Report Issued:

June 25, 1992

TES

Oakland Power Plant

Confirmation Soil Sampling

Surrounding Diesel

Tanks #2 and #3

6/92

Prepared by

Land and Water Quality Unit

June 1992

Report 402.331-92.35

loans 4
SIC 937-2363

Pacific Gas and Electric Company
Technical and Ecological Services
3400 Crow Canyon Road, San Ramon, California 94583

Pacific Gas and Electric Company

Hunters Point/Potrero/
Oakland Power Plants
Steam Generation
1000 Evans Avenue
San Francisco, CA 94124
415/695-2200

Kim A. Sloat
Manager

92 JUL -7 AM 8:39

STID 604

July 1, 1992

Ms. Jennifer Eberle
Alameda County Department of Public Health
80 Swan Way, Room 200
Oakland, CA 94621

Re: PG&E's Oakland Power Plant Diesel Dump Tank Removal Project

94607

Dear Ms. Eberle:

For your information, enclosed is the report of test results for soil boring samples taken around Diesel Fuel Dump Tanks #2 and #3 at Oakland Power Plant on 6/3/92. Your office was notified of the planned sampling on 5/29/92. There were no representatives from your office on site the day of the sampling.

A registered geologist from PG&E's Technical and Ecological Services (TES) supervised the drilling conducted by Power Core, an outside contractor. Samples were collected from a total of four borings. Total sample depths were 7.0 feet for three of the borings and 6.0 feet for the fourth. All borings were terminated at the saturated soil zone.

The first and second soil borings (designated UT1 and UT2) were taken adjacent to Tank #2. The third and fourth borings (UT3 and UT4) were performed adjacent to Tank #3. Results from boring UT1 showed that diesel concentrations decreased with depth from 2700 ppm at the 5.5 to 6.0 foot interval to 72 ppm at the 6.5 to 7.0 foot interval. Samples from UT2 indicated diesel at 2500 ppm in the 4.5 to 5.0 foot range and at 3800 ppm in the 6.5 to 7.0 foot range. In samples from UT3, the maximum level of diesel was 2900 ppm at the 5.5 to 6.0 foot level, decreasing to 170 ppm at 6.5 to 7.0 feet. Results from UT4 indicated levels of diesel at 20 ppm and 140 ppm in the 4.5 to 5.0 and 5.5 to 6.0 foot range respectively.

Further soil removal from the vicinity of the two tank locations would be very difficult due to the close proximity of in-service electrical equipment and related structures. Additionally, soil removal equipment would have limited access to the area due to space constraints.

The previous diesel dump tanks, which were the original sources of the contamination, have been removed and replaced with double-walled tanks, placed within sealed concrete vaults. The area around the tanks has been paved, which will prevent further vertical migration of rain water. Additionally, it is PG&E's intention to address any residual site contamination which may be present upon the decommissioning and closure of Oakland Power Plant. We do not believe that the remaining levels of diesel in the soil present a significant threat to human health or the environment. For these reasons, PG&E requests that this project be considered complete.

If more information or clarification is needed regarding this matter, please contact Mr. Rex Bell of my staff at (415) 695-2205.

Sincerely,

Kim A. Sloat
Plant Manager

← She's not qualified to make these conclusions

RB:rb

cc: Mr. Rich Hiett
RWQCB, San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, CA 94612
(w/enclosure)

Enclosure

bcc: LFWomack/FWStrehlitz
GTSanders (w/enclosures)
DFRunkle
MLyons
MEWalneuski
CEChaney
LRenteria/DWilliams
Central File: 402.361 (w/enclosures)

Prepared by:

Frederick F. Flint
Contract Hydrogeologist

Approved by:

510-866-5822

Darrell S. Klingman
Registered Geologist No. 4888

Gary E. Nulty
Senior Geologist

David Gilbert
Senior Engineer

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FIGURES

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INTRODUCTION

Three underground diesel dump tanks were excavated and replaced at PG&E's Oakland Power Plant on November 6, 1991. The power plant is located at 50 **Martin Luther King, Jr. Way, Oakland, California** (Figure 1). After the excavations were backfilled, Alameda County Department of Health Services requested PG&E to perform confirmation soil sampling near diesel tanks #2 and #3 to quantify the levels of diesel remaining in the soils near the tanks. This report describes the field methodology, analytical procedures and results of confirmation soil sampling performed on June 3, 1992 near the diesel tanks at PG&E's Oakland Power Plant.

