INNOVATIVE TECHNICAL SOLUTIONS, Inc.

ITSI

February 12, 1997

Project No. 95-113.22

Mr. John Prall
Associate Environmental Scientist
Port of Oakland
530 Water Street
Oakland, California 94607

Groundwater Monitoring and Sampling Report
801 Maritime Street
Oakland, California
(Work Order No. 202863)

Dear Mr. Prall:

This Groundwater Monitoring and Sampling Report (Report) has been prepared by Innovative Technical Solutions, Inc. (ITSI) on behalf of the Port of Oakland for groundwater monitoring and sampling performed on December 27, 1996 at the 801 Maritime Street site in Oakland, California. A site location map is shown on Figure 1.

The scope of work included monitoring and sampling one groundwater monitoring well, MW-1. The monitoring well is located in the vicinity of three former underground storage tanks previously removed from the site in February 1989: two 10,000-gallon tanks (CF-06 and CF-35) and a 20,000-gallon tank (CF-07).

SAMPLING OF MONITORING WELL

The groundwater monitoring and sampling was performed on December 27, 1996. The monitoring well was initially gauged for depth to water and checked for the presence of separate phase hydrocarbons. No separate phase hydrocarbons were observed in the monitoring well. The depth to water measurement was recorded on a Monitoring Well Purge and Sample Form. A Copy of the Monitoring Well Purge and Sample Form is provided in Attachment A.

1330 Broadway, Suite 1625, Oakland, CA 94612 (510) 286-8888 (510) 286-8889 fax

After the depth to water measurement was recorded, the monitoring well was purged using a clean disposable bailer. Approximately three casing volumes of water were removed, or until pH, conductivity, and temperature readings stabilized indicating formation water had entered the monitoring well. Field parameters were recorded on the Monitoring Well Purge and Sample Form.

A groundwater sample was collected from the monitoring well using the disposable bailer and placed into laboratory provided containers. The sample containers were properly labeled with the sample number, date and time of collection, and samplers' initials, and were placed on ice in an insulated cooler. Purge water was stored onsite in a properly labeled drum.

The above field activities were performed in accordance with the site-specific Health and Safety Plan for groundwater monitoring activities at the site.

MONITORING WELL GROUNDWATER LEVEL

Depth to water data is summarized in Table 1. The groundwater elevation was calculated using the measured depth to water and survey elevation of top of casing, and is provided in Table 1. This survey used the Port of Oakland datum, which is 3.2 feet below mean sea level. Figure 2 shows the groundwater elevation.

The groundwater gradient for the site could not be determined this quarter. Due to initial access difficulties with MW-1, monitoring activities were not conducted concurrent with the monitoring activities performed by Alisto Engineering Group at the nearby Berth 24 facility. Attempts will be made to coordinate future quarterly monitoring activities with those at Berth 24 in order to determine a general gradient for the site.

LABORATORY ANALYSIS OF GROUNDWATER SAMPLE

The sample was sent under chain-of-custody procedures to Pace Analytical in Petaluma, California, the current Port of Oakland contract laboratory. The samples were analyzed according to the following schedule:

Monitoring Well I.D.	Analyses		
	TPHg[1]	BTEX[2]	TPHd[3]
MW-1	x	x	x

[1] TPH as gasoline by Modified EPA Method 8015.
[2] Benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 602.
[3] TPH as diesel by Modified EPA Method 8015 with silica gel cleanup procedure.

The laboratory results for the groundwater sample are summarized in Table 2, and shown in Figure 2. Copies of the laboratory results and chain-of-custody are provided in Attachment B.

FINDINGS

Results of the December 12, 1996 groundwater monitoring and sampling of MW-1 are summarized below:

- TPHg was reported at a concentration of 180 µg/l.
- Benzene, toluene, ethylbenzene and xylenes were reported at concentrations of 30, 15, 5.8 and 26 µg/l, respectively.
- TPHd was reported at a concentration of 670 µg/l.

Please give us a call if you have any questions or comments.

Sincerely,

Jim Schollard
Environmental Scientist

Jeffrey D. Hess, R.G.
Project Director

Attachments

TABLE 1

GROUNDWATER ELEVATIONS
801 MARITIME STREET
OAKLAND, CALIFORNIA

Monitoring Well ID	Elevation of Top of Casing (feet)	Date of Monitoring	Measured Depth to Water (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Note
MW-1	10.61	07/10/96	7.36	-	3.25	1
		12/27/96	7.55	-	3.06	

1. Data from Table 2, Summary of Results of Groundwater Sampling, Port of Oakland Tanks CF-06, CF-07, and CF-35, 801 Maritime Street, Oakland, California, dated August 7, 1996, by Alisto Engineering Group.

