TES

Additional Soil Investigation
Former Above Ground
Transformer Oil Storage Tank Area
Emeryville Repair Facility
Emeryville, California

Prepared by

Land and Water Quality Unit

Prepared for

Materials and Fleet Services
Pacific Gas and Electric Company

October 1996

Report No.: 402.331-96.210
Pacific Gas and Electric Company
Technical and Ecological Services
3400 Crow Canyon Road, San Ramon, California 94583

TES 24-Hr. Service Line: 8-251-3197 or (510) 866-3197

Prepared by

John Woodruff
Contract Registered Geologist

Frederick F. Flint
Registered Geologist

Approved by

David A. Gilbert
Land and Water Quality Unit Supervisor

CONTENTS

FIGURES

TABLES

Section 1

INTRODUCTION

This report presents the results of a soil investigation performed adjacent to a former above ground transformer oil storage tank area (former tank farm) located in the northwest corner of the PG&E Emeryville Repair Facility. The Emeryville Repair Facility is located at 4525 Hollis Street in the city of Emeryville at an approximate elevation of 25 feet above mean sea level (AMSL) (Figure 1-1). The former tank farm consisted of three 10,000-gallon tanks, one 11,000-gallon tank, and an oil transfer pump (Figure 1-2). The investigation was conducted in accordance with a work plan prepared by PG&E (1995). The work plan presents a description of the site, historical uses, geologic conditions, and a summary of previous soil and ground water investigations.

The purpose of this investigation was to further assess the horizontal extent of soils affected by past transformer oil storage operations. The scope of work consisted of advancing geoprobe borings in the vicinity of the former tank farm, collecting soil samples from the borings, field-screening selected soil samples for relative concentrations of mineral oil, submittal of selected soil samples for laboratory analysis, and preparation of this report. This report documents field and laboratory methods, and the results of soil investigation activities.

PREVIOUS SITE WORK

In October, 1993, an initial soil investigation was performed consisting of advancing and sampling nine Environmentalists Soil Probe (ESP) borings within the former tank farm area (Figure 1-2). Results of laboratory testing of soil samples indicated concentrations of Total Extractable Petroleum Hydrocarbons (TEPH) to 16,000 mg/kg, and polychlorinated biphenyl (PCB) Aroclor 1260 to 385 mg/kg (Table 1-1). PG&E's report documenting these results was issued January 10, 1994 (PG&E, 1994a).

In March, 1994, soil samples were collected from four boreholes (ESE-1 through -4) drilled for the installation of ground water monitoring wells at the site. Well ESE-1 is located in the middle of the former tank farm, ESE-2 is just south of it in the concrete pad, and wells ESE-3 and ESE-4 are located just offsite to the north, along 53rd Street (Figure 1-2). Results of laboratory testing of soil samples indicated the absence of TEPH at the offsite locations, while TEPH was reported at concentrations up to 1800 mg/kg at ESE-1, and 1900 mg/kg at ESE-2 (PG&E, 1994b). PCBs were not detected in any of the samples (Table 1-2).

Figure 1-1. Location map of Emeryville Materials Facility.

402.331-94-WP

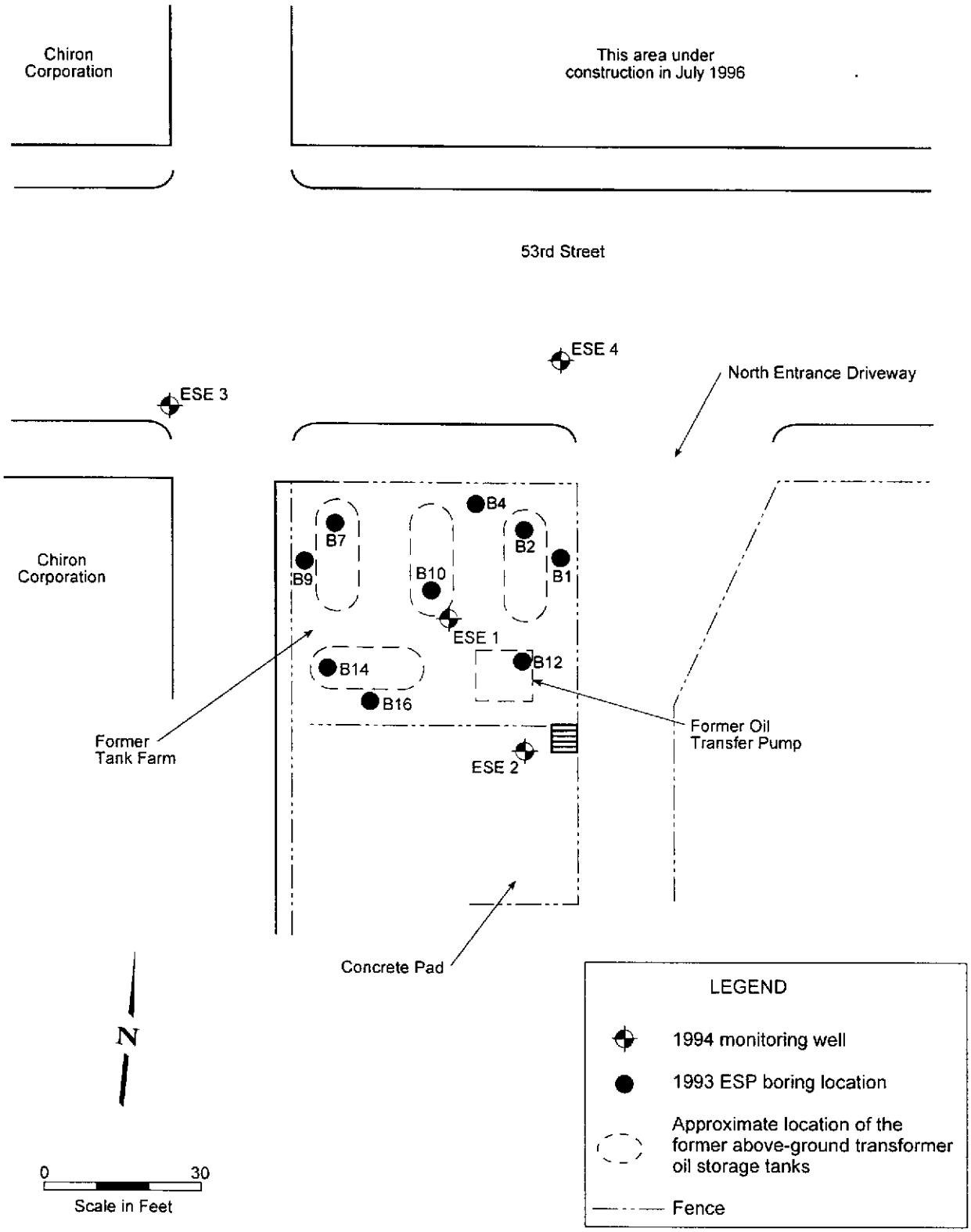

Figure 1-2. Site map showing previous test boring and monitoring well locations, Emeryville Repair Facility.

9608136/fig1-2/pc19

Table 1-1

Emeryville Repair Facility
Soil Analytical Data, October 1993

ESP Boring	Depth	Approximate Sample Elevation	TEPH	PCB Aroclor 1260	ESP	Depth	Approximate Sample Elevation	TEPH	PCB Aroclor 1260
	(feet)	(feet)	(mg/kg)	(mg/kg)	Boring	(feet)	(feet)	(mg/kg)	(mg/kg)
B1	0-1.5	23.7-22.2	NA	38	B9	0-1.5	23.7-22.2	NA	2
B1	1.5-3.0	22.2-20.7	NA	<1	B9	1.5-3.0	22.2-20.7	NA	1
B1	3.0-4.5	20.7-19.2	NA	385	B9	3.0-4.5	20.7-19.2	NA	2
B1	4.5-6.0	19.2-17.7	NA	350	B9	4.5-6.0	19.2-17.7	NA	4
B1	6.0-7.5	17.7-16.2	NA	295	B9	6.0-7.5	17.7-16.2	NA	93
B1	7.5-9.0	16.2-14.7	NA	2	B9	7.5-9.0	16.2-14.7	NA	13
B2	1.0-2.0	22.7-21.7	NA	4	B10	1.5-3.0	22.2-20.7	5200	<1
B2	2.0-3.0	21.7-20.0	NA	<1	B10	4.5-6.0	19.2-17.7	10000	<1
B2	4.0-6.0	19.7-17.7	NA	<1	B10	7.5-9.0	16.2-14.7	1600	<1
B2	6.0-6.5	17.7-17.2	NA	19					
					B12	1.5-3.0	22.2-20.7	11000	<1
B4	0-1.5	23.7-22.2	NA	<1	B12	4.5-6.0	19.2-17.7	8400	<1
B4	1.5-3.0	22.2-20.7	NA	<1	B12	7.5-9.0	16.2-14.7	16000	<1
B4	3.0-4.5	20.7-19.2	NA	<1					
B4	4.5-6.0	19.2-17.7	NA	<1	B14	2.5-3.0	21.2-20.7	NA	<1
B4	6.0-7.5	17.7-16.2	NA	11	B14	3.0-4.5	20.7-19.2	NA	5
B4	7.5-9.0	16.2-14.7	NA	8	B14	4.5-6.0	19.2-17.7	NA	15
					B14	6.0-7.5	17.7-16.2	NA	12
B7	1.5-3.0	22.2-20.7	1950	<1	B14	7.5-9.0	16.2-14.7	NA	16
B7	4.5-6.0	19.2-17.7	640	<1					
B7	7.5-9.0	16.2-14.7	7700	<1	B16	0-1.5	23.7-22.2	NA	185
					B16	1.5-3.0	22.2-20.7	NA	10
					B16	3.0-4.5	20.7-19.2	NA	32
					B16	4.5-6.0	19.2-17.7	NA	0.5
					B16	6.0-7.5	17.7-16.2	NA	18
					B16	7.5-9.0	16.2-14.7	NA	9

Explanation

ESP = Environmentalist Soil Probe (hand sampler)
TEPH = Total Extractable Petroleum Hydrocarbons
PCB = polychlorinated biphenyls
mg/kg = milligrams per kilogram
< = compound concentration was below detection limit shown
NA = Not Analyzed

Notes

1) Samples were collected on October 6 and 7, 1993.
2) Samples were analyzed by Sherwood Labs Corporation, Hilmar, California.
3) PCB Aroclors other than 1260 were not detected in any of the tested samples.
4) No samples were collected from aborted borings B3, B5, B6, B8, B11, B13, and B15.

Table 1-2

Emeryville Repair Facility
Soil Analytical Data, March 1994

Monitoring Well Boring	Depth	Approximate Sample Elevation	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TEPH	PCB Aroclor 1260
	(feet)	(feet)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(mg/kg)	(mg/kg)
ESE-1	5	18.66	6	29	<3	21	270	<1
ESE-1	10	13.66	10	29	3	25	1800	<1
ESE-1	16	8.66	<3	<3	<3	<3	<5	<1
ESE-1	19	3.66	<3	<3	<3	<3	<5	<1
ESE-2	5	22.80	<3	<3	<3	<3	8	<1
ESE-2	9	18.80	9	28	3	21	2100	<1
ESE-2	10	17.80	<3	<3	<3	<3	<5	<1
ESE-2	15	12.80	<3	<3	<3	<3	1900	<1
ESE-3	5	18.91	<3	<3	<3	<3	<5	<1
ESE-3	10	13.91	<3	<3	<3	<3	<5	<1
ESE-3	13	10.91	<3	<3	<3	<3	<5	<1
ESE-3	19	4.91	<3	<3	<3	<3	<5	<1
ESE-4	5	19.33	<3	<3	<3	<3	<5	<1
ESE-4	10	14.33	<3	<3	<3	<3	<5	<1
ESE-4	15	9.33	<3	<3	<3	<3	<5	<1
ESE-4	20	4.33	<3	<3	<3	<3	<5	<1

Explanation
TEPH = Total Extractable Petroleum Hydrocarbons
PCB = polychlorinated biphenyls
< = compound concentration was below detection limit shown
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram

Notes 1) Samples were collected on March 22, 1993.
2) Samples were chemically analyzed by Sherwood Labs Corporation, Hilmar, California.

