April 1997 Semiannual Ground Water Sampling Report Mills College Corporation Yard Oakland, California

June 11, 1997

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Prepared For:

Mills College 5000 MacArthur Boulevard Oakland, CA 94613

Prepared By:

Harza Engineering Company of California 425 Roland Way Oakland, CA 94621

Derek Armentrout Project Chemist

D G REG MNIS DF DUZINS NO. 1535 CERTIFIED × Dennis Laduzinsky, C.E Project Manager

HARZA

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June 11, 1997

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

Re: April 1997 Semiannual Ground Water Sampling Report Mills College Corporation Yard, Oakland, California Project No.: K275-H

Dear Ms. Logan:

We are pleased to submit our report for the above referenced project. Should you have any questions or require additional information, please do not hesitate to contact me.

Sincerely,

### Harza Engineering Company of California

Derek Armentrout Project Chemist

-Illencl. Copies: Addressee Mr. David Johnson (Mills College) Case Officer (Regional Water Quality Control Board)

K275HREP.040 6/11/97

Harza Engineering Company of California 425 Roland Way, Oakland, California 94621 Tel: (510) 568-4001 Fax: (510) 568-2205

### **April 1997 Semiannual Ground Water Sampling Report**

Mills College Corporation Yard, Oakland, California

### **1.0 INTRODUCTION**

This report presents the results of the April 1997 semiannual ground water sampling performed at the Mills College Corporation Yard in Oakland, California. The project location is shown on the Site Vicinity Map (Figure 1).

The purpose of the investigation has been to evaluate the extent of petroleum hydrocarbons in ground water related to a previously removed gasoline underground storage tank (UST) at the site. The investigation included collecting and analyzing ground water samples from five existing monitoring wells. This investigation was performed to comply with the continuing monitoring program under the jurisdiction of Alameda County Health Care Services Agency (ACHCSA).

### 2.0 BACKGROUND

In October 1988, a 1,000-gallon gasoline UST was removed from the Corporation Yard facility. A report prepared by Blaine Tech Services, Inc. of San Jose, California, indicated that soil samples collected from a depth of 21 feet below ground surface (bgs) following tank removal contained moderately high levels of total petroleum hydrocarbons as gasoline (TPHg). It is understood that 100 cubic yards of contaminated soils were excavated from the tank pit area at the time of tank removal and aerated on-site.

Beginning in June 1989, Harza (formerly Kaldveer Associates) performed soil and ground water quality investigations at the site, consisting of the installation and sampling of three ground water monitoring wells (MW-1 through MW-3) and two additional shallow soil borings. The results of these investigations, presented in a report titled *Soil and Ground Water Testing Report for Mills College Corporation Yard*, dated May 7, 1991, indicated that the majority of gasoline contamination in the unsaturated zone in the vicinity of the tanks appeared to have been removed during the soil excavation program conducted when the tanks were removed. Additional wells were installed in May 1994 (MW-4) and April 1995 (MW-5).

Analysis of ground water samples collected from the monitoring wells since June 1989 have indicated the presence of TPHg at concentrations up to 11 parts per million (ppm). The measured ground water flow direction at the site has been toward the south to west-southwest.



### 3.0 SCOPE OF SERVICES

The investigation consisted of the following tasks:

- Measuring ground water levels for use in developing a ground water elevation contour map.
- Collecting ground water samples from the existing wells at the Corporation Yard.
- Analyzing the ground water samples for TPHg and for purgeable aromatic compounds (benzene, toluene, ethylbenzene, and xylenes [BTEX]).

### 4.0 FIELD INVESTIGATION

### 4.1 <u>Well Sampling</u>

Monitoring wells MW-1 through MW-5 were sampled on April 29, 1997. Following an initial ground water level measurement, a minimum of three well-casing volumes of water were purged from each well using a Teflon bailer or a submersible pump. Purging consisted of the gradual removal of water from the well until physical parameters such as pH, temperature, and electrical conductivity (EC) stabilized. Following purging, samples were collected using a Teflon bailer, placed in appropriate sample containers, labeled, and placed in refrigerated storage for transport to the laboratory under chain-of-custody control. The bailer and pump were washed with trisodium phosphate (TSP) and rinsed with deionized water between wells to reduce the potential for cross contamination. Purge water was contained on-site in 55-gallon drums.

