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PHONE 285-2400
CABLE ADDRESS TIMOIL
(FAX) 206-283-8036

TIME OIL CO.

2737 WEST COMMODORE WAY
P.O. BOX 24447

SEATTLE, WA 98199-1233
SEATTLE, WA 98124-0447

September 22, 1992

Washington State Department of Ecology
Northwest Region
3190 160th SE
Bellevue, Washington 98008-5452
Attention: Mr. Joe Hickey

SUBJECT: Excavating Activities Conducted at Former Waste Oil Tank Location
Former Time Oil Co. Vehicle Maintenance Facility
2750 Commodore Way; Seattle, Washington

Dear Mr. Hickey,

This letter is to inform you of the findings of additional assessment activities conducted at the above referenced site. On July 28th and 29th, 1992 additional excavation was conducted in the former location of a waste oil tank which was removed in September 1991. Hydrocarbon contamination was discovered during removal of the tank; thus, this additional phase of excavation was undertaken in an attempt to remove remaining soil contamination.

A small amount of groundwater had pooled in the initial excavation associated with tank removal; therefore, lateral excavation was conducted in an attempt to define the limits of the contaminated area. Previous excavating activities had documented that soils located on the southern and western edges of the excavation did not contain hydrocarbons exceeding MTCA Method A Cleanup Levels; thus, the excavation was expanded primarily to the north and east.

After approximately 150 cubic yards of contaminated soil had been removed, excavating activities were terminated because field observations suggested that contaminant severity increased in an easterly direction, and excavation of the full extent of soil contamination did not appear to be feasible. The excavation was backfilled by placing crushed rock below the groundwater surface, installing a layer of 10-mil visqueen upon the crushed rock to reduce settling and surface water infiltration, and backfilling the remaining excavation with fine sand.

Six soil samples were collected from the limits of the northern and eastern sides of the excavation, directly above the groundwater surface, to assess remaining contaminant levels and evaluate the potential for a groundwater impact (See Figure 1 - Site Map for sample locations). The six samples were submitted to a State certified laboratory for hydrocarbon identification (WHCID) analysis to identify the hydrocarbons present. Hydrocarbons identified as gasoline, diesel, and mineral spirits were identified in samples A-1 @8', A-2 @9', and A-6 @3'. Motor oil was also detected in sample A-6 @3'. Additional analysis was conducted on the three samples in which hydrocarbons

were detected to quantify levels of TPH and BTEX by the WTPH Method and EPA Method 8020. These three samples were found to contain levels of TPH-gasoline ranging from 60 to 290 parts per million (ppm), TPH-diesel ranging from 90 to 1,600 ppm, TPH-mineral spirits between 50 and 210 ppm, and 2,300 ppm TPH-motor oil was detected in sample A-6 @3' (See Table 1 - Analytical Results). Laboratory reports are attached.

Two additional soil samples were recovered from the vicinity of an area of visibly impacted soil located near the ground surface on the south side of the excavation. Sample WO-WC was recovered from material believed to represent "worst case" conditions in order to conduct disposal profiling. Sample WO @5' was collected from the same area at a depth of 5 feet below grade to verify removal of the impacted soil once field observations indicated that the visibly impacted area had been fully excavated. WHCID analysis on these two samples detected the presence of diesel fuel in Sample WO-WC and did not detect petroleum hydrocarbons in sample WO @5'. WTPH analysis conducted on Sample WO-WC detected 2,800 ppm TPH-diesel. Laboratory reports are attached.

These analytical results, in combination with field observations, indicate that petroleum hydrocarbon contamination remains beneath the site, and that an impact upon groundwater may have occurred. Time Oil Co. is in the process of submitting a request for proposals to environmental consultants for further assessment of this area. This next phase of assessment will include the installation of soil borings and groundwater monitoring wells to assess the extent of remaining soil contamination and the potential for an impact upon groundwater.

The excavated soil is currently stockpiled upon an adjacent property also owned by Time Oil Co. Samples of this material have been submitted for disposal profiling. Arrangements to recycle the soil will be made once analytical results are received.

If you have any questions regarding this site, please contact either myself at (206) 286-6457 or Liam Russell at (206) 286-4490. If we are not available, Kevin Murphy may be able to answer your questions.

Sincerely,

Scott B. Sloan
Geologist

Enclosures:
Table 1 - Analytical Results
Figure 1 - Site Map
Analytical Reports

C:\WP51\SCOTT\DOELTRS\DOCKSIDE.LTR

TABLE 1

Soil Analytical Results
Time Oil Co. Property No. 01-228
2750 Commodore Way; Seattle, Washington

Sample Number	Depth	TPH	Benzene	Toluene	Ethyl-benzene	Total Xylenes
Samples Collected 10/3/91						
TI-F	6'	200	NT	NT	NT	NT
TI-E	4'	ND	NT	NT	NT	NT
TI-S	4'	ND	NT	NT	NT	NT
TI-W	4'	ND	NT	NT	NT	NT
TP1	3'	720	NT	NT	NT	NT
Samples Collected 12/10/91						
SS1	6.5'	12	NT	NT	NT	NT
NS2	2'	840	NT	NT	NT	NT
ES4	5'	25,000	NT	NT	NT	NT
TP3	2'	15	NT	NT	NT	NT
Samples Collected 7/29/92						
A1	8'	60-g	ND	ND	ND	ND
		50-m	--	--	--	--
		90-d	--	--	--	--
A2	9'	290-g	ND	ND	ND	ND
		200-m	--	--	--	--
		330-d	--	--	--	--
A3	6'	ND*	NT	NT	NT	NT
A4	3'	ND*	NT	NT	NT	NT
A5	3'	ND*	NT	NT	NT	NT
A6	3'	110-g	0.16	0.14	2.6	4.9
		210-m	--	--	--	--
		1,600-d	--	--	--	--
		2,300-o	--	--	--	--
WO-WC	2'	2,800-d	NT	NT	NT	NT
WO @ 5'	5'	ND*	NT	NT	NT	NT

NOTES:

Results reported in milligrams per kilogram (mg/kg) of parts per million (ppm).

g = TPH as gasoline, d = TPH as diesel,

m = TPH as mineral spirits, o = TPH as motor oil.

Detection limit for benzene, toluene, and ethylbenzene = 0.02 ppm

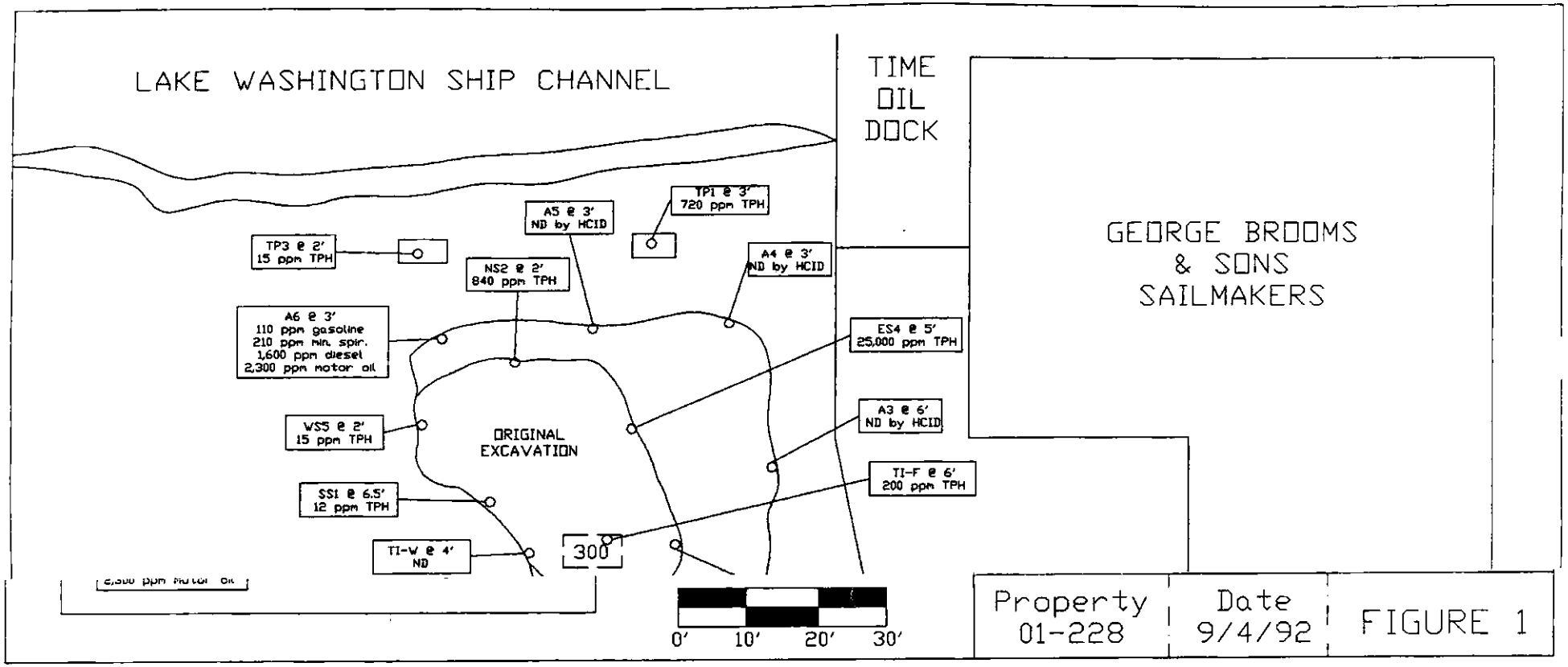
Detection limit for total xylenes = 0.04 ppm.

Shading denotes sample with at least one constituent exceeding Method A Cleanup Standards.

NT = Sample not tested for this constituent.

ND = Not detected.

* = TPH analysis by HCID.


LAKE WASHINGTON SHIP CHANNEL
TIME OIL DOCK
GEORGE BROOMS & SONS SAILMAKERS
TP3 @ 2'
15 ppm TPH
A5 @ 3'
ND by HCID
TP1 @ 3'
720 ppm TPH
NS2 @ 2'
840 ppm TPH
A4 @ 3'
ND by HCID
A6 @ 3'
110 ppm gasoline
210 ppm min. spir.
1,600 ppm diesel
2,300 ppm motor oil
ES4 @ 5'
25,000 ppm TPH
WS5 @ 2'
15 ppm TPH
ORIGINAL EXCAVATION
A3 @ 6'
ND by HCID
SS1 @ 6.5'
12 ppm TPH
TI-F @ 6'
200 ppm TPH
TI-W @ 4'
ND
300
0'
10'
20'
30'
Property
01-228
Date
9/4/92
FIGURE 1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Andrew John Friedman
James E. Bruya, Ph.D.
(206) 285-8282

3008-B 16th Avenue West
Seattle, WA 98119
FAX: (206) 283-5044

August 5, 1992.

Scott Sloan, Environmental Specialist
Time Oil Company
2737 West Commodore Way
Seattle, WA 98199

Dear Mr. Sloan:

Enclosed are the results of the analyses of the samples submitted on July 30, 1992 from Project 01-228, Seattle Terminal Dockside.

We appreciate this opportunity to be of service to you on this project. If you have any questions regarding this material, or if you just want to discuss any aspect of your projects, please do not hesitate to contact me.

Sincerely,

Amy Gray

Amy M. Gray
Chemist

AMG/dp

Enclosures

FRIEDMAN & BRUYA, INC

ENVIRONMENTAL CHEMISTS

Date of Report: August 5, 1992
Date Submitted: July 30, 1992
Project: 01-228, Seattle Terminal Dockside

RESULTS OF ANALYSES OF THE SOIL SAMPLES FOR FINGERPRINT CHARACTERIZATION BY CAPILLARY GAS CHROMATOGRAPHY USING FLAME IONIZATION DETECTION (FID) AND ELECTRON CAPTURE DETECTION (ECD)

Sample #	GC Characterization
A-1@8' - SE Corner in Cap . Fringe	The gas chromatographic trace showed the presence of low and medium boiling compounds, such as those found in gasoline, mineral spirits and diesel. This characterization is based on material eluting in the gasoline range and with a gasoline pattern, as well as the presence of a relatively ragged envelope of peaks present from ca *n*-C_8 to *n*-C_{12} with a maximum near *n*-C_{10}, as well as a second continuing envelope of peaks from ca *n*-C_{18} to *n*-C_{22} with a maximum near *n*-C_{17}. Augmented levels of benzene, toluene, ethylbenzene and the xylenes were seen which is common to most gasolines. The lower boiling material appeared to be slightly weathered most likely by evaporation as evident in the relative lessening of earlier peaks. The medium boiling material appeared to be mostly weathered by biodegradation evident in the loss of *n*-alkane peaks. The ECD trace showed the possible presence of halogenated solvents. The large peak eluting at approximately 24 minutes represents our internal standard.

