

Woodward-Clyde



Engineering & sciences applied to the earth & its environment

June 20, 1995
941366NA/2100

ENVIRONMENTAL
PROTECTION
95 JUN 22 PM 1:20

Ms. Susan L. Hugo
Senior Hazardous Materials Specialist
Alameda County Department of Environmental Health
Environmental Protection Division
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502-6577

Subject: Work Plan for Phase II Soil and Groundwater Investigation
City of Emeryville Fire Station No. 2
Emeryville, California

Dear Ms. Hugo:

Enclosed is the revised Work Plan for Phase II soil and groundwater investigation at the City of Emeryville Fire Station No. 2. The basis for the revision is the original Work Plan dated May 31, 1995, your review comments dated June 15, 1995, and our telephone conversations also on June 15. Changes made to the original Work Plan are listed below.

- A total of seven soil borings are proposed in this revised work plan, as compared to six soil borings in the original plan. The proposed boring locations have also been adjusted somewhat to provide a better coverage of the site.
- All soil and groundwater samples will be analyzed for TPH as gasoline and BTEX.
- A site health and safety plan is included with the work plan.
- Reporting errors in Table 2 of the original work plan have been corrected in the revised one.

Another work plan will be submitted to your office for monitoring well installation and site remediation after the removal of the two USTs. We will notify your office 72 hours in advance of any field work.

Please contact me at (510) 874-3060 if you have questions.

Sincerely,
WOODWARD-CLYDE CONSULTANTS

Xinggang Tong
Project Manager

enclosure.

cc: Ignacio Dayrit, City of Emeryville

June 20, 1995
941366NA

Mr. Ignacio Dayrit
City of Emeryville Redevelopment Agency
2200 Powell Street, 12th Floor
Emeryville, California 94608

**Subject: Revised Work Plan for Phase II
Soil and Groundwater Investigation
City of Emeryville Fire Station No. 2
Emeryville, California**

RECEIVED
ENVIRONMENTAL HEALTH
DIVISION
JUN 22 PM 1:50

Dear Ignacio:

Woodward-Clyde Consultants (WCC) is pleased to submit to the City of Emeryville Redevelopment Agency (Agency) our revised Work Plan for the Phase II soil and groundwater investigation at the City of Emeryville Fire Station No. 2. The basis for this revision is the Proposed Work Plan for Phase II Soil and Groundwater Investigation at Fire Station No. 2, dated May 31, 1995, and review comments from Alameda County Department of Environmental Health, Environmental Protection Division, dated June 15, 1995.

BACKGROUND

The City of Emeryville Fire Station No. 2 (Site) is located at 6303 Hollis Street of Emeryville, California, as shown on Figure 1. Two active underground fuel storage tanks (USTs) exist on the Site: one 1,000-gallon unleaded gasoline UST and one 1,000-gallon diesel UST. Their approximate locations are shown in Figure 2. Both USTs are believed to be single-walled steel tanks. The unleaded gasoline UST may have been replaced in 1989 and the diesel UST may have been replaced in 1982. However, actual replacement documents are unavailable for review at this time.

In March 1995 WCC performed Phase I of soil and groundwater investigations at the site. Phase I included advancing five soil borings (SB-1 through SB-5) in the immediate vicinity of the USTs using hydraulic push continuous soil sampling equipment. The locations of the soil borings are shown in Figure 3. Three soil samples from boring SB-1 and two soil samples from SB-2 through SB-5 were submitted for chemical analyses. Grab groundwater samples were collected from borings SB-1 and SB-3 for chemical analyses. Groundwater was encountered at a depth of about 12 feet below the ground surface in borings SB-1 and SB-3. Soil samples were analyzed for total petroleum hydrocarbons (TPH), quantified as gasoline and diesel, using EPA Method 8015 (Modified) and benzene, toluene, ethylbenzene and xylenes (BTEX) using EPA Method 8020.

Woodward-Clyde

Mr. Ignacio Dayrit
City of Emeryville Redevelopment Agency
June 20, 1995
Page 2

Groundwater samples were analyzed for TPH quantified as gasoline and BTEX using the methods indicated above.

The results of the Phase I investigations are summarized below. The results of Phases I and II will be presented in detail in a report to be prepared following completion of Phase II.

PHASE I RESULTS

The results of chemical analyses on soil and groundwater samples collected during Phase I of the investigations are summarized in Tables 1 and 2 respectively. The results of the Phase I investigation are summarized as follows:

- TPH quantified as gasoline was detected in one or more soil samples from borings SB-1 and SB-2.
- TPH quantified as diesel was not detected in any samples analyzed as part of the Phase I investigations.
- At least three of the BTEX compounds were detected in one or more soil samples from each of the borings.
- BTEX concentrations in soil samples from 10 and 11 feet below ground surface in borings SB-1, SB-4 and SB-5 were less than the detection limits for the analyses.
- The highest concentrations of contaminants in soil were detected in samples from borings SB-1 and SB-3.
- BTEX were detected in groundwater samples collected from borings SB-1 and SB-3. The concentration of benzene in both samples exceeded the maximum contaminant level (1.0 $\mu\text{g/l}$) for groundwater suitable for use as a drinking water supply.
- Soil and groundwater contamination at the site appears to be associated with gasoline only.

Based on the results of the Phase I investigation, further soil and groundwater investigations are proposed to delineate the horizontal extent of soil and groundwater contamination at the site. Our proposed Phase II investigation is described below.

Woodward-Clyde

Mr. Ignacio Dayrit
City of Emeryville Redevelopment Agency
June 20, 1995
Page 3

SCOPE OF PHASE II

To evaluate the lateral extent of petroleum in soil and groundwater a total of seven soil borings are proposed for the Phase II investigation. The proposed locations of the soil borings are shown on Figure 4. Soil samples will be collected for logging and chemical analyses using direct pushing techniques. The soil samples will be logged in accordance with the Unified Soil Classification System by a WCC engineer or geologist.

Two soil samples per boring, from above the groundwater level, will be analyzed for TPH quantified as gasoline and BTEX using EPA Method 8015/8020 (Modified).

Grab groundwater samples will be collected from each boring (seven in total). Groundwater samples will be analyzed for TPH quantified as gasoline and BTEX using the method described above.

A report will be prepared summarizing the results of the Phase I and II soil and groundwater exploration. The report will contain logs of borings, the results of laboratory tests, and our evaluation of the extent of soil and groundwater petroleum contamination. Options for remedial actions will be presented.

Please call Mr. Xinggang Tong at (510) 874-3060 or Mr. Al Ridley at (510) 874-3125 if you have questions.

Sincerely,

WOODWARD-CLYDE CONSULTANTS



Xinggang Tong, Ph.D.
Project Engineer



Albert P. Ridley, C.E.G.
Senior Consulting Geologist

cc: Susan Hugo, Alameda County Health Care Services Agency

Woodward-Clyde

Mr. Ignacio Dayrit
City of Emeryville Redevelopment Agency
June 20, 1995
Page 4

Attachments: Table I Soil Analytical Results
Table II Groundwater Analytical Results
Figure 1 Site Location Map
Figure 2 Site Plan
Figure 3 Proposed Phase I Soil Boring Locations
Figure 4 Proposed Phase II Soil Boring Locations
Logs of Borings SB-1 to SB-5
Laboratory Reports
Site Health and Safety Plan

TABLE 1
PHASE I SOIL ANALYTICAL RESULTS
CITY OF EMERYVILLE
FIRE STATION No. 2

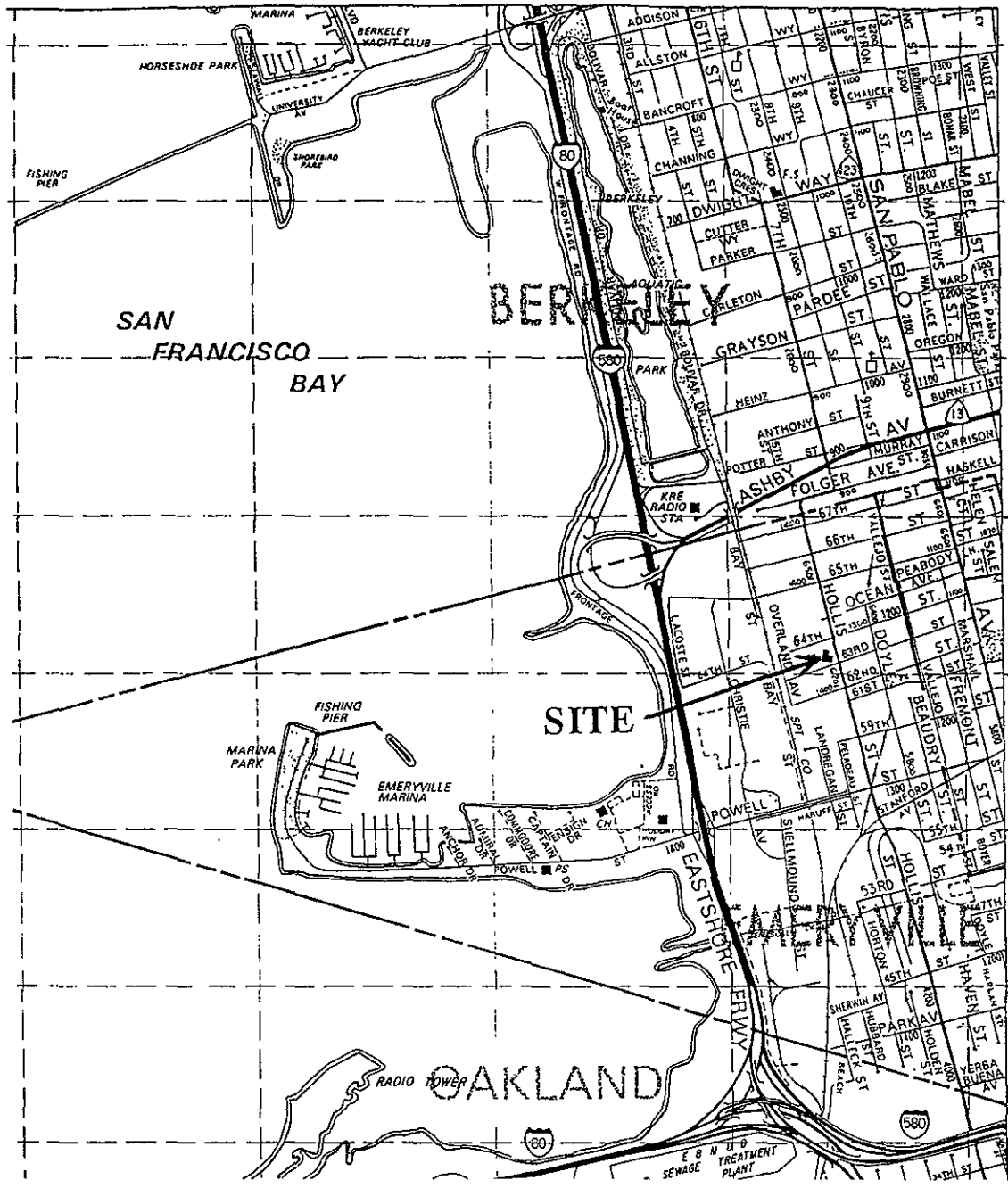
Sample No.	Date Sampled	TPH ^a Gasoline (mg/kg)	TPH ^b Diesel (mg/kg)	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	Total Xylenes (µg/kg)
SB-1-2'	3/15/95	2.4	NA	280	12	200	370
SB-1-5'	3/15/95	540	NA	ND (1,000)	7,000	10,000	51,000
SB-1-10'	3/15/95	ND (1.0)	NA	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
SB-2-6'	3/15/95	3.0	NA	630	5.7	ND (5.0)	15
SB-2-10'	3/15/95	ND (1.0)	NA	110	ND (5.0)	9.7	6.1
SB-3-6'	3/15/95	NA	ND (1.0)	420	11,000	5,500	27,000
SB-3-10'	3/15/95	NA	ND (1.0)	47	81	60	80
SB-4-6'	3/15/95	NA	ND (1.0)	ND (50)	54	1,100	3,300
SB-4-11'	3/15/95	NA	ND (1.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
SB-5-5.5'	3/15/95	NA	ND (1.0)	240	170	2,300	8,200
SB-5-10'	3/15/95	NA	ND (1.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)

Notes: ^a Total petroleum hydrocarbons by EPA Method 8015 (Mod.), quantified as gasoline.
^b Total petroleum hydrocarbons by EPA Method 8015 (Mod.), quantified as diesel.
Benzene, toluene, ethylbenzene and xylenes by EPA Method 8020.
NA - Not analyzed; ND - Not detected at or above the detection limit given in parentheses.

TABLE 2
GROUNDWATER ANALYTICAL RESULTS
CITY OF EMERYVILLE
FIRE STATION No. 2

Sample No.	Date Sampled	TPH ^a Gasoline (mg/L)	TPH ^b Diesel (mg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
SB-3	3/15/95	NA	NA	220	3,800	2,500	14,000
SB-1	3/15/95	0.99	NA	6.1	40	33	160
Trip Blank	3/15/95	NA	NA	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)

Notes: ^a Total petroleum hydrocarbons by EPA Method 8015 (Mod.), quantified as gasoline.
^b Total petroleum hydrocarbons by EPA Method 8015 (Mod.), quantified as diesel.
Benzene, toluene, ethylbenzene and xylenes by EPA Method 8020.
NA - Not analyzed; ND - Not detected at or above the detection limit given in parentheses.



