HARZA *Consulting Engineers and Scientists*

June 19, 1995

Mr. David Johnson
Mills College
5000 MacArthur Boulevard
Oakland, CA 94613

Re: Monitoring Well Installation and Second Quarter 1995 Ground Water Sampling Report
Mills College Corporation Yard, Oakland, California
Project No.: K275-H

Dear Mr. Johnson:

We are pleased to submit our final report for the above referenced project. On your behalf, we will submit copies to Madhulla Logan of Alameda County Health Care Services and the Regional Water Quality Control Board.

Should you have any questions or require additional information, please do not hesitate to contact me.

Sincerely,

Harza Consulting Engineers and Scientists

Lida Kagan for DA

Derek D. Armentrout
Project Chemist

DA\DL:gg\encl.
Copies: Addressee (1)
Ms. Madhulla Logan (Alameda County Health Care Services - 1)
Alameda County LUFT Case Officer (Regional Water Quality Control Board - 1)

K275-H reports\29183
06-19-95

425 Roland Way Oakland, California 94621
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Monitoring Well Installation and Second Quarter 1995 Ground Water Sampling Report

Mills College Corporation Yard
Oakland, California

June 19, 1995

Prepared For:

Mills College
5000 MacArthur Boulevard
Oakland, CA 94613

Prepared By:

Harza Consulting Engineers and Scientists
425 Roland Way
Oakland, CA 94621

Lida Kagan for DA

Derek D. Armentrout
Project Chemist

Dennis Laduzinsky, C.E.G.
Head, Geology and Hydrogeology

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HARZA

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Monitoring Well Installation and Second Quarter 1995 Ground Water Sampling Report

Mills College Corporation Yard
Oakland, California

1.0 INTRODUCTION

This report presents the results of the monitoring well installation and second quarter 1995 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 installing one additional ground water monitoring well downgradient from the former tank location, and collecting and analyzing ground water samples from the new well and three existing 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. The ACHCSA subsequently issued a letter, dated February 15, 1989, requesting investigation of the vertical and lateral extent of petroleum hydrocarbons in soil and ground water related to the former tank.

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 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. 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 historically been toward the south, beneath the existing Corporation Yard buildings, but recent measurements have indicated a more westerly flow direction.

In May 1994, well MW-4 was installed downgradient of the Corporation Yard along Seminary Avenue in response to the ACHCSA letter of April 23, 1993 requesting an additional downgradient monitoring point. In their September 7, 1994 letter, the ACHCSA expressed concern that well MW-4 was not screened in the same aquifer as wells MW-1 through MW-3, and requested an investigation to determine if well MW-4 was hydraulically connected to the other wells. A geologic and chemical investigation was performed in October 1994, and indicated that the well was most likely hydraulically connected to wells MW-1 through MW-3 at depth, but a conclusive determination could not be made, particularly along the upper surface of the ground water where floating hydrocarbons, such as gasoline, tend to reside. The ACHCSA has requested that quarterly ground water monitoring be performed at the site and that an additional well be installed to the west of the former UST to further evaluate possible migration of gasoline hydrocarbons.

3.0 SCOPE OF SERVICES

This work was performed to respond to the ACHCSA letter of December 13, 1994 requesting installation of an additional monitoring point. The investigation consisted of the following tasks:

- Installing one ground water monitoring well to a depth of approximately 33 feet bgs at the west end of the Corporation Yard.
- Surveying the new well-top elevation relative to the existing Corporation Yard wells, and measuring ground water levels in all wells for use in developing a ground water elevation contour map.
- Developing the new well and collecting ground water samples from the new well and three existing wells previously installed at the Corporation Yard.

of water and slow recovery, one casing volume of water was removed from the well.

Monitoring wells MW-1 through MW-3 and MW-5 were sampled on April 27, 1995. 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. Only one casing volume could be removed from well MW-5 because of the slow recovery. Purging consisted of the gradual removal of water from the well until physical parameters such as pH, temperature, and electrical conductivity stabilized. Following purging, samples were decanted from the bailer into appropriate sample containers, labeled, and placed in refrigerated storage for transport to the laboratory under chain-of-custody control. The bailer was 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. Monitoring well sampling logs are attached to this report in Appendix A.

Water levels measured in wells MW-1, 2, and 3 before sampling indicated a gradient toward well MW-5, so well MW-4 was not sampled. This strategy was approved by the ACHCSA.