FRIEDMAN & BRUYA, INC

ENVIRONMENTAL CHEMISTS

Date of Report: August 5, 1992
Date Submitted: July 30, 1992
Project: 01-228, Seattle Terminal Dockside

RESULTS OF ANALYSES OF THE SOIL SAMPLES FOR FINGERPRINT CHARACTERIZATION BY CAPILLARY GAS CHROMATOGRAPHY USING FLAME IONIZATION DETECTION (FID) AND ELECTRON CAPTURE DETECTION (ECD)

Sample #	GC Characterization
A-2@9' - SE Corner, 1' Lower	The gas chromatographic trace showed the presence of low and medium boiling compounds, such as those found in gasoline, mineral spirits and diesel. This characterization is based on material eluting in the gasoline range and with a gasoline pattern, as well as the presence of a relatively ragged envelope of peaks present from ca *n*-C_8 to *n*-C_{12} with a maximum near *n*-C_{10}, as well as a second continuing envelope of peaks from ca *n*-C_{18} to *n*-C_{22} with a maximum near *n*-C_{17}. Augmented levels of benzene, toluene, ethylbenzene and the xylenes were seen which is common to most gasolines. The lower boiling material appeared to be slightly weathered most likely by evaporation as evident in the relative lessening of earlier peaks. The medium boiling material appeared to be mostly weathered by biodegradation evident in the loss of *n*-alkane peaks. The ECD trace showed the possible presence of halogenated solvents. The large peak eluting at approximately 24 minutes represents our internal standard.
A-3@6' - E Side in Cap. Fringe	Both gas chromatographic traces show the absence of significant levels of volatile or semi-volatile compounds. The large peak eluting at approximately 24 minutes represents our internal standard.

FRIEDMAN & BRUYA, INC

ENVIRONMENTAL CHEMISTS

Date of Report: August 5, 1992
Date Submitted: July 30, 1992
Project: 01-228, Seattle Terminal Dockside

RESULTS OF ANALYSES OF THE SOIL SAMPLES FOR FINGERPRINT CHARACTERIZATION BY CAPILLARY GAS CHROMATOGRAPHY USING FLAME IONIZATION DETECTION (FID) AND ELECTRON CAPTURE DETECTION (ECD)

Sample #	GC Characterization
A-4@3' - N in Cap. Fringe	Both gas chromatographic traces show the absence of significant levels of volatile or semi-volatile compounds. The large peak eluting at approximately 24 minutes represents our internal standard.
A-5@3' - NE Corner in Cap. Fringe	Both gas chromatographic traces show the absence of significant levels of volatile or semi-volatile compounds. The large peak eluting at approximately 24 minutes represents our internal standard.
A-6@3' - New Corner in Cap. Fringe	The gas chromatographic trace showed the presence of low, medium and high boiling compounds, such as those found in gasoline, mineral spirits, diesel, and motor oil with the most prominent material being diesel. This characterization is based on the presence of an envelope of peaks eluting in the gasoline range and with a gasoline-like pattern, a second envelope of peaks present from ca *n*-C_8 to *n*-C_{12} with a maximum near *n*-C_{10}, a third continuing envelope of peaks from ca *n*-C_{10} to beyond *n*-C_{22} with a maximum near *n*-C_{17} and a fourth envelope of peaks present from ca *n*-C_{22} to beyond ca *n*-C_{34}, with a maximum near C_{28}. Augmented levels of benzene, toluene, ethylbenzene and the xylenes were seen which is common to most gasolines. The ECD trace showed the possible presence of halogenated solvents. The large peak eluting at approximately 24 minutes represents our internal standard.

2-AMG-A
7-30-92(3:48)

TIME OIL CO. SAMPLE LOG

Site Name: Seattle Terminal Dockside Prop. No: 01-228 Address: 2737 W. Commodore Way
Sampler: Scott Sloan Date: 7/30/92 Seattle, WA
Purpose: Excavation Assessment Method: Grab [X] S.Spoon [ ] Bailer [ ] Pump [ ]
Lab Name: Friedman & Bruya Preserved: Ice [X] Acid [ ] None [ ]
Lab Address: Phone: PO No.:

Sample #	Location/Description	Type*	Analysis Instructions	EPA Method
1	A-108' - SE Corner in Cap. Fringe	(S) W P	WTPH-HCID 31873	
2	A-209' - " , 1' lower	(S) W P	31874	
3	A-306' - E Side in Cap. Fringe	(S) W P	31875	
4	A-403' - N " in Cap. Fringe	(S) W P	31876	
5	A-503' - NE Corner in Cap. Fringe	(S) W P	31877	
6	A-603' - NW Corner in Cap. Fringe	(S) W P	31878	
7	-	S W P		
8	-	S W P		
9	-	S W P		
10	-	S W P		
11	-	S W P		
12	-	S W P		
13	-	S W P		
14	-	S W P		
15	-	S W P		
16	-	S W P		
17	-	S W P		
18	-	S W P		
19	-	S W P		
20	-	S W P		
21	-	S W P		
22	-	S W P		

Other Instructions: Hold Samples for possible additional testing.

Sample Count = *Check sample jar count against Log!* * S = Soil W = Water P = Product

CHAIN OF CUSTODY RECORD

Relinquished By: Received By: Date & Time 7-30-92 2:25

Relinquished By: Received For Lab By: Date & Time:

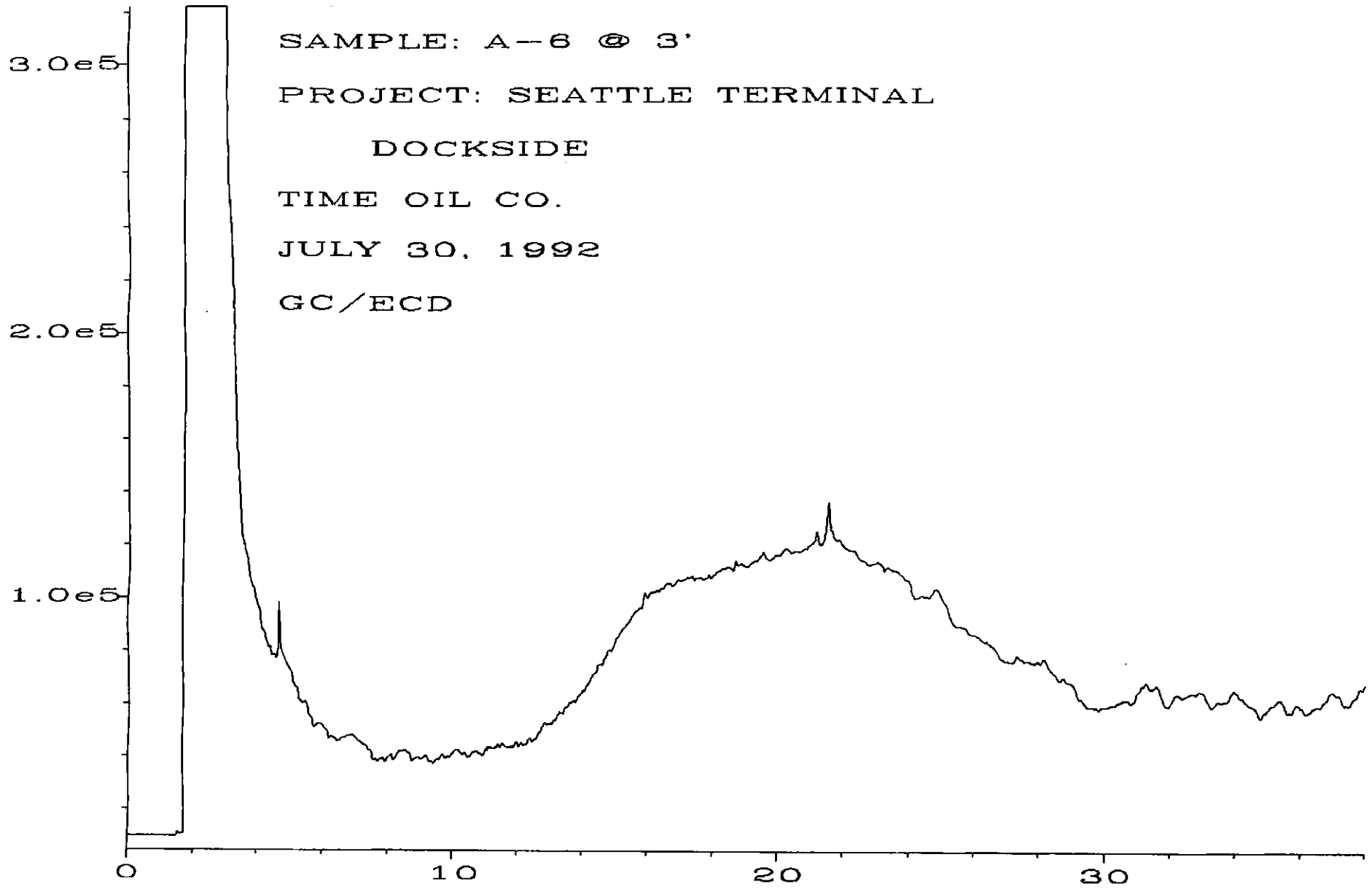
GENERAL LAB INSTRUCTIONS

Please provide the requested information

1. Sample numbers assigned by Lab: 31873 to 31878 Date Analyzed: 7-30-92
2. Person performing analysis: Andrew Friedman, Amy Gray Data Reviewer: Andrew Friedman
3. Scheduled sample disposal date: 8-30-92 *NOTIFY TIME OIL CO. BEFORE DISPOSAL*
4. Provide copies of ALL chromatograms, including QA/QC runs.

IMPORTANT! PLEASE RETURN A COPY OF THIS FORM WITH YOUR REPORT TO TIME OIL CO.

Attn: Environmental Manager, PO Box 24447 Terminal Sta., Seattle, WA 98124 (206) 285-2400



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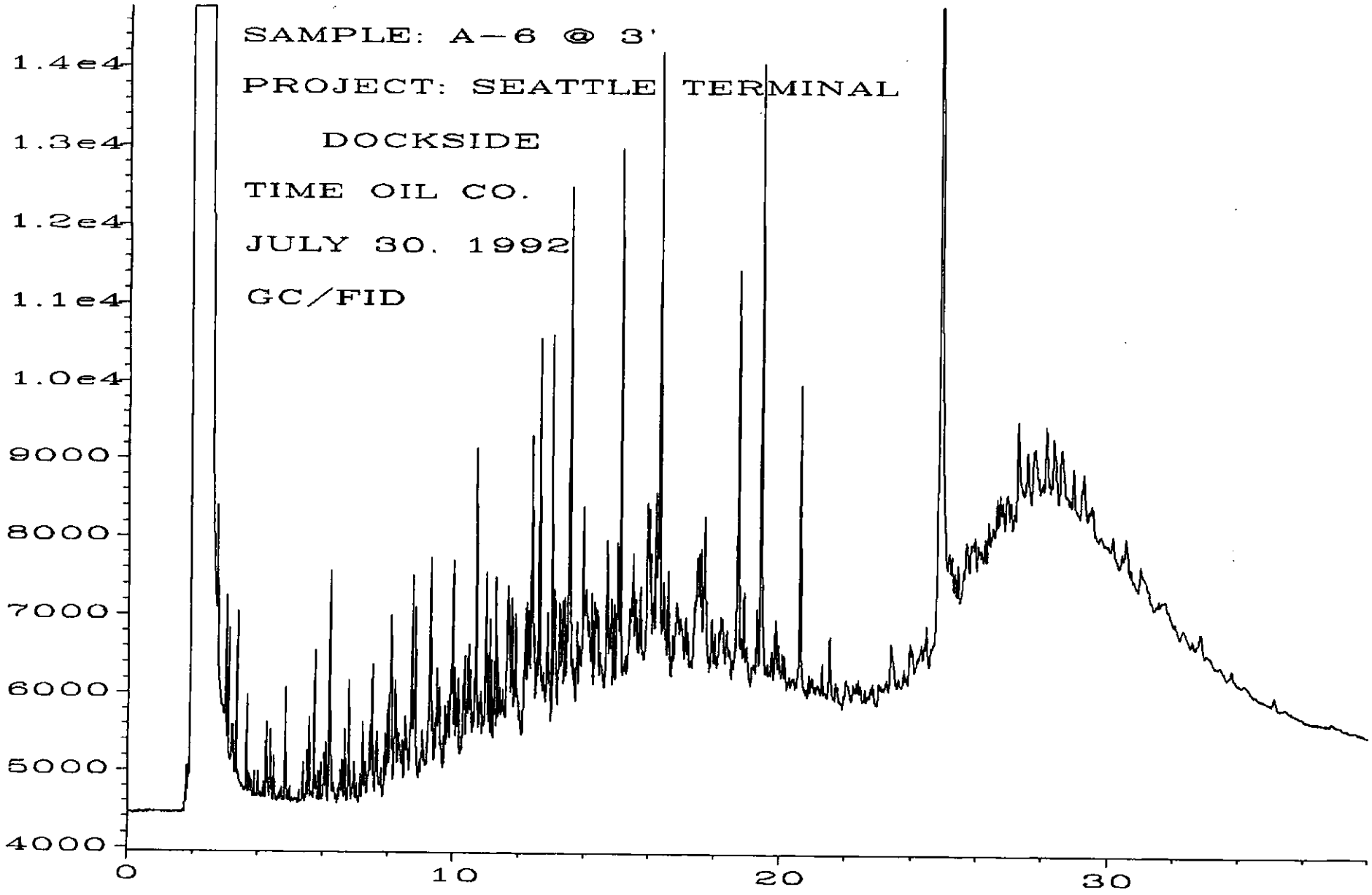

