SOIL AND GROUND WATER QUALITY INVESTIGATION FOR MILLS HALL/TOYON MEADOW MILLS COLLEGE OAKLAND, CALIFORNIA

Apr 1992

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Geoscience Consultants
Geotechnical and Environmental Engineering
Oakland, CA • San Jose, CA • Bellevue, WA • Tacoma, WA

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April 16, 1992
KE1025-3B-718, 19000

Mills College
5000 MacArthur Boulevard
Oakland, California 94613

Attention: Mr. Tom Biddle

RE: SOIL AND GROUND WATER
QUALITY INVESTIGATION
MILLS HALL/TOYON MEADOW
MILLS COLLEGE
OAKLAND, CALIFORNIA

Dear Mr. Biddle:

Kaldveer Associates is pleased to submit our soil and ground water quality investigation report for the Mills Hall/Toyon Meadow project on the Mills College Campus, in Oakland, California. The enclosed report contains a description of our investigation, results of soil and ground water sample analyses, and our conclusions and recommendations regarding site environmental quality.

We appreciate the opportunity to provide continued services to you on this project and trust this report meets your needs at this time. If you have any questions or require additional information, please don't hesitate to call.

Very truly yours,

KALDVEER ASSOCIATES, INC.

Dennis Laduzinsky, C.E.G.
Senior Engineering Geologist

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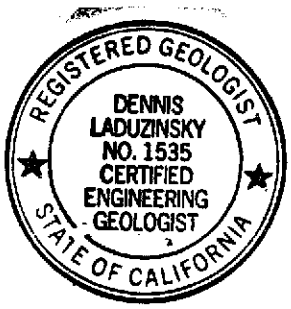
Waste Services
Associate

DL/JRS:pv
Copies: Addressee (4)

SOIL AND GROUND WATER QUALITY INVESTIGATION

For
MILLS HALL/TOYON MEADOW
MILLS COLLEGE
OAKLAND, CALIFORNIA

To
Mills College
5000 MacArthur Boulevard
Oakland, California 94613



April, 1992

EXECUTIVE SUMMARY

A small capacity underground fuel-oil storage tank was removed from the parking lot of the former Mills Kitchen building in June, 1989. This area is now developed as an open lawn and landscape area referred to as Toyon Meadow. A series of contaminated soil excavation, and soil and ground water quality investigation programs performed between June, 1989 and March, 1992 yield the following conclusions:

1. Approximately 250 cubic yards of soil contaminated with diesel fuel have been excavated from the vicinity of the former tank and removed from the site under manifest.

2. The results of a soil quality investigation program indicate that petroleum hydrocarbons as diesel fuel remain in the subsurface, between the depths of about 12 to 15 feet below ground surface, for a distance of at least 60 feet down-gradient from the former tank location. This depth zone represents the probable level of ground water fluctuation on a seasonal basis.

   Measured concentrations of diesel fuel in these soil samples ranged from 16 ppm to 2,400 ppm, with one sample reported to contain 11,000 ppm.

3. Based on measurements made in June, 1991 and March, 1992 ground water is present at a depth of about 10 to 12 feet below the ground surface and flows to the west at a gradient of about 0.05 ft/ft.

4. Ground water samples collected in June, 1991 from Monitoring Well MHW-2, installed at the former tank location, contained 3.2 ppm TPH as diesel. Wells located about 60 feet southwest, and 140 feet northwest of the former tank location contained 0.06 ppm and non-detectable levels of TPH as diesel, respectively.

   Benzene, toluene, ethylbenzene, and xylenes were not detected in any of the water samples collected, with the

exception of 0.001 ppm xylene reported for the sample from the well located at the former tank.

5. Ground water samples collected from Monitoring Well MHW-2 in March, 1992 contained 0.1 ppm TPH as diesel. TPH as diesel was not detected in samples from the other two wells. Benzene, toluene, ethylbenzene or xylenes were not detected in any of the water samples.

6. Analysis of surface water samples collected in Aliso Creek, both upstream and downstream from the former tank area did not contain TPH as diesel or purgeable aromatic compounds in detectable quantities. The samples did contain 0.10 ppm heavy hydrocarbons as oil; typical of urban runoff systems.

Based on the information gathered during this study, it appears that although elevated levels of hydrocarbons as diesel remain in subsurface soils at the site, ground water does not appear to have been significantly impacted. On-site wells should be sampled semi-annually (wet and dry period cycles) for the next year.

TABLE OF CONTENTS

Page No.

Letter of Transmittal

TITLE PAGE

EXECUTIVE SUMMARY

TABLE OF CONTENTS

I. INTRODUCTION 1

II. SCOPE OF SERVICES 3

III. CONTAMINATED SOIL EXCAVATION AND SOIL QUALITY INVESTIGATION 3

IV. GROUND WATER QUALITY INVESTIGATION 6
A. Description of the Investigation 6
B. Subsurface Conditions 7
C. Monitoring Well Construction 7
D. Well Development and Sampling 8
E. Ground Water Gradient 8
F. Surface Water Sampling 9
G. Ground and Surface Water Quality Investigation Results 9

V. LIMITATIONS 10

TABLE 1 - ANALYTICAL RESULTS - SOIL
TABLE 2 - GROUND WATER ELEVATION DATA
TABLE 3 - ANALYTICAL RESULTS - WATER

FIGURE 1 - SITE VICINITY MAP
FIGURE 2 - SITE PLAN
FIGURE 3 - LOCATION OF SOIL BORINGS
FIGURE 4 - TPH DIESEL IN SOIL AT 10 FOOT DEPTH
FIGURE 5 - TPH DIESEL IN SOIL AT 13 TO 15 FOOT DEPTH
FIGURE 6 - SUBSURFACE CROSS-SECTIONS
FIGURE 7 - LOCATION OF GROUND WATER MONITORING WELLS
FIGURE 8 - GROUND WATER ELEVATION CONTOURS - JUNE 1991
FIGURE 9 - GROUND WATER ELEVATION CONTOURS - MARCH 1992

APPENDIX A - BORING LOGS AND WELL CONSTRUCTION DETAILS

APPENDIX B - WELL DEVELOPMENT AND SAMPLING LOGS

APPENDIX C - ANALYTICAL RESULTS

SOIL AND GROUND WATER
QUALITY INVESTIGATION
FOR
MILLS HALL/TOYON MEADOW
MILLS COLLEGE
OAKLAND, CALIFORNIA

I. INTRODUCTION

This report presents the results of an investigation of soil and ground water quality related to removal of an underground fuel-oil storage tank at the Mills Hall/Toyon Meadow area of the Mills College Campus, located at 5000 MacArthur Boulevard in Oakland, California. A general site vicinity map is shown on Figure 1.

The former tank site is located on the north side of Mills Hall, in an open lawn area known as Toyon Meadow. Prior to development of the site as landscape area, the underground fuel-oil tank was located beneath a paved parking area associated the former Mills Kitchen building. Toyon Meadow is presently bordered on the west by Aliso Creek, and by buildings and arterial streets on the north, south, and west. A map of the Mills Hall/Toyon Meadow area is shown on Figure 2.

This report summarizes on-site investigation and clean-up activities performed between June, 1989 and March, 1992. The purpose of this investigation has been to observe and document the excavation and removal of hydrocarbon-contaminated soil related to the tank, and to collect and analyze additional shallow soil and ground water samples to evaluate the distribution of hydrocarbons remaining in the ground at the site. This investigation included the excavation, and removal from the site, of approximately 250 cubic yards of diesel-fuel contaminated soil, installation of three ground water monitoring wells and 11 additional shallow soil borings, with analysis of soil and ground water samples for petroleum hydrocarbons as diesel fuel and purgeable aromatic compounds.

The investigation work described in this report was performed over a period of time from June, 1989 to March, 1992. This work includes the following general sequence of events:

June 15, 1989 - Removal of a small capacity underground storage tank by others. Closure samples collected at the time of removal were reported to contain 860 ppm and 6,300 ppm total petroleum hydrocarbons as diesel.

June 27, 1989 - Excavation and stockpiling of 100 cubic yards of diesel-fuel contaminated soil from around the former tank location.

July 10, 1989 - Perform on-site soil boring investigation to delineate extent of soil contamination. Install Monitoring Well MHW-1.

July 13, 1989 - Meet with Alameda County Department of Environmental Health (ACDEH) officials to discuss investigation findings.

July 14, 1989 - Submit to ACDEH, Work Plan for Soil Excavation and Tank Area Backfilling.

July 19, 1989 - Excavation and stockpiling of an additional 150 cubic yards of contaminated soil from former tank area. Backfilling of excavation. Removal from site (under manifest) of 250 cubic yards of contaminated soil.

December 20, 1990 - Resample Well MHW-1.

December 26, 1990 - Notice of Violation issued by ACDEH, requesting update on site investigation.

January 17, 1991 - Meet with ACDEH staff to discuss additional investigation to define contamination extent.

May 6, 1991 - Preparation of Work Plan for Soil and Ground Water Quality Investigation, Mills Hall/Toyon Meadow.

June 4 through 13, 1991 - Install two additional monitoring wells in performance of on-site soil and ground water quality investigation to define contamination extent.

March 24,1992 - Sample Monitoring Wells MHW-1, MHW-2 and MHW-3.

II. SCOPE OF SERVICES

The work performed during the course of this project includes:

1. Observation of contaminated soil excavation and removal following removal of an underground storage tank.

2. Drilling 11 borings to depths of about 15 feet for soil sample collection.

3. Installation of three ground water monitoring wells to depths of approximately 25 feet.

4. Development and sampling of three ground water monitoring wells.

5. Level-line surveying of well-top elevations and obtaining water-level measurements.

6. Collection of surface water samples from Aliso Creek.

7. Analysis of soil and ground water samples by a contract analytical laboratory.

8. Preparation of this report.

III. CONTAMINATED SOIL EXCAVATION AND SOIL QUALITY INVESTIGATION

On June 15, 1989, a small-capacity underground fuel storage tank was removed from the site by Fuller Excavating and Demolition Inc. of San Jose. Closure samples collected by Fuller at the time of tank removal were reported to contain 860 parts per million (ppm) and 6,300 ppm total petroleum hydrocarbons (TPH) as diesel. Kaldveer representatives did not observe removal of the tank.

On June 27, 1989, Kaldveer began observation of a contaminated soil excavation program performed by Erickson Environmental of Richmond, California. Contaminated soil was excavated by backhoe and stockpiled on-site. Exploratory trenches dug around the former tank pit area indicated that in the vicinity of the former tank, contaminated soil was present beginning at a depth of about 7 to 9 feet below the surface and extending to about a 15 foot depth (two feet below the ground water table present at that time). At a distance of about 20 feet beyond the former tank location, the contaminated zone was present only between depths of 12 to 15 feet below the surface, and appeared as a 3-foot thick layer distributed along the probable zone of ground water fluctuation. At that time, Kaldveer performed a drilling and soil sampling program to evaluate the areal extent of hydrocarbon contamination. Eleven soil borings were drilled at the approximate locations shown on Figure 3. Borings were drilled using a truck-mounted drill rig equipped with 8-inch diameter, hollow-stem augers. Samples were collected in a 2-inch I.D. Modified California Sampler containing thin, brass liners. Samples were collected at depths of about 10 feet, and 13 to 14.5 feet in each boring and immediately analyzed for TPH as diesel in an on-site mobile laboratory using EPA Method 8015. Logs of the borings are attached in Appendix A.

Results of the soil sample laboratory analyses are presented on Table 1 and are shown graphically on Figures 4 and 5. The laboratory reports are attached to this report as Appendix C. The results confirmed that beyond a distance of about 20 feet from the former tank location, hydrocarbons were restricted to an approximate three foot thick zone along the ground water surface, beginning about 12 to 13 feet below the surface. Elevated levels of diesel were present in soil for a distance of at least 60 feet south and west of the former tank. The distribution of hydrocarbons at the 10 foot depth, and the 12 to 15 foot depth are shown graphically on Figures 4 and 5. With the exception of two samples (containing 190 ppm and 240 ppm, respectively) hydrocarbons were not detected in the 10 foot deep samples. Samples collected from the 13 to 14.5 foot depth contained from 16 ppm to 2,400 ppm diesel, and one sample reportedly contained 11,000 ppm diesel.

Average diesel concentration in this zone (excluding the 11,000 ppm sample) was about 1,000 ppm. Cross-sections through the former tank area are shown on Figure 6.

These data were presented to ACDEH officials in graphic form, and following a July 13, 1989 meeting, Kaldveer prepared a work plan for soil excavation and tank area backfilling, dated July 14, 1989. In accordance with this ACDEH-approved work plan, additional soil excavation was performed in the vicinity of the former tank area to remove readily available contaminated soil from the area indicated on Figures 3 through 6. The excavation was backfilled with clean, Class II permeable aggregate. A total of about 250 cubic yards of contaminated soil was excavated and removed from the site under manifest by Erickson Environmental of Richmond, California. Diesel fuel contaminated soil remains in the subsurface between the depths of about 12 to 15 feet as shown on Figures 4 through 6. During the course of this study, the City of Oakland installed a new major sanitary sewer service line along the south side of Mills Hall (Figure 3). Installation of the line included excavation of a trench approximately 20 feet deep. Kaldveer Associates staff collected soil samples from the approximate ground water surface level during this excavation at the approximate locations shown on Figure 3. The sampling points are located in the down-gradient direction, approximately 250 feet from the former tank. Laboratory analysis indicated that these samples did not contain hydrocarbons as diesel in detectable quantities.

In addition to the soil sample analyses described above, two soil samples were collected near the ground water surface in the boreholes drilled for Monitoring Wells MHW-2 and MHW-3 in June, 1991. The sample collected from MHW-2 (at the former tank area) contained 620 ppm diesel. The sample collected from MHW-3 did not contain detectable hydrocarbons. Locations of the monitoring wells are shown on Figure 7.

B. Subsurface Conditions

The surficial soils at the site consist of five to seven feet of old fill material, underlain by clay to a depth of 10 to 13 feet. Strata below this depth consist of sand and gravel with lenses of clay, to the maximum depth explored of 23.5 feet. Ground water was encountered at a depth of 12 to 13 feet at the time of drilling and stabilized water levels were measured at a depth of approximately 10 to 13 feet several days later.

The attached boring logs and related information (Appendix A) depict location-specific subsurface conditions encountered during our field investigation. The approximate locations of the borings were determined by pacing and should be considered accurate only to the degree implied by the method used. The passage of time could result in changes in the surface or subsurface conditions due to natural occurrences or human intervention.