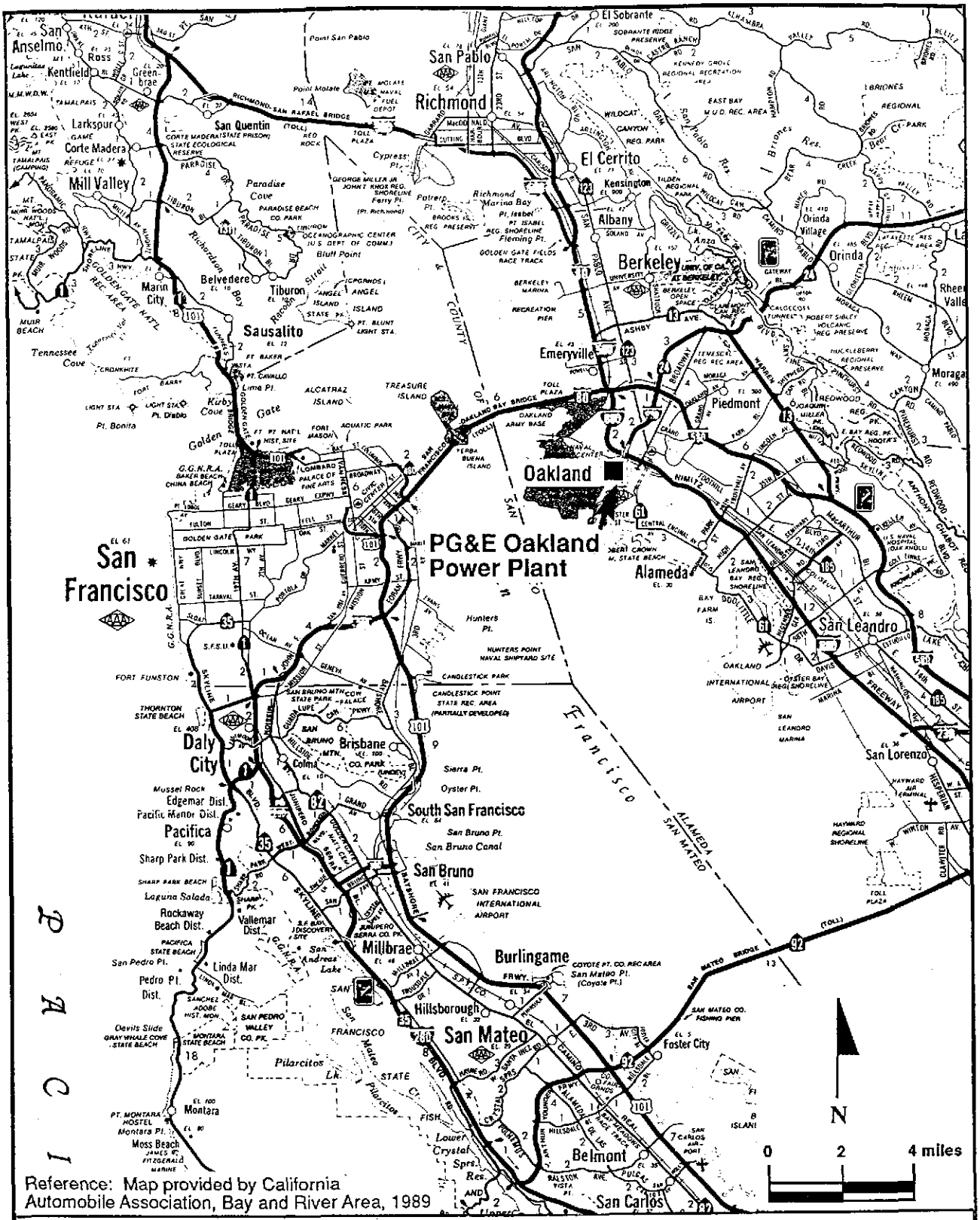
V. Gill proposed 17 + we approved 17

METHODS

Soil samples were collected from four soil borings; borings UT1 and UT2 were located immediately adjacent to diesel tank #2 and borings UT3 and UT4 were located near diesel tank #3 (Figure 2). Soil samples were collected using a hydraulic soil coring device that has a 2-inch split spoon sampler connected to standard drill rod. The subsurface soils were sampled continuously from the depths approximating the bottom of the former underground tanks to groundwater. All boreholes were logged by a qualified field geologist under the supervision of a registered geologist.

The following procedures were employed when collecting and handling the soil samples:

1. Prior to sampling, the sampling probe and sampling liners were washed with a trisodium phosphate solution and rinsed with potable water.
2. The soil samples were retained in the sample liners with aluminum foil and plastic end caps, secured in place with plastic adhesive tape.
3. Each sample was labeled in water proof ink with the job name, job number, boring number, sample depth, date, and time collected.
4. A description of the soil sample was entered on a boring log form by the field geologist. This description included the soil classification (ASTM D-2487-83), color, moisture content, and consistency (in relative terms) and estimated degree of hydrocarbon content (i.e., organic vapor analyzer measurements).
5. Immediately after sample collection and labeling, the samples were placed in a sturdy ice chest containing ice. The temperature in the ice chest was maintained at or below 4°C.
6. When soil sampling was finished, a completed chain-of-custody form was inserted and the ice chest was closed and sealed.
7. The sealed ice chest was transferred to a state of California-certified analytical laboratory (Chromalab, Inc. in San Ramon).



Reference: Map provided by California Automobile Association, Bay and River Area, 1989

Figure 1. Site location map.

