
**REPORT ON TANK REMOVAL AND
REMEDICATION ACTIVITIES
801 MARITIME STREET**

Prepared for

**PORT OF OAKLAND
Oakland, California**

April 1989

Prepared by

**BASELINE ENVIRONMENTAL CONSULTING
5900 Hollis Street, Suite D
Emeryville, California 94608
415/420-8686**

S9-111

BASELINE

ENVIRONMENTAL CONSULTING

13 April 1989
S9-111

Ms. Michele J. Heffes
PORT OF OAKLAND
77 Jack London Square
Oakland, CA 94607

**Subject: Documentation for Underground Tank Removal and Site Remediation at
801 Maritime, Oakland**

Dear Ms. Heffes:

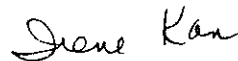
Enclosed please find our report on activities undertaken at the subject site following removal of three underground fuel storage tanks. A copy of the report needs to be submitted to Alameda County and the Regional Water Quality Control Board, San Francisco Bay Region.

Should you have any questions please do not hesitate to contact us at your convenience.

Sincerely,



Yane Nordhav
Principal
Reg. Geologist No. 4009



Irene Kan, MPH
Senior Associate

1YN/IK/cd/S19
Enclosure

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REMEDIATION ACTIVITIES
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**REPORT ON TANK REMOVAL AND REMEDIATION ACTIVITIES
801 MARITIME STREET, OAKLAND**

INTRODUCTION

This report documents the underground tank removal and soil sampling activities performed at 801 Maritime Street in Oakland (see Figure 1). A total of three tanks, ranging from 10,000 to 20,000 gallons, were removed in February 1989. During tank removal, evidence of a fuel spillage was discovered, and the Alameda County Department of Environmental Health was notified. *In accordance with the County requirements for leaking underground storage tanks*, this report documents the remedial activities performed to date, a preliminary assessment of the site conditions, and recommendations for a site investigation.

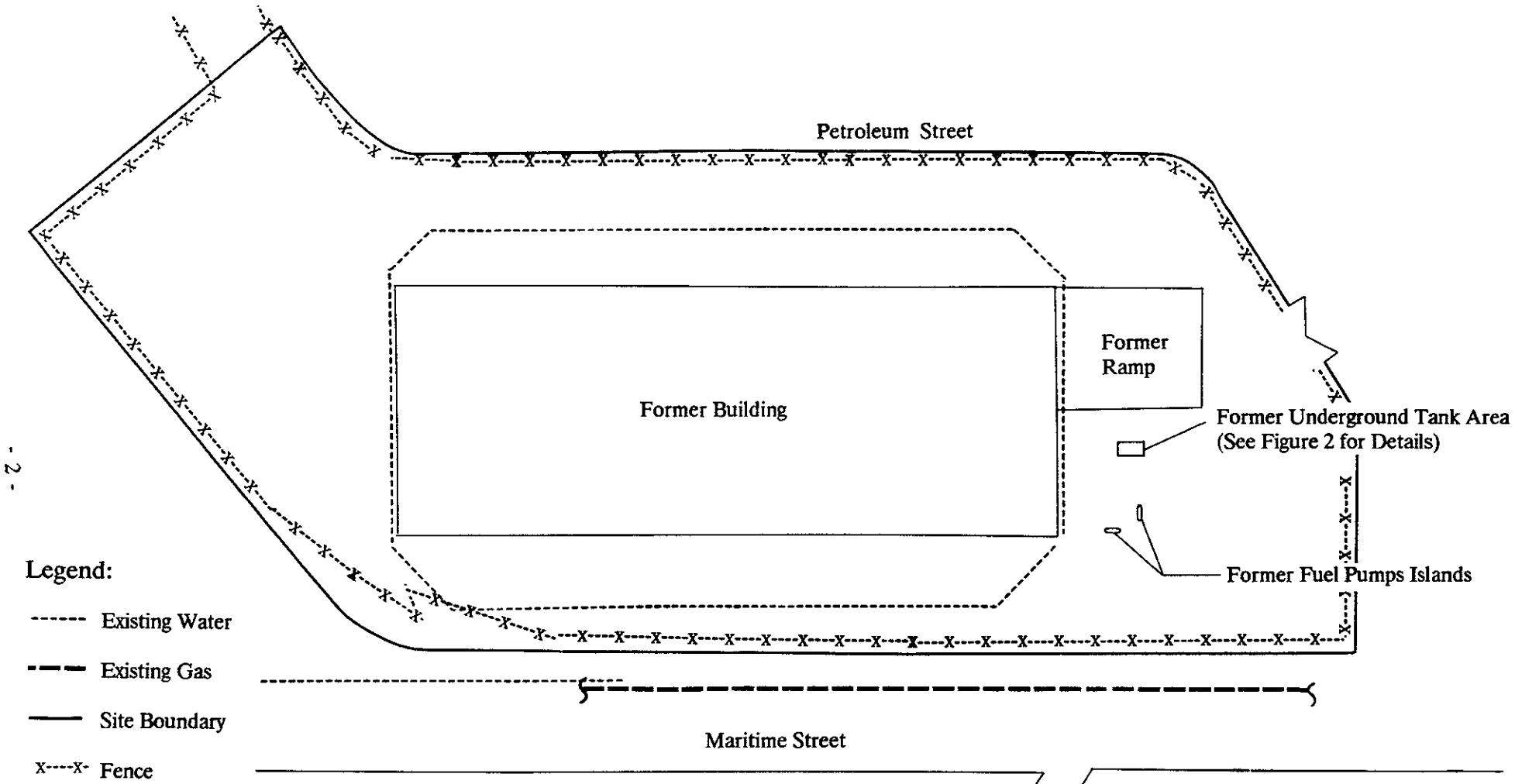
BACKGROUND

Site Description

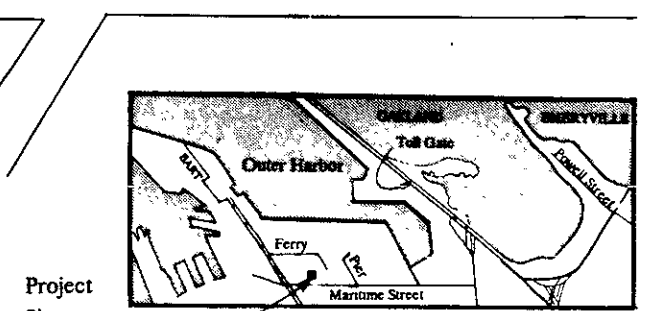
The site is located at the intersection of Maritime and Petroleum streets in Oakland and is currently vacant. Warehouse structures formerly located on the property were demolished and the underground tanks removed in February 1989 as part of Port of Oakland plans to develop the site as a container storage area. At one time, the site contained a foundry operation (unknown years) and a portion of an aboveground tank farm operated by Texaco Company. Groundwater monitoring studies performed on Port of Oakland property located northwest and within 350 feet of the former tank area indicate that the area is subject to tidal actions.

REGIONAL LOCATION AND SITE PLAN

Figure 1



Port of Oakland
801 Maritime Street
Oakland, California



Underground Tanks

The three underground storage tanks formerly located at the site were installed in 1959 (estimated) and were of single-wall steel construction. Two of the tanks had capacities of 10,000 gallons each and one tank, 20,000 gallons (Figure 2). The tanks had been used for storage of diesel. Fill connections indicated that one or two of the tanks may have been used for gasoline storage in the past (Tanks B and/or C on Figure 2). All tanks were filled from the northwest ends. The tanks were anchored to a concrete pad due to shallow groundwater conditions at the site.