C. Monitoring Well Construction

Three ground water monitoring wells were installed under permit from the Alameda County Flood Control and Water Conservation District, Zone 7. Ground water monitoring wells were completed to a depth of 19 to 23.5 feet using 2-inch I.D. Schedule 40, threaded, PVC casing. Fifteen feet of 0.020-inch slotted well screen was installed between the depths of approximately 23.5 to 9 feet in Monitoring Well MHW-1. Monitoring Wells MHW-2 and MHW-3 were constructed using 0.010-inch slotted well screen between the depths of 10 to 20 feet, and 8.5 to 18.5 feet, respectively. A filter pack consisting of washed No. 3 sand for MHW-1 and 2/12 sand for MHW-2 and MHW-3 was placed in the annular space around the well casings to a level approximately two feet above the slotted screen section in each well. One foot of bentonite above the sand pack, followed by neat cement to the ground surface completed the well construction. A locking well cover was installed on each well. Specific well construction details are presented along with the respective boring logs in Appendix A.

D. Well Development and Sampling

Monitoring well sampling was conducted on June 12, 1991 and March 24, 1992. (It should be noted that Well MHW-1 has been sampled periodically since its installation in 1989). Prior to the June, 1991 sampling, Wells MHW-2 and MHW-3 were developed using a centrifugal pump. Well MHW-1 was developed in 1989 using a teflon bailer. Development consisted of the rapid removal of water from the well until physical parameters such as pH, temperature, and specific conductance had stabilized and the water was relatively free of sand, silt and turbidity. Well development consisted of the removal of 30 to 55 gallons (32 to 34 well casing volumes) of water from each well. Well MHW-1 was purged of about 5 well-casing volumes (8 gallons) prior to the June, 1991 sampling. Wells MHW-1, MHW-2, and MHW-3 were purged of approximately four well casing volumes prior to the March, 1992 sampling.

Following development or purging, each well was sampled using a teflon bailer. Water samples from each well were collected and decanted into 3 - 40ml VOA and 2 - 1 liter amber bottles (HCl preserved), labeled and placed in refrigerated storage, and delivered to the laboratory under chain-of-custody control. The bailer was thoroughly washed with Liquinox and rinsed with distilled water between wells to reduce the potential for cross-contamination. Well development and sampling logs are attached to this report as Appendix B.

E. Ground Water Gradient

Well-top elevations were surveyed to an arbitrary datum by Kaldveer personnel. Ground water levels were measured in each well. Well-top elevations, depth to water, and calculated water-surface elevations are presented in Table 2. These data are used to generate the estimated ground water flow direction presented on Figures 8 and 9. Ground water elevation data collected during this investigation indicate a general westerly flow of ground water at an approximate gradient of 0.05 ft/ft.

F. Surface Water Sampling

As part of the investigation to evaluate potential impact of the old tank leak, two water samples were collected from Aliso Creek, which is located about 180 feet west of the former tank site. One surface water sample was collected upstream of the Toyon Meadow area, and the other sample was collected well downstream. Samples at each location were collected in HCl-preserved 40 ml VOA (three each) and 1 liter amber bottles (two each). Surface water sample locations are shown on Figure 2.

G. Ground and Surface Water Quality Investigation Results

Results of the ground water sample analyses are presented in Table 3 and are attached to this report as Appendix C. Monitoring well MHW-1 was sampled in July, 1989, December 20, 1990, and again on June 12, 1991 when newly installed Wells MHW-2 and MHW-3 were sampled for the first time. On March 24, 1992 all three wells were sampled again. Surface water samples were collected from Aliso Creek on June 13, 1991.

1. Ground Water Quality - June 12, 1991

The water sample collected from Well MHW-1 on June 12, 1991 was found to contain 0.06 ppm TPH as diesel. This well was found to be free of detectable hydrocarbons during the two previous sampling rounds in 1989 and 1990 (0.05 ppm detection limit). Well MHW-2, installed in the immediate vicinity of the former tank location contained 3.2 ppm TPH as diesel. The water sample collected from Well MHW-3 did not contain hydrocarbons as diesel in detectable quantities. Purgeable aromatic compounds (benzene, toluene, ethylbenzene, xylenes) were not detected in any of the wells with the exception of 0.001 ppm xylene reported for MHW-2. TPH as diesel was not detected in the surface water samples collected from Aliso Creek. However, both the upstream and downstream samples were reported to contain 0.10 ppm extractable hydrocarbons as oil. Low levels of heavy-end hydrocarbons are typical for urban runoff systems.

2. Ground Water Quality - March 24, 1992

TPH as diesel was detected in the water sample collected from Monitoring Well MHW-2 at 0.1 ppm. TPH as diesel was not detected in the water samples from wells MHW-1 or MHW-3. Water samples from the three monitoring wells did not contain benzene, toluene, ethylbenzene or xylenes in detectable quantities.

V. LIMITATIONS

Our services have been performed in accordance with generally accepted engineering and environmental principles and practices within the area at the time of our investigation. No other warranty, either expressed or implied as to the professional advice provided is made. It should be recognized that certain limitations are inherent in the evaluation of subsurface conditions, and that certain conditions may not be detected during an investigation of this type. If you wish to reduce the level of uncertainty associated with this study, we should be contacted for additional consultation.

The analysis and conclusions contained in this report are based on the site conditions as they existed at the time of our reconnaissance. Changes in the information or the data obtained or in the proposed land use could result in changes in our conclusions. If such changes do occur, we should be advised so that we can review our report in light of those changes.

* * * * * * * * * * * * * * * * * * *

TABLE 1
ANALYTICAL RESULTS - SOIL
(reported in parts per million, mg/kg)

Sample Location Number, and Collection Date	Petroleum Hydrocarbons as Diesel
June 28, 1989 - Initial Excavation Limit Samples	
SS-1, SS-2	480
SS-3, SS-4	1,900
July 17, 1989 - Soil Boring Samples	
B1-10'	190
B1-14'	1,600
B2-10'	ND
B2-13.5'	1,800
B3-10'	ND
B3-14'	60
B4-14.5'	1,700
B5-13.5'	640
B6-14'	630
B7-10'	240
B7-14.5'	240
B8-14'	11,000
B9-13'	250
B10-14.5'	2,700
B11-14'	16
July 18, 19, 1989 - Additional Excavation Closure Samples	
CS1-10'	ND
CS2-13'	5,000
CS3-10'	ND
CS4-12'	260
CS5-10'	ND
CS6-13'	570
CS7-10'	ND
CS8-12'	1,600
August 4 - 7, 1989 - City Sewer Trench Samples, South of Mills Hall	
SS-1, 20'	ND
SS-2, 20'	ND
June 4, 1991 - Soil Samples Collected During Installation of MHW-2 and MHW-3	
MHW-2, 12.5'	620
MHW-3, 11'	ND

TABLE 2

GROUND WATER ELEVATION DATA
(all values reported in feet)

Monitoring Well	Relative Well Top Elevation (1)	Depth to Water	Relative Ground Water Elevation
JUNE 1991			
MHW-1	99.53	11.92	87.61
MHW-2	100.00	10.32	89.68
MHW-3	98.01	12.45	85.56
MARCH 1992			
MHW-1	99.53	9.95	89.58
MHW-2	100.00	8.26	91.84
MHW-3	98.01	11.12	86.89

(1) Well-top elevations based on an arbitrary datum of 100.00 feet at MHW-2.

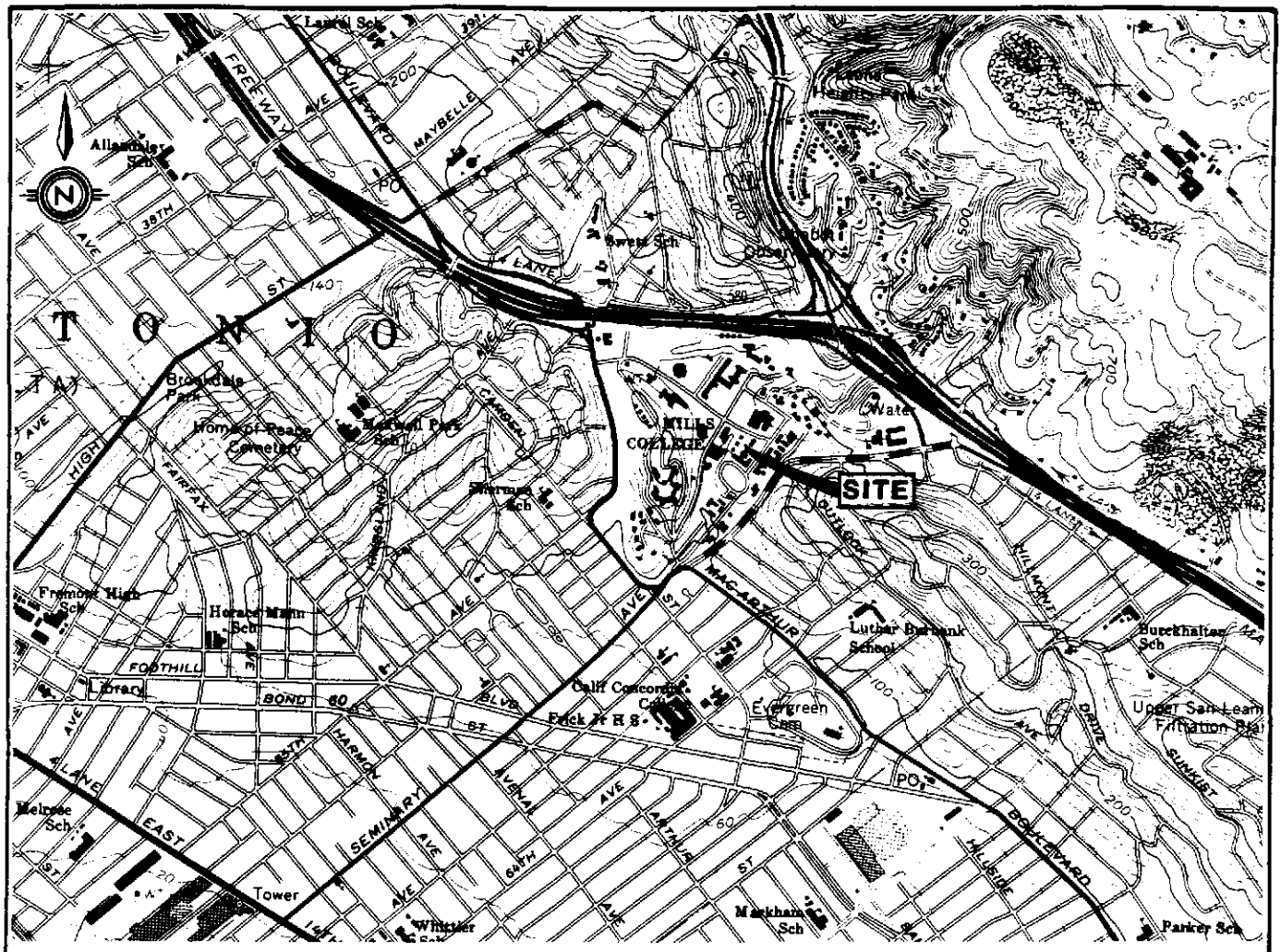
TABLE 3

ANALYTICAL RESULTS - WATER
(Results Reported in parts per million, mg/1)

Constituent	MHW-1	MHW-2	MHW-3	SWS-U	SWS-L
JUNE 1991					
TPH as Diesel	0.06	3.2	ND	ND	ND
TPH as Oil	ND	ND	ND	0.1	0.1
Benzene	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND
Xylene	ND	ND	ND	ND	ND
MARCH 1992					
TPH as Diesel	ND	0.1	ND	NA	NA
TPH as Oil	NA	NA	NA	NA	NA
Benzene	ND	ND	ND	NA	NA
Toluene	ND	ND	ND	NA	NA
Ethylbenzene	ND	ND	ND	NA	NA
Xylene	ND	ND	ND	NA	NA

Notes:

MHW = Ground Water Monitoring Well Sample
SWS-U = Aliso Creek Surface Water Sample - Upstream
SWS-L = Aliso Creek Surface Water Sample - Downstream
NA = Not Analyzed
ND = Not Detected



SCALE IN FEET

0 1000 2000 3000

Base: U.S.G.S. Oakland East 7.5 Minute Quadrangle (Topographic)

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SITE VICINITY MAP

MILLS HALL/TOYON MEADOW
Oakland, California

PROJECT NO.	DATE	Figure 1
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ROTH WELL

OLIN LIBRARY

SWS-UPPER

FLAZA

FOUNTAIN

REMOVE
DRAMA BLDG

POOL

POMODORO

KAPIOLANI ROAD

LISSER
HALL

TOYON MEADOW

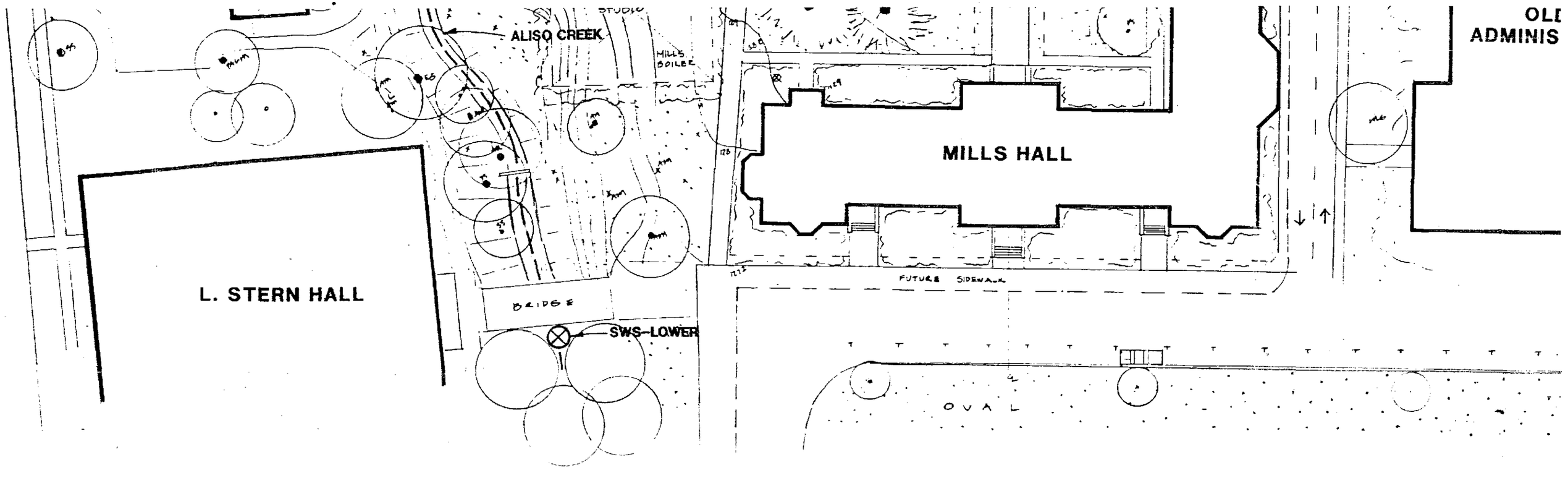
FORMER
TANK
LOCATION

REMOVE
UPWARD BOUND

BRIDGE

FUTURE
/REMOVAL

WETMORE ROAD



SCALE 1"=40'

0 40 80

⊗ SWS–Location of surface water sample from Aliso Creek

lan, dated March 20, 1988.