90-7-604/TI-27

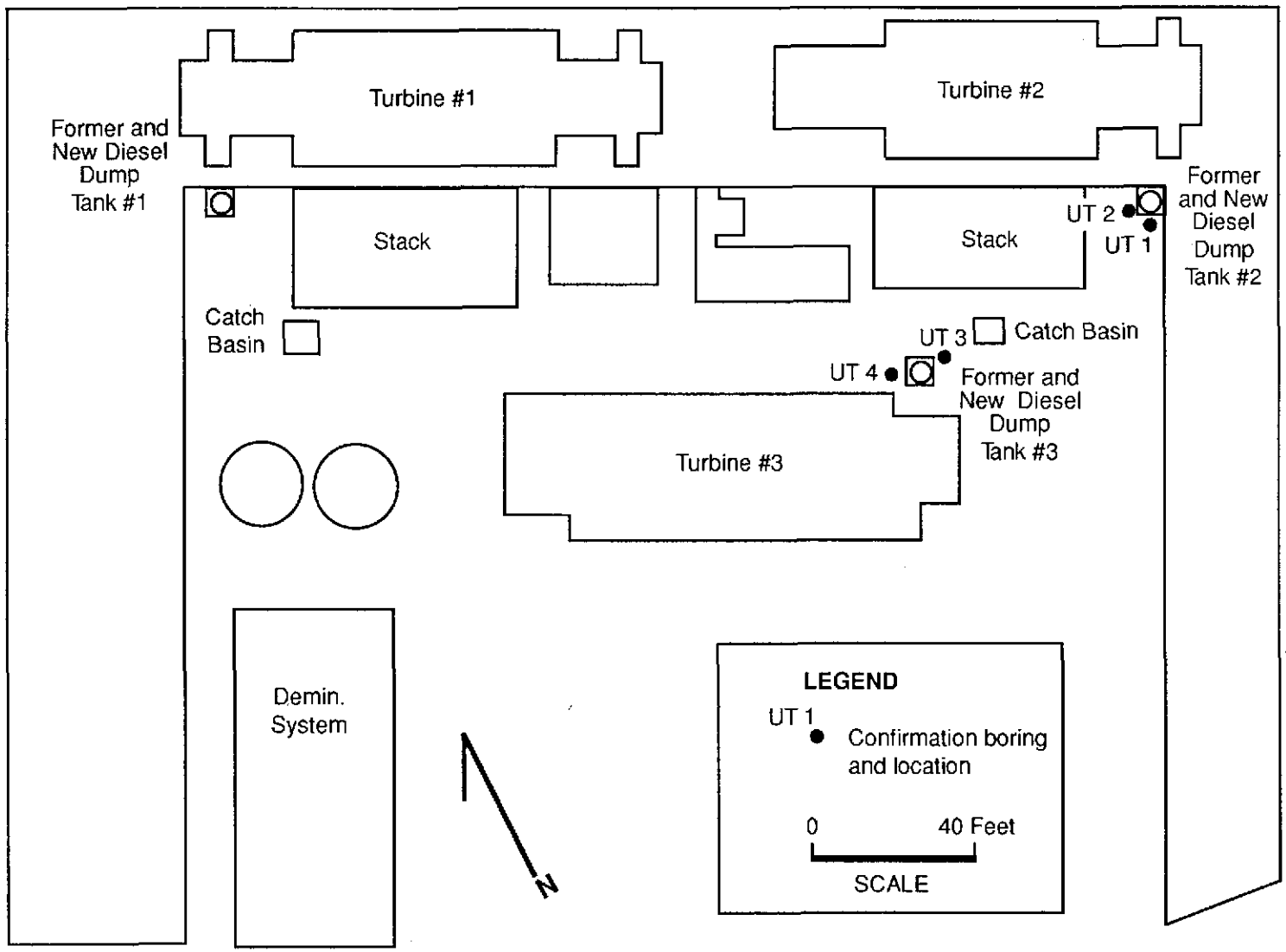


Figure 2. Locations of confirmation soil borings collected on 6/3/92 near the diesel dump tanks, PG&E's Oakland Power Plant.

streets?

The soil samples submitted to Chromalab, Inc. were analyzed for total petroleum hydrocarbons as diesel (TPH-D) (EPA method 3550/8015) and benzene, toluene, ethylbenzene, and xylenes (BTEX) (EPA method 8020).

RESULTS

The area evaluated in this investigation is underlain by sand and clay. The borings generally encountered sand fill to a depth of 3 to 5 feet. Beneath the fill was a well graded sand immediately underlain by gravel showing a well developed fining upward sequence. A 1-foot clay layer was encountered in boring UT3 at 6 feet. Saturated soils were encountered at approximately 7 feet below grade. A distinct petroleum odor was noted in the bottom of each boring with varying levels of hydrocarbons present as measured in the field with the organic vapor meter. Boring logs are included in Appendix A.

