

C A M B R I A



Transmittal

To:	Mr. Barney Chan
Organization:	ACHCSA
Address:	1131 Harbor Bay Parkway, Suite 250 Alameda, California 94502-6577
Phone:	(510) 567-6765
From:	Bob Schultz
Phone:	(510) 420-3341
Date:	October 24, 2000
Re:	SPH Sample Results

Dear Barney:

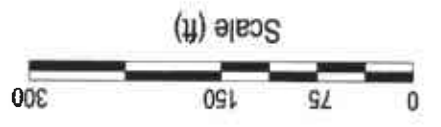
Please find enclosed Cambria's interpretation of the SPH sample analysis and accompanying analytical laboratory reports. If you have any questions, please call me at (510) 420-3341.

Sincerely,

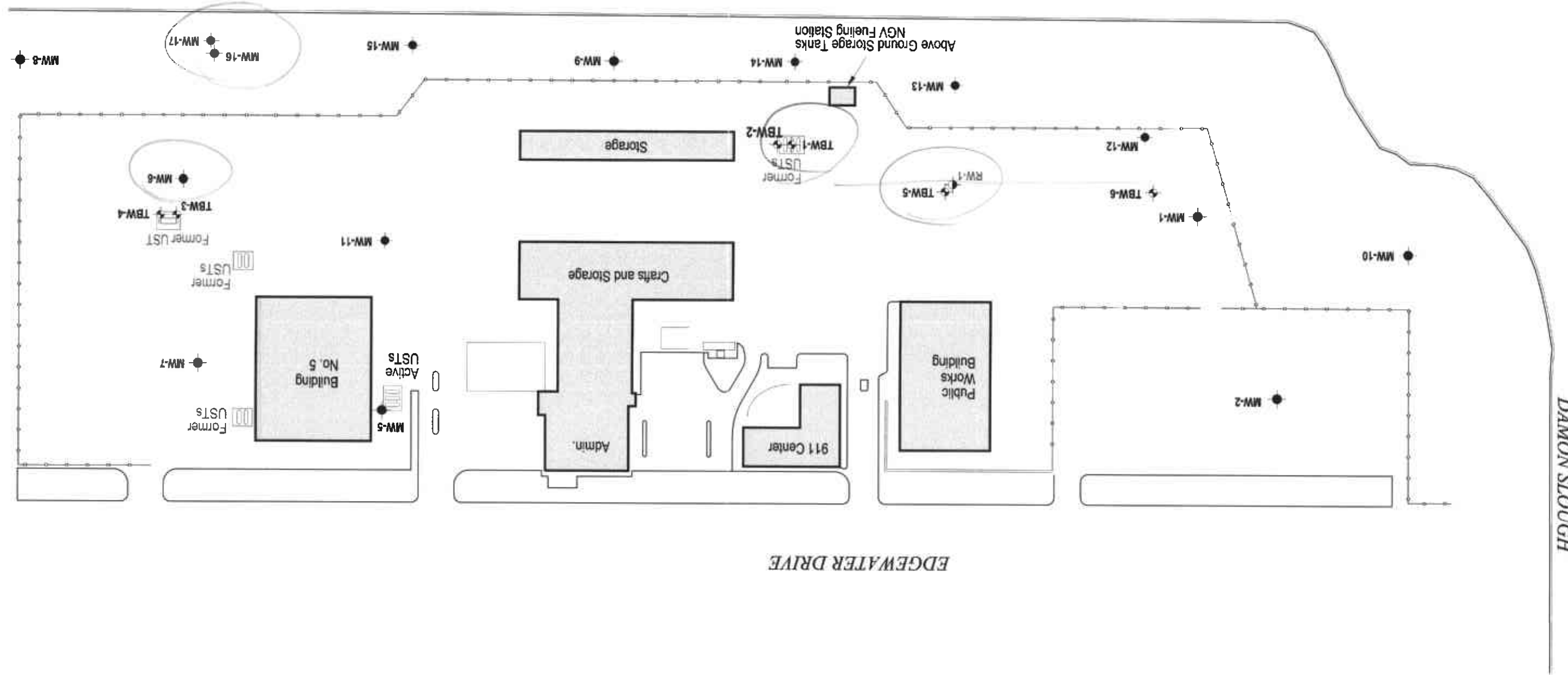
Robert W. Schultz, R.G.
Project Geologist

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Cambria Environmental Technology, Inc. 1144 65th Street Suite B Oakland CA 94608 Tel (510) 420-0700 Fax (510) 420-9170



FIGURE



EXPLANATION

●	Monitoring well location
⊕	Remediation well location
⊕	Tank Backfill Well
⊗	Abandoned Well
—	Fence



Municipal Service Center
7101 Edgewater Drive
Oakland, California

C A M B R I A

Site Map

DAMON SLOUGH

EDGEWATER DRIVE

SAN LEANDRO BAY

CAMBRIA

October 23, 2000

Mr. Joseph Cotton
City of Oakland, Public Works Agency
Environmental Services Division
250 Frank H. Ogawa Plaza, Ste. 5301
Oakland, California 94612-2034

Re: **SPH Sample Analytical Results**
City of Oakland, Municipal Services Center
7101 Edgewater Drive
Oakland, California
Cambria Project #153-1247



Dear Mr. Cotton:

To further investigate the origin of separate phase hydrocarbons (SPH) found in monitoring wells at the subject site, Cambria Environmental Technology, Inc., (Cambria) collected SPH samples from four locations (TBW-1, TBW-5 (FDP-54-L), MW-6, and MW-16, Figure 1) and analyzed the samples to better differentiate the nature of the SPH. Our subcontracted analytical laboratory, Zymax Forensics of North Hills, California, (Zymax) performed high resolution gas chromatography and gas chromatograph-mass spectrometer analyses on all four SPH samples, and performed simulated distillation on samples TBW-1, MW-6, and MW-16. Zymax presented their results in reports dated December 9, 1998; June 30, 2000; and July 19, 2000. You have been previously forwarded the December 1998 Zymax (then Global Geochemistry) report. Copies of the 2000 reports are enclosed. Specifics that you should be aware of in reviewing these reports include:

- Sample FDP-54-L was collected at the location of TBW-5 on October 19, 1998, immediately prior to installing well TBW-5, during the 1998 fuel dispensing pipeline removal and excavation activities. The well was installed to monitor and remove SPH that was observed to have entered the excavation at this location.
- Simulated distillation of MW-16, collected on April 18, 2000, was performed in May 2000. The results of this analysis are presented in both Zymax reports dated, June 30, and July 19, 2000.
- Samples MW-6 and TBW-1 were collected on May 11, 2000.
- Global Geochemistry changed its name to Zymax Forensics in 1999.

Oakland, CA
San Ramon, CA
Sonoma, CA
Portland, OR

**Cambria
Environmental
Technology, Inc.**

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SPH Samples

The four analyzed SPH samples are assumed representative of product plumes found in three different geographic portions of the subject site. (may rep. 4 different release points)

SPH Sample TBW-5: Cambria collected SPH sample FDP-54-L (TBW-5) from an open excavation at the location of a former fuel dispensing hydrant near the west-central portion of the site. Installation of well TBW-5 was reported in Cambria's July 23, 1999, *Fuel Pipeline Removal Sampling Report*. Well TBW-5 was installed immediately after sample FDP-54-L was collected, and is screened through cobbles and boulders that may be part of the 1970 fill line/dike.

SPH Sample TBW-1: Cambria collected product sample TBW-1 from a backfill well to characterize the product plume in the vicinity of another former UST complex near the west-center of the site (Figure 1).

SPH Samples MW-6 and MW-16: Cambria collected product samples MW-6 and MW-16 from monitoring wells installed near the southern portion of the site to characterize groundwater quality downgradient of several tank complexes and the former fuel dispensing pipeline and fuel hydrants which are cross-gradient (north) of MW-6.

Analytical Laboratory Conclusions

Zymax summarized the composition of each SPH sample in Table 14 of their June 30, 2000 report. Cambria has adapted that table and presents it below as Table 1.

In addition to the analytical laboratory conclusions presented in Table 1, in their most recent report, Zymax Forensics concluded that "sample MW-6 is significantly different from sample MW-16..." They state further that "the gasoline fraction in sample MW-16 is more severely weathered than sample FDP-54-L". This conclusion is consistent with our field observations of the physical properties of the collected samples which suggested that sample MW-16 was significantly more viscous than sample MW-6.

Zymax also reports that the SPH samples from wells TBW-1 and MW-6 contain predominantly diesel or jet fuel (similar in composition to diesel) with lesser amounts of gasoline and only trace quantities of heating oil and that TBW-5 contains mostly gasoline with a lesser amount of kerosene-range hydrocarbons. These results differ from those for perimeter sample MW-16 which Zymax described as a mixture of jet fuel and gasoline with a significant fraction of heating oil.

Furthermore, the simulated distillation curves for these three samples show that the MW-16 sample contains higher boiling point compounds than the samples from MW-6 and TBW-1.

These chemical signatures suggest the following conclusions:

- At least three separate SPH plumes exist at the site and,
- The SPH in well MW-6 near the interior of the property appears to originate from a separate source than the SPH in perimeter well MW-16. The relative amounts of different fuel types are notably different (Table 1), and Zymax identified significantly more heating oil no. 6, a heavier hydrocarbon, in the sample from MW-16 than in the sample from MW-6.



It is a pleasure to continue to provide the City of Oakland with environmental consulting services. Please call us at (510) 420-0700 if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc.

Robert W. Schultz, R.G.
Project Geologist

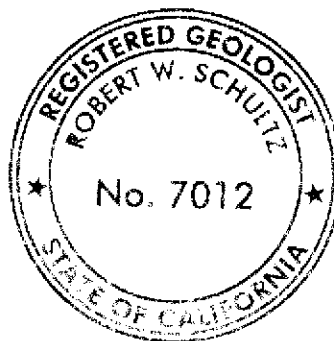


Figure: 1 - Sampling Locations

cc: Mr. Barney Chan, Alameda County Health Care Services Agency, 1131 Harbor Bay Parkway, Suite 250, Alameda, CA 94502-6577

Mr. Bruce Abelli-Amen, Baseline Environmental Consulting, 5900 Hollis Street, Ste. D, Emeryville, CA 94608



Table 1
Chemical characteristics of fuel types in SPH samples
TBW-5, TBW-1, MW-6, and MW-16

Sample Name	Fuel Type	Relative Amount (%)	Condition of Weathering
MW-6	Diesel #2	95	moderate- severe
	Gasoline	5	mild
	Heating oil #6	trace	severe
	Coal tar oil	trace	?
TBW-1	Jet fuel	70	mild
	Diesel #2		moderate
	Gasoline	30	moderate
	Heating oil #6	trace	moderate
MW-16	Coal tar oil	trace	?
	Jet fuel	50	moderate
	Gasoline	40	moderate
FDP-54-L (TBW-5*)	Heating oil #6	10	moderate
	Gasoline	75	moderate
	Kerosene	25	moderate

* - Sample FDP-54-L collected prior to installation of TBW-5 in same location.
Table adapted from the June 30, 2000, Zymax Forensics analytical report Table 14.

how was this measured &
what are its reliability?
ratio of (nC₁₇/pristane)