CITY OF EMERYVILLE
REDEVELOPMENT AGENCY
2200 POWELL STREET, SUITE 1200
EMERYVILLE, CALIFORNIA 94608
(510) 596-4350

September 11, 1995

CERTIFICATION

Document Title: Preliminary Investigation and Evaluation Report, City of Emeryville Fire Station No. 2, August 25, 1995 prepared by Woodward-Clyde Consultants

I, representing the City of Emeryville Redevelopment Agency (Agency), have read the above referenced document and agree with the conclusions and recommendations contained in the document. To the best of my knoledge, the contents of the document are accurate and the document has been prepared following the "Tri-Regional Board of Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Site, August 10, 1990 and Appendix A - Reports, August 30, 1991." The Agency is currently preparing to remove the two underground storage tanks identified in the document.

Ignacio Dayrit
Project Coordinator
City of Emeryville Redevelopment Agency

Document Distribution:

Alameda County Department of Environmental Health (one copy)
Regional Water Quality Control Board - San Francisco Bay Region (one copy)

PRELIMINARY INVESTIGATION AND EVALUATION REPORT CITY OF EMERYVILLE FIRE STATION NO. 2 Emeryville, California

Prepared for

City of Emeryville Redevelopment Agency
2200 Powell Street, 12th Floor
Emeryville, California 94608

August 25, 1995

Woodward-Clyde

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Oakland, California 94607-4014

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Engineering & sciences applied to the earth & its environment

August 25, 1995
941366NA

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

Subject: City of Emeryville Fire Station No. 2, Emeryville, CA
Preliminary Investigation and Evaluation Report

Dear Mr. Dayrit:

Attached for your review is a copy of the report of our recent investigation at the City of Emeryville Fire Station No. 2. Following your review and approval we will forward a copy of this report to Ms. Susan Hugo at the Alameda County Department of Environmental Health.

If you have any questions, please feel free to phone Al Ridley at (510) 874-3125 or Xinggang Tong at (510) 874-3060.

Sincerely,

Albert P. Ridley, CEG
Senior Consulting Geologist

Xinggang Tong
Project Engineer

Attachment

J:\CX\HUNTE0\941366NA.005\1

8/25/95 8.45 AM

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1.0 INTRODUCTION

1.1 SCOPE OF WORK

This report has been prepared in accordance with the Tri-Regional Recommendations and Regional Water Quality Control Board guidelines. It addresses the procedures involved in the Preliminary Investigation and Evaluation of the City of Emeryville Fire Station No. 2 facility at 6303 Hollis Street, in Emeryville. This work was performed to investigate the extent of the presence of petroleum hydrocarbons in the subsurface soil and groundwater at the site. Specific activities performed include the collection of soil samples from soil borings, and collection of grab groundwater samples from those borings. The borings were located in the vicinity of two underground tanks at the site.

1.2 SITE CONTACTS

The site is owned by the City of Emeryville. Table 1 presents the name and address of site contacts and regulatory agency contacts regarding this site. Mr. Ignacio Dayrit, at the City of Emeryville Redevelopment Agency, is the primary contact for this site.

1.3 SITE LOCATION

The site is located at the northwest corner of Hollis and 65 Streets in Emeryville, as shown in Figure 1. The facility is located in a mixed use area with light commercial and residential structures in the area. The site address is 6303 Hollis Street. A commercial building is located immediately north of the site. The site is located at an approximate elevation of 15 feet above mean sea level and about one half mile east of the edge of San Francisco Bay.

1.4 SITE HISTORY

A drawing from the City files, prepared in 1949, shows the planned construction of the Fire Station on this site. It is believed that the Fire Station was constructed in about 1949, and has been in continuous use since that time. Two underground fuel storage tanks (UST) exist on

the site, as shown in Figure 2. A 1,000 gallon gasoline UST is a single wall steel tank that was reportedly replaced in 1989. The 1,000 gallon diesel UST is also a single wall steel tank, and was reportedly replaced in 1982. Actual replacement documents are not available.

1.5 PREVIOUS WORK

WCC performed a preliminary investigation of the tank site area and presented the results in a report dated June 20, 1995. Borings SB-1 through SB-5 were drilled at the site during the previous investigation. The highest reported detection of gasoline in soil was 540 mg/Kg in a soil sample from a depth of 5 feet in SB-1. Only 3.0 mg/Kg were detected in soil at 5 feet in SB-2. BTEX in soil was reported in soil samples from SB-1 through SB-5. Benzene detections ranged from 630 ug/Kg in soil at 6 feet in SB-2, to less than 5 ug/Kg in soil from 11 feet in SB-4. TPH diesel was not detected in soil from these borings. Copies of the logs of borings SB-1 through SB-5 are included in Appendix C.

A grab groundwater sample was collected from SB-1 and SB-3 for laboratory analysis for TPH gasoline and BTEX. No gasoline was detected in groundwater from SB-3. Only 0.99 mg/L TPH gasoline was reported in groundwater from SB-1. Benzene was detected at 220 ug/L in water from SB-3, and 6.1 ug/L in water from SB-1. The laboratory results for soil and groundwater sampled previously are included in Tables 1 and 2 in Appendix C.

2.0
FIELD ACTIVITIES

The following section describes field activities that were performed to explore the soil and groundwater at the site for the presence of petroleum that might be associated with the USTs at the site.

2.1 DRILLING LOCATIONS

Borings SB-6 through SB-12 were drilled and sampled on July 17, 1995 at the locations shown on Figure 2. The borehole locations were selected to explore for evidence of petroleum in soil or groundwater at distances farther from the USTs than the previous borings SB-1 to SB-5. Borings SB-6 and SB-7 were located south of the gasoline tank and near the north wall of the firehouse building. Borings SB-8, SB-9, and SB-10 were located west and north of the gasoline tank in the paved parking area north of the firehouse building. Boring SB-11 was located in the driveway area north of the diesel tank and east of the gasoline tank. Boring SB-12 was located in the sidewalk area south of the diesel tank, and east of the firehouse building. Logs of borings SB-6 through SB-12 are included in Appendix A.

2.2 DRILLING AND SAMPLING METHODS

The borings were drilled using a continuous push method with a 2 1/2 inch inside diameter core sampler. Precision Drilling, Inc. performed the drilling with their" Geoprobe " type continuous sampling rig mounted on a rubber tired "Bobcat". Borings were advanced using a three-foot long sampler with 2 1/2 inch diameter stainless steel sample liners. Sample liners were retrieved and soil was inspected from liners not intended for laboratory testing. Selected sample liners, six-inches in length, were sealed with teflon sheeting and plastic end caps, labeled, and placed on-ice, in and ice chest for transport to the analytical laboratory. A lithologic log was prepared in the field by a WCC engineer based upon the observed soil samples. The depth of soil samples were noted on the log along with soil type and moisture conditions. Boreholes were backfilled with a cement grout mixture, and the pavement surface was repaired. Soil cuttings were placed in 55 gallon drums for proper disposal following the receipt of laboratory reports.

The borings were advanced to depths ranging from 16 to 22 feet below the ground surface. Each borehole was allowed to remain open during the day of drilling activities in an effort to obtain a groundwater sample from the open boreholes. The depth to groundwater was measured before sampling groundwater. The groundwater depths are not considered stabilized, since the boreholes remained open for less than one day. Groundwater grab samples were collected using a clean bailer. Clean sample bottles from the laboratory were filled with groundwater, sealed and labeled, and placed on-ice, in the ice chest. Both the soil and groundwater samples were transported under chain-of-custody procedures to Chromalab, Inc., Pleasanton, California. Soil and groundwater samples were analyzed for TPH gasoline and BTEX using EPA Methods 5030/8015M and 602/8020.

2.3 DECONTAMINATION PROCEDURES

Downhole drilling and sampling equipment such as drill rods, and soil samplers were steam-cleaned prior to each use. The stainless steel bailer was cleaned before each use by washing with a soap and water solution, and then rinsing with tap water and then distilled water.

2.4 HEALTH AND SAFETY

Field activities at this site were conducted in accordance with the provisions of a WCC site specific Health and Safety Plan. The plan was prepared to comply with the state and federal occupational health and safety regulations and provide for the protection of site workers.

3.0
DATA EVALUATION

The subsurface conditions encountered in the borings are described in this section. An assessment of the extent of petroleum in soil and groundwater is provided.

3.1 SITE HYDROGEOLOGY

The site is underlain by alluvial clays with various amounts of sand and some gravel. A light to a greenish gray clay generally occurs within the upper five feet of material under the site. A more sandy layer consisting of clayey sand grading to sandy clay occurs between depths of about 5 to 9 feet in the borings, except boring SB-10 where gray clay extends from 3 to 12 feet below the surface. Below about 10 feet brown colored sandy clays and clayey sands occur in the borings. The change in color of the strata may be a result of historical groundwater levels at about 5 feet below the surface. However, groundwater entered the open boreholes slowly, and required several hours for sufficient water to accumulate in the borehole to allow groundwater sampling. This suggests that the conductivity of the strata is relatively low.