TABLE 2

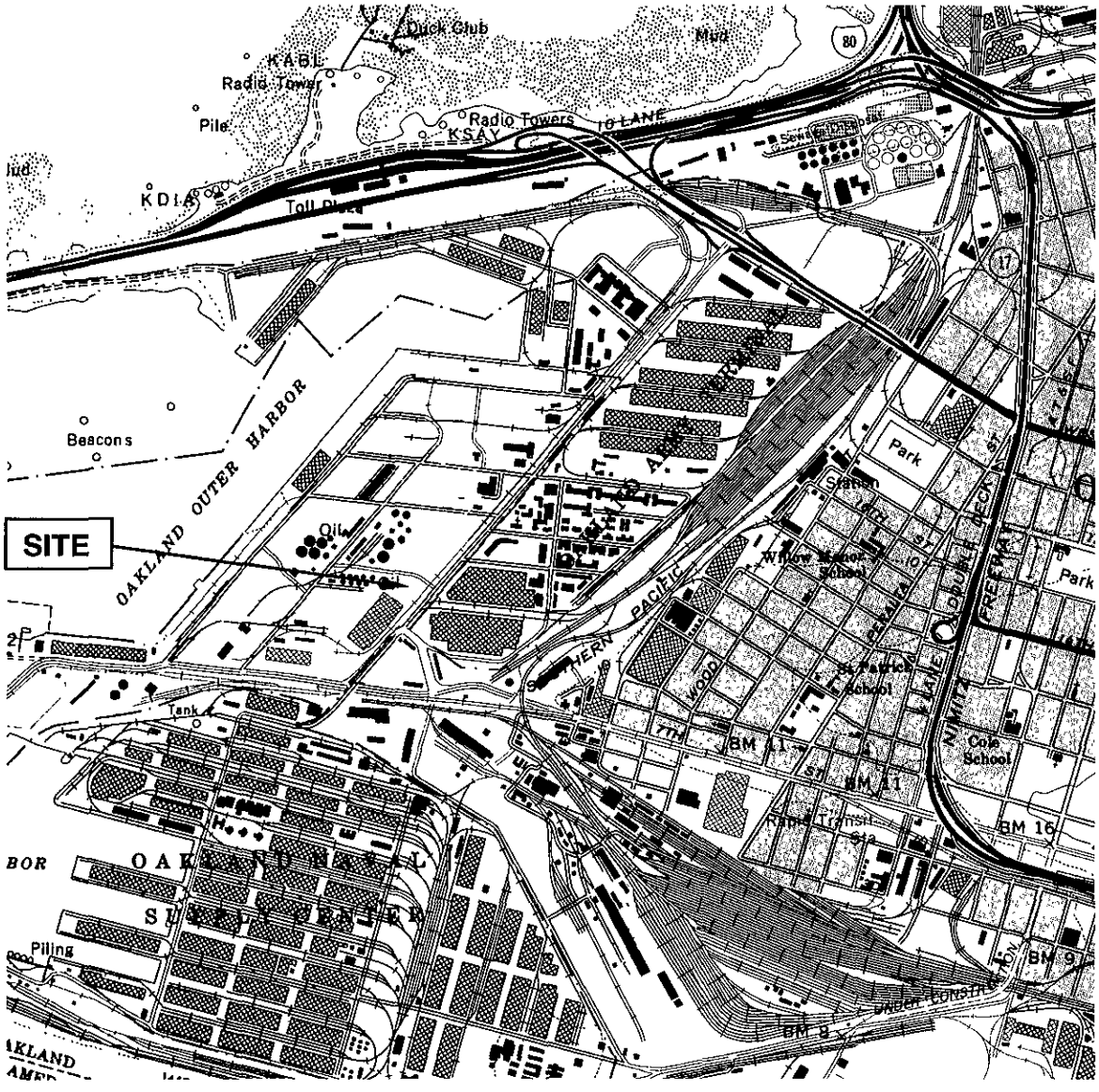
SUMMARY OF LABORATORY RESULTS
801 MARITIME STREET
OAKLAND, CALIFORNIA

Monitoring Well ID	Date of Sampling	TPHg (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	TPHd (µg/l)	Note
MW-1	07/10/96	180	27	14	5.4	23	7,100	1
	12/27/96	180	30	15	5.8	26	670	

1. Data from Table 2, Summary of Results of Groundwater Sampling, Port of Oakland Tanks CF-06, CF-07, and CF-35, 801 Maritime Street, Oakland, California, dated August 7, 1996, by Alisto Engineering Group.

TPHg = Total petroleum hydrocarbons (TPH) as gasoline.
TPHd = TPH as diesel.

95-113 22/F.1-SitLoc



0 2,000 Feet 4,000 Feet

Approximate Scale

Source: Oakland West 7.5-minute U.S.G.S. Quadrangle, dated 1959, and photorevised in 1980.