### 4.2 Ground Water Gradient

Well-top elevations, depth to water, and calculated water-surface elevations are presented in Table 1. These data are used to generate the ground water elevation contours presented on Figure 2. The water levels are similar in wells MW-1, MW-2, and MW-3, suggesting a flat gradient in this area. However, a relatively steep, west-southwestward gradient is depicted using wells MW-1, MW-4, and MW-5. In our opinion, ground water levels measured in wells MW-1 through MW-3 appear to be influenced by the highly transmissive backfill used in the former tank excavation. Only data from wells MW-1, MW-4, and MW-5 were used to calculate the ground water gradient and flow direction shown on Figure 2. It is our professional opinion that ground water most likely follows the natural surface topography and flows toward the west or southwest. Wells MW-4 and MW-5 appear



sufficient for monitoring downgradient water quality in any of the historically observed or potential ground water flow directions.

### 5.0 ANALYTICAL RESULTS

### 5.1 Laboratory Procedures

Ground water samples were analyzed by American Environmental Network (AEN) of Pleasant Hill, California. AEN is certified by the California Environmental Protection Agency for the analyses performed. Samples from each well were analyzed for TPHg using EPA Method 5030/GC-FID, and for BTEX using EPA Method 8020.

### 5.2 Analytical Results

The results of the chemical analyses are presented in Table 2 and laboratory analytical reports are attached as Appendix B. A historical summary of ground water sample analytical results is also included in Table 2.

TPHg was detected in the sample from well MW-1 at a concentration of 0.6 ppm. BTEX compounds were detected in the sample from MW-1 at concentrations of 0.12, 0.027, 0.024, and 0.028 ppm, respectively. A petroleum odor and a slight hydrocarbon sheen on the water surface were recognized during the purging of the well.

Benzene was detected in the sample from well MW-2 at 0.022 ppm, and in the sample from well MW-3 at 0.043 ppm. TPHg concentrations were below the laboratory method reporting limit (MRL) of 0.05 ppm in these wells. No TPHg or BTEX compounds were detected at or above the MRLs in the samples from wells MW-4 and MW-5.

### 6.0 CONCLUSIONS AND RECOMMENDATIONS

The April 1997 analytical results show a slight decrease in concentrations from the previous monitoring event. Historically, sampling at the site has shown fluctuations in reported TPHg and BTEX concentrations. However, a decreasing trend in TPHg and benzene concentrations in MW-1 is apparent; the concentrations of these compounds was the lowest since monitoring began in 1989. Measured hydrocarbon concentrations appear relatively stable in wells MW-2 and MW-3. Ground water elevations in wells MW-1, MW-4, and MW-5 indicate a general ground water flow direction toward the west-southwest. The plume does not appear to be migrating significantly, as evidenced by nondetectable levels of contaminants in downgradient wells MW-4 and MW-5.



Preparation and submittal of reports will continue on a semiannual basis, contingent on ground water quality continuing to exhibit little variation, and on contaminants remaining on-site. The next monitoring event is scheduled for October 1997.

### 7.0 LIMITATIONS

The purpose of a geologic/hydrogeologic study is to reasonably characterize existing site conditions based on the geology/hydrogeology of the area. In performing such a study, a balance must be struck between a reasonable investigation into the site conditions and an exhaustive analysis of each conceivable condition. The following paragraphs discuss the assumptions and parameters under which such a study is conducted.

No investigation is thorough enough to detect every geologic/hydrogeologic condition of interest at a given site. If conditions have not been identified during the study, such a finding should not therefore be construed as a guarantee of the absence of such conditions at the site, but rather as the result of the services performed within the scope, limitations, and cost of the work performed.

We are unable to report on or accurately predict events that may change the site conditions after the described services are performed, whether occurring naturally or caused by external forces. We cannot assume responsibility for conditions we were not authorized to evaluate, or conditions not generally recognized as predictable when services were performed.

Geologic/hydrogeologic conditions may exist at the site that cannot be identified solely by visual observation. Where subsurface exploratory work was performed, our professional opinions are based in part on interpretation of data from discrete sampling locations that may not represent actual conditions at unsampled locations.