4.3 Ground Water Gradient

Well-top elevations were surveyed to a common datum and water levels were measured in each well. Ground water levels measured on April 27 appeared inconsistent with levels measured in previous events. Ground water levels were therefore measured again on May 16, 1995. 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. Ground water levels measured in wells MW-1 through MW-3 appear anomalous and may be influenced by highly transmissive backfill used in the former tank excavation. Data from wells MW-1, MW-4, and MW-5 only were used to calculate ground water gradient and flow direction as shown on Figure 2. However, it is our professional opinion that ground water most likely follows the natural surface topography and flows southwest. In either case, the former UST area is monitored in both previously indicated downgradient 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 3.4 ppm. BTEX compounds were detected in the sample from MW-1 at concentrations of 0.78, 0.34, 0.10 and 0.21 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 samples from wells MW-2 and MW-3 at 0.004 and 0.005 ppm, respectively. No TPHg or BTEX compounds were detected at or above the laboratory method reporting limits (MRLs) in the sample from well MW-5.

6.0 CONCLUSIONS

The sampling performed between June 1989 and April 1995 has shown repeated fluctuations in reported TPHg and BTEX concentrations, although no trends are apparent. Ground water elevations in wells MW-1, MW-2, MW-4, and MW-5 indicate a gradient toward the west. Water levels in wells MW-1 through MW-3 currently indicate an anomalous uphill directed gradient. In our professional opinion, wells MW-4 and MW-5 appear to monitor downgradient water quality.

7.0 RECOMMENDATIONS

We recommend that the frequency of ground water monitoring at the Mills College Corporation Yard site be reduced to a semiannual schedule. The purpose of ground water sample analysis is to determine if ground water quality is changing and if contaminants are migrating off site. It is our opinion that a semiannual schedule will be sufficient to meet this intent. Ground water quality in wells MW-1, MW-2, and MW-3 has been relatively consistent since monitoring was initiated in June 1989, and no trends are apparent (see Table 2). No contamination has been detected in the downgradient monitoring points, wells MW-4 and MW-5. A change to a semiannual schedule was tentatively approved by the ACHCSA in their September 7, 1994 letter contingent on demonstration that

downgradient water quality was being adequately monitored. In our opinion, wells MW-4 and MW-5 fulfill this requirement. We therefore propose to monitor the five wells on a semiannual schedule.

Preparation and submittal of reports would be on a semiannual basis. A semiannual sampling schedule would be maintained contingent on ground water quality continuing to exhibit little variation, and on contaminants remaining on site. Pursuant to your approval of a semiannual schedule, the next monitoring event is scheduled for October 1995.

8.0 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 1

Ground Water Elevation Data

Monitoring Well Installation and Second Quarter 1995 Ground Water Sampling Report
Mills College Corporation Yard, Oakland, California
(Reported in feet)

Year	Monitoring Well	Relative Well-Top Elevation [1]	Depth to Water	Ground Water Elevation
June 1989	MW-1	100.00	19.44	80.56
	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

NOTE
(1): Well-top elevations are based on an arbitrary datum of 100,000 feet at MW-1.

