



New Ventures

***Geochemical Fieldwork Report
on EL 387***

Norman Wells Area – N.W.T.

***Field work performed
August 22 - 27, 1997***

**Glen Andrews
Sr. Geologist
July 24, 1998**

**AEC West Ltd.
New Ventures
Geochemical Fieldwork Report
on EL 387
Norman Wells Area – N.W.T.**

**Field work performed
August 22 - 27, 1997**

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Part 2

- Geochemical Report from E.D.M. Inc.
(Summary localities, geochemical analysis, photographs of sample sites, hydrocarbon assessment with chromatograms)
Note – Lab Results from Norwest Labs

List of References

Appendices (in separate folder)

1. *Topographic Maps, N.T.S. 106H + 96E, showing exact locations of surface geochemical samples in relationship to EL 387 (1:50,000 and 1:250,000)*

AEC West Ltd.
Geochemical Fieldwork Report
on and adjacent to EL 387

South of Fort Good Hope & Northwest of Norman Wells

Title Page

Operation Identifier	9233-A61-1E	
Operator's Report Name	AEC West Ltd.	
Type of Survey	Geochemical sampling fieldwork	
Survey Locality	1. N.T.S. Map Sheet 106H (1:250,000) 2. N.T.S. Map Sheet 96E (1:250,000)	
Year of Field Work	August 22 – 27, 1997	
Name of Operation Operator	AEC West Ltd.	
Field Geologist	Glen D. Andrews (AEC West)	
Name of Sub-contractors	Dermot McCaw, E.D.S. (Environmental Data Management Ltd.) R. Corbet, Norwest Labs (analysed samples)	
Native Guide & Support	Charlie Barnaby	
Field Transportation	Tim Simmons Canadian Helicopters (Norman Wells, NWT)	
Specific Interests	100% AEC West	
Author of the Report	Glen D. Andrews, P.Geol. Senior Geologist – AEC West	
Report Date	July 24, 1998	
AEC Operating Licence	1997: # 878;	1998: # 889



Geochemical Field Report Summary (Purpose & Results)

**for EL 387
Norman Wells Area, N.W.T.
July 13 - 23, 1997**

The purpose of the geochemical field work (sampling and analysis) was to determine locations and types of hydrocarbon seeps on and adjacent to EL 387 (see regional location map, Figure 1). Visual observations from helicopters, during previous field geology work, had noted numerous iridescent sheens on the surface of lakes and small bodies of water, which gave the appearance of a thin film of oil on water.

AEC sub-contracted Dermot McCaw, of Environmental Data Management Inc., to do the field sampling in conjunction with AEC Senior Geologist, Glen D. Andrews, and native guide/support, Charlie Barnaby. The samples were analysed at Norwest Labs, and the complete results are provided in the sub-report by E.D.M. Inc. included in this report.

The area of EL 387 was flown by helicopter at low level and anomalous visual sightings were sampled (see List of Geochemical Sampling Sites; also see Appendix - topographic map 1:250,000 with EL 387 outline and detailed topographic map 1:50,000 showing all sample locations). A few sites around the Norman Wells area were sampled where similar visual observations were noted, such as Seepage Lake, Norman Wells Public Dock and near the dam on Boswell Creek in Norman Wells.

Photographs of all sites sampled are included to show the nature of the visual (sheen / iridescence) anomalies. Most of the samples analysed had "no hydrocarbons detected". Lloyd Snowdon of the G.S.C. suggested that these visual sheens may be due to iron oxides associated with organics in stagnant waters where reducing conditions exist.

Samples 12A, 16A, 24A, 25A and 35A contain some indication of hydrocarbons. Samples 12A, 16A and 24A have insufficient hydrocarbon to allow an accurate assessment (see detailed results). Sample 25A, from the Norman Wells Public Dock,



"contains some hydrocarbon C₁₁-C₃₀, which would indicate possible diesel" – possible spill or leak from boats? Sample 35A, from Seepage Lake, contains *"hydrocarbons in the C₁₁-C₄₀ + range indicating the presence of weathered crude oil"* consistent with a possible oil seep. Sample sites 5 and 29 are near the junction of Mountain River and the Mackenzie River at the old Chevron 1989-90 campsite. These samples were taken from a small, bubbling minor spring on the roadside, in gravel. Sample 29 was taken about 24 hours after the first sampling. This site appeared to have gas bubbling and strong iridescence; however, rusty iron staining was present in the area.

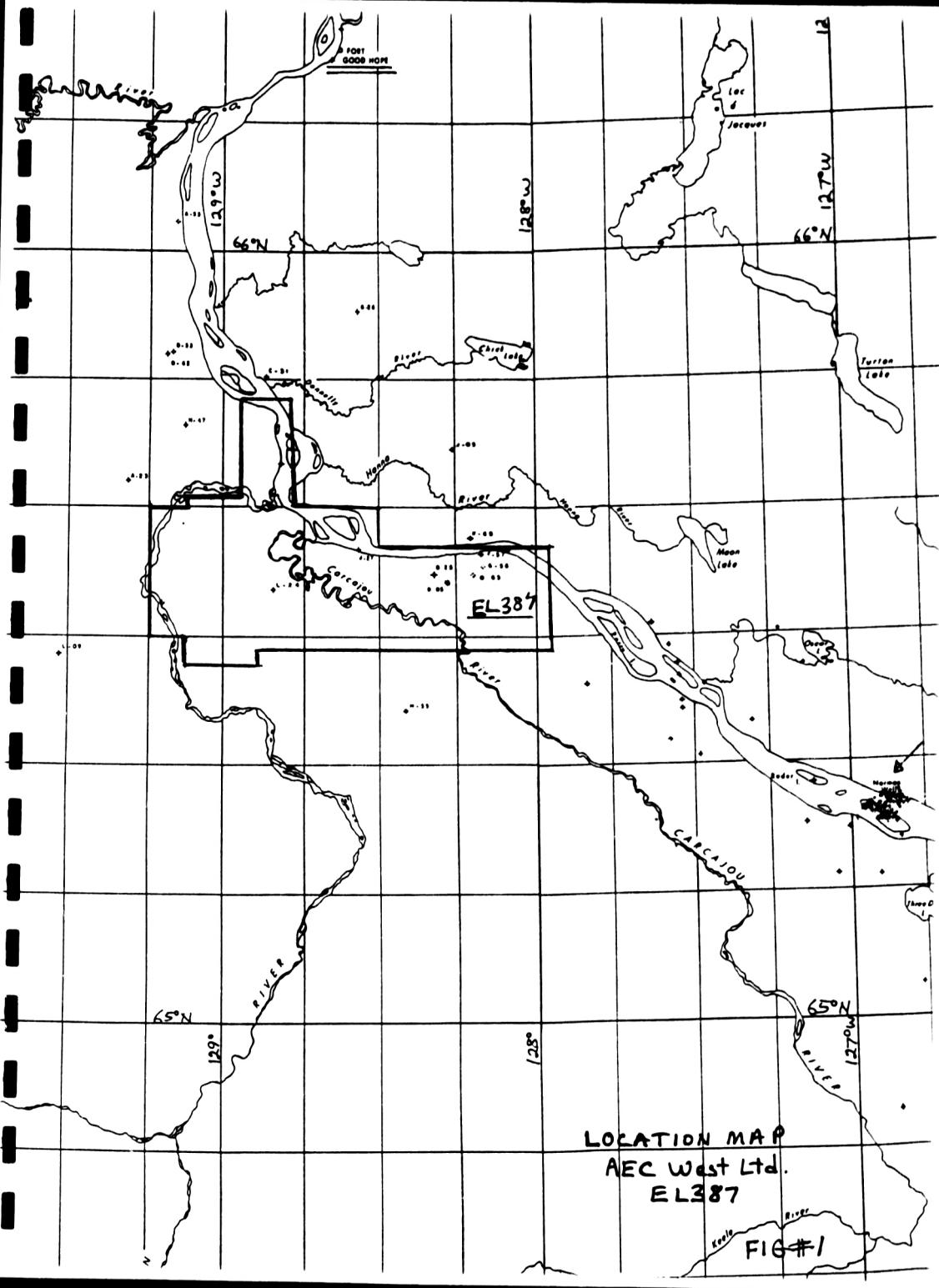
Generally, the results of the field sampling suggest few (if any) significant oil seeps in the area of EL 387 related to the visual iridescence on water bodies.

A handwritten signature in black ink, appearing to read "Glen D. Andrews".

Glen D. Andrews – Sr. Geologist

AEC West Ltd.