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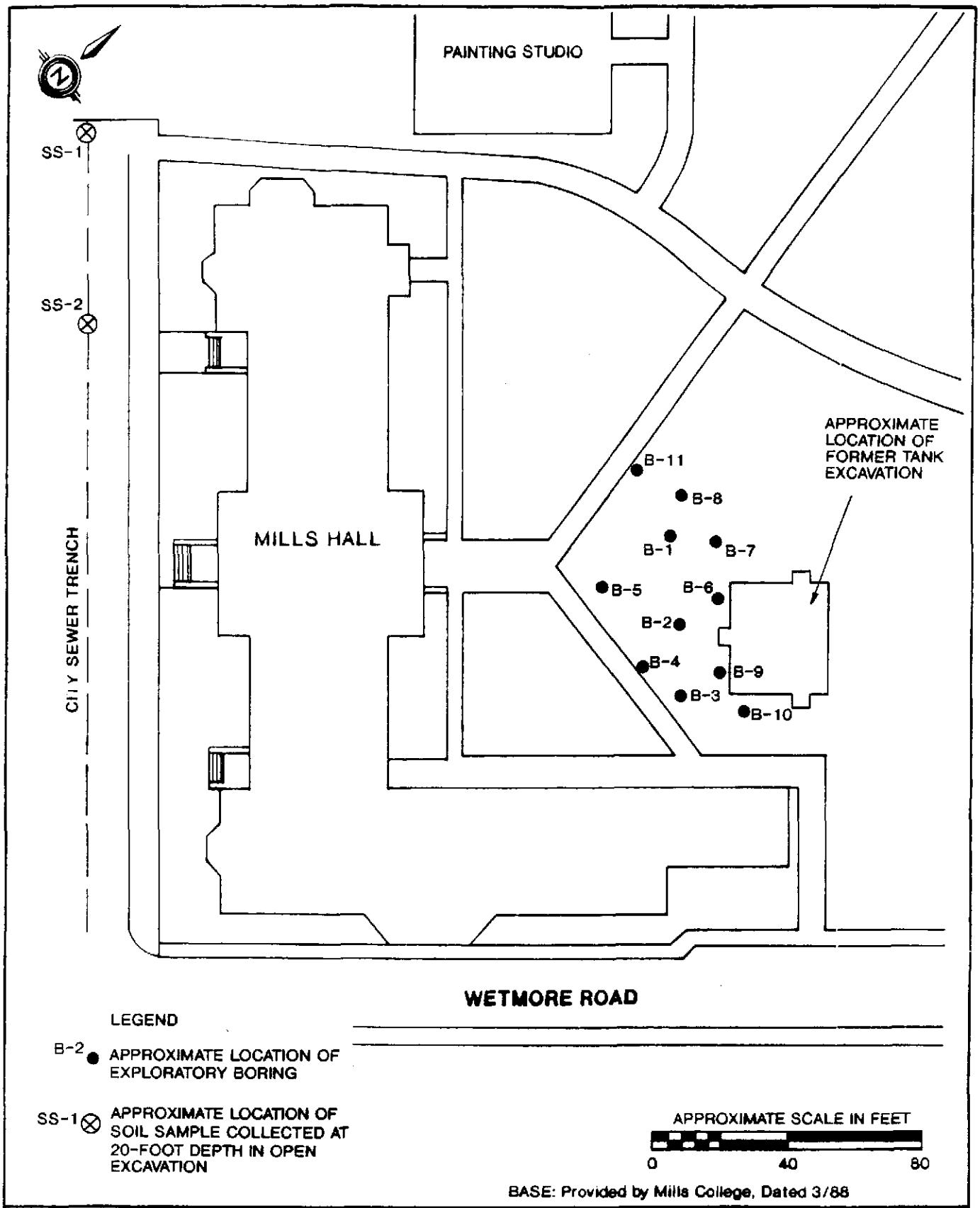
SITE PLAN

MILLS HALL / TOYON MEADOW
Oakland, California

PROJECT NO.	DATE	Figure
KE1025–3B–718	April 1992	



BASE: Provided by Mills College, Dated 3/88

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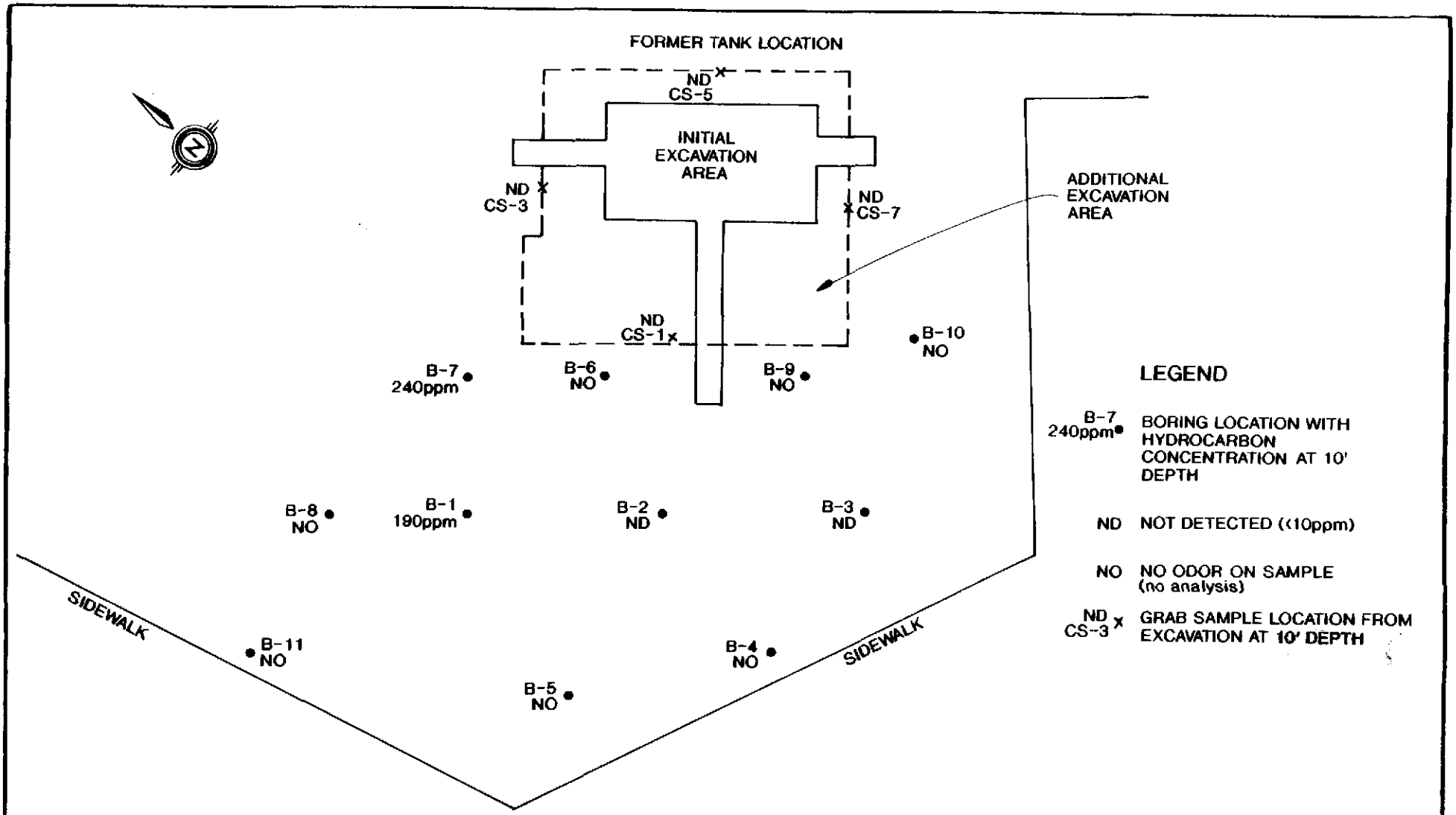
LOCATION OF SOIL BORINGS

MILLS HALL/TOYON MEADOW
Oakland, California

PROJECT NO.	DATE	
KE1025-3B-718	April 1992	Figure 3



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TPH DIESEL IN SOIL AT 10' DEPTH

MILLS HALL/TOYON MEADOW
Oakland, California

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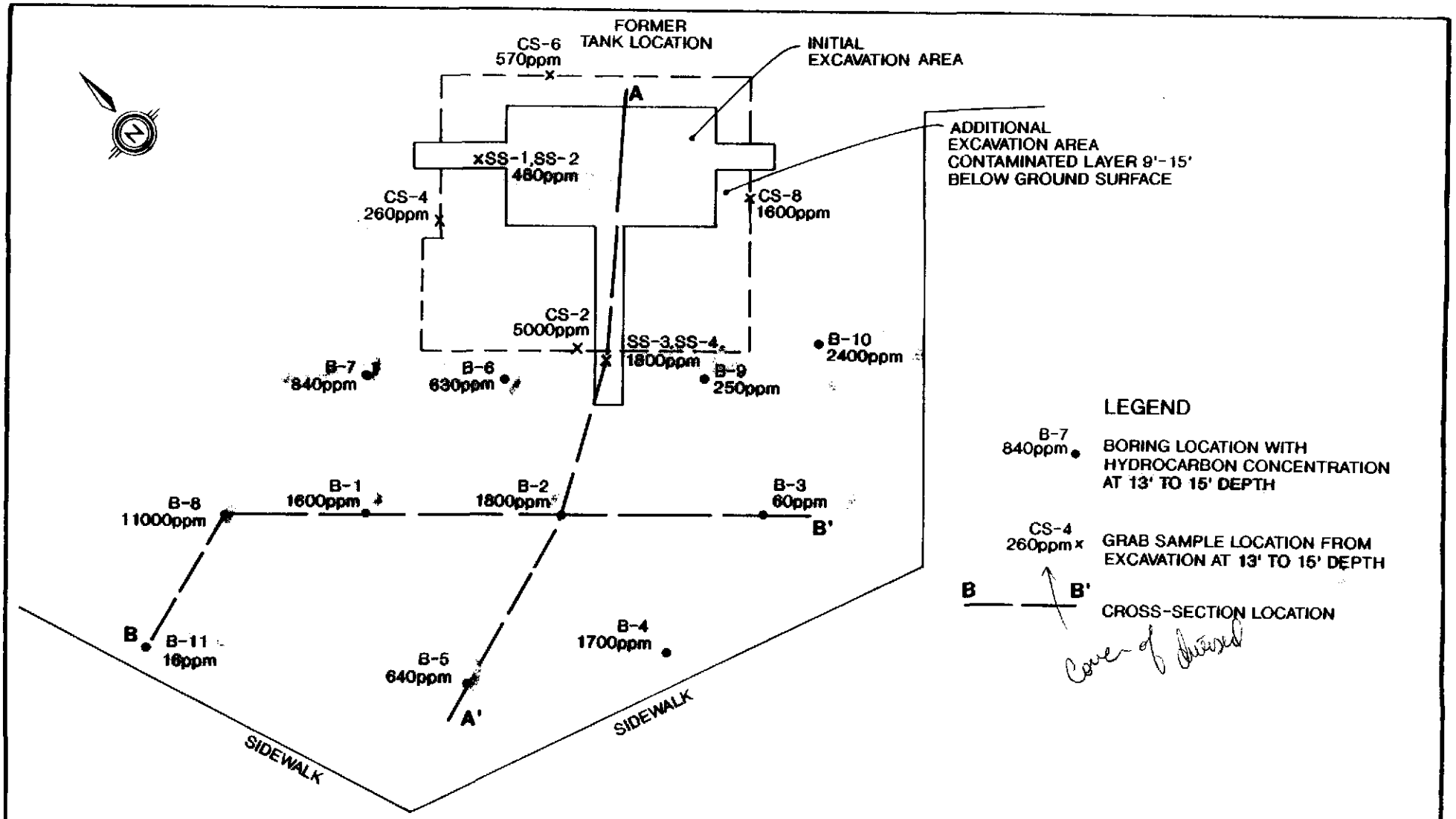

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TPH DIESEL IN SOIL AT 13' TO 15' DEPTH

