

August 17, 1994

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

Re: Monitoring Well Installation and Ground Water Sampling Report
Mills Hall/Toyon Meadow, Oakland, California
Project No.: K275-G

ALAMEDA
HAZMAT
94 AUG 19 PM 3:35

Dear Mr. Johnson:

Enclosed please find a report for the above referenced project. We are submitting copies to Juliet Shin of the Alameda County Department of Environmental Health and to the Regional Water Quality Control Board on your behalf.

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

Sincerely,

Harza Consulting Engineers and Scientists



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

DL:lk\encl.

Copies: Addressee (2)

Ms. Juliet Shin (ACDEH - 1)

RWQCB (1)

K275-G reports\259641
08-17-94

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**Monitoring Well Installation
and Ground Water Sampling Report**
Mills College Corporation Yard
Oakland, California

Harza
August 19, 1994

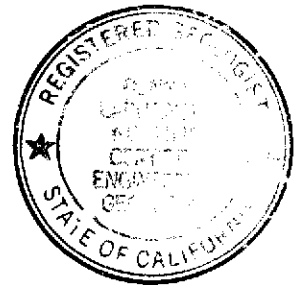
August 17, 1994

Prepared For:

Mills College
5000 MacArthur Boulevard
Oakland, CA 94613

Prepared By:

Harza Consulting Engineers and Scientists
425 Roland Way
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Derek D. Armentrout
Staff Chemist

Dennis Laduzinsky, C.E.G.
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**Monitoring Well Installation
and Ground Water Sampling Report
Mills College Corporation Yard
Oakland, California**

1.0 INTRODUCTION

This report presents the results of the monitoring well installation and 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 installation of one additional ground water monitoring well below the Corporation Yard, downgradient from the former tank location, and collecting and analyzing ground water samples from the new well and three existing wells. The investigation was requested by the Alameda County Department of Environmental Health (ACDEH) in their letter of April 23, 1993.

2.0 BACKGROUND

In October 1988, a 1,000-gallon gasoline underground storage tank 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 ACDEH 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 consistently been toward the south, beneath the existing Corporation Yard buildings.

3.0 SCOPE OF SERVICES

The work performed during this investigation was based on the results of a meeting with Juliet Shin of ACDEH at the Mills College offices office on January 8, 1993, the ACDEH letter of April 23, 1993, and our previous experience at the site. The investigation consisted of the following tasks:

- Install one ground water monitoring well to a depth of approximately 45 feet bgs in the Seminary Avenue right-of-way, immediately below the Corporation Yard office building.
- Survey 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.
- Develop the new well and collect ground water samples from the new well and the three existing wells previously installed at the Corporation Yard.
- Analyze the ground water samples for TPHg using EPA Method 5030/GC-FID, and for purgeable aromatic compounds using EPA Method 8020.
- Prepare this report.

4.0 FIELD INVESTIGATION

4.1 Well Installation

On May 2, 1994, well MW-4 was installed in the Seminary Avenue right-of-way to evaluate the downgradient extent of petroleum hydrocarbons in the ground water. The well was installed by a licensed drilling contractor using a truck-mounted drill rig equipped with 8-inch diameter hollow-stem augers in accordance with ACDEH guidelines. Soils encountered during the

drilling were classified in the field by visual examination in accordance with the Unified Soil Classification System. The boring log is included in Appendix A.

The surficial soils encountered during drilling generally consisted of sandy clay. Leona Rhyolite bedrock was encountered at a depth of 10 feet. Ground water was encountered at a depth of approximately 45 feet bgs at the time of drilling, and stabilized at approximately 14 feet within 3 hours. The well was completed at a depth of approximately 46.5 feet using 2-inch I.D. Schedule 40, threaded, PVC casing. A 0.020-inch slotted well screen was installed between the depths of approximately 26.5 to 46.5 feet. A filter pack consisting of washed #2/12 sand was placed in the annular space around the well casing to a level approximately one foot above the slotted screen. One foot of bentonite above the sand pack followed by neat cement to the ground surface completed the well construction. Well construction details are presented on the boring log (Appendix A).

4.2 Well Development and Sampling

Monitoring well MW-4 was developed on May 4, 1994 using a bailer. Development consisted of the rapid removal of approximately five casing volumes of water from the well.

The four monitoring wells were sampled on May 18 and 20, 1994. 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. Purging consisted of the gradual removal of water from the well until physical parameters such as pH, temperature and electrical conductivity had 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 in 55-gallon drums. Monitoring well development and sampling logs are attached to this report in Appendix A.