No measurements of static groundwater levels were made. Therefore the local groundwater gradient was not measured. However, based upon our experience it is possible that the gradient and flow direction is towards the west, or southwest.

3.2 ANALYTICAL RESULTS

3.2.1 Subsurface Soils

Laboratory results of analyses of soil samples from borings SB-6 to SB-12 are shown on Table 2 and in laboratory reports in Appendix B. The laboratory reports no detection of TPH gasoline or BTEX in soil samples from depths of 5 1/2 and 11 feet in boring SB-9, and from 11 1/2 feet in boring SB-10. TPH gasoline is not reported in the samples from 11 feet in the other borings (SB-6,-7,-8,-11, and-12). No BTEX is reported from the soil samples from

depths of 11 feet in these borings, except for 5.7 ug/Kg toluene, and 26 ug/Kg xylenes at 11 feet in SB-11.

The detections of TPH gasoline and BTEX in soil appear to occur mostly in the soil samples from the 5 foot depths. The highest reported concentration of TPH gasoline in soil is 480 mg/Kg at 5 1/2 feet in SB-7. TPH gasoline is reported at 440 mg/Kg in soil from 5 1/2 feet in SB-6. TPH gasoline is reported at 120 mg/Kg at 5 1/2 feet in SB-8, and 170 mg/Kg at 5 1/2 feet in SB-11.

The distribution of BTEX in soil follows the trend of TPH gasoline with the soil from 5 1/2 feet having the highest reported concentrations. The highest reported concentrations of benzene in soil are 1,200 ug/Kg in a soil sample from 5 1/2 feet in SB-6, and 1,200 ug/Kg in a soil sample from 5 1/2 feet in SB-11. A similar distribution of toluene is reported with 4,900 ug/Kg at 5 1/2 feet in SB-6 and 5,300 ug/Kg at 5 1/2 feet in SB-11. Ethylbenzene and xylenes in soil from at 5 1/2 feet in SB-6 and SB-11 are also relatively high.

3.2.2 Groundwater

Groundwater samples were analyzed for TPH gasoline and BTEX. No gasoline was reported in the groundwater samples from SB-9 and SB-10. The highest reported concentration of TPH gasoline is reported at 5.5 mg/L in groundwater from SB-7. Gasoline was reported in groundwater at 0.41 mg/L in SB-6, 0.46 mg/L in SB-8, 0.23 mg/L in SB-11, and 0.97 mg/L in SB-12. Benzene and toluene were not detected in groundwater from SB-9 and SB-10. Toluene, ethylbenzene, and xylenes were detected in groundwater from SB-6, SB-7, SB-8, SB-11, and SB-12. Laboratory analysis results are shown in Table 3.

4.0
SUMMARY AND CONCLUSIONS

4.1 SUMMARY

Previous exploration at the site show that groundwater has historically been at a depth of about 5 feet at the site. Groundwater entered the boreholes at a slow rate and the stabilized groundwater level was not measured during this investigation. Based upon experience with local groundwater conditions it is possible that the groundwater gradient and flow direction is towards the west southwest.

Total petroleum hydrocarbons (TPH) as gasoline were detected in soil samples from depths of about 5 feet in the vicinity of the USTs at the site. Generally TPH as gasoline was not detected in soil samples from depths of about 10 feet below the surface at the site. TPH as gasoline was not detected in soil samples from borings SB-9 and SB-10 located north of the USTs. The highest detected TPH in soil is reported from a depth of 5 1/2 feet in SB-6.

The detections of BTEX in soil show a similar distribution as the TPH gasoline, with detections of BTEX in soil from a depth of about 5 feet, and generally no detection in soil at depths of about 10 feet. The highest detections of BTEX are in soil from SB-6 and SB-7, in the approximate downgradient direction from the gasoline UST.

4.2 CONCLUSIONS

This report satisfies the requirements of a Preliminary Investigation and Evaluation Report (PIER) and, as noted previously, concludes that the groundwater beneath the site has been impacted by petroleum hydrocarbons.

5.0
LIMITATIONS

The conclusions presented in this report are based on the available data and the professional opinion and experience of WCC. If additional data are collected, the conclusions presented herein may be revised. WCC's services were performed with the standard of care and skill commonly used in the state of the practice in the profession. No other representation, expressed or implied, and no warranty or guarantee, is included or intended.

6.0
REFERENCES

State of California Regional Water Quality Control Board, Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites, August 10, 1990 and Appendix A - Reports, August 30, 1991

Woodward-Clyde Consultants, 1995, Work Plan for Phase II Soil and Groundwater Investigation, City of Emeryville Fire Station No. 2, Emeryville, California, Dated June 20, 1995

TABLES

TABLE 1

LIST OF CONTACTS
CITY OF EMERYVILLE
FIRE STATION NO. 2
6303 Hollis Street
Emeryville, California

Facility Owner/Operator:

City of Emeryville
2200 Powell Street, 12th Floor
Emeryville, California 94608

Ignacio Dayrit
(510) 596-4356

Environmental Consultants to City of Emeryville:

Woodward-Clyde Consultants
500 12th Street, Suite 100
Oakland, California 94607

Albert P. Ridley
(510) 874-3125

Lead Implementing Agency:

Alameda County Department of Environmental Health
Environmental Protection Division
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502

Susan Hugo
(510) 567-6780

Regional Water Quality Control Board:

Regional Water Quality Control Board
2101 Webster Street, Suite 500
Oakland, California 94612

TABLE 2.

SOIL SAMPLES ANALYTICAL RESULTS SUMMARY
FIRE STATION NO. 2
EMERYVILLE, CALIFORNIA

Sample ID	TPH as Gasoline/BTEX (EPA modified 8015/8020)				
(Depth, ft)	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPH as Gasoline
SB-6-5.5	1200	4900	8600	47000	440
SB-6-11	ND	ND	ND	ND	ND
SB-7-5.5	690	760	7500	28000	480
SB-7-11	ND	ND	ND	ND	ND
SB-8-5.5	190	230	1500	3500	120
SB-8-11	ND	ND	ND	ND	ND
SB-9-5.5	ND	ND	ND	ND	ND
SB-9-13	ND	ND	ND	ND	ND
SB-10-11.5	ND	ND	ND	ND	ND
SB-11-5.5	1200	5300	3300	17000	170
SB-11-11	ND	ND	5.7	26	ND
SB-12-5.5	8.3	15	ND	24	ND
SB-12-11.5	ND	ND	ND	ND	ND

Notes:
(1) Gasoline results are in mg/Kg, all other results are in ug/Kg
(2) Samples analyzed by Chromalab, Inc., July 17-18, 1995
(3) Refer to laboratory reports for analytical reporting limits
ND Not detected