Ground water monitoring from these wells is performed on a quarterly basis for TEPH, BTEX, and PCBs. Analytical groundwater data obtained since March 1994 are summarized in Table 1-3. As shown, TEPH has been measured at concentrations up to 500 μg/L in wells ESE-1 and 2. The most recent results of groundwater monitoring found no contaminants above the method detection limits.

Table 1-3

Emeryville Repair Facility
Historical Groundwater Data
(ug/l)[1]

Sample Designation	Sampling Date	Polychlorinated Biphenols	TEPH[2]	Benzene	Toluene	Ethylbenzene	Xylenes	Methyl tert-butyl ether
ESE-1	03/28/94	<1	340	<0.3	<0.3	<0.3	<0.3	NA
ESE-1	12/12/94	<0.5	80	<0.5	<0.5	<0.5	<0.5	NA
ESE-1	03/13/95	1.3	500 [3]	<0.5	<0.5	<0.5	<0.5	NA
ESE-1	06/15/95	<0.5	350 [3]	<0.5	<0.5	<0.5	<0.5	NA
ESE-1	09/15/95	<0.5	470 [3]	<0.5	<0.5	<0.5	<0.5	NA
ESE-1	12/15/95	<0.5	440 [3]	<0.5	<0.5	<0.5	<0.5	NA
ESE-1	03/15/96	<0.5	277	<0.5	<0.5	<0.5	<0.5	<5
ESE-1	06/14/96	<0.5	<500	<0.5	<0.5	<0.5	<0.5	<5
ESE-2	03/28/94	<1	250	0.8	1.5	<0.3	2.7	NA
ESE-2	12/12/94	<0.5	<50	<0.5	<0.5	<0.5	<0.5	NA
ESE-2	03/13/95	<0.5	120 [4]	<0.5	<0.5	<0.5	<0.5	NA
ESE-2	06/15/95	<0.5	<50	<0.5	<0.5	<0.5	<0.5	NA
ESE-2	09/15/95	<0.5	<50	<0.5	<0.5	<0.5	<0.5	NA
ESE-2	12/15/95	<0.5	<50	<0.5	<0.5	<0.5	<0.5	NA
ESE-2	03/15/96	<0.5	<59	<0.5	<0.5	<0.5	<0.5	<5
ESE-2	06/14/96	<0.5	<500	<0.5	<0.5	<0.5	<0.5	<5
ESE-3	03/28/94	<1	<50	<0.3	<0.3	<0.3	<0.3	NA
ESE-3	12/12/94	<0.5	<50	<0.5	<0.5	<0.5	<0.5	NA
ESE-3	03/13/95	<0.5	<50	<0.5	<0.5	<0.5	<0.5	NA
ESE-3	06/15/95	<0.5	<50	<0.5	<0.5	<0.5	<0.5	NA
ESE-3	09/15/95	<0.5	<50	<0.5	<0.5	<0.5	<0.5	NA
ESE-3	12/15/95	<0.5	<50	<0.5	<0.5	<0.5	<0.5	NA
ESE-3	03/15/96	<0.5	<59	<0.5	<0.5	<0.5	<0.5	<5
ESE-3	06/14/96	<0.5	<500	<0.5	<0.5	<0.5	<0.5	<5

Table 1-3 (continued)

Emeryville Repair Facility
Historical Groundwater Data
(ug/l)[1]

Sample Designation	Sampling Date	Polychlorinated Biphenols	TEPH[2]	Benzene	Toluene	Ethylbenzene	Xylenes	Methyl tert-butyl ether
ESE-4	03/28/94	<1	<50	<0.3	<0.3	<0.3	<0.3	NA
ESE-4	12/12/94	<0.5	<50	<0.5	<0.5	<0.5	<0.5	NA
ESE-4	03/13/95	<0.5	56 [4]	<0.5	<0.5	<0.5	<0.5	NA
ESE-4	06/15/95	<0.5	<50	<0.5	<0.5	<0.5	<0.5	NA
ESE-4	09/15/95	<0.5	<50	<0.5	<0.5	<0.5	<0.5	NA
ESE-4	12/15/95	<0.5	57 [4]	<0.5	<0.5	<0.5	<0.5	NA
ESE-4	03/15/96	<0.5	<59	<0.5	<0.5	<0.5	<0.5	<5
ESE-4	06/14/96	<0.5	<500	<0.5	<0.5	<0.5	<0.5	<5
Trip Blank	03/28/94	<1	<50	<0.3	<0.3	<0.3	<0.3	NA
Trip Blank	12/12/94	NA[5]	NA	<0.5	<0.5	<0.5	<0.5	NA
Trip Blank	03/13/95	NA	NA	<0.5	<0.5	<0.5	<0.5	NA
Trip Blank	06/15/95	NA	NA	<0.5	<0.5	<0.5	<0.5	NA
Trip Blank	09/15/95	NA	NA	<0.5	<0.5	<0.5	<0.5	NA
Trip Blank	12/15/95	NA	NA	<0.5	<0.5	<0.5	<0.5	NA
Field Blank	03/28/94	NA	NA	NA	NA	NA	NA	NA
Field Blank	12/12/94	NA	NA	<0.5	<0.5	<0.5	<0.5	NA
Field Blank	03/13/95	NA	NA	<0.5	<0.5	<0.5	<0.5	NA
Field Blank	06/15/95	NA	NA	<0.5	<0.5	<0.5	<0.5	NA
Field Blank	09/15/95	NA	NA	<0.5	<0.5	<0.5	<0.5	NA
Field Blank	12/15/95	NA	NA	<0.5	<0.5	<0.5	<0.5	NA
Field Blank	03/15/96	NA	NA	<0.5	<0.5	<0.5	<0.5	<5
Field Blank	06/14/96	NA	NA	<0.5	<0.5	<0.5	<0.5	<5

[1] ug/l = micrigrams per liter.
[2] TEPH = total extractable petroleum hydrocarbons..
[3] Compounds similar to client-supplied transformer oil were found.
[4] Compounds in diesel range not similar to laboratory standard for transformer oil.
[5] NA = not analyzed.

Section 2

FIELD AND LABORATORY TESTING

Field work was performed on July 25 and 26, 1996. Twelve geoprobe borings, G1 through G12, were advanced and sampled by Fisch Environmental Exploration Services, Inc. (Lodi, California) using a truck-mounted geoprobe. The geoprobe boreholes were two inches in diameter, and samples were collected in 1.75-inch diameter, 46-inch long, transparent, acetate, macrocore tubes. Samples were collected in consecutive four-foot runs. The geoprobe borings were logged by a Registered Geologist. Logs of the geoprobe borings are presented in Appendix A.

Six of the geoprobe borings were advanced on a concrete pad south of the former tank farm, and six were advanced in the facility's north entrance driveway east of the former tank farm (Figure 2-1). The elevation of the concrete pad is about 24 feet AMSL, and the elevation of the concrete driveway ranges from about 24 feet AMSL to 21 feet AMSL where it connects with 53rd Street. The concrete pad borings and the two southernmost driveway borings were advanced to a total depth of 16 feet, and the two northern driveway borings were advanced to a total depth of twelve feet. Each borehole was backfilled to the surface with neat cement following its completion. At the time of the field work, the elevation of ground water in monitoring well ESE-2, located on the concrete pad (Figure 2-1), was measured to be about 14.5 feet below the top of casing (13.3 feet AMSL).

A total of fourteen selected soil samples from six geoprobe borings were screened in the field for mineral oil concentration using a chemical-based test developed by Hanby Environmental Laboratory Procedures (HELP) Inc. Field-screening was not performed on samples collected from the five geoprobe borings advanced in the north entrance driveway (G5 through G10) due to schedule limitations.

In addition to field testing, a total of twelve soil samples, one from each of the geoprobe borings, were analyzed at Chromalab, Inc. (Pleasanton, California) for: benzene, toluene, ethylbenzene, and total xylenes (BTEX) using method EPA 8020; total extractable petroleum hydrocarbons for mineral oil (TEPH-MO) using method EPA 8015; and polychlorinated biphenyls (PCB) using method EPA 8080A. The tested sample from each boring was selected from the zone thought to contain the highest possible concentrations of oil on the basis of any or all of the following factors: soil discoloration, product odor, or field-screening results. Laboratory Data Sheets and Chain-of-Custody documentation are presented in Appendix B.

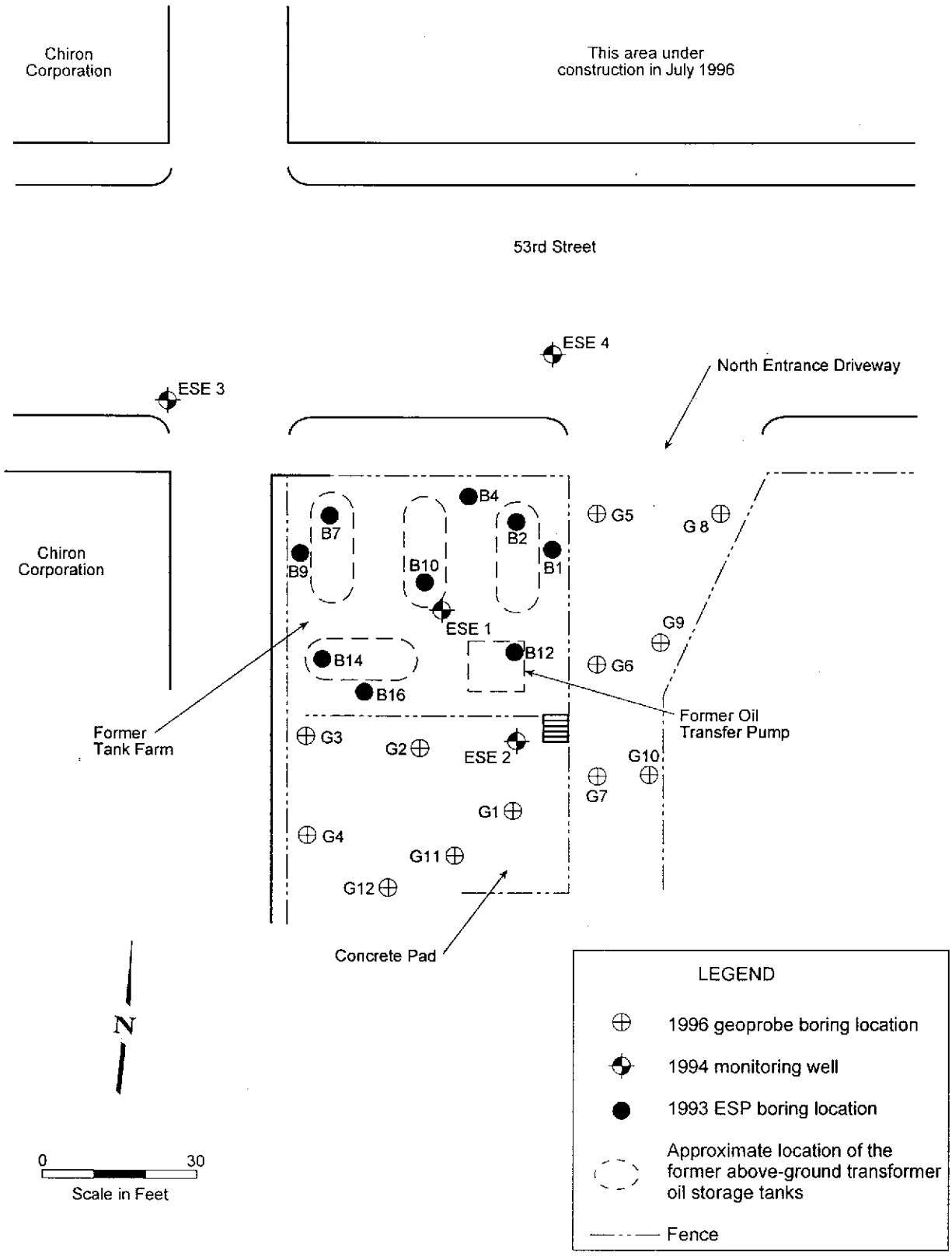

Figure 2-1. Site map showing test boring and monitoring well locations, Emeryville Repair Facility.