Measurements of pH in the wells collected during well purging were uncharacteristically low, and the pH values showed large fluctuations as the probe was placed in each sample. The pH meter was recalibrated, but this did not correct the problem. It is therefore believed that the pH probe was not functioning properly, and the measured pH values are not indicative of actual ground water pH.

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 May 18 appeared inconsistent with historical levels. Ground water levels were therefore measured again on June 3, 1994. 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 Contour Map presented on Figure 2. Ground water elevation data collected during this investigation indicate ground water has a gradient of 0.002 foot per foot to the southwest. This flow direction is slightly westward of the direction that has historically been observed at the site.

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 (Cal-EPA) for the analyses performed. Samples from each well were analyzed for TPHg using EPA Method 5030/GC-FID, and for purgeable aromatic compounds using EPA Method 8020.

5.2 Analytical Results

The results of the chemical analyses are presented in Table 2 and laboratory analytical results are attached to this report 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 3.6 ppm. Benzene, toluene, ethylbenzene, and xylenes (BTEX) were detected in the sample from MW-1 at concentrations of 0.6, 0.11, 0.11 and 0.15 ppm, respectively. A petroleum odor and a slight hydrocarbon sheen on the water surface were recognized during the purging of the well.

TPHg was detected in the sample from well MW-2 at 0.2 ppm. Benzene and toluene were also detected in the sample at 0.084 and 0.0006 ppm. Benzene (0.005 ppm) was the only compound detected in the sample from well MW-3. No TPHg or BTEX compounds were detected in the sample from well MW-4.

5.3 Discussion

The sampling performed between June 1989 and May 1994 have shown a fluctuation in reported TPHg concentrations in well MW-1 from 1.6 to 16 ppm. The reported changes in concentration may be related to changes in ground water elevation, although a consistent correlation is not evident in the data. Changes in relative concentrations of purgeable aromatics generally reflect the changes in TPHg concentrations.

Results for MW-2 show a general increase from below the method reporting limit to 0.2 ppm TPHg. For the same period, benzene concentrations also show a possible positive trend.

Hydrocarbon concentrations measured in MW-3 do not show an apparent trend at this time.

Groundwater elevations measured during this investigation indicate an apparent shift in flow direction toward the southwest, from the general southerly flow direction historically measured at the site.

6.0 RECOMMENDATIONS

We recommend that the frequency of ground water sampling and analysis 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). Because the ground water flow direction and gradient has shown more variability, we recommend that ground water elevations measurements and development of ground water contours be continued on a quarterly 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. If contaminant concentrations increase significantly, or if TPHg or BTEX is detected in the downgradient well (MW-4), a quarterly sampling schedule would be resumed.

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

HARZA

Table 1
GROUND WATER ELEVATION DATA
Monitoring Well Installation and Ground Water Sampling Report
Mills College Corporation Yard, Oakland, California
(all values reported in feet)

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
June 1994⁽²⁾:			
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

NOTES

- (1) Well-top elevations based on arbitrary datum of 100.00 feet at MW-1.
- (2) Well-top elevations were resurveyed by a licensed surveyor in May 1994.

Table 2
SUMMARY OF GROUND WATER SAMPLE ANALYSES
Monitoring Well Installation and Ground Water Sampling Report
Mills College Corporation Yard, Oakland, California
(reporting in parts per million, mg/l)

Monitoring Well/Date	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes
MW-1:					
June 1989	11.0	2.1	1.9	0.031	1.4
December 1990	2.5	0.4	0.21	0.056	0.31
June 1991	16.0	2.0	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
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
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
MW-4:					
May 1994	ND	ND	ND	ND	ND