1" = 0.5 mile

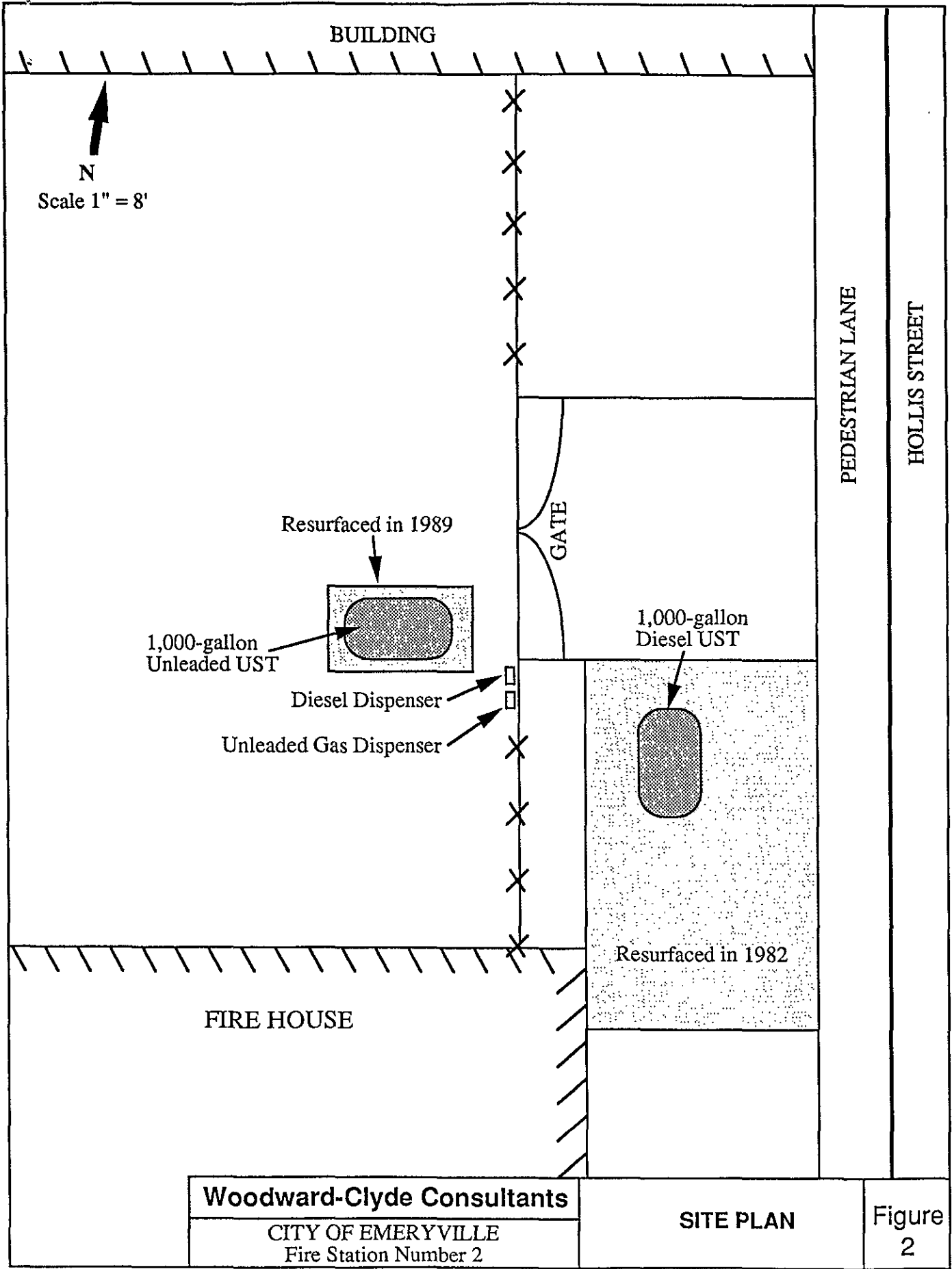
from Thomas Map 1991

CITY OF EMERYVILLE
Fire Station No. 2

Woodward-Clyde Consultants

SITE LOCATION MAP

Figure
1



Woodward-Clyde Consultants
 CITY OF EMERYVILLE
 Fire Station Number 2

SITE PLAN

Figure
 2

Figure 2a 5/24/95

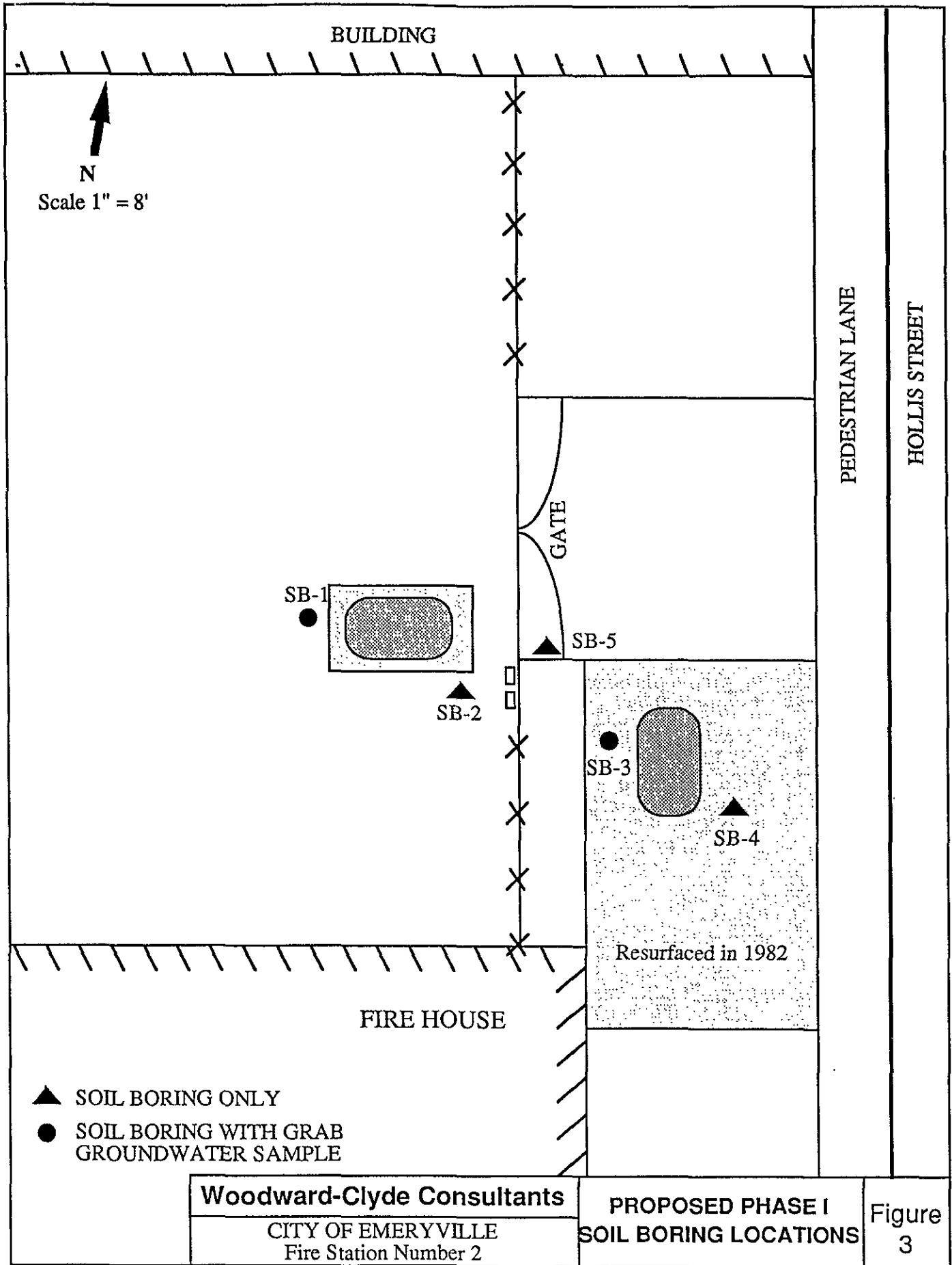


Figure 3 5/24/95

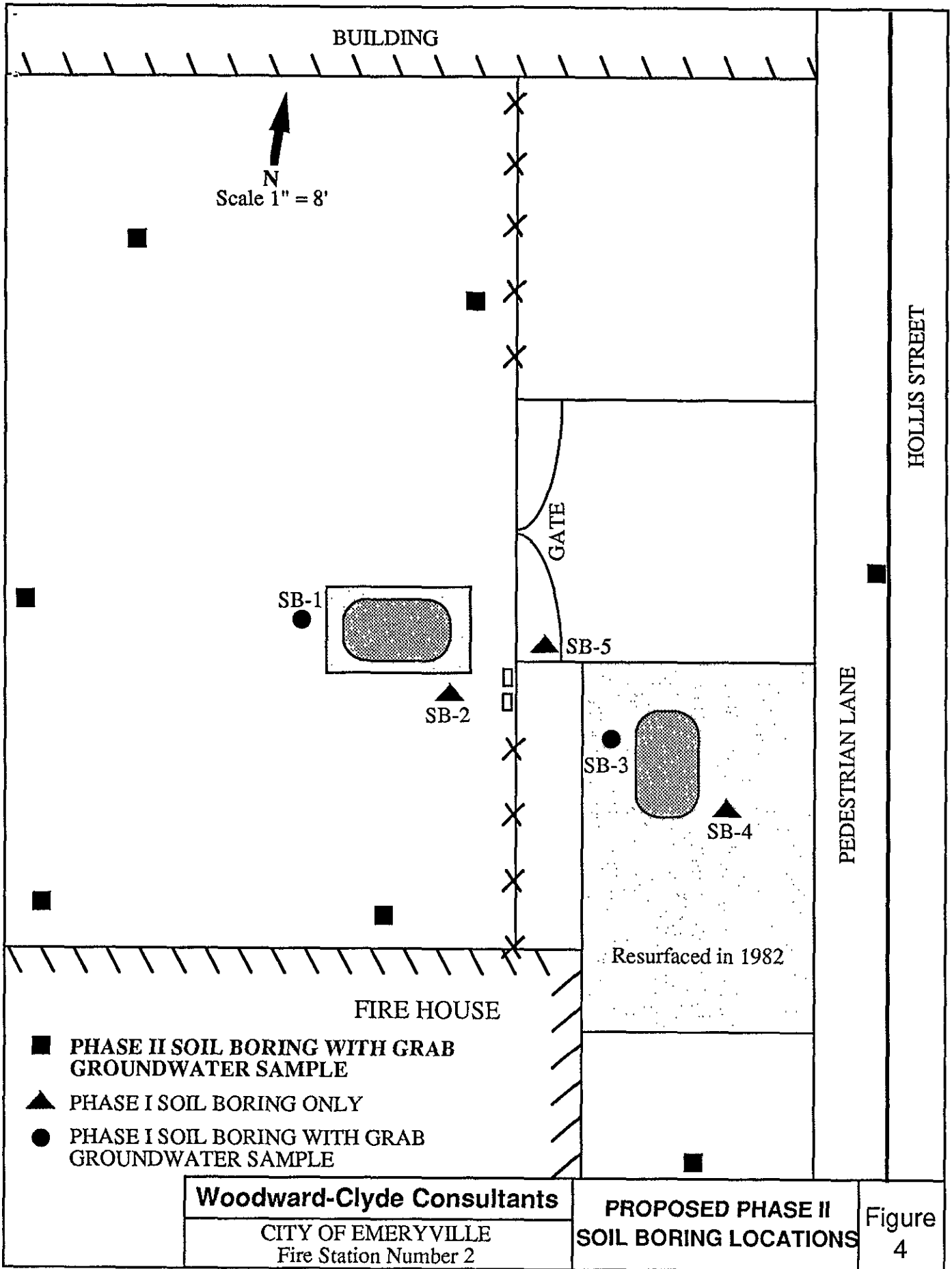
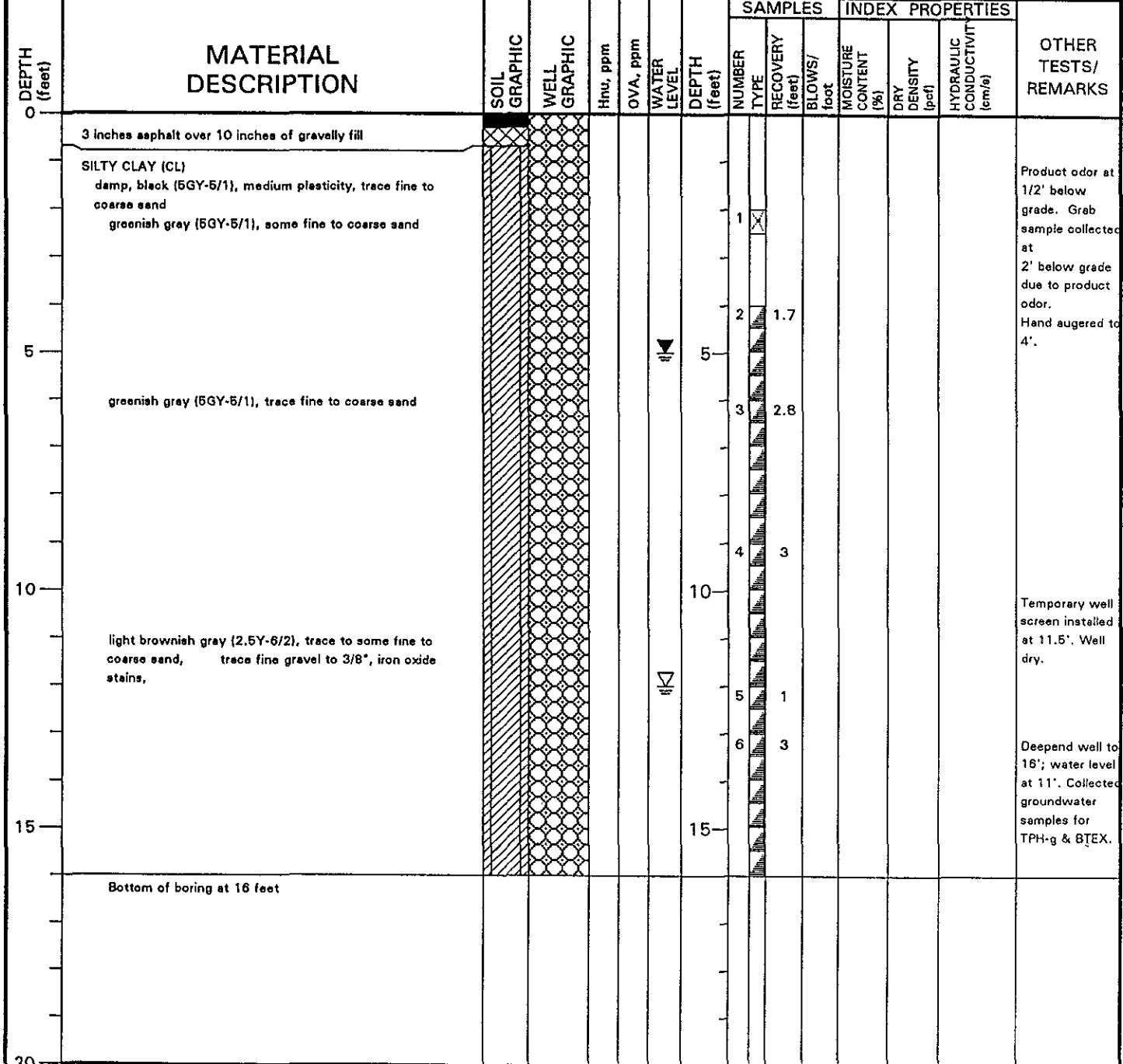