Table 1 presents the results of the analytical analysis. TPH-D and BTEX compounds were present in all the borings in varying amounts; however, benzene was not detected in any of the soil samples. Sample UT1 (5.5 to 6.0 feet) contained xylenes (6.3 μg/kg) and TPH-D (2700 mg/kg). Sample UT1 (6.5 to 7.0 feet) contained toluene (130 μg/kg), ethylbenzene (140 μg/kg), xylenes (1300 μg/kg), and TPH-D (72 mg/kg). Sample UT2 (4.5 to 5.0 feet) contained toluene (10 μg/kg), xylenes (10 μg/kg), and TPH-D (2500 mg/kg). Sample UT2 (6.5 to 7.0 feet) contained toluene (8.7 μg/kg), ethylbenzene (28 μg/kg), xylenes (220 μg/kg), and TPH-D (3800 mg/kg). Sample UT3 (4.5 to 5.0 feet) contained xylenes (10 μg/kg), and TPH-D (530 mg/kg). Sample UT3 (5.5 to 6.0 feet) contained toluene (6.7 μg/kg), ethylbenzene (17 μg/kg), xylenes (140 μg/kg), and TPH-D (2900 mg/kg). Sample UT3 (6.5 to 7.0 feet) contained toluene (10 μg/kg), ethylbenzene (22 μg/kg), xylenes (57 μg/kg), and TPH-D (170 mg/kg). Sample UT4 (4.5 to 5.0 feet) contained TPH-D (20 mg/kg). Sample UT4 (5.5 to 6.0 feet) contained ethylbenzene (5.7 μg/kg), xylenes (29 μg/kg), and TPH-D (140 mg/kg). Analytical data sheets and chain-of-custody are included in Appendix B.

Table 1
Summary of Analytical Results
Oakland Power Plant
Diesel Dump tanks #2 and #3

BORING	DATE SAMPLED	B µg/kg	T µg/kg	E µg/kg	X µg/kg	TPH-D mg/kg	
UT1 5.5-6.0	6/3/92	<5.0	<5.0	<5.0	6.3	2700	tank #2
UT1 6.5-7.0	6/3/92	<5.0	130	140	1300	72	
UT2 4.5-5.0	6/3/92	<5.0	10	<5.0	10	2500	
UT2 6.5-7.0	6/3/92	<5.0	8.7	28	220	3800	
UT3 4.5-5.0	6/3/92	<5.0	<5.0	<5.0	10	530	tank # 3
UT3 5.5-6.0	6/3/92	<5.0	6.7	17	140	2900	
UT3 6.5-7.0	6/3/92	<5.0	10	22	57	170	
UT4 4.5-5.0	6/3/92	<5.0	<5.0	<5.0	<5.0	20	
UT4 5.5-6.0	6/3/92	<5.0	<5.0	5.7	29	140	

TPH-D = Total Petroleum Hydrocarbons as Diesel
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes

< = Concentrations of analyte were non-detectable at or above stated detection limit.

CONCLUSIONS

The following conclusions are drawn from the investigation:

1. Soil beneath the underground tanks consists predominantly of well graded sand with some clay.
2. Saturated soil is present beneath the site at approximately 7 feet below grade.
3. Petroleum hydrocarbons, in the form of volatile hydrocarbons (BTEX) and total petroleum hydrocarbons as diesel (TPH-D) are present to some degree in all of the borings performed. Benzene, however, was below the detection limit in each of the soil samples analyzed.

Appendix A

BORING LOGS

BORING LOG

Job No.	Boring No.	Sheet
60007194 EA	UT-1	1 of 1

Client	Boring Location
PG&E	Oakland Power Plant

Drilling Contractor	Driller	Rig
Power Core	Mike Nosewicz	NA

Logged By	Surface Conditions	Groundwater Depth
F. Flint	Asphalt	Not Encountered

DRILLING	
START TIME	FINISH TIME
DATE	DATE
6/3/92	6/3/92

Type & Diameter of Boring	Sampling Method
1-7/8"	Hydraulic Sampler

SAMPLES: Inches Driven | Inches Recovered | Blows/6" / Sampler | Well Detail | Ground Water | Depth (Feet) | Sample Interval | Graphic Log | Soil Symbol

MATERIALS ENCOUNTERED AND DRILLING CONDITIONS

0–4: SP

Sand fill, light moderate brown with concrete rubble

4–7: SC

OVM = 6ppm

Clayey sand,dark gray, fine grained, poorly sorted

Fining upward, well graded gravel at bottom, saturated, petroleum odor, OVM = 59ppm