Section 3

RESULTS OF GEOPROBE EXPLORATION

Results of the geoprobe exploration and logs of soil borings (Appendix A) indicates that the area is underlain by a variable thickness of heterogeneous, clayey to gravelly fill ranging from four to nine feet deep. Some of the fill soils contained fragments of glass and bricks. Beneath the fill are mixtures of alluvial silt, sand, and gravel soils.

Results of the field screening indicated the absence of detectable mineral oil in nine of the tested soil samples, and the presence of mineral oil in concentrations ranging from 500 to 2000 parts per million (ppm) in the other five samples (Table 3-1, Appendix A). The presence of detectable mineral oil in tested samples generally coincided with soils which exhibited oily product odor, soils which were obviously discolored an olive gray color, or both.

Table 3-1

Field Screening Results of Soil Samples Collected from July 1996 Geoprobe Borings
Emeryville Repair Facility

Depth	Geoprobe Boring No.											
(feet)	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12
4.0	0	--	--	--	--	--	--	--	--	--	--	--
8.0	0	0	--	0	--	--	--	--	--	--	--	--
12.0	1000	0	0	--	--	--	--	--	--	--	2000	2000
13.5	--	--	--	0	--	--	--	--	--	--	--	--
15.5	0	500	1000	--	--	--	--	--	--	--	--	--
16.0	--	--	--	0	--	--	--	--	--	--	--	--

Notes
1) Samples were chemically analyzed according to Hanby Environmental Laboratory Procedures using mineral oil in soil as the standard.
2) All concentrations are in parts per million.
3) – = not field screened

Results of the laboratory analyses, which are summarized in Table 3-2, indicate the following:

- BTEX was not detected in any of the tested samples;
- TEPH-MO was detected at two of the six concrete pad locations, in concentrations of 1,200 and 2,400 mg/kg, and at five of the six driveway locations, in concentrations ranging from 1,100 to 13,000 mg/kg.
- PCB Aroclor 1260 was detected at only two locations (G6 and G9 at 11.5-12 feet), in concentrations of 0.26 and 0.13 mg/kg, respectively, slightly higher than the laboratory detection limit of 0.10 mg/kg. PCBs were not detected in any other sample.

Table 3-2

Analytical Results of Soil Samples Collected from July 1996 Geoprobe Borings
Emeryville Repair Facility

Geoprobe Boring	Depth	Approximate Sample Elevation	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TEPH-MO	PCB Aroclor No. 1016	1221	1232	1242	1248	1254	1260
	(feet)	(feet)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(mg/kg)	(mg/kg)						
G1	11.5-12	15.8-16.3	<5	<5	<5	<5	1200	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
G2	14-14.5	13.3-13.8	<5	<5	<5	<5	<10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
G3	14-14.5	13.3-13.8	<5	<5	<5	<5	<10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
G4	14-14.5	13.3-13.8	<5	<5	<5	<5	<10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
G5	11-11.5	12.5-13.0	<5	<5	<5	<5	<10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
G6	11.5-12	13.5-14.0	<5	<5	<5	<5	13000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.26
G7	13-13.5	13.0-13.5	<5	<5	<5	<5	1400	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
G8	11-11.5	12.5-13.0	<5	<5	<5	<5	1100	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
G9	11.5-12	13.5-14.0	<5	<5	<5	<5	3100	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.13
G10	11.5-12	14.5-15.0	<5	<5	<5	<5	2200	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
G11	11.5-12	15.8-16.3	<5	<5	<5	<5	<10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
G12	13-13.5	14.3-14.8	<5	<5	<5	<5	2400	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Explanation

TEPH-MO = Total Extractable Petroleum Hydrocarbons as Mineral Oil
PCB = polychlorinated biphenyls
< = compound concentration was below detection limit shown
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram

Notes 1) Samples were collected on July 25 and 26, 1996.
2) Samples were chemically analyzed by Chromalab, Inc., Pleasanton, California.

LATERAL AND VERTICAL DISTRIBUTION OF TEPH AND PCBs IN SOILS

The estimated lateral and vertical distribution of TEPH and PCBs in soils at the site are shown in isoconcentration maps using data obtained from the 1996 geoprobe borings, the 1994 monitoring well borings, and the 1993 ESP borings (Figures 3-1 - 3-4).

Figure 3-1 shows isoconcentration of TEPH as mineral oil at an elevation of approximately 18 to 22 feet above mean sea level (MSL). Concentrations are highest in the vicinity of boring B12 (the location of the former pump facility) with decreasing concentrations toward the north, west, and south. Figure 3-2 shows isoconcentration of TEPH as mineral oil at an elevation of approximately 12 to 16 feet above MSL. Although TEPH concentrations in the vicinity of B12 exceed 10,000 mg/kg, the surrounding sample locations are significantly diminished relative to shallow sample depths.

The lateral and vertical distribution of PCBs in soils at the site are characterized in Figures 3-3 and 3-4. Information was collected for the three soil investigations mentioned above. Figure 3-3 shows PCB concentrations at an elevation approximately 18 to 22 feet above MSL. Elevated concentrations are present in isolated areas surrounding borings B1 and B16. Figure 3-4 shows PCB concentrations at an elevation of approximately 13 to 15 feet above MSL. Only two borings indicate the presence of PCBs at this elevation and the concentrations are only slightly above the method detection limits.

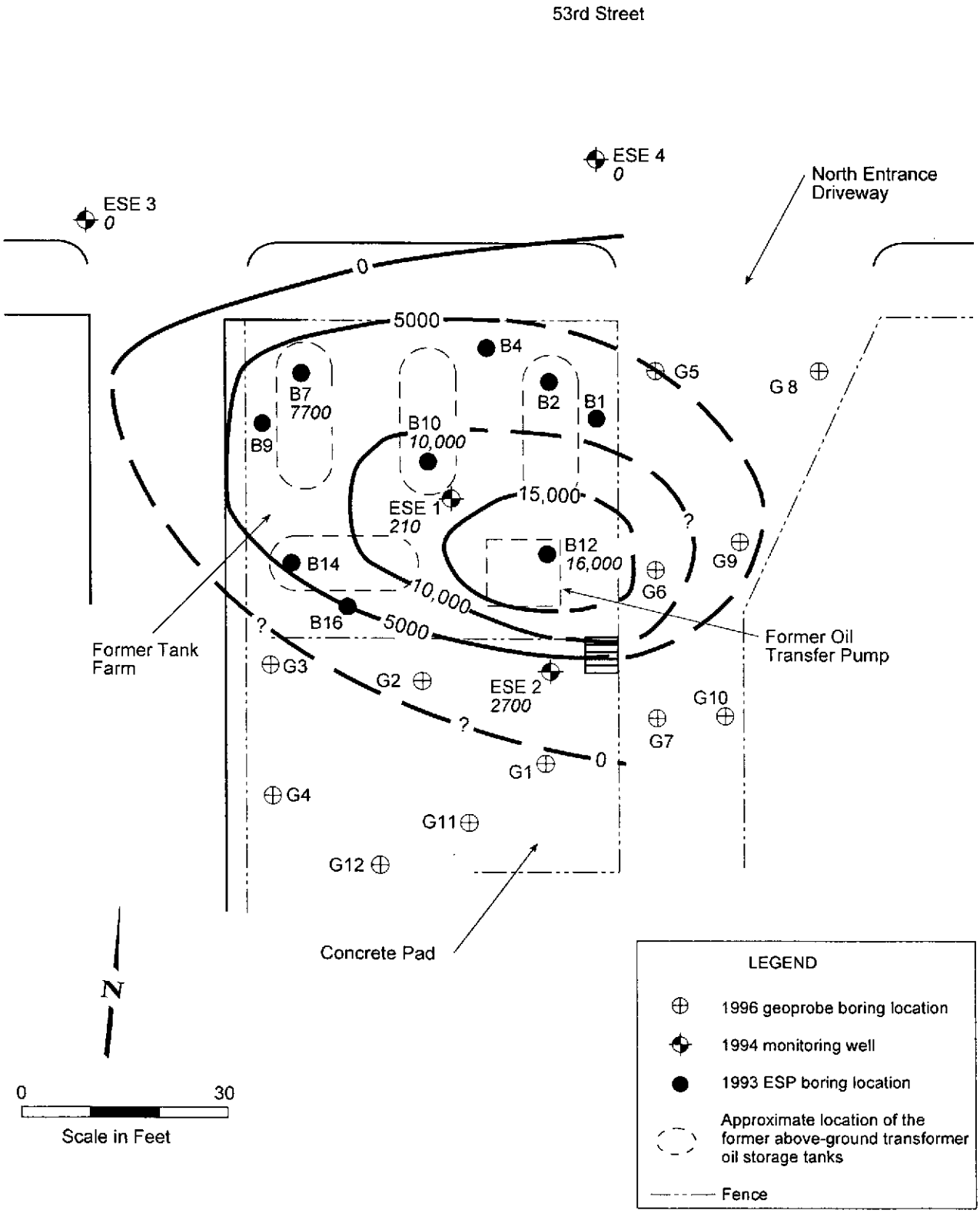

Figure 3-1. Site map showing test boring and monitoring well locations with isoconcentration of TEPH as mineral oil (mg/kg) at an approximate elevation of 18 to 22 feet above mean sea level, Emeryville Repair Facility.

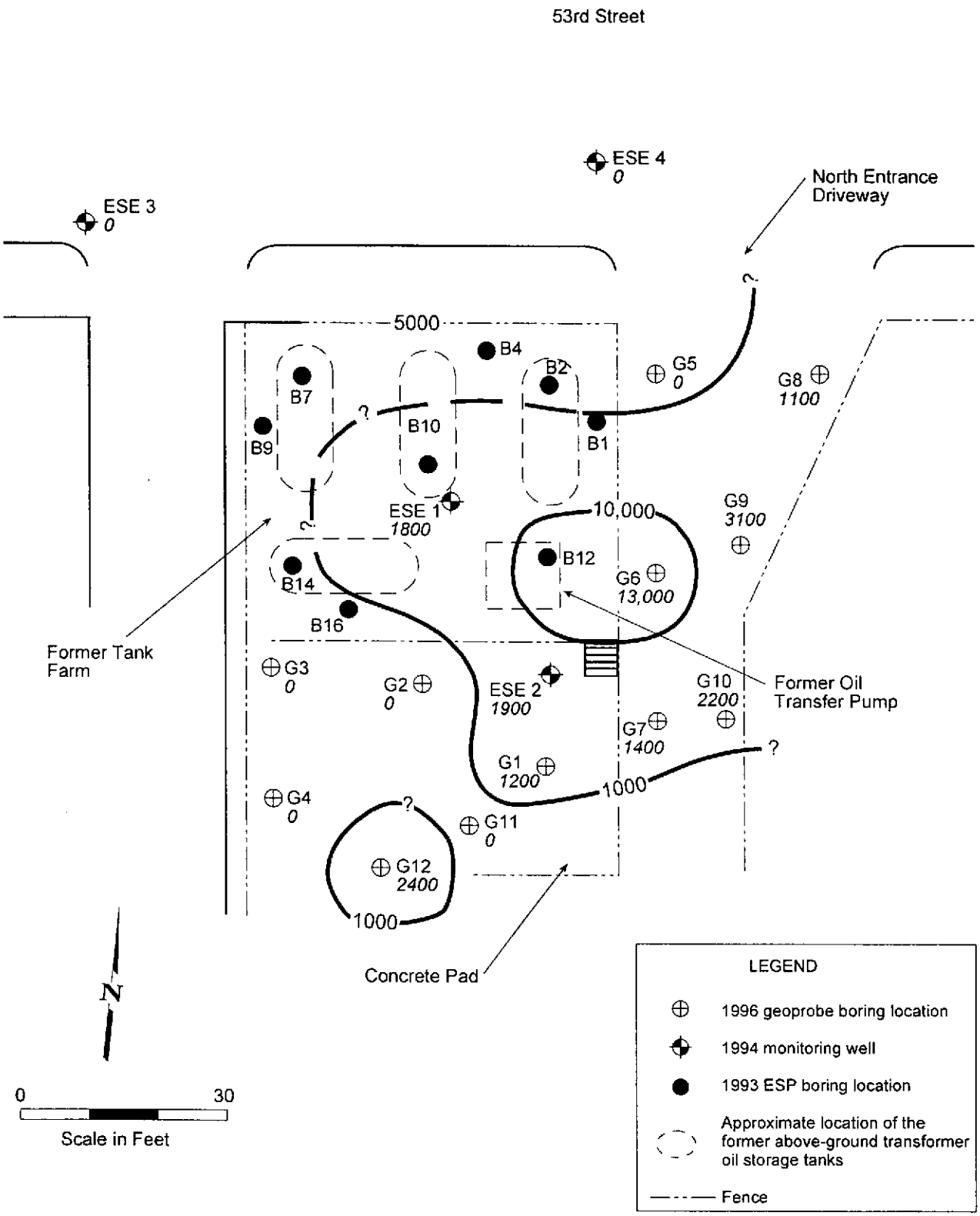

Figure 3-2. Site map showing test boring and monitoring well locations with isoconcentration of TEPH as mineral oil (mg/kg) at an approximate elevation of 12 to 16 feet above mean sea level, Emeryville Repair Facility.