Tank Removal Activities

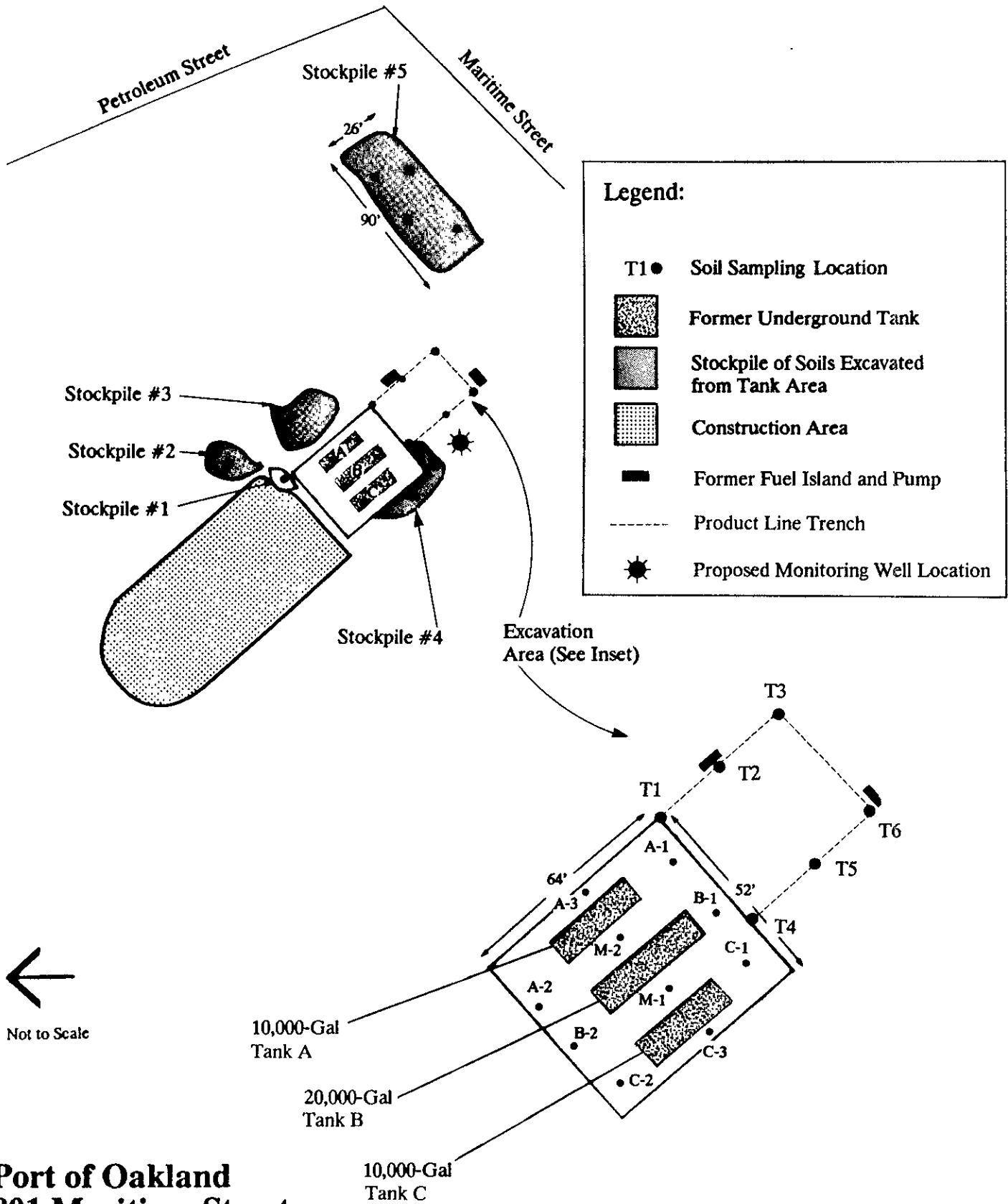
Tank removal and excavation activities were performed by Evans Brothers Inc. of Livermore. Prior to tank removal, all tanks were emptied of their contents; and the associated pipes disconnected and capped. Flammable vapors were purged from the tanks in-situ through the placement of dry ice in the tanks. The three tanks were removed on 16 February 1989, after approval by a representative of the Oakland Fire Department. The tanks were removed from the site as hazardous waste by H & H Ship Service Company of San Francisco; copies of the Uniform Manifest for the tanks are provided in Appendix A. No evidence of corrosion, punctures, or leaks was detected in the tank exteriors during and after tank removal.

Following uncovering of the tank in preparation for tank removal, water accumulated in the tank area (depth unknown). After removal of the tanks, the water level dropped to approximately 10 feet below the ground surface. The accumulated water was removed by H & H Ship Service Company to enable excavation of soils in the former tank area.

During tank removal activities, discolored soils and petroleum odors were detected in the tank area. Water accumulated in the hole contained oil and exhibited a sheen. Floating product was not observed.

SOIL SAMPLING LOCATIONS

Figure 2



←
Not to Scale

**Port of Oakland
801 Maritime Street
Oakland, California**

BASELINE

Remediation Activities

After tank removal, soil samples were collected in the former tank area (see Sampling Activities and Laboratory Results, below). The analytical results confirmed the presence of petroleum hydrocarbons and removal of contaminated soils was undertaken through excavation of the soils overlaying the concrete pad. Excavation at the fill ends was restricted by the on-site construction area (see Figure 2). Contaminated soils (identified by odor and color) were excavated from the former tank area and stockpiled separately and covered with plastic (stockpiles #2 and #5 in Figure 2). The final dimensions of the excavation were 52 feet by 64 feet; and the maximum depth, 12 feet below the ground surface. The former tank area was then filled with concrete rubble from demolition activities at the site, and base rock. Approximately 120 feet of piping were also removed as part of tank closure.

overex?

PRELIMINARY ASSESSMENT

Sampling Activities and Laboratory Results

Immediately after removal of the three tanks, soil and water samples were collected in the former tank area to identify areas of soil contamination; after completion of excavation, samples were collected in the former product line trenches. Soil sampling results are shown in Table 1 and sampling locations, in Figure 2.

Soil samples were collected in clean brass sleeves driven into the soils using a stainless steel corer. After collection of each sample, the sleeve was capped with aluminum foil and plastic caps, taped, labelled, placed in zip-lock bags, and refrigerated in a cooler. The water sample was collected using a teflon bottom-valve sampler. Samples collected from the tank area and stockpiles were transported to Curtis and Tompkins, Ltd. of Berkeley; samples from the product line trenches were transported to Chromalab, Inc. of San Ramon. All samples were analyzed for total volatile and total extractable hydrocarbons, benzene, toluene, xylenes, and ethylbenzene (BTX & E). Proper chain-of-custody procedures were followed. Laboratory reports and chain-of-custody records are included in this report as Appendix B.