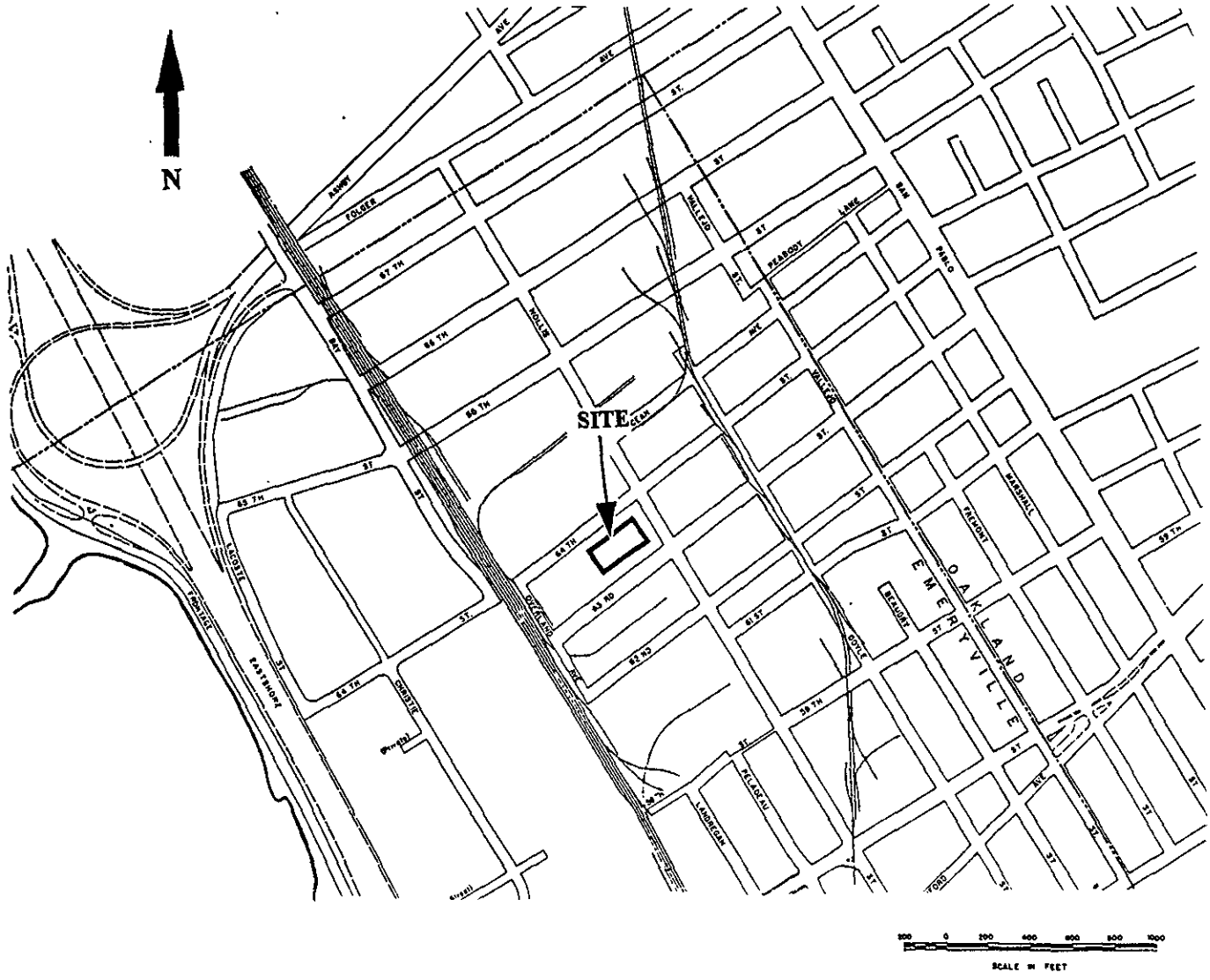
TABLE 3.

GROUNDWATER SAMPLES ANALYTICAL RESULTS SUMMARY
FIRE STATION NO. 2
EMERYVILLE, CALIFORNIA

Sample ID	TPH as Gasoline/BTEX (EPA Modified 8015/8020)				
(Depth, ft)	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPH as Gasoline
SB-6-W	24	27	27	110	0.41
SB-7-W	36	30	180	510	5.5
SB-8-W	18	36	27	100	0.46
SB-9-W	ND	ND	0.7	3.7	ND
SB-10-W	ND	ND	0.6	3.3	ND
SB-11-W	12	8.6	12	44	0.23
SB-12-W	40	130	38	170	0.97
TB	ND	ND	ND	ND	ND

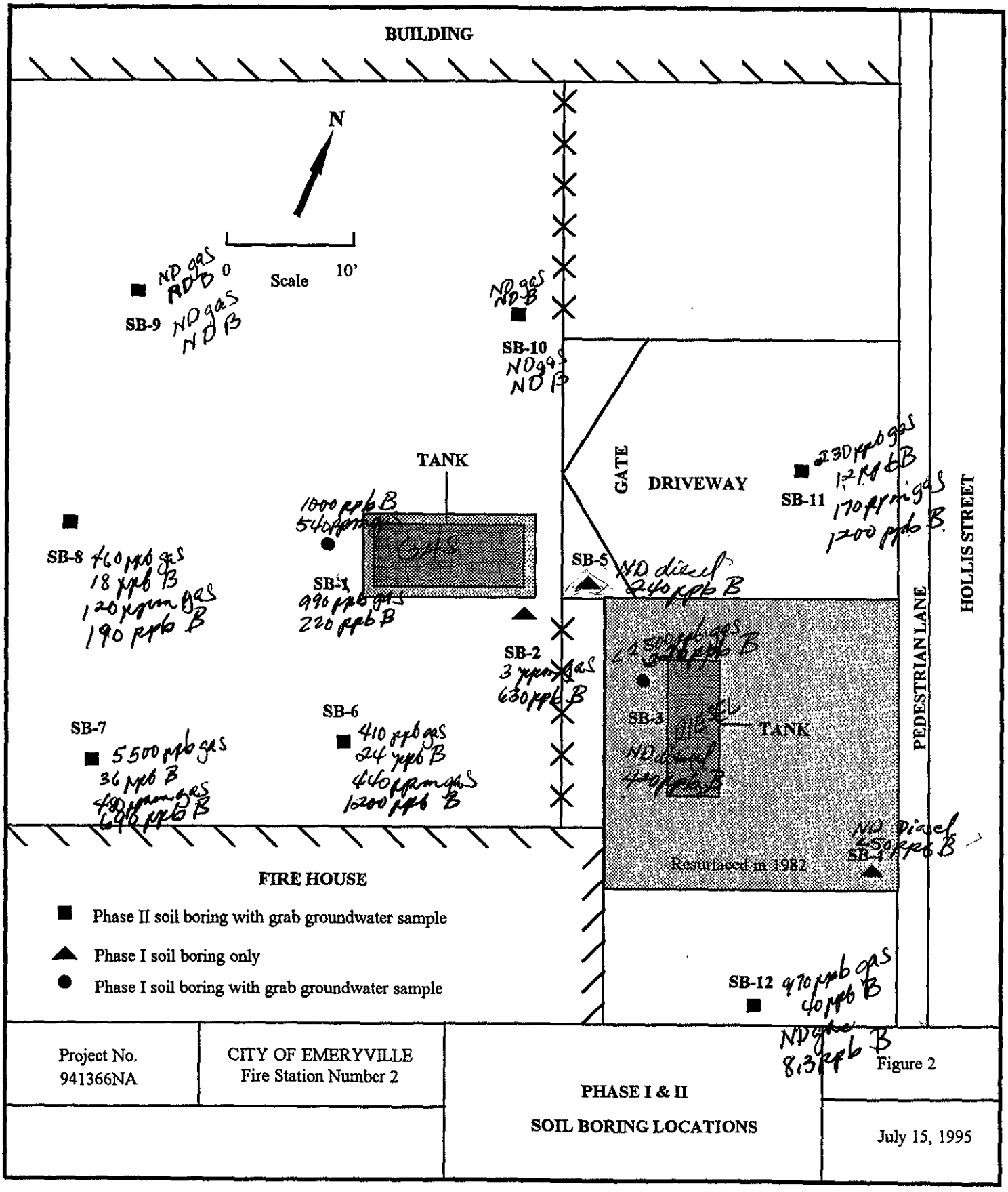
Notes:
(1) Gasoline results are in mg/L, all other results are in ug/L
(2) Samples analyzed by Chramolab, Inc., July 17-18, 1995
(3) Refer to laboratory reports for analytical reporting limits
ND Not Detected

FIGURES



Project No. 94166NA	CITY OF EMERYVILLE Fire Station Number 2	**SITE LOCATION**	Figure 1
Woodward-Clyde Consultants			July 15, 1995

* Hold
* Soil



Project No. 941366NA	CITY OF EMERYVILLE Fire Station Number 2	PHASE I & II SOIL BORING LOCATIONS	Figure 2
			July 15, 1995

APPENDIX A
BORING LOGS

8/3/95 JWLOGAB 366NA

City of Emeryville Fire Station #2, Emeryville, California

BORING LOCATION	10' E. of Roll Updoors & 13.5' SE. of corner of Firehouse		GROUND SURFACE ELEVATION: TOP OF WELL CASING ELEVATION:
DRILLING AGENCY	Precision Sampling, Inc.	DRILLER J.Ambriz & S. King	DATE STARTED: 7/17/95 DATE FINISHED: 7/17/95
DRILLING EQUIPMENT	XD-2		COMPLETION DEPTH (ft) 19.0
DRILLING METHOD	Hand Auger & Hydraulic Push	DRILL BIT 2-1/2" Core Sample	HAMMER N/A SAMPLER 2-1/2" core
SIZE AND TYPE OF CASING			NUMBER OF SAMPLES BULK: 1 DRIVE: 1
TYPE OF PERFORATION		FROM TO	WATER DEPTH FIRST: 13 COMPL.: 24 hrs.:
SIZE AND TYPE OF PACK		FROM TO	LOGGED BY J. Vernalia CHECKED BY AR

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO
	No. 1: Neat cement (15% Bentonite)	0	19	No. 3:		
	No. 2:			No. 4:		