Figure 4 5/24/95

City of Emeryville Fire Station #2, Emeryville, California

BORING LOCATION West end of gasoline tank		GROUND SURFACE ELEVATION: TOP OF WELL CASING ELEVATION:	
DRILLING AGENCY Precision Sampling, Inc.	DRILLER F. Rangel	DATE STARTED: 3/15/95 DATE FINISHED: 3/15/95	
DRILLING EQUIPMENT CMW 400SXD		COMPLETION DEPTH (ft) 16.0	
DRILLING METHOD Hydraulic Push Continuous Sampling	DRILL BIT 2" Core Sampler	HAMMER N/A	SAMPLER 2" core
SIZE AND TYPE OF CASING		NUMBER OF SAMPLES BULK: 1 DRIVE: 2	
TYPE OF PERFORATION		FROM	TO
SIZE AND TYPE OF PACK		FROM	TO
TYPE OF SEAL		LOGGED BY W. Dittman	
TYPE		FR	TO
No. 1: Neat cement (15% Bentonite)		0	16
No. 2:			
No. 3:			
No. 4:			



City of Emeryville Fire Station #2, Emeryville, California

BORING LOCATION	North east corner of gasoline tank		GROUND SURFACE ELEVATION:		TOP OF WELL CASING ELEVATION:	
DRILLING AGENCY	Precision Sampling, Inc.	DRILLER	F. Rangel	DATE STARTED:	3/15/95	
DRILLING EQUIPMENT	CMW 400SXD		DATE FINISHED:	3/15/95		
DRILLING METHOD	Hydraulic Push Continuous Sampling	DRILL BIT	2" Core Sampler	COMPLETION DEPTH (ft)	11.0	
SIZE AND TYPE OF CASING			HAMMER	N/A	SAMPLER	2" core
TYPE OF PERFORATION			NUMBER OF SAMPLES	BULK:	DRIVE: 2	
TYPE OF SEAL			FROM	TO	WATER DEPTH	FIRST: COMPL.: 24 hrs.:
SIZE AND TYPE OF PACK			FROM	TO	LOGGED BY	CHECKED BY
					W. Dittman	

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO	LOG OF BORING SB-2
	No. 1: Neat cement (15% Bentonite)	0	11	No. 3:			
	No. 2:			No. 4:			

DEPTH (feet)	MATERIAL DESCRIPTION	SOIL GRAPHIC	WELL GRAPHIC	Hnu, ppm	OVA, ppm	WATER LEVEL	DEPTH (feet)	SAMPLES			INDEX PROPERTIES				OTHER TESTS/REMARKS
								NUMBER	RECOVERY (feet)	BLOWS/foot	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	HYDRAULIC CONDUCTIVITY (cm/s)		
0	3 inches asphalt over sandy fill														
5	SILTY CLAY (CL) Moist, greenish gray (5GY-5/1), medium to high plasticity, trace fine sand						1	0.5							Standing water at 3' at time of drilling. Hand augered to 4'.
	At 7 to 8 feet: trace to some fine to coarse sand						2	2.5							Soil sample collected at 6' due to poor recovery.
10							3	2							
15	Bottom of boring at 11 feet														



City of Emeryville Fire Station #2, Emeryville, California

BORING LOCATION West side of diesel tank		GROUND SURFACE ELEVATION: TOP OF WELL CASING ELEVATION:	
DRILLING AGENCY Precision Sampling, Inc.	DRILLER F. Rangel	DATE STARTED: 3/15/95 DATE FINISHED: 3/15/95	
DRILLING EQUIPMENT CMW 400SXD		COMPLETION DEPTH (ft) 14.0	
DRILLING METHOD Hydraulic Push Continuous Sampling	DRILL BIT 2" Core Sampler	HAMMER N/A	SAMPLER 2" core
SIZE AND TYPE OF CASING		NUMBER OF SAMPLES BULK: DRIVE: 2	
TYPE OF PERFORATION		FROM TO	WATER DEPTH FIRST: 12 COMPL.: 24 hrs.:
SIZE AND TYPE OF PACK		FROM TO	LOGGED BY W. Dittman CHECKED BY
TYPE OF SEAL	TYPE	FR TO	LOG OF BORING SB-3
	No. 1: Neat cement (15% Bentonite)	0 14	
	No. 2:		
	No. 3:		

DEPTH (feet)	MATERIAL DESCRIPTION	SOIL GRAPHIC	WELL GRAPHIC	Hnu, ppm	OVA, ppm	WATER LEVEL	DEPTH (feet)	SAMPLES			INDEX PROPERTIES			OTHER TESTS/REMARKS
								NUMBER	RECOVERY (feet)	BLOWS/foot	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	HYDRAULIC CONDUCTIVITY (cm/s)	
0	6 inches of concrete													
	SILTY CLAY (CL) Fill material: moist, very dark grayish brown (10YR-3/2), low to medium plasticity, trace fine to coarse sand													
5	SILTY CLAY (CL) Moist, grayish brown (10YR-5/2), medium plasticity, trace fine to coarse sand. greenish gray (5GY-5/1)						5	1	2.5					Hand augered to 5'.
10	CLAYEY SAND (SC) Damp, greenish gray (5GY-5/1) some fine to coarse sand, little fine gravel to 1/2"						10	2	3					Temporary well screen installed at 14'. Collected groundwater samples for TPH-d & BTEX.
	SILTY CLAY (CL) Damp, yellowish brown (10YR-5/4), little fine to coarse sand							3	3					
15	Bottom of boring at 14 feet													



City of Emeryville Fire Station #2, Emeryville, California

BORING LOCATION South end of diesel tank		GROUND SURFACE ELEVATION: TOP OF WELL CASING ELEVATION:	
DRILLING AGENCY Precision Sampling, Inc.	DRILLER F. Rangel	DATE STARTED: 3/15/95 DATE FINISHED: 3/15/95	
DRILLING EQUIPMENT CMW 400SXD		COMPLETION DEPTH (ft) 11.0	
DRILLING METHOD Hydraulic Push Continuous Sampling	DRILL BIT 2" Core Sampler	HAMMER N/A	SAMPLER 2" core
SIZE AND TYPE OF CASING		NUMBER OF SAMPLES BULK: DRIVE: 2	
TYPE OF PERFORATION		FROM TO	WATER DEPTH FIRST: COMPL.: 24 hrs.:
SIZE AND TYPE OF PACK		FROM TO	LOGGED BY: W. Dittman CHECKED BY:

TYPE OF SEAL	TYPE		FR	TO	TYPE		FR	TO	LOG OF BORING SB-4
	No. 1: Neat cement (15% Bentonite)		0	11	No. 3:				
	No. 2:				No. 4:				

DEPTH (feet)	MATERIAL DESCRIPTION	SOIL GRAPHIC	WELL GRAPHIC	Hnu, ppm	OVA, ppm	WATER LEVEL	DEPTH (feet)	SAMPLES			INDEX PROPERTIES				OTHER TESTS/REMARKS
								NUMBER	TYPE	RECOVERY (feet)	BLOWS/foot	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	HYDRAULIC CONDUCTIVITY (cm/s)	
0	8 inches of concrete														
	CLAY (CH) Damp, very dark gray (10YR-3/1), high plasticity, trace fine sand														
	SILTY CLAY (CL) Damp, greenish gray (5GY-4/1), medium to high plasticity, trace fine to coarse sand														
5	becoming sandy, trace to some fine to coarse sand, trace fine gravel to 3/8"						1		.5						
	yellowish brown (10YR-5/4) patches of sand and fine gravel to 1/2"						2		3						
10							3		2						
	Bottom of boring at 11 feet														Hand augered to 5'. Soil sample collected at 6' due to poor recovery.



City of Emeryville Fire Station #2, Emeryville, California

BORING LOCATION Between gas & diesel tanks		GROUND SURFACE ELEVATION:	
DRILLING AGENCY Precision Sampling, Inc.		TOP OF WELL CASING ELEVATION:	
DRILLING EQUIPMENT CMW 400SXD		DATE STARTED: 3/15/95	
DRILLING METHOD Hydraulic Push Continuous Sampling		DATE FINISHED: 3/15/95	
DRILL BIT 2" Core Sampler		COMPLETION DEPTH (ft) 11.5	
SIZE AND TYPE OF CASING		HAMMER N/A SAMPLER 2" core	
TYPE OF PERFORATION		NUMBER OF SAMPLES BULK: DRIVE: 2	
SIZE AND TYPE OF PACK		WATER DEPTH FIRST: COMPL.: 24 hrs.:	
FROM TO		LOGGED BY W. Dittman CHECKED BY	

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO	LOG OF BORING SB-5
	No. 1: Neat cement (15% Bentonite)	0	11.5				
	No. 2:			No. 4:			

DEPTH (feet)	MATERIAL DESCRIPTION	SOIL GRAPHIC	WELL GRAPHIC	fmu, ppm	OVA, ppm	WATER LEVEL	DEPTH (feet)	SAMPLES			INDEX PROPERTIES				OTHER TESTS/REMARKS
								NUMBER	RECOVERY (feet)	BLOWS/foot	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	HYDRAULIC CONDUCTIVITY (cm/s)		
0	7 inches of concrete														
0 - 5	SILTY CLAY (CL) Damp, black (10YR-2/1), medium plasticity, trace fine to coarse sand moist, dark grayish brown (10YR-4/2), dark greenish gray (5GY-4/1) dark greenish gray (5GY-4/1), high plasticity						5	1	1.5						
5 - 11.5	dark greenish gray (5GY-4/1), medium plasticity							2	3						
10	CLAYEY SAND (SC) Dry to damp, gray (10YR-5/1) fine to coarse sand, trace to little fine gravel to 1/2" Bottom of boring at 11.5 feet							3	2						



CHROMALAB, INC.

Environmental Services (SDB)

April 12, 1995

Submission #: 9503218

WOODWARD-CLYDE/OAKLAND
500 12th St., Suite 100
Oakland, CA 94607-4014

Attn: Xingong Tong

RE: Analysis for project 941366NA.


REPORTING INFORMATION

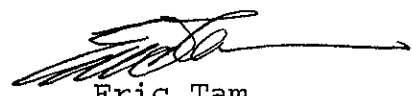
Samples were received cold and in good condition on March 15, 1995. They were refrigerated upon receipt and analyzed as described in the attached report. ChromaLab followed EPA or equivalent methods for all testing reported.

No discrepancies were observed or difficulties encountered with the testing.

SAMPLES TESTED IN THIS REPORT

<u>Client Sample ID</u>	<u>Matrix</u>	<u>Date collected</u>	<u>Sample #</u>
TRIP BLANK	WATER	March 15, 1995	81066
SB1-2'	SOIL	March 15, 1995	81067
SB1-5'	SOIL	March 15, 1995	81068
SB1-10'	SOIL	March 15, 1995	81069
SB3-6'	SOIL	March 15, 1995	81070
SB3-10'	SOIL	March 15, 1995	81071
SB5-5.5'	SOIL	March 15, 1995	81072
SB5-10'	SOIL	March 15, 1995	81073
SB-3	WATER	March 15, 1995	81074
SB-2-6'	SOIL	March 15, 1995	81075
SB-2-10'	SOIL	March 15, 1995	81076
SB4-6'	SOIL	March 15, 1995	81077
SB-1'	WATER	March 15, 1995	81078
SB4-11'	SOIL	March 15, 1995	81079


Jill Thomas
Quality Assurance Manager


Eric Tam
Laboratory Director

CHROMALAB, INC.

Environmental Services (SDB)

March 22, 1995

Submission #: 9503218

WOODWARD-CLYDE/OAKLAND

Atten: Xingong Tong

Project: 941366NA

Received: March 15, 1995

re: 2 samples for BTEX analysis.