FIGURE 1

SITE LOCATION

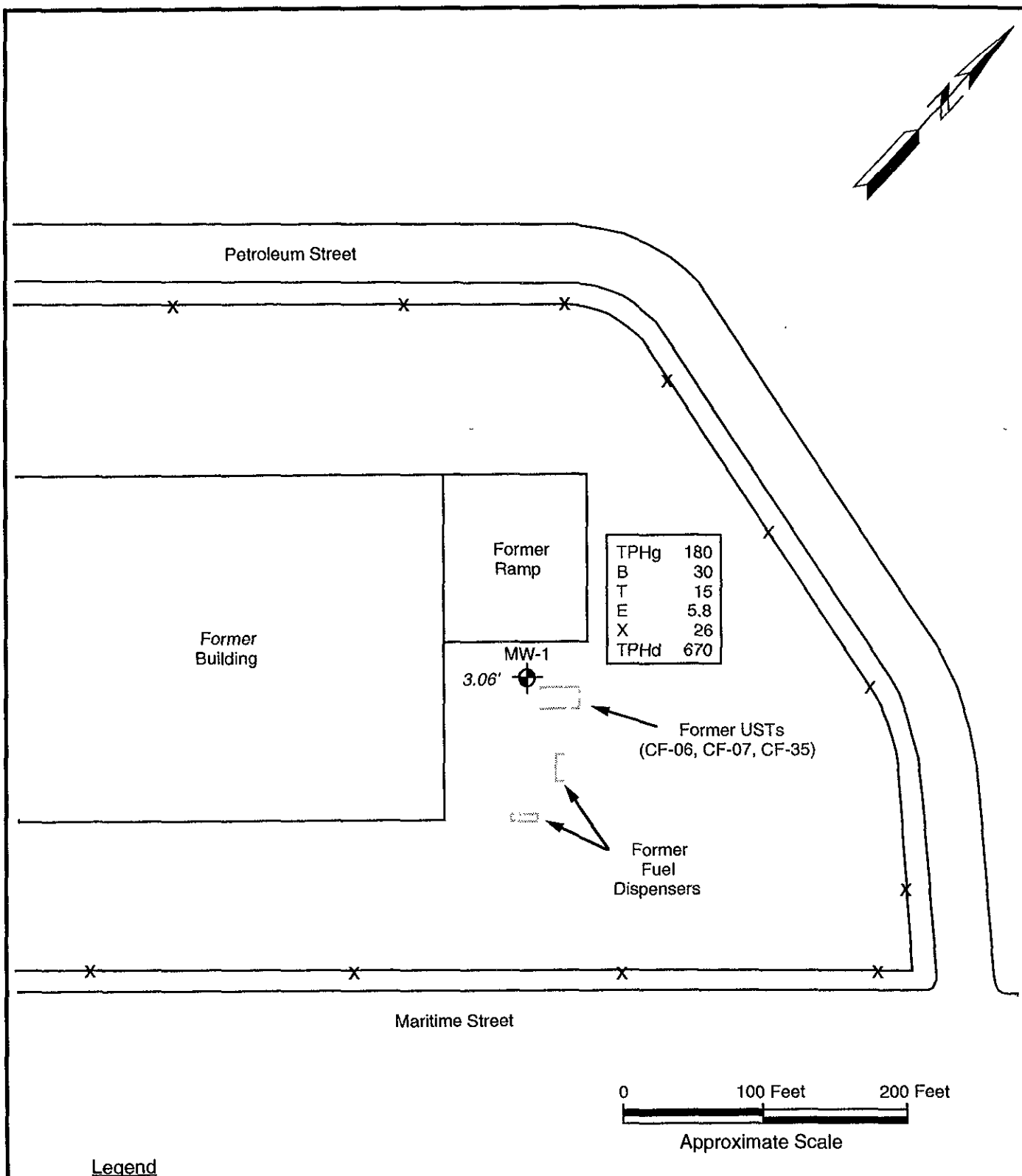
801 Maritime Street
Oakland, California

PORT OF OAKLAND

ITSI

INNOVATIVE TECHNICAL SOLUTIONS, INC.

95-113.22/F.1-Results



Legend

- Monitoring Well
- *3.06'* Groundwater elevation on 12/27/96 (in feet)
- TPHg TPH as gasoline (in µg/L)
- BTEX Benzene, toluene, ethylbenzene, xylenes (in µg/L)
- TPHd TPH as diesel (in µg/L)

Source: Adapted from Figure 2, Site Plan, 801 Maritime Street, Alisto Engineering Group, August 7, 1996.

FIGURE 2

LABORATORY RESULTS FOR PETROLEUM HYDROCARBONS

801 Maritime Street
Oakland, California

PORT OF OAKLAND

ITSI
INNOVATIVE TECHNICAL SOLUTIONS, INC.

ATTACHMENT A

COPY OF MONITORING WELL PURGE AND SAMPLE FORM

MONITORING WELL
PURGE AND SAMPLE FORM

PROJECT NAME: Port of Oakland - 801 Maritime PROJECT NO.: 95-113.22

WELL NO.: MW-1 TESTED BY: Jim Scholland DATE: 12/27/96

Measuring Point Description: red mark, T.O.C. Static Water Level (ft.): 7.55

Total Well Depth (ft.): 14.72 Sample Method: 2" disposable bailer

Water Level Measurement Method: Solinist DTW Probe Time Sampled: 1040

Purge Method: 2" disposable bailer Sample Depth (ft.): ~8-14'

Time Start Purge: 1024 Field Filtering: NA

Time End Purge: 1035 Field Preservation: Blue Ice

Comments: Cut existing lock & replaced w/ ITSI 0895 Lock; DTB = "30 ft" (sediments present); no sheen or product observed

Well Volume Calculation (fill in before purging)	Total Depth (ft)	-	Depth to Water (ft)	=	Water Column (ft)	x	Multiplier for Casing Diameter (in)			=	Casing Volume (gal)
							2	4	6		
	14.72		7.55		7.17		0.16	0.64	1.44		1.15 (3 vols = 3.45 gal.)