LOG OF BORING SB-12

DEPTH (feet)	MATERIAL DESCRIPTION	SOIL GRAPHIC	WELL GRAPHIC	Hnu, ppm	OVA, ppm	WATER LEVEL	DEPTH (feet)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY (feet)	SAMPLES: BLOWS/foot	INDEX PROPERTIES: MOISTURE CONTENT (%)	INDEX PROPERTIES: DRY DENSITY (pcf)	INDEX PROPERTIES: HYDRAULIC CONDUCTIVITY (cm/s)	OTHER TESTS/ REMARKS
0	6" of asphalt and concrete														
	reddish brown base rock														Slight petroleum odor in cuttings (<1ppm VOCs in borehole)
	CLAY Light gray, with reddish brown mottled, with gravel, medium stiff, moist														
	CLAY Greenish gray, with some gravel, medium stiff, moist														No odor
	CLAYEY SAND (SC) Gray, with some gravel, loose, moist														
5	CLAY Grayish green, with some gravel, medium stiff, moist						5	1							
	CLAY Light brown, with black, brown, greenish gray mottled, with some gravel, medium stiff, moist														
10							10	2							No recovery
	CLAYEY SAND (SC) Light brown, with black, brown, greenish gray mottled, with some gravel, loose, moist					▽									
	CLAYEY SAND (SC) Dark brown, with gravel, loose, moist														
	SANDY CLAY (SC) Brown, with gravel, loose, moist														
15							15								
	CLAYEY SAND (SC) Light brown, with gravel, loose, moist to wet														Collected groundwater samples for TPHg & BTEX.
	Bottom of boring at 19 feet														
20															

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PROJECT NO. 941366NA FIGURE:

City of Emeryville Fire Station #2, Emeryville, California

BORING LOCATION	6'4" N. of Firehouse & 16'8" From Fence		GROUND SURFACE ELEVATION: TOP OF WELL CASING ELEVATION:
DRILLING AGENCY	Precision Sampling, Inc.	DRILLER J.Ambriz & S. King	DATE STARTED: 7/17/95 DATE FINISHED: 7/17/95
DRILLING EQUIPMENT	XD-2		COMPLETION DEPTH (ft) 19.0
DRILLING METHOD	Hand Auger & Hydraulic Push	DRILL BIT 2-1/2" Core Sample	HAMMER N/A SAMPLER 2-1/2" core
SIZE AND TYPE OF CASING			NUMBER OF SAMPLES BULK: 1 DRIVE: 1
TYPE OF PERFORATION		FROM TO	WATER DEPTH FIRST: 15 COMPL.: 24 hrs.:
SIZE AND TYPE OF PACK		FROM TO	LOGGED BY J. Vernalia CHECKED BY AR

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO
	No. 1: Neat cement (15% Bentonite)	0	19	No. 3:		
	No. 2:			No. 4:		

LOG OF BORING SB-6

DEPTH (feet)	MATERIAL DESCRIPTION	SOIL GRAPHIC	WELL GRAPHIC	Hnu, ppm	OVA, ppm	WATER LEVEL	DEPTH (feet)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY (feet)	SAMPLES BLOWS/foot	INDEX PROPERTIES MOISTURE CONTENT (%)	INDEX PROPERTIES DRY DENSITY (pcf)	INDEX PROPERTIES HYDRAULIC CONDUCTIVITY (cm/s)	OTHER TESTS/ REMARKS
0	6" of thick asphalt concrete														
	reddish brown base rock														
	CLAY Dark gray to black														Petrolem odor
	CLAY (CL) Light gray, medium stiff														1 ppm at top of borehole
5	CLAYEY SAND (SC-SM) Dense, moist						5	1							Petroleum odor
	SILTY CLAY Light greenish gray, some gravel, medium stiff														
	GRAVELLY CLAY (GC) Light brown and greenish grey, medium stiff														No odor
10	becoming yellowish brown, moist						10	2							
	Light brown to brown, stiff, moist														Placed 1" PVC 10' screen at 19'.
15						▽	15								Collected groundwater samples for TPHg & BTEX
	SANDY CLAY (SC) Brown, medium stiff, moist														
	Bottom of boring at 19 feet														
20															

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PROJECT NO. 941366NA FIGURE:

City of Emeryville Fire Station #2, Emeryville, California

BORING LOCATION	5'6" N. of Firehouse & 34'0" W. of Fence		GROUND SURFACE ELEVATION: TOP OF WELL CASING ELEVATION:
DRILLING AGENCY	Precision Sampling, Inc.	DRILLER J.Ambriz & S. King	DATE STARTED: 7/17/95 DATE FINISHED: 7/17/95
DRILLING EQUIPMENT	XD-2		COMPLETION DEPTH (ft) 22.0
DRILLING METHOD	Hand Auger & Hydraulic Push	DRILL BIT 2-1/2" Core Sampl	HAMMER N/A SAMPLER 2-1/2" core
SIZE AND TYPE OF CASING			NUMBER OF SAMPLES BULK: 1 DRIVE: 1
TYPE OF PERFORATION		FROM TO	WATER DEPTH FIRST: 14.45 COMPL.: 24 hrs.:
SIZE AND TYPE OF PACK		FROM TO	LOGGED BY J. Vernalia CHECKED BY AR

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO
	No. 1: Neat cement (15% Bentonite)	0	22	No. 3:		
	No. 2:			No. 4:		

LOG OF BORING SB-7

DEPTH (feet)	MATERIAL DESCRIPTION	SOIL GRAPHIC	WELL GRAPHIC	Hnu, ppm	OVA, ppm	WATER LEVEL	DEPTH (feet)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY (feet)	SAMPLES BLOWS/foot	INDEX PROPERTIES MOISTURE CONTENT (%)	INDEX PROPERTIES DRY DENSITY (pcf)	INDEX PROPERTIES HYDRAULIC CONDUCTIVITY (cm/s)	OTHER TESTS/ REMARKS
0	6" of asphalt concrete														
	reddish brown base rock														
	CLAY Dark brown to black, with some gravel and sand, roots, medium stiff, moist														
	CLAY Gray, with some gravel and sand, medium stiff, moist														Petroleum odor 1-2 ppm at top of borehole after hand auger the first 3 ft.
	GRAVELLY CLAY (GC) Greenish gray, with gravel, roots, medium stiff, moist														
5	CLAYEY SAND (SC) Light greenish gray, with gravel, dense, moist						5	1							
	SANDY CLAY (CL) Light greenish gray, with some gravel, stiff, moist														
	SILTY CLAY (CL) Light brown mottled with black														No odor
10	yellowish brown with reddish brown (dark brown and greenish gray), mottled, medium stiff, moist					▽	10	2							
	light brown with reddish brown, dark brown and greenish gray mottled, medium stiff, moist														
	CLAY (CL) Brown with dark brown and gray mottled, medium stiff, moist to wet														
15							15								Becoming wet at 17'
	light brown with gravel														300 ppm at top of borehole (6" hole) after drilling 22'
20							20								Collected groundwater samples for TPHg & BTEX
	Bottom of boring at 22 feet														
25															

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PROJECT NO. 941366NA FIGURE:

City of Emeryville Fire Station #2, Emeryville, California

BORING LOCATION	12' E. of Metallockers & 3' S. of Metal Lockers		GROUND SURFACE ELEVATION: TOP OF WELL CASING ELEVATION:
DRILLING AGENCY	Precision Sampling, Inc.	DRILLER J.Ambriz & S. King	DATE STARTED: 7/17/95 DATE FINISHED: 7/17/95
DRILLING EQUIPMENT	XD-2		COMPLETION DEPTH (ft) 16.0
DRILLING METHOD	Hand Auger & Hydraulic Push	DRILL BIT 2-1/2" Core Sample	HAMMER N/A SAMPLER 2-1/2" core
SIZE AND TYPE OF CASING			NUMBER OF SAMPLES BULK: 1 DRIVE:
TYPE OF PERFORATION		FROM TO	WATER DEPTH FIRST: 15.5 COMPL.: 24 hrs.:
SIZE AND TYPE OF PACK		FROM TO	LOGGED BY J. Vernalia CHECKED BY AR

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO
	No. 1: Neat cement (15% Bentonite)	0	16	No. 3:		
	No. 2:			No. 4:		

LOG OF BORING SB-8

DEPTH (feet)	MATERIAL DESCRIPTION	SOIL GRAPHIC	WELL GRAPHIC	Hnu, ppm	OVA, ppm	WATER LEVEL	DEPTH (feet)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY (feet)	SAMPLES: BLOWS/foot	INDEX PROPERTIES: MOISTURE CONTENT (%)	INDEX PROPERTIES: DRY DENSITY (pcf)	INDEX PROPERTIES: HYDRAULIC CONDUCTIVITY (cm/s)	OTHER TESTS/ REMARKS
0	8" of asphalt and concrete														
	reddish brown base rock														Petroleum odor
	CLAY Dark gray, with some roots, medium stiff, moist														1 ppm in excavated soil bucket
	SANDY CLAY (SC) Greenish gray with black mottled, with some gravel, medium stiff, moist														200-300 ppm at top of borehole after hand auger the first 3 ft.
5							5	1							
	CLAY Light brown with gray and black mottled, with some gravel, medium stiff														
10	SANDY CLAY (SC) Gray with brown and black mottled, with some gravel, medium stiff						10	2							
	CLAYEY SAND (SC) Brown with gray mottled, with some gravel, loose, moist to wet														Collected groundwater samples for TPHg & BTEX.
	SANDY CLAY (SC) Brown with gray mottled, with some gravel, medium stiff, moist					▽									
15							15								
	Bottom of boring at 16 feet														
20															