TABLES

## TABLE 1Ground Water Elevation Data

April 1997 Semiannual Ground Water Sampling Report Mills College Corporation Yard, Oakland, California (Reported in Feet)

Date	Monitoring Well	Relative Well-Top Elevation <sup>(1)</sup>	Depth to Water	Ground Water Elevation
June 1989	MW-1	100.00	19.44	80.56
3GHU 1707	MW-2	99.98	19.36	80.62
	MW-3	100.01	19.40	80.61
December 1990	MW-1	100.00	22.05	77.95
	MW-2	99.98	21.96	78.02
	MW-3	100.01	22.00	78.01
June 1991	MW-1	100.00	20.85	79.15
	MW-2	99.98	20.76	79.22
	MW-3	100.01	20.81	79.20
March 1992	MW-1	100.00	19.87	80.13
	MW-2	99.98	19.92	80.06
	MW-3	100.01	19.82	80.19
October 1992	MW-1	100.00	21.69	78.31
	MW-2	99.98	21.60	78.38
	MW-3	100.01	21.65	78.36
May 1994	MW-1	100.00	19.66	80.34
·	MW-2	99.97	19.62	80.35
	MW-3	100.01	19.60	80.41
	MW-4	88.88	13.60	75.28
June 1994	MW-1	100.00	19.72	80.28
	MW-2	99.97	19.65	80.32
	MW-3	100.01	19.65	80.36
	MW-4	88.88	14.01	74.87
October 1994	MW-1	100.00	20.17	79,83
	MW-2	99.97	20.10	79,87
	MW-3	100.01	20.08	79,93
	MW-4	88.88	17.95	70.93
January 1995	MW-1	100.00	17.46	82.54
	MW-2	99.97	17.48	82.49
	MW-3	100.01	17.30	82.71
	MW-4	88.88	10.76	78.12
May 1995	MW-1	100.00	15.56	84.44
	MW-2	99.99	15.75	84.24
	MW-3	100.03	15.50	84.53
	MW-4	88,88	9.25	79.63
	MW-5	99.98	27.66	72.32

### TABLE 1 Ground Water Elevation Data

April 1997 Semiannual Ground Water Sampling Report Mills College Corporation Yard, Oakland, California (Reported in Feet)

Date	Monitoring Well	Relative Well-Top	Depth to Water	Ground Water Elevation
		Elevation		Elevation
October 1995	MW-1	100.00	18.68	81.32
	MW-2	99.99	18.21	81.78
	MW-3	100.03	18.62	81.41
	MW-4	88.88	14.65	74.23
	MW-5	99.98	28.36	71.62
May 1996	MW-1	100.00	15.92	84.08
-	MW-2	99.99	15.70	84.29
	MW-3	100.03	15.83	84.20
	MW-4	88.88	9.55	79.33
	MW-5	99.98	25.51	74.47
September 1996	MW-1	100.00	17.74	82.26
	MW-2	99.99	17.67	82.32
	MW-3	100.03	17.64	82.39
	MW-4	88.88	14.59	74.29
	MW-5	99.98	27.83	72.15
April 1997	MW-1	100.00	16.91	83.09
•	MW-2	99.99	16.82	83.17
	MW-3	100.03	16.83	83.20
	MW-4	88.88	11.77	77.11
	MW-5	99.98	26.93	73.05

### NOTE

Well-top elevations are based on an arbitrary datum of 100.00 feet at MW-1.

### TABLE 2

### Ground Water Sample Analytical Results

April 1997 Semiannual Ground Water Sampling Report Mills College Corporation Yard, Oakland, California

Sample ID	Sample Date	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes
		ppm	ppm	ppm	ppm	ppm
MW-1	June 1989	11.	2.1	1.9	0.031	1.4
	December 1990	2.5	0.4	0.21	0.056	0.31
	June 1991	16.	2.0	1.1	0.41	2.8
	March 1992	1.6	0.26	0.10	0.47	0.12
	October 1992	2.8	0.33	0.13	0.06	0.20
	October 1992(D)	4.2	0.54	0.23	0.08	0.36
	May 1994	3.4	0.6	0.11	0.11	0.15
	October 1994	8.7	1.0	0.29	0.14	0.36
	January 1995	5.9	1.5	0.088	0.13	0.14
	April 1995	3.4	0.78	0.34	0.10	0.21
	October 1995	0.87	0.092	0.026	0.041	0.025
	May 1996	1.0	0.20	0.068	0.035	0.050
	September 1996	1.5	0.27	0.073	0.064	0.095
	April 1997	0.6	0.12	0.027	0.024	0.028
MW-2	June 1989	ND	ND	ND	ND	ND
	December 1990	ND	ND	ND	ND	ND
	June 1991	ND	0.005	ND	ND	ND
	March 1992	0.09	0.047	0.0005	ND	ND
	October 1992	ND	0.003	ND	ND	ND
	May 1994	0.2	0.084	0.0006	ND	ND
	October 1994	0.2	0.13	ND	ND	ND
	January 1995	0.7	0.21	ND	ND	ND
	April 1995	ND	0.004	ND	ND	ND
	October 1995	0.2	0.11	ND	ND	ND
	May 1996	0.2	0.086	ND	0.0010	ND
	September 1996	0.09	0.059	ND	ND	ND
	April 1997	ND	0.022	ND	ND	ND
MW-3	June 1989	ND	ND	ND	ND	ND
	December 1990	0.05	0.011	ND	ND	ND
	June 1991	0.1	0.007	ND	ND	ND
	March 1992	0.09	0.27	0.0009	ND	ND
	October 1992	ND	0.005	ND	ND	ND
	May 1994	ND	0.005	ND	ND	ND
	October 1994	ND	0.004	ND	ND	ND
	January 1995	0.07	0.012	ND	ND	ND
	April 1995	ND	0.006	ND	ND.	ND
	October 1995	ND	0.002	ND	ND	0.002
	May 1996	ND	0.007	ND	ND	ND
	September 1996	ND	0.012	ND	ND	ND
	April 1997	ND	0.043	ND /	ND	ND