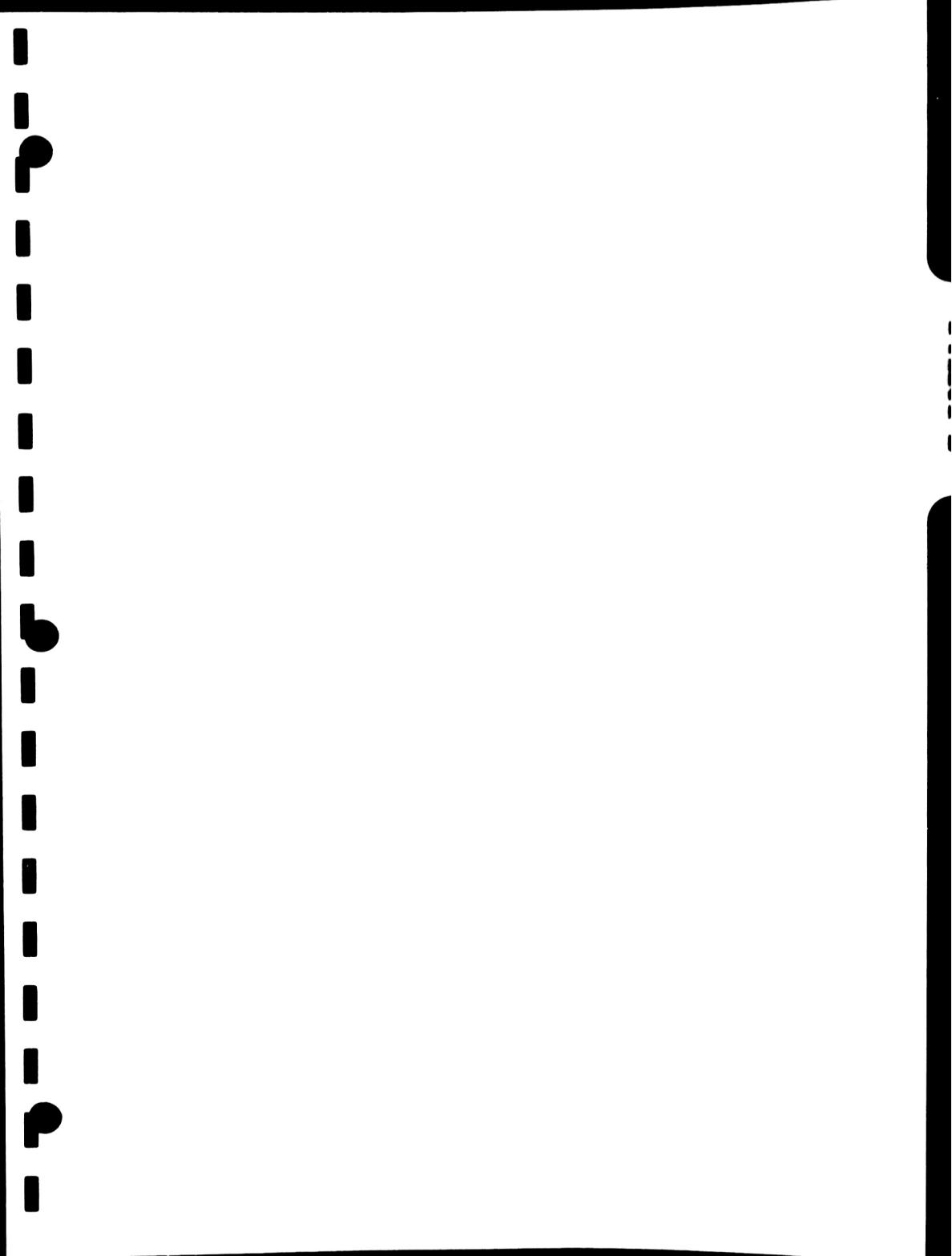
July 24, 1998



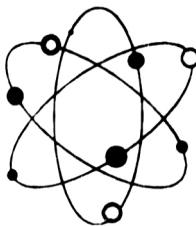
**List of Geochemical Sampling Sites
for EL 387
(Central N.W.T.)**

Site #	Global Positioning Satellite		
	Latitude	Longitude	
1	65° 39' 3.2" N	128° 40' 28.5" W	Axel Island, West end
2	65° 39' 12.1" N	128° 40' 47. 1 W	
3	65° 38' 58.2" N	128° 40' 26. 1 W	
4	65° 39' 13.7" N	128° 39' 35.8" W	
5	65° 40' 15.4" N	128° 49' 8.3" W	Road gravel, old Chevron site
6	65° 33' 22.6" N	128° 22' 17.2" W	
7	65° 34' 19.3" N	128° 28' 42.9" W	
8	65° 34' 26.9" N	128° 31' 19.7" W	
9	65° 35' 12.8" N	128° 29' 22.9" W	
10	65° 38' 46.2" N	128° 42' 45.3" W	
11	65° 44' 49.4" N	128° 46' 34.7" W	
12	65° 45' 8.5" N	128° 47' 27.0" W	
13	65° 49' 33.3" N	128° 55' 11.7" W	
14	65° 47' 5.7" N	128° 51' 29.8" W	
15	65° 46' 50.8" N	128° 51' 31.2" W	
16	65° 43' 20.1" N	128° 42' 53.6" W	
17	65° 43' 53.8" N	128° 50' 57.8" W	
18	65° 43' 26.7" N	128° 51' 53.9" W	
19	65° 42' 38.3" N	128° 55' 17.5" W	
20	65° 38' 30.5" N	128° 49' 15.0" W	
21	65° 37' 27.7" N	128° 50' 10.7" W	Immediately adjacent to Carcajou River in small slough
22	65° 35' 10.5" N	128° 48' 44.8" W	
23	65° 36' 4.8" N	128° 41' 30.1" W	
24	Norman Wells Public Dock		
25	Norman Wells Public Dock		
26	65° 35' 20.2" Ground	128° 20' 17.8" W	
	65° 35' 17" Air	128° 20' 32.8" W	
27	65° 35' 26.6 N	128° 34' 14.3 " W	
28	65° 32' 26.2" N	128° 37' 20.9" W	
29	65° 40' 15.4" N	128° 49' 8.3" W	Chevron Site Road revisited
30	65° 29' 53.7" N	128° 31' 34.5" W	
31	65° 33' 5.9" N	128° 29' 34.4" W	
32	65° 35' 16.9" N	128° 20' 19.0" W	
33	65° 34' 15.5" N	128° 17' 43.8" W	
34	65° 39' 36.2" N	128° 49' 38.4" W	
35	65° 17' 37.4" N	126° 50' 3.6" W	
	Seepage Lake		
36	Norman Wells Boswell Creek (Dam Street)		

See Appendix – Topographic maps showing localities



E.D.M. INC.



AEC West

Drilling Waste Analysis for:

Water Hydrocarbon Assessment

Date Reported: November 28, 1997

Invoice # E97-254

License # EL 387

Environmental Data Management Inc.

Dermot McCaw

4211 - 147 St. Edmonton, Alberta

T6H 5V6

Phone: 434-4584 Cell: 915-5596 Fax: 431-2890

e-mail: dmccaw@oanet.com



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Summary of Results of combined samples from

12a, 16a, 24a, 25a and 35a

Hydrocarbon Characterization Chromatograms

Tab 5

Quality Control Results

EDM

ENVIRONMENTAL DATA MANAGEMENT INC.

4211 - 147 Street, Edmonton, AB T6H 5V6 Tel: (403) 434-4584 Fax: (403) 431-2890

Site #	Global Position Satellite	
	Latitude	Longitude
1	65° 39' 3.2" N	128° 40' 28.5" W
2	65° 39' 12.1" N	128° 40' 47.1" W
3	65° 38' 58.2" N	128° 40' 26.1" W
4	65° 39' 13.7" N	128° 39' 35.8" W
5	65° 40' 15.4" N	128° 49' 8.3" W
6	65° 33' 22.6" N	128° 22' 17.2" W
7	65° 34' 19.3" N	128° 28' 42.9" W
8	65° 34' 26.9" N	128° 31' 19.7" W
9	65° 35' 12.8" N	128° 29' 22.9" W
10	65° 38' 46.2" N	128° 42' 45.3" W
11	65° 44' 49.4" N	128° 46' 34.7" W
12	65° 45' 8.5" N	128° 47' 27.0" W
13	65° 49' 33.3" N	128° 55' 11.7" W
14	65° 47' 5.7" N	128° 51' 29.8" W
15	65° 46' 50.8" N	128° 51' 31.2" W
16	65° 43' 20.1" N	128° 42' 53.6" W
17	65° 43' 53.8" N	128° 50' 57.8" W
18	65° 43' 26.7" N	128° 51' 53.9" W
19	65° 42' 38.3" N	128° 55' 17.5" W
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25	Norman Wells Public Dock	
26	65° 35' 20.2" Ground	128° 20' 17.8" W
	65° 35' 17" Air	128° 20' 32.8" W
27	65° 35' 26.6" N	128° 34' 14.3" W
28	65° 32' 26.2" N	128° 37' 20.9" W
29	65° 40' 15.4" N	128° 49' 8.3" W
30	65° 29' 53.7" N	128° 31' 34.5" W
31	65° 33' 5.9" N	128° 29' 34.4" W
32	65° 35' 16.9" N	128° 20' 19.0" W
33	65° 34' 15.5" N	128° 17' 43.8" W
34	65° 39' 36.2" N	128° 49' 38.4" W
35	65° 17' 37.4" N	126° 50' 3.6" W
	Seepage Lake	
36	Norman Wells Boswell Creek	





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TO: Enviro. Data Management Inc.
AEC West
ATTN: Dermot McCaw
Glen Andrews

DATE SAMPLED: 25-Aug-97
DATE RECEIVED: 28-Aug-97
DATE REPORTED: 24-Sep-97
LAB FILE#: 97-08-3169

Revised

Project: E97-254

HYDROCARBON ASSESSMENT - WATER

LAB #	1	2	3	4	Detection Limit
	Sample #1A	Sample #2A	Sample #3A	Sample #4A	
²Total Extractables (C₁₁ - C₃₀ +)	<0.1	<0.1	<0.1	<0.1	0.1