NOTES

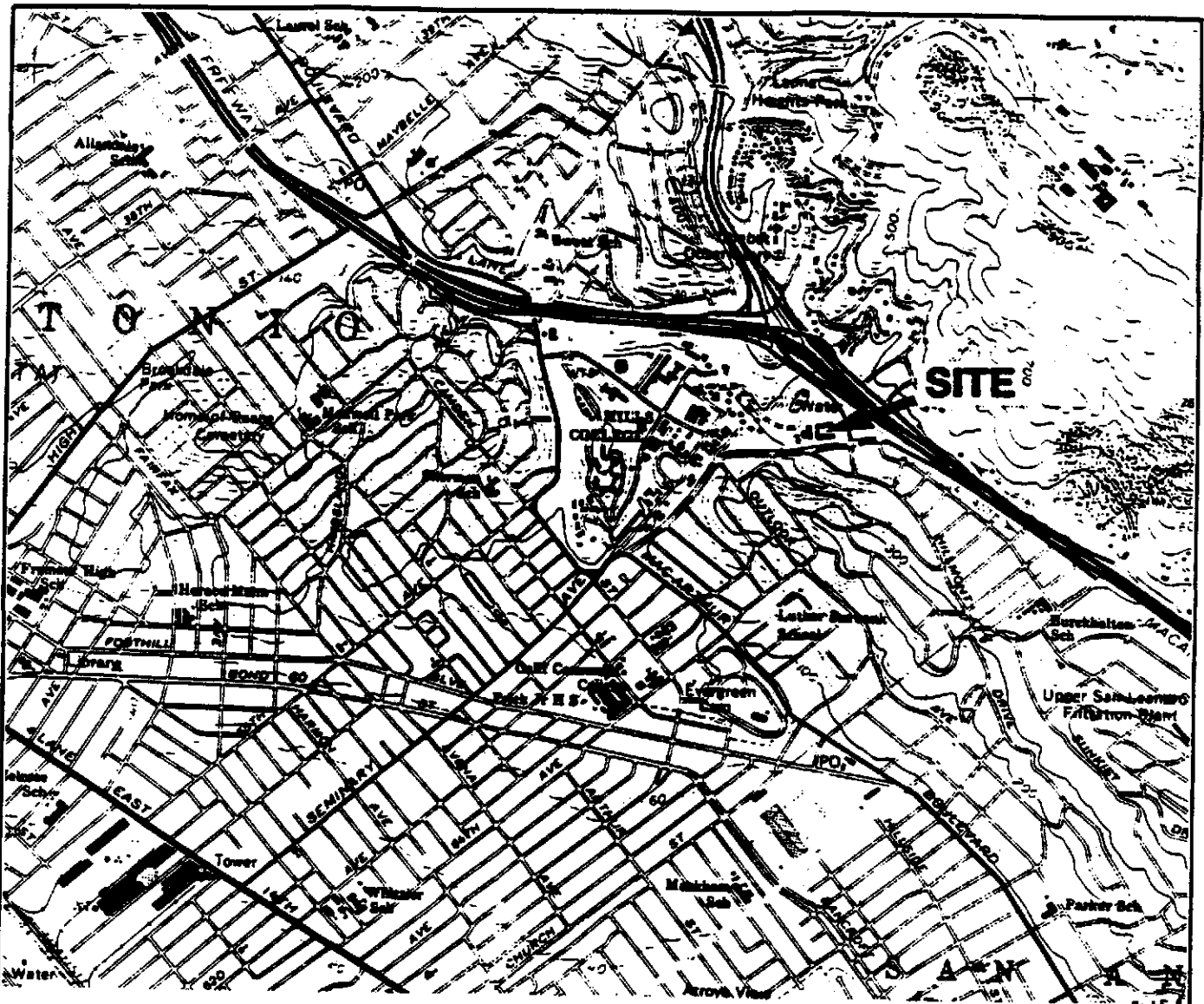
TPHg: Total Petroleum Hydrocarbons as Gasoline