Time	1027	1032	1035				
Volume Purged (gals)	1.20	1.20	1.20				
Cumulative Volume Purged (gals)	1.20	2.40	3.60				
Cumulative Number of Casing Volumes	1.04	2.08	3.13				
Purge Rate (gpm)	0.4	0.24	0.4				
Temperature (F°) or (C°)	60.7	61.1	61.1				
pH	8.37	9.1	9.2				
Specific Conductivity (µmhos/cm) X1000	4.17	4.50	4.67				
Dissolved Oxygen (mg/L)	NA	→	→				
Turbidity/Color (NTU)	olive yellow	olive green	→				
Odor	None	→	→				
Dewatered?	No	→	→				

Jim Scholland ITSI

CHECKED BY: _____ DATE: _____

ITSI

ATTACHMENT B

COPY OF LABORATORY REPORTS, CHROMATOGRAMS AND CHAIN-OF-CUSTODY FORM FOR GROUNDWATER SAMPLE

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

January 09, 1997

Mr. Jim Schollard
Innovative Technical Solutions
2855 Mitchell Drive, Suite 118
Walnut Creek, CA 94598

RE: PACE Project Number: 707380
Client Project ID: 801 Maritime Street/202863

Dear Mr. Schollard:

Enclosed are the results of analyses for sample(s) received on December 27, 1996. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ron Chew
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

DATE: 01/09/97
PAGE: 1

Innovative Technical Solutions
2855 Mitchell Drive, Suite 118
Walnut Creek, CA 94598

PACE Project Number: 707380
Client Project ID: 801 Maritime Street/202863

Attn: Mr. Jim Schollard
Phone: (510)256-8898

PACE Sample No: 70843172
Client Sample ID: TRIP BLANK

Date Collected: 12/27/96
Date Received: 12/27/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	ND	ug/L	50	01/06/97	CA LUFT	AMH		
Benzene	ND	ug/L	0.5	01/06/97	CA LUFT	AMH	71-43-2	
Toluene	ND	ug/L	0.5	01/06/97	CA LUFT	AMH	108-88-3	
Ethylbenzene	ND	ug/L	0.5	01/06/97	CA LUFT	AMH	100-41-4	
Xylene (Total)	ND	ug/L	1	01/06/97	CA LUFT	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	104	%		01/06/97	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	96	%		01/06/97	CA LUFT	AMH	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

PACE Project Number: 707380
Client Project ID: 801 Maritime Street/202863

PACE Sample No: 70843180 Date Collected: 12/27/96
Client Sample ID: MW-1 Date Received: 12/27/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	180	ug/L	50	01/06/97	CA LUFT	AMH		
Benzene	30	ug/L	0.5	01/06/97	CA LUFT	AMH	71-43-2	
Toluene	15	ug/L	0.5	01/06/97	CA LUFT	AMH	108-88-3	
Ethylbenzene	5.8	ug/L	0.5	01/06/97	CA LUFT	AMH	100-41-4	
Xylene (Total)	26	ug/L	1	01/06/97	CA LUFT	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	101	%		01/06/97	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	98	%		01/06/97	CA LUFT	AMH	460-00-4	
GC								
TPH by 8015M w/ silica gel								
Diesel Fuel	0.67	mg/L	0.05	01/08/97	EPA 8015M w/ SG	AMH	11-84-7...	
n-Pentacosane (S)	69	%		01/08/97	EPA 8015M w/ SG	AMH	629-99-2	
Date Extracted				01/03/97				

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

PACE Project Number: 707380
Client Project ID: 801 Maritime Street/202863

PACE Sample No: 70843198 Date Collected: 12/27/96
Client Sample ID: QC-1 Date Received: 12/27/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	180	ug/L	50	01/06/97	CA LUFT	AMH		
Benzene	30	ug/L	0.5	01/06/97	CA LUFT	AMH	71-43-2	
Toluene	15	ug/L	0.5	01/06/97	CA LUFT	AMH	108-88-3	
Ethylbenzene	5.6	ug/L	0.5	01/06/97	CA LUFT	AMH	100-41-4	
Xylene (Total)	25	ug/L	1	01/06/97	CA LUFT	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	100	%		01/06/97	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	97	%		01/06/97	CA LUFT	AMH	460-00-4	
GC								
TPH by 8015M w/ silica gel								
Diesel Fuel	1.0	mg/L	0.05	01/08/97	EPA 8015M w/ SG	AMH	11-84-7...	
n-Pentacosane (S)	72	%		01/08/97	EPA 8015M w/ SG	AMH	629-99-2	
Date Extracted				01/03/97				