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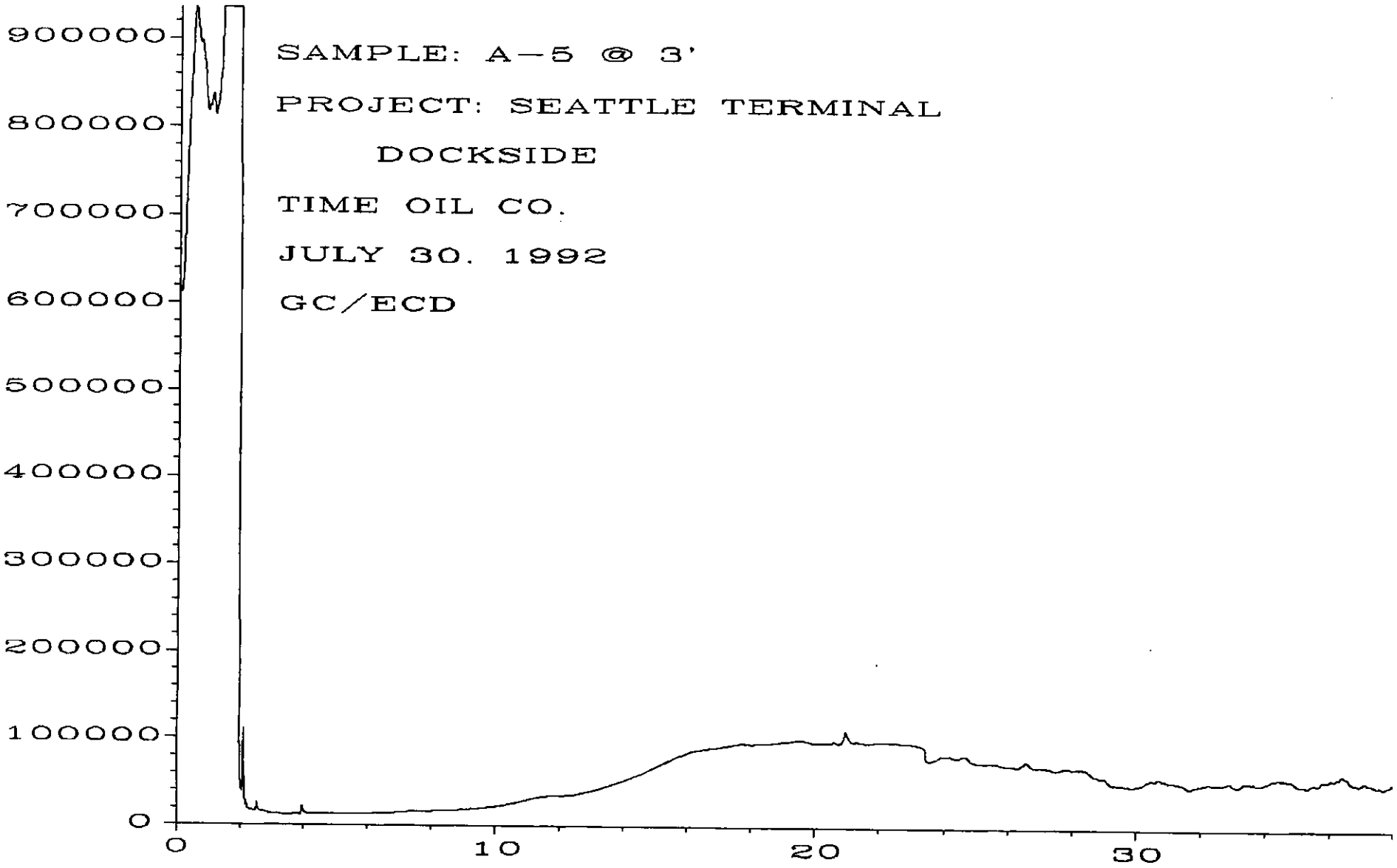

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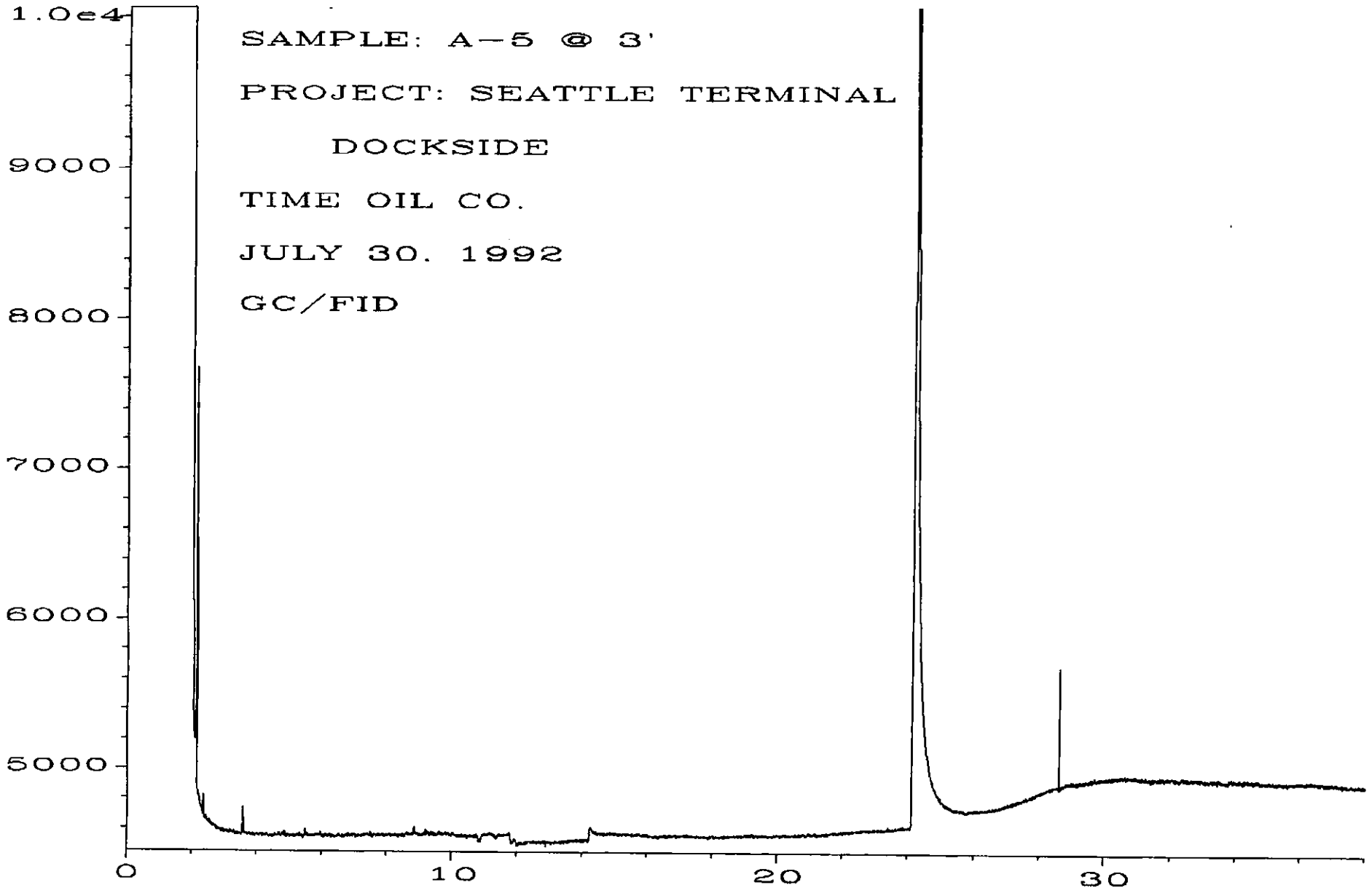

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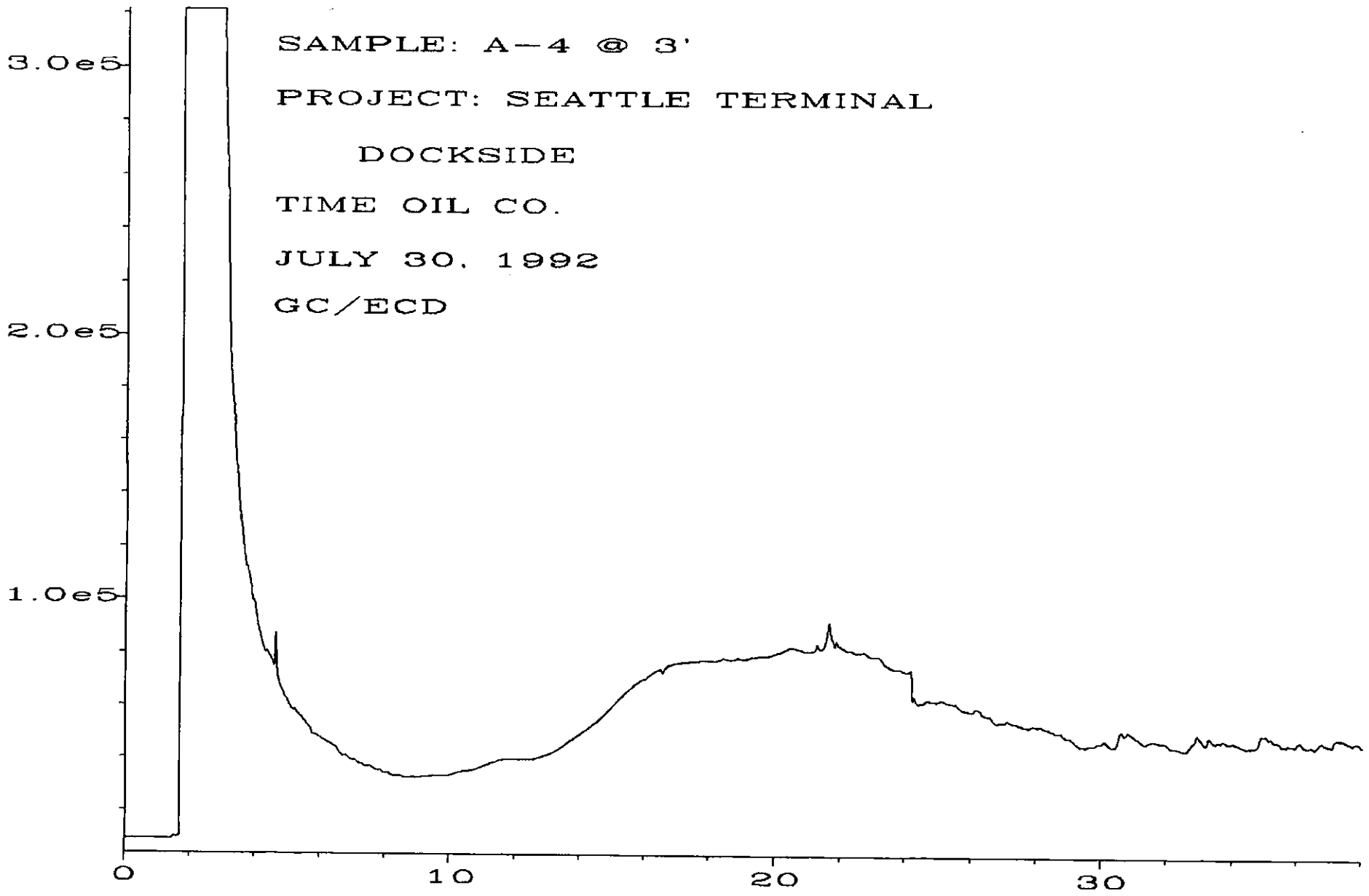

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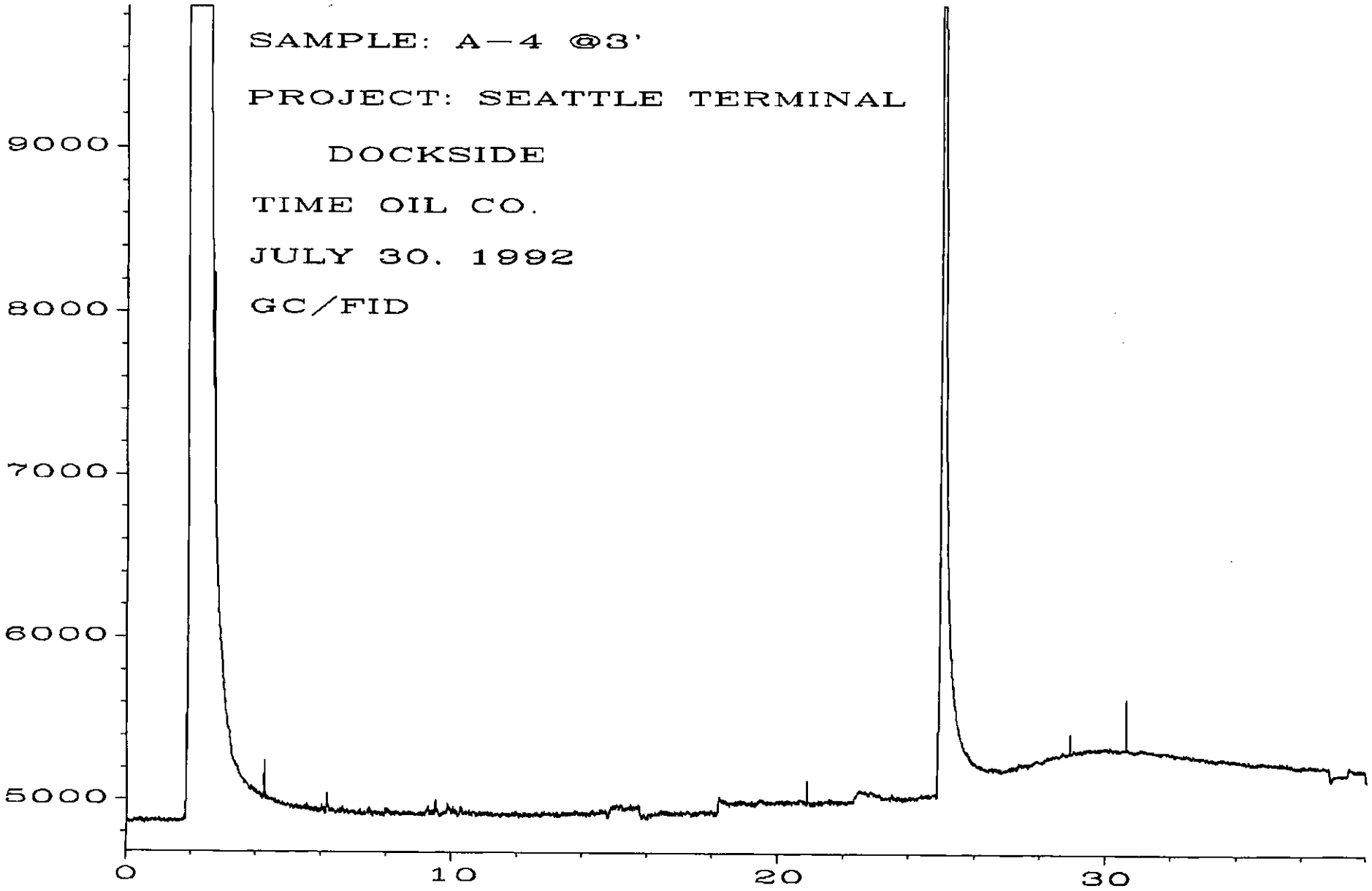