TABLE 1
**SOIL AND WATER SAMPLING ANALYTICAL RESULTS
 FOR UNDERGROUND TANK REMOVAL**
 801 Maritime Street, Oakland

Sample ID ¹	Depth (feet)	Total Volatile HC	Total Extractable HC	Benzene	Toluene	Xylenes	Ethylbenzene
Tank Area							
<u>Soil Samples (mg/kg) (2/16/89)</u>							
A-1	8	ND	27 ²	ND	ND	ND	ND
A-2	8	ND	ND	ND	0.017	0.029	ND
A-3	8	ND	ND	ND	ND	ND	ND
B-1	9.5	ND	ND	ND	ND	ND	ND
B-2	9.5	ND	3,600 ^{3,9}	ND	ND	ND	ND
C-1	6	ND	ND	0.025	0.035	0.045	0.025
C-2	6	25	1,600 ^{4,9}	<0.5	<0.5	<0.5	<0.5
C-3	6	ND	ND	ND	ND	ND	ND
M-1	10	ND	ND	ND	0.1	0.145	ND
M-2	10	10	ND	ND	0.26	0.4	0.08
<u>Tank Area Water Sample (mg/L) (2/16/89)</u>							
W-1/W-2/W-3		0.48	21	0.019	0.026	0.078	0.017
<u>Stockpile Soil Samples (mg/kg) (2/16/89 and 2/21/89)</u>							
ST-1	-	ND	ND	ND	ND	ND	ND
ST-2	-	ND	920 ⁵	ND	ND	ND	ND
ST-3a & b ⁶	-	ND	ND	ND	ND	ND	ND
ST-4a & b ⁶	-	ND	ND	ND	ND	ND	ND
ST-5a & b ⁶	-	ND	110 ²	ND	ND	ND	ND
ST-5c & d ⁶	-	<2.5	149	ND	ND	0.0062	ND
<u>Product Line Trench Samples (mg/kg) (4/7/89)</u>							
T-1	1.5	ND ⁷	6.6	0.0063	ND	ND	0.0051
T-2	1	ND ⁷	17.8	0.0167	ND	ND	ND
T-3	1	ND ⁷	ND ⁸	ND	ND	ND	ND
T-4	0.25	ND ⁷	ND ⁸	ND	ND	ND	ND
T-5	0.5	ND ⁷	ND ⁸	ND	ND	ND	ND
T-6	0.5	2.6	ND ⁸	0.0165	0.0051	ND	ND
Detection							
Limit (mg/kg)		10	10	0.005	0.005	0.005	0.005
(mg/L)		0.05	500	0.001	0.001	0.001	0.001
EPA Method		8015/5030	8015	8020/602	8020/602	8020/602	8020/602

TABLE 1 (continued)

-
- ¹ Samples collected by Baseline Environmental Consulting. See Figure 1 for soil sampling locations. Water sample was collected in tank area (in three containers).
² As diesel.
³ Quantitation based on largest peaks in the C-6 to C-20 boiling range.
⁴ Quantitation based on largest peaks in the C-6 to C-9 boiling range.
⁵ Quantitation based on largest peaks in the C-12 to C-24 boiling range.
⁶ Composite sample.
⁷ Detection limit = 2.5 mg/kg.
⁸ Detection limit = 5 mg/kg.
⁹ Soils subsequently removed and placed in stockpiles #2 and #5.
- = Not Applicable.
NA = not analyzed.
ND = not detected.

Tank Area

Ten soil samples and one water sample were collected in the former tank area. Soil samples prefixed with A, B, and C (see Figure 2 and Table 1) were collected in the unsaturated zone using a backhoe. The analytical results indicated that: 1) releases of petroleum hydrocarbons had occurred; 2) primarily diesel hydrocarbons were released; 3) the fill ends of Tanks B and C (samples B-2 and C-2, respectively) contained the highest diesel hydrocarbon concentrations (3,600 and 1,600 mg/kg, respectively); and 4) gasoline and aromatic (BTX & E) hydrocarbons were present in the vicinity of tank C (samples C-1 and C-2). The soils containing concentrations of hydrocarbons in excess of 1,000 mg/kg were subsequently removed and stockpiled in stockpiles #2 and #5. The walls of the excavation in those areas were inaccessible for sampling after soils removal due to site constraints.

The water sample analytical results indicated the presence of 0.48 mg/L of gasoline, 21 mg/L of diesel, 0.019 mg/L of benzene, 0.026 mg/L of toluene, 0.078 mg/L of xylenes and 0.017 mg/L of ethylbenzene. The presence of hydrocarbons in the water may have been due to tank removal activities, however.

Product Line Trenches

Petroleum hydrocarbons were detected in samples collected from product line trenches at depths of less than 1.5 feet. The concentrations ranged from non-detected to 17.8 mg/kg and aromatic hydrocarbons, at concentrations not exceeding 0.02 mg/kg.

Excavated Soils

After completion of excavation, stockpiles were sampled to identify appropriate disposal options; the analytical results are shown in Table 1. Stockpiles 2 and 5 contained diesel hydrocarbons ranging from 110 mg/kg to 920 mg/kg which are below the California Department of Health Services (DHS) level of 1,000 mg/kg of petroleum hydrocarbons in soils for classification of hazardous waste. Petroleum hydrocarbons were not detected in the other stockpiles above detection limits.

how - where disposed?

Regulatory Agency Notification

Local and state regulatory requirements for investigations of leaking fuel tanks require an evaluation of the potential impacts of unauthorized releases on the beneficial uses of ground and surface water. In Oakland, the Alameda County Department of Environmental Health is the lead agency overseeing remediation for leaking underground tank sites, working jointly with the Regional Water Quality Control Board, San Francisco Bay Region.

Due to the discovery of petroleum hydrocarbons at the site, an Underground Storage Tank Unauthorized Release Report was completed by BASELINE and submitted to the County. A copy of the report is included as Appendix C.

Analytical results were transmitted by the Port of Oakland to the County Hazardous Materials Division in March 1989. Based upon the results, the County requested that the Port submit an Unauthorized Release Report, establish the extent of contamination, submit a preliminary assessment, perform a site investigation, and develop a final remediation plan.

CONCLUSIONS

Based upon field observations and analytical results from soil and water sampling, the following conclusions are made:

- An unauthorized release of fuel product has occurred at the project site. In the absence of any evidence of corrosion, punctures, or holes in the tank walls, the fuel release most probably resulted from spillage during filling operations.
- Petroleum hydrocarbons in the water sample may have resulted from tank removal activities.
- Remediation activities consisting of removal of significantly contaminated soils from the excavation has been completed. *Follow up sampling for verification?*
- Excavated soils are not considered hazardous waste based on sampling of stockpiled materials. *920 ppm?*

RECOMMENDATIONS AND WORK PLAN FOR A SITE INVESTIGATION

A preliminary groundwater investigation will be performed to determine the potential magnitude of groundwater contamination underlying the site:

- A groundwater monitoring well will be installed within 10 feet of the former tank area to identify whether the groundwater underlying the site has been affected by the fuel release. Since the site is subject to tidal influences, construction of three wells to establish groundwater gradient is not deemed necessary. The proposed well location is shown in Figure 2.
- The well will consist of two-inch PVC casing and screen. The screen location will depend on field conditions but would be installed to account for shall groundwater fluctuations.