Matrix: WATER

Sampled: March 15, 1995

Run#: 5791

Analyzed: March 16, 1995

Method: EPA 602/8020

Spl #	CLIENT SMPL ID	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
81066	TRIP BLANK	N.D.	N.D.	N.D.	N.D.
81074	SB-3	220	3800	2500	14000

Note: GAS DET.LIMIT=2.5mg/L, BTEX DET.LIMIT=25ug/L

Reporting Limits

0.5

0.5

0.5

0.5

Blank Result

N.D.

N.D.

N.D.

N.D.


Blank Spike Result (%)


101

103

107

113


Jack Kelly
Chemist


Ali Kharrazi
Organic Manager

CHROMALAB, INC.

Environmental Services (SDB)

March 22, 1995

Submission #: 9503218

WOODWARD-CLYDE/OAKLAND

Atten: Xingong Tong

Project: 941366NA

Received: March 15, 1995

re: 1 sample for Gasoline and BTEX analysis.

Matrix: WATER

Sampled: March 15, 1995

Run#: 5791

Analyzed: March 16, 1995

Method: EPA 5030/8015M/602/8020

Spl #	CLIENT	SMPL ID	Gasoline (mg/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
81078	SB-1'		0.99	6.1	40	33	160
Reporting Limits			0.05	0.5	0.5	0.5	0.5
Blank Result			N.D.	N.D.	N.D.	N.D.	N.D.
Blank Spike Result (%)			90	101	103	107	113



Jack Kelly
Chemist



Ali Kharrazi
Organic Manager

CHROMALAB, INC.

Environmental Services (SDB)

March 22, 1995

Submission #: 9503218

WOODWARD-CLYDE/OAKLAND

Atten: Xingong Tong

Project: 941366NA

Received: March 15, 1995

re: 5 samples for Gasoline and BTEX analysis.

Matrix: SOIL

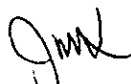
Sampled: March 15, 1995


Run#: 5792

Analyzed: March 16, 1995

Method: EPA 5030/8015M/8020

Spl #	CLIENT	SMPL ID	Gasoline (mg/Kg)	Benzene (ug/Kg)	Toluene (ug/Kg)	Ethyl Benzene (ug/Kg)	Total Xylenes (ug/Kg)
81067	SB1-2'		2.4	280	12	200	370
	Note: GAS DET.LIMIT=2.0mg/Kg, BTEX DET.LIMIT=10ug/Kg						
81068	SB1-5'		540	N.D.	7000	10000	51000
	Note: GAS DET.LIMIT=200mg/Kg, BTEX DET.LIMIT=1000ug/Kg						
81069	SB1-10'		N.D.	N.D.	N.D.	N.D.	N.D.
81075	SB-2-6'		3.0	630	5.7	N.D.	15
81076	SB-2-10'		N.D.	110	N.D.	9.7	6.1
Reporting Limits			1.0	5.0	5.0	5.0	5.0
Blank Result			N.D.	N.D.	N.D.	N.D.	N.D.
Blank Spike Result (%)			95	106	107	114	110


Jack Kelly
Chemist


Ali Kharrazi
Organic Manager

CHROMALAB, INC.

Environmental Services (SDB)

March 22, 1995

Submission #: 9503218

WOODWARD-CLYDE/OAKLAND

Atten: Xingong Tong

Project: 941366NA

Received: March 15, 1995

re: 6 samples for BTEX compounds analysis.

Matrix: SOIL

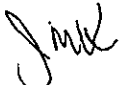
Sampled: March 15, 1995


Run#: 5792

Analyzed: March 16, 1995

Method: EPA 8020

Spl #	CLIENT SMPL ID	Benzene (ug/Kg)	Toluene (ug/Kg)	Ethyl Benzene (ug/Kg)	Total Xylenes (ug/Kg)
81070	SB3-6' Note: GAS DET.LIMIT=40mg/Kg, BTEX DET.LIMIT=200ug/Kg	420	11000	5500	27000
81071	SB3-10' Note: GAS DET.LIMIT=2.0mg/Kg, BTEX DET.LIMIT=10ug/Kg	47	81	60	80
81072	SB5-5.5' Note: GAS DET.LIMIT=40mg/Kg, BTEX DET.LIMIT=200ug/Kg	240	170	2300	8200
81073	SB5-10'	N.D.	N.D.	N.D.	N.D.
81077	SB4-6' Note: GAS DET.LIMIT=10mg/Kg, BTEX DET.LIMIT=50ug/Kg	N.D.	54	1100	3300
81079	SB4-11'	N.D.	N.D.	N.D.	21
Reporting Limits		5	5	5	5
Blank Result		N.D.	N.D.	N.D.	N.D.
Blank Spike Result (%)		106	107	114	110


Jack Kelly
Chemist


Ali Kharrazi
Organic Manager

CHROMALAB, INC.

Environmental Services (SDB)

March 22, 1995

Submission #: 9503218

WOODWARD-CLYDE/OAKLAND

Atten: Xingong Tong

Project: 941366NA

Received: March 15, 1995

re: 6 samples for Diesel analysis.

Sampled: March 15, 1995

Method: EPA 3550/8015M

Matrix: SOIL

Run#: 5845

Extracted: March 17, 1995

Analyzed: March 20, 1995

Spl #	CLIENT	SMPL ID	DIESEL (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE RESULT (%)
81070	SB3-6'		N.D.	1.0	N.D.	84
81071	SB3-10'		N.D.	1.0	N.D.	84
81072	SB5-5.5'		N.D.	1.0	N.D.	84
81073	SB5-10'		N.D.	1.0	N.D.	84
81077	SB4-6'		N.D.	1.0	N.D.	84
81079	SB4-11'		N.D.	1.0	N.D.	84

Sirirat Chullakorn

Sirirat (Sindy) Chullakorn
Chemist

Ali Kharrazi

Ali Kharrazi
Organic Manager

CHROMALAB, INC.

Environmental Services (SDB)

March 27, 1995

Submission #: 9503218

WOODWARD-CLYDE/OAKLAND

Atten: Xingong Tong

Project: 941366NA

Received: March 15, 1995

re: **Matrix spike** report for Diesel analysis.

Matrix: SOIL

Lab Run#: 5845 Instrument: GC2-EXT-S

Analyzed: March 17, 1995

Method: EPA 3550/8015M

Analyte	Spiked Sample Result	Spike Amt	% Spike Rec	Dup Spike Rec	Control Limits	% RPD	% RPD Lim
DIESEL	N.D. mg/Kg	6.7 mg/Kg	68.3	67.7	60-130	0.9	20

Sample Spiked: 81073
Submission #: 9503218
Client Sample ID: SB5-10'

SPK1

CHROMALAB, INC.

Environmental Services (SDB)

March 27, 1995

Submission #: 9503218

WOODWARD-CLYDE/OAKLAND

Atten: Xingong Tong

Project: 941366NA

Received: March 15, 1995

re: **Surrogate** report for 6 samples for Diesel analysis.

Matrix: SOIL

Lab Run#: 5845

Analyzed: March 17, 1995

Method: EPA 3550/8015M

Sample#	Client Sample ID	Surrogate	% Recovered
81070	SB3-6'	O-TERPHENYL	81
81071	SB3-10'	O-TERPHENYL	83
81072	SB5-5.5'	O-TERPHENYL	79
81073	SB5-10'	O-TERPHENYL	79
81077	SB4-6'	O-TERPHENYL	81
81079	SB4-11'	O-TERPHENYL	84

Sample#	QC Sample Type	Surrogate	% Recovered
81764	Method blank (MDB)	O-TERPHENYL	80
81765	Blank Spike (BSP)	O-TERPHENYL	84
81766	Matrix spike (MS)	O-TERPHENYL	86
81767	Matrix spike duplicate (MSD)	O-TERPHENYL	85

SPK1

SPK2

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CHROMALAB, INC.

Environmental Services (SDB)

March 23, 1995

Submission #: 9503218

WOODWARD-CLYDE/OAKLAND

Atten: Xingong Tong

Project: 941366NA

Received: March 15, 1995

re: **Matrix spike** report for BTEX analysis.

Matrix: WATER

Lab Run#: 5791 Instrument: GC1-1

Analyzed: March 16, 1995

Method: EPA 602/8020

Analyte	Spiked Sample Result	Spike Amt	% Spike Rec	Dup Spike Rec	Control Limits	% RPD	% RPD Lim
BENZENE	N.D. ug/L	5.0 ug/L	113	112	80-127	0.9	20
TOLUENE	N.D. ug/L	5.0 ug/L	106	105	80-122	0.9	20
ETHYL BENZENE	N.D. ug/L	5.0 ug/L	106	105	81-119	0.9	20
XYLENES	N.D. ug/L	15 ug/L	110	110	83-125	0.0	20

Sample Spiked: 81012

Submission #: 9503204

Client Sample ID: EFFLUENT

SPK1

CHROMALAB, INC.

Environmental Services (SDB)

March 27, 1995

Submission #: 9503218

WOODWARD-CLYDE/OAKLAND

Atten: Xingong Tong

Project: 941366NA

Received: March 15, 1995

re: **Surrogate** report for 2 samples for BTEX analysis.

Matrix: WATER

Lab Run#: 5791

Method: EPA 602/8020

Analyzed: March 16, 1995

Sample#	Client Sample ID	Surrogate	% Recovered
81066	TRIP BLANK	TRIFLUOROTOLUENE	104
81074	SB-3	TRIFLUOROTOLUENE	102

Sample#	QC Sample Type	Surrogate	% Recovered
81230	Method blank (MDB)	TRIFLUOROTOLUENE	105
81231	Blank Spike (BSP)	TRIFLUOROTOLUENE	102

CHROMALAB, INC.

Environmental Services (SDB)

March 23, 1995

Submission #: 9503218

WOODWARD-CLYDE/OAKLAND

Atten: Xingong Tong

Project: 941366NA

Received: March 15, 1995

re: **Matrix spike** report for Gasoline and BTEX analysis.

Matrix: WATER

Lab Run#: 5791 Instrument: GC1-1

Analyzed: March 16, 1995

Method: EPA 5030/8015M/602/8020

Analyte	Spiked Sample Result	Spike Amt	% Spike Rec	Dup Spike Rec	Control Limits	% RPD	% RPD Lim
GASOLINE	N.D. mg/L	1.0 mg/L	90	--	80-110	N/A	N/A
BENZENE	N.D. ug/L	5.0 ug/L	113	112	80-127	0.9	20
TOLUENE	N.D. ug/L	5.0 ug/L	106	105	80-122	0.9	20
ETHYL BENZENE	N.D. ug/L	5.0 ug/L	106	105	81-119	0.9	20
XYLENES	N.D. ug/L	15 ug/L	110	110	83-125	0.0	20

Sample Spiked: 81012

Submission #: 9503204

Client Sample ID: EFFLUENT

SPK1

CHROMALAB, INC.

Environmental Services (SDB)

March 27, 1995

Submission #: 9503218

WOODWARD-CLYDE/OAKLAND

Atten: Xingong Tong

Project: 941366NA

Received: March 15, 1995

re: **Surrogate** report for 1 sample for Gasoline and BTEX analysis.

Matrix: WATER

Lab Run#: 5791

Analyzed: March 16, 1995

Method: EPA 5030/8015M/602/8020

<u>Sample#</u>	<u>Client Sample ID</u>	<u>Surrogate</u>	<u>Recovered</u>
81078	SB-1'	TRIFLUOROTOLUENE	114
			%
<u>Sample#</u>	<u>QC Sample Type</u>	<u>Surrogate</u>	<u>Recovered</u>
81230	Method blank (MDB)	TRIFLUOROTOLUENE	105
81231	Blank Spike (BSP)	TRIFLUOROTOLUENE	102

CHROMALAB, INC.

Environmental Services (SDB)

March 23, 1995

Submission #: 9503218

WOODWARD-CLYDE/OAKLAND

Atten: Xingong Tong

Project: 941366NA

Received: March 15, 1995

re: **Matrix spike** report for Gasoline and BTEX analysis.

Matrix: SOIL

Lab Run#: 5792 Instrument: GC1-2

Analyzed: March 16, 1995

Method: EPA 5030/8015M/8020

Analyte	Spiked Sample Result	Spike Amt	% Spike Rec	Dup Spike Rec	Control Limits	% RPD	% RPD Lim
GASOLINE	N.D. mg/Kg	5.0 mg/Kg	95	--	80-118	N/A	N/A
BENZENE	N.D. ug/Kg	25 ug/Kg	102	104	80-127	1.9	20
TOLUENE	N.D. ug/Kg	25 ug/Kg	102	105	80-130	2.9	20
ETHYL BENZENE	N.D. ug/Kg	25 ug/Kg	104	106	81-119	1.9	20
XYLENES	N.D. ug/Kg	50 ug/Kg	108	108	83-125	0.0	20

Sample Spiked: 81069

Submission #: 9503218

Client Sample ID: SB1-10'

SPK1

CHROMALAB, INC.

Environmental Services (SDB)

March 27, 1995

Submission #: 9503218

WOODWARD-CLYDE/OAKLAND

Atten: Xingong Tong

Project: 941366NA

Received: March 15, 1995

re: **Surrogate** report for 5 samples for Gasoline and BTEX analysis.

Matrix: SOIL

Lab Run#: 5792

Analyzed: March 16, 1995

Method: EPA 5030/8015M/8020

Sample#	Client Sample ID	Surrogate	% Recovered
81067	SB1-2'	TRIFLUOROTOLUENE	87
81068	SB1-5'	TRIFLUOROTOLUENE	101
81069	SB1-10'	TRIFLUOROTOLUENE	89
81075	SB-2-6'	TRIFLUOROTOLUENE	99
81076	SB-2-10'	TRIFLUOROTOLUENE	93

Sample#	QC Sample Type	Surrogate	% Recovered
81235	Method blank (MDB)	TRIFLUOROTOLUENE	97
81236	Blank Spike (BSP)	TRIFLUOROTOLUENE	99
82249	Matrix spike (MS)	TRIFLUOROTOLUENE	104
82250	Matrix spike duplicate (MSD)	TRIFLUOROTOLUENE	102

SPK1
SPK2

CHROMALAB, INC.