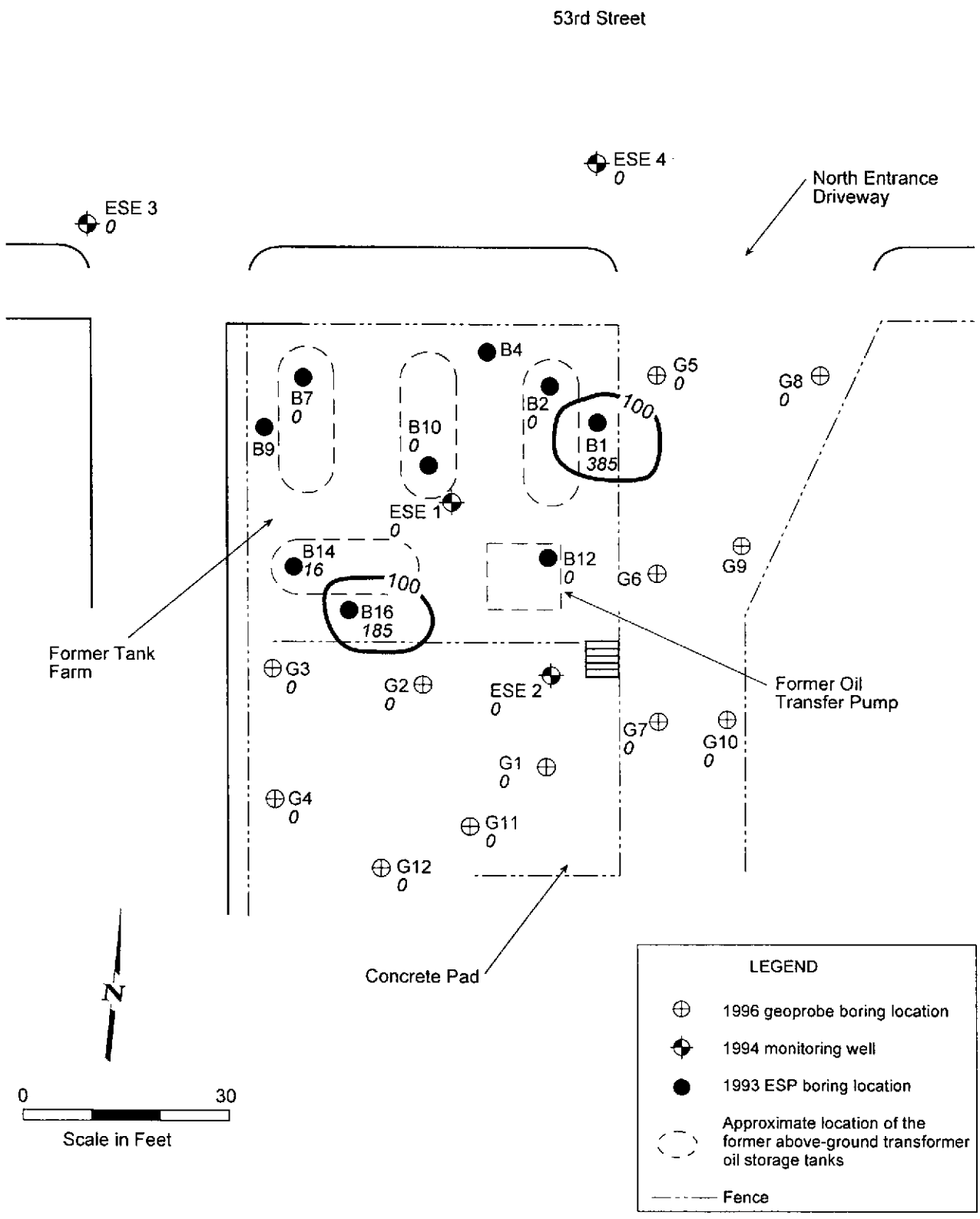

Figure 3-3. Site map showing test boring and monitoring well locations with isoconcentration of PCBs (mg/kg) at an approximate elevation of 18 to 22 feet above mean sea level, Emeryville Repair Facility.

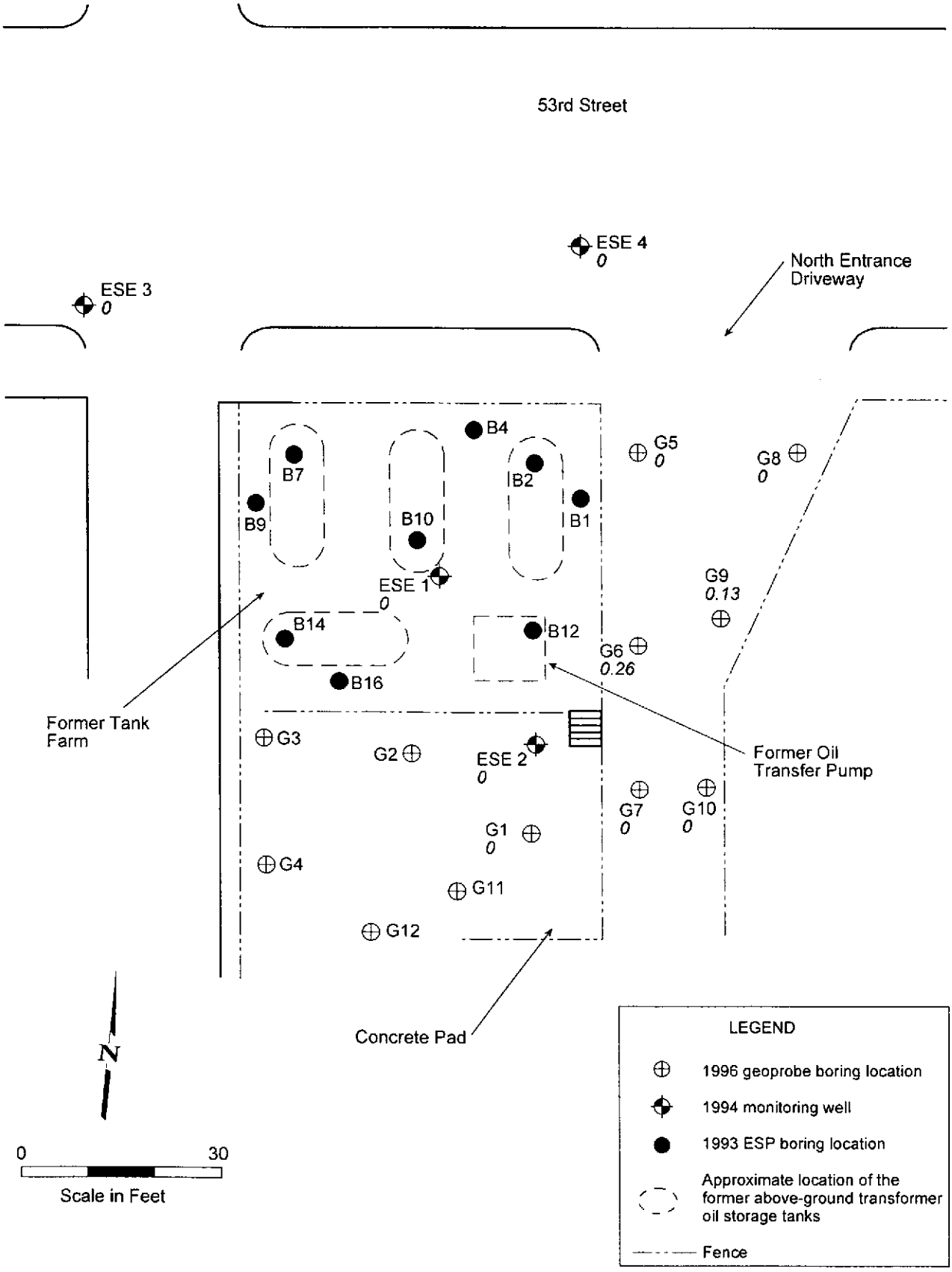

Figure 3-4. Site map showing test boring and monitoring well locations with isoconcentration of PCBs (mg/kg) at an approximate elevation of 13 to 15 feet above mean sea level, Emeryville Repair Facility.

Section 4

SUMMARY AND CONCLUSIONS

- Results of the sampling of twelve geoprobe borings indicates that the area of investigation is underlain by a variable thickness of heterogeneous, clayey to gravelly fill ranging from four to nine feet deep, and mixtures of alluvial silt, sand, and gravel soils.

- Results of field screening of fourteen selected soil samples for mineral oil using a chemical-based test indicates concentrations to 2000 mg/kg. The presence of detectable mineral oil generally coincided with soils which exhibited oily product odor, discolored soils, or both.

- Results of laboratory testing of one sample from each geoprobe boring indicates that BTEX was not detected in any of the tested samples, and TEPH-MO was present at seven locations at concentrations up to 13,000 mg/kg. PCB Aroclor 1260 was detected at two locations in concentrations of 0.13 to 0.26 mg/kg, and no PCBs were detected in any other samples.

- Isoconcentration maps using the laboratory TEPH concentrations in soil samples collected from the 1996, 1994, and 1993 borings shows that the highest concentrations are in the southeastern quadrant of the former tank farm area, near the former oil transfer pump; the concentrations decrease in all directions away from this area. The interpreted lateral distribution of TEPH in the soils suggests that the source of TEPH in the soils may be from the area of transfer pump.