- During well installation, soil samples will be collected in the unsaturated soil column at five-foot intervals unless field observations indicate that more frequent sampling would be appropriate. Soil samples will be collected using a California Modified sampler fitted onto a hollow-stem drill rig. A diagram showing the recommended well construction, and recommended soil and groundwater sampling methods are included as Appendix D. Gravel pack, bentonite, and a cement-bentonite grout should be tremied into the well through the hollow stem.

- Soil and groundwater samples will be analyzed for total volatile and total extractable hydrocarbons, benzene, toluene, xylenes, and ethylbenzene.

Hydrogeological data from the project site will be evaluated to identify whether the beneficial uses of ground and surface water have been affected.

Further remedial actions will be determined based upon the results of the preliminary groundwater investigation.

Alternative treatment methods will be investigated for the excavated soils containing petroleum hydrocarbons, which are currently being stored on-site.

APPENDIX A
UNIFORM HAZARDOUS WASTE MANIFESTS

Please print or type. (Form designed for use on elite (12-pitch typewriter).)

IN CASE OF AN EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-9802; WITHIN CALIFORNIA CALL 1-800-852-7550

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. <i>CAKADDDV1410280R1V1212</i>		Manifest Document No. <i>1212</i>		2. Page 1 of		Information in the shaded areas is not required by Federal law.						
3. Generator's Name and Mailing Address <i>PORT OF OAKLAND 66 JACK LONDON SQ OAKLAND, CA</i>						A. State Manifest Document Number 88231188								
4. Generator's Phone (415) <i>444-3188</i>						B. State Generator's ID								
5. Transporter 1 Company Name <i>H+H Ship Service CO</i>			6. US EPA ID Number <i>KADDDV177V1168</i>			C. State Transporter's ID <i>003758</i>		D. Transporter's Phone <i>415-5434836</i>						
7. Transporter 2 Company Name			8. US EPA ID Number			E. State Transporter's ID		F. Transporter's Phone						
9. Designated Facility Name and Site Address <i>H+H Ship Service CO 320 CHINA BASIN SAN FRANCISCO CAL</i>						10. US EPA ID Number <i>KADDDV177V1168</i>								
						G. State Facility's ID		H. Facility's Phone <i>415-5434835</i>						
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)						12. Containers		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.		
a. <i>WASTE EMPTY DIESEL TANK UN-1993</i>						No. Type <i>010VTP</i>		<i>10</i>		<i>10/11/89</i>		State <i>CA</i>		
b.												State EPA/Other		
c.												State EPA/Other		
d.												State EPA/Other		
J. Additional Descriptions for Materials Listed Above <i>EMPTY UNDERGROUND DIESEL STORAGE TANK WITH LESS THAN ONE GALLON RESIDUAL LIQUID IN EACH TANK</i>						K. Handling Codes for Wastes Listed Above								
						a.		b.		c.		d.		
15. Special Handling Instructions and Additional Information <i>NOTE</i>														
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.														
Printed/Typed Name <i>JOHN STEWART</i>			Signature <i>[Signature]</i>			Month Day Year <i>10/21/89</i>								
17. Transporter 1 Acknowledgement of Receipt of Materials						Printed/Typed Name <i>ROBERT S. HANSEN</i>			Signature <i>[Signature]</i>			Month Day Year <i>10/21/89</i>		
18. Transporter 2 Acknowledgement of Receipt of Materials						Printed/Typed Name			Signature			Month Day Year		
19. Discrepancy Indication Space														
20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19						Printed/Typed Name			Signature			Month Day Year		

GENERATOR

TRANSPORTER

FACILITY

Please print or type (Form designed for use on elite (12-pitch typewriter).)

88231139
 IN CASE OF AN EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA CALL 1-800-852-7550

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. CACD0011H021815311139		Manifest Document No. 311139		2 Page 1 of 1		Information in the shaded areas is not required by Federal law				
3 Generator's Name and Mailing Address PORT OF OAKLAND 66 JACK LONDON SQ OAKLAND CA 94612						A. State Manifest Document Number 88231139						
4 Generator's Phone (415) 444-3118						B. State Generator's ID						
5 Transporter 1 Company Name H+H SHIP SERVICE CO			6. US EPA ID Number EAD1064771168			C. State Transporter's ID 003759		D. Transporter's Phone 455434835				
7 Transporter 2 Company Name						E. State Transporter's ID		F. Transporter's Phone				
9 Designated Facility Name and Site Address H+H SHIP SERVICE CO 220 CHINA BASIN SAN FRANCISCO, CA 94107						10 US EPA ID Number CADDD04771168		G. State Facility's ID				
						H. Facility's Phone 455434835						
11 US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)					12. Containers		13. Total Quantity		14. Unit Wt/Vol			
a. EMPTY GASOLINE TANK, WASTE FLAMMABLE UN1203					No.				I. Waste No.			
					Type				State			
									EPA/Other			
									State			
									EPA/Other			
J. Additional Descriptions for Materials Listed Above EMPTY UNDERGROUND STORAGE TANK WITH LESS THAN 1% RESIDUAL LIQUID IN TANK					K. Handling Codes for Wastes Listed Above							
					a.		b.					
					c.		d.					
15. Special Handling Instructions and Additional Information GLOVES												
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford												
Printed/Typed Name JOHN STEWART				Signature <i>John Stewart</i>			Month Day Year 12/16/89					
17 Transporter 1 Acknowledgement of Receipt of Materials				Printed/Typed Name FRED MOGAN			Signature <i>Fred Mogan</i>			Month Day Year 12/16/89		
18 Transporter 2 Acknowledgement of Receipt of Materials				Printed/Typed Name			Signature			Month Day Year		
19 Discrepancy Indication Space												
20 Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19												
Printed/Typed Name				Signature			Month Day Year					

GENERATOR

TRANSPORTER

FACILITY

Please print or type (Form designed for use on elite (12-pitch typewriter))

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. CA1910101140285311473		Manifest Document No. 311473		2. Page 1 of 1		Information in the shaded areas is not required by Federal law					
3. Generator's Name and Mailing Address PORT OF OAKLAND 66 JACK LONDON SQ OAKLAND CA 94604						A. State Manifest Document Number 88231473							
4. Generator's Phone (415) 444-3188						B. State Generator's ID							
5. Transporter 1 Company Name HEIL SHIP SERVICE						8. US EPA ID Number CA0004771168		C. State Transporter's ID 003745					
7. Transporter 2 Company Name						B. US EPA ID Number		D. Transporter's Phone 415-543 4835					
9. Designated Facility Name and Site Address HEIL SHIP SERVICE CO 220 CHINA BASIN ST SAN FRANCISCO CA 94107						10. US EPA ID Number CA1910101140285311473		E. State Transporter's ID					
								F. Transporter's Phone					
								G. State Facility's ID CA1910101140285311473					
								H. Facility's Phone 415-543 0906					
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)						12. Containers No. Type		13. Total Quantity		14. Unit Wt/Vol		1. Waste No.	
a. WASTE COMBUSTIBLE EMPTY DIESEL TANK N.A 1993						001TR 00010115		20,88				State 512 EPA/Other	
b.												State EPA/Other	
c.												State EPA/Other	
d.												State EPA/Other	
J. Additional Descriptions for Materials Listed Above EMPTY UNDERGROUND DIESEL TANK DRY ICE INSERTED AND READY FOR DISPOSAL.						K. Handling Codes for Wastes Listed Above a. b. c. d.							
15. Special Handling Instructions and Additional Information NONE													
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford													
Printed/Typed Name JOHN STEWART						Signature John Stewart		Month Day Year 12/16/89					
17. Transporter 1 Acknowledgement of Receipt of Materials Printed/Typed Name ESTEBAN M. PENALVER						Signature [Signature]		Month Day Year 10/21/89					
18. Transporter 2 Acknowledgement of Receipt of Materials Printed/Typed Name						Signature		Month Day Year					
19. Discrepancy Indication Space													
20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19. Printed/Typed Name													
						Signature		Month Day Year					