Environmental Services (SDB)

March 23, 1995

Submission #: 9503218

WOODWARD-CLYDE/OAKLAND

Atten: Xingong Tong

Project: 941366NA

Received: March 15, 1995

re: **Matrix spike** report for BTEX compounds analysis.

Matrix: SOIL

Lab Run#: 5792

Instrument: GC1-2

Analyzed: March 16, 1995

Method: EPA 8020

Analyte	Spiked Sample Result	Spike Amt	% Spike Rec	Dup Spike Rec	Control Limits	% RPD	% RPD Lim
BENZENE	N.D. ug/Kg	25 ug/Kg	102	104	80-127	1.9	20
TOLUENE	N.D. ug/Kg	25 ug/Kg	102	105	80-130	2.9	20
ETHYL BENZENE	N.D. ug/Kg	25 ug/Kg	104	106	81-119	1.9	20
XYLENES	N.D. ug/Kg	50 ug/Kg	108	108	83-125	0.0	20

Sample Spiked: 81069

Submission #: 9503218

Client Sample ID: SB1-10'

SPX1

CHROMALAB, INC.

Environmental Services (SDB)

March 27, 1995

Submission #: 9503218

WOODWARD-CLYDE/OAKLAND

Atten: Xingong Tong

Project: 941366NA

Received: March 15, 1995

re: **Surrogate** report for 6 samples for BTEX compounds analysis.

Matrix: SOIL

Lab Run#: 5792

Analyzed: March 16, 1995

Method: EPA 8020

Sample#	Client Sample ID	Surrogate	% Recovered
81070	SB3-6'	TRIFLUOROTOLUENE	113
81071	SB3-10'	TRIFLUOROTOLUENE	91
81072	SB5-5.5'	TRIFLUOROTOLUENE	109
81073	SB5-10'	TRIFLUOROTOLUENE	88
81077	SB4-6'	TRIFLUOROTOLUENE	131
81079	SB4-11'	TRIFLUOROTOLUENE	97

Sample#	QC Sample Type	Surrogate	% Recovered
81235	Method blank (MDB)	TRIFLUOROTOLUENE	97
81236	Blank Spike (BSP)	TRIFLUOROTOLUENE	99
82249	Matrix spike (MS)	TRIFLUOROTOLUENE	104
82250	Matrix spike duplicate (MSD)	TRIFLUOROTOLUENE	102

SPK1

SPK2

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218/81066-81079

20989

Woodward-Clyde Consultants

500 12th Street, Suite 100, Oakland, CA 94607-4024
(510) 893-3600

Chain of Custody

SUBM #: 9503218
CLIENT: W&C-OAK
DUE: 03/22/95
REF #: 20989

PROJECT NO. 941366NA			Sample Matrix (Soil, Water, Air)	ANALYSES				Number of Containers	REMARKS (Sample preservation, handling procedures, etc.)
SAMPLERS: (Signature) <i>Wayne Dittman</i>				EPA Method (8015) GA-80/84	EPA Method (602) BT EX	EPA Method TPH-d (8015)	EPA Method		
DATE	TIME	SAMPLE NUMBER							
3-15-95		Trip Blank	W	X				3	
3-15-95	9:30	SB1-2'	S	X	X			1	Grab sample
	10:00	SB1-5'	S	X	X			1	
	10:20	SB1-10'	S	X	X			1	
	10:50	SB3-6'	S	X	X			1	No TPH-g analysis
	11:01	SB3-10'	S		X	X		1	
	11:40	SB5-5 1/2'	S		X	X		1	
	12:06	SB5-10'	S		X	X		1	
	13:00	SB-3	W	X				4	
	13:05	SB-2-6'	S	X	X			1	
	13:20	SB-2-10'	S	X	X			1	
	13:50	SB4-6'	S		X	X		1	
	14:10	SB-1	W	X	X			3	
	14:20	SB4-11'	S		X	X		1	
							TOTAL NUMBER OF CONTAINERS	21	

RELINQUISHED BY: (Signature) <i>Wayne Dittman</i>	DATE/TIME 3-15-95 1745	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
METHOD OF SHIPMENT:	SHIPPED BY: (Signature)	COURIER: (Signature)	RECEIVED FOR LAB BY: (Signature) <i>Alan Baker</i>	DATE/TIME 3-15-95 1745	

CHROMALAB, INC.

SAMPLE RECEIPT CHECKLIST

Client Name WOODWARD CLYDE Date/Time Received 3/15/95 12:45
 Project 941366 NA Received by P. Solis Date 1 Time
 Reference/Subm # 20989/9503218 Carrier name
 Checklist completed by: Chowley 3/16/95 Logged in by TA 3/15/95
 Signature J Date Matrix SOIL + H2O Initials 1 Date

- Shipping container in good condition? pickup on site NA Yes No
- Custody seals present on shipping container? Intact Broken Yes No
- Custody seals on sample bottles? Intact Broken Yes No
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Samples intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- VOA vials have ^{no} zero headspace? NA Yes No
- Trip Blank received? NA Yes No
- All samples received within holding time? Yes No
- Container temperature?
- pH upon receipt pH adjusted Check performed by: NA

Any **NO** response must be detailed in the comments section below. If items are not applicable, they should be marked NA.

Client contacted? Date contacted?
 Person contacted? Contacted by?
 Regarding?

Comments:

Corrective Action:

HEALTH AND SAFETY PLAN

for

THE INVESTIGATION

of

EMERYVILLE FIRE STATION #2

**FORM HS-507
SITE SAFETY PLAN
FIELD INVESTIGATION OF UNDERGROUND FUEL SPILLS**

ADMINISTRATIVE INFORMATION

Project Number 941366 NA Project Name Fire Station #2
Project Manager Xinggang Tong Operating Unit Oakland WMG
Site Safety Officer Xinggang Tong Health & Safety Officer Tanya Pawley
Date of Issue 2/3/95 Effective Dates 2/27/95-3/27/96

SITE INFORMATION (attach map of site)

Location: 6303 Hollis St., Emeryville, CA
Pertinent History: Fire station, One 1,000-gallon Unleaded UST
One 1,000-gallon Diesel UST

Material(s) Spilled: TPH gasoline & Diesel - potentially

FIELD ACTIVITIES

Soil and Groundwater Sampling
Monitoring well installation
UST Removal

EMERGENCY TELEPHONE NUMBERS

Fire Department 911
Ambulance 911
Hospital 510-204-4444
Project Manager 510-874-3060
Health & Safety Officer 510-874-3146
Hospital _____

FORM HS-507
SITE SAFETY PLAN

FIELD INVESTIGATION OF UNDERGROUND FUEL SPILLS, CONCLUDED

HOSPITAL INFORMATION

Name: Atta Bates Hospital
Address: 2450 Ashby Ave. Berkeley
Route: From the site take 63rd st east to San Pablo Ave, Right
turn on Ashby Ave and continue east, Hospital is on right side
Cross road is Colby Ave.

AUTHORIZED FIELD PERSONNEL

Kingsang Tong _____
Jackie Lee _____
Wayne Dittman _____

NAME OF SUBCONTRACTORS (field work)

Name: _____ Telephone Number: _____

Address: _____

Authorized Representatives: _____

Name: _____ Telephone Number: _____

Address: _____

Authorized Representative: _____

APPROVALS

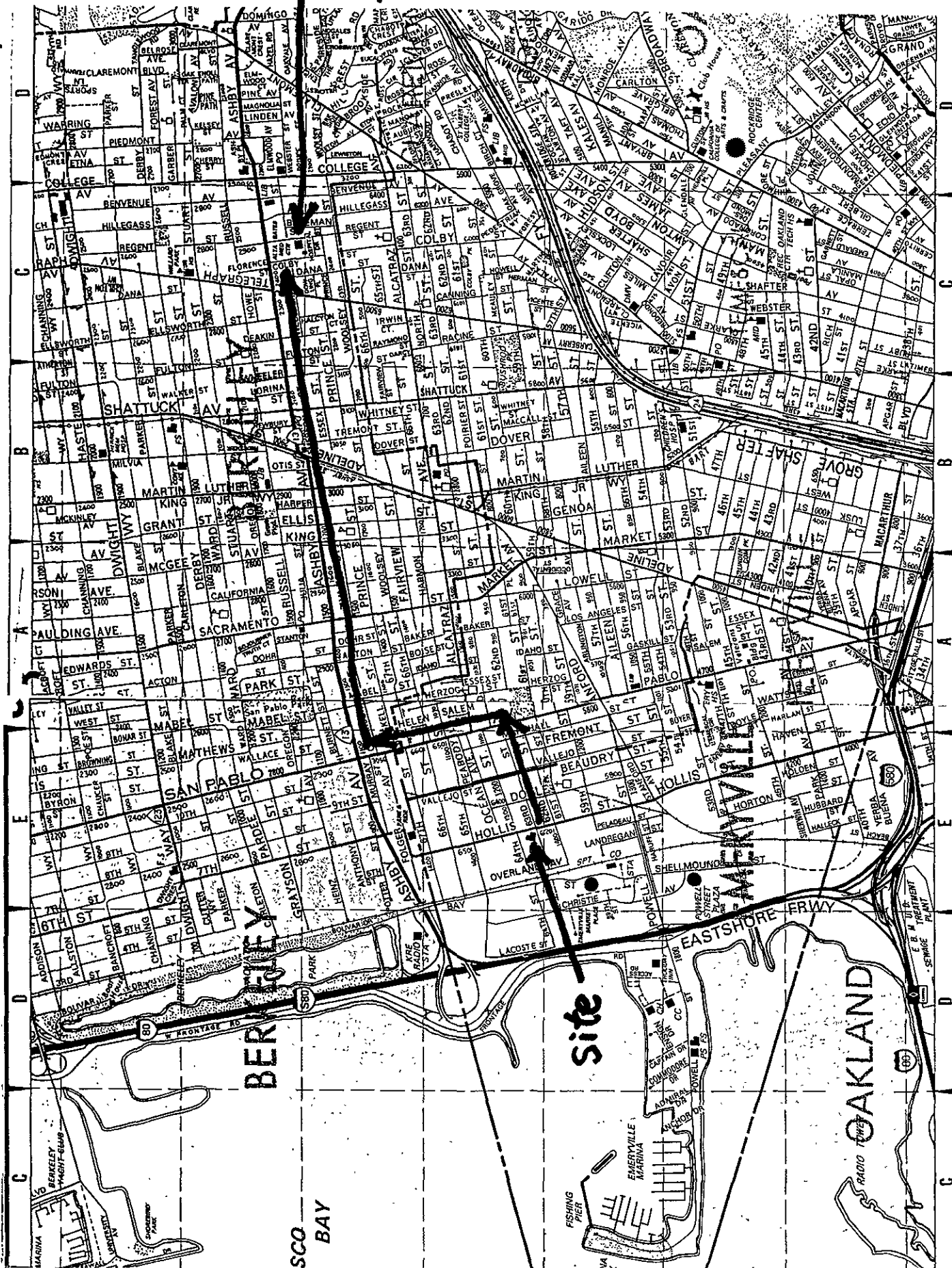
Kingsang Tong _____ Feb 16, 95
Project Manager Date

Health & Safety Officer Date

Corporate Health & Safety Officer* Date

*Signature required only for modified plans.

Hospital



SCO BAY

Site

OAKLAND

OPERATING PROCEDURE NO. HS-507

507.0 PROCEDURES FOR FIELD INVESTIGATIONS OF UNDERGROUND
SPILLS OF GASOLINE AND OTHER PETROLEUM DISTILLATE
FUELS

507.1 PURPOSE

The purpose of this procedure is to establish sound and uniform health and safety procedures and guidelines for field operations associated with investigations of leakage of petroleum hydrocarbon fuels from underground storage tanks and pipes.

507.2 SCOPE

This procedure identifies the types of fuels and field activities to which it applies, assesses the hazards of fuels, and describes risk control measures.

507.3 APPLICABILITY

This procedure applies to: (1) collection of samples of surface and subsurface soil, (2) construction, completion, testing, and abandonment of groundwater monitoring wells, (3) collection of water samples from new and existing wells, and observing removal of underground fuel pipes and storage tanks at facilities that currently dispense or store:

- (1) leaded gasoline
- (2) unleaded gasoline,
- (3) gasohol,
- (4) Numbers 1, 1D (diesel), 2, 2D (diesel), 4, 5, or 6 fuel oils,
- (5) jet A, jet A-1, jet B, JP-1, JP-3, JP-4, and JP-5 jet fuels,
- (6) crankcase oil,
- (7) methanol (when used as a motor fuel), and/or
- (8) stoddard solvent.

This procedure shall not be used for confined space entry or for installing or operating pilot and full-scale fuel recovery systems. This plan may be used for the installation of vapor extraction systems only by appropriate modification and proper health and safety approvals. This plan may not be used for the start-up or operation of vapor extraction systems. It is also not applicable to field work performed at refineries, sites where spills of chemicals other than the substances listed above have occurred, sites of unusual hazard; and any other site or activity for which the use of this plan is identified as inappropriate by the operating unit HSO.

This plan is applicable to work involving the removal of underground fuel pipes and storage tanks only when used with and attached to the American Petroleum Institute API Recommended Practice 1604, Second Ed. 1987 as revised March 6, 1989, Removal and Disposal of Used Underground Petroleum Storage Tanks.