Woodward-Clyde Consultants

PROJECT NO. 941366NA FIGURE:

City of Emeryville Fire Station #2, Emeryville, California

BORING LOCATION	15'9" S. of Brick Bldg. & 33' W. of Fence		GROUND SURFACE ELEVATION: TOP OF WELL CASING ELEVATION:
DRILLING AGENCY	Precision Sampling, Inc.	DRILLER J.Ambriz & S. King	DATE STARTED: 7/17/95 DATE FINISHED: 7/17/95
DRILLING EQUIPMENT	XD-2		COMPLETION DEPTH (ft) 16.0
DRILLING METHOD	Hand Auger & Hydraulic Push	DRILL BIT 2-1/2" Core Sample	HAMMER N/A SAMPLER 2-1/2" core
SIZE AND TYPE OF CASING			NUMBER OF SAMPLES BULK: 1 DRIVE: 1
TYPE OF PERFORATION		FROM TO	WATER DEPTH FIRST: 15.5 COMPL.: 24 hrs.:
SIZE AND TYPE OF PACK		FROM TO	LOGGED BY J. Vernalia CHECKED BY

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO
	No. 1: Neat cement (15% Bentonite)	0	16	No. 3:		
	No. 2:			No. 4:		

LOG OF BORING SB-9

DEPTH (feet)	MATERIAL DESCRIPTION	SOIL GRAPHIC	WELL GRAPHIC	Hnu, ppm	OVA, ppm	WATER LEVEL	DEPTH (feet)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY (feet)	SAMPLES BLOWS/foot	INDEX PROPERTIES MOISTURE CONTENT (%)	INDEX PROPERTIES DRY DENSITY (pcf)	INDEX PROPERTIES HYDRAULIC CONDUCTIVITY (cm/s)	OTHER TESTS/ REMARKS
0	6" of asphalt and concrete														
	reddish brown base rock														
	CLAY Dark gray, with some gravel, medium stiff, moist														Petroleum odor present (<1ppm VOCs)
	CLAY Greenish gray, with some gravel, medium stiff, moist														
5							5	1							
	SANDY CLAY (SC) Gray, with some gravel, medium stiff, moist														No odor
	SANDY CLAY (SC) Yellowish brown, with some gravel, mottled with gray and black brown clay, medium stiff, moist														
10							10								
	SANDY CLAY (SC) Light brown, mottled with gray, black and brown clay, with some gravel, medium stiff, moist														
	CLAY Brown, mottled with gray and dark grey clay, medium stiff, moist							2							Collected groundwater samples for TPHg & BTEX.
15						▽	15								
	Bottom of boring at 16 feet														
20															

Woodward-Clyde Consultants

PROJECT NO. 941366NA FIGURE:

8/3/95 JWLOGAB 366NA

City of Emeryville Fire Station #2, Emeryville, California

BORING LOCATION	5'6" S. of Metal Storage Lockers & 3'5" E. of Fence		GROUND SURFACE ELEVATION: TOP OF WELL CASING ELEVATION:
DRILLING AGENCY	Precision Sampling, Inc.	DRILLER J.Ambriz & S. King	DATE STARTED: 7/18/95 DATE FINISHED: 7/18/95
DRILLING EQUIPMENT	XD-2		COMPLETION DEPTH (ft) 16.0
DRILLING METHOD	Hand Auger & Hydraulic Push	DRILL BIT 2-1/2" Core Sampl	HAMMER N/A SAMPLER 2-1/2" core
SIZE AND TYPE OF CASING			NUMBER OF SAMPLES BULK: DRIVE: 1
TYPE OF PERFORATION		FROM TO	WATER DEPTH FIRST: 12 COMPL.: 24 hrs.:
SIZE AND TYPE OF PACK		FROM TO	LOGGED BY J. Vernalia CHECKED BY AR

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO
	No. 1: Neat cement (15% Bentonite)	0	16	No. 3:		
	No. 2:			No. 4:		

LOG OF BORING SB-10

DEPTH (feet)	MATERIAL DESCRIPTION	SOIL GRAPHIC	WELL GRAPHIC	Hnu, ppm	OVA, ppm	WATER LEVEL	DEPTH (feet)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY (feet)	SAMPLES: BLOWS/foot	INDEX PROPERTIES: MOISTURE CONTENT (%)	INDEX PROPERTIES: DRY DENSITY (pcf)	INDEX PROPERTIES: HYDRAULIC CONDUCTIVITY (cm/s)	OTHER TESTS/ REMARKS
0	6" of asphalt and concrete														
	reddish brown base rock														No petroleum odor Poor recovery in borehole from 0 to 1'
	CLAY Gray, mottled with brown clay, with some gravel, medium stiff, moist														
5							5								Could not recover sample at 5.5' due to a rock in hole
10							10	1							
	CLAYEY SAND (SC) Gray, with some gravel, loose, moist					▽									
	CLAYEY SAND (SC) Brown, with some gravel, loose, moist to wet														Collected groundwater samples for TPHg & BTEX.
15							15								
	Bottom of boring at 16 feet														
20															

Woodward-Clyde Consultants

PROJECT NO. 941366NA FIGURE:

City of Emeryville Fire Station #2, Emeryville, California

BORING LOCATION	14'E of Fence & Center of Driveway		GROUND SURFACE ELEVATION: TOP OF WELL CASING ELEVATION:
DRILLING AGENCY	*Precision Sampling, Inc.*	DRILLER J.Ambriz & S. King	DATE STARTED: 7/17/95 DATE FINISHED: 7/17/95
DRILLING EQUIPMENT	XD-2		COMPLETION DEPTH (ft) 19.0
DRILLING METHOD	Hand Auger & Hydraulic Push	DRILL BIT 2-1/2" Core Sampler	HAMMER N/A SAMPLER 2-1/2" core
SIZE AND TYPE OF CASING			NUMBER OF SAMPLES BULK: 1 DRIVE: 1
TYPE OF PERFORATION		FROM TO	WATER DEPTH FIRST: 11 COMPL.: 24 hrs.:
SIZE AND TYPE OF PACK		FROM TO	LOGGED BY J. Vernalia CHECKED BY AR

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO
	No. 1: Neat cement (15% Bentonite)	0	19	No. 3:		
	No. 2:			No. 4:		

LOG OF BORING SB-11

DEPTH (feet)	MATERIAL DESCRIPTION	SOIL GRAPHIC	WELL GRAPHIC	Hnu, ppm	OVA, ppm	WATER LEVEL	DEPTH (feet)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY (feet)	SAMPLES BLOWS/foot	INDEX PROPERTIES MOISTURE CONTENT (%)	INDEX PROPERTIES DRY DENSITY (pcf)	INDEX PROPERTIES HYDRAULIC CONDUCTIVITY (cm/s)	OTHER TESTS/ REMARKS
0	6" of asphalt and concrete														
	SAND poorly graded, loose, dry														Petroleum odor in cutting and in soil boring (100 ppm VOCs at top of borehole (6"bgs)
	CLAY Light grey, with black mottled, with gravel, medium stiff, moist														
	CLAY Greenish gray, with some gravel, medium stiff, moist														
	CLAY Greenish grey, with light brown mottled, with some gravel, loose, moist							1							
5							5								
	SANDY CLAY (SC) Grayish green, with some gravel, medium stiff, moist														
	CLAYEY SAND (SC) Greenish gray, with some gravel, loose, moist to wet														Poor recovery
10						▽	10	2							
	CLAY Brown, mottled with greenish gray clay, with some gravel, moist														No odor
	CLAY Brown, mottled with light brown clay, with some gravel and sand, moist to wet														
15							15								Collected groundwater samples for TPHg & BTEX
	Bottom of boring at 19 feet														
20															

Woodward-Clyde Consultants

PROJECT NO. 941366NA FIGURE:

APPENDIX B
LABORATORY REPORTS

CHROMALAB, INC.

Environmental Services (SDB)

July 21, 1995 Submission #: 9507189

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

Attn: Xianggang Tong

RE: Analysis for project 941366NA.

REPORTING INFORMATION

Samples were received cold and in good condition on July 18, 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.

Please call us if you have questions regarding them.