IN CASE OF AN EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802, WITHIN CALIFORNIA CALL 1-800-852-7550

GENERATOR

Do Not Write Below This Line

APPENDIX B

LABORATORY REPORTS AND CHAIN-OF-CUSTODY RECORDS



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

LABORATORY NUMBER: 16844
 CLIENT: BASELINE
 JOB #: S9-111
 LOCATION: P OF O/801 MARITIME

DATE RECEIVED: 02-17-89
 DATE ANALYZED: 02-17-89
 DATE REPORTED: 02-23-89
 PAGE 1 OF 4

Total Petroleum Hydrocarbons in Soils & Wastes
 EPA 8015 (Modified)
 Extraction Method: EPA 3550

LAB ID	CLIENT ID	GASOLINE (mg/Kg)	KEROSINE (mg/Kg)	DIESEL (mg/Kg)	OTHER (mg/Kg)
16844-1	ST - 1	ND(10)	ND(10)	ND(10)	ND(10)
16844-2	ST - 2	ND(10)	ND(10)	ND(10)	920 *
16844-3/4	COMPOSITE ST - 3a ST - 3b	ND(10)	ND(10)	ND(10)	ND(10)

* Fingerprint pattern does not match Hydrocarbon Standards. Quantitation based on largest peaks withing C12-C24 boiling range.

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

Duplicate: Relative % Difference	16
Spike: % Recovery	97


 LABORATORY DIRECTOR



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

LABORATORY NUMBER: 16844-1
CLIENT: BASELINE
JOB #: S9-111
LOCATION: P OF O/801 MARITIME
SAMPLE ID: ST - 1

DATE RECEIVED: 02-17-89
DATE ANALYZED: 02-17-89
DATE REPORTED: 02-23-89
PAGE 2 OF 4

EPA 8020: Volatile Aromatic Hydrocarbons in Soils & Wastes
Extraction Method: EPA 5030 - Purge & Trap

Table with 3 columns: COMPOUND, Result ug/Kg, LOD ug/Kg. Rows include Benzene, Toluene, Ethyl Benzene, Total Xylenes, Chlorobenzene, 1,4-Dichlorobenzene, 1,3-Dichlorobenzene, and 1,2-Dichlorobenzene.

ND = None Detected. Limit of detection (LOD) in last column.

QA/QC:

Duplicate: Relative % Difference 15
Average Spike Recovery % 99



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

LABORATORY NUMBER: 16844-2
 CLIENT: BASELINE
 JOB #: S9-111
 LOCATION: P OF O/801 MARITIME
 SAMPLE ID: ST - 2

DATE RECEIVED: 02-17-89
 DATE ANALYZED: 02-17-89
 DATE REPORTED: 02-23-89
 PAGE 3 OF 4

EPA 8020: Volatile Aromatic Hydrocarbons in Soils & Wastes
 Extraction Method: EPA 5030 - Purge & Trap

COMPOUND	Result ug/Kg	LOD ug/Kg
Benzene.....	ND	5
Toluene.....	ND	5
Ethyl Benzene.....	ND	5
Total Xylenes.....	ND	5
Chlorobenzene.....	ND	5
1,4-Dichlorobenzene.....	ND	5
1,3-Dichlorobenzene.....	ND	5
1,2-Dichlorobenzene.....	ND	5

ND = None Detected. Limit of detection (LOD) in last column.

QA/QC:

Duplicate: Relative % Difference 15
 Average Spike Recovery % 99



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

LABORATORY NUMBER: 16844-3/4
 CLIENT: BASELINE
 JOB #: S9-111
 LOCATION: P OF O/801 MARITIME
 SAMPLE ID: COMPOSTE ST - 3a/ST - 3b

DATE RECEIVED: 02-17-89
 DATE ANALYZED: 02-17-89
 DATE REPORTED: 02-23-89
 PAGE 4 OF 4

EPA 8020: Volatile Aromatic Hydrocarbons in Soils & Wastes
 Extraction Method: EPA 5030 - Purge & Trap

COMPOUND	Result ug/Kg	LOD ug/Kg
Benzene.....	ND	5
Toluene.....	ND	5
Ethyl Benzene.....	ND	5
Total Xylenes.....	ND	5
Chlorobenzene.....	ND	5
1,4-Dichlorobenzene.....	ND	5
1,3-Dichlorobenzene.....	ND	5
1,2-Dichlorobenzene.....	ND	5

ND = None Detected. Limit of detection (LOD) in last column.

QA/QC:

Duplicate: Relative % Difference 15
 Average Spike Recovery % 99



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

LABORATORY NUMBER: 16845
CLIENT: BASELINE
JOB NUMBER: S9-111
JOB LOCATION: 801 MARITIME

DATE RECEIVED: 02/17/89
DATE ANALYZED: 02/28/89
DATE REPORTED: 03/06/89
PAGE 1 OF 4

Total Volatile Hydrocarbons (TVH) by EPA 8015
Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 602/8020
Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	TVH *	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES
		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
16845-1	W-1/W-2	480	19	26	17	78

* NOTE: Fingerprint pattern does not match gasoline standard.

ND = None Detected; Limit of detection is indicated in parentheses.

QA/QC SUMMARY

%RPD	12
%RECOVERY	86

RECEIVED

FEB 7 1989

BASELINE

Stephen L. ...
LABORATORY DIRECTOR



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

LABORATORY NUMBER: 16845
 CLIENT: BASELINE
 JOB #: S9-111
 LOCATION: 801 MARITIME

DATE RECEIVED: 02/17/89
 DATE ANALYZED: 02/22/89
 DATE REPORTED: 03/06/89
 PAGE 2 OF 4

Total Heavy Petroleum Hydrocarbons in Aqueous Solutions
 EPA 8015 (Modified)
 Extraction Method: EPA 3510

LAB ID	CLIENT ID	KEROSINE (mg/L)	DIESEL (mg/L)	OTHER (mg/L)
16845-3	W-3	ND(0.5)	21	ND(0.5)

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

Duplicate: Relative % Difference	11
Spike: % Recovery	126



LABORATORY NUMBER: 16845
 CLIENT: BASELINE
 JOB #: S9-111
 LOCATION: 801 MARITIME

DATE RECEIVED: 01/26/89
 DATE ANALYZED: 02/21/89
 DATE REPORTED: 03/06/89
 PAGE 3 OF 4

Total Heavy Petroleum Hydrocarbons in Soils & Wastes
 EPA 8015 (Modified)
 Extraction Method: EPA 3550

LAB ID	CLIENT ID	KEROSINE (mg/Kg)	DIESEL (mg/Kg)	OTHER (mg/Kg)
16845-4	M-2	ND(10)	ND(10)	ND(10)
16845-5	A-1	ND(10)	27	ND(10)
16845-6	A-2	ND(10)	ND(10)	ND(10)
16845-7	A-3	ND(10)	ND(10)	ND(10)
16845-8	B-1	ND(10)	ND(10)	ND(10)
16845-9	B-2	ND(10)	ND(10)	3,600 *
16845-10	C-1	ND(10)	ND(10)	ND(10)
16845-11	C-2	ND(10)	ND(10)	1,600 **
16845-12	C-3	ND(10)	ND(10)	ND(10)
16845-13	M-1	ND(10)	ND(10)	ND(10)

* Fingerprint pattern does not match hydrocarbon standards; Quantitation based on largest peaks within C6-C20 boiling range.