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

PACE Project Number: 707380
Client Project ID: 801 Maritime Street/202863

PARAMETER FOOTNOTES

ND	Not Detected
NC	Not Calculable
PRL	PACE Reporting Limit
(S)	Surrogate

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

QUALITY CONTROL DATA

Innovative Technical Solutions
2855 Mitchell Drive, Suite 118
Walnut Creek, CA 94598

PACE Project Number: 707380
Client Project ID: 801 Maritime Street/202863

Attn: Mr. Jim Schollard
Phone: (510)256-8898

QC Batch ID: 20455
QC Batch Method: EPA 3520
Date of Batch: 01/03/97
Analysis Method: EPA 8015M w/ SG
Analysis Description: TPH by 8015M w/ silica gel
Associated PACE Samples: 70843180 70843198

METHOD BLANK: 70848882
Associated PACE Samples:
70843180 70843198

Parameter	Units	Method Blank Result	PRL	Footnotes
Diesel Fuel	mg/L	0.10	0.05	1
n-Pentacosane (S)	%	60		

LABORATORY CONTROL SAMPLE & LCSD: 70848916 70848924

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Diesel Fuel	mg/L	1.0	0.3528	35.3	0.5342	53.4	41	2
n-Pentacosane (S)				43.9		79.8		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

QUALITY CONTROL DATA

Innovative Technical Solutions
2855 Mitchell Drive, Suite 118
Walnut Creek, CA 94598

PACE Project Number: 707380
Client Project ID: 801 Maritime Street/202863

Attn: Mr. Jim Schollard
Phone: (510)256-8898

QC Batch ID: 20459 QC Batch Method: CA LUFT Date of Batch: 01/03/97
Analysis Method: CA LUFT Analysis Description: GAS/BTEX by CA LUFT, Water
Associated PACE Samples: 70843172 70843180 70843198

METHOD BLANK: 70849070
Associated PACE Samples:
70843172 70843180 70843198

Parameter	Units	Method Blank Result	PRL	Footnotes
Gasoline	ug/L	ND	50	
Benzene	ug/L	ND	0.5	
Toluene	ug/L	ND	0.5	
Ethylbenzene	ug/L	ND	0.5	
Xylene (Total)	ug/L	ND	1	
a,a,a-Trifluorotoluene (S)	%	102		
4-Bromofluorobenzene (S)	%	94		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 70849591 70849609

Parameter	Units	70843180	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Benzene	ug/L	30.20	100	124.6	94.4	122.0	91.8	3	
Toluene	ug/L	15.36	100	112.3	96.9	109.8	94.4	3	
Ethylbenzene	ug/L	5.796	100	108.1	102	105.2	99.4	3	
Xylene (Total)	ug/L	25.52	300	341.3	105	333.3	103	3	
a,a,a-Trifluorotoluene (S)					103		101		
4-Bromofluorobenzene (S)					102		98.6		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

QUALITY CONTROL DATA

DATE: 01/09/97

PACE Project Number: 707380
Client Project ID: 801 Maritime Street/202863

LABORATORY CONTROL SAMPLE & LCSD: 70849104 70849112

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Benzene	ug/L	100	101.2	101	100.8	101	0	
Toluene	ug/L	100	104.2	104	103.4	103	1	
Ethylbenzene	ug/L	100	108.7	109	107.9	108	1	
Xylene (Total)	ug/L	300	337.8	113	335.9	112	1	
a,a,a-Trifluorotoluene (S)				102		101		
4-Bromofluorobenzene (S)				107		105		

REPORT OF LABORATORY ANALYSIS

Pace Analytical

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

PACE Project Number: 707380
Client Project ID: 801 Maritime Street/202863

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

ND	Not Detected
NC	Not Calculable
PRL	PACE Reporting Limit
RPD	Relative Percent Difference
(S)	Surrogate
[1]	Chromatograpic pattern matches known laboratory contaminant.
[2]	RPD value was outside control limits, however both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.

REPORT OF LABORATORY ANALYSIS

INNOVATIVE TECHNICAL SOLUTIONS, Inc.

ITSI
2855 Mitchell Drive, Suite 118
Walnut Creek, California 94598
(510) 256-8898 (Tel), (510) 256-8998 (Fax)

707380

PROJECT NAME: Port of Oakland - 801 Maritime
PROJECT NUMBER: 95-113.22
SITE LOCATION: 801 Maritime Dr., Oakland CA

CHAIN OF CUSTODY

DATE: 12/27/96
PAGE: 1 of 1

Pace Analytical, Petaluma CA

SAMPLE I.D.	SAMPLE DEPTH	DATE	TIME	NUMBER OF CONTAINERS	TYPE OF CONTAINERS	SAMPLE MATRIX	TPH as Gas/BTEX - 8015/8020	TPH as Diesel - 8015	TPH as Diesel - 8015 modified (w/ Silica Gel Cleanup)	TEPH - 8015	TEPH-8015 m (w/ Silica Gel Cleanup)	TRPH - 418.1	Oil and Grease - 5520	Purgeable Halocarbons - 601/8010	VOCs - 624/8240	SVOCs - 625/8270	LUFT Metals (Cd, Cr, Ni, Pb, Zn)	CAM 17 Metals		SPECIAL INSTRUCTIONS/COMMENTS
Trip Blank	—	12/27/96	—	2	voas	W	X													70843172
MW-1	—	↓	1040	3	voas	W	X													70843180
↓	—		↓	2	1l A	W			X											↓
QC-1	—		—	3	voas	W	X													70843198
↓	—	↓	—	2	1l A	W			X											↓