7

BOH

8 9 10 11 12 13 14 15 16 17 18

60007150G5TI102

BORING LOG

Job No.	Boring No.	Sheet
60007194 EA	UT-2	1 of 1

Client	Boring Location
PG&E	Oakland Power Plant

Drilling Contractor	Driller	Rig
Power Core	Mike Nosewicz	NA

Logged By	Surface Conditions	Groundwater Depth
F. Flint	Asphalt	Not Encountered

DRILLING	
START TIME	FINISH TIME
DATE	DATE
6/3/92	6/3/92

Type & Diameter of Boring	Sampling Method
1 -/8"	Hydraulic Sampler

SAMPLES: Inches Driven | Inches Recovered | Blows/6" / Sampler

Well Detail | Ground Water | Depth (Feet) | Sample Interval | Graphic Log | Soil Symbol

MATERIALS ENCOUNTERED AND DRILLING CONDITIONS

Depth (Feet)	Soil Symbol	Description
0–3	SP	Sand fill, with rubble, moderate brown to gray
3–4	SC	Clayey sand, light moderate brown, fine grained, no odor
4–7	SW	OVM = 7.7ppm Dark gray sand fining upwards sequence, gravel at bottom, petroleum odor, OVM = 30ppm Saturated
7		BOH

60007150G5TI102

BORING LOG

Job No.	Boring No.	Sheet
60007194 EA	UT-3	1 of 1

Client	Boring Location
PG&E	Oakland Power Plant

DRILLING

Drilling Contractor	Driller	Rig	START TIME	FINISH TIME
Power Core	Mike Nosewicz	NA		

Logged By	Surface Conditions	Groundwater Depth	DATE	DATE
F. Flint	Asphalt	Not Encountered	6/3/92	6/3/92

Type & Diameter of Boring	Sampling Method
1-7/8"	Hydraulic Sampler

SAMPLES: Inches Driven	SAMPLES: Inches Recovered	SAMPLES: Blows/6" Sampler	Well Detail	Ground Water	Depth (Feet)	Sample Interval	Graphic Log	Soil Symbol	MATERIALS ENCOUNTERED AND DRILLING CONDITIONS
					0			SP	Sand fill, with rubble, moderate brown, no odor
					1				
					2				
					3				
					4				OVM = 18ppm
					5				OVM = 6ppm
					6			CL	**Clay**, light green, with discoloration to black, saturated, petroleum odor, OVM = 5ppm
					7				BOH
					8				
					9				
					10				
					11				
					12				
					13				
					14				
					15				
					16				
					17				
					18				

BORING LOG

Job No.	Boring No.	Sheet
60007194 EA	UT-4	1 of 1

Client	Boring Location
PG&E	Oakland Power Plant

Drilling Contractor	Driller	Rig
Power Core	Mike Nosewicz	NA

Logged By	Surface Conditions	Groundwater Depth
F. Flint	Asphalt	Not Encountered

DRILLING	
START TIME	FINISH TIME
DATE	DATE
6/3/92	6/3/92

Type & Diameter of Boring	Sampling Method
1-7/8"	Hydraulic Sampler

SAMPLES: Inches Driven	SAMPLES: Inches Recovered	SAMPLES: Blows/6" / Sampler	Well Detail	Ground Water	Depth (Feet)	Sample Interval	Graphic Log	Soil Symbol	MATERIALS ENCOUNTERED AND DRILLING CONDITIONS
					0				
					1			SP	Sand fill, with rubble, moderate brown, no odor
					2				
					3				
					4				
					5			SW	Sand and gravel, fining upwards, odor, OVM = 22ppm
					6				BOH
					7				
					8				
					9				
					10				
					11				
					12				
					13				
					14				
					15				
					16				
					17				
					18				