** Fingerprint pattern does not match hydrocarbon standards; Quantitation based on largest peaks within C6-C9 boiling range.

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

Duplicate: Relative % Difference	4
Spike: % Recovery	107



LABORATORY NUMBER: 16845
 CLIENT: BASELINE
 JOB NUMBER: S9-111
 JOB LOCATION: 801 MARITIME

DATE RECEIVED: 02/17/89
 DATE ANALYZED: 02/28/89
 DATE REPORTED: 03/06/89
 PAGE 4 OF 4

Total Volatile Hydrocarbons (TVH) by EPA 8015
 Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 602/8020
 Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	TVH * (mg/Kg)	BENZENE (ug/Kg)	TOLUENE (ug/Kg)	ETHYL BENZENE (ug/Kg)	TOTAL XYLENES (ug/Kg)
16845-4	M-2	10	ND(5)	260	80	400
16845-5	A-1	ND(10)	ND(5)	ND(5)	ND(5)	ND(5)
16845-6	A-2	ND(10)	ND(5)	17	ND(5)	29
16845-7	A-3	ND(10)	ND(5)	ND(5)	ND(5)	ND(5)
16845-8	B-1	ND(10)	ND(5)	ND(5)	ND(5)	ND(5)
16845-9	B-2	ND(10)	ND(5)	ND(5)	ND(5)	ND(5)
16845-10	C-1	ND(10)	25	35	25	45
16845-11	C-2	25	ND(500)	ND(500)	ND(500)	ND(500)
16845-12	C-3	ND(10)	ND(5)	ND(5)	ND(5)	ND(5)
16845-13	M-1	ND(10)	ND(5)	100	ND(5)	145

* NOTE: Fingerprint pattern does not match gasoline standard.

ND = None Detected; Limit of detection is indicated in parentheses.

QA/QC SUMMARY

%RPD	12
%RECOVERY	86



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

LABORATORY NUMBER: 16856
CLIENT: BASELINE
JOB #: S9-111
LOCATION: 801 MARITIME

RECEIVED

FEB 23 1989

BASELINE

DATE RECEIVED: 02/21/89
DATE ANALYZED: 02/21/89
DATE REPORTED: 02/27/89

Total Petroleum Hydrocarbons in Soils & Wastes
EPA 8015 (Modified)
Extraction Method: EPA 3550

LAB ID	COMPOSITE ID	GASOLINE (mg/Kg)	KEROSINE (mg/Kg)	DIESEL (mg/Kg)	OTHER (mg/Kg)
16856-1,2	ST-4a, ST-4b	ND(10)	ND(10)	ND(10)	ND(10)

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

Duplicate: Relative % Difference	4
Spike: % Recovery	107

LABORATORY DIRECTOR

BASELINE

315 Washington Street
Oakland, CA 94607
(415) 763-7037

CHAIN OF CUSTODY RECORD

Turn-Around Time 10X MCL
Lab UIC & TAMPKINS
Contact Person W. K. K.

Project No.		Project Name and Location						Analysis										Remarks	Detection Limits
S9-111		PFO/EO1 Maritime						<div style="text-align: center;"> TPH Light TPH Heavy BTX (METHANOL) </div>											
Samplers: (Signature)		No. Station	Date	Time	Media	Depth	Compo-sites											No. of Con-tainers	Station Location
Jesse Kan		A-1	2/16/87	13:47	soil	4'													
		A-2	2/16/87	14:13	soil	8'													
		A-3	2/16/87	14:17	soil	8'													
		B-1	2/16/87	13:45	soil	9.5'													
		B-2	2/16/87	14:10	soil	9.5'													
		C-1	2/16/87	13:45	soil	6'													
		C-2	2/16/87	14:08	soil	6'													
		C-3	2/16/87	14:05	soil	6'													
		4-1	2/16/87	13:50	soil	6'													

Relinquished by: (Signature) <i>Jesse Kan</i>	Date / Time 2/16/87 4:10 PM	Received by: (Signature) <i>Mesa Amaya</i>	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature) <i>Mesa Amaya</i>	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) <i>W. K. K.</i>	Date / Time 2/17 10:00	Remarks: K-100 E guideline 1/11/88	

BASELINE

315 Washington Street
Oakland, CA 94607
(415) 763-7037

CHAIN OF CUSTODY RECORD

Turn-Around Time Normal

Lab Curtis & Tompkins

Contact Person _____

Project No.		Project Name and Location					Analysis										Remarks	Detection Limits
57-111		P of O / 401 Maritime					TPH Light TPH Heavy BTX & E PAHs Manganese Total Hydrocarbons Manganese 8016 Total Hydrocarbons											
Samplers: (Signature)																		
Jane Kan																		
No. Station	Date	Time	Media	Depth	Compo- sites	No. of Con- tainers	Station Location										Remarks	Detection Limits
M-2	2/14/89	13:55	soil	6'														
ST-1	2/14/89	14:30	soil	N/A													24-hr	
ST-2	2/14/89	14:40	soil	N/A													24-hr	
ST 3a	2/14/89	14:45	soil	N/A	X												} composite into 1 24-hr sample	
ST 3b	2/14/89	14:50	soil	N/A														
W-1	2/14/89	13:30	water															
W-2	2/14/89	13:33	water															
W-3	2/14/89	13:45	water															

Relinquished by: (Signature) Jane Kan	Date / Time 2/14/89 4:00 PM	Received by: (Signature) Mesa Amaya	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature) Mesa Amaya	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) Mesa Amaya	Date / Time 2/17 10:00	Remarks water's Gentle in ...	

BASELINE

315 Washington Street
Oakland, CA 94607
(415) 763-7037

CHAIN OF CUSTODY RECORD

Turn-Around Time 24-hr
Lab Curtis & Tompkins
Contact Person

Project No.		Project Name and Location						Analysis										Remarks	Detection Limits
59-111		801 Maritime						ANALYZED FOR TOTAL HYDROCARBONS											
Samplers: (Signature)																			
Jessa Anaya																			
No. Station	Date	Time	Media	Depth	Compo-sites	No. of Con-tainers	Station Location										Remarks	Detection Limits	
ST-4a	2/7/89	10:40	soil	N/A	X														
ST-4b	2/7/89	10:50	soil	N/A	X														

Relinquished by: (Signature) <i>Jessa Anaya</i>	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) <i>[Signature]</i>	Date / Time 2/21 9:00	Remarks: RWQCB Guidelines to June '88	

CHROMALAB, INC.

Analytical Laboratory
Specializing in G. C.