MILLS HALL/TOYON MEADOW
Oakland, California

PROJECT NO	DATE	
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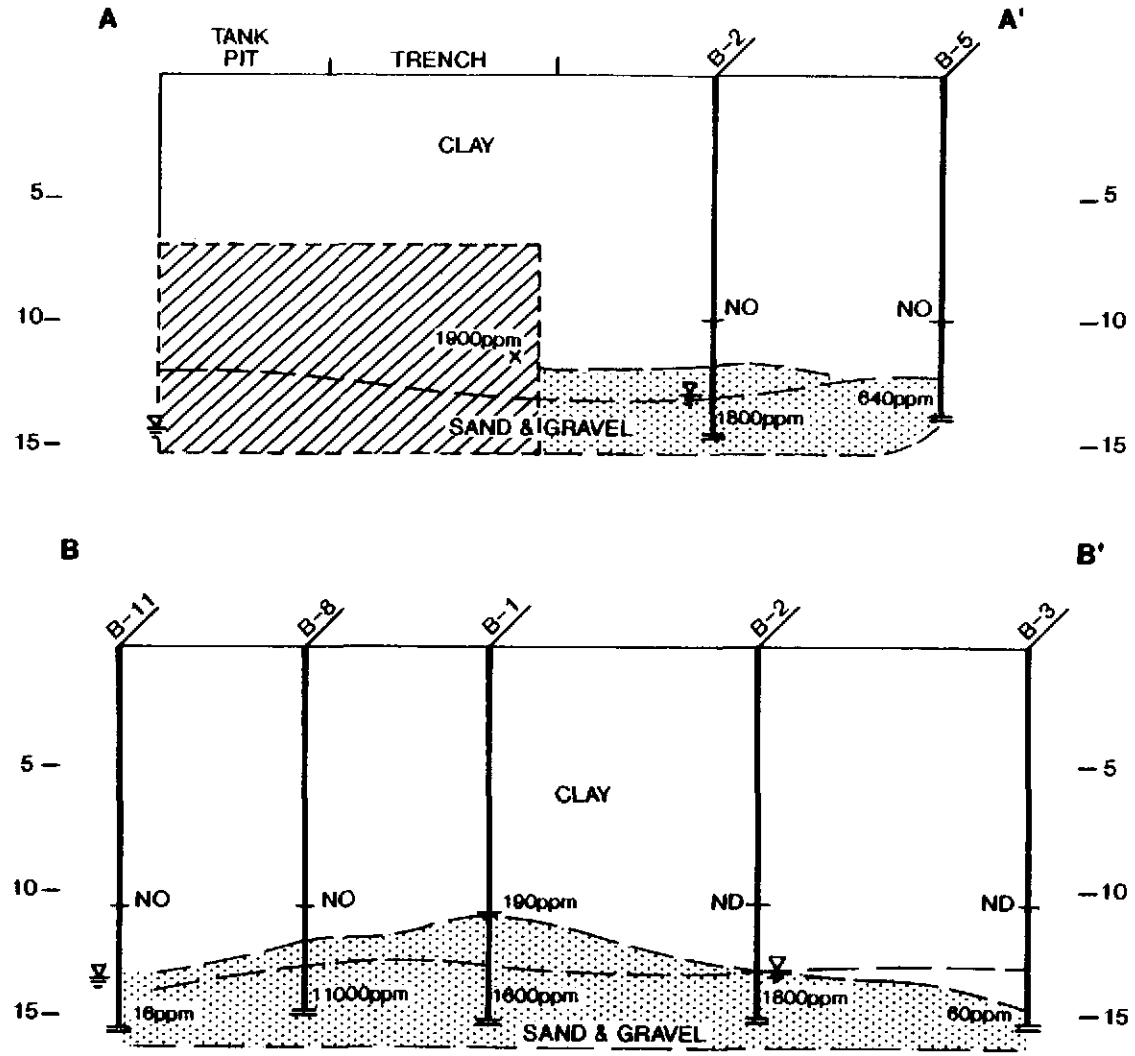


LEGEND

B-2	BORING LOCATION
▽	GROUND WATER LEVEL AT TIME OF DRILLING
ND	HYDROCARBONS NOT DETECTED IN LABORATORY ANALYSIS
NO	NO ODOR ON SAMPLE WHEN COLLECTED (no analysis)
480ppm	HYDROCARBONS AS DIESEL CONCENTRATION IN SAMPLE
	AREA OF CONTAMINATED SOIL REMOVED DURING EXCAVATION
	EXTENT OF CONTAMINATED SOIL REMAINING IN SUBSURFACE

15 FEET

7.5 FEET

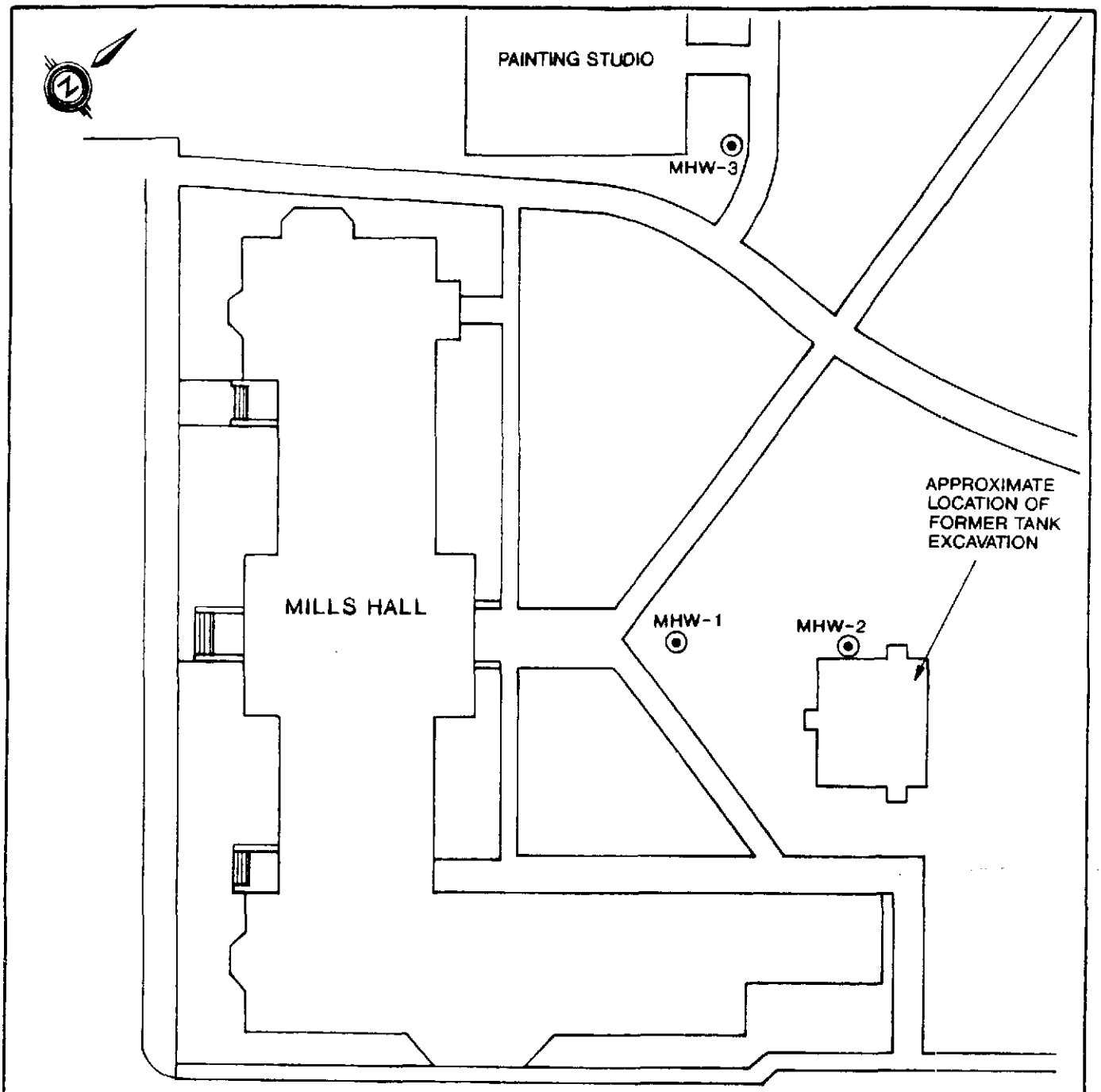
x2 VERTICAL EXAGERATION

Kaldveer Associates
Geoscience Consultants
A California Corporation

SUBSURFACE CROSS-SECTIONS

MILLS HALL/TOYON MEADOW
Oakland, California

PROJECT NO	DATE	
KE1025-3B-718	April 1992	Figure 6



LEGEND

MHW-1 ⊙ APPROXIMATE LOCATION OF MONITORING WELL

APPROXIMATE SCALE IN FEET

0 40 80

BASE: Provided by Mills College, Dated 3/88

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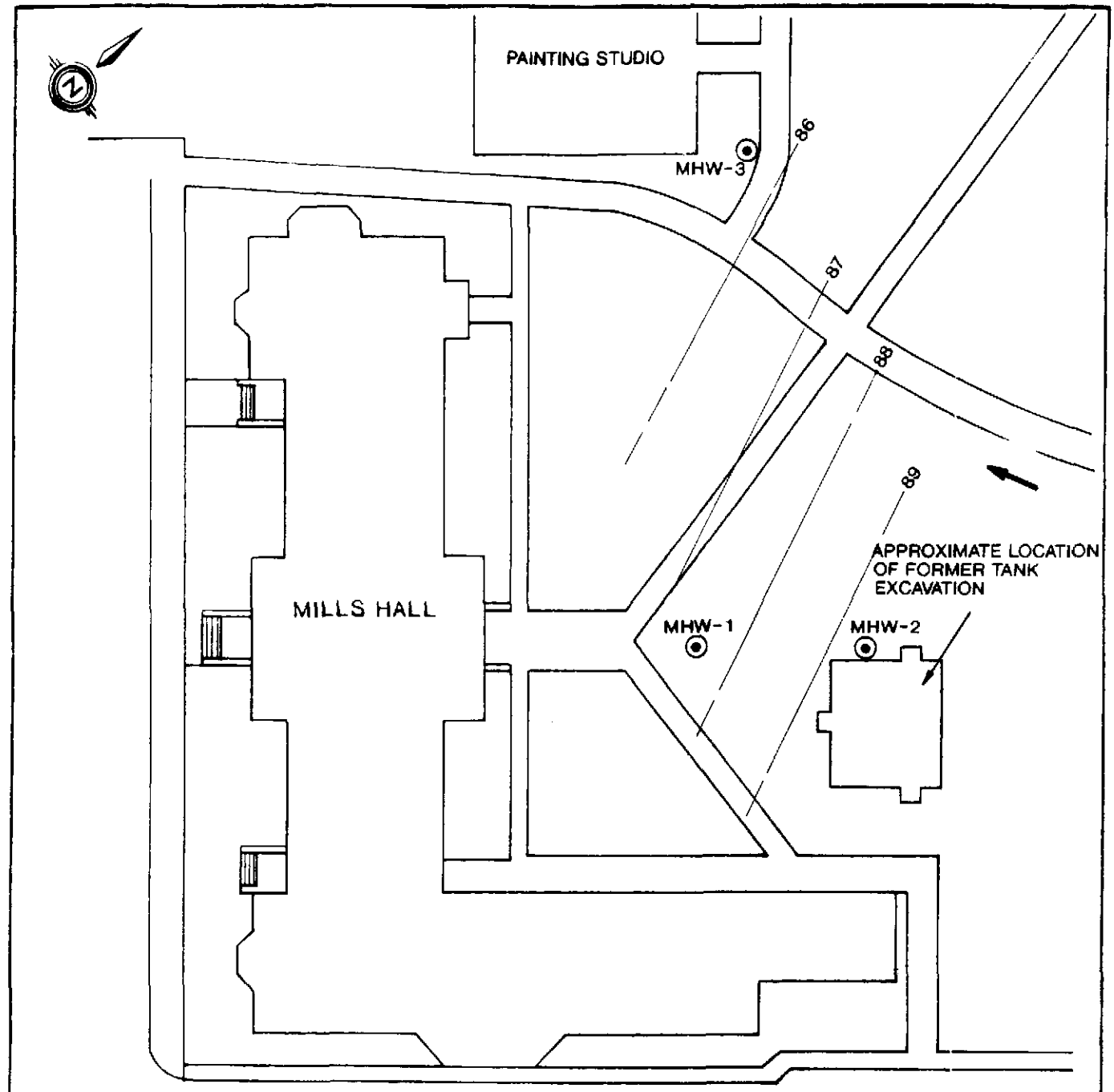
LOCATION OF GROUND WATER MONITORING WELLS

MILLS HALL/TOYON MEADOW
Oakland, California

PROJECT NO.	DATE	
KE1025-3B-718	April 1992	Figure 7



LEGEND

MHW-1 ⊙ APPROXIMATE LOCATION OF MONITORING WELL

GROUND WATER CONTOURS APPROXIMATED BY STRAIGHT LINE INTERPOLATION BETWEEN WELLS

DIRECTION OF GROUND WATER FLOW

APPROXIMATE SCALE IN FEET

0 40 80

BASE: Provided by Mills College, Dated 3/88

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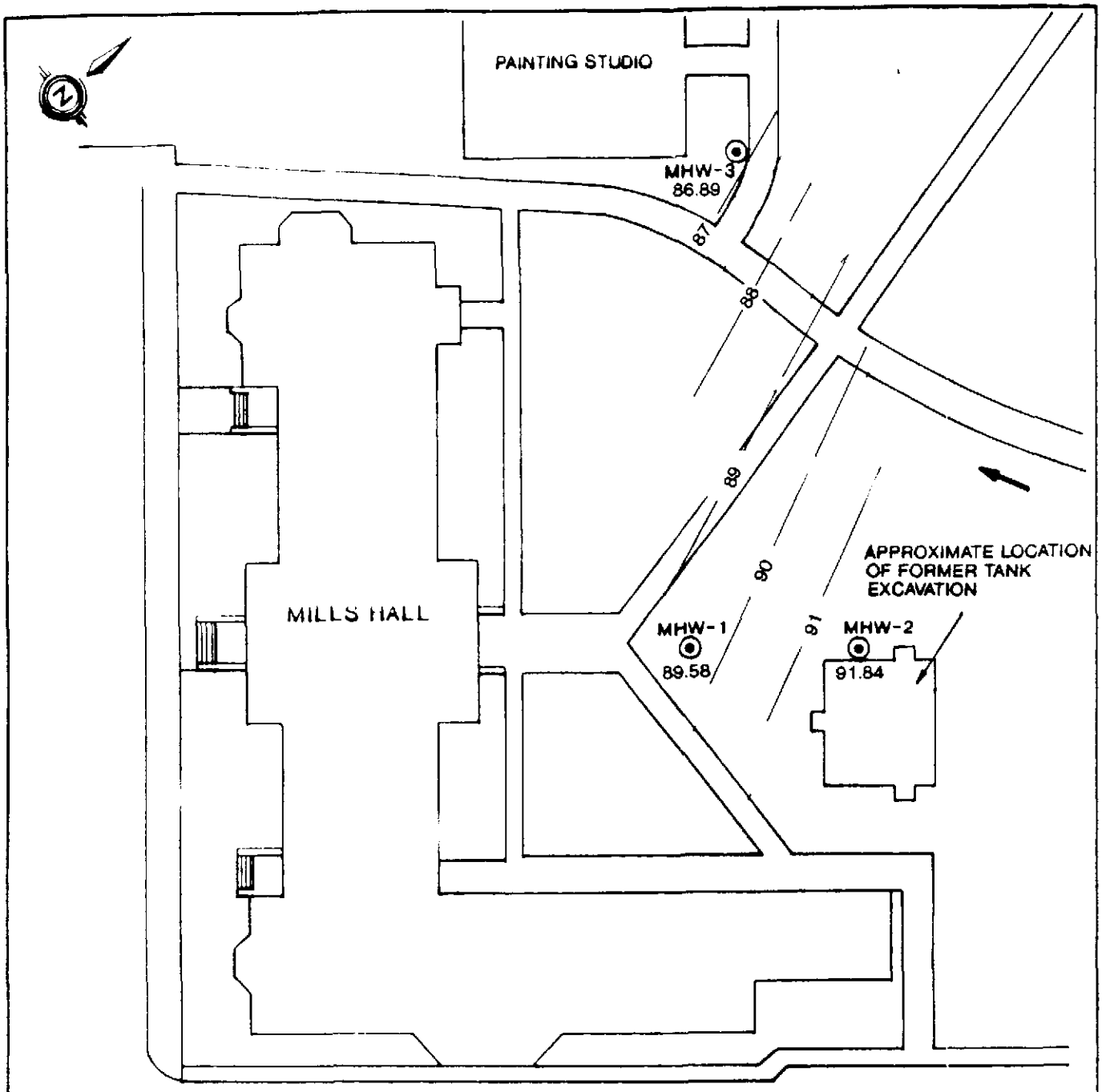
GROUND WATER CONTOUR MAP - JUNE 1991

MILLS HALL/TOYON MEADOW
Oakland, California

PROJECT NO.	DATE	
KE1025-3B-718	April 1992	Figure 8



BASE: Provided by Mills College, Dated 3/88

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GROUND WATER CONTOUR MAP - MARCH 1992

MILLS HALL/TOYON MEADOW
Oakland, California

PROJECT NO.	DATE	
KE1025-3B-718	April 1992	Figure 9

APPENDIX A

BORING LOGS AND WELL CONSTRUCTION DETAILS

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
			mh	Inorganic silts, micaceous or diatomaceous fine or silty soils, elastic silts
	Silts And Clays LL > 50		ch	Inorganic clays of high plasticity, fat clays
			oh	Organic clays of medium to high plasticity
			pt	Peat and other highly organic soils
Highly Organic Soils				

SYMBOLS

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

Visual Relative Moisture Content
Increasing Moisture Content

Dry
Damp
Moist
Wet
Saturated

Note(1): Penetration resistance values are recorded as the number of blows of a 140-pound hammer falling 30-inches required to drive a sampler through the last 12 inches of an 18-inch drive. Blow count for samples obtained using a Modified California sampler (indicated by an asterisk) should be multiplied by a factor of 0.8 to obtain equivalent standard penetration resistance values.