60007150G5TI102

Appendix B

ANALYTICAL DATA SHEET AND CHAIN-OF-CUSTODY

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

June 5, 1992 ChromaLab File No.: 0692025

P.G.& E./TES

Attn: Fred Flint/ Gary Nulty

RE: Nine rush soil samples for Diesel/BTEX analyses

Project Name: OAKLAND P.P.
Project Number: 60007154 EA TESA 22375
Date Sampled: June 3, 1992 Date Submitted: June 3, 1992
Date Extracted: June 4, 1992 Date Analyzed: June 4,1992

RESULTS:

Sample I.D.	Diesel (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (µg/Kg)	Total Xylenes (µg/Kg)
UT1 5.5-6.0	2700	N.D.	N.D.	N.D.	6.3
UT1 6.5-7.0	72	N.D.	130	140	1300
UT2 4.5-5.0	2500	N.D.	10	N.D.	10
UT2 6.5-7.0	3800	N.D.	8.7	28	220
UT3 4.5-5.0	530	N.D.	N.D.	N.D.	10
UT3 5.5-6.0	2900	N.D.	6.7	17	140
UT3 6.5-7.0	170	N.D.	10	22	57
UT4 4.5-5.0	20	N.D.	N.D.	N.D.	N.D.
UT4 5.5-6.0	140	N.D.	N.D.	5.7	29
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE REC.	105%	91%	92%	91%	91%
DUP SPIKE REC	107%	99%	101%	99%	99%
DET. LIMIT	1.0	5.0	5.0	5.0	5.0
METHOD OF ANALYSIS	3550/ 8015	8020	8020	8020	8020

ChromaLab, Inc.

Mary Cappelli
Analytical Chemist

Eric Tam
Laboratory Director

2239 Omega Road, #1 • San Ramon, California 94583
510/831-1788 • Facsimile 510/831-8798
Federal ID #68-0140157

CHAIN OF CUSTODY RECORD

Technical and Ecological Services

3400 Crow Canyon Road, San Ramon, California 94583

SHIP TO: CHROMALAB

ATTENTION: _____ PHONE: _____

Page _____ of _____

60007194 EA TESA 22375

Project Number:	Project Name:	Project Manager:
	OAKLAND P.P.	GARY NULTY 866-5812
Samplers: (Signature)		Field Team Leader:
		FRED FLINT

SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	SAMPLE INFORMATION	STATION LOCATION	NUMBER OF CONTAINERS	TPH-D 3510/8015	BTEX 8020	8270	REMARKS
1	6/2/92	905	SOIL	LT 1 5.5-6.0		1	/	/	/	CHROMALAB FILE # 692025
2	"	910	"	LT 1 6.5-7.0		1	/	/	/	ORDER # 6611
3	"	958	"	LT 2 4.5-5.0		1	/	/	/	
4	"	1001	"	LT 2 6.5-7.0		1	/	/	/	
5	"	1148	"	LT 3 4.5-5.0		1	/	/	/	48 HR TAT
6	"	1155	"	LT 3 5.5-6.0		1	/	/	/	6/5
7	"	1205	"	LT 3 6.5-7.0		1	/	/	/	FAX TO: GARY NULTY
8	"	1110	"	LT 4 4.5-5.0		1	/	/	/	866-5915
9	"	1112	"	LT 4 5.5-6.0		1	/	/	/	AND
										VALERIE GILL / REX BOLL
										415-695-2267

Relinquished By: (Signature)	Date/Time:	Received By: (Signature)	Relinquished By: (Signature)	Date/Time:	Received By: (Signature)	Ship Via:
[signature]	6/3/92 1259	[signature]				
Relinquished By: (Signature)	Date/Time:	Received By: (Signature)	Relinquished By: (Signature)	Date/Time:	Received By: (Signature)	BL/Airbill Number: / Date:
Relinquished By: (Signature)	Date/Time:	Received By: (Signature)	Relinquished By: (Signature)	Date/Time:	Received By: (Signature)	

89-7-632 Distribution: Original Accompanies Shipment; Canary Copy to PG&E; Pink-Sampler

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made.