This plan is applicable to work involving boring with power equipment only when used with and attached to Woodward-Clyde Operating Procedure HS-509, Safety Guidelines For Drilling Into Soil and Rocks.

This plan is applicable to work involving entry into excavations by Woodward-Clyde or Woodward-Clyde subcontractor personnel only when used with and attached to Woodward-Clyde Operating Procedure HS-510, Safety Procedures for Trench Construction and Other Excavating Operations.

507.4 RESPONSIBILITY AND AUTHORITY

The Project Manager has overall responsibility for safe conduct of all field work, including ensuring full implementation of this procedure by the site manager, project staff and subcontractors assisting with field work. The PM shall assign (with the concurrence of the operating unit HSO or HSC) a Site Safety Officer (SSO) to attend to day-to-day health and safety matters in the field. The PM may elect, if qualified, to serve as SSO. The SSO must be on-site whenever work by employees of WC or its subcontractors is being performed at the site.

Both the PM and SSO are authorized to suspend work when working conditions become too hazardous and are authorized to remove from the site any WC and subcontractor employee whose conduct endangers the health and safety of the employee or of others.

507.5 HAZARD EVALUATION

Petroleum distillate fuels are mixtures of aliphatic and aromatic hydrocarbons, the constituent concentrations of which can vary significantly dependent upon the crude feedstock, refining process, and seasonal variations. The predominant types of compounds in fuels are paraffins (e.g., pentane, hexane), naphthenes (e.g., cyclohexane) and aromatics (e.g., benzene, toluene, polynuclear aromatics). Gasoline contains about 80 percent paraffins, 6 percent naphthenes, and 14 percent aromatics. JP-1 and 4 contain up to 48 percent paraffin, 38 percent naphthenes, and 20 percent aromatics. Fuel oils and certain jet fuels (JP-3 and 5) contain about 10 percent paraffin, up to 23 percent naphthenes, and up to 78 percent non-volatile aromatic hydrocarbons. Gasohol is gasoline containing 10 to 40 percent ethyl alcohol. Methanol as it is used as a motor fuel typically contains up to 20% gasoline to improve cold starting characteristics as a safety factor to provide a visible flame. To improve their burning properties, compounds such as tetraethyl-lead, methyl tertbutyl ether (MTBE) and ethylene dibromide (EDB) are often added to automotive and aviation fuels.

Petroleum distillate fuels exhibit relatively low acute inhalation and dermal toxicity. Concentrations of 160 to 270 ppm gasoline vapor have been reported to cause eye, nose, and throat irritation in people after several hours of exposure. Levels of 500 to 900 ppm have been reported to cause irritation and dizziness in one hour and 2,000 ppm has been reported to cause mild anesthesia in 30 minutes. Gasoline, kerosene, and some jet fuels will cause severe eye irritation on contact with the eye and low to moderate skin irritation on contact with the skin. Methanol can be toxic by either skin or inhalation exposure, and is unique in that it attacks the optic nerve. Methanol blindness can be irreversible.

Ingestion of 10 to 15 grams (2 to 3 teaspoons) of gasoline has caused death in children. In adults, ingestion of 20 to 50 grams may produce severe symptoms of poisoning. The most dangerous aspect of ingestion of these motor fuels is the development of chemical pneumonia from the aspiration of gasoline or other fuels are aspirated into the lungs.

Aspiration of very small quantities of these motor fuels into the lungs is often fatal. Some gasoline additives, such as ethylene dichloride, ethylene dibromide, and tetraethyl- and tetramethyl-lead are highly toxic materials; however, their concentrations in gasoline are so low that their contribution to the overall toxicity of gasoline is negligible in most instances.

Petroleum distillate fuels are flammable. Under certain conditions, this property presents a greater risk than toxicity. Six of the fuels covered by this procedure are classified by the Federal Department of Transportation as flammable liquids as all six typically have flash points of 100 degrees F or less. These fuels are gasoline, gasohol, Jet B, JP-1, JP-4, and No. 1 fuel oil. Lower explosive limits of the fuels range from 0.6 to 1.4 percent (6,000 to 14,000 ppm).

507.6 HEALTH AND SAFETY CLEARANCE

WC employees as well as subcontractor employees assigned to perform field activities covered by this procedure must be currently approved for hazardous waste field work, including:

Current medical clearance to conduct hazardous waste field work and to wear a respirator;

Successful completion of a respirator fit test within the last 12 months for the make and model of the respirator assigned to that individual for use at that site;

Completion of training as required by 29 CFR 1910.120(e), including either:

40 hours of hazardous waste worker basic instruction within the last 12 months, or,

8 hours of hazardous waste worker refresher training within the last 12 months, subsequent to completion of 40 hours of basic hazardous waste worker training.

507.7 HEALTH AND SAFETY BRIEFING

Before field work begins, all field personnel, including subcontractor employees, must be briefed on their work assignments and the provisions of this procedure, and each person briefed must be given a copy of this document and each must acknowledge receipt and willingness to comply by submitting a signed safety compliance agreement to the WC Project Manager. Individuals refusing to sign the agreement will be prohibited from working at the site.

507.8 PERSONAL PROTECTIVE EQUIPMENT

Equipment listed below must be available on-site in appropriate sizes for use when needed.

1. NIOSH approved full- or half-face respirator with organic vapor cartridges. Respirators must be worn when airborne hydrocarbon action levels are reached or exceeded.
2. Saranex or polyethylene coated Tyvek coveralls. Coated coveralls must be worn when product quantities of fuel are encountered and when fuel-saturated soil is handled.
3. Safety goggles or glasses. Must be worn when working within 10 feet of operating heavy equipment (e.g., drill rig, backhoe). Must be splash-proof when handling concentrated fuel product.
4. Nitrile or neoprene gloves for all fuels except methanol. Workers handling methanol must wear butyl gloves. Gloves must be worn when handling contaminated soil or water or drilling or digging into contaminated soil. Confirm with your HSO the applicability of model and brand of gloves!
5. Neoprene or butyl rubber safety boots, calf-length. Must be worn when walking on obviously contaminated soil and when working within 10 feet of operating heavy equipment.

6. Hardhat. Must be worn when working within 10 feet of operating heavy equipment.

507.9 ORGANIC VAPOR MONITORING

507.9.1 Monitoring Instruments

Two instruments are required for this work:

- 1) Combustible Gas/Oxygen indicator (CGI/O₂) with readout in %LEL and %O₂.
- 2) Photoionization (PID) field survey instrument (HNU, ThermoEnvironmental 580A, Photovac Microtip, or equivalent)*, or, Flame-ionization (FID) field survey instrument (Foxboro OVA or equivalent).

*PID instruments cannot readily detect methanol, and therefore may NOT be used on sites where methanol is or may be encountered.

507.9.2 Toxicity Action Levels

The toxicity action levels given below are set to comply with OSHA Permissible Exposure Levels and ACGIH Threshold Limit Values. Some of the more volatile motor fuels also contain some concentration of benzene. Gasoline averages approximately 1% benzene. Therefore, for motor fuels which may contain benzene, the action levels specified below are also set to comply with the proposed TLV of 0.1 ppm. These action levels are also adjusted for the relative response of common PID or FID instruments to motor fuel vapors.

Respirators must be worn when meter readings averaged over 10 minutes equal or exceed the action level for upgrade to Level C PPE. Workers must be evacuated from the area when organic vapor concentrations exceeding respiratory protective equipment protection factors are encountered.

507.9.2.1 Toxicity Action Levels for Gasoline and Jet B

TOXICITY ACTION LEVELS
GASOLINE AND JET B
(in PPM indicated)

Instrument	Calibration Gas	Action Upgrade to Level C	Evacuate
Photoionization meter# (10.0 to 10.2 eV lamp)	H.Nu calibration gas* or Benzene	2	60** 300***
Photoionization meter (10.0 to 10.2 eV lamp)	Isobutylene	3.3	100** 500***
Flame-ionization meter (OVA-128)	Methane	10	300** 1500***

Photoionization instruments do not work and shall not be used for work in high (<90%) humidity or rainy weather, or sites where methanol is or may be present.

* Although the calibration gas purchased from HNU is isobutylene, the concentration identified on the cylinder for calibration of an HNU with 10.2 eV lamps is a benzene equivalent.

** for workers wearing 1/2 face respirators.

*** for workers wearing full face respirators.

507.9.2.2 Toxicity Action Levels for Fuels other than Gasoline and Jet B

TOXICITY ACTION LEVELS
FUELS OTHER THAN GASOLINE, METHANOL AND JET B
(in PPM indicated)

Instrument	Calibration Gas	Action Upgrade to Level C	Evacuate
Photoionization meter# (10.0 to 10.2 eV lamp)	H.Nu calibration gas* or Benzene	20	60** 300***
Photoionization meter (10.0 to 10.2 eV lamp)	Isobutylene	33	100** 500***
Flame-ionization meter (OVA-128)	Methane	99	300** 1500***

Photoionization instruments do not work and shall not be used for work in high (<90%) humidity or rainy weather.

* Although the calibration gas purchased from H.Nu is isobutylene, the concentration identified on the cylinder for calibration of H.Nu's with 10.2 eV lamps is a benzene equivalent.

** for workers wearing 1/2 face respirators.

*** for workers wearing full face respirators.

All instruments shall be calibrated both immediately prior to commencing the day's field work and after work ceases for the day. Calibration and monitoring records shall be kept in the project file and provided to the operating unit HSO. Records shall include:

Worker's name,
Date,
Time,
Location,
Temperature and humidity, and
Calibration gas identity and concentration.
Exposure data (time, location, and concentration)

507.9.3 Explosion Hazard Action Levels

The explosivity action levels below are set to prevent the creation of flammable or explosive atmospheres. Measurements should be taken at all locations where personnel are present or power/hand tools are in use.

EXPLOSIVITY ACTION LEVELS
(% of the LEL)

Instrument	Calibration Gas	Action Level (Evacuate)
Combustible Gas Indicator	hexane	20%
Combustible Gas Indicator	methane	20%

The CGI alarm must be set to sound at the action level. For this work it is highly recommended that hexane be used as the calibration gas.

When measurements with a combustible gas indicator (CGI) indicate the presence of combustible gas levels equal to or exceeding the explosivity action level in the work area, the following action must be taken:

1. Extinguish all possible ignition sources in the work area and shut down all powered equipment.

2. Move personnel at least 100 feet away from work area.
3. Contact Health and Safety Officer (HSO).
4. At the instruction of the HSO and after waiting 5 minutes for organic vapors to dissipate, the SSO or PM may use the CGI to cautiously and with prudence approach the worksite to determine the extent and concentration of organic emissions. The SSO or PM shall not enter any area where CGI readings exceed the explosivity action level, nor shall the SSO or PM make any approach if there is possibility of fire or explosion.
5. Personnel may reenter the work area only by clearance of the HSO after the cause of the emission has been determined and the source abated.
6. Prepare incident report and submit to HSO.

507.9.4 Monitoring Guidelines

Personnel exposure monitoring should be performed as often as necessary and wherever necessary to protect field personnel from hazardous concentrations of organic vapors. Monitoring must be performed by individuals trained in the calibration, use and care of the required instruments.

Toxicity action levels are considerably lower than explosivity action levels. Therefore initial and periodic monitoring should be conducted with the PID or FID. Monitoring shall be conducted in the worker's breathing zone, which is a 1 foot diameter sphere surrounding the worker's head. The alarm on this instrument should be set to sound at the action level. If vapors are measured continuously and the instrument must be unattended, the detector inlet should be located as close to the worker's breathing zone as possible. Decisions regarding respirator use should be based on breathing zone vapor concentrations of personnel expected to have the greatest exposures. Particular effort should be made to monitor personnel exposures while trenching, boring or tank inerting is progressing.

Explosivity monitoring should be continuous, with the detector set at a location near and downwind of the source of emission. Additional monitoring with the CGI should be

performed when organic vapor concentrations exceed the ppm range of the PID or FID instrument. If the alarm sounds while continuously monitoring with a CGI, initiate shut-down and evacuation procedures immediately.

507.10 AREA CONTROL

Access to hazardous and potentially hazardous areas of spill sites must be controlled to reduce the probability of occurrence of physical injury and chemical exposure of field personnel, visitors, and the public. A hazardous or potentially hazardous area includes any area where (1) field personnel are required to wear respirators, (2) borings are being drilled with powered augers, or (3) excavating operations with heavy equipment are being performed.

The boundaries of hazardous and potentially hazardous areas must be identified by cordons, barricades, or emergency traffic cones or posts, depending on conditions. If such areas are left unattended, signs warning of the danger and forbidding entry must be placed around the perimeter if the areas are accessible to the public. Trenches and other large holes must be guarded with wooden or metal barricades spaced no further than 20 feet apart and connected with yellow or yellow and black nylon tape not less than 3/4-inches wide. The barricades must be placed no less than two feet from the edge of the excavation or hole.

Entry of hazardous areas shall be limited to individuals who must work in those areas. Unofficial visitors must not be permitted to enter hazardous areas while work in those areas is in progress. Official visitors should be discouraged from entering hazardous areas, but may be allowed to enter only if they agree to abide by the provisions of this document, follow orders issued by the site safety officer, and are informed of the potential dangers that could be encountered in the areas.

507.11 DECONTAMINATION

Field decontamination of personnel and equipment is not required except when contamination is obvious (visually or by odor). Recommended decontamination procedures follow.

507.11.1 Personnel Decontamination

Gasoline, kerosene, jet fuel, and gasohol should be removed from skin using a mild detergent and water. Hot water is more effective than cold. Liquid dishwashing detergent is more effective than hand soap.