ND: Not detected; see laboratory reports for specific method reporting limits

(D): Duplicate sample analytical results

FIGURES

HARZA



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

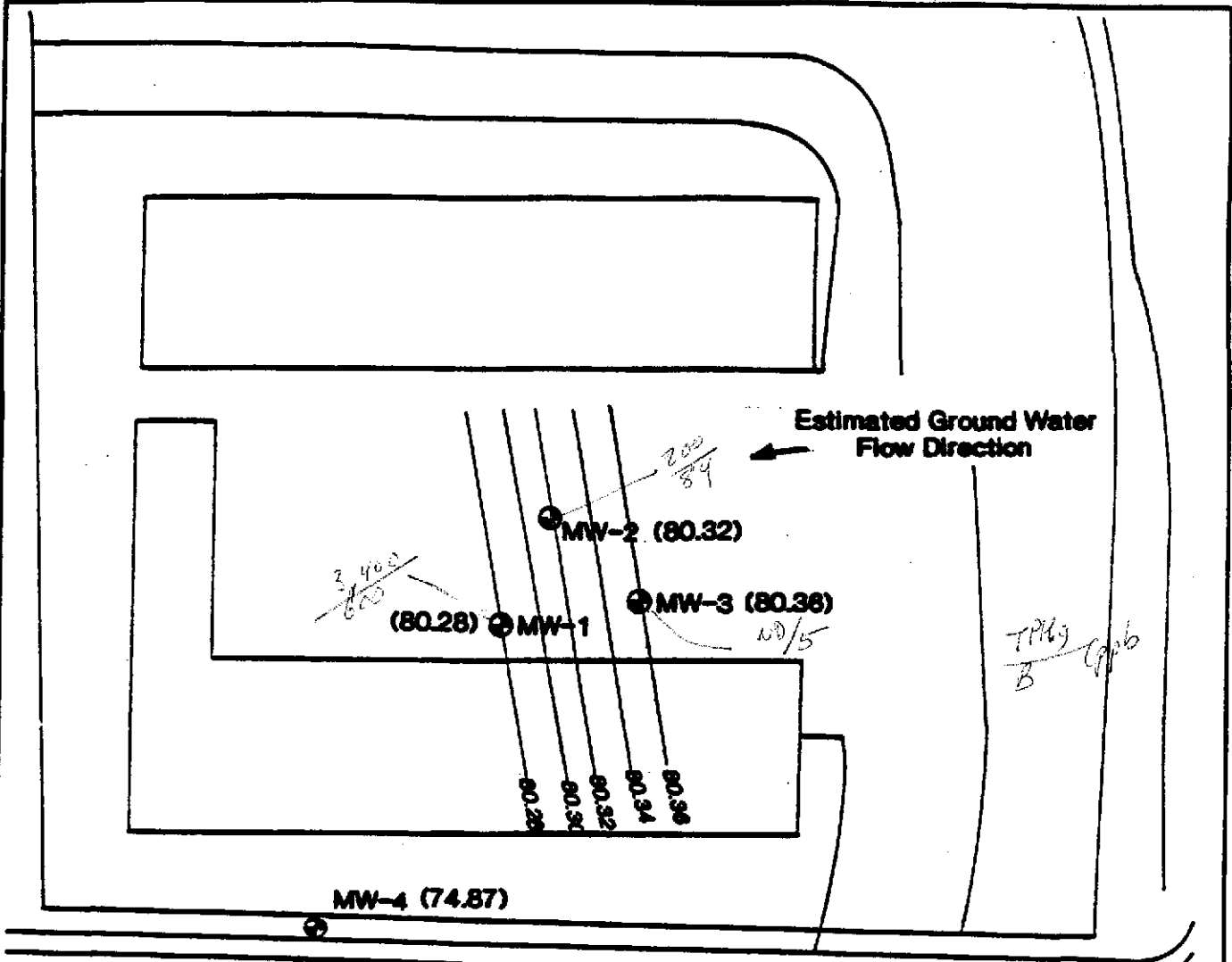
HARZA

Consulting Engineers and Scientists

SITE VICINITY MAP

**MILLS COLLEGE
CORPORATION YARD FACILITY
Oakland, California**

PROJECT NO.	DATE	Figure 1
K275-H	June, 1994	

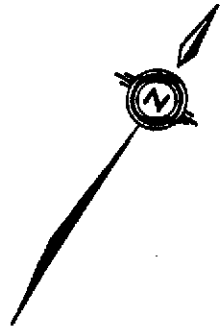


SEMINARY AVENUE

LEGEND

⊙ Monitoring Well Location
With Relative Ground Water Elevation

80.36 ——— Ground Water Contour 6/3/94



<p>HARZA</p> <p><i>Consulting Engineers and Scientists</i></p>	SITE PLAN		
	<p>MILLS CORPORATION YARD Oakland, California</p>		
	PROJECT NO.	DATE	Figure 2
	K275-H	June 1994	

APPENDIX A
Boring Logs and Well Sampling Logs

HARZA

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions		grf	ltr	Description	Major Divisions	grf	ltr	Description			
Coarse Grained Soils	Gravel And Gravely Soils	GW	GP	Well-graded gravels or gravel sand mixtures, little or no fines	Fine Grained Soils	Sills And Clays LL < 50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity			
				Poorly-graded gravels or gravel sand mixture, little or no fines				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
				Silty gravels, gravel-sand-silt mixtures					OL	Organic silts and organic silt-clays of low plasticity	
				Clayey gravels, gravel-sand-clay mixtures				Sills And Clays LL > 50		MH	Inorganic silts, micaceous or diatomaceous fine or silty soils, elastic silts
	Sand And Sandy Soils	SW	SP	SM		SC	CH		Inorganic clays of high plasticity, fat clays		
									Well-graded sands or gravelly sands, little or no fines	OH	Organic clays of medium to high plasticity
									Poorly-graded sands or gravelly sands, little or no fines		PT
	Silty sands, sand-silt mixtures	Highly Organic Soils	PT	PT							
	Clayey sands, and-clay mixtures										