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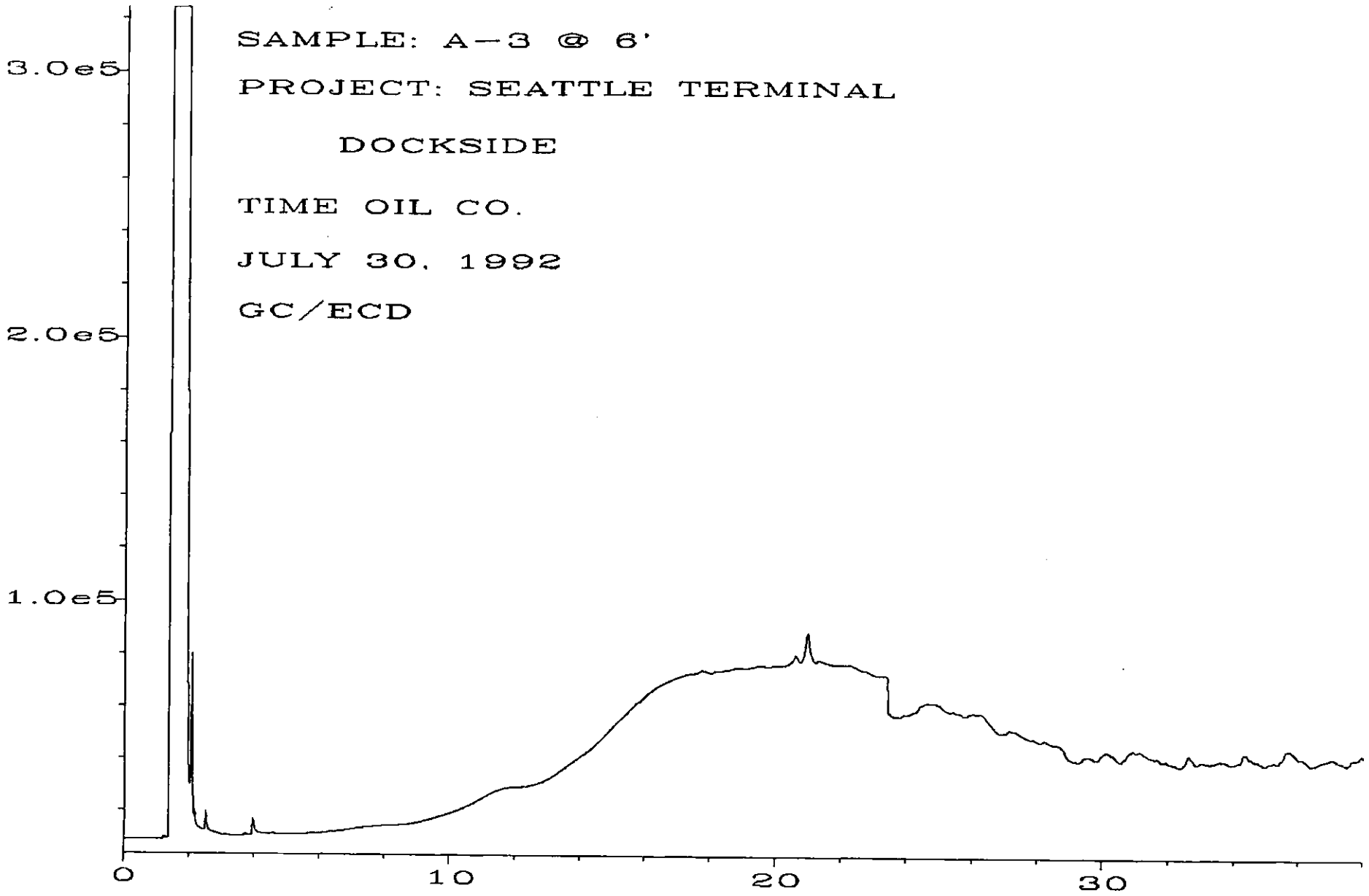

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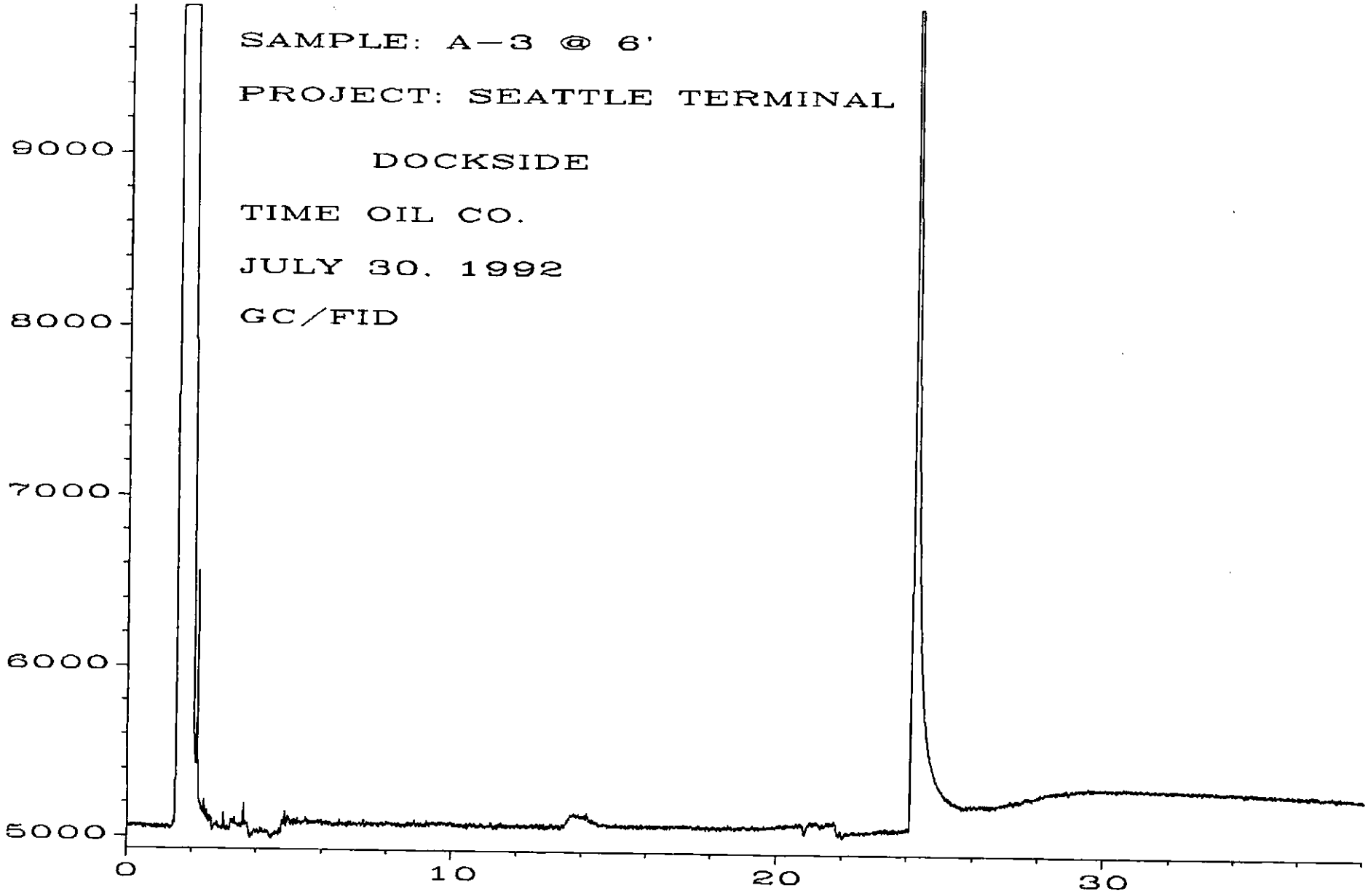

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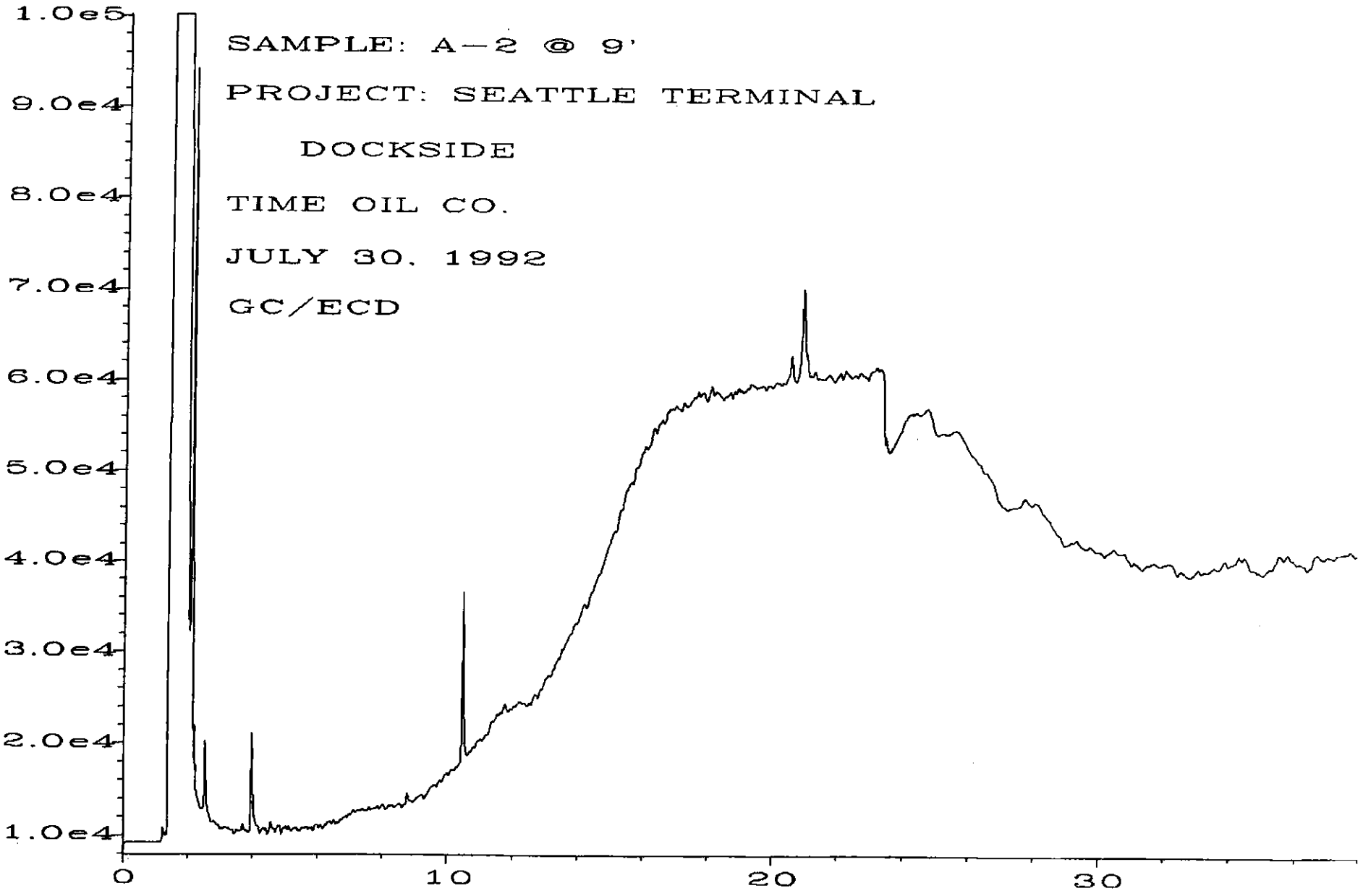