TABLE 2

Summary of Ground Water Sample Analyses

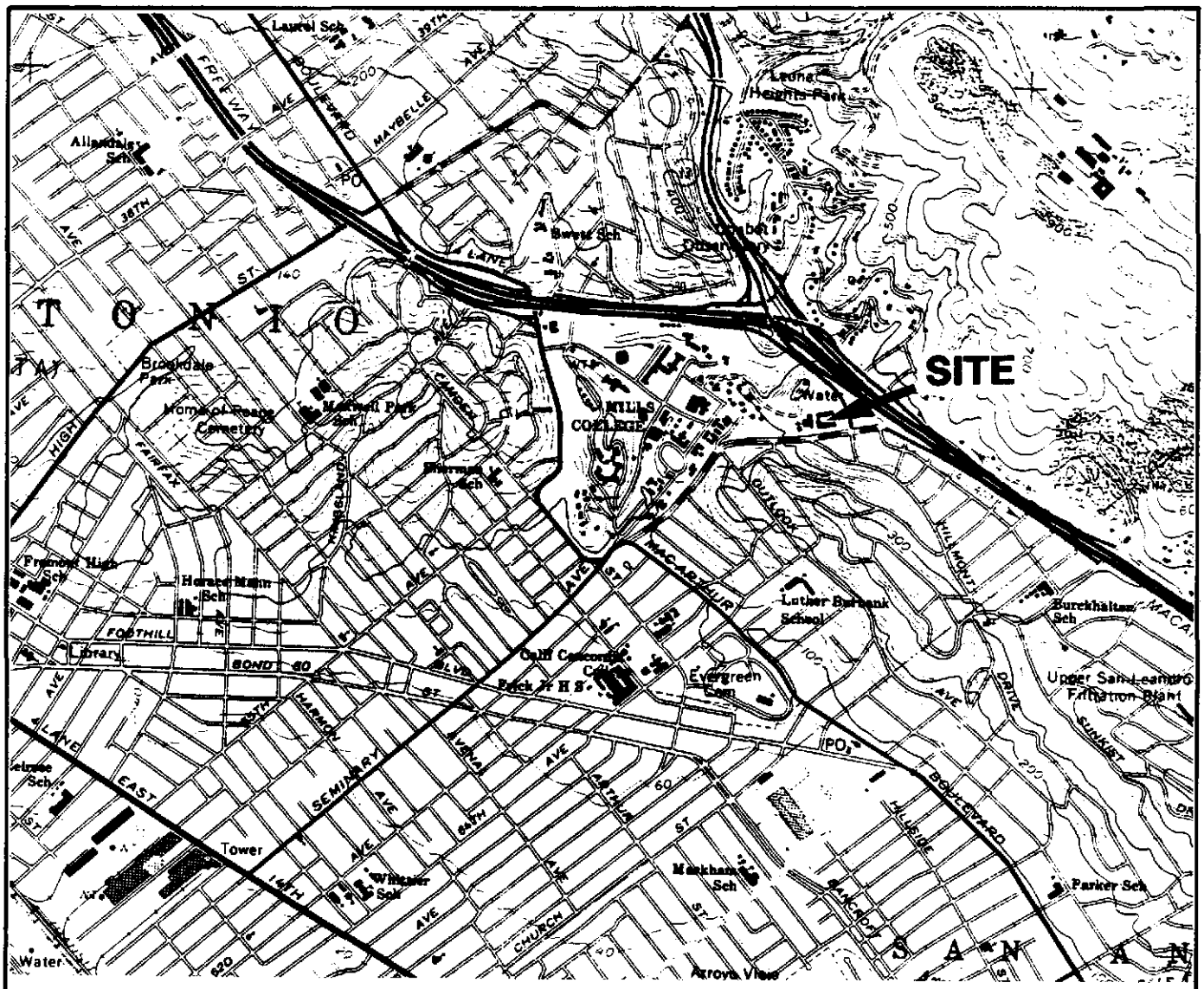
Monitoring Well Installation and Second Quarter 1995 Ground Water Sampling Report
Mills College Corporation Yard, Oakland, California

Sample ID	Sample Date	TPHg ppb	Benzene ppb	Toluene ppb	Ethylbenzene ppb	Xylenes ppb
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.	1.1	0.41	2.8
	March 1992	1.6	0.26	0.1	0.47	0.12
	October 1992	2.8	0.33	0.13	0.06	0.2
	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.	0.29	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
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	0.001	ND	ND
	October 1992	ND	0.003	ND	ND	ND
	May 1994	0.2	0.084	0.001	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
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	0.001	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
MW-4	May 1994	ND	ND	ND	ND	ND
	October 1994	ND	ND	ND	ND	ND
	January 1995	ND	ND	ND	ND	ND
MW-5	April 1995	ND	ND	ND	ND	ND

NOTES

TPHg: Total petrolum hydrocarbons as gasoline
ppb: parts per billion or micrograms per liter
ND: Not detected at or above the laboratory method reporting limits
(D): Duplicate sample analytical results

FIGURES



Approximate Scale in Feet

0 1000 2000 4000

BASE: U.S.G.S. Oakland East 7.5 Minute Quadrangle (topographic)