Note(2): 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 Hall/Toyon Meadow
Oakland, California

PROJECT NO.	DATE	FIGURE NO
KE1025-3B-718	AUGUST 1991	A-1

DRILL RIG	CMC	SURFACE ELEVATION	N.S.	LOGGED BY	PBH
DEPTH TO GROUNDWATER	Feet	BORING DIAMETER	8-inch	DATE DRILLED	7/10/89

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
SILT (FILL), dark brown to black, damp, also contains clay, sand, gravel, angular debris (wood, brick)							
SILTY CLAY (CL), brown, moist, very stiff, trace organics, fine gravel, no odor		5		20			
		10		15			
SAND (SP), green with grey mottling, wet, dense, also contains silt and minor gravel, slight odor		15		41			
SAND (SW), brown, very dense, well graded with trace fines, some gravels (subrounded to rounded), no odor				25			
SANDY SILT (ML), brown, very stiff		20					
SILT (ML), brown to dark brown, very moist to wet, hard, also contains sand and gravel (angular to subrounded), graded to stiff clay at 23.3 feet, no odor				37			
CLAY (CL), brown, moist, trace sand, no odor							
Bottom of boring - 23.5 feet							

NOTES:
1) N.S. = Not surveyed
2) Dashed lines indicate a gradational or indistinct contact

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EXPLORATORY BORING LOG

Mills Hall/Toyon Meadow
Oakland, California

PROJECT NO.	DATE	BORING NO
KE1025-3B-718	AUGUST 1991	MHW-1

DRILL RIG	MOBILE B-53	SURFACE ELEVATION	N.S.	LOGGED BY	JAF
DEPTH TO GROUNDWATER	10.2 Feet	BORING DIAMETER	8-inch	DATE DRILLED	6/4/91

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
Lawn and topsoil							
GRAVELLY CLAY (FILL), dark brown, moist to wet, moderate plasticity, some woody fragments and brick, slight 'sewage' odor		5		4	0		
Base of fill and perched water							
SANDY CLAY (CL), brown, damp, very stiff, low plasticity, medium to very coarse sand, 10-20% angular gravel, no odor				21	0		
		10		15	10	DTW @ 10:00, 6/6/91 10.17	
as above, greenish staining, moderate diesel odor, trace gravel				17	50-70		
SAND (SP), greenish gray, moist medium dense, medium, 5-10% clay, trace gravel, moderate diesel odor							
		15		44	40		
Interbedded gravelly sand, clayey sand and clayey gravel							
GRAVELLY SAND (SW), multi-colored, wet, medium dense, medium to very coarse, subround to angular, slight odor		20		10	43		
Bottom of boring - 21 feet							

NOTES:
1) PID readings in parts-per-million
2) N.S. = Not surveyed
3) Dashed lines indicate a gradational or indistinct contact

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EXPLORATORY BORING LOG

Mills Hall/Toyon Meadow
Oakland, California

PROJECT NO.	DATE	BORING NO
KE1025-3B-718	AUGUST 1991	MHW-2

DRILL RIG	MOBILE B-53	SURFACE ELEVATION	N.S.	LOGGED BY	JAF
DEPTH TO GROUNDWATER	12.0 Feet	BORING DIAMETER	8-inch	DATE DRILLED	6/4/91

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
Wood mulch and topsoil SAND (FILL), brown, damp, clayey, trace brick and multi-colored, angular gravel							
SANDY CLAY (CL), tan-brown, slightly damp, very stiff, low plasticity, fine to medium grained sand, trace red-brown mottling, trace carbon, to 1.5 inch laminations, no odor		5		25	0		
				25	0		
CLAY (CL), tan-brown, damp, very stiff, medium to high plasticity, trace gravel and rootlets, dark brown oxidation staining around rootlets, no odor		10		16	0	DTW @ 10:00, 6/6/91 12.39	
SAND (SW), tan-gray(mottled), damp to moist, medium dense, 10-25% subangular gravel, no odor				50	0		
		15		30	0		
GRAVEL (GP), tan-brown, wet, dense, angular, to 1 inch diameter, trace interbedded sand, no odor				50/4"	0		
SANDY CLAY (CL), tan-brown, moist to wet, very stiff, moderate to high plasticity, trace angular to subround gravel, no odor							
GRAVEL (GW), tan-gray, damp, very dense, subround to angular, no odor							
Bottom of boring - 19 feet							

NOTES:
1) PID readings in parts-per-million
2) N.S. = Not surveyed

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EXPLORATORY BORING LOG

Mills Hall/Toyon Meadow
Oakland, California

PROJECT NO.	DATE	BORING NO
KE1025-3B-718	AUGUST 1991	MHW-3

DRILL RIG	B-34	SURFACE ELEVATION		LOGGED BY	PBH
DEPTH TO GROUNDWATER	14 Feet	BORING DIAMETER	7-inch	DATE DRILLED	7/10/89

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
SILT (FILL), dark brown, moist, also contains clay, sand, gravel, wood debris		5		84			
CLAY (FILL), dark brown and grey, mottled with some green, moist, minor sand and trace rounded to subrounded gravel, odor in 9.5 to 10 foot liner		10		20 20			
SILTY CLAY (CL), dark brown, moist, contains sand, minor gravels, trace organics, odor of diesel				11			
GRAVEL (GP), black/green, in coarse sand matrix, strong odor				9			
Bottom of boring - 14.5 feet							

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EXPLORATORY BORING LOG

Mills Hall/Toyon Meadow
Oakland, California

PROJECT NO.	DATE	BORING NO
KE1025-3B-718	AUGUST 1991	B-1

DRILL RIG	B-34	SURFACE ELEVATION		LOGGED BY	PBH
DEPTH TO GROUNDWATER	14 Feet	BORING DIAMETER	7-inch	DATE DRILLED	7/10/89

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
SILT (FILL), brown, also contains clay, sand, subrounded to rounded gravel, and brick debris		5					
SILTY CLAY (CL), brown, minor sands and gravel, no odor in sample		10		15 12			
CLAY (CL), brown, with silt, sand, subrounded to rounded gravel, green at 12.5 feet (contaminated), diesel odor ▼				12			
SAND (SP), green, with coarse, angular gravel, some silt				16 31			
Bottom of Boring - 14.5 feet							

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EXPLORATORY BORING LOG

Mills Hall/Toyon Meadow
Oakland, California

PROJECT NO.	DATE	BORING NO
KE1025-3B-718	AUGUST 1991	B-2

DRILL RIG	B-34	SURFACE ELEVATION		LOGGED BY	PBH
DEPTH TO GROUNDWATER	14 Feet	BORING DIAMETER	7-inch	DATE DRILLED	7/10/89

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
SILT (FILL), brown, with some silt, sand, and rounded to subrounded gravel, organic debris and brick		5					
SILTY CLAY (FILL), light brown to brown, some fine to coarse sand and minor gravel, organic debris, no odor on cuttings		10		33 23			
SAND (SP), green/brown, trace silt, grades to coarser with depth, odor ▼				18 32			
Bottom of Boring - 14.5 feet							

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EXPLORATORY BORING LOG

Mills Hall/Toyon Meadow
Oakland, California

PROJECT NO.	DATE	BORING NO
KE1025-3B-718	AUGUST 1991	B-3

DRILL RIG	B-34	SURFACE ELEVATION		LOGGED BY	PBH
DEPTH TO GROUNDWATER	14 Feet	BORING DIAMETER	7-inch	DATE DRILLED	7/10/89

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
SILT (FILL), black, with clay, sand, some gravel, organic debris, and brick fragments							
SILTY CLAY (FILL), brown, moist, some sand, trace rounded to subrounded gravel		5					
grades to coarser, angular gravel, no odor		10		59			
CLAY (CL), green, moist, with gravel, silt and sand, strong odor							
GRAVELLY SAND (SW), green, wet, trace fines, strong odor				74			
		15					
Bottom of Boring - 15 feet							

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EXPLORATORY BORING LOG

Mills Hall/Toyon Meadow
Oakland, California

PROJECT NO.	DATE	BORING NO
KE1025-3B-718	AUGUST 1991	B-4

DRILL RIG	B-34	SURFACE ELEVATION		LOGGED BY	PBH
DEPTH TO GROUNDWATER	N.E.	BORING DIAMETER	7-inch	DATE DRILLED	7/10/89

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
SILTY CLAY (FILL), dark brown to black, moist, with sand, trace angular gravel, wood debris, brick fragments							
SILTY CLAY (CL), brown to grey, moist, some sand, rounded to angular gravel		5					
SILTY CLAY (CL), brown to rust (mottled), trace sand, fine gravels, no odor in sample		10		53			
GRAVEL (GP), green, cobbles, some fine to coarse sand, strong odor				43			
Bottom of Boring - 14 feet				53			

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EXPLORATORY BORING LOG

Mills Hall/Toyon Meadow
Oakland, California

PROJECT NO.	DATE	BORING NO
KE1025-3B-718	AUGUST 1991	B-5

DRILL RIG	B-34	SURFACE ELEVATION		LOGGED BY	PBH
DEPTH TO GROUNDWATER	14 Feet	BORING DIAMETER	7-inch	DATE DRILLED	7/10/89

DESCRIPTION AND CLASSIFICATION	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS							
SILT (FILL), black, with clay, sand, trace gravel, wood, brick, debris, minor asbestos		5					
CLAY (FILL), light brown to brown, moist, with silt, sand, fine gravel, trace debris (brick, wood), no odor on cuttings		10					
SILT (ML), green with grey mottling, moderately moist, also contains sand,clay, trace fine gravel, odor ▼				13			
				50			
Bottom of Boring - 14.5 feet							

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EXPLORATORY BORING LOG

Mills Hall/Toyon Meadow
Oakland, California

PROJECT NO.	DATE	BORING NO
KE1025-3B-718	AUGUST 1991	B-6

DRILL RIG	B-34	SURFACE ELEVATION		LOGGED BY	PBH
DEPTH TO GROUNDWATER	15 Feet	BORING DIAMETER	7-inch	DATE DRILLED	7/10/89

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
SILT (FILL), black, with sand and fine gravel, some clay, wood and brick debris		5					
SILTY CLAY (CL), mottled grey and green, some sand, trace fine gravel, slight odor		10		34 21			
SILT (ML), mottled green/grey, with clay, sand, gravel, and trace cobbles, strong odor				40			
Bottom of Boring - 15 feet		15		50			

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EXPLORATORY BORING LOG

Mills Hall/Toyon Meadow
Oakland, California

PROJECT NO.	DATE	BORING NO
KE1025-3B-718	AUGUST 1991	B-7

DRILL RIG	B-34	SURFACE ELEVATION		LOGGED BY	PBH
DEPTH TO GROUNDWATER	14 Feet	BORING DIAMETER	7-inch	DATE DRILLED	7/10/89

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
SILT (FILL), dark brown to black, with clay, sand, gravel, brick and wood debris		5					
SILTY CLAY (CL), light brown to brown, moist, wtih sand, minor fine gravel, no odor on cuttings		10					
SILTY CLAY (CL), mottled green/grey, trace fine to coarse sand, grades to coarse sand with depth, strong odor				45 24			
GRAVELLY SAND (SW), mottled green/grey, very strong odor							
Bottom of Boring - 14.5 feet							

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EXPLORATORY BORING LOG

Mills Hall/Toyon Meadow
Oakland, California

PROJECT NO.	DATE	BORING NO
KE1025-3B-718	AUGUST 1991	B-8

DRILL RIG	B-34	SURFACE ELEVATION		LOGGED BY	PBH
DEPTH TO GROUNDWATER	N.E.	BORING DIAMETER	7-inch	DATE DRILLED	7/10/89

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
SILT (FILL), black, with clay, sand, trace gravel, wood and brick debris							
CLAY (FILL), as above, reddish brown, moist		5					
SILTY CLAY (CL), light brown to brown, trace sand with minor fine gravel, no odor on cuttings		10					
SANDY SILT (ML), mottled green/grey, moist, trace clay and gravel, odor				17			
as above, reddish brown				77			
Bottom of Boring - 14.5 feet							

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EXPLORATORY BORING LOG

Mills Hall/Toyon Meadow
Oakland, California

PROJECT NO.	DATE	BORING NO
KE1025-3B-718	AUGUST 1991	B-9

DRILL RIG	B-34	SURFACE ELEVATION	t	LOGGED BY	PBH
DEPTH TO GROUNDWATER	14.5 Fee	BORING DIAMETER	7-inch	DATE DRILLED	7/10/89