R. Corbet, M.Sc., P. Ag.
Manager - Organics

Results expressed in mg/L (ppm)

¹Assessment as per US EPA Method 8020

²Assessment as per Alta. Env. Method A108.0



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DATE SAMPLED: 25-Aug-97
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Project: E97-254

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HYDROCARBON ASSESSMENT - WATER

LAB #	5	6	7	8	Detection Limit
CLIENT #	Sample #5A	Sample #6A	Sample #7A	Sample #8A	
*Total Extractables (C₁₁ - C₃₀₊)	<0.1	<0.1	<0.1	<0.1	0.1

Results expressed in mg/L (ppm)

¹Assessment as per US EPA Method 8020

²Assessment as per Alta. Env. Method A108.0



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DATE SAMPLED: 25-Aug-97
DATE RECEIVED: 28-Aug-97
DATE REPORTED: 24-Sep-97
LAB FILE#: 97-08-3169

Project: E97-254

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HYDROCARBON ASSESSMENT - WATER

LAB #	9	10	11	12	Detection Limit
CLIENT #	Sample #9A	Sample #10A	Sample #11A	Sample #12A	
¹Total Extractables (C₁₁ - C₃₀ +)	<0.1	<0.1	<0.1	0.2	0.1

Results expressed in mg/L (ppm)

¹Assessment as per US EPA Method 8020

²Assessment as per Alta. Env. Method A108.0



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DATE SAMPLED: 25-Aug-97
DATE RECEIVED: 28-Aug-97
DATE REPORTED: 24-Sep-97
LAB FILE#: 97-08-3169

Project: E97-254

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HYDROCARBON ASSESSMENT - WATER

LAB #	13	14	15	16	Detection Limit
CLIENT #	Sample #13A	Sample #14A	Sample #15A	Sample #16A	
²Total Extractables (C₁₁ - C₃₀₊)	<0.1	<0.1	<0.1	0.6	0.1

Results expressed in mg/L (ppm)

¹Assessment as per US EPA Method 8020

²Assessment as per Alta. Env. Method A108.0



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DATE SAMPLED: 25-Aug-97
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LAB FILE#: 97-08-3169

Project: E97-254

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HYDROCARBON ASSESSMENT - WATER

LAB #	17	18	19	20	Detection Limit
CLIENT #	Sample #17A	Sample #18A	Sample #19A	Sample #20A	
²Total Extractables (C₁₁ - C₃₀ +)	<0.1	<0.1	<0.1	<0.1	0.1

Results expressed in mg/L (ppm)

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²Assessment as per Alta. Env. Method A108.0



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DATE RECEIVED: 28-Aug-97
DATE REPORTED: 24-Sep-97
LAB FILE#: 97-08-3169

Project: E97-254

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HYDROCARBON ASSESSMENT - WATER

LAB #	21	22	23	24	Detection Limit
CLIENT #	Sample #21A	Sample #22A	Sample #23A	Sample #24A	
#Total Extractables (C₁₁ - C₃₀ +)	<0.1	<0.1	<0.1	0.5	0.1

Results expressed in mg/L (ppm)

¹Assessment as per US EPA Method 8020

²Assessment as per Alta. Env. Method A108.0



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DATE SAMPLED: 25-Aug-97
DATE RECEIVED: 28-Aug-97
DATE REPORTED: 24-Sep-97
LAB FILE#: 97-08-3169

Project: E97-254

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HYDROCARBON ASSESSMENT - WATER

LAB #	25	26	27	28	Detection Limit
CLIENT #	Sample #25A	Sample #26A	Sample #27A	Sample #28A	
*Total Extractables (C₁₁ - C₃₀₊)	2.8	<0.1	<0.1	<0.1	0.1

Results expressed in mg/L (ppm)

¹Assessment as per US EPA Method 8020

²Assessment as per Alta. Env. Method A108.0



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Winnipeg, MB Phone (204) 982-0630
Fax (204) 275-6019

TO:	Enviro. Data Management Inc.	DATE SAMPLED:	25-Aug-97
	AEC West	DATE RECEIVED:	28-Aug-97
ATTN:	Dermot McCaw	DATE REPORTED:	24-Sep-97
	Glen Andrews	LAB FILE#:	97-08-3169

Project: E97-254

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HYDROCARBON ASSESSMENT - WATER

LAB #	29	30	31	32	Detection Limit
CLIENT #	Sample #29A	Sample #30A	Sample #31A	Sample #32A	
² Total Extractables (C ₁₁ - C ₃₀₊)	<0.1	<0.1	<0.1	<0.1	0.1

Results expressed in mg/L (ppm)

¹Assessment as per US EPA Method 8020

²Assessment as per Alta. Env. Method A108.0



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TO: Enviro. Data Management Inc.
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ATTN: Dermot McCaw
Glen Andrews

DATE SAMPLED: 25-Aug-97
DATE RECEIVED: 28-Aug-97
DATE REPORTED: 24-Sep-97
LAB FILE#: 97-08-3169

Project: E97-254

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HYDROCARBON ASSESSMENT - WATER

LAB #	33	34	35	36	Detection Limit
CLIENT #	Sample #33A	Sample #31A	Sample #35A	Sample #36A	
*Total Extractables (C₁₁ - C₃₀ +)	<0.1	<0.1	13.9	<0.1	0.1

Results expressed in mg/L (ppm)

¹Assessment as per US EPA Method 8020

²Assessment as per Alta. Env. Method A108.0



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TO: Enviro Data Management Inc.
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ATTN: Dermot McCaw

DATE SAMPLED: 17-Oct-97
DATE RECEIVED: 18-Oct-97
DATE REPORTED: 22-Oct-97
LAB FILE#: 97-10-4245

HYDROCARBON ASSESSMENT - WATER

LAB #	1	4	Detection Limit
CLIENT #	37A	38A	
¹Total Extractables (C₁₁ - C₃₀+	<0.1	<0.1	0.1


R. Corbet, M.Sc., P. Ag.
Manager - Organics

Results expressed in mg/L (ppm)

¹Assessment as per US EPA Method 8020

²Assessment as per Alta. Env. Method A108.0

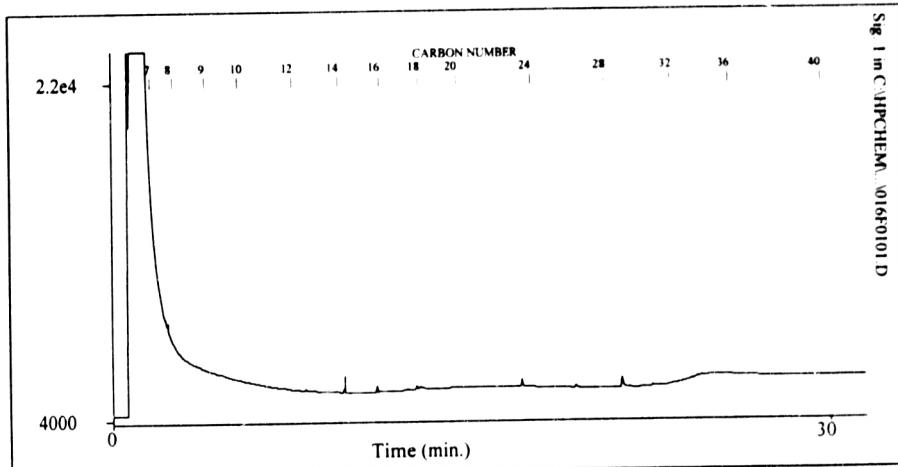


**NORWEST
LABS**

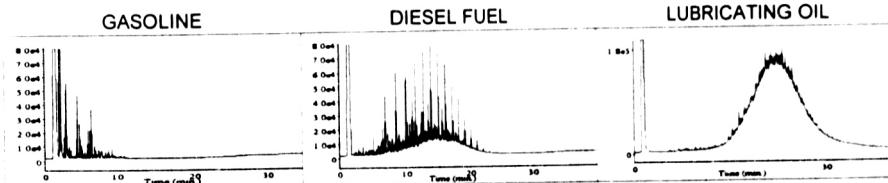
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #1A
Lab No.: 3169-1W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.