SYMBOLS

<ul style="list-style-type: none"> Standard penetration split spoon sample Modified California (Porter) sample Shelby tube sample Water level observed in boring Stable water level 	<ul style="list-style-type: none"> Blank casing Screened Casing Cement grout Bentonite Filter Pack
---	--

Visual Relative Moisture Content Increasing Moisture Content



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 data of drilling only.

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Consulting Engineers & Scientists

BORING LOG LEGEND

MILLS CORPORATION YARD
Oakland, California

PROJECT NO.

DATE

FIGURE

K275H

June 1994

NO

A-1

DRILL RIG	CME 75	SURFACE ELEVATION	LOGGED BY	TCM
DEPTH TO GROUNDWATER	14.0 Feet	BORING DIAMETER	DATE DRILLED	5/2/94

DESCRIPTION AND CLASSIFICATION	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLDMS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE					
FILL: SANDY CLAY/CLAYEY SAND (CL/SC), mottled tan, gray, brown, damp, very fine- to fine-grained, trace gravel, trace white rootlets, rock and silt.						
CLAYEY SAND (SC), mottled gray-brown, dry/damp, trace gravel.	5		12	0		
GRANITIC ROCK gray and white, dry, decomposed, trace clay.	10		26	0		
As above, color change to orangish-brown, trace black speckles, dry/damp.	15		27	0		
As above, orangish-brown, damp very decomposed.	20		32	0		
As above, multicolored, damp/moist, with clay.	25		21	0		
As above, mottled dark brown and gray, damp, trace black speckles.	30		21	0		
As above, dark gray and brown, damp to moist.	35		28	0		

HARZA
Consulting Engineers & Scientists

EXPLORATORY BORING LOG

MILLS CORPORATION YARD
Oakland, California

PROJECT NO.

DATE




BORING NO

K275G

June 1994

MW-4

DRILL RIG	CME 75	SURFACE ELEVATION		LOGGED BY	TCM
DEPTH TO GROUNDWATER	14.0 Feet	BORING DIAMETER	8-inch	DATE DRILLED	5/2/94

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
As above, with clay.				26	0		
As above, more clay, saturated.		45					
Bottom of Boring = 46.5 Feet				26	0		
Notes: 1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual. 2. PID readings in parts per million (ppm). 3. Well Construction Details -2-inch PVC, Schedule 40 solid and slotted (0.020-inch) casing -2/12 washed sand filter pack -bentonite pellets plug -cement grout surface seal with steel, traffic rated cover							



EXPLORATORY BORING LOG

**MILLS CORPORATION YARD
Oakland, California**

PROJECT NO.	DATE	BORING NO.	MW-4
K275G	June 1994		

WELL DEVELOPMENT LOG

Project Name: Mills College - CORP YARD
 Project Number: K275A
 Well Number: MW-4
 Well Location: SEMINARY AVE.

Date: 5/4/94
 Sampler: Derek Armentrout
 Weather: CLOUDY, 60's

Well Construction

Date Completed: 5/2/94
 Total Depth of Well: _____
 Diameter: 2"
 Well Elevation and Reference: _____

Sampling Equipment & Cleaning

Sampler Type: not sampled
 Method of Cleaning: _____
 Pump/Bailer Type: PVC bailer
 Method of Cleaning: TSP wash/DI rinse
 pH Meter: _____
 Conductivity Meter: _____
 Comments: _____

Ground Water Levels:

Initial: 14.54
 Final: 35.40
 Reference Point: top of casing
 Well Volume of Water: 4.9

WELL UNDER PRESSURE WHEN REMOVED CAP.
WATER LEVEL INITIALLY AT ~24' BELOW
TOC, ROSE ~ 0.1 ft/min. STABILIZED
AT 14.54'

SAMPLING MEASUREMENTS

Time	Discharge (gal.)		pH	Temp (°F)	Spec. Conductance (µmhos/cm)		Color/Turbidity	Odor
	Per Time Period	Cumulative			Field	@ 25°C		
1401	start	0					CLEAR	NONE
1416		5					ORANGE/BROWN, CLOUDY	"
1432		10					ORANGE/BROWN OPAQUE	"
1449		15					BROWN, OPAQUE	"
1508		20					"	"
1528		25					"	"