- Environmental Analysis
- Hazardous Waste
- Drinking Water
- Research and Method Development
- Consultation
- Training

March 8, 1989

ChromaLab File # 0389005

Baseline Environmental Consulting

Attn: Irene Kan

Re: Four soil samples marked ST-5a,b,c, and d for gasoline, BTEX and TEPH analysis.

Duration of Analysis: March 6-8, 1989

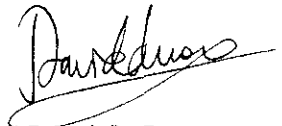
Results:

Sample No.	Gasoline (ppm)	Diesel (ppm)	Benzene (ppb)	Toluene (ppb)	Ethyl Benzene (ppb)	Total Xylenes (ppb)
ST-5a+b	N.D.	110	N.D.	N.D.	N.D.	N.D.
ST-5c+d	<2.5	149	N.D.	N.D.	6.2	<5.0
Blank	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Rec.	109.3%	105.2%	90.4%	93.7%	86.4%	87.0%
MDL	2.5	5.0	5.0	5.0	5.0	5.0
Method #	mod.8015	mod.8015	8020	8020	8020	8020

ChromaLab, Inc.



Eric Tam
Chief Chemist



David Duong
Senior Chemist

5900 Hollis Street, Suite D
 Emeryville, CA 94608
 (415) 420-8686

CHAIN OF CUSTODY RECORD

Turn-Around Time Normal
 Lab G&T Chromalab 831-1758
 Contact Person PIERRE

Project No:		Project Name and Location						Analysis										Remarks	Detection Limits		
S9-111		801 Maritime Street						TWA TEH (Diesel)													
Samplers: (Signature)																					
William K. Scott																					
No. Station	Date	Time	Media	Depth ft	Compo-sites	No. of Containers	Station Location														
T1	4-7-89		Soil	1.5- 2.0		1							X	X							
T2	4-7-89		Soil	1.0- 1.5		1							X	X							
T3	4-7-89		Soil	1.0- 1.5		1							X	X							
T4	4-7-89		Soil	.25- .75		1							X	X							
T5	4-7-89		Soil	.5- 1.0		1							X	X							
T6	4-7-89		Soil	.5 1.0		1							X	X							

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
		<i>William K. Scott</i>			
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:	
<i>William K. Scott</i>	4-7-89 1:36 PM				