### TABLE 2

### **Ground Water Sample Analytical Results**

April 1997 Semiannual Ground Water Sampling Report Mills College Corporation Yard, Oakland, California

Sample ID	Sample Date	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes
		ppm	ppm	ppm	ppm	ppm
MW-4	May 1994	ND	ND	ND	ND	ND
	October 1994	ND	ND	ND	ND	ND
	January 1995	ND	ND	ND	ND	ND
	October 1995	ND	ND	ND	ND	ND
	May 1996	ND	ND	ND	ND	ND
	September 1996	ND	ND	ND	ND	ND
	April 1997	ND	ND	ND	ND	ND
MW-5	April 1995	ND	ND	ND	ND	ND
	October 1995	ND	ND	ND	ND	ND
	May 1996	ND	ND	ND	ND	ND
	September 1996	ND	ND	ND	ND	ND
	April 1997	ND	ND	ND	ND	ND

NOTES

TPHg: Total petrolum hydrocarbons as gasoline

ppm: Parts per million or milligrams per liter

ND: Not detected at or above the laboratory method reporting limits

(D): Duplicate sample analytical results

FIGURES

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APPENDIX A Laboratory Analytical Reports

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# American Environmental Network

Certificate of Analysis

DOHS Certification: 1172

AIHA Accreditation: 11134

PAGE 1

HARZA 425 ROLAND WAY OAKLAND, CA 94621

ATTN: LYNN LANCASTER CLIENT PROJ. ID: K275-H-971 CLIENT PROJ. NAME: MILLS COLLEGE REPORT DATE: 05/10/97 DATE(S) SAMPLED: 04/29/97 DATE RECEIVED: 04/29/97 AEN WORK ORDER: 9704349

PROJECT SUMMARY:

On April 29, 1997, this laboratory received 5 water sample(s).

Client requested sample(s) be analyzed for chemical parameters. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.

Larn Klein

Laboratory Director

### HARZA

**DATE SAMPLED:** 04/29/97 **DATE RECEIVED:** 04/29/97 **REPORT DATE: 05/10/97** 

SAMPLE ID: MW-1 AEN LAB NO: 9704349-01 AEN WORK ORDER: 9704349 CLIENT PROJ. ID: K275-H-971

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020	120 *	0.5.0	a/l	05/05/97
Toluene Fthylbenzene	108-88-3	27 *	0.5 u 0.5 u 0.5 u	ig/L ig/l	05/05/97
Xylenes, Total Purgeable HCs as Gasoline	1330-20-7 5030/GCFID	28 * 0.6 *	2 u 0.05 m	ig/L ig/L	05/05/97 05/05/97

ND = Not detected at or above the reporting limit
 \* = Value at or above reporting limit

### HARZA

SAMPLE ID: MW-2 AEN LAB NO: 9704349-02 AEN WORK ORDER: 9704349 CLIENT PROJ. ID: K275-H-971

DATE SAMPLED: 04/29/97 DATE RECEIVED: 04/29/97 REPORT DATE: 05/10/97

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
<b>BTEX &amp; Gasoline HCs</b> Benzene Toluene Ethylbenzene Xylenes, Total Purgeable HCs as Gasoline	EPA 8020 71-43-2 108-88-3 100-41-4 1330-20-7 5030/GCFID	22 * ND ND ND ND	0.5 0.5 0.5 2 0.05	ug/L ug/L ug/L ug/L mg/L	05/01/97 05/01/97 05/01/97 05/01/97 05/01/97