Total Discharge: 25
 Casing Volumes Removed: 5

Comments: TURBIDITY DID NOT NOTICEABLY DECREASE

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

WATER SAMPLE LOG

Project Name: Mills College - Corp Yard
 Project Number: K275-H
 Well Number: MW-1
 Well Location: _____

Date: 5/18²⁰/94
 Sampler: Derek Armentrout Hugo Hsu
 Weather: PTLY CLDY, 70

Well Construction

Sampling Equipment & Cleaning

Date Completed: _____
 Total Depth of Well: 32.5
 Diameter: 2"
 Well Elevation and Reference: _____

Sampler Type: Teflon bailer
 Method of Cleaning: TSP wash/DI rinse
 Pump/Bailer Type: Teflon bailer
 Method of Cleaning: TSP wash/DI rinse
 pH Meter: triple tester
 Conductivity Meter: _____
 Comments: _____

Ground Water Levels:

Initial: 19.66 (5/18/94) 19.13 (5/20) SHEEN ON WATER
 Final: 20.21'
 Reference Point: TOC
 Well Volume of Water: 2.2 gal

SAMPLING MEASUREMENTS

Time	Discharge (gal.)		pH	Temp (°F)	Spec. Conductance (µmhos/cm)		Color/Turbidity	Odor
	Per Time Period	Cumulative			Field	@ 25°C		
	start	0						
1118		2	3.49	63.6	3870		BLACK-GRAY / HIGH	PETROLEUM
1128		4	3.45	65.9	4420		"	"
1137		7	3.11	66.4	4520		"	"

Total Discharge: 7
 Casing Volumes Removed: 3
 Method of Disposal: drummed on site

Comments: _____

HARZA <i>Consulting Engineers and Scientists</i>	WATER SAMPLE LOG		
	Project No.	Date	Figure

WATER SAMPLE LOG

Project Name: Mills College - CORP YARD
 Project Number: K275-H
 Well Number: MW-1
 Well Location: _____

Date: 5/18/94
 Sampler: Derek Armentrout HUGO HBU
 Weather: PTLY CLDY, 70

Well Construction

Date Completed: _____
 Total Depth of Well: 32.5
 Diameter: 2"
 Well Elevation and Reference: _____

Sampling Equipment & Cleaning

Sampler Type: Teflon bailer
 Method of Cleaning: TSP wash/DI rinse
 Pump/Bailer Type: Teflon bailer
 Method of Cleaning: TSP wash/DI rinse
 pH Meter: triple tester
 Conductivity Meter: "
 Comments: _____

Ground Water Levels:

Initial: 19.66 (5/18/94) 19.73 (5/20) SHOWN ON WATER
 Final: 20.21
 Reference Point: TOC
 Well Volume of Water: 2.7 gal

SAMPLING MEASUREMENTS

Time	Discharge (gal.)		pH	Temp (°F)	Spec. Conductance (µmhos/cm)		Color/Turbidity	Odor
	Per Time Period	Cumulative			Field	@ 25°C		
	start	0						
1118		2	3.49	63.6	3870		BLACK-GRAY/HIGH	PETROLEUM
1128		4	3.45	65.9	4420		"	"
1137		7	3.11	65.4	4520		"	"

Total Discharge: 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 - CORR YARD
 Project Number: K275-H
 Well Number: MW-2
 Well Location: _____

Date: 5/20/94
 Sampler: Derek Armentrout Hugo Hsu
 Weather: _____

Well Construction

Date Completed: _____
 Total Depth of Well: 34.5'
 Diameter: 2"
 Well Elevation and Reference: _____

Sampling Equipment & Cleaning

Sampler Type: Teflon bailer
 Method of Cleaning: TSP wash/DI rinse
 Pump/Bailer Type: Teflon bailer
 Method of Cleaning: TSP wash/DI rinse
 pH Meter: triple tester
 Conductivity Meter: "
 Comments: _____

Ground Water Levels:

Initial: 19.62' (5/18/94) 19.65 (5/20)
 Final: 21.96'
 Reference Point: TOC
 Well Volume of Water: 2.4 gal

SAMPLING MEASUREMENTS

Time	Discharge (gal.)		pH	Temp (°F)	Spec. Conductance (µmhos/cm)		Color/Turbidity	Odor
	Per Time Period	Cumulative			Field	@ 25°C		
10:05	start	0						
10:15		2 gal	6.60	67.0	1280		light brown/high	None
10:28		4 gal	6.65	66.5	1450		"	"
10:38		6 gal	6.52	67.0	1470		"	"
10:45		8 gal	sampled					