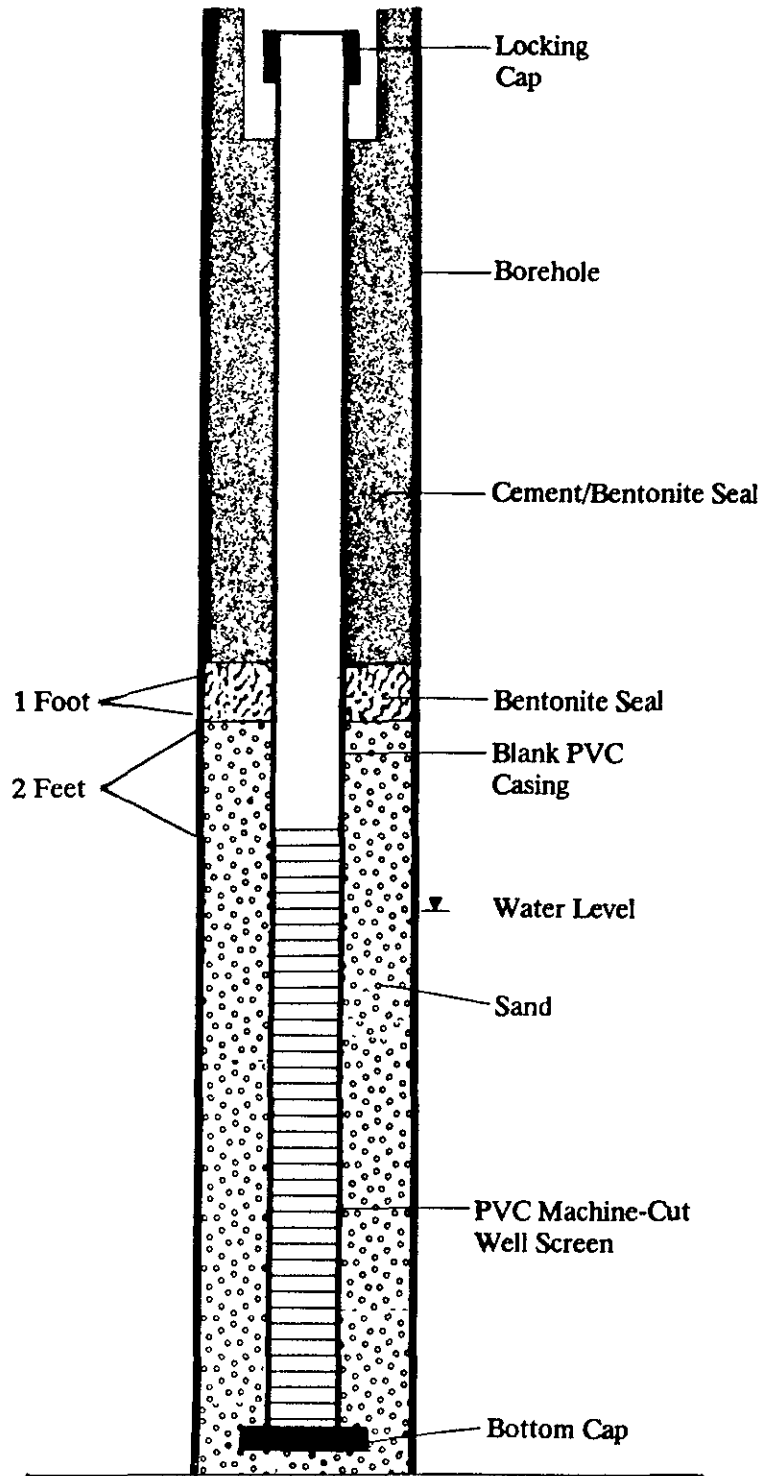
APPENDIX C

UNDERGROUND STORAGE TANK UNAUTHORIZED RELEASE/CONTAMINATION SITE REPORT

UNDERGROUND STORAGE TANK UNAUTHORIZED RELEASE (LEAK) / CONTAMINATION SITE REPORT

EMERGENCY <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		HAS STATE OFFICE OF EMERGENCY SERVICES REPORT BEEN FILED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		FOR LOCAL AGENCY USE ONLY I HEREBY CERTIFY THAT I AM A DESIGNATED GOVERNMENT EMPLOYEE AND THAT I HAVE REPORTED THIS INFORMATION TO LOCAL OFFICIALS PURSUANT TO SECTION 25180.7 OF THE HEALTH AND SAFETY CODE.		
REPORT DATE Oct 21 10 7 8 9		CASE #		SIGNED _____ DATE _____		
REPORTED BY	NAME OF INDIVIDUAL FILING REPORT Yane Nordhav		PHONE (415) 763-7037		SIGNATURE 	
	REPRESENTING <input checked="" type="checkbox"/> OWNER/OPERATOR <input type="checkbox"/> REGIONAL BOARD <input type="checkbox"/> LOCAL AGENCY <input type="checkbox"/> OTHER		COMPANY OR AGENCY NAME BASELINE ENVIRONMENTAL CONSULTING			
ADDRESS 315 Washington Street Oakland CA 94607						
RESPONSIBLE PARTY	NAME Port of Oakland		CONTACT PERSON Michele Heffes		PHONE (415) 839-2282	
	ADDRESS 66 Jack London Square Oakland CA 94607					
SITE LOCATION	FACILITY NAME (IF APPLICABLE) former Parker Warehouse		OPERATOR Port of Oakland		PHONE ()	
	ADDRESS 801 Maritime Oakland Alameda 94607					
	CROSS STREET Petroleum		TYPE OF AREA <input type="checkbox"/> COMMERCIAL <input checked="" type="checkbox"/> INDUSTRIAL <input type="checkbox"/> RURAL <input type="checkbox"/> RESIDENTIAL <input type="checkbox"/> OTHER		TYPE OF BUSINESS <input type="checkbox"/> RETAIL FUEL STATION <input type="checkbox"/> FARM <input checked="" type="checkbox"/> OTHER warehouse	
IMPLEMENTING AGENCIES	LOCAL AGENCY Alameda County		CONTACT PERSON Mary Jo Meyers		PHONE (415) 271-4320	
	REGIONAL BOARD San Francisco Bay		PHONE (415) 464-1255			
SUBSTANCES INVOLVED	(1) NAME Gasoline				QUANTITY LOST (GALLONS) _____ <input checked="" type="checkbox"/> UNKNOWN	
	(2) NAME Diesel				QUANTITY LOST (GALLONS) _____ <input checked="" type="checkbox"/> UNKNOWN	
DISCOVERY/ABATEMENT	DATE DISCOVERED 08 21 6 8 9		HOW DISCOVERED <input type="checkbox"/> INVENTORY CONTROL <input type="checkbox"/> SUBSURFACE MONITORING <input type="checkbox"/> NUISANCE CONDITIONS <input type="checkbox"/> TANK TEST <input checked="" type="checkbox"/> TANK REMOVAL <input type="checkbox"/> OTHER			
	DATE DISCHARGE BEGAN _____ <input checked="" type="checkbox"/> UNKNOWN		METHOD USED TO STOP DISCHARGE (CHECK ALL THAT APPLY) <input type="checkbox"/> REMOVE CONTENTS <input type="checkbox"/> REPLACE TANK <input checked="" type="checkbox"/> CLOSE TANK <input type="checkbox"/> REPAIR TANK <input type="checkbox"/> REPAIR PIPING <input type="checkbox"/> CHANGE PROCEDURE <input type="checkbox"/> OTHER			
	HAS DISCHARGE BEEN STOPPED? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, DATE 0 2 1 6 8 9					
SOURCE/CAUSE	SOURCE OF DISCHARGE <input type="checkbox"/> TANK LEAK <input checked="" type="checkbox"/> UNKNOWN <input type="checkbox"/> PIPING LEAK <input type="checkbox"/> OTHER		TANKS ONLY/CAPACITY 1-20,000 1-8,000 GAL. 1-10,000 1-8,000 AGE 30 YRS <input type="checkbox"/> UNKNOWN		MATERIAL <input type="checkbox"/> FIBERGLASS <input checked="" type="checkbox"/> STEEL <input type="checkbox"/> OTHER	
	CAUSE(S) <input type="checkbox"/> OVERFILL <input type="checkbox"/> RUPTURE/FAILURE <input type="checkbox"/> CORROSION <input checked="" type="checkbox"/> UNKNOWN <input type="checkbox"/> SPILL <input type="checkbox"/> OTHER					
CASE TYPE	CHECK ONE ONLY <input checked="" type="checkbox"/> UNDETERMINED <input type="checkbox"/> SOIL ONLY <input type="checkbox"/> GROUNDWATER <input type="checkbox"/> DRINKING WATER - (CHECK ONLY IF WATER WELLS HAVE ACTUALLY BEEN AFFECTED)					
	CHECK ONE ONLY <input type="checkbox"/> SITE INVESTIGATION IN PROGRESS (DEFINING EXTENT OF PROBLEM) <input checked="" type="checkbox"/> CLEANUP IN PROGRESS <input type="checkbox"/> SIGNED OFF (CLEANUP COMPLETED OR UNNECESSARY) <input type="checkbox"/> NO ACTION TAKEN <input type="checkbox"/> POST CLEANUP MONITORING IN PROGRESS <input type="checkbox"/> NO FUNDS AVAILABLE TO PROCEED <input type="checkbox"/> EVALUATING CLEANUP ALTERNATIVES					
REMEDIAL ACTION	CHECK APPROPRIATE ACTION(S) (SEE BACK FOR DETAILS)					
	<input type="checkbox"/> CAP SITE (CD) <input type="checkbox"/> CONTAINMENT BARRIER (CB) <input type="checkbox"/> TREATMENT AT HOOKUP (HU)		<input checked="" type="checkbox"/> EXCAVATE & DISPOSE (ED) <input checked="" type="checkbox"/> EXCAVATE & TREAT (ET) <input type="checkbox"/> NO ACTION REQUIRED (NA)		<input type="checkbox"/> REMOVE FREE PRODUCT (FP) <input type="checkbox"/> PUMP & TREAT GROUNDWATER (GT) <input type="checkbox"/> OTHER (OT)	
COMMENTS						

APPENDIX D
TYPICAL WELL DESIGN
SOIL AND WATER SAMPLING METHOD



MONITORING WELL CONSTRUCTION DETAILS
Underground Tank Investigations

SAMPLING PROCEDURES

SOILS

1. In-place soil samples are collected with a stainless steel corer, fitted with a 6-inch brass liner. The corer is driven into the ground by a slide hammer. The brass liner is removed from the steel corer, capped with aluminum foil and a plastic cap, taped, placed in a zip-lock bag, and iced prior to being brought to the laboratory for analysis. Proper chain-of-custody and sample labeling procedures are followed.

All sampling equipment is decontaminated with tri-sodium phosphate (TSP) and deionized water prior to collection of each sample.

2. In-place soil samples may also be collected during drilling activities. The samples are collected with a California Modified sampler (2-inch diameter) fitted with 6-inch brass sleeves. The sampler is driven into the ground by a 140-lb. hammer falling 30 inches. The samples are handled similarly to the procedures described above and the equipment is decontaminated in the same fashion.

3. During tank removal activities, soil samples are collected from a backhoe bucket having extracted material from a specific depth. The soil brought to the surface in a bucket is sampled after about 6 inches of the surface is discarded. The sample is collected with a stainless steel cover fitted with a brass tube. The sample is handled in the same manner as described above, and decontamination procedures are similar.

GROUNDWATER

The well is checked for floating product with a dual interface probe. A water level measurement is then made with an electrical probe, calibrated to the nearest 1/10th of a foot.

The well is then evacuated of five well volumes of water prior to sampling. The evacuation is performed with a PVC 1.7-inch hand pump and the sampling is accomplished by bottom-valve, teflon bailer. The sample is transferred directly into glass vials, iced, and brought to the laboratory. Proper chain-of-custody and sample labeling procedures are followed.

All sampling equipment is decontaminated with TSP and deionized water prior to collection of each sample.

(In the case of sampling from dewatering, wells, manholes, or in tank excavations, no evacuation occurs, but the sample is collected immediately after a check has been made for floating product. The sample is immediately transferred from the teflon bailer to the sample vials, iced, and brought to the laboratory for analysis).