Not Used (JS) 12/27/96

TOTAL NUMBER OF CONTAINERS: 12 TOTAL TESTS: 3 (TPH as Gas/BTEX), 2 (TPH as Diesel modified)

SAMPLED BY: Jim Schollard
SIGNATURE: [signature]

SPECIAL INSTRUCTIONS/COMMENTS: Please send chromatographs with TPH analytical results

RELINQUISHED BY:	RELINQUISHED BY:	RELINQUISHED BY:
Printed Name / Signature: Jim Schollard / [signature]	Printed Name / Signature: T MAINARIS	Printed Name / Signature:
Company / Date and Time: ITSI 12/27/96 @1314	Company / Date and Time: PASI 12/27/96 1314	Company / Date and Time:
RECEIVED BY:	**RECEIVED BY:**	**RECEIVED BY:**
Printed Name / Signature: T MAINARIS 12/27/96 1530	Printed Name / Signature: T MAINARIS	Printed Name / Signature:
Company / Date and Time: PASI	Company / Date and Time: PASI 12-27-96 1530	Company / Date and Time:

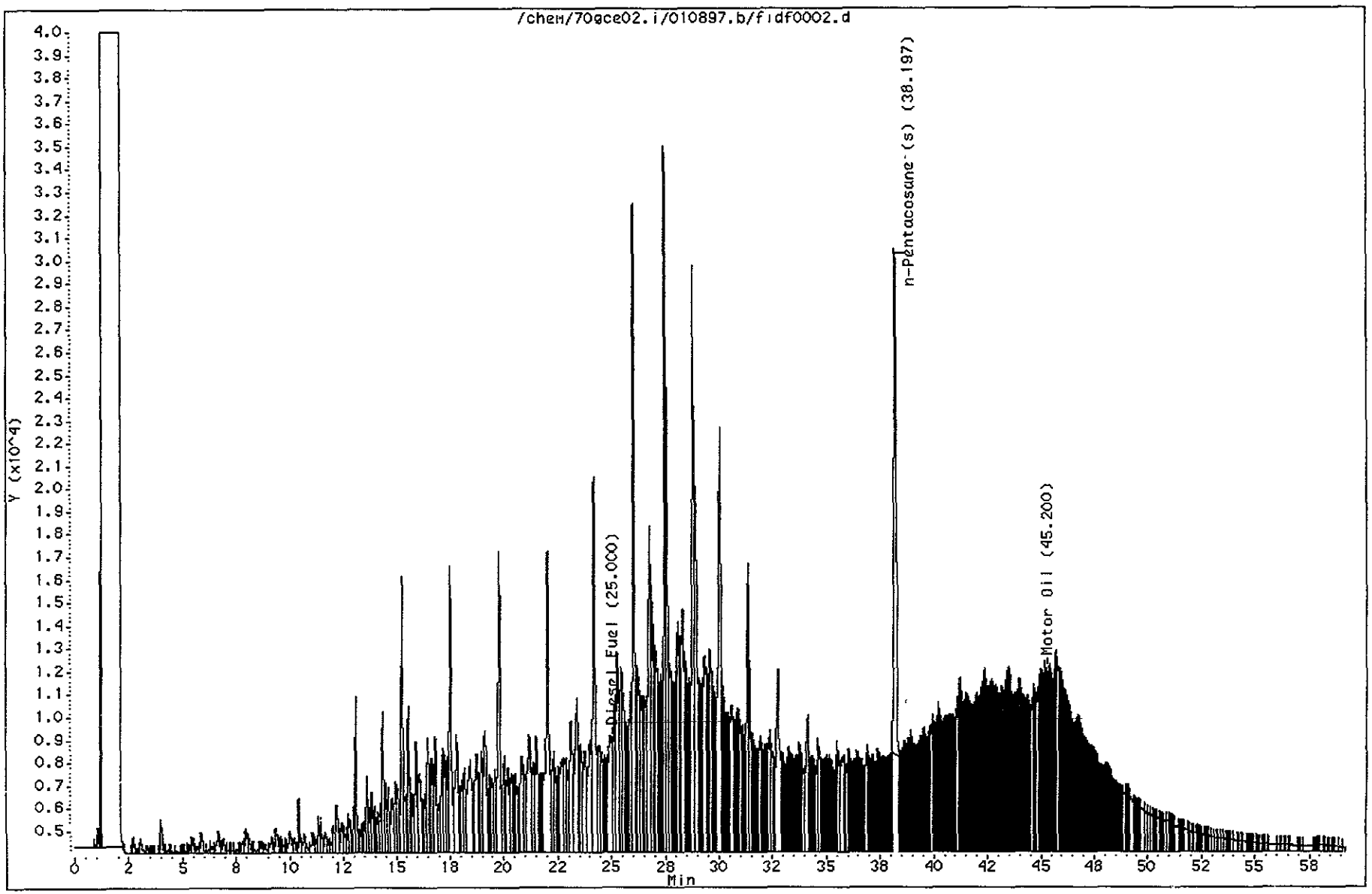
SEND RESULTS TO: Jim Schollard, 1330 Broadway, Suite 1625, Oakland, CA 94612