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
SILT (FILL), black, with clay, sand, some gravel, and wood debris							
SILTY CLAY (CL), reddish brown, moist, with sand, minor fine gravel, and wood fragments		5					
SILTY CLAY (CL), light brown to brown, moist, with sand, minor gravel, no odor on cuttings		10					
SAND (SW), mottled green/grey, with subrounded to rounded gravel, strong odor		15		37 50			
Bottom of Boring - 15 feet							

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EXPLORATORY BORING LOG

Mills Hall/Toyon Meadow
Oakland, California

PROJECT NO.	DATE	BORING NO
KE1025-3B-718	AUGUST 1991	B-10

DRILL RIG	B-34	SURFACE ELEVATION		LOGGED BY	PBH
DEPTH TO GROUNDWATER	15 Feet	BORING DIAMETER	7-inch	DATE DRILLED	7/10/89

DESCRIPTION AND CLASSIFICATION		DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	PID READING	REMARKS	WELL CONSTRUCTION
DESCRIPTION AND REMARKS	SOIL TYPE						
SANDY SILT (FILL), dark brown to black, with clay, some fine gravel							
SILTY CLAY (FILL), brown, moist, with sand and fine gravel mix, some wood debris		5					
SILTY CLAY (CL), light brown to brown, with minor sands		10					
SILTY CLAY (CL), mottled green/grey, moist to very moist, sand, gravel, angular cobbles		15		18 50			
as above, grades to gravelly sand							
Bottom of Boring - 16.5 feet							

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EXPLORATORY BORING LOG

Mills Hall/Toyon Meadow
Oakland, California

PROJECT NO.	DATE	BORING NO
KE1025-3B-718	AUGUST 1991	B-11

APPENDIX B

WELL DEVELOPMENT AND SAMPLING LOGS

WATER SAMPLE LOG

Project Name: Mills Hall / Toyon Meadow Date: 6/12/91
Project Number: KE1025-3B-718 Sampler: JAF
Well Number: MHW-1 Weather: Clear, warm, calm
Well Location: North of Mills Hall entrance approx. 30 feet

Well Construction:

Date Completed: 7/10/89
Total Depth of Well: 21.87 Feet (6/12/91)
Diameter: 2 Inch
Well Elevation & Reference:
Not Surveyed

Groundwater Levels:

Initial: 11.92 Feet
Final:
Reference Point: Top of PVC casing
Casing Volume of Water: 1.7 Gallons

Sampling Equipment & Cleaning

Sampler Type: Teflon Bailer
Method of Cleaning: Liquinox; DI Water
Pump or Bailer Type: Centrifugal
Method of Cleaning: DI Rinse
pH Meter: Orion
Conductivity Meter: Orion
Comments:

SAMPLING MEASUREMENTS

Time	Discharge (gal.) Per Time Period	Discharge (gal.) Cumulative	pH	Temp (°C)	Spec. Conductance (umhos/cm) Field	Spec. Conductance (umhos/cm) @ 25°C	Color/ Turbidity	Odor
15:45	Started Bailing							
15:53		2g	7.02	18.4	1364		Yellow/Silty	No
15:57		4g	7.10	16.5	1302		"	"
16:07		6g	7.12	16.4	1329		"	"
16:11	Sampled	8g					"	"

Total Discharge: 8 Gallons
Casing Volumes Removed: 4.7 Volumes
Method of Disposal: To 55 Gallon Drum

Comments:

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WATER SAMPLE LOG

MILLS HALL / TOYON MEADOW
Oakland, California

PROJECT NO.	DATE	
KE1025-3B-718	August 1991	Figure B-1

WATER SAMPLE LOG

Project Name: Mills Hall / Toyon Meadow Date: 6/12/91
Project Number: KE1025-3B-718 Sampler: JAF
Well Number: MHW-2 Weather: Clear, warm, sunny
Well Location: 90' North of Mills Hall entrance

Well Construction:

Date Completed: 6/3/91
Total Depth of Well: 20 Feet
Diameter: 2 Inch
Well Elevation & Reference: Not Surveyed

Groundwater Levels:

Initial: 10.32 Feet
Final: 13.25 Feet
Reference Point: Top of PVC casing
Casing Volume of Water: 1.6 Gallons

Sampling Equipment & Cleaning

Sampler Type: Teflon Bailer
Method of Cleaning: Liquinox; DI Water
Pump or Bailer Type: Centrifugal
Method of Cleaning: DI Rinse
pH Meter: Orion
Conductivity Meter: Orion
Comments: Well development by surging and pumping well.

SAMPLING MEASUREMENTS

Time	Discharge (gal.) Per Time Period	Discharge (gal.) Cumulative	pH	Temp (°C)	Spec. Conductance (umhos/cm) Field	Spec. Conductance (umhos/cm) @ 25°C	Color/ Turbidity	Odor
13:25	Begin Development - Surge							
13:28	Begin Pumping							
13:35	(Dry)	6	7.16	67.9	4070		Brown/V. Silty	Sl. Diesel
13:40	Surged / Pump Intermittently							
14:00		25	7.20	70.3	1755		Light Brown/ Slight	Sl. Diesel
14:35		55	7.01	65.7	1505		V. Slight Tan/ None	"

Total Discharge: 55 Gallons
Casing Volumes Removed: 34.38 Volumes
Method of Disposal: To 55 Gallon Drum

Comments:

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WATER SAMPLE LOG

MILLS HALL / TOYON MEADOW
Oakland, California

PROJECT NO.	DATE	Figure
KE1025-3B-718	August 1991	B-2

WATER SAMPLE LOG

Project Name: Mills Hall / Toyon Meadow Date: 6/12/91
Project Number: KE1025-3B-718 Sampler: JAF
Well Number: MHW-3 Weather: Clear, hot, calm
Well Location: North of former boiler plant bldg. (NE corner)

Well Construction:

Date Completed: 6/3/91
Total Depth of Well: 18.5 Feet
Diameter: 2 Inch
Well Elevation & Reference:
Not Surveyed

Groundwater Levels:

Initial: 12.45 Feet
Final: 17.80 Feet
Reference Point: Top of PVC casing
Casing Volume of Water: 1.02 Gallons

Sampling Equipment & Cleaning

Sampler Type: Teflon Bailer
Method of Cleaning: Liquinox; DI Water
Pump or Bailer Type: Centrifugal
Method of Cleaning: DI Rinse
pH Meter: Orion
Conductivity Meter: Orion
Comments: Pumped intermittently, surged when not pumping.

SAMPLING MEASUREMENTS

Time	Discharge (gal.) Per Time Period	Discharge (gal.) Cumulative	pH	Temp (°C)	Spec. Conductance (umhos/cm) Field	Spec. Conductance (umhos/cm) @ 25°C	Color/ Turbidity	Odor
15:12	Begin Development						Brown/Silty	None
15:18		5	7.12	64.2	1266		"	"
15:28	Pump turned off 15mins.	10	6.95	62.9	1617		Brown/Mod. Silty	"
16:30		33	6.95	63.9	1635		Light Brown/ Tr. Silt	"

Total Discharge: 33 Gallons
Casing Volumes Removed: 32.3 Volumes
Method of Disposal: To 55 Gallon Drum

Comments:

Kaldveer Associates
Geoscience Consultants
A California Corporation

WATER SAMPLE LOG

MILLS HALL / TOYON MEADOW
Oakland, California

PROJECT NO.	DATE	Figure
KE1025-3B-718	August 1991	B-3

WATER SAMPLE LOG

Project Name: Mills Hall/Toyon Meadow Date: 3/24/92
Project Number: KE1025-3B-718 Sampler: JAF
Well Number: MHW-1 Weather: Overcast, cool, calm
Well Location: North of Mills Hall entrance approx. 30 feet

Well Construction:

Date Completed: 7/10/89
Total Depth of Well: 21.9 Feet
Diameter: 2 Inch
Well Elevation & Reference:
Not Surveyed

Groundwater Levels:

Initial: 9.95 Feet
Final: 11.28 Feet
Reference Point: Top of PVC casing
Casing Volume of Water: 1.7 Gallons

Sampling Equipment & Cleaning

Sampler Type: Teflon Bailer
Method of Cleaning: See Below
Pump or Bailer Type: Teflon
Method of Cleaning: See Below
pH Meter: Orion
Conductivity Meter: Orion
Comments: Liquinox wash with deionized water rinse.

SAMPLING MEASUREMENTS

Time	Discharge (gal.) Per Time Period	Discharge (gal.) Cumulative	pH	Temp (°C)	Spec. Conductance (umhos/cm) Field	Spec. Conductance (umhos/cm) @ 25°C	Color/ Turbidity	Odor
10:40	Begin Purging Well							
		2	7.45	22.1		1051	Lt. Tan/ V. Slight	None
		4	7.38	21.7		1055	"	"
		6	7.28	21.7		1053	"	"
		7	7.21	21.4		1060	Clear/None	"
11:00	Sampled							

Total Discharge: 7 Gallons
Casing Volumes Removed: 4 Volumes
Method of Disposal: To 55 Gallon drum

Comments:

Kaldveer Associates
Geoscience Consultants
A California Corporation

WATER SAMPLE LOG

MILLS HALL / TOYON MEADOW
Oakland, California

PROJECT NO.	DATE	
KE1025-3B-718	April 1992	Figure B-4

WATER SAMPLE LOG

Project Name: Mills Hall/Toyon Meadow Date: 3/24/92
Project Number: KE1025-3B-718 Sampler: JAF
Well Number: MHW-2 Weather: Overcast, cool, calm
Well Location: 90' north of Mills Hall entrance

Well Construction:

Date Completed: 6/3/91
Total Depth of Well: 20 Feet
Diameter: 2 Inch
Well Elevation & Reference:
Not Surveyed

Groundwater Levels:

Initial: 8.26 Feet
Final: 8.44 Feet
Reference Point: Top of PVC casing
Well Volume of Water: 2.0 Gallons

Sampling Equipment & Cleaning

Sampler Type: Teflon Bailer
Method of Cleaning: See Below
Pump or Bailer Type: Teflon
Method of Cleaning: See Below
pH Meter: Orion
Conductivity Meter: Orion
Comments: Liquinox wash with deionized water rinse.

SAMPLING MEASUREMENTS

Time	Discharge (gal.) Per Time Period	Discharge (gal.) Cumulative	pH	Temp (°C)	Spec. Conductance (umhos/cm) Field	Spec. Conductance (umhos/cm) @ 25°C	Color/ Turbidity	Odor
11:10	Begin Purging Well							Slight
		2	7.32	21.0		1625	Clear/V. Slight	None
		4	7.21	19.5		1451	"	"
		6	7.18	19.6		1430	"	"
		8	7.18	19.2		1425	"	"
11:34	Sampled							

Total Discharge: 8 Gallons
Casing Volumes Removed: 4 Volumes
Method of Disposal: To 55 Gallon drum

Comments:

Kaldveer Associates
Geoscience Consultants
A California Corporation

WATER SAMPLE LOG

MILLS HALL / TOYON MEADOW
Oakland, California

PROJECT NO.	DATE	
KE1025-3B-718	April 1992	Figure B-5

WATER SAMPLE LOG

Project Name: Mills Hall/Toyon Meadow Date: 3/24/92
Project Number: KE1025-3B-718 Sampler: JAF
Well Number: MHW-3 Weather: Overcast, cool, calm
Well Location: North of former boiler plant bldg. (NE corner)

Well Construction:

Date Completed: 6/3/91
Total Depth of Well: 18.5 Feet
Diameter: 2 Inch
Well Elevation & Reference:
Not Surveyed

Groundwater Levels:

Initial: 11.12 Feet
Final: 11.40 Feet
Reference Point: Top of PVC casing
Casing Volume of Water: 1.3 Gallons

Sampling Equipment & Cleaning

Sampler Type: Teflon Bailer
Method of Cleaning: See Below
Pump or Bailer Type: Teflon
Method of Cleaning: See Below
pH Meter: Orion
Conductivity Meter: Orion
Comments: Liquinox wash with deionized water rinse.

SAMPLING MEASUREMENTS

Time	Discharge (gal.) Per Time Period	Discharge (gal.) Cumulative	pH	Temp (°C)	Spec. Conductance (umhos/cm) Field	Spec. Conductance (umhos/cm) @ 25°C	Color/ Turbidity	Odor
09:40	Begin Purging Well							
		1.5	8.02	21.4		954	Lt. Brn./Slight	None
		3	7.68	21.4		1189	"	"
		4	7.50	21.0		1198	"	"
		6.5	7.40	19.8		1299	"	"
10:15	Sampled							

Total Discharge: 6.5 Gallons
Casing Volumes Removed: 5 Volumes
Method of Disposal: To 55 Gallon drum

Comments: Calibration 7.00/7.00 10.01/10.05

Kaldveer Associates
Geoscience Consultants
A California Corporation

WATER SAMPLE LOG

MILLS HALL / TOYON MEADOW
Oakland, California

PROJECT NO.	DATE	
KE1025-3B-718	April 1992	Figure B-6

LABORATORY PROCEDURES

Soil and ground water samples were analyzed by Quanteq Laboratories (formerly Med-Tox Incorporated) of Pleasant Hill, California, and NET, Incorporated of Santa Rosa, California. Quanteq and NET are certified by the California Department of Health Services for the analyses performed. Soil samples analyzed by NET were analyzed in an on-site mobile laboratory.

Soil and ground water samples collected during investigations performed in 1989 and 1990 were analyzed for TPH as diesel using EPA Method 8015. Samples collected during investigations performed in 1991 were analyzed for TPH as diesel using EPA Method 3550 GC.

MED-TOX ASSOCIATES, INC.