SAMPLES SUBMITTED IN THIS REPORT

Client Sample ID	Matrix	Date collected	Sample #
SB-6-5.5	SOIL	July 17, 1995	96186
SB-6-11	SOIL	July 17, 1995	96187
SB-7-5.5	SOIL	July 17, 1995	96188
SB-7-11	SOIL	July 17, 1995	96189
SB-8-5.5	SOIL	July 17, 1995	96190
SB-8-11	SOIL	July 17, 1995	96191
SB-9-5.5	SOIL	July 17, 1995	96192
SB-9-13	SOIL	July 17, 1995	96193
SB-10-11.5	SOIL	July 17, 1995	96194
SB-6-W	WATER	July 17, 1995	96195
SB-7-W	WATER	July 17, 1995	96196
SB-8-W	WATER	July 17, 1995	96197
SB-12-5.5	SOIL	July 17, 1995	96198
SB-12-11.5	SOIL	July 17, 1995	96199
SB-11-5.5	SOIL	July 17, 1995	96200
SB-11-11	SOIL	July 17, 1995	96201
SB-9-W	WATER	July 17, 1995	96202
SB-10-W	WATER	July 17, 1995	96203
SB-12-W	WATER	July 17, 1995	96204
SB-11-W	WATER	July 17, 1995	96205
TB	WATER	July 17, 1995	96206

CHROMALAB, INC.

Environmental Services (SDB)

July 21, 1995 Submission #: 9507189

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

Attn: Xianggang Tong

RE: Analysis for project 941366NA.

No discrepancies were observed or difficulties encountered with the testing.

Please call us if you have questions regarding them.

SAMPLES SUBMITTED IN THIS REPORT

Client Sample ID	Matrix	Date collected	Sample #

Jill Thomas
Quality Assurance Manager

Eric Tam
Laboratory Director

CHROMALAB, INC.

Environmental Services (SDB)

July 21, 1995 *Submission #:* 9507189

WOODWARD-CLYDE/OAKLAND

Atten: Xianggang Tong

Project: 941366NA
Received: July 18, 1995

re: 8 samples for Gasoline and BTEX analysis.
Method: EPA 5030/8015M/602/8020

Sampled: July 17, 1995 *Matrix:* WATER
Run: 7689-2 *Analyzed:* July 20, 1995

Spl #	Sample ID	Gasoline (mg/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
96195	SB-6-W	0.41	24	27	27	110
96196	SB-7-W	5.5	36	30	180	510
	For above sample:	*GAS DET.LIMIT=0.1mg/L,BTEX DET.LIMIT=1.0ug/L*				
96197	SB-8-W	0.46	18	26	27	100
96202	SB-9-W	N.D.	N.D.	N.D.	0.7	3.7
96203	SB-10-W	N.D.	N.D.	N.D.	0.6	3.3
96204	SB-12-W	0.97	40	130	38	170
96205	SB-11-W	0.23	12	8.6	12	44
96206	TB	N.D.	N.D.	N.D.	N.D.	N.D.
	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 (%)	89	101	100	105	97

Jack Kelly
Chemist

Ali Kharrazi
Organic Manager

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

July 21, 1995 *Submission #:* 9507189

WOODWARD-CLYDE/OAKLAND

Atten: Xianggang Tong

Project: 941366NA
Received: July 18, 1995

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

Matrix: WATER
Lab Run#: 7689 *Instrument:* GC1-2 *Analyzed:* July 20, 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	89	--	80-118	N/A	N/A
BENZENE	N.D. ug/L	20 ug/L	102	103	80-127	1.0	20
TOLUENE	N.D. ug/L	20 ug/L	100	101	80-122	1.0	20
ETHYL BENZENE	1 ug/L	20 ug/L	102	104	81-119	1.9	20
XYLENES	3 ug/L	60 ug/L	95.0	94.0	83-125	1.1	20

Sample Spiked: 96203
Submission #: 9507189
Client Sample ID: SB-10-W

SPK1

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CHROMALAB, INC.

Environmental Services (SDB)

July 21, 1995 *Submission #:* 9507189

WOODWARD-CLYDE/OAKLAND

Atten: Xianggang Tong

Project: 941366NA
Received: July 18, 1995

re: **Surrogate** report for 8 samples for Gasoline and BTEX analysis.

Matrix: WATER
Lab Run#: 7689 *Analyzed:* July 20, 1995
Method: EPA 5030/8015M/602/8020

Sample#	Client Sample ID	Surrogate	% Recovered
96195	SB-6-W	TRIFLUOROTOLUENE	102
96196	SB-7-W	TRIFLUOROTOLUENE	121
96197	SB-8-W	TRIFLUOROTOLUENE	91
96202	SB-9-W	TRIFLUOROTOLUENE	95
96203	SB-10-W	TRIFLUOROTOLUENE	101
96204	SB-12-W	TRIFLUOROTOLUENE	96
96205	SB-11-W	TRIFLUOROTOLUENE	96
96206	TB	TRIFLUOROTOLUENE	104

Sample#	QC Sample Type	Surrogate	% Recovered	
96397	*Method blank (MDB)*	TRIFLUOROTOLUENE	98	
96398	*Blank Spike (BSP)*	TRIFLUOROTOLUENE	102	
96598	*Matrix spike (MS)*	TRIFLUOROTOLUENE	92	SPK1
96597	*Matrix spike duplicate (MSD)*	TRIFLUOROTOLUENE	94	SPK2

OCSURR JACK 21-Jul-95 13:55:33

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Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

July 21, 1995 *Submission #:* 9507189

WOODWARD-CLYDE/OAKLAND

Atten: Xianggang Tong

Project: 941366NA
Received: July 18, 1995

re: 13 samples for Gasoline and BTEX analysis.
Method: EPA 5030/8015M/8020

Sampled: July 17, 1995 *Matrix:* SOIL
Run: 7688-1 *Analyzed:* July 20, 1995

Spl #	Sample ID	Gasoline (mg/Kg)	Benzene (ug/Kg)	Toluene (ug/Kg)	Ethyl Benzene (ug/Kg)	Total Xylenes (ug/Kg)
96186	SB-6-5.5	440	1200	4900	8600	47000
	For above sample:	*GAS DET.LIMIT=200mg/Kg,BTEX DET.LIMIT=1000ug/Kg*				
96187	SB-6-11	N.D.	N.D.	N.D.	N.D.	N.D.
96188	SB-7-5.5	480	690	760	7500	28000
	For above sample:	*GAS DET.LIMIT=200mg/Kg,BTEX DET.LIMIT=1000ug/Kg*				
96189	SB-7-11	N.D.	N.D.	N.D.	N.D.	N.D.
96190	SB-8-5.5	120	190	230	1500	3500
	For above sample:	*GAS DET.LIMIT=0.5mg/Kg,BTEX DET.LIMIT=5.0ug/Kg*				
96191	SB-8-11	N.D.	N.D.	N.D.	N.D.	N.D.
96192	SB-9-5.5	N.D.	N.D.	N.D.	N.D.	N.D.
96193	SB-9-13	N.D.	N.D.	N.D.	N.D.	N.D.
96194	SB-10-11.5	N.D.	N.D.	N.D.	N.D.	N.D.
96198	SB-12-5.5	N.D.	8.3	15	N.D.	24
96199	SB-12-11.5	N.D.	N.D.	N.D.	N.D.	N.D.
96200	SB-11-5.5	170	1200	5300	3300	17000
	For above sample:	*GAS DET.LIMIT=1.0mg/Kg,BTEX DET.LIMIT=10ug/Kg*				
96201	SB-11-11	N.D.	N.D.	N.D.	5.7	26
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 (%)		102	106	106	105	106

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Chemist

Ali Kharrazi
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CHROMALAB, INC.

Environmental Services (SDB)

July 21, 1995 *Submission #:* 9507189

WOODWARD-CLYDE/OAKLAND

Atten: Xianggang Tong

Project: 941366NA
Received: July 18, 1995

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

Matrix: SOIL
Lab Run#: 7688 *Instrument:* GC1-1 *Analyzed:* July 20, 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	102	--	80-118	N/A	N/A
BENZENE	N.D. ug/Kg	100 ug/Kg	105	104	80-127	1.0	20
TOLUENE	N.D. ug/Kg	100 ug/Kg	103	103	80-130	0.0	20
ETHYL BENZENE	N.D. ug/Kg	100 ug/Kg	103	103	81-119	0.0	20
XYLENES	N.D. ug/Kg	300 ug/Kg	105	105	83-125	0.0	20

Sample Spiked: 96187
Submission #: 9507189
Client Sample ID: SB-6-11

SPK1

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CHROMALAB, INC.

Environmental Services (SDB)

July 21, 1995 *Submission #:* 9507189

WOODWARD-CLYDE/OAKLAND

Atten: Xianggang Tong

Project: 941366NA
Received: July 18, 1995

re: **Surrogate** report for 13 samples for Gasoline and BTEX analysis.