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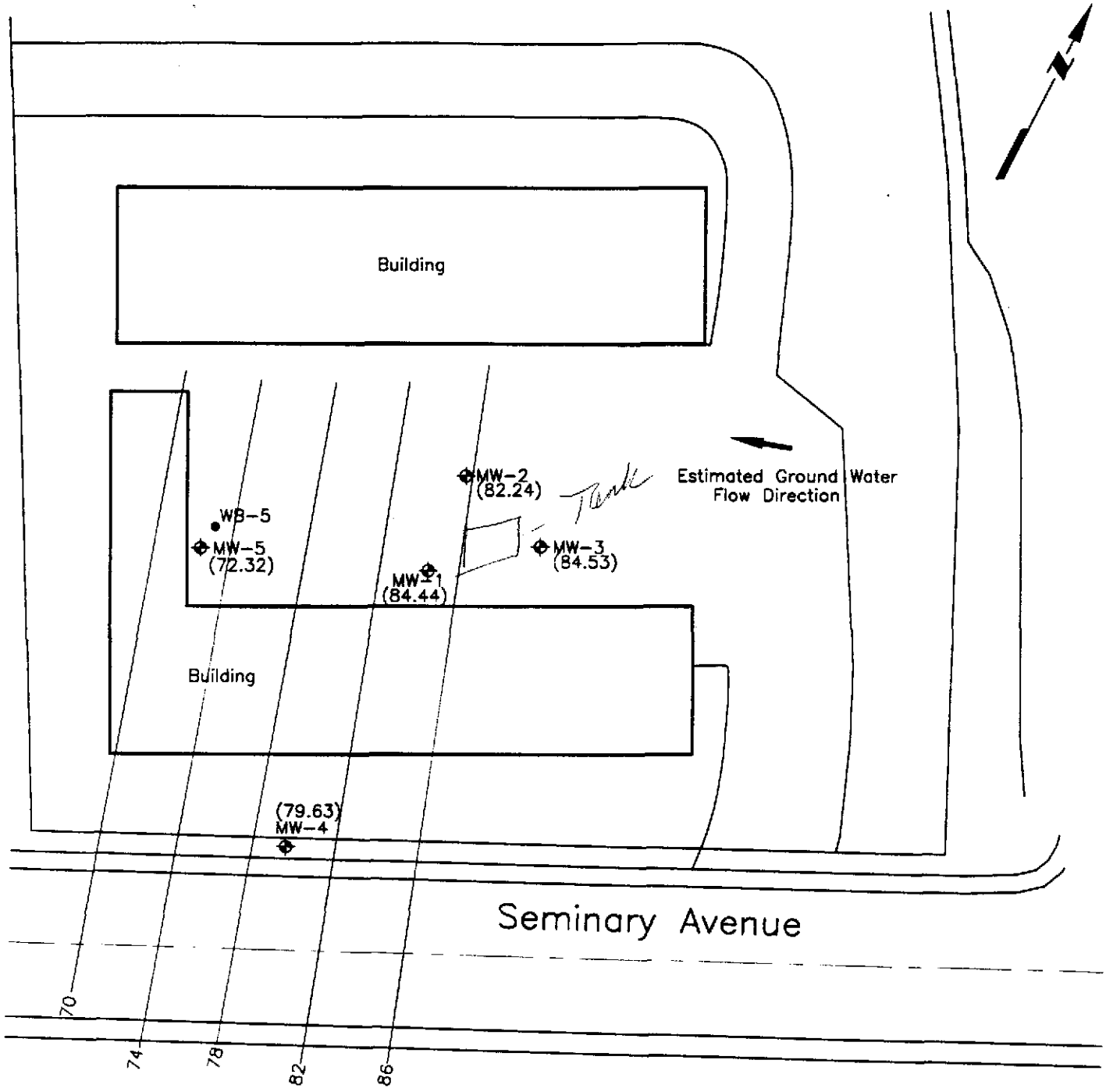
SITE VICINITY MAP

MILLS COLLEGE
CORPORATION YARD FACILITY
Oakland, California

PROJECT NO.	DATE	
K275-H	JUNE 1995	Figure 1



LEGEND

- ◆ Monitoring Well Location
- ——70 Ground Water Contour 5/16/95
- ● Soil Boring

Approximate scale in feet

0 50 100

6-95-2

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SITE PLAN

MILLS COLLEGE
CORPORATION YARD FACILITY
Oakland, California

PROJECT NO.	DATE	FIGURE NO.
K275-H	June 1995	2

APPENDIX A

Boring Logs and Water Sample Logs

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions		grf	ltr	Description
Coarse Grained Soils	Gravel And Gravely Soils		GW	Well-graded gravels or gravel sand mixtures, little or no fines
			GP	Poorly-graded gravels or gravel sand mixture, little or no fines
			GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	Sand And Sandy Soils		SW	Well-graded sands or gravelly sands, little or no fines
			SP	Poorly-graded sands or gravelly sands, little or no fines
			SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, and-clay mixtures