ENVIRONMENTAL & OCCUPATIONAL HEALTH SERVICES

3440 Vincent Road Pleasant Hill, CA 94523 • (415) 930-9090 • FAX# (415) 930-0256

JUL 14 1989

LABORATORY ANALYSIS REPORT

KALDVEER ASSOCIATES, INC.
425 ROLAND WAY
OAKLAND, CA 94621

ATTN: DENNIS LADUZINSKY

REPORT DATE: 07/13/89
DATE SAMPLED: 06/28/89
DATE RECEIVED: 06/29/89
DATE EXTRACTED: 06/29/89
DATE ANALYZED: 06/29/89

CLIENT PROJECT NO: KE1025-3

MED-TOX JOB NO: 8906190

ANALYSIS OF: TWO SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS

METHOD: EPA 8015 (EXTRACTION)

Sample Identification Client Id.	Lab No.	Total Petroleum Hydrocarbons As Diesel (mg/kg)
SS-1 & SS-2 (Comp)	01A	480
SS-3 & SS-4 (Comp)	02A	1,900
Detection limit		10

Michael Lynch, Manager
Organic Laboratory

Results FAXed to Dennis Laduzinsky 07/05/89

ME[redacted]X A[redacted]CIAT[redacted] INC[redacted] P[redacted] 1 [redacted] 1 [redacted]

ANALYTICAL REQUEST/CHAIN OF CUSTODY FORM
(Complete Information on Opposite Side)

Date: 6/29/89
SAMPLER(S): Dennis Laduzinsky

CLIENT Kaldveer Assoc.
CLIENT JOB REF.: KE1025-3
LAB PROJECT NO: 8906190
(lab use only)

CLIENT SAMPLE IDENTIFICATION	DATE	Lab Number (lab use only)	AIR VOLUME (Liters)	NO. CONT.	SAMPLE TYPE *	ANALYSES: TPH Diesel										COMMENTS/ INTERFERENCES
SS-1	6/28	1A			soil	X	composite									western trench
SS-2	↓	1A			↓											↓
SS-3	6/28	2A				X	composite.									Northern Trench
SS-4	↓	2A			↓											↓

48 hr TAT

Relinquished by: (Signature) Dennis Laduzinsky	Date 6/29/89	Time 0850	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Dispatched by: (Signature)	Date	Time	Received for lab by: (Signature) G. Van Vleck	Date 6-29-89	Time 0850
Method of Shipment:			Lab Comments:		

*SAMPLE TYPE (SPECIFY): (1) 37 mm 0.8 um MCEF;2) 25 mm 0.8 um MCEF; (3) 25 mm 0.4 um polycarb. filter; (4) PVC filter, diam. _____ pore size _____; (5) Charcoal tube; (6) Silica gel tube (7) Water; (8) Soil; (9) Bulk Sample; (10) Other __________ (11) Other __________

NATIONAL ENVIRONMENTAL TESTING, INC.

JUL 24 1989

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

Formerly: ANATEC Labs, Inc.

Dennis Laduzinsky
Kaldveer Assoc, Inc.
425 Roland Way
Oakland, CA 94621

07-17-89
NET Pacific Log No: 7038
Series No: 507
Client Ref: Project# KE 1025-38

Subject: Analytical Results for Mills College, Oakland Received 07-12-89.

Dear Mr. Laduzinsky:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Susan Joy Griffin
Group Leader
Gas Chromatography

Approved by:

William G. Rotz
Group Leader
Mobile Laboratory

/sm
Enc: Sample Custody Document

KEY TO ABBREVIATIONS

mean	:	Average; the sum of the measurements divided by the total number of measurements.
mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample, unless noted otherwise.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
N/A	:	Not applicable.
ND	:	Not detected; the analyte concentration is less than the listed reporting limit.
NR	:	Not requested.
NTU	:	Nephelometric turbidity units.
RL	:	Reporting limit.
RPD	:	Relative percent difference, $[V^1-V^2/V \text{ mean}]x100$.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
ug/filter	:	Concentration in units of micrograms of analyte per filter.
umhos/cm	:	Micromhos per centimeter.
*	:	See cover letter for details.

ANALYTE: PETROLEUM HYDROCARBONS
Extractable, as diesel

REPORTING LIMIT: 10 (mg/Kg)

Lab No.	Descriptor	Results	Units
-30798	1-A 10' 07-10-89	190	mg/Kg
-30799	1-B 14' 07-10-89	1600	mg/Kg
-30800	2-A 10' 07-10-89	ND	mg/Kg
-30801	2-B 13.5' 07-10-89	1800	mg/Kg
-30802	3-A 10' 07-10-89	ND	mg/Kg
-30803	3-B 14' 07-10-89	60	mg/Kg
-30804	4-A 14.5' 07-10-89	1700	mg/Kg
-30805	5-A 13.5' 07-10-89	640	mg/Kg
-30806	6-A 14' 07-10-89	630	mg/Kg
-30807	7-A 10' 07-10-89	240	mg/Kg
-30808	7-B 14.5' 07-10-89	240	mg/Kg
-30809	8-A 14' 07-10-89	11000	mg/Kg
-30810	9-A 13' 07-10-89	250	mg/Kg
-30811	10-A 14.5' 07-10-89	2700	mg/Kg
-30812	11-A 14' 07-10-89	16	mg/Kg

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name
KE 1025-38	MILLS COLLEGE - KITCHEN

Sampler's Name (printed): P. HUDSON

Boring Number	Date	Time	Soil	Water	Sample Location or Depth (FEET)	Sample Number	Number/Type of Containers	Analytical Tests: DIESEL	Remarks
1	7/10/09	AM/PM	X		10	1-A	1/BRASS LINER	X	
1					14	1-B		X	
2					10	2-A		X	
2					13 1/2	2-B		X	
3					10	3-A		X	
3					14	3-B		X	
4					14 1/2	4-A		X	
5					13 1/2	5-A		X	
6					14	6-A		X	
7					10	7-A		X	
7					14 1/2	7-B		X	
8					14	8-A		X	
9					13	9-A		X	
10					14 1/2	10-A		X	
11					14	11-A		X	

	Date/Time	
Relinquished by: (Signature)	7/10/09	Received by: (Signature)
Relinquished by: (Signature)		Received by: (Signature)
Relinquished by: (Signature)		Received for Laboratory by: (Signature)

Ship To: NET (MOBILE LAB)
NET PACIFIC INC, SANTA ROSA CA.

Attention: DEBRA DOW / BILL ROTZ
Phone No: 1-707-526-7200

Requested Turnaround Time: — (ONSITE)

Remarks:

Kaldveer Assoc. Contact: P. HUDSON / D. LADUSINSKY

Please address correspondence to:
Kaldveer Associates, Inc.
425 Roland Way
Oakland, California 94621
(415) 568-4001

Kaldveer Associates
Geoscience Consultants
A California Corporation

White - Kaldveer Associates Yellow - Analytical Laboratory

MED-TOX ASSOCIATES, INC.

ENVIRONMENTAL & OCCUPATIONAL HEALTH SERVICES

3440 Vincent Road Pleasant Hill, CA 94523 • (415) 930-9090 • FAX# (415) 930-0256

AUG 1 0 1989

LABORATORY ANALYSIS REPORT

KALDVEER ASSOCIATES, INC.
425 ROLAND WAY
OAKLAND, CA 94621

REPORT DATE: 08/08/89
DATE SAMPLED: 07/18-19/89
DATE RECEIVED: 07/20/89

ATTN: DENNIS LADUZINSKY

DATE EXTRACTED: 07/31/89
DATE ANALYZED: 08/01-03/89

CLIENT PROJECT NO: KE1025-3

MED-TOX JOB NO: 8907132

ANALYSIS OF: EIGHT SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS

METHOD: EPA 8015 (EXTRACTION)

Sample Identification Client Id.	Lab No.	Total Petroleum Hydrocarbons as Diesel (mg/kg)	Total Petroleum Hydrocarbons as Waste Oil (mg/kg)
CS1-10	01A	ND	ND
CS2-13	02A	5,000	ND(2,000)
CS3-10	03A	ND	ND
CS4-12	04A	260	ND(200)
CS5-10	05A	ND	ND
CS6-13	06A	570	ND
CS7-10	07A	ND	ND
CS8-12	08A	1,600	ND(200)
Detection limit (Unless otherwise indicated in parentheses)		10	20

ND = Not detected at or above indicated method detection limit

Michael Lynch, Manager
Organic Laboratory

Results FAXed to Dennis Laduzinsky 08/08/89

390132

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name
KE1025-3	

Sampler's Name (printed): Dennis Ladwzinsky

Boring Number	Date	Time	Soil	Water	Sample Location or Depth	Sample Number	Number/Type of Containers	Analytical Tests: TPH Diesel	Remarks
	7/18		X		CS1-10		BRASS	X	
	↓		↓		CS2-13		TUBE	X	
	7/19				CS3-10		↓	X	
	↓				CS4-13			X	
					CS5-10			X	
					CS6-13			X	
					CS7-10			X	
	↓		↓		CS8-12		↓	X	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
[signature]	7/20/89 | 10:10	Denise Harrington

Ship To: MED-TOX

Attention:

Phone No:

Requested Turnaround Time: 2 week

Kaldveer Assoc. Contact: Dennis Ladzinsky

Remarks:

Please address correspondence to:

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

Kaldveer Associates
Geoscience Consultants
A California Corporation

White - Kaldveer Associates Yellow - Analytical Laboratory

MED-TOX ASSOCIATES, INC.

SEP 5 1989

ENVIRONMENTAL & OCCUPATIONAL HEALTH SERVICES
3440 Vincent Road Pleasant Hill, CA 94523 • (415) 930-9090 • FAX# (415) 930-0256

LABORATORY ANALYSIS REPORT

KALDVEER ASSOCIATES, INC.
425 ROLAND WAY
OAKLAND, CA 94621

ATTN: DENNIS LADUZINSKY

REPORT DATE: 08/31/89
DATE SAMPLED: 08/04-07/89
DATE RECEIVED: 08/08/89
DATE EXTRACTED: 08/14/89
DATE ANALYZED: 08/15/89

CLIENT PROJECT NO: KE1025-3A

MED-TOX JOB NO: 8908065

ANALYSIS OF: TWO SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS

METHOD: EPA 8015 (EXTRACTION)

Sample Identification Client Id.	Lab No.	Total Petroleum Hydrocarbons as Diesel (mg/kg)	Total Petroleum Hydrocarbons as Waste Oil (mg/kg)
SS-1	01A	ND	ND
SS-2	02A	ND	ND
Detection limit		10	20

ND = Not detected at or above indicated method detection limit

Michael Lynch, Manager
Organic Laboratory

Results FAXed to Dennis Laduzinsky 08/17/89

8908065

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name
KE 1025-3A	—

Sampler's Name (printed): Robert D Busby

Boring Number	Date	Time	Soil	Water	Sample Location or Depth	Sample Number	Number/Type of Containers	Analytical Tests: TPH as Diesel	Remarks
SS-1	8/4/89	—	X		—	SS-1	1-brass	X	
SS-2	8/7/89	—	X		—	SS-2	1-brass	X	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Robert D Busby	8/7/89 1615	Denise Lowry
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
Denise Lowry	8/8/89 1640	Denise Harrington

Ship To: Med-Tox
3440 Vincent, Road
Pleasant Hill, CA 94523

Attention: Suzanne
Phone No: 415-930-9090

Requested Turnaround Time: 2 week

Kaldveer Assoc. Contact: ~~Rob Busby~~ * Dennis Laduzinsky

Remarks:

Please address correspondence to:
Kaldveer Associates, Inc.
425 Roland Way
Oakland, California 94621
(415) 568-4001

Kaldveer Associates
Geoscience Consultants
A California Corporation

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ANALYTICAL SERVICES

MED-TOX ASSOCIATES, INC.

CERTIFICATE OF ANALYSIS

KALDVEER ASSOCIATES, INC.
425 ROLAND WAY
OAKLAND, CA 94621

ATTN: DENNIS LADUZINSKY

CLIENT PROJ. ID: KE1025-3B-718

REPORT DATE: 06/13/91

DATE SAMPLED: 06/04/91

DATE RECEIVED: 06/05/91

MED-TOX JOB NO: 9106027

ANALYSIS OF: SOIL SAMPLES

Sample Identification Client Id.	Lab No.	Extractable Hydrocarbons as Diesel (mg/kg)	Extractable Hydrocarbons as Oil (mg/kg)
MHW-2	01A	620	ND
MHW-3	02A	ND	ND
Detection Limit		10	20

Method: 3550 GCFID

Instrument: C

Date Extracted: 06/06/91

Date Analyzed: 06/08-10/91

ND = Not Detected

Andrew Bradeen, Manager
Organic Laboratory

Results FAXed 06/11/91

JUN 17 1991

MED-TOX ASSOCIATES INC

QUALITY CONTROL DATA

KALDVEER ASSOCIATES, INC.

CLIENT PROJ. ID: KE1025-3B-718

MED-TOX JOB NO: 9106027

DATE EXTRACTED: 06/06/91
DATE ANALYZED: 06/08/91
SAMPLE SPIKED: 9106044-01A

MED-TOX JOB NO: 9106027
CLIENT PROJ. ID: KE1025-3B-718
INSTRUMENT: C

MATRIX SPIKE RECOVERY SUMMARY
TPH EXTRACTABLE SOILS
METHOD 3550
(SOIL MATRIX; EXTRACTION METHOD)

ANALYTE	Spike Conc. (mg/kg)	Sample Result (mg/kg)	MS Result (mg/kg)	MSD Result (mg/kg)	Average Percent Recovery	RPD
Diesel	84.8	ND	81.3	82.0	96.3	0.9

CURRENT QC LIMITS (Revised 05/02/91)

Analyte	Percent Recovery	RPD
Diesel	(48.8-126.6)	19.1

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

Lab Job # 910602

R-4S-B

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name
KE1025-3B-718	MILLS HALL
	Location: OAKLAND

Sampler's Name (printed): JEFF FIEDLER

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
MHW-2	01A	6/4/91	X		2"x6" BRASS		X										
MHW-3	02A	6/4/91	X		" "		X										

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Jeff Fiedler	6/5/91 1410	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
	6/5/91 1410	Denise Harrington

Ship To: _____

Attention: _____

Phone No: _____

Requested Turnaround Time: NORMAL

Kaldveer Assoc. Contact: DENNIS LADZINSKY

Remarks:

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

ANALYTICAL SERVICES

MED-TOX ASSOCIATES

CERTIFICATE OF ANALYSIS

KALDVEER ASSOCIATES, INC.
425 ROLAND WAY
OAKLAND, CA 94621

ATTN: DENNIS LADUZINSKY

CLIENT PROJ. ID: KE1025-3B

REPORT DATE: 06/26/91

DATE SAMPLED: 06/12-13/91

DATE RECEIVED: 06/13/91

MED-TOX JOB NO: 9106085

ANALYSIS OF: WATER SAMPLES

Sample Identification Client Id.	Lab No.	Extractable Hydrocarbons as Diesel (mg/L)	Extractable Hydrocarbons as Oil (mg/L)
MHW-1	04D	0.06	ND
MHW-2	05D	3.2	ND
MHW-3	06D	ND	ND
SWS-UPPER	07D	ND	0.1
SWS-LOWER	08D	ND	0.1
Detection Limit		0.05	0.1

Method: 3510 GCFID

Instrument: C

Date Extracted: 06/20/91
Date Analyzed: 06/21/91

ND = Not Detected

Andrew Bradeen, Manager
Organic Laboratory

Results FAXed 06/24/91

JUN 27 1991

KALDVEER ASSOCIATES, INC.