507.11.2 Equipment Decontamination

Gloves, respirators, hardhats, boots and goggles should be cleaned as described under personnel; however, if boots do not become clean after washing with detergent and water, wash them with a strong solution of trisodium phosphate and hot water.

Sampling equipment, augers, vehicle undercarriages, and tires should be steam or high pressure washer cleaned. The steam cleaner is a convenient source of hot water for personnel and protective equipment cleaning.

507.12 SMOKING

Smoking and open flames are strictly prohibited at sites under investigation.

507.13 INERTING OF TANKS

Whenever WC personnel must be present during removal or transport of fuel storage tanks, the SSO or designee must determine whether or not the procedures to be used by the firm responsible for tank removal/transport agree with API Recommended Practice 1604, Second Ed. 1987 as revised March 6, 1989, Removal and Disposal of Used Underground Petroleum Storage Tanks. If the firm's procedures, especially those addressing removal/inactivation of flammable vapors, disagree substantially with API's procedures, the PM and HSO must be notified immediately (by telephone, if possible). In turn, the PM shall inform the client that WC personnel will not report to the site during tank/removal operations unless proper procedures are used. If the firm responsible for tank removal/transport is under subcontract to WC, the WC project manager shall require the subcontractor to follow API procedures.

OPERATING PROCEDURE NO. HS-203

203.0 SAFETY GUIDELINES FOR DRILLING INTO SOIL AND ROCKS

203.1 PURPOSE

The purpose of this Operating Procedure (OP) is to provide an overview for working safely around drilling operations with truck-mounted and other engine-powered drill rigs. The procedure addresses off-road movement of drill rigs, overhead and buried utilities, use of augers, rotary and core drilling, and other drilling operations and activities.

203.2 APPLICATION

The guidelines shall be applied in Woodward-Clyde (W-C) projects in which truck-mounted, or other engine-powered, drill rigs are used. The guidelines are applicable to W-C employees and W-C owned rigs. For drill rigs operated by contractors, the primary responsibility for drilling safety is with the drilling contractor.

203.3 RESPONSIBILITY AND AUTHORITY

Drill rig safety and maintenance is the responsibility of the drill rig operator. W-C employees are responsible for their own safety including recognizing and avoiding drill rig hazards. W-C employees that observe a drill rig condition believed to be unsafe, shall advise the drill rig operator of the unsafe condition.

203.4 SAFETY GUIDELINES

203.4.1 Movement of Drill Rigs

Before moving a rig, the operator must do the following:

1. To the extent practical, walk the planned route of travel and inspect it for depressions, gullies, ruts, and other obstacles.

2. Check the brakes of the truck/carrier, especially if the terrain along the route of travel is rough or sloped.
3. Discharge all passengers before moving on rough or steep terrain.
4. Engage the front axle (on 4x4, 6x6, etc. vehicles) before traversing rough or steep terrain.

Driving drill rigs along the sides of hills or embankments should be avoided; however, if side-hill travel becomes necessary, the operator must conservatively evaluate the ability of the rig to remain upright while on the hill or embankment. The possibility must be considered that the presence of drilling tools on the rig may reduce the ability of the rig to remain upright (raises the center of mass of the rig).

Logs, ditches, road curbs, and other long and horizontal obstacles should be normally approached and driven over squarely, not at an angle.

When close lateral or overhead clearance is encountered, the driver of the rig should be guided by another person on the ground.

Loads on the drill rig and truck must be properly stored while the truck is moving, and the mast must be in the fully lowered position.

After the rig has been positioned to begin drilling, all brakes and/or locks must be set before drilling begins. If the rig is positioned on a steep grade and leveling of the ground is impossible or impractical, the wheel of the transport vehicle should be blocked and other means of preventing the rig from moving or topping over employed.

203.5 BURIED AND OVERHEAD UTILITIES

The location of overhead and buried utility lines must be determined before drilling begins, and the locations should be noted on boring plans or assignment sheets.

When overhead power lines are close by, the drill rig mast should not be raised unless the distance between the rig and the nearest power line is at least 20 feet or other distance as required by local ordinances, whichever is greater. The drill rig operator or assistant should walk completely around the rig to make sure that proper distance exists.

When the drill rig is positioned near an overhead line, the rig operator should be aware that hoist lines and power lines can be moved towards each other by wind. When necessary and approved by the Project Manager (PM) and the utility and/or powerlines may be shielded, shut down, or moved by the appropriate personnel.

203.6 CLEARING THE WORK AREA

Before a drill rig is positioned to drill, the area on which the rig is to be positioned should be cleared of removable obstacles and the rig should be leveled if sloped. The cleared/leveled area should be large enough to accommodate the rig and supplies.

203.7 SAFE USE OF AUGERS

Never place hands or fingers under the bottom of an auger flight or drill rods when hoisting the augers or rods over the top of another auger or rod in the ground or other hard surfaces, such as the drill rig platform.

Never allow feet to get under the auger or drill rod while they are being hoisted.

When the drill is rotating, stay clear of the drill string and other rotating components of the drill rig. Never reach behind or around a rotating auger for any reason.

Move auger cuttings away from the auger with a long-handled shovel or spade; never use hands or feet.

Never clean an auger attached to the drill rig unless the transmission is in neutral or the engine is off, and the auger has stopped rotating.

203.8 SAFE USE OF HAND TOOLS

OSHA regulations regarding hand tools should be observed in addition to the guidelines provided below:

1. Each tool should be used only to perform tasks for which it was originally designed.
2. Damaged tools should be repaired before use or discarded.
3. Safety goggles or glasses should be worn when using a hammer or chisel. Nearby co-workers and by-standers should be required to wear safety goggles or glasses also, or move away.
4. Tools should be kept cleaned and stored in an orderly manner when not in use.

203.9 SAFE USE OF WIRE LINE HOISTS, WIRE ROPE, AND HOISTING HARDWARE

Safety rules described in Title 29 Code of Federal Regulations (CFR) 1926.552 and guidelines contained in the Wire RPE User's Manual published by the American Iron and Steel Institute shall be used whenever wire line hoists, wire rope, or hoisting hardware are used.

203.10 PROTECTIVE GEAR

203.10.1 Minimum Protective Gear

Items listed below should be worn by all members of the drilling team while engaged in drilling activities.

- Hard Hat;
- Safety Shoes (shoes or boots with steel toes and shanks); and
- Gloves.

203.10.2 Other Gear

Items listed below should be worn when conditions warrant their use. Some of the conditions are listed after each item.

1. Safety Goggles or Glasses: Use when working within 25 feet of a drill rig or when using hand tools or chemicals that may create eye hazards.
2. Safety Belts and Lifelines: Safety belts and lifelines should be worn by all persons working on top of an elevated derrick beam. The lifeline should be secured at a position that will allow a person to fall no more than eight feet.
3. Life Vests: Use for work over water.

203.11 TRAFFIC SAFETY

Drilling in streets, parking lots or other areas of vehicular traffic requires definition of the work zones with cones, warning tape, etc. and compliance with local police requirements.

203.12 FIRE SAFETY

1. Fire extinguishers shall be kept on or near drill rigs for fighting small fires.
2. If methane is suspected in the area, a combustible gas instrument (CGI) shall be used to monitor the air near the borehole with all work to stop at 20 percent of the Lower Explosive Limit.
3. Work shall stop during lightning storms.

OPERATING PROCEDURE NO. HS-204

204.0 SAFETY PROCEDURES FOR TRENCH CONSTRUCTION AND OTHER EXCAVATING OPERATIONS

204.1 PURPOSE

This procedure contains an overview of the safety requirements for excavating and trenching operations. The requirements are consistent with standards established by the Occupational Safety and Health Administration (OSHA) and described in Title 29 Code of Federal Regulations (CFR) 1926.650. The detailed OSHA standard was effective in January 1990 and should be consulted before design of a shoring system, with questions regarding sloping options, or before working as a "competent person" on an excavation site.

204.2 RESPONSIBILITY

The responsibility and authority for excavating and trenching safety must be well defined prior to project start-up. In general, the contractor will assume responsibility for excavation safety and Woodward-Clyde (W-C) will maintain safety responsibility and authority only for W-C and W-C subcontractor employees. W-C employees will not serve in the OSHA defined role of "competent person" unless specifically defined in the project scope of work and approved by the Project Manager (PM) and Management Oversight Reviewer (MOR). The PM shall ensure that the W-C field staff clearly understands the limitation of their excavation safety responsibilities and authorities.

W-C employees are responsible for understanding the general excavation safety requirements and for not entering improper trenches or excavations.

204.3 APPLICABILITY

This procedure is applicable to all W-C projects in which trenching or other excavating operations, exclusive of borings, are entered by W-C personnel or personnel employed by firms under contract to W-C. It is also applicable to W-C projects requiring W-C personnel

or personnel of firms under contract to W-C to enter trenches and other types of excavations.

The best approach for avoiding the detailed trenching requirements is to perform sampling and other procedures without entry into excavations. Use of a backhoe to bring up samples, use of long-handled sampling devices, and similar techniques are recommended.

204.4 REQUIREMENTS

204.4.1 Preliminary Requirements

Certain government agencies (e.g. California) require a permit to perform excavation operations.

Before digging, determine or have the client determine if underground installations, such as sewer, water, fuel, or electrical lines are to be encountered, and if so, determine the exact locations of the lines. Information can be obtained by contacting Underground Service Alert (consult local telephone directory for toll-free number), local utility companies, and the owner of the property on which excavating operations are planned.

Trees, boulders, and other surface encumbrances, located so as to pose a potential hazard to employees must be removed or made safe before the operation begins.

204.4.2 Placement of Excavated Materials

Excavated materials must be placed at least two feet back from the edge of the excavation and precautions must be taken to prevent the materials from falling into the excavation.

204.4.3 Working in Excavations

Shoring and Sloping

Except for solid rock, trenches in which personnel are required to work must be shored or sloped if the depth of the excavation is five (5) feet or more. When a shoring system is used, it shall consist of hydraulic shores or the equivalent, with sheathing or sheet piling as needed. Trench boxes are also permitted. OSHA uses a soil classification system to determine the allowable slopes for trenches. The shoring system must be properly designed and installed to sustain all existing and expected loads. For details on shoring and sloping requirements, consult Title 29 CFR, Subpart P, Sections 1926.650 to 1926.653 (attached).

Access

When work is to be performed in any excavation, safe access to the excavation must be provided by means of ladders, stairs, or ramps. Trenches four or more feet deep must have ladders spaced no less than 25 feet apart, and the ladders must extend at least three feet above grade.

Hazardous Atmospheres

At sites where oxygen deficiency or hazardous concentrations of flammable or toxic vapors or gases may be encountered in excavations, the atmosphere in the excavations must be tested by the site safety officer or other qualified person before work in an excavation begins and at appropriate intervals afterward. Trenches may be classified as confined spaces and require an entry permit as covered in HS-205, Confined Space Entry.

204.4.4 Inspection of Excavation

Excavations must be observed daily by the "competent person". If evidence for potential cave-ins or slides is apparent, all work in the excavation must be suspended until necessary steps have been taken to safeguard employees.

204.4.5 Operations of Vehicles Near Excavations

When vehicles or heavy equipment must operate near an excavation, the sides of the excavation must be shored or braced as necessary to withstand forces exerted by the superimposed load and the earth pressure. Stop logs or other types of secure barriers must be installed at the edges of the excavations.

204.4.6 Bell-Bottom Pier Holes

Employees entering drilled pier holes must be protected by a casing proportioned to sustain the maximum stresses imposed by earth and water or slurry that extends the full depth of the shaft and to the bottom of the bell. A safety cage or a shoulder harness secured to a full-time tended lifeline shall be required for entry and exit. Air monitoring and related requirements of HS-205, Confined Space entry, shall be followed.

204.4.7 Bridges and Walkways

Walkways or bridges with standard guardrails must be provided where employees or equipment are required or permitted to cross over excavations. Pedestrian walkways shall be of sufficient strength to permit a vertical deflection of no more than 0.5 inch when a 250-pound weight is applied to the center of the walkway. All bridges intended for vehicular traffic must be constructed to withstand twice the load of the heaviest vehicle expected.

204.4.8 Barricades and Fences

Excavated areas must be completely guarded on all sides with barricades or fences, as appropriate. If barricades are used, they must be spaced no more than 20 feet apart and

shall not be less than 35 inches high when erected. A yellow or yellow and black tape, at least 0.75 inches wide, shall be stretched between the barricades.

204.4.9 Backfilling

Excavated areas must be backfilled in accordance with the work plan as soon as practical after work is completed, and all associated equipment must be removed from the area.

204.5 EXCAVATIONS NEXT TO EXISTING STRUCTURES

A registered engineer will review all plans for excavations next to existing structures to avoid undermining the structures and possible collapse.

JOB SAFETY & HEALTH PROTECTION

The Occupational Safety and Health Act of 1970 provides job safety and health protection for workers by promoting safe and healthful working conditions throughout the Nation. Requirements of the Act include the following:

Employers

All employers must furnish to employees employment and a place of employment free from recognized hazards that are causing or are likely to cause death or serious harm to employees. Employers must comply with occupational safety and health standards issued under the Act.

Employees

Employees must comply with all occupational safety and health standards, rules, regulations and orders issued under the Act that apply to their own actions and conduct on the job.

The Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor has the primary responsibility for administering the Act. OSHA issues occupational safety and health standards, and its Compliance Safety and Health Officers conduct jobsite inspections to help ensure compliance with the Act.

Inspection

The Act requires that a representative of the employer and a representative authorized by the employees be given an opportunity to accompany the OSHA inspector for the purpose of aiding the inspection.