Appendix A

LOGS OF 1996 GEOPROBE BORINGS

- *The ground elevations indicated on the logs are approximate.*
- *The groundwater depths indicated on the logs are approximate, and are estimated based on the depth to groundwater in nearby monitoring well ESE-2, measured at 13.3 feet at the time of the field work.*
- *Results of field tested soil samples are shown for Total Extractable Petroleum Hydrocarbons as Mineral Oil (TEPH-MO), in parts per million (ppm), and for polychlorinated biphenyls (PCB), in parts per billion (ppb).*

GEOPROBE SOIL BORING LOG

Project	Boring Location		Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	Elevated concrete pad south of former tank farm		G1
Client	**Surface Conditions**		**Elevation and Datum (feet)**
Materials and Fleet Services	Concrete		~24' USGS
Drilling Contractor and Rig	**Inspector**		**Total Depth (feet)**
Fisch Environmental Exploration & Construction, Ford 250 Truck	John Woodruff		16.0
Diameter of Boring (inches)	**Driller(s)**		**Groundwater Depth (feet)**
2	David Fisch		~14.5
Diameter of Sample Tube (inches)	**Date Started**	**Date Completed**	**Depth to Bedrock (feet)**
1.75 (acetate macrocore tubes)	July 25, 1996	July 25, 1996	Not Encountered

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
0	GP				0-0.2 CONCRETE.	3.2-4.0	
1					0.2-0.5 POORLY GRADED GRAVEL WITH SAND: brown, moist, medium dense, gravel is mostly f., BASEROCK.		
2	SM	2.0/4.0	No		0.5-3 SILTY SAND WITH GRAVEL: brown, moist, loose to medium dense, FILL.		
3							
4				0@4			
5					3-8 SANDY FAT CLAY: very dark gray, moist, medium stiff, some fine organics, sand is f. to m., FILL.	5.0-7.5 7.5-8.0	
6	CH	2.2/4.0	No				
7							
8				0@8			
9							
10	MH	3.4/4.0	Sl		8-11.5 ELASTIC SILT: grayish brown, moist, medium stiff, sand is f., ALLUVIUM.	8.5-10.5 10.5-11.0 11.0-11.5 11.5-12.0*	11.5-12.0: 1200 ppm TEPH-MO.
11							
12				1000 @12			
13	SM	3.0/4.0	No		11.5-15.8 SILTY SAND: grayish brown, moist, medium dense, sand is f., ALLUVIUM.	13.5-14.0	
14							

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG1A.CDR

GEOPROBE SOIL BORING LOG

Project	Date	Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	July 25, 1996	G1

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
14					11.5-15.8 SILTY SAND: grayish brown, moist, medium dense, sand is f., ALLUVIUM.		
15	SM	3.0/ 4.0	No	0@ 15,5		14.0-15.5 15.5-16.0	
					15.8-16 ELASTIC SILT: olive brown, moist, medium stiff, ALLUVIUM.		
16	MH						

Bottom of borehole at 16.0 feet. Borehole grouted with neat cement.

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG1B.CDR

GEOPROBE SOIL BORING LOG

Project	Boring Location		Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	Elevated concrete pad south of former tank farm		G2
Client	Surface Conditions		Elevation and Datum (feet)
Materials and Fleet Services	Concrete		~24' USGS
Drilling Contractor and Rig	Inspector		Total Depth (feet)
Fisch Environmental Exploration & Construction, Ford 250 Truck	John Woodruff		16.0
Diameter of Boring (inches)	Driller(s)		Groundwater Depth (feet)
2	David Fisch		~14.5
Diameter of Sample Tube (inches)	Date Started	Date Completed	Depth to Bedrock (feet)
1.75 (acetate macrocore tubes)	July 25, 1996	July 25, 1996	Not Encountered

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
0	GP				0-0.2 CONCRETE.	1.5-3.5	
1					0.2-0.4 SANDY GRAVEL: brown, moist, medium dense, gravel is mostly f., BASEROCK.	3.5-4.0	
2		3.0/ 4.0	No				
3					0.4-8 SANDY FAT CLAY WITH GRAVEL: dark gray, moist, medium stiff, local glass fragments, FILL.		
4	CH						
5						5.5-7.5	
6		3.0/ 4.0	No			7.5-8.0	
7							
8				0@8			
9					8-11.8 SILTY SAND TO POORLY GRADED GRAVEL WITH SAND: brown, moist, medium dense, gravel is f., ALLUVIUM.		
10	SM/ GP	3.2/ 4.0	No			9.5-11.5	
11				0@ 12		11.5-12.0	
12					11.8-16 SANDY ELASTIC SILT TO SILTY SAND: mottled grayish brown, moist, medium stiff/medium dense, sand is f., ALLUVIUM.		
13	MH/ SM	2.5/ 4.0	No			13.5-14.0	
14							

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG2A.CDR

GEOPROBE SOIL BORING LOG

Project	Date	Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	July 25, 1996	G2

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
14					11.8-16 SANDY ELASTIC SILT TO SILTY SAND: mottled grayish brown, moist, medium stiff/medium dense, sand is f., ALLUVIUM.	14.0-14.5* 15.5-15.5 15.5-16.0	14.0-14.5: 10 ppm TEPH-MO.
15	MH/SM	2.5/4.0	No to Sl	0@15.5			
16							

Bottom of borehole at 16.0 feet. Borehole grouted with neat cement.

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and Sr=Strong.

ERFG2B.CDR

GEOPROBE SOIL BORING LOG

Project	Boring Location		Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	Elevated concrete pad south of former tank farm		G3
Client	**Surface Conditions**		**Elevation and Datum (feet)**
Materials and Fleet Services	Concrete		~24' USGS
Drilling Contractor and Rig	**Inspector**		**Total Depth (feet)**
Fisch Environmental Exploration & Construction, Ford 250 Truck	John Woodruff		16.0
Diameter of Boring (inches)	**Driller(s)**		**Groundwater Depth (feet)**
2	David Fisch		~14.5
Diameter of Sample Tube (inches)	**Date Started**	**Date Completed**	**Depth to Bedrock (feet)**
1.75 (acetate macrocore tubes)	July 25, 1996	July 25, 1996	Not Encountered

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
0	GP				0-0.2 CONCRETE.	2.0-3.5	
1					0.2-0.4 SANDY GRAVEL: brown, moist, medium dense, gravel is mostly f., BASEROCK.	3.5-4.0	
2		3.0/4.0	No				
3					0.4-8 SANDY FAT CLAY WITH GRAVEL: dark gray, moist, medium stiff, local glass fragments, FILL.		
4	CH						
5						5.5-7.5	
6		3.0/4.0	No			7.5-8.0	
7							
8					8-10 SILTY SAND TO POORLY GRADED GRAVEL WITH SAND: brown, moist, medium dense, gravel is f., local brick fragments, FILL.		
9	SM/GP						
10		3.2/4.0	No			9.5-11.5	
11				0@12		11.5-12.0	
12	MH/SM				10-16 SANDY ELASTIC SILT TO SILTY SAND: mottled grayish brown, moist, medium stiff/medium dense, sand is f., ALLUVIUM.	13.5-14.0	
13		3.2/4.0	Sl				
14							

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PF&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG3A.CDR

GEOPROBE SOIL BORING LOG

Project	Date	Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	July 25, 1996	G3

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
14							
15	MH/SM	3.2/4.0	Sl	1000 @15.5	10-16 SANDY ELASTIC SILT TO SILTY SAND: mottled grayish brown, moist, medium stiff/medium dense, sand is f., ALLUVIUM.	14.0-14.5* 15.5-15.5 15.5-16.0	14.0-14.5: <10 ppm TEPH-MO.
16							

Bottom of borehole at 16.0 feet. Borehole grouted with neat cement.

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG3B.CDR

GEOPROBE SOIL BORING LOG

Project	Boring Location		Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	Elevated concrete pad south of former tank farm		G4
Client	**Surface Conditions**		**Elevation and Datum (feet)**
Materials and Fleet Services	Concrete		~24' USGS
Drilling Contractor and Rig	**Inspector**		**Total Depth (feet)**
Fisch Environmental Exploration & Construction, Ford 250 Truck	John Woodruff		16.0
Diameter of Boring (inches)	**Driller(s)**		**Groundwater Depth (feet)**
2	David Fisch		~14.5
Diameter of Sample Tube (inches)	**Date Started**	**Date Completed**	**Depth to Bedrock (feet)**
1.75 (acetate macrocore tubes)	July 25, 1996	July 25, 1996	Not Encountered

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
0	GP				0-0.2 CONCRETE.		
1	GP	3.0/4.0	No		0.2-0.5 POORLY GRADED GRAVEL WITH SAND: brown, moist, medium dense, gravel is mostly f., BASEROCK.	3.5-4.0	
2					0.5-2.5 POORLY GRADED GRAVEL WITH SAND: dark gray, moist, medium dense, gravel is mostly f., FILL.		
3							
4	SM				2.5-5 SILTY SAND: dark gray, moist, medium dense, sand is f.-c., FILL.		
5						6.0-7.0	
6	MH/SM	2.5/4.0	No				
7							
8				0@8	5-16 SANDY ELASTIC SILT TO SILTY SAND: mottled grayish brown, moist, medium stiff/medium dense, sand is f., FILL to ~8; ALLUVIUM below ~ 8.		
9							
10		3.2/4.0	No			9.5-11.5 11.5-12.0	
11	MH/SM						
12						13.5-14.0	
13		3.2/4.0	Sl	0@13.5			
14							

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG4A.CDR

GEOPROBE SOIL BORING LOG

Project	Date	Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	July 25, 1996	G4

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
14							
15	MH/SM	3.2/4.0	No	0 @16	5-16 SANDY ELASTIC SILT TO SILTY SAND: mottled grayish brown, moist, medium stiff/medium dense, sand is f., FILL to ~8; ALLUVIUM below ~ 8.	14.0-14.5* 15.5-15.5 15.5-16.0	14.0-14.5: <10 ppm TEPH-MO.
16							

Bottom of borehole at 16.0 feet. Borehole grouted with neat cement.

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG4B.CDR

GEOPROBE SOIL BORING LOG

Project	Boring Location	Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	Lower west shoulder of concrete driveway	G5
Client	**Surface Conditions**	**Elevation and Datum (feet)**
Materials and Fleet Services	Concrete	~21' USGS
Drilling Contractor and Rig	**Inspector**	**Total Depth (feet)**
Fisch Environmental Exploration & Construction, Ford 250 Truck	John Woodruff	12.0
Diameter of Boring (inches)	**Driller(s)**	**Groundwater Depth (feet)**
2	David Fisch	~11.5
Diameter of Sample Tube (inches)	**Date Started** / **Date Completed**	**Depth to Bedrock (feet)**
1.75 (acetate macrocore tubes)	July 25, 1996 / July 25, 1996	Not Encountered

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
0	GP				0-0.3 CONCRETE.		
1					0.3-0.6 POORLY GRADED GRAVEL WITH SAND: brown, moist, medium dense, gravel is mostly f., BASEROCK.	3.0-4.0	
2	CH	3.0/4.0	No		0.6-4 SANDY FAT CLAY: dark gray, moist, medium stiff, sand is f. to m., FILL.		
3							
4							
5						6.0-8.0	
6		3.5/4.0	No				
7							
8	GP/SP				4-12 POORLY GRADED GRAVEL WITH SAND TO POORLY GRADED SAND WITH GRAVEL: dark gray, moist, medium dense, gravel is f., sand is m. to c., ALLUVIUM.	9.0-9.5 9.5-10.0 10.0-10.5 10.5-11.0 11.0-11.5* 11.5-12.0	11.0-11.5: <10 ppm TEPH-MO.
9							
10		3.2/4.0	No				
11			Sl				
12							

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Bottom of borehole at 12.0 feet. Borehole grouted with neat cement.

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG5A.CDR

GEOPROBE SOIL BORING LOG

Project	Boring Location		Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	Middle west shoulder of concrete driveway		G6
Client	Surface Conditions		Elevation and Datum (feet)
Materials and Fleet Services	Concrete		~21' USGS
Drilling Contractor and Rig	Inspector		Total Depth (feet)
Fisch Environmental Exploration & Construction, Ford 250 Truck	John Woodruff		12.0
Diameter of Boring (inches)	Driller(s)		Groundwater Depth (feet)
2	David Fisch		~13.0
Diameter of Sample Tube (inches)	Date Started	Date Completed	Depth to Bedrock (feet)
1.75 (acetate macrocore tubes)	July 25, 1996	July 25, 1996	Not Encountered

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
0					0-0.5 CONCRETE.		
1	GP				0.5-0.8 POORLY GRADED GRAVEL WITH SAND: brown, moist, medium dense, gravel is mostly f., BASEROCK.	3.5-4.0	
2	GP/SP	1.0/4.0	No		0.8-4 POORLY GRADED GRAVEL WITH SAND TO POORLY GRADED SAND WITH GRAVEL: brownish gray, moist, medium dense, gravel is f., sand is m. to c., FILL.		
3							
4			Mo				
5	SP				4-5 POORLY GRADED SAND: brown, moist, medium dense, sand is f., ALLUVIUM.	4.0-6.0 6.0-8.0	
6		3.8/4.0	St				
7							
8	SM					9.0-10.5 10.5-11.5 11.5-12.0*	11.5-12.0: 13,000 ppm TEPH-MO, 0.26 ppb PCB Aroclor 1260.
9					5-12 SILTY SAND: olive gray, moist, medium dense, sand is f., ALLUVIUM.		
10		3.0/4.0	St to 12				
11							
12							Wet at 12.0

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Bottom of borehole at 12.0 feet. Borehole grouted with neat cement.

