8015/8022) MTBE	TPH AS DIESEL (AAD EPA 8015)	VOC (EPA 624/6240)	SEM-VOC (EPA 624/6270)	THPH (EPA 416.1)	BTX (EPA 8020/802)	PH (Dissolved Chlorine & mth)	HOLD	TURNAROUND TIME: 5/Normal DAYS	
SAMPLERS (SIGNATURE)															REMARKS:	
DATE	TIME	COMP	GRAB	SAMPLE NAME/LOCATION												
99006	EBALD															
Mark Jetteman																
8/12/99	110			GW-1		3 VOA	X								⊕ Highest MTBE result to be confirmed w/ EPA 8260 (150 g.w. sample) (otherwise highest Benzene)	
	120			GW-2			X								Preserved VOA's	
	140			GW-3			X					X			" "	
	250			GW-4			X					X			2 Preserved, 1 Unpreserved	
	400			GW-5			X					X			3 Unpreserved VOA's 3 Unpreserved "	
															17242	
															17243	
															17244	
															17245	
															17246	
REQUESTED BY: M. Jetteman						RESULTS AND INVOICE TO: Mark/Blymyer Eng.										
RELINQUISHED BY (SIGNATURE): Mark Jetteman		DATE/TIME: 8/13/99 11:15 AM	RECEIVED BY (SIGNATURE): E. Suber 2673			RELINQUISHED BY (SIGNATURE):		DATE/TIME:	RECEIVED BY (SIGNATURE):							
RELINQUISHED BY (SIGNATURE): E. Suber 2673		DATE/TIME: 8-13-99 2:00 PM	RECEIVED FOR LABORATORY BY (SIGNATURE): [Signature]			DATE/TIME: 8/13/99 2:00	REMARKS: GOOD CONDITION, HEAD SPACE ABSENT	PRESERVATION APPROPRIATE CONTAINERS		VOAS / OAS / METALS / OTHER						

5x
5x
5x
5x

Sent By: McCampbell Analytical;

925 798 4012;

AUG-19-99 11:57AM;


Page 3/7

WHITE: Accompany Sample

YELLOW: BEI, After Lab Sign

PINK: Original Sampler

W

 McCAMPBELL ANALYTICAL INC.	110 2nd Avenue South, #D7, Pacheco, CA 94553-5560 Telephone: 925-798-1620 Fax: 925-798-1622 http://www.mccampbell.com E-mail: main@mccampbell.com
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Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #99066	Date Sampled: 08/12/99
		Date Received: 08/13/99
	Client Contact: Mark Detterman	Date Extracted: 08/13-08/17/99
	Client P.O:	Date Analyzed: 08/14-08/18/99

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*
 EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g) ⁺	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	% Recovery Surrogate
17229	B-15	S	ND	ND	ND	ND	ND	ND	105
17230	B1-10.5	S	ND	ND	ND	ND	ND	ND	96
17232	B-2-5.5	S	ND	ND	ND	ND	ND	ND	95
17233	B-2-11	S	ND	ND	ND	ND	ND	ND	108
17234	B-3-5	S	ND	ND	0.007	ND	0.007	0.027	105
17235	B-3-11.5	S	1100,a	ND<2	2.0	19	17	88	104
17237	B-4-5	S	ND	ND	ND	ND	ND	ND	95
17238	B-4-10	S	ND	ND	ND	ND	ND	ND	97
17240	B5-7.5	S	9.4,a	ND	0.029	0.023	0.10	0.54	102
17241	B5-10.5	S	1500,a	ND<2	5.9	37	22	120	108
17242	GW-1	W	ND,i	ND	ND	ND	ND	ND	106
17243	GW-2	W	31,000,a,i	ND<480	320	690	2400	4000	105
17244	GW-3	W	95,000,a,h,i	ND<200	3700	10,000	2800	14,000	101
17245	GW-4	W	ND,i	ND	1.5	4.4	0.67	3.4	107
17246	GW-5	W	110,000,a,h,i	ND<1300	5800	16,000	3100	18,000	105
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W	50 ug/L	5.0	0.5	0.5	0.5	0.5	0.5	
	S	1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	0.005	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPL² extracts in ug/L

* cluttered chromatogram; sample peak coelutes with surrogate peak

The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant (aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.

DHS Certification No. 1644

APL Edward Hamilton, Lab Director

 McCAMPBELL ANALYTICAL INC.	110 2nd Avenue South, #D7, Pacheco, CA 94553-3560 Telephone : 925-798-1620 Fax : 925-798-1622 http://www.mccampbell.com E-mail: main@mccampbell.com
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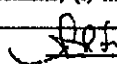
Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #99066	Date Sampled: 08/12/99
	Client Contact: Mark Detterman	Date Received: 08/13/99
	Client P.O:	Date Extracted: 08/19/99
		Date Analyzed: 08/19/99