Major Divisions		grf	ltr	Description
Fine Grained Soils	Silts And Clays LL < 50		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic silts and organic silt-clays of low plasticity
	Silts And Clays LL > 50		MH	Inorganic silts, micaceous or diatomaceous fine or silty soils, elastic silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
Highly Organic Soils			PT	Peat and other highly organic soils

SYMBOLS

- Standard penetration split spoon sample
- Modified California (Porter) sample
- Shelby tube sample
- Water level observed in boring
- Stable water level
- Blank casing
- Screened Casing
- Cement grout
- Bentonite
- Filter Pack

Visual Relative Moisture Content
Increasing Moisture Content

Dry
Damp
Moist
Wet
Saturated

Note: The lines separating strata on the logs represent approximate boundaries only. No warranty is provided as to the continuity of soil strata between borings. Logs represent the soil section observed at the boring location on the date of drilling only.

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BORING LOG LEGEND

MILLS COLLEGE
Oakland, California

PROJECT NO.	DATE	FIGURE NO
K275H	June 1995	A-1

DRILL RIG	B-57 HSA	SURFACE ELEVATION	NM	LOGGED BY	JEM
DEPTH TO GROUNDWATER	Not Enc.	BORING DIAMETER	8-inch	DATE DRILLED	3/27/95

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
Asphalt and Base Rock.						Petroleum hydrocarbon odor absent throughout the drilling operation.	
CLAY (CL), yellowish brown; 80% low to moderate plasticity fines; 10% sand; 10% gravel; firm to stiff; damp.		5					
CLAY (CH), brown; 90% moderate to high plasticity fines; 5% sand; 5% gravel; stiff to very stiff; damp.		10					
BEDROCK, decomposed granitic rock; brown; 90% low to moderate plasicity fines; 10% rock fragments; stiff to hard; damp. @ 14.5': wet.		15				Advance of Hollow Stem Augers (HSA) slow and difficult due to hard bedrock fragments.	
@ 21': increase rock fragments to 25%; hard.		20					
@30': increase rock fragments to 35%; less decomposed rocks; hard.		25					
BORING TERMINATED AT 33.5 FEET ACFCWCD Permit No. 95147		30				Advance of HSA more difficult due to larger and harder bedrock fragments averaging 2 inches in diameter.	

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EXPLORATORY BORING LOG

MILLS COLLEGE
Oakland, California

PROJECT NO.	DATE	BORING NO
K275H	June 1995	MW-5

DRILL RIG	B-61 HSA	SURFACE ELEVATION	NM	LOGGED BY	DDA
DEPTH TO GROUNDWATER	Not Enc.	BORING DIAMETER	8-inch	DATE DRILLED	4/27/95

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
Asphalt and Base Rock.							
FILL, brown mottled orange, gravel to 1/4", dry, no odor.		5		35			
		10		24			
BEDROCK, decomposed granitic rock, brown mottled orange, friable, some gravel, damp.							
@15': increase fines.		15		40			
@20': with sandy clay.		20		41			
CLAYEY SAND (SC), reddish brown with angular fragments to 1/2", damp.		25		50			
@30': wet.		30		65		Sampler wet when withdrawn.	
@33.5': damp.		35		47			
@38.5': as above.				65			

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EXPLORATORY BORING LOG

MILLS COLLEGE
Oakland, California

PROJECT NO.	DATE	BORING NO
K275H	June 1995	WB-5

DRILL RIG	B-61 HSA	SURFACE ELEVATION	NM	LOGGED BY	DDA
DEPTH TO GROUNDWATER	Not Enc.	BORING DIAMETER	8-inch	DATE DRILLED	4/27/95

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
@40': as above.						Pulled auger 15', waited 20 minutes. No water in hole.	
@44': as above.		45		78		Increased rig chatter.	
@48.5': black.		50		50/6"		Increased rig chatter.	
@53.5': brown, increase fines.		55		79			
@58.5': as above.		60		56/6"			
@65': as above.		65		93		Pulled auger 15', waited 15 minutes. No water in hole.	
@73.5': as above.		70		50/6"		Pulled auger 15', waited 20 minutes. No water in hole.	
Bottom of Boring = 75 feet ACFCWCD Permit No. 95246		75					

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EXPLORATORY BORING LOG

MILLS COLLEGE
Oakland, California

PROJECT NO.	DATE	BORING NO
K275H	June 1995	WB-5

WATER SAMPLE LOG

Project Name: Mills College
Project Number: K275-G
Well Number: MW-1
Well Location:

Date: 4/27/95
Sampler: J. PYRCH
Weather:

Well Construction

Date Completed: ~~8/27~~ 1
Total Depth of Well: 32.5'
Diameter: 2"
Well Elevation and Reference:

Sampling Equipment & Cleaning

Sampler Type: Teflon bailer
Method of Cleaning: TSP wash/rinse
Pump/Bailer Type: Teflon bailer
Method of Cleaning: TSP wash/rinse
pH Meter: Hydac
Conductivity Meter: Hydac
Comments:

Ground Water Levels:

Initial: 15.8
Final: 12.2
Reference Point: TOC
Well Volume of Water: 2.9

SAMPLING MEASUREMENTS

Time	Discharge (gal.) Per Time Period	Discharge (gal.) Cumulative	pH	Temp (°F)	Spec. Conductance (µmhos/cm) Field	Spec. Conductance (µmhos/cm) @ 25°C	Color/ Turbidity	Odor
	start	0						
1530		2.9	7.09	63.2	1240		BROWN / HIGH	PETR.
1542		5.8	7.32	64.1	1260		BLACK / HIGH	"
1558		8.7	7.18	64.3	1270		"	"

Total Discharge: 8.7
Casing Volumes Removed: 3
Method of Disposal: drummed on site

Comments:

HARZA *Consulting Engineers and Scientists*	WATER SAMPLE LOG		
	Project No.	Date	Figure

WATER SAMPLE LOG

Project Name: Mills College
Project Number: K275-G
Well Number: MW-2
Well Location:

Date: 4/27/95
Sampler:
Weather:

Well Construction

Date Completed:
Total Depth of Well: 33.2'
Diameter: 2"
Well Elevation and Reference:

Sampling Equipment & Cleaning

Sampler Type: Teflon bailer
Method of Cleaning: TSP wash/rinse
Pump/Bailer Type: Teflon bailer
Method of Cleaning: TSP wash/rinse
pH Meter: Hydac
Conductivity Meter: Hydac
Comments:

Ground Water Levels:

Initial: 16.15'
Final: 13.45'
Reference Point: TOC
Well Volume of Water: 2.8 gal

SAMPLING MEASUREMENTS

Time	Discharge (gal.) Per Time Period	Discharge (gal.) Cumulative	pH	Temp (°F)	Spec. Conductance (µmhos/cm) Field	Spec. Conductance (µmhos/cm) @ 25°C	Color/ Turbidity	Odor
1415	start	0					BROWN/ HIGH	NONE
1425		2.8	6.49	62.7	680		"	"
1435		5.6	7.20	62.8	716		"	"
1445		8.4	7.34	63.4	712		"	"
	SAMPLED							

Total Discharge: 8.4 gal
Casing Volumes Removed: 3
Method of Disposal: drummed on site

Comments:

HARZA Consulting Engineers and Scientists	WATER SAMPLE LOG		
	Project No.	Date	Figure

DDA:WATSAMP.XLS

WATER SAMPLE LOG

Project Name: Mills College
Project Number: K275- 6
Well Number: MW-3
Well Location:

Date: 9/27/95
Sampler: J. PYRICH
Weather:

Well Construction

Date Completed:
Total Depth of Well: 34.41
Diameter: 2"
Well Elevation and Reference:

Sampling Equipment & Cleaning

Sampler Type: Teflon bailer
Method of Cleaning: TSP wash/rinse
Pump/Bailer Type: Teflon bailer
Method of Cleaning: TSP wash/rinse
pH Meter: Hydac
Conductivity Meter: Hydac
Comments:

Ground Water Levels:

Initial: 15.8
Final: 19.3
Reference Point: TOC
Well Volume of Water: 3

SAMPLING MEASUREMENTS

Time	Discharge (gal.) Per Time Period	Discharge (gal.) Cumulative	pH	Temp (°F)	Spec. Conductance (µmhos/cm) Field	Spec. Conductance (µmhos/cm) @ 25°C	Color/ Turbidity	Odor
	start	0					BROWN / HIGH	NONE
1300		3	6.98	61	860		"	"
1315		6	6.71	62.3	699		"	"
1325		9	6.69	64	911		"	"

Total Discharge: 9 gal
Casing Volumes Removed: 3
Method of Disposal: drummed on site

Comments:

HARZA *Consulting Engineers and Scientists*	WATER SAMPLE LOG		
	Project No.	Date	Figure

WATER SAMPLE LOG

Project Name: Mills College
Project Number: K275-G
Well Number: MW-5
Well Location:

Date: 4/27/95
Sampler: ARMENTROUT
Weather:

Well Construction

Date Completed: 3/27/95
Total Depth of Well: 33'
Diameter: 2"
Well Elevation and Reference:

Sampling Equipment & Cleaning

Sampler Type: Teflon bailer
Method of Cleaning: TSP wash/rinse
Pump/Bailer Type: Teflon bailer
Method of Cleaning: TSP wash/rinse
pH Meter: Hydac
Conductivity Meter: Hydac
Comments:

Ground Water Levels:

Initial: 27.41
Final: 32.03
Reference Point: TOC
Well Volume of Water: 0.9 gal

SAMPLING MEASUREMENTS

Time	Discharge (gal.)		pH	Temp (°F)	Spec. Conductance (µmhos/cm)		Color/ Turbidity	Odor
	Per Time Period	Cumulative			Field	@ 25°C		
0825	start	0						
0827		0.5	6.84	65.1	1860		CLEAR/LOW	NONE
	WELL	DRY						
0840	SAMPLED							

Total Discharge: 0.5
Casing Volumes Removed: 1/2
Method of Disposal: drummed on site

Comments: WELL DRY - WAITED UNTIL ENOUGH WATER FOR SAMPLE.

HARZA *Consulting Engineers and Scientists*	WATER SAMPLE LOG		
	Project No.	Date	Figure

APPENDIX B

Laboratory Analytical Reports

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172 AIHA Accreditation: 11134

HARZA
425 ROLAND WAY
OAKLAND, CA 94621

ATTN: MS. LIDA KAGAN
CLIENT PROJ. ID: K275-H
CLIENT PROJ. NAME: MILLS COLLEGE

REPORT DATE: 05/10/95

DATE(S) SAMPLED: 04/27/95

DATE RECEIVED: 04/28/95

AEN WORK ORDER: 9504342

PROJECT SUMMARY:

On April 28, 1995, this laboratory received 3 water sample(s).

Client requested sample(s) be analyzed for organic 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.

Larry Klein
Laboratory Director

HARZA

SAMPLE ID: MW-1
AEN LAB NO: 9504342-01
AEN WORK ORDER: 9504342
CLIENT PROJ. ID: K275-H

DATE SAMPLED: 04/27/95
DATE RECEIVED: 04/28/95
REPORT DATE: 05/10/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	780 *	10	ug/L	05/03/95
Toluene	108-88-3	340 *	10	ug/L	05/03/95
Ethylbenzene	100-41-4	100 *	10	ug/L	05/03/95
Xylenes, Total	1330-20-7	210 *	40	ug/L	05/03/95
Purgeable HCs as Gasoline	5030/GCFID	3.4 *	1	mg/L	05/03/95

Reporting limits elevated due to high levels of target compounds. Sample run at dilution.

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

HARZA

SAMPLE ID: MW-2
AEN LAB NO: 9504342-02
AEN WORK ORDER: 9504342
CLIENT PROJ. ID: K275-H

DATE SAMPLED: 04/27/95
DATE RECEIVED: 04/28/95
REPORT DATE: 05/10/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	4 *	0.5	ug/L	05/03/95
Toluene	108-88-3	ND	0.5	ug/L	05/03/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	05/03/95
Xylenes, Total	1330-20-7	ND	2	ug/L	05/03/95
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	05/03/95

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

HARZA

SAMPLE ID: MW-3
AEN LAB NO: 9504342-03
AEN WORK ORDER: 9504342
CLIENT PROJ. ID: K275-H

DATE SAMPLED: 04/27/95
DATE RECEIVED: 04/28/95
REPORT DATE: 05/10/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	6 *	0.5	ug/L	05/03/95
Toluene	108-88-3	ND	0.5	ug/L	05/03/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	05/03/95
Xylenes, Total	1330-20-7	ND	2	ug/L	05/03/95
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	05/03/95

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

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9504342

CLIENT PROJECT ID: K275-H

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

AEN JOB NO: 9504342
INSTRUMENT: H
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
05/03/95	MW-1	01	102
05/03/95	MW-2	02	100
05/03/95	MW-3	03	98
QC Limits:			92-109

DATE ANALYZED: 05/02/95
SAMPLE SPIKED: 9504326-05
INSTRUMENT: H

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	36.3	102	4	85-109	17
Toluene	103.0	103	3	87-111	16
Hydrocarbons as Gasoline	1000	102	<1	66-117	19

Daily method blanks for all associated analytical runs showed no contamination over the reporting limit.