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG6A.CDR

GEOPROBE SOIL BORING LOG

Project	Boring Location		Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	Upper west shoulder of concrete driveway		G7
Client	**Surface Conditions**		**Elevation and Datum (feet)**
Materials and Fleet Services	Concrete		~24' USGS
Drilling Contractor and Rig	**Inspector**		**Total Depth (feet)**
Fisch Environmental Exploration & Construction, Ford 250 Truck	John Woodruff		16.0
Diameter of Boring (inches)	**Driller(s)**		**Groundwater Depth (feet)**
2	David Fisch		~14.5
Diameter of Sample Tube (inches)	**Date Started**	**Date Completed**	**Depth to Bedrock (feet)**
1.75 (acetate macrocore tubes)	July 25, 1996	July 25, 1996	Not Encountered

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
0					0-0.3 CONCRETE.		
1	GP				0.3-0.6 POORLY GRADED GRAVEL WITH SAND: brown, moist, medium dense, gravel is mostly f., BASEROCK.	2.0-3.0 3.0-4.0	
2		2.5/ 4.0	No				
3					0.6-9 SANDY FAT CLAY: dark gray, moist, medium stiff, FILL.		
4							
5	CH					4.5-6.0	
6		3.8/ 4.0	St			6.0-7.5 7.5-8.0	
7							
8							
9					9-15 SANDY ELASTIC SILT TO SILTY SAND: grayish brown, moist, medium stiff/medium dense, sand is f., ALLUVIUM.	9.0-10.0 10.0-11.0 11.0-12.0	
10							
11	MH/ SM	3.0/ 4.0	No				
12						13.0-13.5* 13.5-14.0	13.0-13.5: 1400 ppm TEPH-MO.
13			Sl				
14							

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG7A.CDR

GEOPROBE SOIL BORING LOG

Project	Date	Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	July 25, 1996	G7

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
14							
15	MH/SM	3.2/4.0	No		7-16 SANDY ELASTIC SILT TO SILTY SAND: grayish brown, moist, medium stiff/medium dense, sand is f., ALLUVIUM.	15.0-16.0	
16							

Bottom of borehole at 16.0 feet. Borehole grouted with neat cement.

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG10B.CDR

GEOPROBE SOIL BORING LOG

Project	Boring Location		Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	Lower east shoulder of concrete driveway		G8
Client	**Surface Conditions**		**Elevation and Datum (feet)**
Materials and Fleet Services	Concrete		~21' USGS
Drilling Contractor and Rig	**Inspector**		**Total Depth (feet)**
Fisch Environmental Exploration & Construction, Ford 250 Truck	John Woodruff		12.0
Diameter of Boring (inches)	**Driller(s)**		**Groundwater Depth (feet)**
2	David Fisch		~11.5
Diameter of Sample Tube (inches)	**Date Started**	**Date Completed**	**Depth to Bedrock (feet)**
1.75 (acetate macrocore tubes)	July 25, 1996	July 25, 1996	Not Encountered

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
0					0-0.5 CONCRETE.		
1	GP				0.5-1.0 POORLY GRADED GRAVEL WITH SAND: brown, moist, medium dense, gravel is mostly f., BASEROCK.	3.5-4.0	
2	CH	2.0/4.0	No		1.0-4 SANDY FAT CLAY: dark gray, moist, medium stiff, sand is f. to m., local fine gravel, FILL.		
3							
4							
5						5.0-6.0	
6		3.0/4.0	No			6.0-7.0	
7						7.0-8.0	
8	GP/SM				4-12 POORLY GRADED GRAVEL WITH SAND TO SILTY SAND: dark gray, moist, medium dense, gravel is f., sand is f. to c., ALLUVIUM.		
9			No			9.0-10.0	
10		3.5/4.0	Sl			10.0-11.0	
11						11.0-11.5*	11.0-11.5: 1100 ppm TEPH-MO.
12			No			11.5-12.0	

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Bottom of borehole at 12.0 feet. Borehole grouted with neat cement.

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG8A.CDR

GEOPROBE SOIL BORING LOG

Project	Boring Location		Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	Middle east shoulder of concrete driveway		G9
Client	**Surface Conditions**		**Elevation and Datum (feet)**
Materials and Fleet Services	Concrete		~22.5' USGS
Drilling Contractor and Rig	**Inspector**		**Total Depth (feet)**
Fisch Environmental Exploration & Construction, Ford 250 Truck	John Woodruff		12.0
Diameter of Boring (inches)	**Driller(s)**		**Groundwater Depth (feet)**
2	David Fisch		~13.0
Diameter of Sample Tube (inches)	**Date Started**	**Date Completed**	**Depth to Bedrock (feet)**
1.75 (acetate macrocore tubes)	July 25, 1996	July 25, 1996	Not Encountered

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
0					0-0.5 CONCRETE.		
1	GP				0.5-1.0 POORLY GRADED GRAVEL WITH SAND: brown, moist, medium dense, gravel is mostly f., BASEROCK.	3.5-4.0	
2	CH	1.0/ 4.0	No		1.0-4 SANDY CLAY WITH GRAVEL: dark gray, moist, medium stiff, gravel is f., FILL.		
3							
4							
5					4-12 SILTY SAND WITH GRAVEL: brown, moist, medium dense, sand is f. to c., ALLUVIUM.	6.0-7.0	
6		3.5/ 4.0	No			7.0-8.0	
7							
8	SM					9.0-10.5	
9						10.5-11.5	
10		3.2/ 4.0	No			11.5-12.0*	11.5-12.0: 3100 ppm TEPH-MO, 0.13 ppb PCB Aroclor 1260.
11			Mo to 12				
12							

Bottom of borehole at 12.0 feet. Borehole grouted with neat cement.

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG9A.CDR

GEOPROBE SOIL BORING LOG

Project	Boring Location		Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	Upper east shoulder of concrete driveway		G10
Client	**Surface Conditions**		**Elevation and Datum (feet)**
Materials and Fleet Services	Concrete		~24' USGS
Drilling Contractor and Rig	**Inspector**		**Total Depth (feet)**
Fisch Environmental Exploration & Construction, Ford 250 Truck	John Woodruff		12.0
Diameter of Boring (inches)	**Driller(s)**		**Groundwater Depth (feet)**
2	David Fisch		~14.5
Diameter of Sample Tube (inches)	**Date Started**	**Date Completed**	**Depth to Bedrock (feet)**
1.75 (acetate macrocore tubes)	July 25, 1996	July 25, 1996	Not Encountered

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
0					0-0.4 CONCRETE.		
1	GP				0.4-1.0 POORLY GRADED GRAVEL WITH SAND: brown, moist, medium dense, gravel is mostly f., BASEROCK.	2.0-3.0 3.0-4.0	
2		2.5/ 4.0	No				
3					1.0-7 SANDY FAT CLAY: dark gray, moist, medium stiff, FILL.		
4							
5	CH					4.5-6.0	
6		3.4/ 4.0	No			6.0-7.5 7.5-8.0	
7							
8							
9			No				
10		3.5/ 4.0			7-16 ELASTIC SILT TO SILTY SAND: grayish brown, moist, medium stiff/ medium dense, ALLUVIUM.	9.0-10.0 10.0-11.0 11.0-11.5	
11	MH/ SM					11.5-12.0*	11.5-12.0: 2200 ppm TEPH-M.
12			Mo				
13		3.0/ 4.0	Mo				
14			No				

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG10A.CDR

GEOPROBE SOIL BORING LOG

Project	Date	Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	July 25, 1996	G10

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
14							
15	MH	3.0/ 4.0	No	7-16	ELASTIC SILT TO SILTY SAND: grayish brown, moist, medium stiff/ medium dense, ALLUVIUM.	14.0-15.5 15.5-16.0	
16							

Bottom of borehole at 16.0 feet. Borehole grouted with neat cement.

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFGIB.CDR

GEOPROBE SOIL BORING LOG

Project	Boring Location		Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	Elevated concrete pad south of former tank farm		G11
Client	**Surface Conditions**		**Elevation and Datum (feet)**
Materials and Fleet Services	Concrete		~24' USGS
Drilling Contractor and Rig	**Inspector**		**Total Depth (feet)**
Fisch Environmental Exploration & Construction, Ford 250 Truck	John Woodruff		16.0
Diameter of Boring (inches)	**Driller(s)**		**Groundwater Depth (feet)**
2	David Fisch		~14.5
Diameter of Sample Tube (inches)	**Date Started**	**Date Completed**	**Depth to Bedrock (feet)**
1.75 (acetate macrocore tubes)	July 26, 1996	July 26, 1996	Not Encountered

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
0	GP				0-0.2 CONCRETE.		
1					0.2-0.5 POORLY GRADED GRAVEL WITH SAND: brown, moist, medium dense, gravel is mostly f., BASEROCK.		
2	CH	2.5/ 4.0	No		0.5-4 SANDY CLAY WITH GRAVEL: brown, moist, medium stiff, FILL.		
3							
4							
5					4-8 SILTY SAND WITH GRAVEL: gray, moist, medium dense, FILL.	7.0-7.5	
6	SM	3.0/ 4.0	No			7.5-8.0	
7							
8							
9							
10		3.4/ 4.0	No		8-15.8 ELASTIC SILT TO SILTY SAND: mottled grayish brown, moist, medium stiff/medium dense, sand is f., ALLUVIUM.		
11	MH/ SM		Mo	2000 @12		11.5-12.0*	11.5-12.0: <10 ppm TEPH-MO.
12							
13		3.0/ 4.0	Mo to 14			13.5-14.0	
14							

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PF&F

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG11A.CDR

GEOPROBE SOIL BORING LOG

Project	Date	Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	July 26, 1996	G11

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
14							
15	ML/ SM	3.0/ 4.0	No		8-15.8 ELASTIC SILT TO SILTY SAND: mottled grayish brown, moist, medium stiff/medium dense, sand is f., ALLUVIUM.	14.0-15.5 15.5-16.0	
					15.8-16.0 ELASTIC SILT: grayish brown, moist, medium stiff, ALLUVIUM.		
16	ML				Bottom of borehole at 16.0 feet. Borehole grouted with neat cement.		

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG11B.CDR

GEOPROBE SOIL BORING LOG

Project	Boring Location		Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	Elevated concrete pad south of former tank farm		G12
Client	**Surface Conditions**		**Elevation and Datum (feet)**
Materials and Fleet Services	Concrete		~24' USGS
Drilling Contractor and Rig	**Inspector**		**Total Depth (feet)**
Fisch Environmental Exploration & Construction, Ford 250 Truck	John Woodruff		16.0
Diameter of Boring (inches)	**Driller(s)**		**Groundwater Depth (feet)**
2	David Fisch		~14.5
Diameter of Sample Tube (inches)	**Date Started**	**Date Completed**	**Depth to Bedrock (feet)**
1.75 (acetate macrocore tubes)	July 26, 1996	July 26, 1996	Not Encountered

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
0	GP				0-0.2 CONCRETE.		
1					0.2-0.6 POORLY GRADED GRAVEL WITH SAND: brown, moist, medium dense, gravel is mostly f., BASEROCK.		
2		2.5/ 4.0	No				
3	CH				0.6-7 SANDY FAT CLAY WITH GRAVEL: brown, moist, medium stiff, FILL.		
4							
5						7.0-7.5	
6		3.0/ 4.0	No			7.5-8.0	
7							
8							
9					7-13 SILTY SAND WITH GRAVEL TO SILTY SAND: gray, moist, medium dense, ALLUVIUM.		
10	SM	3.4/ 4.0	No				
11				2000 @12		11.5-12.0*	
12			Mo		13-16 ELASTIC SILT: grayish brown, moist, medium stiff, ALLUVIUM.	13.0-13.5*	13.0-13.5: 2400 ppm TEPH-MO.
13	MH	3.0/ 4.0	No			13.5-14.0	
14							

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG12A.CDR

GEOPROBE SOIL BORING LOG

Project	Date	Boring Number
Emeryville Repair Facility, Former Transformer Oil Tank Farm	July 26, 1996	G12

Hanby Environmental Laboratory Procedures using mineral oil in soil as standard.