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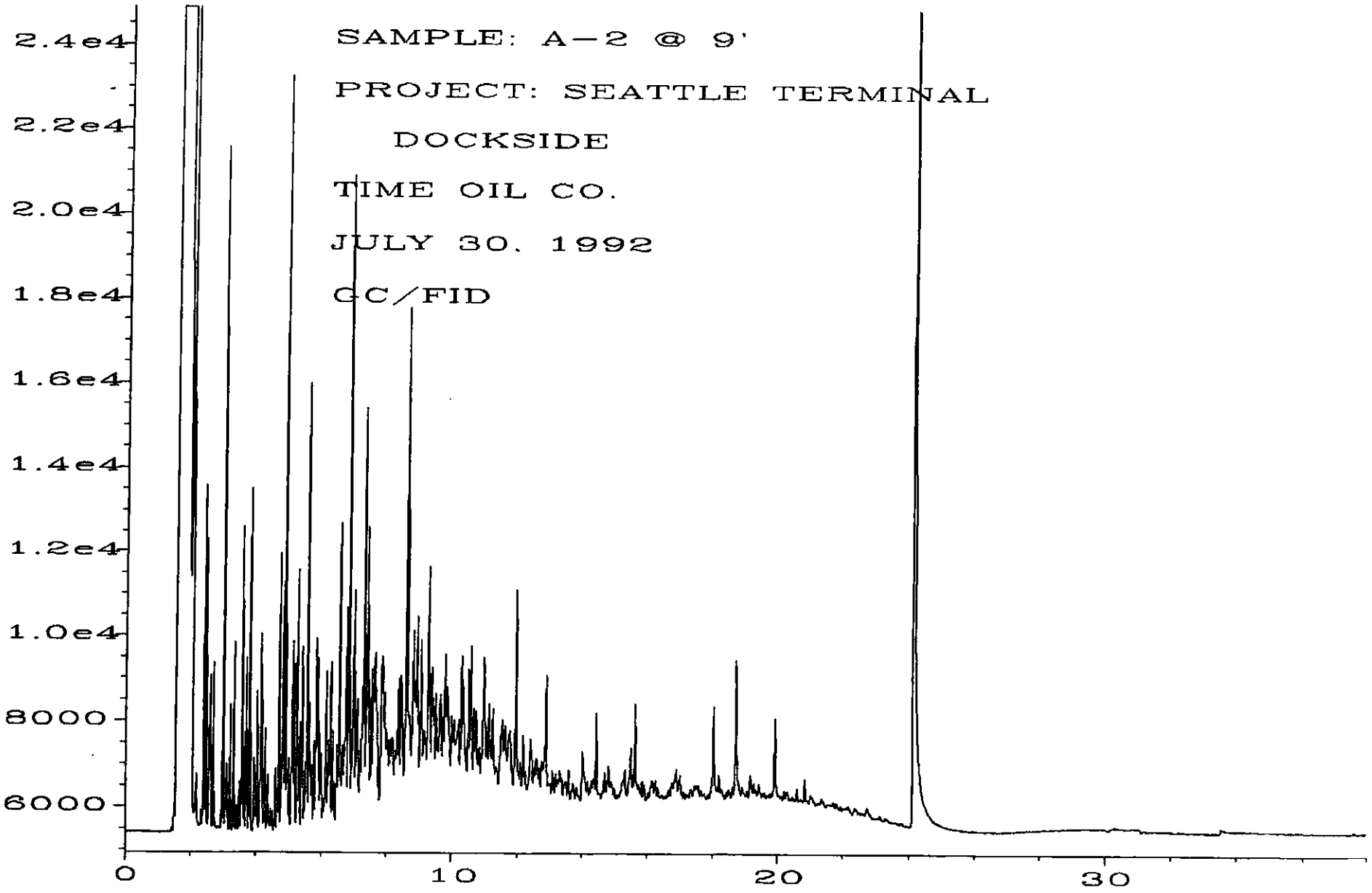

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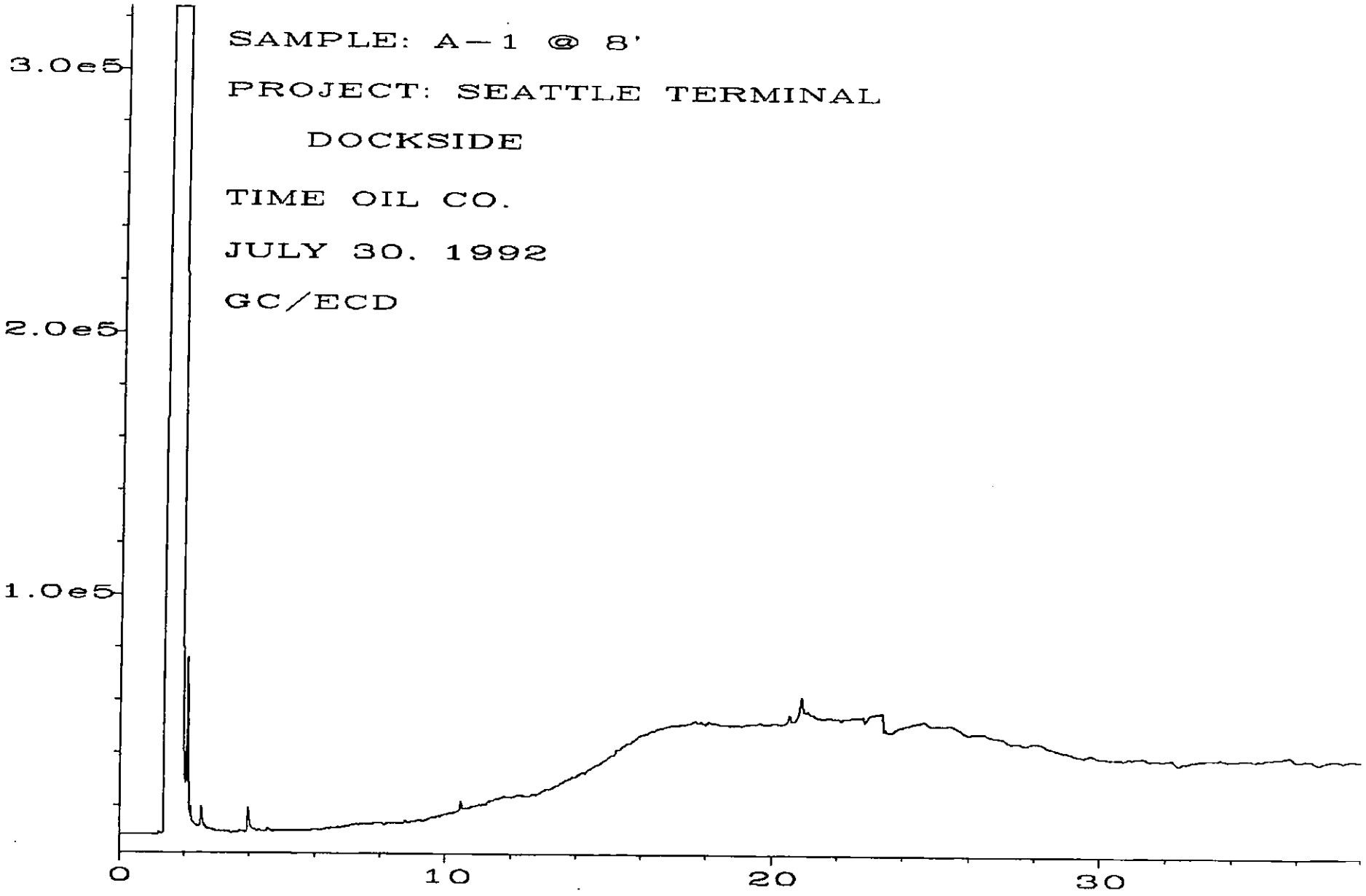

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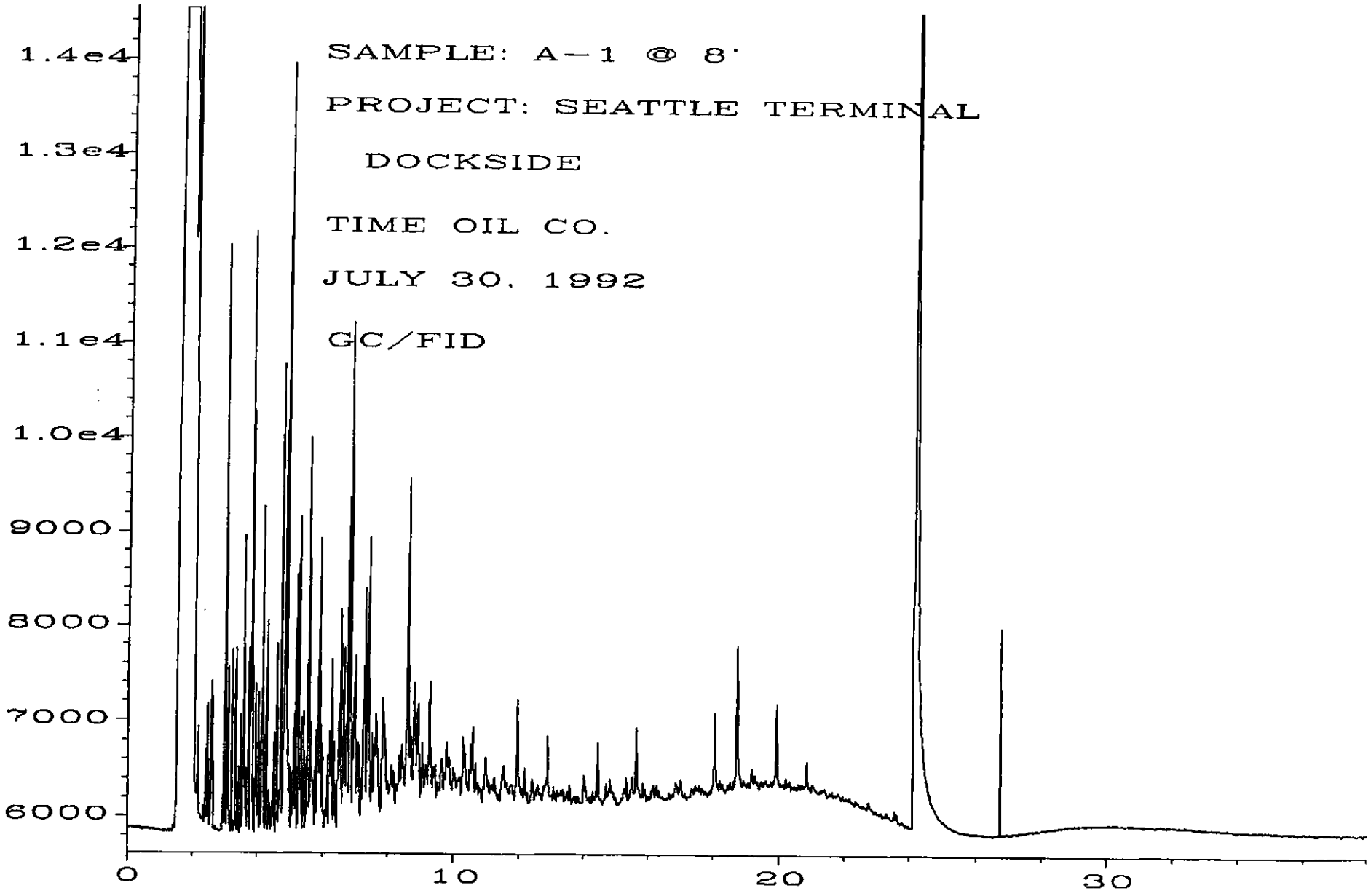

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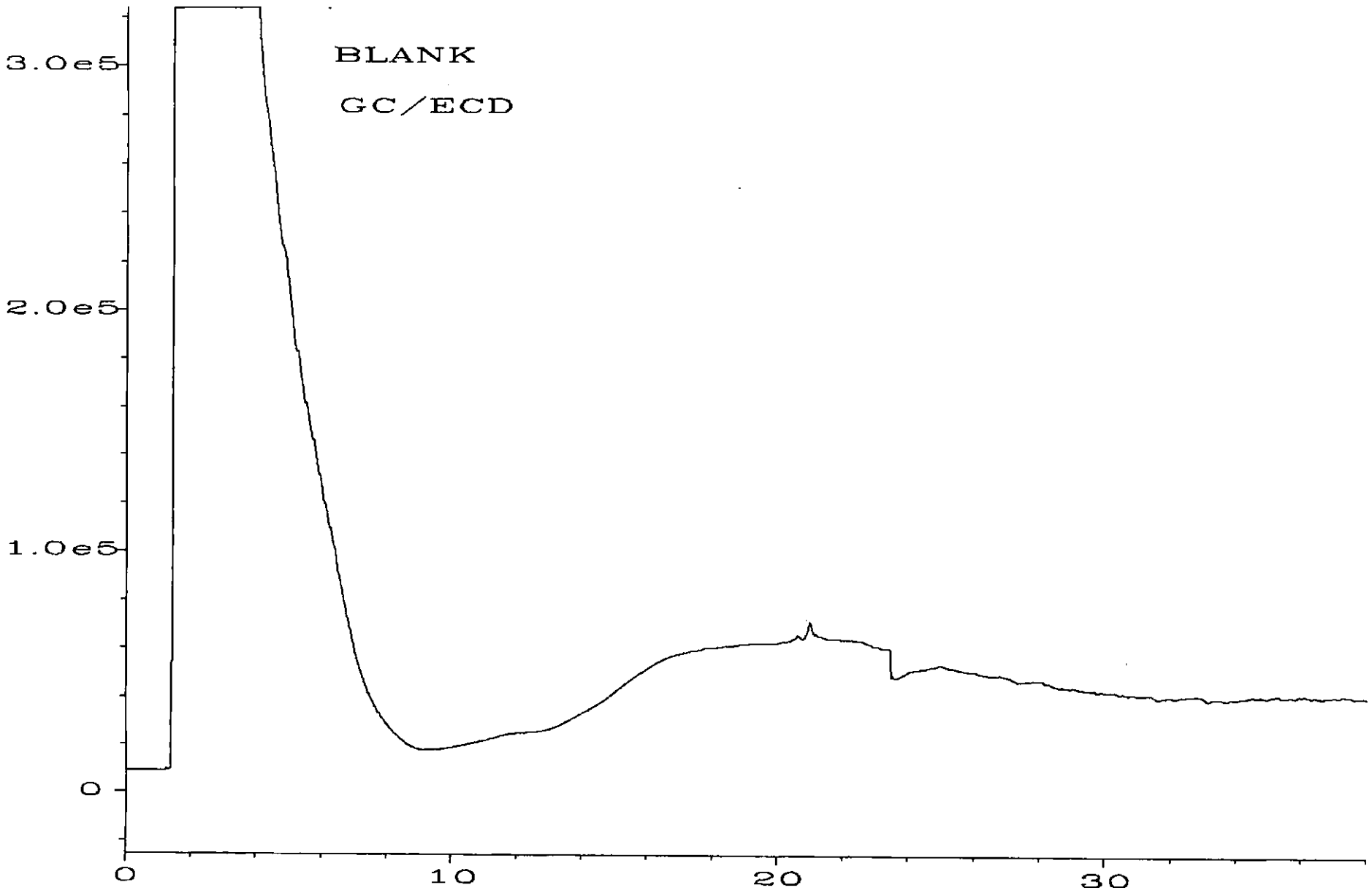