Matrix: SOIL
Lab Run#: 7688 *Analyzed:* July 20, 1995
Method: EPA 5030/8015M/8020

Sample#	Client Sample ID	Surrogate	% Recovered
96186	SB-6-5.5	TRIFLUOROTOLUENE	107
96187	SB-6-11	TRIFLUOROTOLUENE	112
96188	SB-7-5.5	TRIFLUOROTOLUENE	110
96189	SB-7-11	TRIFLUOROTOLUENE	99
96190	SB-8-5.5	TRIFLUOROTOLUENE	168*
96191	SB-8-11	TRIFLUOROTOLUENE	100
96192	SB-9-5.5	TRIFLUOROTOLUENE	99
96193	SB-9-13	TRIFLUOROTOLUENE	103
96194	SB-10-11.5	TRIFLUOROTOLUENE	107
96198	SB-12-5.5	TRIFLUOROTOLUENE	105
96199	SB-12-11.5	TRIFLUOROTOLUENE	103
96200	SB-11-5.5	TRIFLUOROTOLUENE	139*
96201	SB-11-11	TRIFLUOROTOLUENE	105

Sample#	QC Sample Type	Surrogate	% Recovered	
96389	*Method blank (MDB)*	TRIFLUOROTOLUENE	102	
96390	*Blank Spike (BSP)*	TRIFLUOROTOLUENE	99	
96393	*Matrix spike (MS)*	TRIFLUOROTOLUENE	100	SPK1
96392	*Matrix spike duplicate (MSD)*	TRIFLUOROTOLUENE	101	SPK2

* Matrix interference verified by reanalysis.

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199/96186-962C6

22954

Woodward-Clyde Consultants

500 12th Street, Suite 100, Oakland, CA 94607-4041
(415) 893-3600

Chain of Custody Record

PROJECT NO. 94136 NA

SAMPLERS: (Signature) Jane Vernaha

SUBM #: 9507189 REP: GC
CLIENT: W&C-OAK
DUE: 07/25/95
REF #: 22954

DATE 1995	TIME	SAMPLE NUMBER	Sample Matrix (S)oil, (W)ater, (A)ir	ANALYSES: EPA Method 8015/8020	EPA Method	EPA Method	EPA Method	Number of procedures, etc.)
7/17	9:00	SB-6-5.5	S	X				1
7/17	9:30	SB-6-11	S	X				1
7/17	10:15	SB-7-5.5	S	X				1
7/17	10:30	SB-7-11	S	X				1
7/17	11:35	SB-8-5.5	S	X				1
7/17	11:45	SB-8-11	S	X				1
7/17	13:05	SB-9-5.5	S	X				1
7/17	13:20	SB-9-13	S	X				1
7/17	14:10	SB-10-11.5	S	X				1
7/17	14:30	SB-6-W	W	X				3
7/17	14:45	SB-7-W	W	X				3
7/17	15:00	SB-8-W	W	X				2
7/17	15:25	SB-12-5.5	S	X				1
7/17	15:35	SB-12-11.5	S	X				1
7/17	16:15	SB-11-5.5	S	X				1
7/17	16:25	SB-11-11	S	X				1
7/17	17:00	SB-9-W	W	X				2
7/17	17:10	SB-10-W	W	X				3
7/17	17:15	SB-12-W	W	X				3
7/17	17:25	SB-11-W	W	X				3
		All samples for TPHg & BTEX Analysis						
7/17		TB	W	X				3

TPHg & BTEX

- Samples collected in stainless steel liners.
- Soil inspected on both ends.
- Teflon liners & caps immediately.
- Ends of soil sample wrapped with duct tape & labeled.
- All samples immediately put on ice
- GW samples wrapped in plastic bags
- Analyze Soil samples at least 1" from the ends of the tube
- GW samples collected from top of bailer

for questions call Xianggang Tong @510-874-3060

TOTAL NUMBER OF CONTAINERS: 35

* Cooler RECEIVED w/ TCPA intact

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
	7/18/95 10:00am	7/18/95 10:00am	7/18/95 15:26		

METHOD OF SHIPMENT:	SHIPPED BY: (Signature)	COURIER: (Signature)	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
				7/18/95 15:26

APPENDIX C
PREVIOUS WORK

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

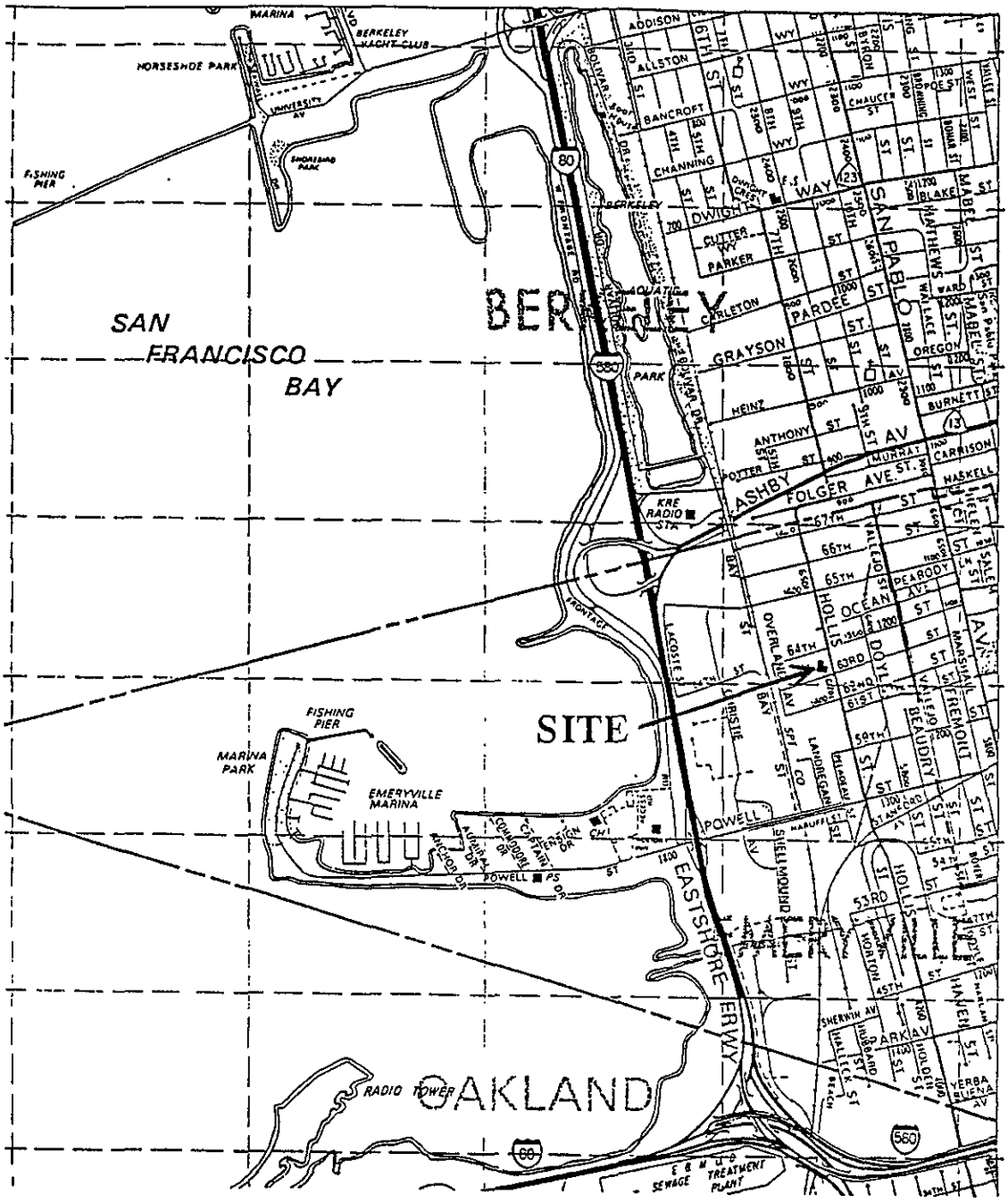
Sample No.	Date Sampled	TPH[a] Gasoline (mg/kg)	TPH[b] Diesel (mg/kg)	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	Total Xylenes (µg/kg)
SB-1-2'	3/15/95	2.4	NA	280	12	200	370
SB-1-5'	3/15/95	540	NA	ND (1,000)	7,000	10,000	51,000
SB-1-10'	3/15/95	ND (1.0)	NA	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
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	SITE LOCATION MAP	Figure 1
Woodward-Clyde Consultants		

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	WATER DEPTH FIRST: 12 COMPL.: 5 24 hrs.:
SIZE AND TYPE OF PACK		FROM TO	LOGGED BY W. Dittman CHECKED BY AR.