ITSI 707380

Data File: /chem/70gce02.i/010897.b/fidf0002.d
Date : 08-JAN-1997 16:53
Client ID:
Sample Info: CCAL-DIESEL/MO

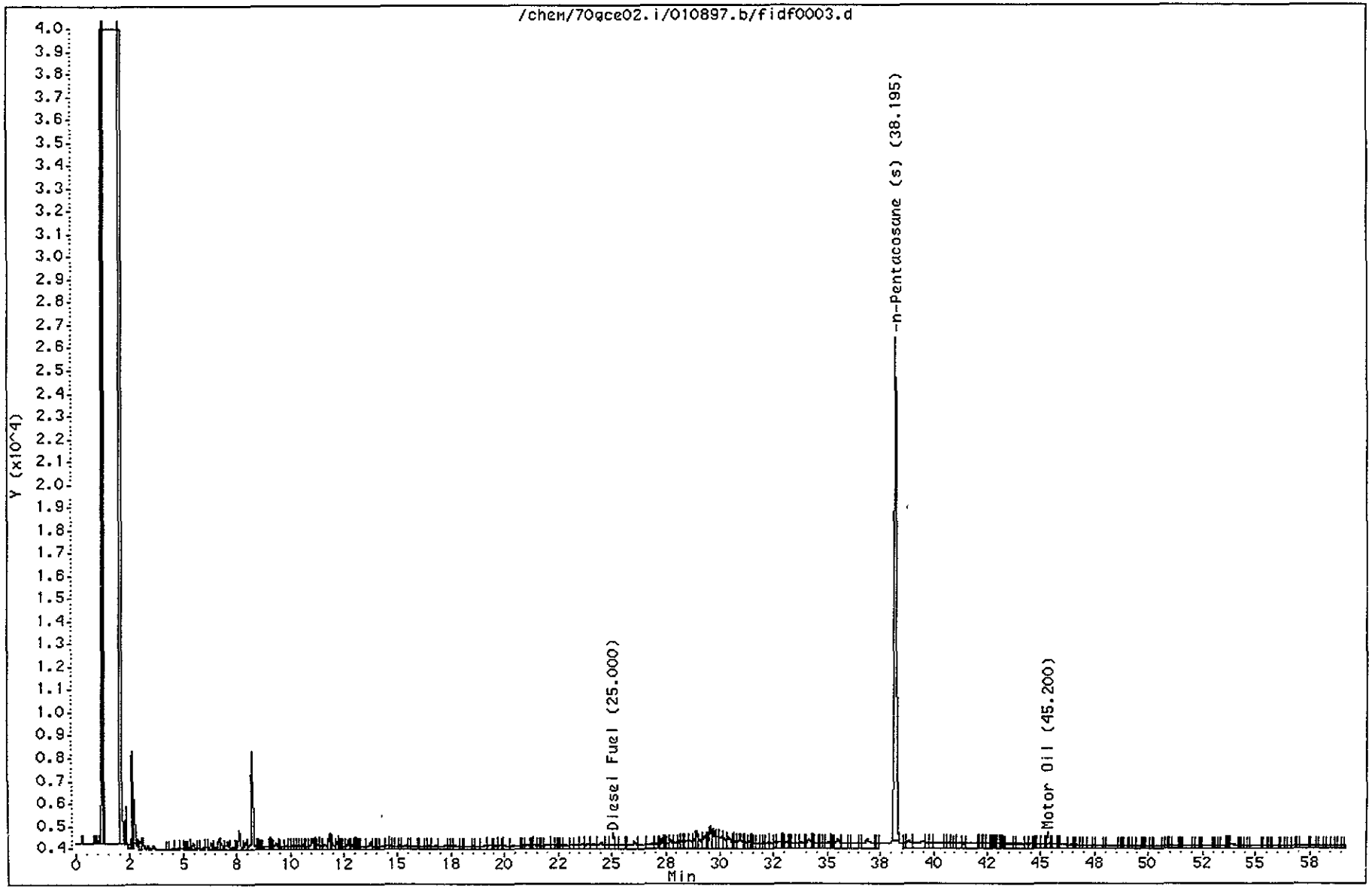
Column phase: RESTEK XTI-5

Instrument: 70gce02.i
Misc Info: 90C,,,,,2,6,CCAL,,,dmof.sub,dmor.sub
Operator: AMH
Column diameter: 0.53