ND = Not detected at or above the reporting limit
 \* = Value at or above reporting limit

### HARZA

DATE SAMPLED: 04/29/97 DATE RECEIVED: 04/29/97 **REPORT DATE: 05/10/97** 

SAMPLE ID: MW-3 AEN LAB NO: 9704349-03 AEN WORK ORDER: 9704349 CLIENT PROJ. ID: K275-H-971

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ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs Benzene Toluene Ethylbenzene Xylenes, Total Purgeable HCs as Gasoline	EPA 8020 71-43-2 108-88-3 100-41-4 1330-20-7 5030/GCFID	4.3 * ND ND ND ND	0.5 ug 0.5 ug 0.5 ug 2 ug 0.05 mg	9/L g/L g/L g/L g/L	05/01/97 05/01/97 05/01/97 05/01/97 05/01/97

ND = Not detected at or above the reporting limit \* = Value at or above reporting limit

### HARZA

**DATE SAMPLED:** 04/29/97 DATE RECEIVED: 04/29/97 REPORT DATE: 05/10/97

SAMPLE ID: MW-4 AEN LAB NO: 9704349-04 AEN WORK ORDER: 9704349 CLIENT PROJ. ID: K275-H-971

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs Benzene Toluene Ethylbenzene Xylenes, Total Purgeable HCs as Gasoline	E <b>PA 8020</b> 71-43-2 108-88-3 100-41-4 1330-20-7 5030/GCFID	ND ND ND ND	0.5 u 0.5 u 0.5 u 2 u 0.05 m	g/L g/L g/L g/L g/L	05/01/97 05/01/97 05/01/97 05/01/97 05/01/97

ND = Not detected at or above the reporting limit
 \* = Value at or above reporting limit

### HARZA

DATE SAMPLED: 04/29/97 DATE RECEIVED: 04/29/97 **REPORT DATE: 05/10/97** 

SAMPLE ID: MW-5 AEN LAB NO: 9704349-05 AEN WORK ORDER: 9704349 CLIENT PROJ. ID: K275-H-971

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs Benzene Toluene Ethylbenzene Xylenes, Total Purgeable HCs as Gasoline	EPA 8020 71-43-2 108-88-3 100-41-4 1330-20-7 5030/GCFID	ND ND ND ND	0.5 u 0.5 u 0.5 u 2 u 0.05 m	ig/L ig/L ig/L ig/L	05/01/97 05/01/97 05/01/97 05/01/97 05/01/97

ND = Not detected at or above the reporting limit

\* = Value at or above reporting limit

American Environmental Network

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### AEN (CALIFORNIA) QUALITY CONTROL REPORT

AEN JOB NUMBER: 9704349

### CLIENT PROJECT ID: K275-H-971

#### Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

#### Definitions

Laboratory Control Sample (LCS)/Method Spike(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analysis.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behavior, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrumental performance.

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

### QUALITY CONTROL DATA

### METHOD: EPA 8020, 5030 GCFID

9704349 AEN JOB NO: INSTRUMENT: F MATRIX: WATER

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene			
05/05/97 05/01/97 05/01/97 05/01/97 05/01/97	MW-1 MW-2 MW-3 MW-4 MW-5	01 02 03 04 05	90 86 87 87 88			
QC Limits:			70-130			

Surrogate Standard Recovery Summary

DATE ANALYZED: SAMPLE SPIKED: 05/02/97 9705038-03 INSTRUMENT: F

### Matrix Spike Recovery Summary

				QC Limi	ts
Analyte	Spike Added (ug/L)	Percent Recovery	RPD	Percent Recovery	RPD
Benzene Toluene	18.5 64.4	88 102	5 3	85-109 87-111	17 16
Hydrocarbons as Gasoline	500	102	4	66-117	19

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

\*\*\* END OF REPORT \*\*\*

Contact: <u>Decele</u> HARZA <i>Consultii</i> 425 Roland Way Oakland, CA 94621	<u>Fracentrout</u> g Engineers and Sci (510) 56 (510) 56	<i>ientists</i> 58–4001 58–2205 Fa	X	(F	TEN								SOUT	¢		- Correct	Capital Contract				
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