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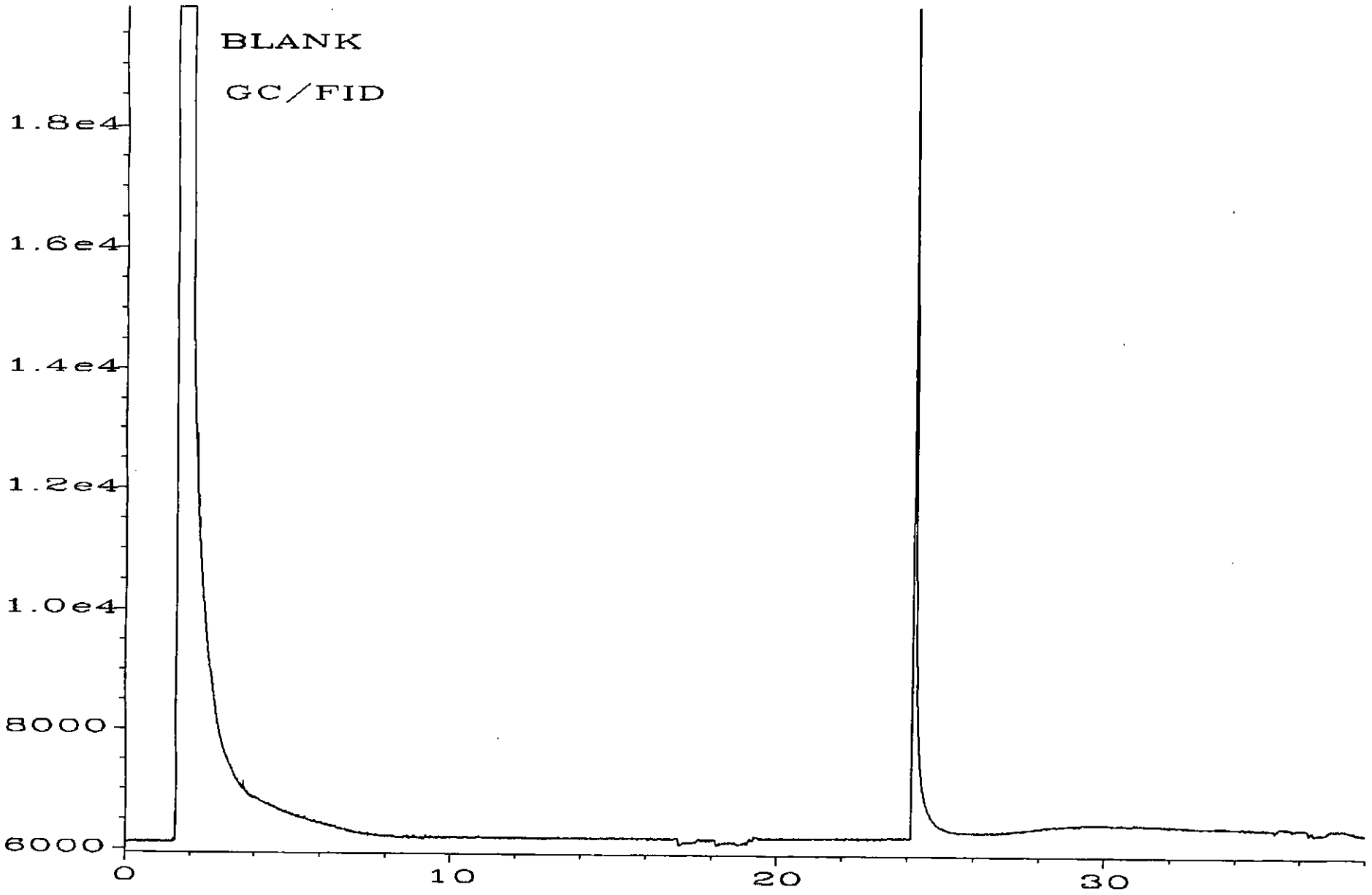

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FRIEDMAN & BRUYA, INC

ENVIRONMENTAL CHEMISTS

Andrew John Friedman
James E. Bruya, Ph.D.
(206) 285-8282

3008-B 16th Avenue West
Seattle, WA 98119
FAX: (206) 283-5044

August 10, 1992

Scott Sloan, Environmental Specialist
Time Oil Company
2737 West Commodore Way
Seattle, WA 98199

Dear Mr. Sloan:

Enclosed are the results of the analyses of the samples submitted on August 3, 1992 from Project 01-228, Commodore Way Dockside.

We appreciate this opportunity to be of service to you on this project. If you have any questions regarding this material, or if you just want to discuss any aspect of your projects, please do not hesitate to contact me.

Sincerely,

for Amy Gray

Amy M. Gray
Chemist

AMG/dp

Enclosures

FRIEDMAN & BRUYA, INC

ENVIRONMENTAL CHEMISTS

Date of Report: August 10, 1992
Date Submitted: August 3, 1992
Project: 01-228, Commodore Way Dockside

RESULTS OF ANALYSES OF THE SOIL SAMPLE FOR SELECTED METALS BY ICP (6010)
Results Reported as µg/g (ppm)

Sample #	Lead
WO-WC - Per Plan	18
Quality Assurance	
Method Blank	<0.5
WO-WC - Per Plan (Duplicate)	22
WO-WC - Per Plan (Matrix Spike) Percent Recovery	80%
WO-WC - Per Plan (Matrix Spike Duplicate) Percent Recovery	111%
Spike Blank Percent Recovery	107%
Spike Level	10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: August 10, 1992
Date Submitted: August 3, 1992
Project: 01-228, Commodore Way Dockside

RESULTS OF ANALYSES OF THE SOIL SAMPLE FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL BY GC/FID (MODIFIED 8015) Results Reported as µg/g (ppm)

Sample #	Diesel (ppm)	Internal Standard (% Recovery)
WO-WC - Per Plan	2,800	132%
Quality Assurance		
Method Blank	<10	100%
WO-WC - Per Plan (Duplicate)	4,070	125%
WO-WC - Per Plan (Matrix Spike) Percent Recovery	**ai**	134%
WO-WC - Per Plan (Matrix Spike Duplicate) Percent Recovery	**ai**	133%
Spike Blank Percent Recovery	100%	106%
Spike Level	500	

ai - The amount spiked was insufficient to give meaningful recovery data.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: August 10, 1992
Date Submitted: August 3, 1992
Project: 01-228, Commodore Way Dockside

RESULTS OF ANALYSES OF THE SOIL SAMPLES FOR FINGERPRINT CHARACTERIZATION BY CAPILLARY GAS CHROMATOGRAPHY USING FLAME IONIZATION DETECTION (FID) AND ELECTRON CAPTURE DETECTION (ECD)

Sample #	GC Characterization
WO-WC - Per Plan	The gas chromatographic trace showed the presence of medium boiling compounds, such as those found in diesel. This characterization is based on the presence of a relatively smooth envelope of peaks present from ca *n*-C_{10} to *n*-C_{22} with a maximum near *n*-C_{17} The material appeared to be slightly weathered due to the ragged nature of the envelope. A peak eluting at approximately 4 minutes is most likely not due to contamination from the soil. The ECD trace showed the absence of significant levels of halogenated materials. The large peak eluting at approximately 24 minutes represents our internal standard.
WO05' - Per Plan	The gas chromatographic trace showed an absence of significant levels of volatile or semi-volatile compounds. The large peak eluting at approximately 24 minutes represents our internal standard.

TIME OIL CO. SAMPLE LOG

Site Name: Commodore Way Dockside | Prop. No: 01-228 | Address: 2737 W. Commodore Seattle, WA
Sampler: Scott Sloan | Date: 7/29/92
Purpose: Assessment | Method: Grab [X] S.Spoon [ ] Bailer [ ] Pump [ ]
Lab Name: Friedman & Bruya | Preserved: Ice [X] Acid [ ] None [ ]
Lab Address: | Phone: | PO No.:

FBI

Sample #	Location/Description	Type*	Analysis Instructions	EPA Method
WO-WC -	Per Plan	(S) W P	WTPH-HCID / Total Lead	31936
WOOS' -	"	(S) W P	WTPH-HCID	31937
-		S W P		
-		S W P		
-		S W P		
-		S W P	Hold for further analyses 8-3-92	
-		S W P		
-		S W P		
-		S W P		
-		S W P		
-		S W P		
-		S W P	call w/results to discuss further analysis.	
-		S W P		
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-		S W P		
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-		S W P		

Other Instructions: Hold Samples for possible additional analysis

Sample Count = 2 *Check sample jar count against Log!* * S = Soil W = Water P = Product

CHAIN OF CUSTODY RECORD

Relinquished By: [signature] Received By: Lisa Bentley Date & Time 8-3-92 12:35p.

Relinquished By: Received For Lab By: Date & Time:

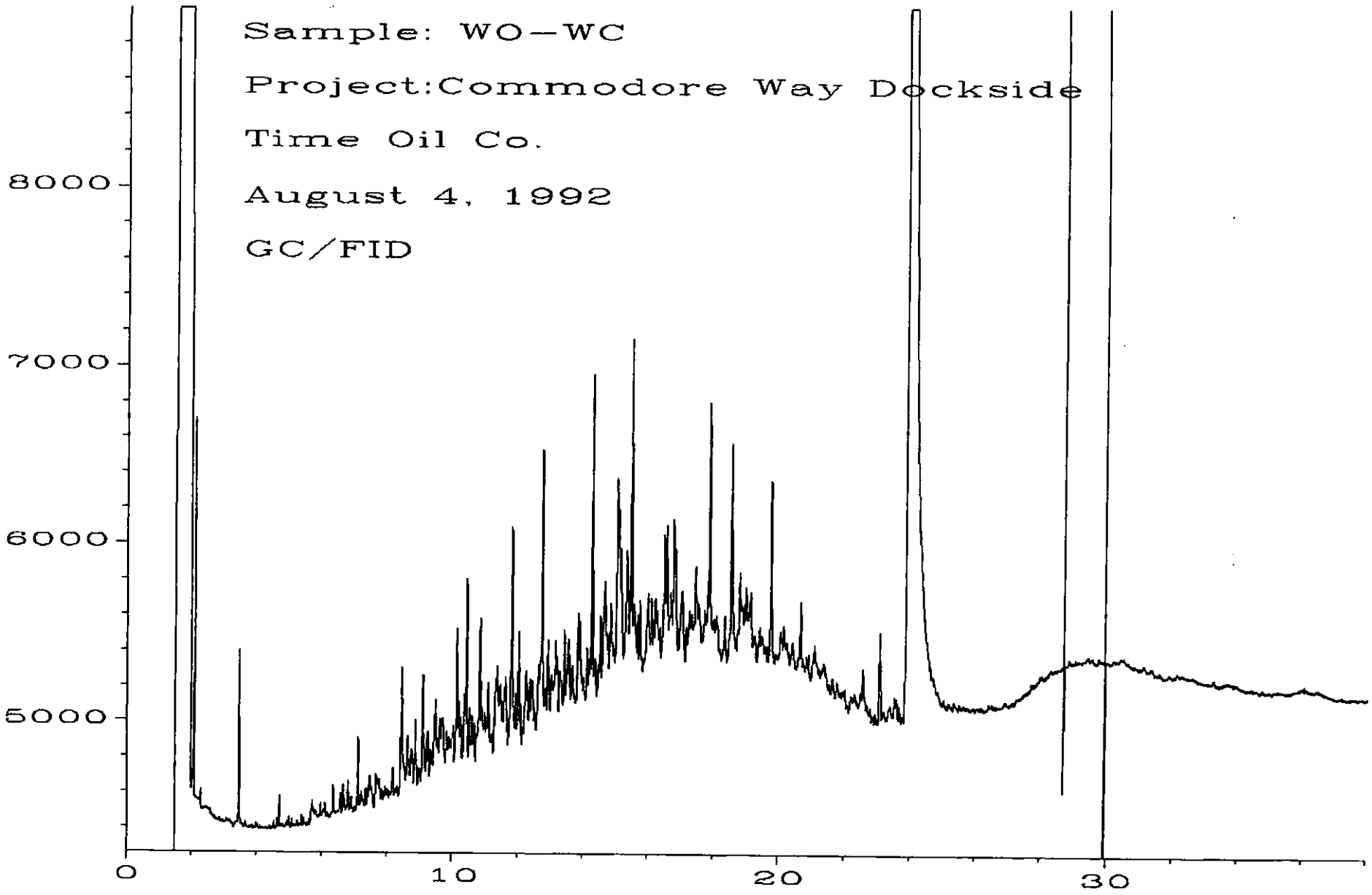
GENERAL LAB INSTRUCTIONS

Please provide the requested information

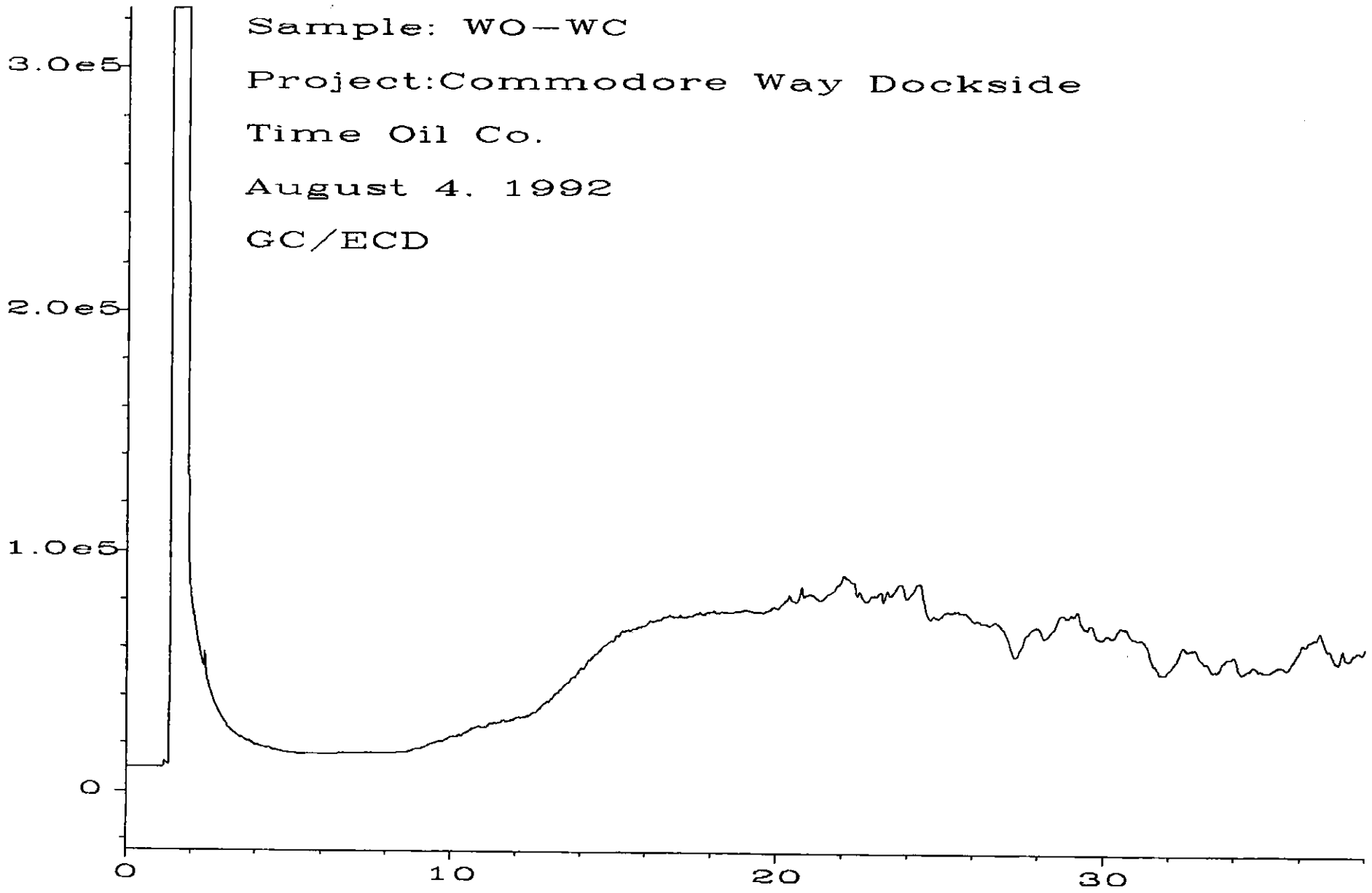
1. Sample numbers assigned by Lab: 31936 to 31937 Date Analyzed: 08-06-92
2. Person performing analysis: Melanie Kirol, Greg Monten Data Reviewer: Mark Perin, Amy Gray Brook, Sherfield
3. Scheduled sample disposal date: 9-3-92 NOTIFY TIME OIL CO. BEFORE DISPOSAL
4. Provide copies of ALL chromatograms, including QA/QC runs.

IMPORTANT! PLEASE RETURN A COPY OF THIS FORM WITH YOUR REPORT TO TIME OIL CO.
Attn: Environmental Manager, PO Box 24447 Terminal Sta., Seattle, WA 98124 (206) 285-2400

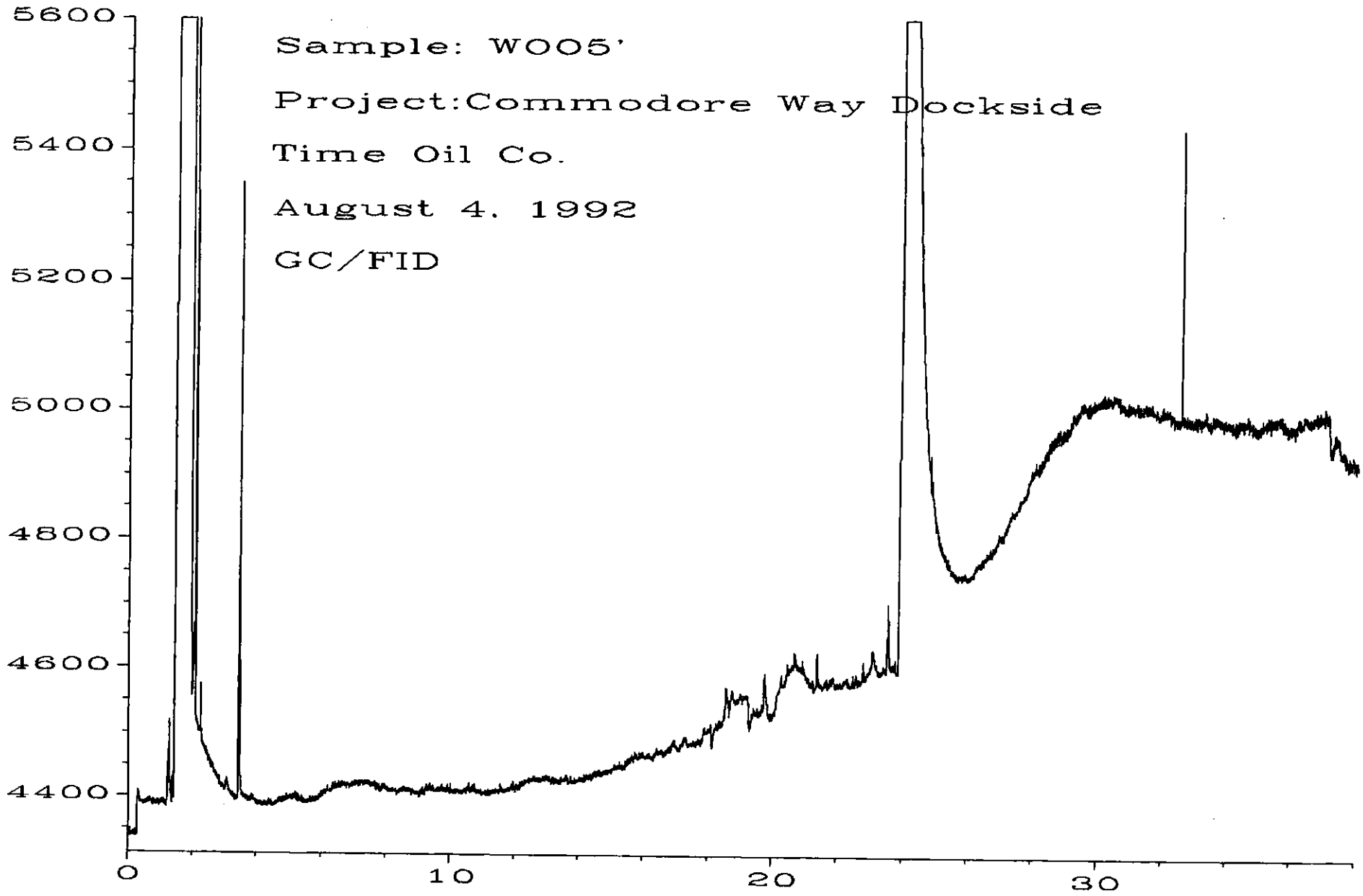
/



Sig. 1 in C:\HPCHEM\4\DATA\08-04-92\029F0201.D



Sig. 2 in C:\HPCHEM\4\DATA\08-04-92\029R0201.D



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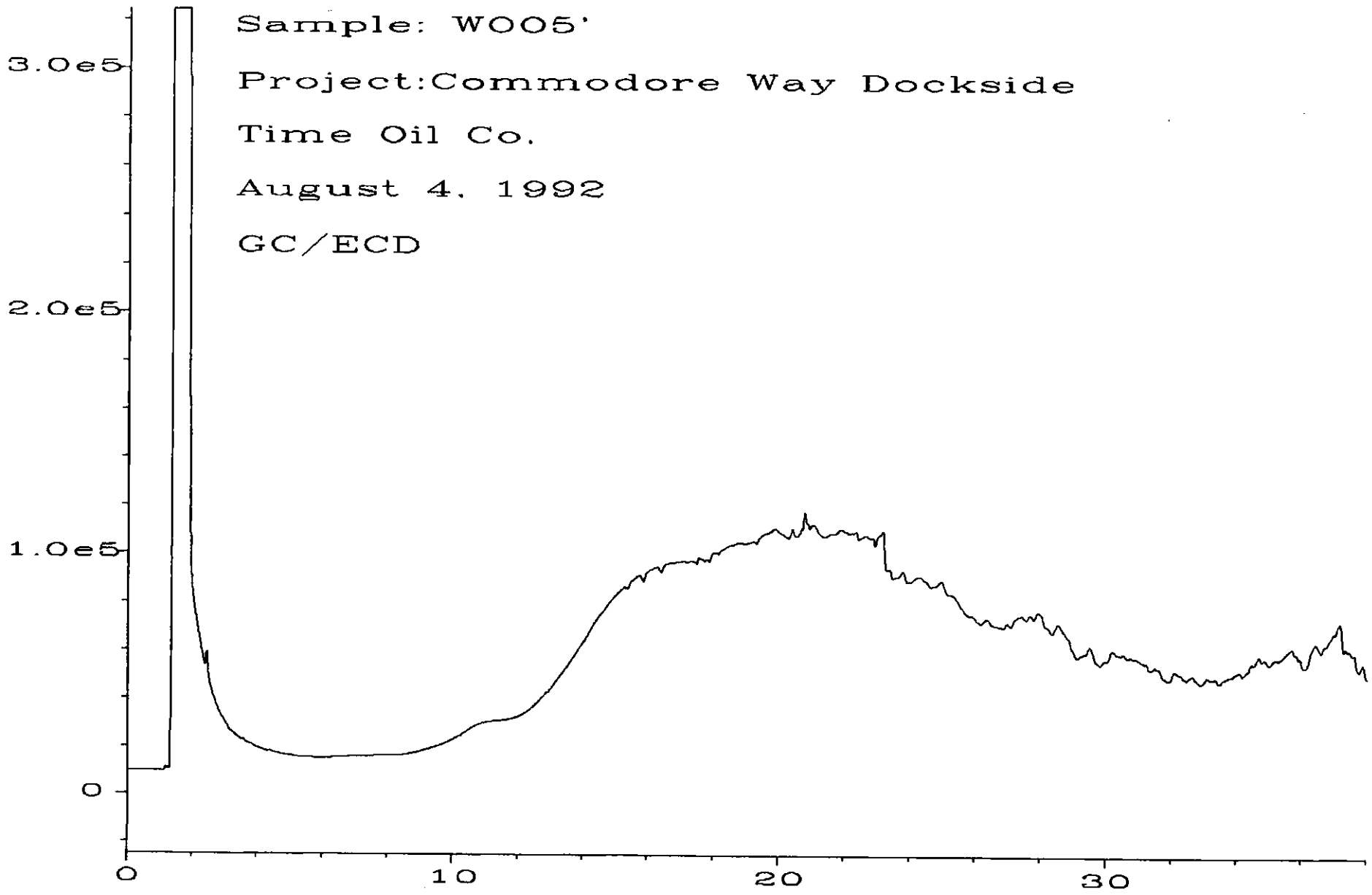

Sig. 2 in C:\HPCHEM\4\DATA\08-04-92\030R0201.D

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Andrew John Friedman
James E. Bruya, Ph.D.
(206) 285-8282

3008-B 16th Avenue West
Seattle, WA 98119
FAX: (206) 283-5044

August 18, 1992

Scott Sloan, Environmental Specialist
Time Oil Company
2737 West Commodore Way
Seattle, WA 98199

Dear Mr. Sloan:

Enclosed are the results of the analyses of the samples submitted on July 30, 1992 from Project 01-228, Seattle Terminal Dockside, PO #27608.