CLIENT PROJ. ID: KE1025-3B
CLIENT ID: MHW-1
DATE SAMPLED: 06/12/91
DATE RECEIVED: 06/13/91
REPORT DATE: 06/26/91

MED-TOX LAB NO: 9106085-04A
MED-TOX JOB NO: 9106085

DATE ANALYZED: 06/19/91
INSTRUMENT: F

BTEX (WATER MATRIX)

METHOD: EPA 8020 (5030)

	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Benzene	71-43-2	ND	0.3
Toluene	108-88-3	ND	0.3
Ethylbenzene	100-41-4	ND	0.3
Xylenes, Total	1330-20-7	ND	1

ND = Not Detected

KALDVEER ASSOCIATES, INC.

CLIENT PROJ. ID: KE1025-3B
CLIENT ID: MHW-2
DATE SAMPLED: 06/12/91
DATE RECEIVED: 06/13/91
REPORT DATE: 06/26/91

MED-TOX LAB NO: 9106085-05A
MED-TOX JOB NO: 9106085

DATE ANALYZED: 06/20-21/91
INSTRUMENT: F

BTEX (WATER MATRIX)

METHOD: EPA 8020 (5030)

	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Benzene	71-43-2	ND	0.3
Toluene	108-88-3	ND	0.3
Ethylbenzene	100-41-4	ND	0.3
Xylenes, Total	1330-20-7	1	1

ND = Not Detected

KALDVEER ASSOCIATES, INC.

CLIENT PROJ. ID: KE1025-3B
CLIENT ID: MHW-3
DATE SAMPLED: 06/12/91
DATE RECEIVED: 06/13/91
REPORT DATE: 06/26/91

MED-TOX LAB NO: 9106085-06A
MED-TOX JOB NO: 9106085

DATE ANALYZED: 06/20/91
INSTRUMENT: F

BTEX (WATER MATRIX)

METHOD: EPA 8020 (5030)

	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Benzene	71-43-2	ND	0.3
Toluene	108-88-3	ND	0.3
Ethylbenzene	100-41-4	ND	0.3
Xylenes, Total	1330-20-7	ND	1

ND = Not Detected

KALDVEER ASSOCIATES, INC.

CLIENT PROJ. ID: KE1025-3B
CLIENT ID: SWS-UPPER
DATE SAMPLED: 06/13/91
DATE RECEIVED: 06/13/91
REPORT DATE: 06/26/91

MED-TOX LAB NO: 9106085-07A
MED-TOX JOB NO: 9106085

DATE ANALYZED: 06/20/91
INSTRUMENT: F

BTEX (WATER MATRIX)

METHOD: EPA 8020 (5030)

	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Benzene	71-43-2	ND	0.3
Toluene	108-88-3	ND	0.3
Ethylbenzene	100-41-4	ND	0.3
Xylenes, Total	1330-20-7	ND	1

ND = Not Detected

KALDVEER ASSOCIATES, INC.

CLIENT PROJ. ID: KE1025-3B
CLIENT ID: SWS-LOWER
DATE SAMPLED: 06/13/91
DATE RECEIVED: 06/13/91
REPORT DATE: 06/26/91

MED-TOX LAB NO: 9106085-08A
MED-TOX JOB NO: 9106085

DATE ANALYZED: 06/20/91
INSTRUMENT: F

BTEX (WATER MATRIX)

METHOD: EPA 8020 (5030)

	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Benzene	71-43-2	ND	0.3
Toluene	108-88-3	ND	0.3
Ethylbenzene	100-41-4	ND	0.3
Xylenes, Total	1330-20-7	ND	1

ND = Not Detected

MED-TOX ASSOCIATES, INC

QUALITY CONTROL DATA

KALDVEER ASSOCIATES, INC.

CLIENT PROJ. ID: KE1025-3B

MED-TOX JOB NO: 9106085

DATE EXTRACTED: 06/20/91
DATE ANALYZED: 06/21/91
INSTRUMENT: C

MED-TOX JOB NO: 9106085

CLIENT PROJ. ID: KE1025-3B

MATRIX SPIKE RECOVERY SUMMARY
TPH EXTRACTABLE WATERS
METHOD 3510
(WATER MATRIX; EXTRACTION METHOD)

ANALYTE	Spike Conc. (mg/L)	Sample Result (mg/L)	MS Result (mg/L)	MSD Result (mg/L)	Average Percent Recovery	RPD
Diesel	0.636	ND	0.437	0.498	73.5	6.4

CURRENT QC LIMITS (Revised 05/02/91)

Analyte	Percent Recovery	RPD
Diesel	(49.8-100.0)	30.1

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

DATE ANALYZED: 06/17/91
SAMPLE SPIKED: 9106085-03A
INSTRUMENT: F

MED-TOX JOB NO: 9106085
CLIENT PROJ. ID: KE1025-3B

MATRIX SPIKE RECOVERY SUMMARY
METHOD TPHBTW
5030 w/GCFID/8020

ANALYTE	Spike Conc. (ug/L)	Sample Result (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	Average Percent Recovery	RPD
Benzene	16.4	7.4	23.1	23.5	97.0	1.7
Toluene	51.4	ND	51.3	51.9	100.4	1.2
Hydrocarbons as Gasoline	520	112	547	562	85.1	2.7

CURRENT QC LIMITS (Revised 04/30/91)

Analyte	Percent Recovery	RPD
Benzene	(75.6-118.0)	12.6
Toluene	(78.2-116.8)	10.9
Gasoline	(66.3-114.0)	14.4

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

R-3, S-2
R-1, S-E

Lab Job # 910688

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name / Location
KE1025-3B	Mills Wells / Oakland, CA

Sampler's Name (printed): Terry L. Olson

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 -	Meth. 8020 - BTEX			Remarks
MW-1	01A-C	6-12		X	3 x 40ml VOA	X							X				HCl PRESERVED
MW-2	02A-C				3 x 40 ml VOA	X							X				
MW-3	03A-C				3 x 40ml VOA	X							X				
MHW-1	04A-C				3 x 40 ml VOA								X				
MHW-1	DE				2 x Amber		X										
MHW-2	05A-C				3 x 40 ml VOA								X				
MHW-2	DE				2 x Amber		X										
MHW-3	06A-C				3 x 40 ml VOA								X				
MHW-3	DE				2 x Amber		X										
SWS-Upper	07A-C	6/13			3 x 40ml								X				
SWS-lower	DE	6/13			2 x LITER		X										
SWS-upper	08A-C	6/13			3 x 40ml								X				
SWS-lower	DE	6/13		↓	2 x LITER		X										
																	Sample ID'ed as upper
																	" lower

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Jeff Fuchs	6/13/91 0950	michelle c yuen
michelle c yuen	6-13-91 1035	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) 1035 Cynthia Gillespie 6-13-91

Ship To: Med Tox

Attention:

Phone No:

Requested Turnaround Time: NORMAL - 2 WEEK

Kaldveer Assoc. Contact: DENNIS LAZINSKY

Remarks:

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

Quanteq Laboratories

An Ecologies Company

FORMERLY MED-TOX

Certificate of Analysis

DOHS CERTIFICATION NO. 1772

AIHA ACCREDITATION NO. 352

KALDVEER ASSOCIATES, INC.
425 ROLAND WAY
OAKLAND, CA 94621

ATTN: DENNIS LADUZINSKY

CLIENT PROJ. ID: KE1025-3C

REPORT DATE: 04/07/92

DATE SAMPLED: 03/24/92

DATE RECEIVED: 03/25/92

QUANTEQ JOB NO: 9203206

ANALYSIS OF: WATER SAMPLES

Client Sample Id.	Quanteq Lab Id.	Extractable Hydrocarbons as Diesel (mg/L)
MHW-1	01A	ND
MHW-2	02A	0.1
MHW-3	04A	ND
Detection Limit		0.05

Method: 3520 GCFID

Instrument: C

Date Extracted: 04/01/92
Date Analyzed: 04/03/92

ND = Not Detected

Andrew Bradeen, Manager
Organic Laboratory

Results FAXed 04/03/92

Quanteq Laboratories
An Ecologica Company

KALDVEER ASSOCIATES, INC.

CLIENT ID: MHW-1
CLIENT PROJ. ID: KE1025-3C
DATE SAMPLED: 03/24/92
DATE RECEIVED: 03/25/92
REPORT DATE: 04/07/92

QUANTEQ LAB NO: 9203206-01C
QUANTEQ JOB NO: 9203206
DATE ANALYZED: 04/02/92
INSTRUMENT: F

BTEX (WATER MATRIX)
METHOD: EPA 8020 (5030)

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Benzene	71-43-2	ND	0.3
Toluene	108-88-3	ND	0.3
Ethylbenzene	100-41-4	ND	0.3
Xylenes, Total	1330-20-7	ND	1

ND = Not Detected

Quanteq Laboratories
An Ecologics Company

KALDVEER ASSOCIATES, INC.

CLIENT ID: MHW-2
CLIENT PROJ. ID: KE1025-3C
DATE SAMPLED: 03/24/92
DATE RECEIVED: 03/25/92
REPORT DATE: 04/07/92

QUANTEQ LAB NO: 9203206-02C
QUANTEQ JOB NO: 9203206
DATE ANALYZED: 04/02/92
INSTRUMENT: F

BTEX (WATER MATRIX)
METHOD: EPA 8020 (5030)

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Benzene	71-43-2	ND	0.3
Toluene	108-88-3	ND	0.3
Ethylbenzene	100-41-4	ND	0.3
Xylenes, Total	1330-20-7	ND	1

ND = Not Detected

Quanteq Laboratories
An Ecologies Company

KALDVEER ASSOCIATES, INC.

CLIENT ID: MHW-3
CLIENT PROJ. ID: KE1025-3C
DATE SAMPLED: 03/24/92
DATE RECEIVED: 03/25/92
REPORT DATE: 04/07/92

QUANTEQ LAB NO: 9203206-03C
QUANTEQ JOB NO: 9203206
DATE ANALYZED: 04/02/92
INSTRUMENT: F

BTEX (WATER MATRIX)
METHOD: EPA 8020 (5030)

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Benzene	71-43-2	ND	0.3
Toluene	108-88-3	ND	0.3
Ethylbenzene	100-41-4	ND	0.3
Xylenes, Total	1330-20-7	ND	1

ND = Not Detected

Quanteq Laboratories
An Ecologics Company

KALDVEER ASSOCIATES, INC.

CLIENT ID: FB
CLIENT PROJ. ID: KE1025-3C
DATE SAMPLED: 03/24/92
DATE RECEIVED: 03/25/92
REPORT DATE: 04/07/92

QUANTEQ LAB NO: 9203206-04A
QUANTEQ JOB NO: 9203206
DATE ANALYZED: 04/02/92
INSTRUMENT: F

BTEX (WATER MATRIX)
METHOD: EPA 8020 (5030)

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Benzene	71-43-2	ND	0.3
Toluene	108-88-3	ND	0.3
Ethylbenzene	100-41-4	ND	0.3
Xylenes, Total	1330-20-7	ND	1

ND = Not Detected

Quanteq Laboratories
An Ecologics Company

QUALITY CONTROL DATA

DATE EXTRACTED: 03/30/92
DATE ANALYZED: 04/01/92
CLIENT PROJ. ID: KE1025-3C

QUANTEQ JOB NO: 9203206
SAMPLE SPIKED: D.I. WATER
INSTRUMENT: C

MATRIX SPIKE RECOVERY SUMMARY
TPH EXTRACTABLE WATERS
METHOD 3520 GCFID
(WATER MATRIX; EXTRACTION METHOD)

ANALYTE	Spike Conc. (mg/L)	Sample Result (mg/L)	MS Result (mg/L)	MSD Result (mg/L)	Average Percent Recovery	RPD
Diesel	2.51	ND	1.72	1.51	64.3	13.0

CURRENT QC LIMITS (Revised 08/15/91)

Analyte	Percent Recovery	RPD
Diesel	(49.3-101.4)	29.0

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

Quanteq Laboratories
An Ecologics Company

QUALITY CONTROL DATA

DATE ANALYZED: 04/02/92
SAMPLE SPIKED: 9203206-01C
CLIENT PROJ. ID: KE1025-3C

QUANTEQ JOB NO: 9203206
INSTRUMENT: F

MATRIX SPIKE RECOVERY SUMMARY
METHOD 5030 w/GCFID/8020
(WATER MATRIX)

ANALYTE	Spike Conc. (ug/L)	Sample Result (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	Average Percent Recovery	RPD
Benzene	15.5	ND	14.9	15.3	97.4	2.6
Toluene	45.7	ND	43.8	45.2	97.4	3.1
Hydrocarbons as Gasoline	507	ND	500	500	98.6	0.0

CURRENT QC LIMITS (Revised 08/15/91)

Analyte	Percent Recovery	RPD
Benzene	(77.7-118.0)	10.3
Toluene	(80.7-116.2)	10.1
Gasoline	(72.5-110.7)	13.6

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

APR 07 '92 11:25 QUANTEQ 173 P09

R-3, S-1

Pa[redacted] 1 [redacted] 1

Lab Job # 92032

CHAIN-OF-CUSTODY RECORD

Project Number: KE025-3C

Project Name: MILLS HALL

Location: OAKLAND

Sampler's Name (printed): JEFF FIEDLER

KA Sample I.D. Number	Lab Sample I.D. Number	Date	Soil	Water	Number/Type of Container	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 -	TPH DIESEL 3550	BTEX EPA 8020	Remarks
✓ MHW-1	01A-D	3/24		X	2 x 1 liter									X		PRESERVED WITH HCl
✓ MHW-1	[illegible]	↓		X	2 x 40ml										X	↓
✓ MHW-2	02A-D	↓		X	2 x 1 liter									X		↓
✓ MHW-2	↓	↓		X	2 x 40ml										X	↓
✓ MHW-3	03A-D	↓		X	2 x 1 liter									X		↓
✓ MHW-3	↓	↓		X	2 x 40ml										X	↓
✓ EB	04A	3/24		X	2 x 40ml										X	HCl PRESERVED APPEARS ON TWO COCS-

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
From Refrigeration [signature]	3/25/92 1050	Kim Flores 3/25/92 10:50
Kim Flores	3/25/92 11:45	
		Received for Laboratory by: (Signature) Jana Gillespie 3-25-92 1145

Ship To:

Attention:

Phone No:

Requested Turnaround Time: NORMAL - 10 DAYS

Kaldveer Assoc. Contact: DENNIS LADUZINSKY OR JEFF FIEDLER

Remarks:

Please address correspondence and return cooler # ______ to:

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

Kaldveer Associates
Geoscience Consultants