Volatile Organics By GC/MS

EPA method 8260			
Lab ID	17246		
Client ID	GW-3		
Matrix	W		
Compound	Concentration ^a	Compound	Concentration ^a
Acetone ^(b)	ND<500	trans-1,3-Dichloropropene	ND<500
Benzene	5400	Ethylene dibromide	ND<500
Bromobenzene	ND<500	Ethylbenzene	3800
Bromochloromethane	ND<500	Hexachlorobutadiene	ND<500
Bromodichloromethane	ND<500	Iodomethane	ND<500
Bromoform	ND<500	Isopropylbenzene	ND<500
Bromomethane	ND<500	p-Isopropyl toluene	ND<500
n-Butyl benzene	ND<500	Methyl butyl ketone ^(d)	ND<500
sec-Butyl benzene	ND<500	Methylene Chloride ^(e)	ND<500
tert-Butyl benzene	ND<500	Methyl ethyl ketone ^(f)	ND<500
Carbon Disulfide	ND<500	Methyl isobutyl ketone ^(g)	ND<500
Carbon Tetrachloride	ND<500	Methyl tert-Butyl Ether (MTBE)	---
Chlorobenzene	ND<500	Naphthalene	ND<500
Chloroethane	ND<500	n-Propyl benzene	550
2-Chloroethyl Vinyl Ether ^(h)	ND<500	Styrene ⁽ⁱ⁾	ND<500
Chloroform	ND<500	1,1,1,2-Tetrachloroethane	ND<500
Chloromethane	ND<500	1,1,2,2-Tetrachloroethane	ND<500
2-Chlorotoluene	ND<500	Tetrachloroethene	ND<500
4-Chlorotoluene	ND<500	Toluene ^(j)	18,000
Dibromochloromethane	ND<500	1,2,3-Trichlorobenzene	ND<500
1,2-Dibromo-3-chloropropane	ND<500	1,2,4-Trichlorobenzene	ND<500
Dibromomethane	ND<500	1,1,1-Trichloroethane	ND<500
1,2-Dichlorobenzene	ND<500	1,1,2-Trichloroethane	ND<500
1,3-Dichlorobenzene	ND<500	Trichloroethene	ND<500
1,4-Dichlorobenzene	ND<500	Trichlorofluoromethane	ND<500
Dichlorodifluoromethane	ND<500	1,2,3-Trichloropropane	ND<500
1,1-Dichloroethane	ND<500	1,2,4-Trimethylbenzene	4900
1,2-Dichloroethane	500	1,3,5-Trimethylbenzene	1100
1,1-Dichloroethene	ND<500	Vinyl Acetate ^(k)	ND<500
cis-1,2-Dichloroethene	ND<500	Vinyl Chloride ^(l)	ND<500
trans-1,2-Dichloroethene	ND<500	Xylenes, total ^(m)	23,000
1,2-Dichloropropane	ND<500	Comments: h, l	
1,3-Dichloropropane	ND<500	Surrogate Recoveries (%)	
2,2-Dichloropropane	ND<500	Dibromofluoromethane	101
1,1-Dichloropropene	ND<500	Toluene-d8	118
cis-1,3-Dichloropropene	ND<500	4-Bromofluorobenzene	97

water and vapor samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / SPLP extracts in ug/L.
 Reporting limits unless otherwise stated: water samples 1 ug/L; vapor samples 0.5 ug/L; solid and sludge samples 5 ug/kg; wipes 0.2ug/wipe
 ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis
 (b) 2-propanone or dimethyl ketone; (c) (2-chloromethoxy) ethene; (d) 2-hexanone; (e) dichloromethane; (f) 2-butanone; (g) 4-methyl-2-pentanone or isopropylacetone; (h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content; (k) ethylbenzene; (l) methylbenzene; (m) acetic acid ethenyl ester; (n) chloroethene; (o) dimethylbenzenes.

DHS Certification No. 1644

 Edward Hamilton, Lab Director

 McCAMPBELL ANALYTICAL INC.	110 2nd Avenue South, #D7, Pacheco, CA 94553-5560 Telephone: 925-798-1620 Fax: 925-798-1622 http://www.mccampbell.com E-mail: main@mccampbell.com

Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501	Client Project ID: #99066	Date Sampled: 08/12/99
		Date Received: 08/13/99
	Client Contact: Mark Detterman	Date Extracted: 08/13/99
	Client P.O:	Date Analyzed: 08/13-08/16/99

Lead*

EPA analytical methods: 6010/200.7, 239.2*

Lab ID	Client ID	Matrix	Extraction °	Lead*	% Recovery Surrogate
17229	B-15	S	TTLC	ND	105
17230	B1-10.5	S	TTLC	3.3	103
17232	B-2-5.5	S	TTLC	5.8	105
17233	B-2-11	S	TTLC	3.1	105
17234	B-3-5	S	TTLC	4.7	103
17235	B-3-11.5	S	TTLC	6.9	102
17237	B-4-5	S	TTLC	8.7	101
17238	B-410	S	TTLC	3.2	103
17240	B5-7.5	S	TTLC	5.3	104
17241	B5-10.5	S	TTLC	7.1	103
17244	GW-3	W	Dissolved	ND	NA
17245	GW-4	W	Dissolved	ND	NA
17246	GW-5	W	Dissolved	ND	NA
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	S	TTLC	3.0 mg/kg		
	W	Dissolved	0.005 mg/L		
	—	STLC,TCLP	0.2 mg/L		

* soil and sludge samples are reported in mg/kg, wipe samples in ug/wipe, and water samples and all STLC / SPLP / TCLP extracts in mg/L.

° Lead is analysed using EPA method 6010 (ICP) for soils, sludges, STLC & TCLP extracts and method 239.2 (AA Furnace) for water samples

* EPA extraction methods 1311 (TCLP), 3010/3020 (water, TTLC), 3040 (organic matrices, TTLC), 3050 (solids, TTLC); STLC - CA Title 22

° surrogate diluted out of range; N/A means surrogate not applicable to this analysis

△ reporting limit raised due matrix interference

1) liquid sample that contains greater than ~2 vol. % sediment; this sediment is extracted with the liquid, in accordance with EPA methodologies and can significantly effect reported metal concentrations.

DHS Certification No. 1644

 Edward Hamilton, Lab Director