Depth (feet)	USCS Soil Symbol	Recovery/Drive (feet)	Product Odor	Field Screening (ppm)	Description	Retained Samples Asterisk (*) indicates laboratory tested	Remarks
14							
15	ML	3.0/ 4.0	No		13-14 ELASTIC SILT: grayish brown, moist, medium stiff, ALLUVIUM.	14.0-15.5 15.5-16.0	
16							

Bottom of borehole at 16.0 feet. Borehole grouted with neat cement.

REGISTERED GEOLOGIST
JOHN W. WOODRUFF
No. 1894
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PG&E

Soil Symbols: C=Clay or clayey, M=Silt or silty, O=Organic soil, L=Low plasticity, H=High plasticity, G=Gravel or gravelly, S=Sand or sandy, W=Well graded, P=Poorly graded. Consistency of fine-grained soils: very soft, soft, medium stiff, stiff, very stiff, and hard. Density of coarse-grained soils: very loose, loose, medium dense, dense, and very dense. Particle size abbreviations: c.=coarse; m.=medium; f.=fine. Soil components: boulders = >12", cobbles = 12" to 3", c. gravel = 3" to 3/4", f. gravel = 3/4" to #4, c. sand = #4 to #10, m. sand = #10 to #40, f. sand = #40 to #200. Product Odor: No=None, Sl=Slight, Mo=Moderate, and St=Strong.

ERFG12B.CDR

Appendix B

LABORATORY DATA SHEETS
CHAIN-OF-CUSTODY DOCUMENTATION

- *A total of twelve soil samples, one from each of the geoprobe borings, was analyzed at Chromalab, Inc. (Pleasanton, California) for:*
  - *benzene, toluene, ethylbenzene, and total xylenes (BTEX) using method EPA 8020;*
  - *total extractable petroleum hydrocarbons for mineral oil (TEPH-MO) using method EPA 8015; and*
  - *polychlorinated biphenyls (PCBs) using method EPA 8080A.*

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: 12 samples for BTEX compounds analysis.
Method: *EPA 8020*

Matrix: SOIL
Sampled: July 25, 1996 *Run#:* 2404 *Analyzed:* August 1, 1996

Spl#	CLIENT SPL ID	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethyl Benzene (mg/Kg)	Total Xylenes (mg/Kg)
93153	G3 14-14.5	N.D.	N.D.	N.D.	N.D.
93154	G4 14-14.5	N.D.	N.D.	N.D.	N.D.
93157	G7 13-13.5	N.D.	N.D.	N.D.	N.D.

Matrix: SOIL
Sampled: July 25, 1996 *Run#:* 2404 *Analyzed:* August 2, 1996

Spl#	CLIENT SPL ID	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethyl Benzene (mg/Kg)	Total Xylenes (mg/Kg)
93151	G1 11.5-12	N.D.	N.D.	N.D.	N.D.
93156	G6 11.5-12	N.D.	N.D.	N.D.	N.D.
93160	G10 11.5-12	N.D.	N.D.	N.D.	N.D.

Matrix: SOIL
Sampled: July 26, 1996 *Run#:* 2404 *Analyzed:* August 1, 1996

Spl#	CLIENT SPL ID	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethyl Benzene (mg/Kg)	Total Xylenes (mg/Kg)
93162	G12 13-13.5	N.D.	N.D.	N.D.	N.D.

Matrix: SOIL
Sampled: July 25, 1996 *Run#:* 2408 *Analyzed:* August 1, 1996

Spl#	CLIENT SPL ID	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethyl Benzene (mg/Kg)	Total Xylenes (mg/Kg)
93152	G2 14-14.5	N.D.	N.D.	N.D.	N.D.
93155	G5 11-11.5	N.D.	N.D.	N.D.	N.D.
93158	G8 11-11.5	N.D.	N.D.	N.D.	N.D.
93159	G9 11.5-12	N.D.	N.D.	N.D.	N.D.

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: 1 sample for BTEX compounds analysis.
Method: *EPA 8020*

Matrix: SOIL
Sampled: July 26, 1996 *Run#:* 2408 *Analyzed:* August 1, 1996

Spl# CLIENT SPL ID	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethyl Benzene (mg/Kg)	Total Xylenes (mg/Kg)
93161 G11 11.5-12	N.D.	N.D.	N.D.	N.D.
Reporting Limits	0.0050	0.0050	0.0050	0.0050
Blank Result	N.D.	N.D.	N.D.	N.D.
Blank Spike Result (%)	106	104	110	107

June Zhao
Chemist

Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for TEPH analysis.
Method: *EPA METHOD 8015 (Mod)*

Client Sample ID: **G1 11.5-12**
Spl#: 93151 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2390 *Analyzed:* August 3, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
MINERAL OIL	1200	200	N.D.	--	20

NOTE: Quantitation for the above Analyte is based on the response factor of Diesel.

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for TEPH analysis.
Method: *EPA METHOD 8015 (Mod)*

Client Sample ID: **G2 14-14.5**
Spl#: 93152 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2390 *Analyzed:* August 3, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
MINERAL OIL	N.D.	10	N.D.	--	1

NOTE: Quantitation for the above Analyte is based on the response factor of Diesel.

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for TEPH analysis.
Method: *EPA METHOD 8015 (Mod)*

Client Sample ID: **G3 14-14.5**
Spl#: 93153 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2390 *Analyzed:* August 3, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
MINERAL OIL	N.D.	10	N.D.	--	1

NOTE: Quantitation for the above Analyte is based on the response factor of Diesel.

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for TEPH analysis.
Method: *EPA METHOD 8015 (Mod)*

Client Sample ID: **G4 14-14.5**
Spl#: 93154 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2390 *Analyzed:* August 3, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
MINERAL OIL	N.D.	10	N.D.	--	1

NOTE: Quantitation for the above Analyte is based on the response factor of Diesel.

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for TEPH analysis.
Method: *EPA METHOD 8015 (Mod)*

Client Sample ID: **G5 11-11.5**
Spl#: 93155 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2390 *Analyzed:* August 3, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
MINERAL OIL	N.D.	10	N.D.	--	1

NOTE: Quantitation for the above Analyte is based on the response factor of Diesel.

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for TEPH analysis.
Method: *EPA METHOD 8015 (Mod)*

Client Sample ID: **G6 11.5-12**
Spl#: 93156 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2390 *Analyzed:* August 5, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
MINERAL OIL	13000	2000	N.D.	--	200

NOTE: Quantitation for the above Analyte is based on the response factor of Diesel.

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for TEPH analysis.
Method: *EPA METHOD 8015 (Mod)*

Client Sample ID: **G7 13-13.5**
Spl#: 93157 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2390 *Analyzed:* August 5, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
MINERAL OIL	1400	200	N.D.	--	20

NOTE: Quantitation for the above Analyte is based on the response factor of Diesel.

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for TEPH analysis.
Method: *EPA METHOD 8015 (Mod)*

Client Sample ID: **G8 11-11.5**
Spl#: 93158 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2390 *Analyzed:* August 3, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
MINERAL OIL	1100	200	N.D.	--	20

NOTE: Quantitation for the above Analyte is based on the response factor of Diesel.

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for TEPH analysis.
Method: *EPA METHOD 8015 (Mod)*

Client Sample ID: **G9 11.5-12**
Spl#: 93159 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2390 *Analyzed:* August 5, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
MINERAL OIL	3100	500	N.D.	--	50

NOTE: Quantitation for the above Analyte is based on the response factor of Diesel.

Bruce Havlik for
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for TEPH analysis.
Method: *EPA METHOD 8015 (Mod)*

Client Sample ID: **G10 11.5-12**
Spl#: 93160 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2390 *Analyzed:* August 5, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
MINERAL OIL	2200	200	N.D.	--	20

NOTE: Quantitation for the above Analyte is based on the response factor of Diesel.

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for TEPH analysis.
Method: *EPA METHOD 8015 (Mod)*

Client Sample ID: **G11 11.5-12**
Spl#: 93161 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 26, 1996 *Run#:* 2390 *Analyzed:* August 3, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
MINERAL OIL	N.D.	10	N.D.	--	1

NOTE: Quantitation for the above Analyte is based on the response factor of Diesel.

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for TEPH analysis.
Method: *EPA METHOD 8015 (Mod)*

Client Sample ID: **G12 13-13.5**
Spl#: 93162 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 26, 1996 *Run#:* 2390 *Analyzed:* August 5, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
MINERAL OIL	2400	1000	N.D.	--	100

NOTE: Quantitation for the above Analyte is based on the response factor of Diesel.

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for Polychlorinated Biphenyls (PCBs) analysis.
Method: *EPA SW846 8080A*

Client Sample ID: **G1 11.5-12**
Spl#: 93151 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2384 *Analyzed:* August 3, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
AROCLOR 1016	N.D.	0.10	N.D.	--	1
AROCLOR 1221	N.D.	0.10	N.D.	--	1
AROCLOR 1232	N.D.	0.10	N.D.	--	1
AROCLOR 1242	N.D.	0.10	N.D.	--	1
AROCLOR 1248	N.D.	0.10	N.D.	--	1
AROCLOR 1254	N.D.	0.10	N.D.	--	1
AROCLOR 1260	N.D.	0.10	N.D.	119	1

Dennis Mayugba
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for Polychlorinated Biphenyls (PCBs) analysis.
Method: *EPA SW846 8080A*

Client Sample ID: **G2 14-14.5**
Spl#: 93152 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2384 *Analyzed:* August 3, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
AROCLOR 1016	N.D.	0.10	N.D.	--	1
AROCLOR 1221	N.D.	0.10	N.D.	--	1
AROCLOR 1232	N.D.	0.10	N.D.	--	1
AROCLOR 1242	N.D.	0.10	N.D.	--	1
AROCLOR 1248	N.D.	0.10	N.D.	--	1
AROCLOR 1254	N.D.	0.10	N.D.	--	1
AROCLOR 1260	N.D.	0.10	N.D.	119	1

Dennis Mayugba
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for Polychlorinated Biphenyls (PCBs) analysis.
Method: *EPA SW846 8080A*

Client Sample ID: **G3 14-14.5**
Spl#: 93153 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2384 *Analyzed:* August 3, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
AROCLOR 1016	N.D.	0.10	N.D.	--	1
AROCLOR 1221	N.D.	0.10	N.D.	--	1
AROCLOR 1232	N.D.	0.10	N.D.	--	1
AROCLOR 1242	N.D.	0.10	N.D.	--	1
AROCLOR 1248	N.D.	0.10	N.D.	--	1
AROCLOR 1254	N.D.	0.10	N.D.	--	1
AROCLOR 1260	N.D.	0.10	N.D.	119	1

Dennis Mayugba
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for Polychlorinated Biphenyls (PCBs) analysis.
Method: *EPA SW846 8080A*

Client Sample ID: **G4 14-14.5**
Spl#: 93154 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2384 *Analyzed:* August 3, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
AROCLOR 1016	N.D.	0.10	N.D.	--	1
AROCLOR 1221	N.D.	0.10	N.D.	--	1
AROCLOR 1232	N.D.	0.10	N.D.	--	1
AROCLOR 1242	N.D.	0.10	N.D.	--	1
AROCLOR 1248	N.D.	0.10	N.D.	--	1
AROCLOR 1254	N.D.	0.10	N.D.	--	1
AROCLOR 1260	N.D.	0.10	N.D.	119	1

Dennis Mayugba
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for Polychlorinated Biphenyls (PCBs) analysis.
Method: *EPA SW846 8080A*