*** END OF REPORT ***

R-3,5-1

Lab Job # 950434-2

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name	Location
K275-1	MILLS COLLEGE	OAKLAND

Sampler's Name (printed): JOHN

KA Sample I.D. Number	Lab Sample I.D. Number	Date	Soil	Water	Number/Type of Container	Analytical Tests: Method 8015 - TPH as Gasoline	Method 8015 - TPH as Diesel	Method 8240 - Volatile Organics	Method 8270 - Semi-Volatile Organics	Method 8010 - Halogenated Volatile Organics	Method 8080 - Organochlorine Pesticides & PCB's	Waste Oil -	Metals -	Remarks
MW-1	01A-C	4/27		✓	3 VOA	X								
MW-2	02A-C	↓		↓	↓	X								
MW-3	03A-C	↓		↓	↓	X								

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	4-28-95 1700	[signature]
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	4-28-95 1130	[signature]
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) 4-28-95 1130 [signature]

Ship To: _____

Attention: _____

Phone No: _____

Requested Turnaround Time: STANDARD

Kaldveer Assoc. Contact: DEREK ARMENTROUT

Please address correspondence and return cooler # _____ to:

Remarks: BILL TO MILLS COLLEGE. DAVE JOHNSON

Kaldveer Associates, Inc.
425 Roland Way
Oakland, California 94621
(415) 568-4001

Kaldveer Associates
Geoscience Consultants
A California Corporation

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172 AIHA Accreditation: 11134

HARZA
425 ROLAND WAY
OAKLAND, CA 94621

ATTN: MS. LIDA KAGAN
CLIENT PROJ. ID: K275-H
CLIENT PROJ. NAME: MILLS COLLEGE

REPORT DATE: 05/10/95

DATE(S) SAMPLED: 04/27/95

DATE RECEIVED: 04/28/95

AEN WORK ORDER: 9504343

PROJECT SUMMARY:

On April 28, 1995, this laboratory received 1 water sample(s).

Client requested sample(s) be analyzed for organic 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.

Larry Klein
Laboratory Director

HARZA

SAMPLE ID: MW-5
AEN LAB NO: 9504343-01
AEN WORK ORDER: 9504343
CLIENT PROJ. ID: K275-H

DATE SAMPLED: 04/27/95
DATE RECEIVED: 04/28/95
REPORT DATE: 05/10/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	ND	0.5	ug/L	05/03/95
Toluene	108-88-3	ND	0.5	ug/L	05/03/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	05/03/95
Xylenes, Total	1330-20-7	ND	2	ug/L	05/03/95
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	05/03/95

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

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9504343

CLIENT PROJECT ID: K275-H

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

AEN JOB NO: 9504343
INSTRUMENT: H
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
05/03/95	MW-5	01	100
QC Limits:			92-109

DATE ANALYZED: 05/03/95
SAMPLE SPIKED: 9504343-01
INSTRUMENT: H

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	36.3	104	3	85-109	17
Toluene	103.0	104	3	87-111	16
Hydrocarbons as Gasoline	1000	99	<1	66-117	19

Daily method blanks for all associated analytical runs showed no contamination over the reporting limit.

*** END OF REPORT ***

R3,5-1

Page ____ of ____

Lab Job # 9504343

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name	Location
K275-11	MILLS COLLEGE	OAKLAND

Sampler's Name (printed): DEREK ARMENTROUT

KA Sample I.D. Number	Lab Sample I.D. Number	Date	Soil	Water	Number/Type of Container	Analytical Tests	Method 8015 – TPH as Gasoline/BTEX	Method 8015 – TPH as Diesel	Method 8240 – Volatile Organics	Method 8270 – Semi – Volatile Organics	Method 8010 – Halogenated Volatile Organics	Method 8080 – Organochlorine Pesticides & PCB's	Waste Oil –	Metals –				Remarks
MW-5	01A-C	4/27		✓	3 VOA	X												

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	4-28-95 10:45	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	4-28-95 11:30	
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) 4-28-95 Lynn Gillespie 1130

Ship To: _____

Attention: _____

Phone No: _____

Requested Turnaround Time: STAND.

Kaldveer Assoc. Contact: DEREK

Remarks: BILL TO MILLS COLLEGE

Please address correspondence and return cooler # _____ to:

Kaldveer Associates, Inc.
425 Roland Way
Oakland, California 94621
(415) 568-4001

Kaldveer Associates
Geoscience Consultants
A California Corporation