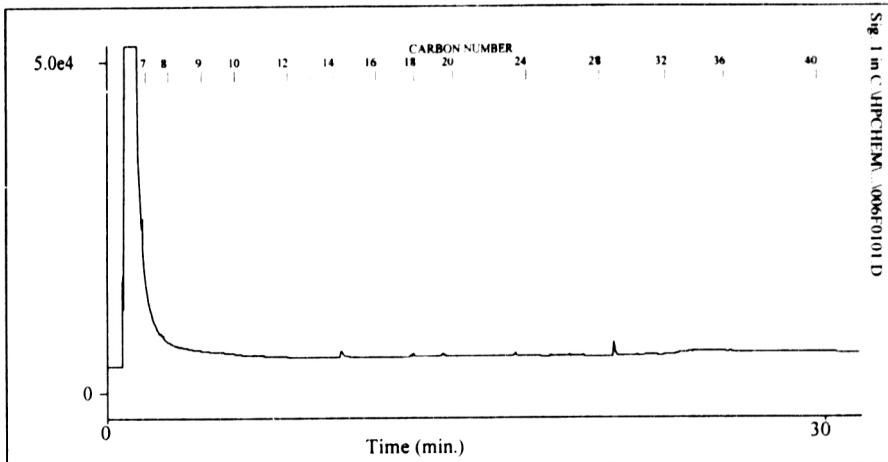


**NORWEST
LABS**

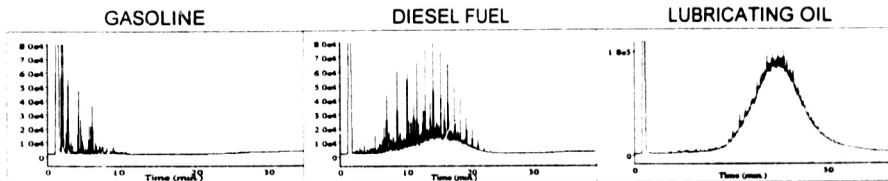
HYDROCARBON CHARACTERIZATION

Client: E.D.M. Inc.
Sample ID: Sample #2A
Lab No.: 3169-2W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



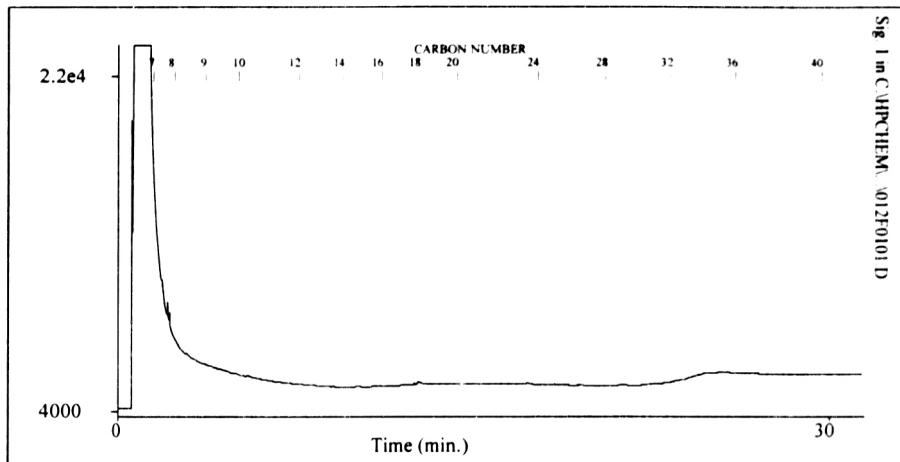


**NORWEST
LABS**

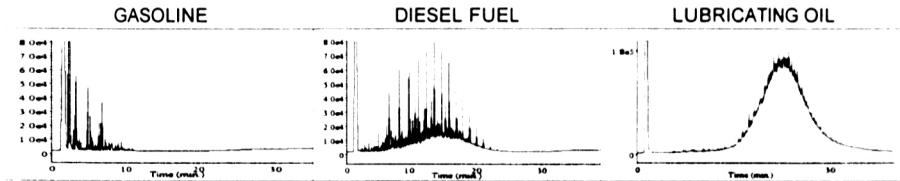
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #3A
Lab No.: 3169-3W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



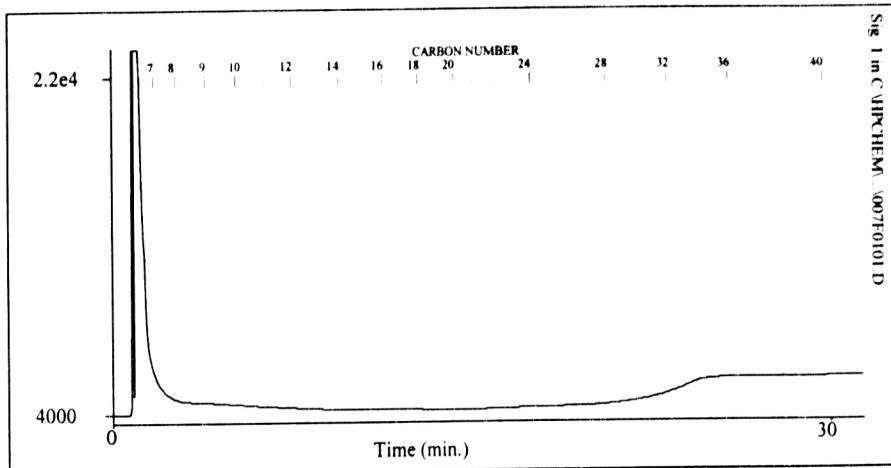


NORWEST LABS

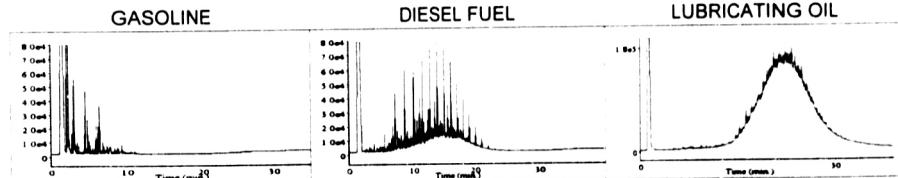
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #4A
Lab No.: 3169-4W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



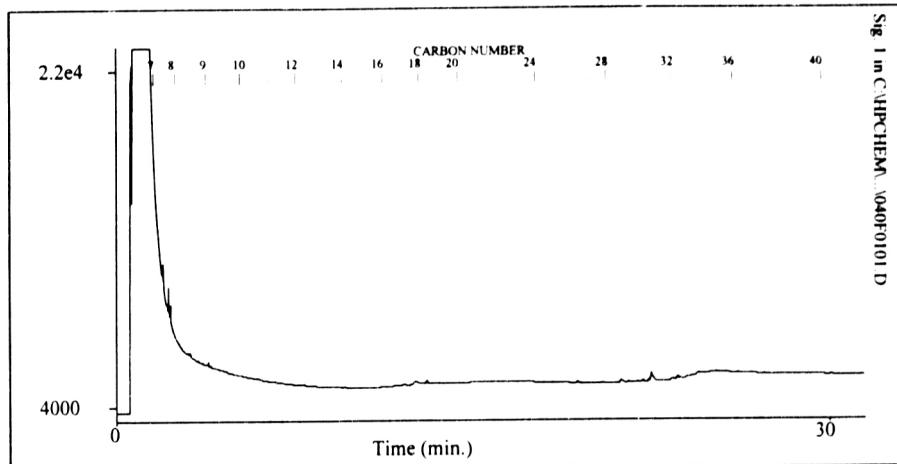


**NORWEST
LABS**

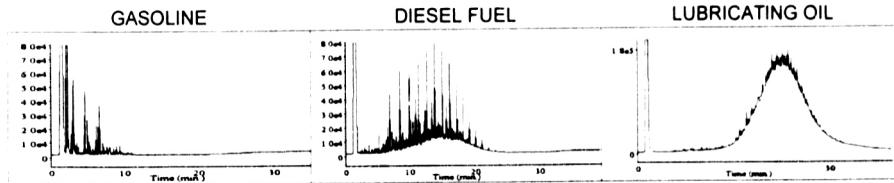
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #5A
Lab No.: 3169-5W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



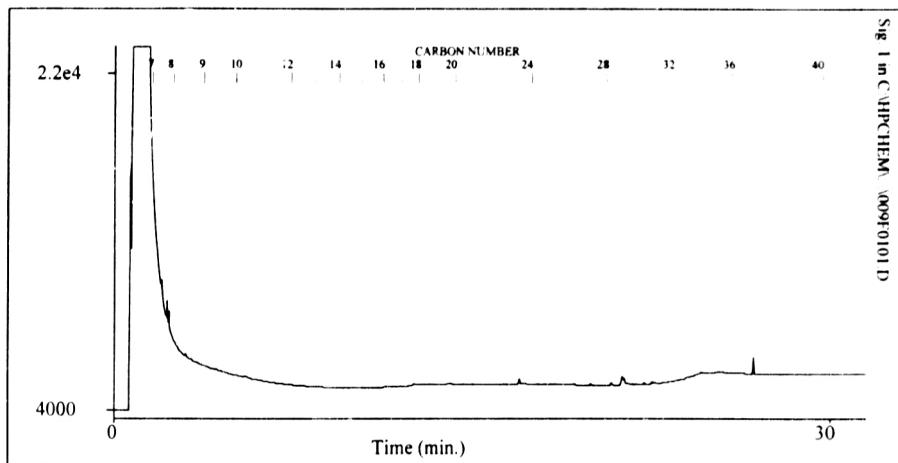


**NORWEST
LABS**

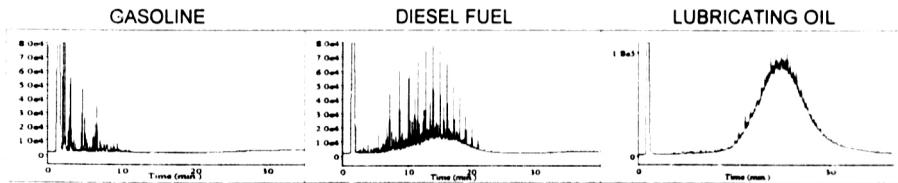
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #6A
Lab No.: 3169-6W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS

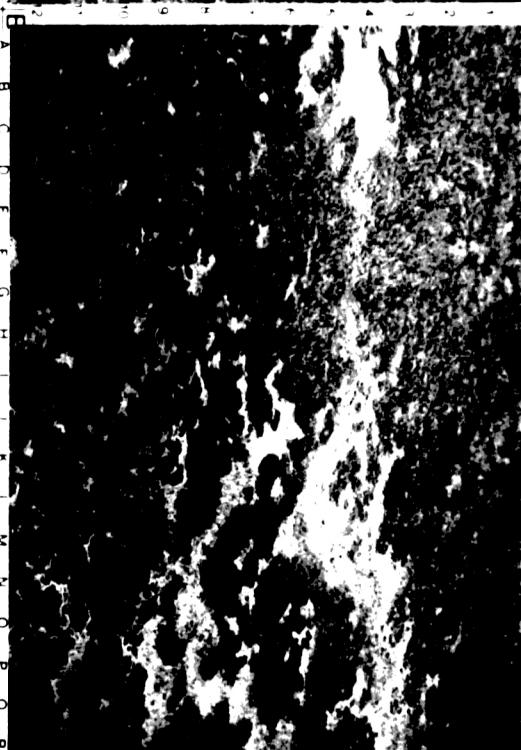
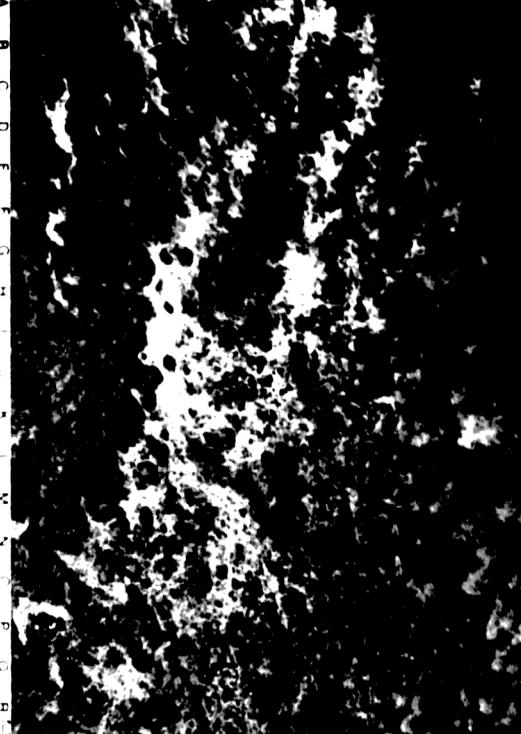


Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



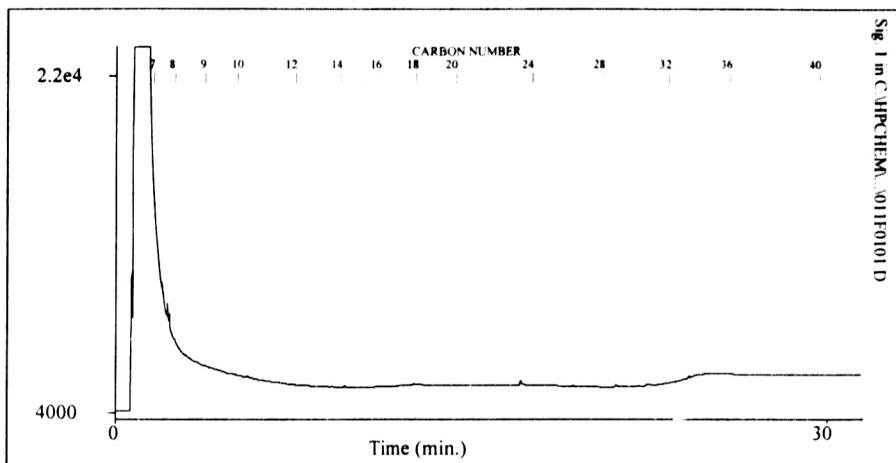


**NORWEST
LABS**

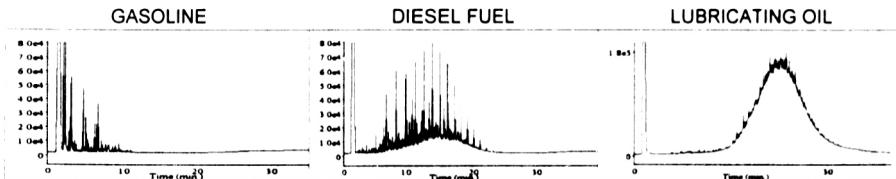
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #7A
Lab No.: 3169-7W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



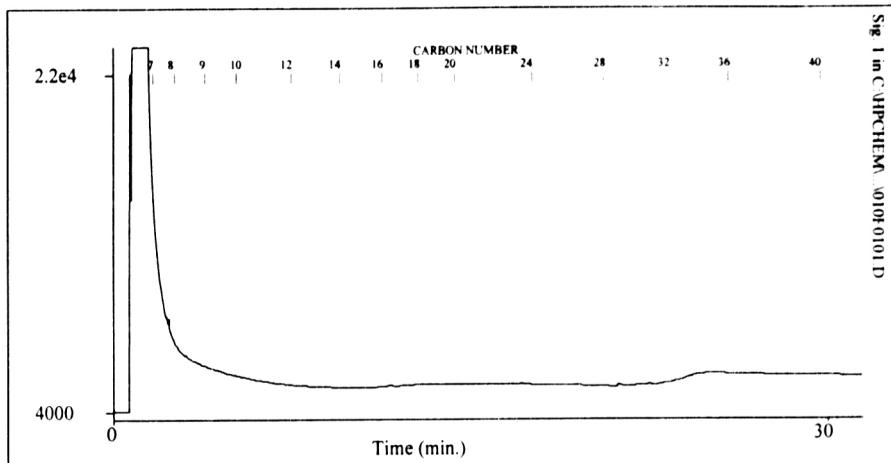


**NORWEST
LABS**

HYDROCARBON CHARACTERIZATION

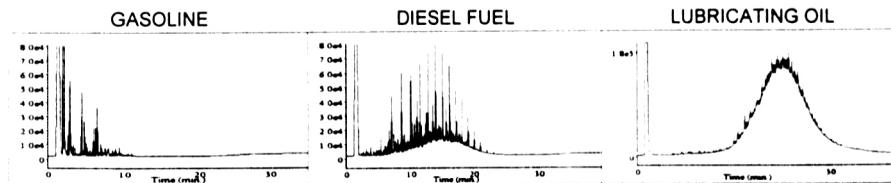
Client: E.D.M
Sample ID: Sample #8A
Lab No.: 3169-8W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



Sample ID: 97-08-3169
Date Sampled: 11-Sep-97
Date Reported: 11-Sep-97

TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



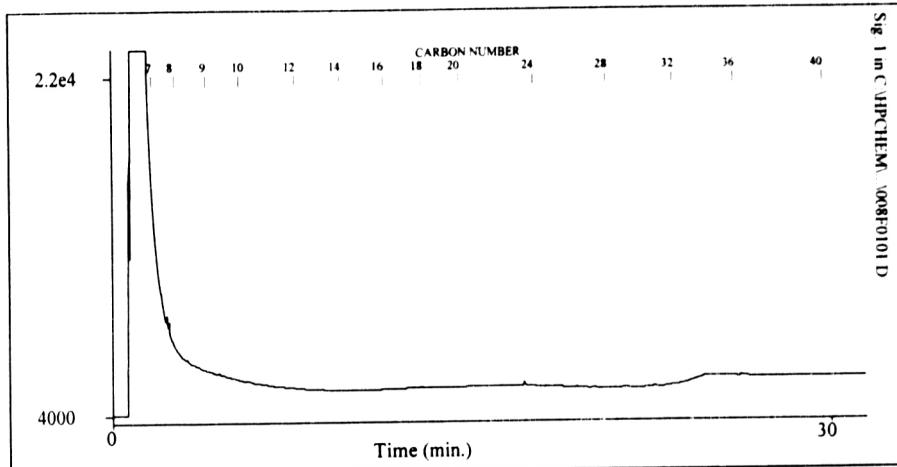


**NORWEST
LABS**

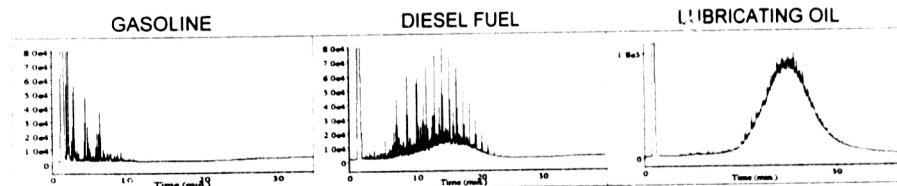
HYDROCARBON CHARACTERIZATION

Client: E.D.M.
Sample ID: Sample #9A
Lab No.: 3169-9W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 22-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