Client Sample ID: **G5 11-11.5**
Spl#: 93155 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2384 *Analyzed:* August 2, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
AROCLOR 1016	N.D.	0.10	N.D.	--	1
AROCLOR 1221	N.D.	0.10	N.D.	--	1
AROCLOR 1232	N.D.	0.10	N.D.	--	1
AROCLOR 1242	N.D.	0.10	N.D.	--	1
AROCLOR 1248	N.D.	0.10	N.D.	--	1
AROCLOR 1254	N.D.	0.10	N.D.	--	1
AROCLOR 1260	N.D.	0.10	N.D.	119	1

Dennis Mayugba
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for Polychlorinated Biphenyls (PCBs) analysis.
Method: *EPA SW846 8080A*

Client Sample ID: **G6 11.5-12**
Spl#: 93156 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2384 *Analyzed:* August 3, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
AROCLOR 1016	N.D.	0.10	N.D.	--	1
AROCLOR 1221	N.D.	0.10	N.D.	--	1
AROCLOR 1232	N.D.	0.10	N.D.	--	1
AROCLOR 1242	N.D.	0.10	N.D.	--	1
AROCLOR 1248	N.D.	0.10	N.D.	--	1
AROCLOR 1254	N.D.	0.10	N.D.	--	1
AROCLOR 1260	0.26	0.10	N.D.	119	1

Dennis Mayugba
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for Polychlorinated Biphenyls (PCBs) analysis.
Method: *EPA SW846 8080A*

Client Sample ID: **G7 13-13.5**
Spl#: 93157 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2384 *Analyzed:* August 3, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
AROCLOR 1016	N.D.	0.10	N.D.	--	1
AROCLOR 1221	N.D.	0.10	N.D.	--	1
AROCLOR 1232	N.D.	0.10	N.D.	--	1
AROCLOR 1242	N.D.	0.10	N.D.	--	1
AROCLOR 1248	N.D.	0.10	N.D.	--	1
AROCLOR 1254	N.D.	0.10	N.D.	--	1
AROCLOR 1260	N.D.	0.10	N.D.	119	1

Dennis Mayugba
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for Polychlorinated Biphenyls (PCBs) analysis.
Method: *EPA SW846 8080A*

Client Sample ID: **G8 11-11.5**
Spl#: 93158 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2384 *Analyzed:* August 4, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
AROCLOR 1016	N.D.	0.10	N.D.	--	1
AROCLOR 1221	N.D.	0.10	N.D.	--	1
AROCLOR 1232	N.D.	0.10	N.D.	--	1
AROCLOR 1242	N.D.	0.10	N.D.	--	1
AROCLOR 1248	N.D.	0.10	N.D.	--	1
AROCLOR 1254	N.D.	0.10	N.D.	--	1
AROCLOR 1260	N.D.	0.10	N.D.	119	1

Dennis Mayugba
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for Polychlorinated Biphenyls (PCBs) analysis.
Method: *EPA SW846 8080A*

Client Sample ID: **G9 11.5-12**
Spl#: 93159 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2384 *Analyzed:* August 4, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
AROCLOR 1016	N.D.	0.10	N.D.	--	1
AROCLOR 1221	N.D.	0.10	N.D.	--	1
AROCLOR 1232	N.D.	0.10	N.D.	--	1
AROCLOR 1242	N.D.	0.10	N.D.	--	1
AROCLOR 1248	N.D.	0.10	N.D.	--	1
AROCLOR 1254	N.D.	0.10	N.D.	--	1
AROCLOR 1260	0.13	0.10	N.D.	119	1

Dennis Mayugba
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for Polychlorinated Biphenyls (PCBs) analysis.
Method: *EPA SW846 8080A*

Client Sample ID: **G10 11.5-12**
Spl#: 93160 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 25, 1996 *Run#:* 2384 *Analyzed:* August 4, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
AROCLOR 1016	N.D.	0.10	N.D.	--	1
AROCLOR 1221	N.D.	0.10	N.D.	--	1
AROCLOR 1232	N.D.	0.10	N.D.	--	1
AROCLOR 1242	N.D.	0.10	N.D.	--	1
AROCLOR 1248	N.D.	0.10	N.D.	--	1
AROCLOR 1254	N.D.	0.10	N.D.	--	1
AROCLOR 1260	N.D.	0.10	N.D.	119	1

Dennis Mayugba
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for Polychlorinated Biphenyls (PCBs) analysis.
Method: *EPA SW846 8080A*

Client Sample ID: **G11 11.5-12**
Spl#: 93161 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 26, 1996 *Run#:* 2384 *Analyzed:* August 4, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
AROCLOR 1016	N.D.	0.10	N.D.	--	1
AROCLOR 1221	N.D.	0.10	N.D.	--	1
AROCLOR 1232	N.D.	0.10	N.D.	--	1
AROCLOR 1242	N.D.	0.10	N.D.	--	1
AROCLOR 1248	N.D.	0.10	N.D.	--	1
AROCLOR 1254	N.D.	0.10	N.D.	--	1
AROCLOR 1260	N.D.	0.10	N.D.	119	1

Dennis Mayugba
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

August 5, 1996 *Submission #:* 9607809

P.G.& E. WATER QUAL GP S RAMON

Atten: Fred Flint

Project: EMERYVILLE AST *Project#:* 0524-E1
Received: July 26, 1996

re: One sample for Polychlorinated Biphenyls (PCBs) analysis.
Method: *EPA SW846 8080A*

Client Sample ID: **G12 13-13.5**
Spl#: 93162 *Matrix:* SOIL *Extracted:* July 31, 1996
Sampled: July 26, 1996 *Run#:* 2384 *Analyzed:* August 4, 1996

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
AROCLOR 1016	N.D.	0.10	N.D.	--	1
AROCLOR 1221	N.D.	0.10	N.D.	--	1
AROCLOR 1232	N.D.	0.10	N.D.	--	1
AROCLOR 1242	N.D.	0.10	N.D.	--	1
AROCLOR 1248	N.D.	0.10	N.D.	--	1
AROCLOR 1254	N.D.	0.10	N.D.	--	1
AROCLOR 1260	N.D.	0.10	N.D.	119	1

Dennis Mayugba
Chemist

Alex Tam
Semivolatiles Supervisor

CHROMALAB, INC.
SAMPLE RECEIPT CHECKLIST

Client Name PGE-WAT

Project _____

Reference/Subm # 28942/9607809

Checklist completed by: C Rowley 7/29/96 (Signature / Date)

Date/Time Received 7/26/96 (Date) 1645 (Time)

Received by C Rowley

Carrier name _____

Logged in by CR (Initials) 7/26/96 (Date)

Matrix Soil

Shipping container in good condition?		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 headspace?		NA✓	Yes____ No____
Trip Blank received?		NA✓	Yes____ No____
All samples received within holding time?			Yes✓ No____

Container temperature? 18.3°C

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: _____

SMPLRECD.CK

879/93151- 28942

CHROMALAB, INC.

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

Environmental Services (SDB) (DOHS 1094)

Chain of Custody

DATE 7/26/96 PAGE 1 OF 2

PROJ. MGR Fred Flint
COMPANY PG&E
ADDRESS 3400 Crow Canyon Rd
San Ramon, CA 94583

SAMPLERS (SIGNATURE) [signature] 5108665808 (PHONE NO.)
(FAX NO.)

SUBM #: 9607599 REP: AC
CLIENT: PGE-001
DUE: 08/02/96
REF #:28942

ANALYSIS REPORT (= Mineral Oil)

SAMPLE ID.	DATE	TIME	MATRIX	PRESERV.	TPH - Gasoline (EPA 5030, 8015)	TPH - Gasoline (5030, 8015) w/BTEX (EPA 602, 8020)	TPH - Diesel, TEPH (M.O.) (EPA 3510/3550, 8015)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240, 524.2)	BASE/NEUTRALS, ACIDS (EPA 625/627, 8270, 525)	TOTAL OIL & GREASE (EPA 5520, B+F, E+F)	PCB (EPA 608, 8080)	PESTICIDES (EPA 608, 8080)	TOTAL RECOVERABLE HYDROCARBONS (EPA 418.1)		LUFT METALS: Cd, Cr, Pb, Zn, Ni	CAM METAL	PRIORITY P. METALS (13	TOTAL LEA	EXTRACTIO (TCLP, STLC			NUMBER OF
G1 11.5-12	7/25						X	X					X											
G2 14-14.5							X	X					X											
G3 14-14.5							X	X					X											
G4 14-14.5							X	X					X											
G5 11-11.5							X	X					X											
G6 11.5-12							X	X					X											
G7 13-13.5							X	X					X											
G8 11-11.5							X	X					X											
G9 11.5-12							X	X					X											

PROJECT INFORMATION

PROJECT NAME: Emeryville Ast
PROJECT NUMBER
P.O. # 0524 E1

SAMPLE RECEIPT

TOTAL NO. OF CONTAINERS	
HEAD SPACE	
REC'D GOOD CONDITION/COLD	
CONFORMS TO RECORD	

TAT	STANDARD 5-DAY			24	48	72	OTHER

SPECIAL INSTRUCTIONS/COMMENTS:

RELINQUISHED BY 1.	RELINQUISHED BY 2.	RELINQUISHED BY 3
[signature] 1630 (SIGNATURE) (TIME)	(SIGNATURE) (TIME)	(SIGNATURE) (TIME)
John Woodruff 7/26 (PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)
Self (COMPANY)	(COMPANY)	(COMPANY)

RECEIVED BY 1	RECEIVED BY 2	RECEIVED BY (LABORATORY) 3
(SIGNATURE) (TIME)	(SIGNATURE) (TIME)	Chris Rowley 7/26/96 (SIGNATURE) (TIME)
(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)	Chris Rowley 1145 (PRINTED NAME) (DATE)
(COMPANY)	(COMPANY)	Chris R Chromalab (LAB)

B-28

9601309

28942

CHROMALAB, INC.

Environmental Services (SDB) (DOHS 1094)

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

Chain of Custody

~ Mineral Oil

DATE 7/26/96 PAGE 2 OF 2

PROJ. MGR

COMPANY

ADDRESS

SAMPLERS (SIGNATURE) (PHONE NO.)

(FAX NO.)

11.5-12

SAMPLE ID.	DATE	TIME	MATRIX	PRESERV.	TPH - Gasoline (EPA 5030, 8015)	TPH - Gasoline (5030, 8015) w/BTEX (EPA 602, 8020)	TPH - Diesel (EPH) (EPA 3510/3550, 8015)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240, 524.2)	BASE/NEUTRALS, ACIDS (EPA 625/627, 8270, 525)	TOTAL OIL & GREASE (EPA 5520, B+F, E+F)	PCB (EPA 608, 8080)	PESTICIDES (EPA 608, 8080)	TOTAL RECOVERABLE HYDROCARBONS (EPA 418.1)		LUFT METALS: Cd, Cr, Pb, Zn, Ni	CAM METALS (17)	PRIORITY POLLUTANT METALS (13)	TOTAL LEAD	EXTRACTION (TCLP, STLC)				NUMBER OF CONTAINERS
G10 11.5	7/25						X	X					X											
G11 11.5-12	7/26						X	X					X											
G12 13 13.5	↓						X	X					X											

PROJECT INFORMATION

PROJECT NAME: Emeryville Ast

PROJECT NUMBER:

P.O. # 0524-E1

SAMPLE RECEIPT

TOTAL NO. OF CONTAINERS	
HEAD SPACE	
REC'D GOOD CONDITION/COLD	
CONFORMS TO RECORD	

TAT: STANDARD 5-DAY | | | 24 | 48 | 72 | OTHER

SPECIAL INSTRUCTIONS/COMMENTS:

RELINQUISHED BY 1.	RELINQUISHED BY 2.	RELINQUISHED BY 3
(SIGNATURE) (TIME) 16:30	(SIGNATURE) (TIME)	(SIGNATURE) (TIME)
(PRINTED NAME) (DATE) 7/26	(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)
(COMPANY)	(COMPANY)	(COMPANY)
RECEIVED BY 1	**RECEIVED BY 2**	**RECEIVED BY (LABORATORY) 3**
(SIGNATURE) (TIME)	(SIGNATURE) (TIME)	(SIGNATURE) (TIME) 7/24/96 1645
(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)
(COMPANY)	(COMPANY)	(LAB) Chromalab

B-29