Total Discharge: 8 gallons
 Casing Volumes Removed: 3
 Method of Disposal: drummed on site

Comments: _____

HARZA <i>Consulting Engineers and Scientists</i>	WATER SAMPLE LOG		
	Project No.	Date	Figure

WATER SAMPLE LOG

Project Name: Mills College - CORP YARD
 Project Number: K275 -H
 Well Number: M4-3
 Well Location: _____

Date: 5/20/94
 Sampler: Derek Armentrout
 Weather: _____

Well Construction

Sampling Equipment & Cleaning

Date Completed: _____
 Total Depth of Well: 32.5
 Diameter: 2"
 Well Elevation and Reference: _____

Sampler Type: Teflon bailer
 Method of Cleaning: TSP wash/DI rinse
 Pump/Bailer Type: Teflon bailer
 Method of Cleaning: TSP wash/DI rinse
 pH Meter: triple tester
 Conductivity Meter: "
 Comments: _____

Ground Water Levels:

Initial: 19.60 (5/18/94) 19.62 (5/20)
 Final: 20.54
 Reference Point: TOC
 Well Volume of Water: 2.1 gal

SAMPLING MEASUREMENTS

Time	Discharge (gal.)		pH	Temp (°F)	Spec. Conductance (µmhos/cm)		Color/ Turbidity	Odor
	Per Time Period	Cumulative			Field	@ 25°C		
1003	start	0						
1015		2.5	6.67	66.5	1160		GRAY / HIGH	NONE
1027		4.5	6.70	65.8	1180		GRAY / HIGH	"
1045		7.5	6.58	66.2	1270		"	"

Total Discharge: 7.5 gal
 Casing Volumes Removed: 3
 Method of Disposal: drummed on site

Comments: _____

HARZA <i>Consulting Engineers and Scientists</i>	WATER SAMPLE LOG		
	Project No.	Date	Figure

APPENDIX B
Laboratory Analytical Reports

HARZA

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172

AIHA Accreditation: 11134

PAGE 1

HARZA
425 ROLAND WAY
OAKLAND, CA 94621

ATTN: DEREK ARMENTROUT
CLIENT PROJ. ID: K275-H
CLIENT PROJ. NAME: MILLS-CORP YD.

REPORT DATE: 06/08/94

DATE(S) SAMPLED: 05/18/94-05/20/94

DATE RECEIVED: 05/20/94

AEN WORK ORDER: 9405274

PROJECT SUMMARY:

On May 20, 1994, this laboratory received 4 water sample(s).

Client requested samples be analyzed for organic parameters. Sample identification, methodologies, results and dates analyzed are summarized on the following pages.

Please see quality control report for a summary of QC data pertaining to this project.

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: 9405274-01
AEN WORK ORDER: 9405274
CLIENT PROJ. ID: K275-H

DATE SAMPLED: 05/20/94
DATE RECEIVED: 05/20/94
REPORT DATE: 06/08/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	600 *	0.5	ug/L	05/27/94
Toluene	108-88-3	110 *	0.5	ug/L	05/26/94
Ethylbenzene	100-41-4	110 *	0.5	ug/L	05/26/94
Xylenes, Total	1330-20-7	150 *	2	ug/L	05/26/94
Purgeable HCs as Gasoline	5030/GCFID	3.4 *	0.05	mg/L	05/27/94

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

HARZA

SAMPLE ID: MW-2
AEN LAB NO: 9405274-02
AEN WORK ORDER: 9405274
CLIENT PROJ. ID: K275-H

DATE SAMPLED: 05/20/94
DATE RECEIVED: 05/20/94
REPORT DATE: 06/08/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	84 *	0.5	ug/L	05/26/94
Toluene	108-88-3	0.6 *	0.5	ug/L	05/26/94
Ethylbenzene	100-41-4	ND	0.5	ug/L	05/26/94
Xylenes, Total	1330-20-7	ND	2	ug/L	05/26/94
Purgeable HCs as Gasoline	5030/GCFID	0.2 *	0.05	mg/L	05/26/94