Where there is no authorized employee representative, the OSHA Compliance Officer must consult with a reasonable number of employees concerning safety and health conditions in the workplace.

Complaint

Employees or their representatives have the right to file a complaint with the nearest OSHA office requesting an inspection if they believe unsafe or unhealthful conditions exist in their workplace. OSHA will withhold, on request, names of employees complaining.

The Act provides that employees may not be discharged or discriminated against in any way for filing safety and health complaints or for otherwise exercising their rights under the Act.

Employees who believe they have been discriminated against may file a complaint with their nearest OSHA office within 30 days of the alleged discrimination.

Citation

If upon inspection OSHA believes an employer has violated the Act, a citation alleging such violations will be issued to the employer. Each

citation will specify a time period within which the alleged violation must be corrected.

The OSHA citation must be prominently displayed at or near the place of alleged violation for three days, or until it is corrected, whichever is later, to warn employees of dangers that may exist there.

Proposed Penalty

The Act provides for mandatory penalties against employers of up to \$1,000 for each serious violation and for optional penalties of up to \$1,000 for each nonserious violation. Penalties of up to \$1,000 per day may be proposed for failure to correct violations within the proposed time period. Also, any employer who willfully or repeatedly violates the Act may be assessed penalties of up to \$10,000 for each such violation.

Criminal penalties are also provided for in the Act. Any willful violation resulting in death of an employee, upon conviction, is punishable by a fine of not more than \$10,000, or by imprisonment for not more than six months, or by both. Conviction of an employer after a first conviction doubles these maximum penalties.

Voluntary Activity

While providing penalties for violations, the Act also encourages efforts by labor and management, before an OSHA inspection, to reduce workplace hazards voluntarily and to develop and improve safety and health programs in all workplaces and industries. OSHA's Voluntary Protection Programs recognize outstanding efforts of this nature.

Such voluntary action should initially focus on the identification and elimination of hazards that could cause death, injury, or illness to employees and supervisors. There are many public and private organizations that can provide information and assistance in this effort, if requested. Also, your local OSHA office can provide considerable help and advice on solving safety and health problems or can refer you to other sources for help such as training.

Consultation

Free consultative assistance, without citation or penalty, is available to employers, on request, through OSHA supported programs in most State departments of labor or health.

More Information

Additional information and copies of the Act, specific OSHA safety and health standards, and other applicable regulations may be obtained from your employer or from the nearest OSHA Regional Office in the following locations:

Atlanta, Georgia
Boston, Massachusetts
Chicago, Illinois
Dallas, Texas
Denver, Colorado
Kansas City, Missouri
New York, New York
Philadelphia, Pennsylvania
San Francisco, California
Seattle, Washington

Telephone numbers for these offices, and additional area office locations, are listed in the telephone directory under the United States Department of Labor in the United States Government listing.

Washington, D.C.
1985
OSHA 2203



William E. Brock
William E. Brock, Secretary of Labor

U.S. Department of Labor
Occupational Safety and Health Administration

SAFETY AND HEALTH PROTECTION ON THE JOB



State of California
Department of Industrial Relations

The California Occupational Safety and Health Act of 1973 provides job safety and health protection for workers. The Department of Industrial Relations has primary responsibility for administering the Cal/OSHA program. Job safety and health standards are promulgated by the Occupational Safety and Health Standards Board. Employers and employees are required to comply with these standards. Enforcement is carried out by the Division of Occupational Safety and Health within the Department of Industrial Relations.

EMPLOYERS AND EMPLOYEES

California law requires every employer to provide employment and a place of employment which are safe and healthful for the employees therein. Employers and employees are required to comply with the occupational safety and health standards contained in Title 8 of the California Code of Regulations and all rules, regulations and orders pursuant to Division 5 of the California Labor Code which are applicable to their employment and actions on the job.

COMPLIANCE WITH JOB SAFETY AND HEALTH REQUIREMENTS

To ensure compliance with State job safety and health requirements, the Division of Occupational Safety and Health conducts periodic jobsite inspections. The inspections are made by trained safety engineers and industrial hygienists.

The law provides that an authorized representative of the employer and a representative of the employees be given an opportunity to accompany the safety engineer/industrial hygienist for the purpose of aiding the inspection. Where there is no authorized employee representative, the safety engineer/industrial hygienist talks with a reasonable number of employees about the safety and health conditions in the workplace.

Every employee has the right to bring unsafe or unhealthful conditions to the attention of the safety engineer/industrial hygienist making the inspection. In addition, any employee who believes unsafe or unhealthful conditions exist at the worksite has the right to notify the Division of Occupational Safety and Health. The Division upon request will withhold the names of employees who submit or make statements during an inspection or investigation.

If the Division of Occupational Safety and Health believes that an employer has violated a safety and health standard or order, it issues a citation to the employer. Each citation specifies a date by which the alleged violation must be corrected. The law provides for mandatory penalties against employers of up to \$2,000 for each serious violation and for optional penalties of up to \$1,000 for each general violation. Penalties of up to \$2,000 per day may be proposed for failure to correct serious violations and up to \$1,000 per day may be proposed for failure to correct general violations by the abatement date. Also any employer who willfully or repeatedly violates any occupational safety and health standard or order may be assessed civil penalties of not more than \$20,000 for serious violations and \$10,000 for general violations.

A willful violation that causes death or permanent impairment of the body of any employee results, upon conviction, in a fine of not more than \$10,000 or imprisonment of not more than six months, or both. A second conviction, after a first conviction, doubles these maximum penalties.

While governmental entries may be cited on the same basis as other employers, and abatement dates set, civil penalties will not be assessed.

An employer who receives a citation, Order to Take Special Action or Special Order must post it prominently at or near the place of the violation for three working days, or until the unsafe condition is corrected, whichever is longer, to warn employees of danger that may exist there. Any employee may protest the time allowed for correction of the violation.

COMPLAINTS

Employees or their representatives who believe unsafe or unhealthful conditions exist in their workplace have the right to file a complaint with any office of the Division of Occupational Safety and Health and thereby to request an inspection. The Division keeps confidential the names of complainants unless they request otherwise.

An employee may not be fired or punished in any way for filing a complaint about unsafe or unhealthful working conditions or using any other right given to employees by the Cal/OSHA law. An employee of a private employer who believes that he/she has been fired or punished for exercising such rights may file a complaint about this discrimination with the nearest office of the Department of Industrial Relations - Division of Labor Standards Enforcement (State Labor Commissioner) or with the San Francisco office of the U.S. Department of Labor, Occupational Safety and Health Administration. Employees of state or local government agencies may file discrimination complaints only with the State Labor Commissioner. Consult your local telephone directory for the office nearest you.

OTHER EMPLOYEE RIGHTS

Any employee has the right to refuse to perform work which would violate the Cal/OSHA Act or any occupational safety or health standard or order where such violation would create a real and apparent hazard to the employee or other employees.

Employers who use any substance listed as a hazardous substance in Section 339 of Title 8 of the California Code of Regulations or subject to the Federal Hazard Communication Standard (29 CFRs 1910.1200) must provide employees with information on the contents of material safety data sheets (MSDS) or equivalent information about the substance which trains employees to use the substance safely.

Employers shall make available on a timely and reasonable basis a material safety data sheet on each hazardous substance in the workplace upon request of an employee collective bargaining representative, or an employee's physician.

Employees have the right to see and copy their medical records and accurate records of employee exposure to potentially toxic materials or harmful physical agents.

Any employee has the right to observe monitoring or measuring of employee exposure to hazards conducted pursuant to Cal/OSHA standards. Employers must tell their employees when they are being, or have been, exposed to concentrations of harmful substances higher than the exposure limits allowed by Cal/OSHA standards, and the corrective action being taken.

For information and assistance, contact the nearest office of the Division of Occupational Safety and Health. See addresses below.

The law requires each employer in California to post this poster conspicuously in each workplace.

CONSULTATION SERVICE

In order to encourage voluntary compliance, Cal/OSHA provides free, upon request, a full range of occupational safety and health consulting services. The Cal/OSHA Consultation Service is separate from Cal/OSHA enforcement activities.

OFFICES OF THE DIVISION OF OCCUPATIONAL SAFETY AND HEALTH

HEADQUARTERS: 395 Oyster Point Blvd. So. San Francisco 94080

Regional Offices

Anaheim	2100 E. Katella Ave., Room 125, 92806	(714) 939-8611
Los Angeles	6150 Van Nuys Blvd., Ste. 310, Van Nuys, 91401	(818) 901-5421
Sacramento	2422 Arden Way, Suite B-53, 95825	(916) 920-6127
San Francisco	455 Golden Gate Ave., Room 1171, 94102	(415) 557-8640

Van Nuys	6150 Van Nuys Blvd., Suite 405, 91401	(818) 901-5403
Ventura	1655 Mesa Verde, 93003	(805) 654-4581
Vernon	11980 Telegraph Rd., Ste. 102, Santa Fe Sops, 90670	(213) 944-7676

District Offices

Anaheim	2100 E. Katella Ave., Room 140, 92806	(714) 939-0145
Bakersfield	4800 Stockdale Highway, Suite 212, 93309	(805) 395-2718
Concord	1465 Enea Circle, Bldg. E, Suite 900, 94520	(415) 676-5333
Covina	1123 So. Parkview, Suite 100, 91724	(818) 956-1166
Fresno	2550 Mariposa St., Room 4000, 93721	(209) 445-5302
Long Beach	401 E. Ocean Blvd., Room. 400, 90802	(213) 590-5035
Los Angeles	3550 West 5th St., Room 431, 90020	(213) 736-3041
Modesto	1209 Woodrow Ave., Suite C-4, 95350	(209) 576-6260
Oakland	7700 Edgewater Dr., Suite 125, 94621	(415) 568-8602
Redding	381 Hamsted Drive, 96002	(916) 224-4743
Sacramento	2422 Arden Way, Suite B-55, 95825	(916) 920-6123
San Bernardino	303 West Third St., Room 640, 92401	(714) 353-4321
San Diego	7807 Conroy Court, Suite 140, 92111	(619) 237-7325
San Francisco	455 Golden Gate Ave., Room 1193, 94102	(415) 557-1677
San Jose	100 Paseo De San Antonio, Suite 101, 95113	(408) 277-1260
San Mateo	1920 So. Norfolk St., Suite 215, 94403	(415) 573-3812
Santa Fe Sops*	11980 Telegraph Rd., Suite 102, 90670	(213) 944-7676
Santa Rosa	50 "D" St., Suite 430, 95404	(707) 576-2388

Field Offices

Chico	555 Rio Lindo, Suite A, 95926	(916) 895-4761
Eureka	619 Second St., Room 109, 95501	(707) 445-6611
Sahnas	1164 Monroe St., Suite 1, 93506	(408) 443-3050
Stockton	31 E. Channel St., Room 418, 95202	(209) 946-7762
Ukiah	620 Kings Court, Suite 5, 95482	(707) 463-4783

* Denotes temporary location.

CAL/OSHA CONSULTATION SERVICE

Headquarters, 395 Oyster Pt. Blvd., 3rd Fl., So. San Francisco, 94080 (415) 737-2843

Area Offices

Downey	8535 E. Florence Ave., Suite 200, 90240	(213) 861-9993
Fresno	1901 N. Gateway, Suite 102, 93727	(209) 454-1256
Sacramento	2424 Arden Way, Suite D-90, 95825	(916) 920-6131
San Diego	7807 Conroy Court, Suite 140, 92111	(619) 279-3771
San Mateo	3 Waters Park Drive, Suite 230, 94403	(415) 557-1715

Persons wishing to register a complaint alleging inadequacy in the administration of the California Occupational Safety and Health Plan may do so by contacting the San Francisco Regional Office of the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor (Tel. 415/744-6570). OSHA monitors the operation of State Plans to assure that continued approval is merited.

TO ALL EMPLOYERS OF CALIFORNIA EMPLOYEES: Section 6408(a) of the California Labor Code requires that information shall be posted regarding protections and obligations of employees under the occupational safety and health laws. This poster meets that requirement and must be prominently posted in all places of employment in the state of California. Section 6431 of the California Labor Code provides that any employer who violates any of the posting requirements of Section 6408 of the California Labor Code shall be assessed a civil penalty of up to one thousand dollars (\$1,000) for each violation.

WARNING

THE CALIFORNIA STATE SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) REQUIRES PUBLIC NOTIFICATION OF THE PRESENCE OF CHEMICALS KNOWN BY THE STATE OF CALIFORNIA TO CAUSE CANCER OR REPRODUCTIVE TOXICITY. COMPOUNDS LISTED BY THE GOVERNOR MAY BE PRESENT DURING THIS OPERATION.

Site or Project Name _____ Project No. _____ Date: _____

Person(s) Collecting Data _____

General Operation and Location at Site _____

Instrument Type, Make, Model _____

Instrument Serial or ID No. _____ Battery Check Results _____

Date of Last Calibration or Check _____ Date of Last Service _____

Contaminant(s) Suspected _____

	Specific Location	Specific Operation or Work Phase	Employee Name If Breathing Zone Monitored	Time	Reading	Comments (e.g., duration, causation of reading)
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

General Comments: _____

Signature of Person Responsible for Data: _____ Date Signed _____

HEALTH AND SAFETY COMPLIANCE AGREEMENT

I, the undersigned, have received a copy of the health and safety plan for the project identified below. I have read the plan, understand it, and agree to comply with all of the health and safety requirements therein. I understand that I may be prohibited from continuing work on the project for failing to comply.

I have have not (check one) been briefed by a project safety authority on the health and safety requirements of the project.

Project No. _____

Project Title _____

Date of Plan _____

Print Name

Signature

Title

Date