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO
	No. 1: Neat cement (15% Bentonite)	0	16	No. 3:		
	No. 2:			No. 4:		

LOG OF BORING SB-1

DEPTH (feet)	MATERIAL DESCRIPTION	SOIL GRAPHIC	WELL GRAPHIC	Hnu, ppm	OVA, ppm	WATER LEVEL	DEPTH (feet)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY (feet)	SAMPLES BLOWS/foot	INDEX PROPERTIES MOISTURE CONTENT (%)	INDEX PROPERTIES DRY DENSITY (pcf)	INDEX PROPERTIES HYDRAULIC CONDUCTIVITY (cm/s)	OTHER TESTS/ REMARKS
0	3 inches asphalt over 10 inches of gravelly fill														
	SILTY CLAY (CL) damp, black (5GY-5/1), medium plasticity, trace fine to coarse sand							1	X						Product odor at 1/2' below grade. Grab sample collected at 2' below grade due to product odor. Hand augered to 4'.
	greenish gray (5GY-5/1), some fine to coarse sand							2		1.7					
5						▼	5	3		2.8					
	greenish gray (5GY-5/1), trace fine to coarse sand							4		3					
10							10								Temporary well screen installed at 11.5'. Well dry.
	light brownish gray (2.5Y-6/2), trace to some fine to coarse sand, trace fine gravel to 3/8", iron oxide stains,					▽		5		1					
								6		3					Deepend well to 16'; water level at 11'. Collected groundwater samples for TPH-g & BTEX.
15							15								
	Bottom of boring at 16 feet														
20															

Woodward-Clyde Consultants

PROJECT NO. 941366NA FIGURE:

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 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 AR

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

LOG OF BORING SB-2

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

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 GR

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO
	No. 1: Neat cement (15% Bentonite)	0	14	No. 3:		
	No. 2:			No. 4:		

LOG OF BORING SB-3

DEPTH (feet)	MATERIAL DESCRIPTION	SOIL GRAPHIC	WELL GRAPHIC	Hnu, ppm	OVA, ppm	WATER LEVEL	DEPTH (feet)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY (feet)	SAMPLES BLOWS/foot	INDEX PROPERTIES MOISTURE CONTENT (%)	INDEX PROPERTIES DRY DENSITY (pcf)	INDEX PROPERTIES HYDRAULIC CONDUCTIVITY (cm/s)	OTHER TESTS/ REMARKS
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														
	SILTY CLAY (CL) Moist, grayish brown (10YR-5/2), medium plasticity, trace fine to coarse sand. greenish gray (5GY-5/1)														
5							5	1		2.5					Hand augered to 5'.
								2		3					
	CLAYEY SAND (SC) Damp, greenish grey (5GY-5/1) some fine to coarse sand, little fine gravel to 1/2"														
10							10	3		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														
	Bottom of boring at 14 feet														
15															

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PROJECT NO. 941366NA FIGURE:

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 AR

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

LOG OF BORING SB-4

DEPTH (feet)	MATERIAL DESCRIPTION	SOIL GRAPHIC	WELL GRAPHIC	Hnu, ppm	OVA, ppm	WATER LEVEL	DEPTH (feet)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY (feet)	SAMPLES BLOWS/foot	INDEX PROPERTIES MOISTURE CONTENT (%)	INDEX PROPERTIES DRY DENSITY (pcf)	INDEX PROPERTIES HYDRAULIC CONDUCTIVITY (cm/s)	OTHER TESTS/ REMARKS
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							1		.5					
5							5	2		3					Hand augered to 5'. Soil sample collected at 6' due to poor recovery.
	becoming sandy, trace to some fine to coarse sand, trace fine gravel to 3/8"														
	yellowish brown (10YR-5/4) patches of sand and fine gravel to 1/2"							3		2					
10							10								
	Bottom of boring at 11 feet														
15															

Woodward-Clyde Consultants

PROJECT NO. 941366NA FIGURE:

City of Emeryville Fire Station #2, Emeryville, California

BORING LOCATION	Between gas & diesel tanks		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) 11.5
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
	No. 1: Neat cement (15% Bentonite)	0	11.5	No. 3:		
	No. 2:			No. 4:		

LOG OF BORING SB-5

DEPTH (feet)	MATERIAL DESCRIPTION	SOIL GRAPHIC	WELL GRAPHIC	Hnu, ppm	OVA, ppm	WATER LEVEL	SAMPLES DEPTH (feet)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY (feet)	SAMPLES BLOWS/foot	INDEX PROPERTIES MOISTURE CONTENT (%)	INDEX PROPERTIES DRY DENSITY (pcf)	INDEX PROPERTIES HYDRAULIC CONDUCTIVITY (cm/s)	OTHER TESTS/ REMARKS
0	7 inches of concrete														
	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							5	1		1.5					
	dark greenish gray (5GY-4/1), medium plasticity							2		3					
10							10	3		2					
	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														
15															

Woodward-Clyde Consultants

PROJECT NO. 941366NA FIGURE:

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

Client Sample ID	Matrix	Date collected	Sample #
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

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096

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

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OC JACK 11:11.44

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

QC JACK 11:11 44

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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'	420	11000	5500	27000
	Note: GAS DET.LIMIT=40mg/Kg,BTEX DET.LIMIT=200ug/Kg				
81071	SB3-10'	47	81	60	80
	Note: GAS DET.LIMIT=2.0mg/Kg,BTEX DET.LIMIT=10ug/Kg				
81072	SB5-5.5'	240	170	2300	8200
	Note: GAS DET.LIMIT=40mg/Kg,BTEX DET.LIMIT=200ug/Kg				
81073	SB5-10'	N.D.	N.D.	N.D.	N.D.
81077	SB4-6'	N.D.	54	1100	3300
	Note: GAS DET.LIMIT=10mg/Kg,BTEX DET.LIMIT=50ug/Kg				
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

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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.

Matrix: SOIL *Extracted:* March 17, 1995
Sampled: March 15, 1995 *Run#:* 5845 *Analyzed:* March 20, 1995
Method: EPA 3550/8015M

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
Organic Manager

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Federal ID #68-0140157

QC SIRIRAT 14:51:23

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

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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	SPK1
81767	*Matrix spike duplicate (MSD)*	O-TERPHENYL	85	SPK2

QCSURR GARY 27-Mar-95 15:35:32

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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

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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 *Analyzed:* March 16, 1995
Method: EPA 602/8020

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

QCSURR GARY 27-Mar-95 15:35:32

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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 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 SPK1
Submission #: 9503204
Client Sample ID: EFFLUENT

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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

Sample#	Client Sample ID	Surrogate	% Recovered
81078	SB-1'	TRIFLUOROTOLUENE	114

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

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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 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

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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	SPK1
82250	*Matrix spike duplicate (MSD)*	TRIFLUOROTOLUENE	102	SPK2

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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'

SPK1

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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	SPK1
82250	*Matrix spike duplicate (MSD)*	TRIFLUOROTOLUENE	102	SPK2

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218/810666-81079

20989

Woodward-Clyde Consultants
500 12th Street, Suite 100, Oakland, CA 94607-4014
(510) 893-3600

Chain of Custo

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

PROJECT NO. 941366NA

SAMPLERS: (Signature) Wayne Dittmar

DATE	TIME	SAMPLE NUMBER	Sample Matrix (S)oil, (W)ater, (A)ir	ANALYSES: EPA Method (8015) TPH-g & BTEX	EPA Method (8020) BTEX	EPA Method TPH-d (8015)	EPA Method	Number of Containers	REMARKS (Sample preservation, handling procedures, etc.)
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	
	1020	SB1-10'	S	X	X			1	
	1050	SB3-6'	S	[redacted]	X	X		1	No TPH-g analysis
	1101	SB3-10'	S		X	X		1	
	1140	SB5-5½'	S		X	X		1	
	1200	SB5-10'	S		X	X		1	
	1300	SB-3	W	[redacted]	X			4	
	1305	SB-2-6'	S	X	X			1	
	1320	SB-2-10'	S	X	X			1	
	1350	SB4-6'	S		X	X		1	
	1410	SB-1	W	X	X			3	
	1420	SB4-11'	S		X	X		1	

TOTAL NUMBER OF CONTAINERS: 21

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Wayne Dittmar	3-15-95 1745				

METHOD OF SHIPMENT:	SHIPPED BY: (Signature)	COURIER. (Signature)	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
			Ron Sohl	3-15-95 17:45

CHROMALAB, INC.
SAMPLE RECEIPT CHECKLIST

Client Name WOODWARD CLYDE

Date/Time Received 3/15/95 (Date) 12:45 (Time)

Project 941366 NA

Received by P. Solis

Reference/Subm # 20989/9503218

Carrier name

Checklist completed by: Chowling 3/16/95 (Signature / Date)

Logged in by TA 3/15/95 (Initials / Date)

Matrix Soil - H2O

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 ~~zero~~ NO 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: ___