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

HARZA

SAMPLE ID: MW-3
AEN LAB NO: 9405274-03
AEN WORK ORDER: 9405274
CLIENT PROJ. ID: K275-H

DATE SAMPLED: 05/20/94
DATE RECEIVED: 05/20/94
REPORT DATE: 06/08/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	5 *	0.5	ug/L	05/26/94
Toluene	108-88-3	ND	0.5	ug/L	05/26/94
Ethylbenzene	100-41-4	ND	0.5	ug/L	05/26/94
Xylenes, Total	1330-20-7	ND	2	ug/L	05/26/94
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	05/26/94

ND = Not detected at or above the reporting limit

* = Value above reporting limit

HARZA

SAMPLE ID: MW-4
AEN LAB NO: 9405274.04
AEN WORK ORDER: 9405274
CLIENT PROJ. ID: K275-H

DATE SAMPLED: 05/18/94
DATE RECEIVED: 05/20/94
REPORT DATE: 06/08/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	05/26/94
Toluene	108-88-3	ND	0.5	ug/L	05/26/94
Ethylbenzene	100-41-4	ND	0.5	ug/L	05/26/94
Xylenes, Total	1330-20-7	ND	2	ug/L	05/26/94
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	05/26/94

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

**AEN (CALIFORNIA)
QUALITY CONTROL REPORT**

AEN JOB NUMBER: 9405274

CLIENT PROJECT ID: K275-H

Quality Control Summary

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

Definitions

The following abbreviations are found throughout the QC report:

- ND = Not Detected at or above the reporting limit
- RPD = Relative Percent Difference
- < = Less Than

QUALITY CONTROL DATA

CLIENT PROJ. ID: K275-H

AEN JOB NO: 9405274

INSTRUMENT: F

SURROGATE STANDARD RECOVERY SUMMARY
METHOD: EPA 8020, 5030 GCFID
(WATER MATRIX)

Date Analyzed	SAMPLE IDENTIFICATION		SURROGATE RECOVERY (PERCENT)
	Sample Id.	Lab Id.	Fluorobenzene
05/26/94	MW-1	01	112
05/26/94	MW-2	02	95
05/26/94	MW-3	03	95
05/26/94	MW-4	04	99

CURRENT QC LIMITS

<u>ANALYTE</u>	<u>PERCENT RECOVERY</u>
Fluorobenzene	(70-115)

QUALITY CONTROL DATA

DATE ANALYZED: 05/25/94
SAMPLE SPIKED: LCS
CLIENT PROJ. ID: K275-H

AEN JOB NO: 9405274
INSTRUMENT: F

LABORATORY CONTROL SAMPLE
METHOD: EPA 8020, 5030 GCFID
(WATER MATRIX)

ANALYTE	Spike Added (ug/L)	Percent Recovery
Benzene	10.0	80
Toluene	34.7	82
Hydrocarbons Gasoline	500	88

CURRENT QC LIMITS

<u>Analyte</u>	<u>Percent Recovery</u>
Benzene	(65-122)
Toluene	(67-124)
Gasoline	(60-125)

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

*** END OF REPORT ***

CHAIN-OF-CUSTODY RECORD

Project Number
K275-H

Project Name
MILLS -CORP YARD

Location
OAKLAND

Sampler's Name (printed)
DEREK ARMENTROUT
HUGO HSU

KA Sample I.D. Number	Lab Sample I.D. Number	Date	Soil	Water	Number/Type of Container	Analytical Tests										Remarks										
						Method 8015 - TPH as Gasoline	Method 8015 - TPH as Diesel	Method 8240 - Volatile Organics	Method 8270 - Semi-Volatile Organics	Method 8010 - Inorganic	Method 8080 - Organochlorine Pesticides & PCB's	Waste Oil -	Metals -	8020 - BTEX												
MW-1	01AB	5/20/04		✓	2 VOA	X																				
MW-2	02AB	↓		✓	↓	X																				
MW-3	03AB	↓		✓	↓	X																				
MW-4	04AB	5/18/04		✓	↓	X																				

Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 5/20/04 1445	Received by: (Signature) <i>[Signature]</i>
Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 5/20/04 18:45	Received by: (Signature) <i>[Signature]</i>
Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 5/20/04 1845	Received for Laboratory by: (Signature) <i>[Signature]</i>

Ship To: _____

Attention: _____

Phone No: _____

Requested Turnaround Time: **STANDARD**

Kaldveer Assoc. Contact: **DEREK ARMENTROUT**

Please address correspondence and return cooler # _____ to:

Remarks:

Kaldveer Associates, Inc.
425 Roland Way
Oakland, California 94621
(415) 588-4001



Kaldveer Associates
Geoscience Consultants
A California Corporation