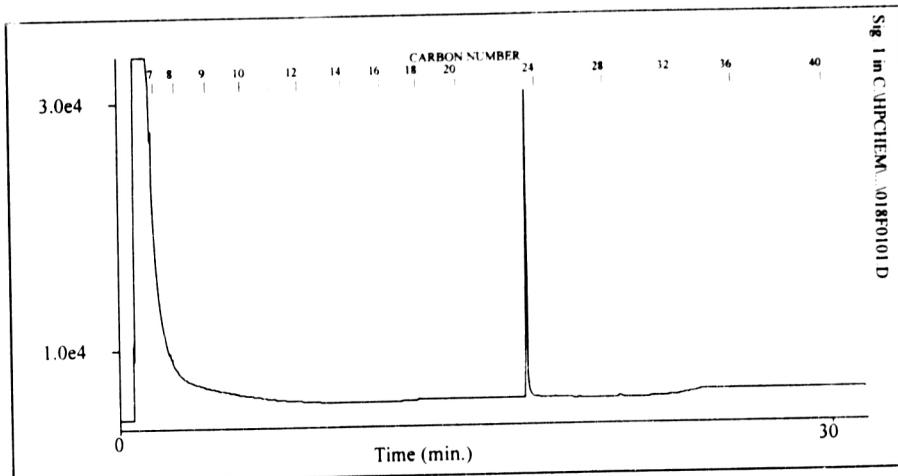


**NORWEST
LABS**

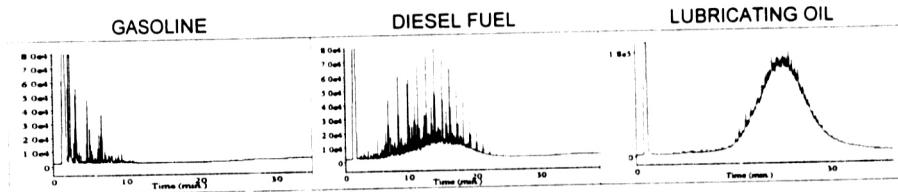
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #10A
Lab No.: 3169-10W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



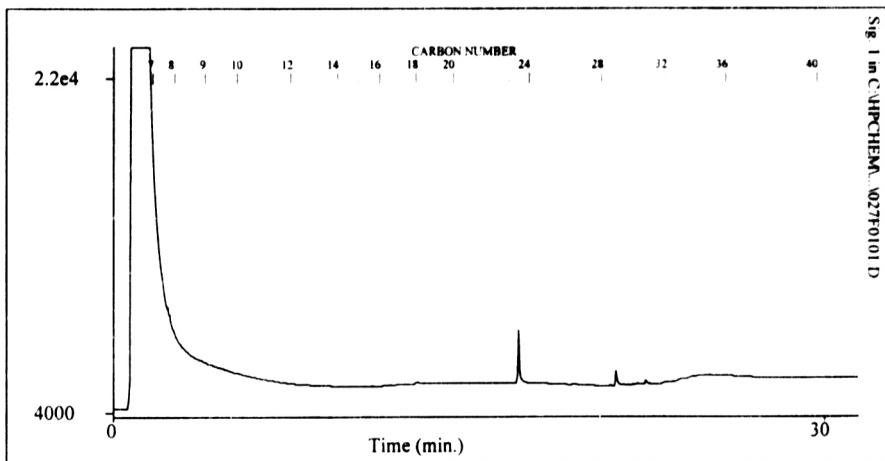


**NORWEST
LABS**

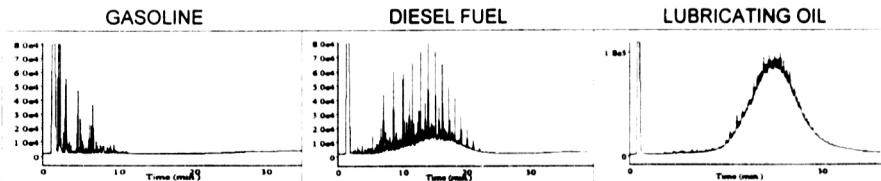
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #11A
Lab No.: 3169-11W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C3-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



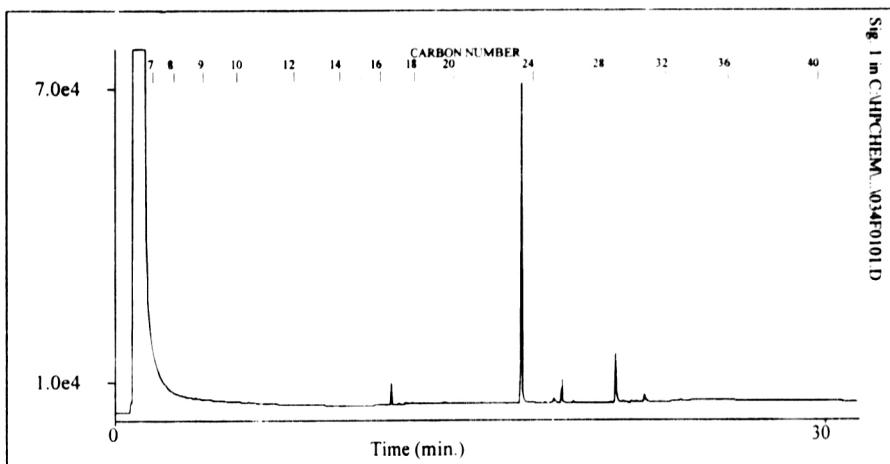


NORWEST LABS

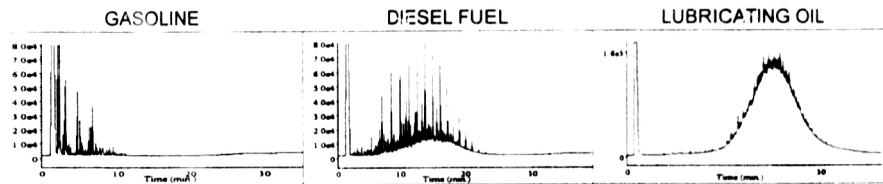
HYDROCARBON CHARACTERIZATION

Client: E.D.M.
Sample ID: Sample #12A
Lab No.: 3169-12W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 22-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline
Varsol
Kerosene

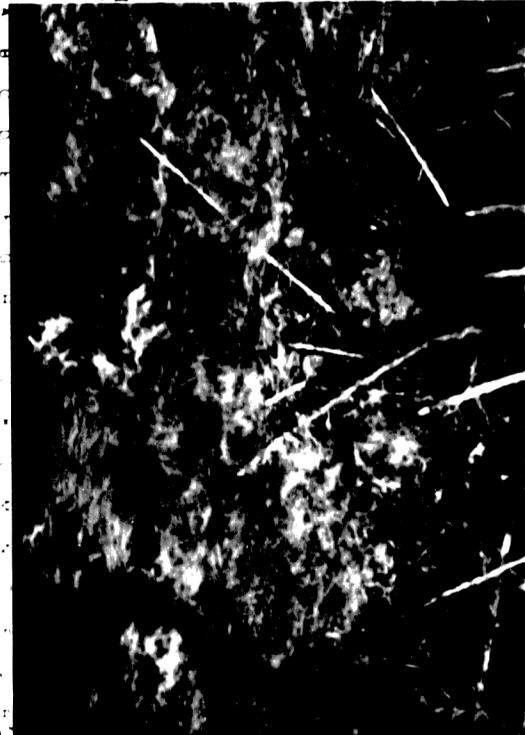
C4-C12
C8-C12
C7-C16

Diesel
Lubricating Oils
Crude Oils

C8-C22
C20-C40
C3-C60+

Sample Hydrocarbon Product Type Assessment

Insufficient amounts of hydrocarbons to do an accurate assessment.



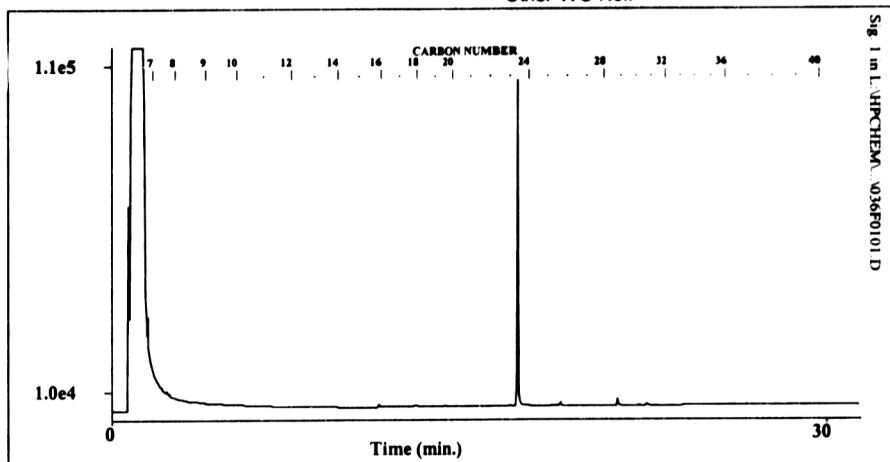


**NORWEST
LABS**

HYDROCARBON CHARACTERIZATION

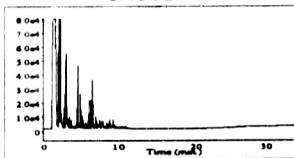
Client: E.D.M.
Sample ID: Sample #13A
Lab No.: 3169-13W

Work Order No.: 97-08-3169
Date Sampled: 25-09-95
Date Reported: 24-Nov-97
Other WO No.:

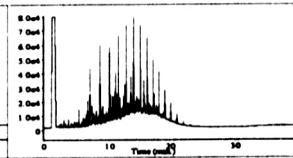


TYPICAL PRODUCT CHROMATOGRAMS

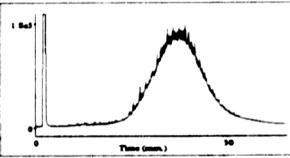
GASOLINE



DIESEL FUEL



LUBRICATING OIL



Product Carbon Number Ranges

Gasoline
Varsol
Kerosene

C4-C12
C8-C12
C7-C16

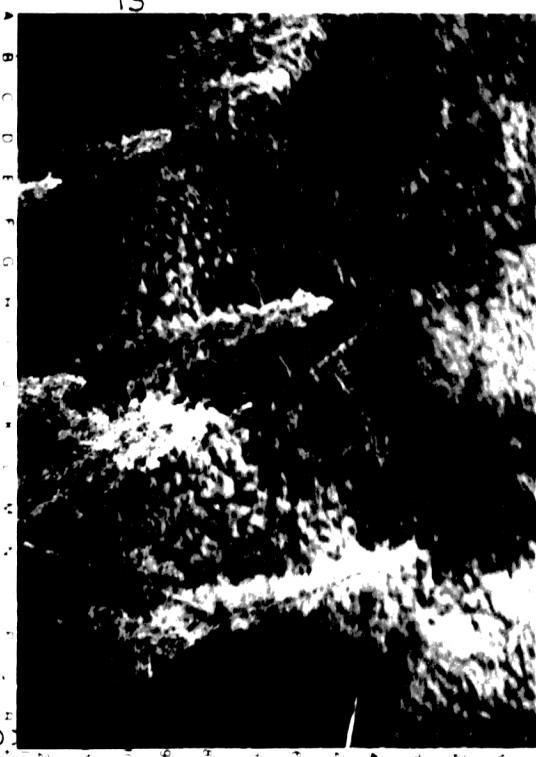
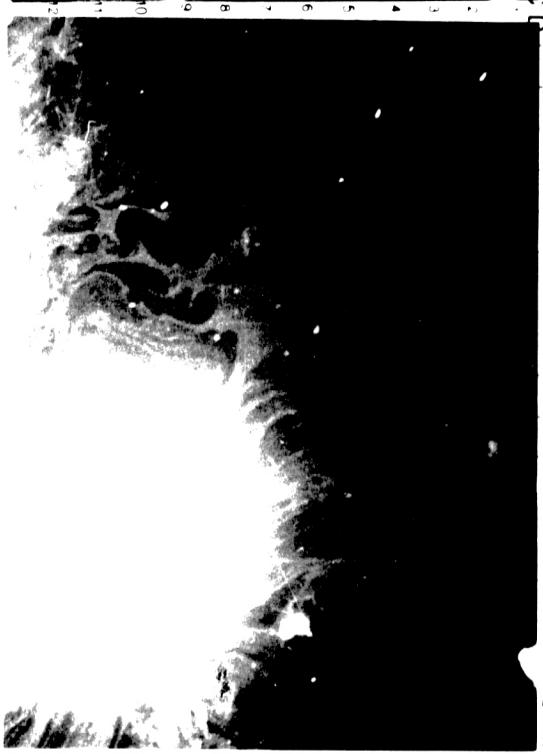
Diesel
Lubricating Oils
Crude Oils

C8-C22
C20-C40
C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.

13



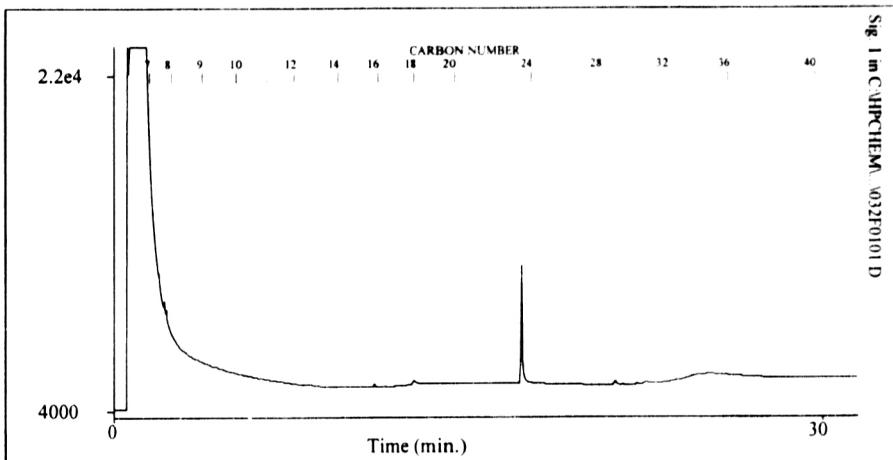


**NORWEST
LABS**

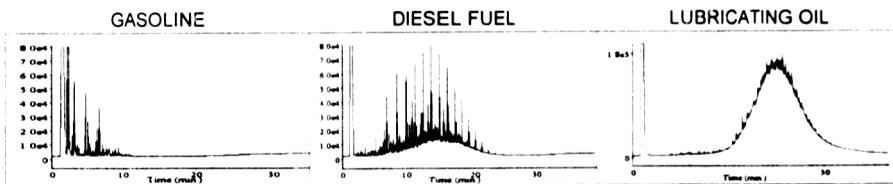
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #14A
Lab No.: 3169-14W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS

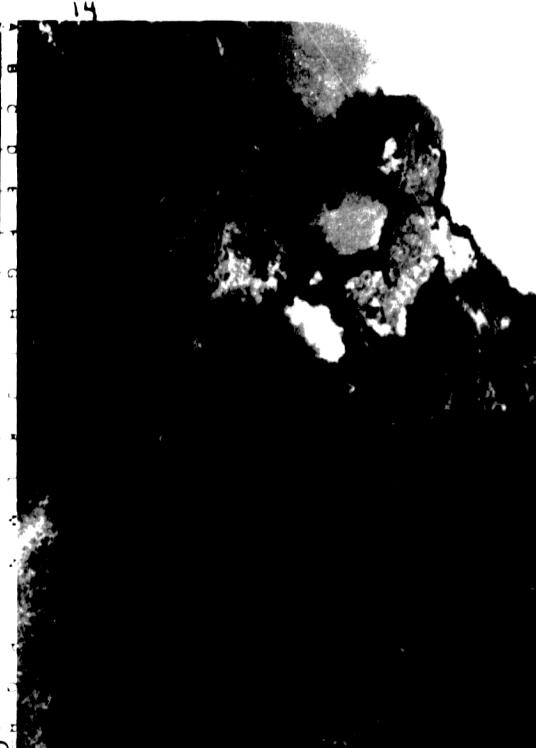


Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



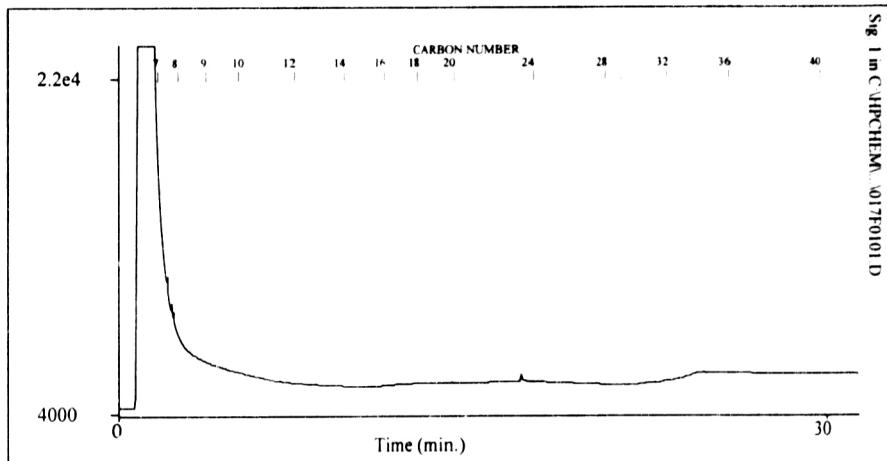


**NORWEST
LABS**

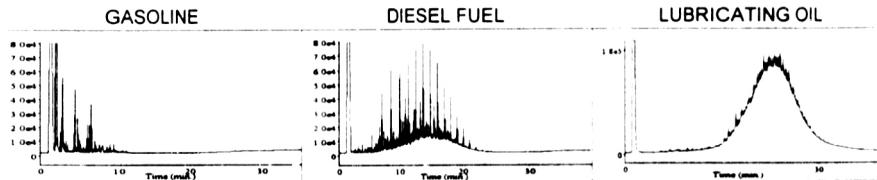
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #15A
Lab No.: 3169-15W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



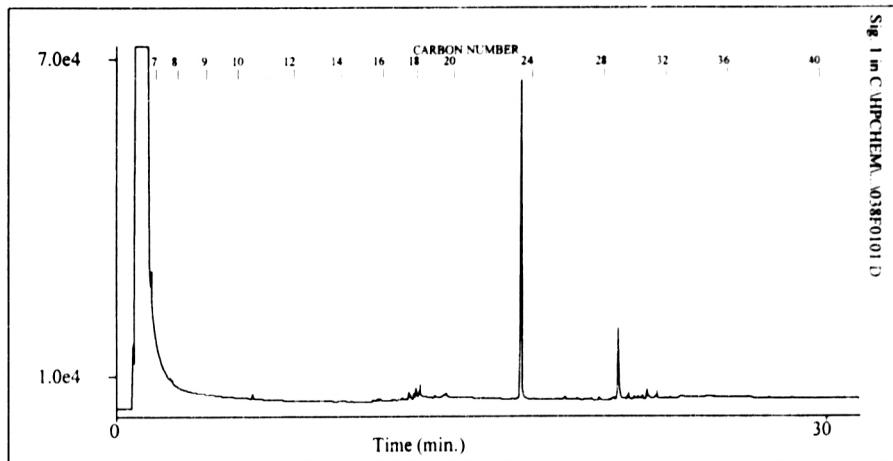


**NORWEST
LABS**

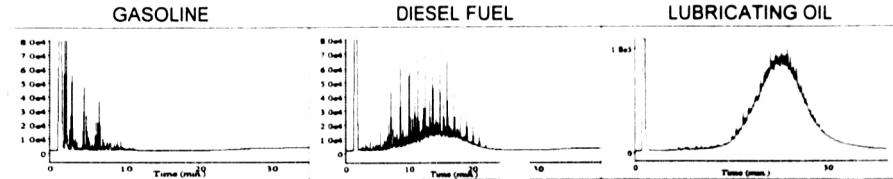
HYDROCARBON CHARACTERIZATION

Client: E.D.M.
Sample ID: Sample #16
Lab No.: 3169-16W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

Insufficient amounts of hydrocarbons to do an accurate assessment.