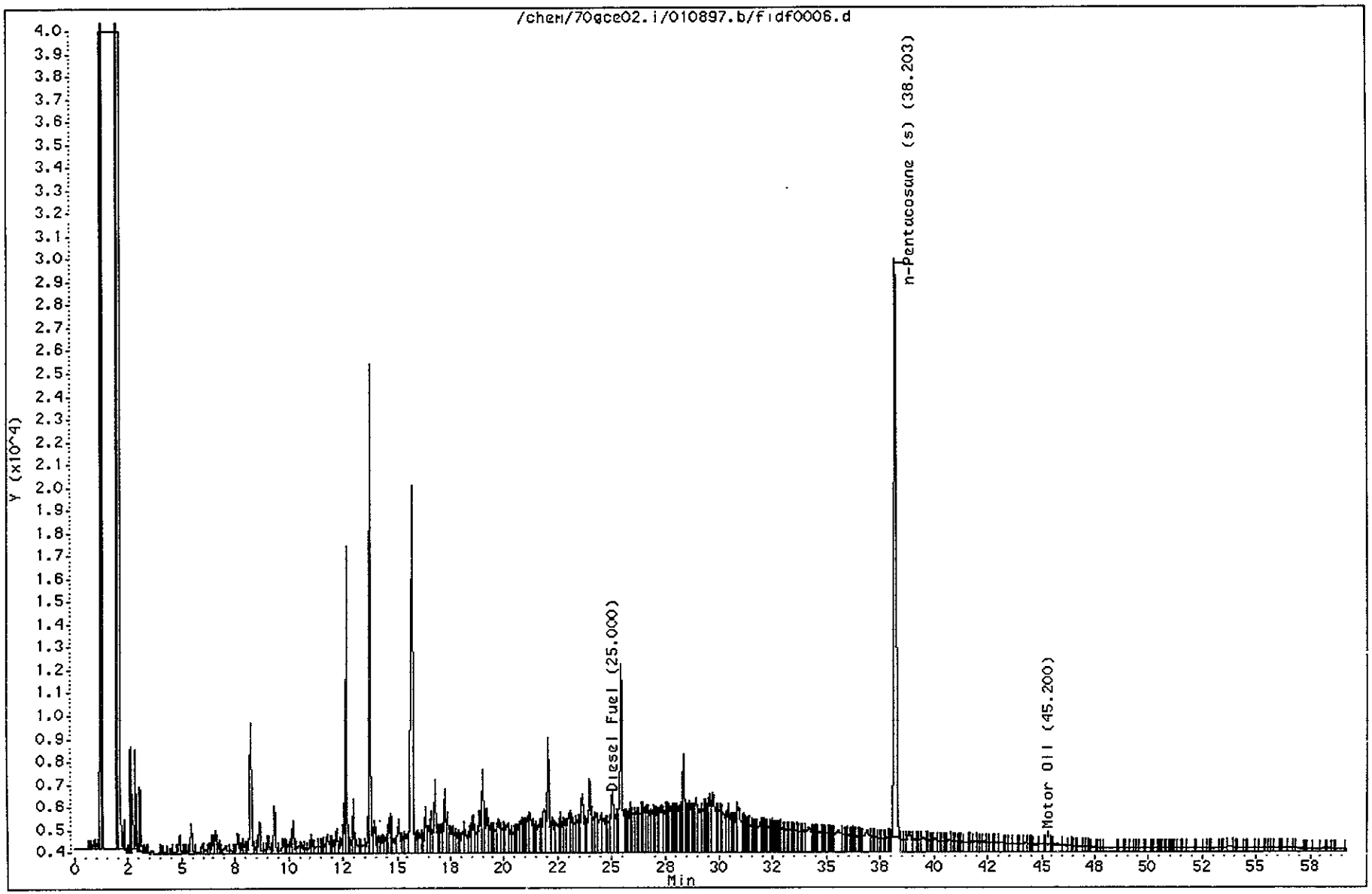
Data File: /chem/70gce02.i/010897.b/fidf0003.d
Date : 08-JAN-1997 17:59
Client ID:
Sample Info: BLANK-water
Volume Injected (uL): 1.0
Column phase: RESTEK XTI-5

Instrument: 70gce02.i
Misc Info: 70848882,,1,20630,1,3,,BLANK,,,dmof.sub,dmor.sub
Operator: AMH
Column diameter: 0.53



Data File: /chem/70gce02.i/010897.b/fidf0006.d
Date : 08-JAN-1997 21:20
Client ID:
Sample Info: SAMPLE-water
Volume Injected (uL): 1.0
Column phase: RESTEK XTI-5

Instrument: 70gce02.i
Misc Info: 70843180,,1,20630,1,0,,SAMPL,,,dmof.sub,dmor.sub
Operator: AMH
Column diameter: 0.53



Data File: /chem/70gce02.i/010897.b/fidf0007.d
Date : 08-JAN-1997 22:26
Client ID:
Sample Info: SAMPLE-water
Volume injected (uL): 1.0
Column phase: RESTEK XTI-5

Instrument: 70gce02.i
Misc Info: 70843198,,1,20630,1,0,,SAMPL,,,dmof.sub,dmor.sub
Operator: AMH
Column diameter: 0.53