We appreciate this opportunity to be of service to you on this project. If you have any questions regarding this material, or if you just want to discuss any aspect of your projects, please do not hesitate to contact me.

Sincerely,

Kathy McMullen

Kathy McMullen
Chemist

KMC/dp

Enclosures

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: August 18, 1992
Date Submitted: July 30, 1992
Project: 01-228, Seattle Terminal Dockside, PO #27608

RESULTS OF ANALYSES OF THE SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND GASOLINE USING EPA METHODS 5030 COUPLED TO 8020 and 8015 Results Reported as mg/kg (ppm)

Sample #	A-1@8'	A-2@9'	A-6@3
Analyte:			
Benzene	<0.02	<0.02	0.16
Toluene	<0.02	<0.02	0.14
Ethylbenzene	<0.02	<0.02	2.6
Total Xylenes	<0.04	<0.04	4.9
Gasoline	60	290	110
Internal Standard (% Recovery)	87%	**ai, ip**	76%

ai - The amount spiked was insufficient to give meaningful recovery data.

ip - Interferences were present which prevented the identification and quantitation of the analyte at the established detection limit.

FRIEDMAN & BRUYA, INC

ENVIRONMENTAL CHEMISTS

Date of Report: August 18, 1992
Date Submitted: July 30, 1992
Project: 01-228, Seattle Terminal Dockside, PO #27608

RESULTS OF ANALYSES OF THE SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND GASOLINE USING EPA METHODS 5030 COUPLED TO 8020 and 8015
Results Reported as mg/kg (ppm)
Quality Assurance

Sample #	Method Blank	A-6@3' (Duplicate)
Analyte:		
Benzene	<0.02	0.31
Toluene	<0.02	0.22
Ethylbenzene	<0.02	5.0
Total Xylenes	<0.04	9.5
Gasoline	<2	190
Internal Standard (% Recovery)	78%	91%

FRIEDMAN & BRUYA, INC

ENVIRONMENTAL CHEMISTS

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Project: 01-228, Seattle Terminal Dockside, PO #27608

RESULTS OF ANALYSES OF THE SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND GASOLINE USING EPA METHODS 5030 COUPLED TO 8020 and 8015
Results Reported as mg/kg (ppm)
Quality Assurance

Sample #	A-6@3' Matrix Spike % Recovery	A-6@3' Matrix Spike Duplicate % Recovery	Spike Level
Analyte:			
Benzene	83%	88%	1
Toluene	73%	81%	1
Ethylbenzene	**ai**	**ai**	1
Total Xylenes	**ai**	**ai**	2
Internal Standard (% Recovery)	88%	102%	
Gasoline	50%	89%	100
Internal Standard (% Recovery)	88%	101%	

ai - The amount spiked was insufficient to give meaningful recovery data.

FRIEDMAN & BRUYA, INC

ENVIRONMENTAL CHEMISTS

Date of Report: August 18, 1992
Date Submitted: July 30, 1992
Project: 01-228, Seattle Terminal Dockside, PO #27608

RESULTS OF ANALYSES OF THE SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND GASOLINE USING EPA METHODS 5030 COUPLED TO 8020 and 8015
Results Reported as mg/kg (ppm)
Quality Assurance

Sample # / Analyte:	Spike Blank % Recovery	Spike Level
Benzene	103%	1
Toluene	99%	1
Ethylbenzene	112%	1
Total Xylenes	118%	2
Internal Standard (% Recovery)	113%	
Gasoline	95%	100
Internal Standard (% Recovery)	130%	

FRIEDMAN & BRUYA, INC

ENVIRONMENTAL CHEMISTS

Date of Report: August 18, 1992
Date Submitted: July 30, 1992
Project: 01-228, Seattle Terminal Dockside, PO #27608

RESULTS OF ANALYSES OF THE SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MINERAL SPIRITS BY GC/FID (MODIFIED 8015) Results Reported as µg/g (ppm)

Sample #	Mineral Spirits (ppm)	Diesel (ppm)
A-1@8'	50	90
A-2@9'	200	330
A-6@3'	210[a]	1,600
Quality Assurance		
Method Blank	<10	<10
A-1@8' (Duplicate)	20	40
A-1@8' (Matrix Spike) Percent Recovery	99%	111%
A-1@8' (Matrix Spike Duplicate) Percent Recovery	91%	115%
Spike Blank Percent Recovery	84%	107%
Spike Level	1,000	1,000

a - The material present may be indicative of diesel.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: August 18, 1992
Date Submitted: July 30, 1992
Project: 01-228, Seattle Terminal Dockside, PO #27608

RESULTS OF ANALYSES OF THE SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL BY GC/FID (MODIFIED 8015)
Results Reported as µg/g (ppm)

Sample #	Motor Oil (ppm)
A-1@8'	<100
A-2@9'	<100
A-6@3'	2,300
Quality Assurance	
Method Blank	<100
A-1@8' (Duplicate)	<100
A-1@8' (Matrix Spike) Percent Recovery	110%
A-1@8' (Matrix Spike Duplicate) Percent Recovery	111%
Spike Blank Percent Recovery	122%
Spike Level	1,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: August 18, 1992
Date Submitted: July 30, 1992
Project: 01-228, Seattle Terminal Dockside, PO #27608

RESULTS OF ANALYSES OF THE SOIL SAMPLES FOR FINGERPRINT CHARACTERIZATION BY INDUCTIVELY COUPLED PLASMA (ICP) EMISSION SPECTROSCOPY

Sample #	ICP Characterization
A-1@8'	The ICP emission spectroscopy trace showed the presence of the following metals at the approximate level indicated. Aluminum (25,000 ppm) Antimony (<1 ppm) Arsenic (<1 ppm) Barium (150 ppm) Berylium <10 ppm) Boron (<10 ppm) Cadmium (<10 ppm) Calcium (2,000 ppm) Chromium (25 ppm) Cobalt (10 ppm) Copper (10 ppm) Gold (<1 ppm) Iron (10,000 ppm) Lead (<1 ppm) Lithium (50 ppm) Magnesium (1,500 ppm) Manganese (200 ppm) Mercury (<1 ppm) Molybdenum (<1 ppm) Nickel (25 ppm) Palladium (<1 ppm) Phosphorous (<1 ppm) Platinum (<1 ppm) Potassium (1,500 ppm) Rhenium (<1 ppm) Selenium (<1 ppm) Silver (<1 ppm) Sodium (2,500 ppm) Strontium (1,000 ppm) Thallium (<1 ppm) Tin (<1 ppm) Titanium (2,000 ppm) Uranium (<1 ppm) Vanadium (1 ppm) Yttrium (50 ppm) Zinc (50 ppm) Zirconium (100 ppm)

FRIEDMAN & BRUYA, INC

ENVIRONMENTAL CHEMISTS

Date of Report: August 18, 1992
Date Submitted: July 30, 1992
Project: 01-228, Seattle Terminal Dockside, PO #27608

RESULTS OF ANALYSES OF THE SOIL SAMPLES FOR FINGERPRINT CHARACTERIZATION BY INDUCTIVELY COUPLED PLASMA (ICP) EMISSION SPECTROSCOPY

Sample #
A-2@9'

ICP Characterization

The ICP emission spectroscopy trace showed the presence of the following metals at the approximate level indicated.

- Aluminum (25,000 ppm)
- Antimony (<1 ppm)
- Arsenic (<1 ppm)
- Barium (150 ppm)
- Berylium (<1 ppm)
- Boron (<1 ppm)
- Cadmium (<1 ppm)
- Calcium (<1 ppm)
- Chromium (25 ppm)
- Cobalt (10 ppm)
- Copper (10 ppm)
- Gold (<1 ppm)
- Iron (10,000 ppm)
- Lead (<1 ppm)
- Lithium (50 ppm)
- Magnesium (1,500 ppm)
- Manganese (200 ppm)
- Mercury (<1 ppm)
- Molybdenum (<1 ppm)
- Nickel (25 ppm)
- Palladium (<1 ppm)
- Phosphorous (<1 ppm)
- Platinum (<1 ppm)
- Potassium (1,500 ppm)
- Rhenium (<1 ppm)
- Selenium (<1 ppm)
- Silver (<1 ppm)
- Sodium (2,500 ppm)
- Strontium (1,000 ppm)
- Thallium (<1 ppm)
- Tin (<1 ppm)
- Titanium (2,000 ppm)
- Uranium (<1 ppm)
- Vanadium (1 ppm)
- Yttrium (50 ppm)
- Zinc (50 ppm)
- Zirconium (100 ppm)

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: August 18, 1992
Date Submitted: July 30, 1992
Project: 01-228, Seattle Terminal Dockside, PO #27608

RESULTS OF ANALYSES OF THE SOIL SAMPLES FOR FINGERPRINT CHARACTERIZATION BY INDUCTIVELY COUPLED PLASMA (ICP) EMISSION SPECTROSCOPY

Sample #	ICP Characterization
A-6@3'	The ICP emission spectroscopy trace showed the presence of the following metals at the approximate level indicated.

Aluminum (25,000 ppm)
Antimony (<1 ppm)
Arsenic (<1 ppm)
Barium (150 ppm)
Berylium (<10 ppm)
Boron (<1 ppm)
Cadmium (<1 ppm)
Calcium (<1 ppm)
Chromium (25 ppm)
Cobalt (10 ppm)
Copper (10 ppm)
Gold (<1 ppm)
Iron (10,000 ppm)
Lead (<1 ppm)
Lithium (50 ppm)
Magnesium (1,000 ppm)
Manganese (200 ppm)
Mercury (<1 ppm)
Molybdenum (<1 ppm)
Nickel (25 ppm)
Palladium (<1 ppm)
Phosphorous (<1 ppm)
Platinum (<1 ppm)
Potassium (1,500 ppm)
Rhenium (<1 ppm)
Selenium (<1 ppm)
Silver (<1 ppm)
Sodium (2,500 ppm)
Strontium (1,000 ppm)
Thallium (<1 ppm)
Tin (<1 ppm)
Titanium (2,000 ppm)
Uranium (<1 ppm)
Vanadium (1 ppm)
Yttrium (50 ppm)
Zinc (50 ppm)
Zirconium (100 ppm)

TIME C _ CO. SAMPLE LO

AMG-A
1-2 30-32 (3148)

Site Name: Seattle Terminal Dockside Prop. No: 01-228 Address: 2330 Elliott Ave
Sampler: Scott Sloan Date: 7/30/92 Seattle, Wa
Purpose: Excavation Assessment Method: Grab ☒ S.Spoon ☐ Bailer ☐ Pump ☐
Lab Name: Friedman & Bruya Preserved: Ice ☒ Acid ☐ None ☐
Lab Address: Phone: # 276062 PO No.:

Sample #	Location/Description	Type*	Analysis Instructions	EPA Method
A-108'	- SE Corner in Cap. Fringe	S W P	WTPH - HCID	31873
A-209'	- " , 1' lower	S W P		31874
A-306'	- E Side in Cap. Fringe	S W P		31875
A-403'	- N in Cap. Fringe	S W P		31876
A-503'	- NE Corner in Cap. Fringe	S W P		31877
A-603'	- NW Corner in Cap. Fringe	S W P		31878
	-	S W P		
	-	S W P		
	-	S W P		
	-	S W P		
	-	S W P		
	-	S W P	WTPH analysis requested	
	-	S W P	in addition as Scott	
	-	S W P	Sloan - BTE, Gasoline and	
	-	S W P	801 thru motor oil range	
	-	S W P	on A/A-2 and	
	-	S W P	08-06-92 A6 1000 A	
	-	S W P	And total metal scans	
	-	S W P	08-06-92	
	-	S W P	A6	
	-	S W P		
	-	S W P		

Other Instructions: Hold Samples for possible additional testing.

Sample Count = Check sample jar count against Log! * S = Soil W = Water P = Product

CHAIN OF CUSTODY RECORD

Relinquished By: [signature] Received By: [signature] Date & Time: 7-30-92 12:25
Relinquished By: Received For Lab By: Date & Time:

GENERAL LAB INSTRUCTIONS

Please provide the requested information

1. Sample numbers assigned by Lab: 31873 to 31878 Date Analyzed: 7-31-92
2. Person performing analysis: Andrew Friedman, Amy Gra Data Reviewer: Andrew Friedman
3. Scheduled sample disposal date: 8-30-92 NOTIFY TIME OIL CO. BEFORE DISPOSAL
4. Provide copies of ALL chromatograms, including QA/QC runs.

IMPORTANT! PLEASE RETURN A COPY OF THIS FORM WITH YOUR REPORT TO TIME OIL C
Attn: Environmental Manager, PO Box 24447 Terminal Sta., Seattle, WA 98124 (206) 285-2400