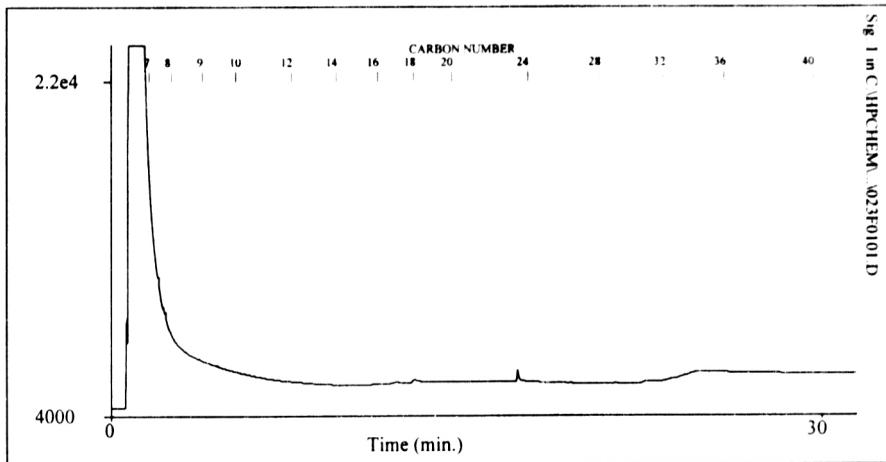


**NORWEST
LABS**

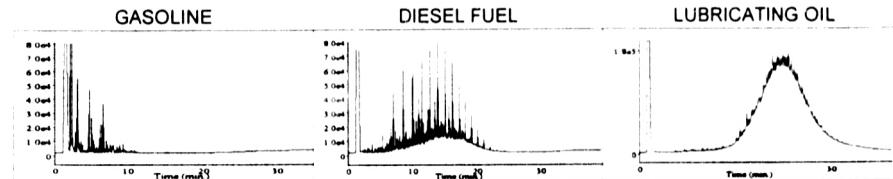
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #17A
Lab No.: 3169-17W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



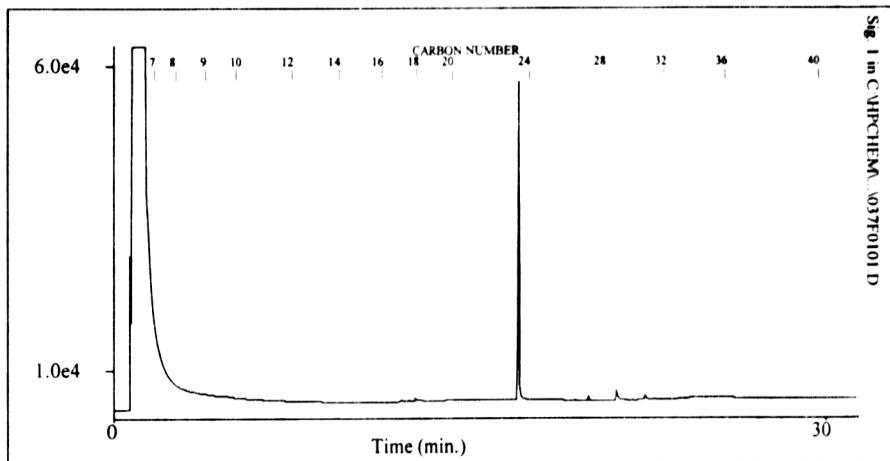


**NORWEST
LABS**

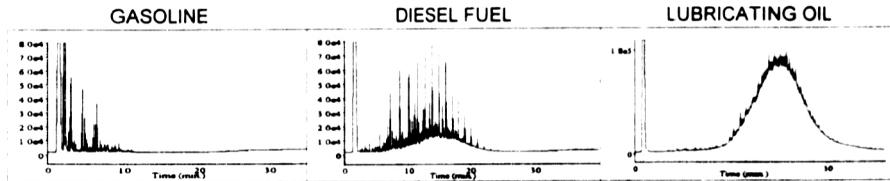
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #18A
Lab No.: 3169-18W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



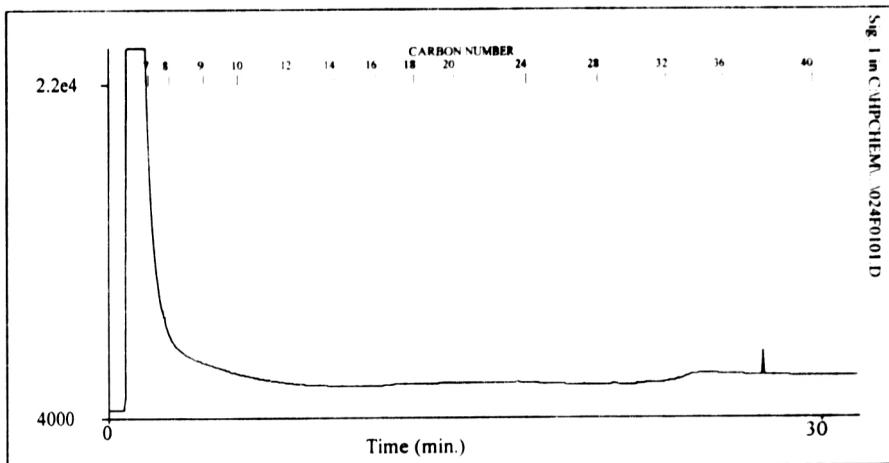


**NORWEST
LABS**

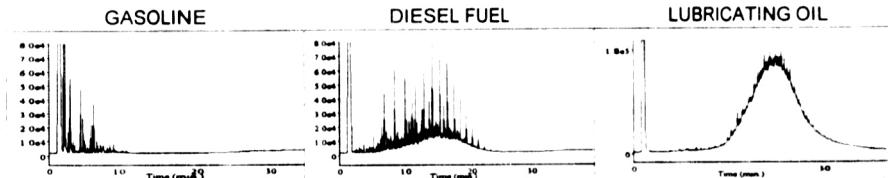
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #19A
Lab No.: 3169-19W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



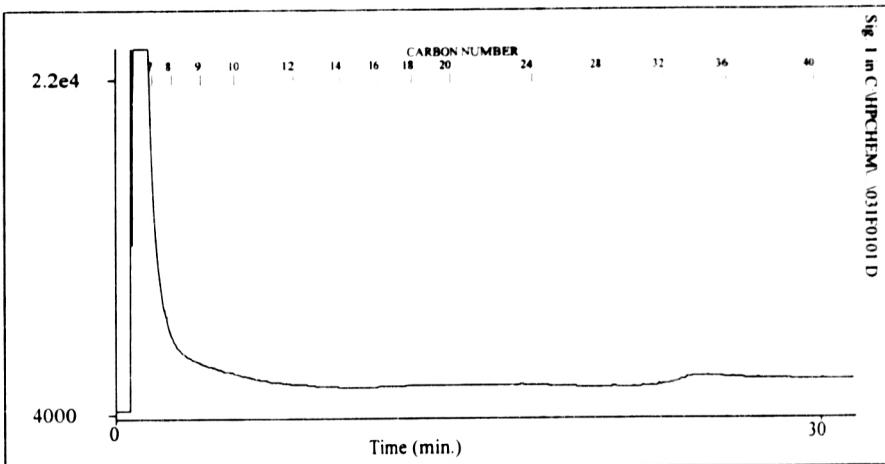


**NORWEST
LABS**

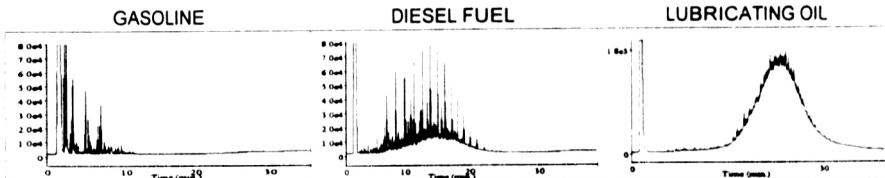
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #20A
Lab No.: 3169-20W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS

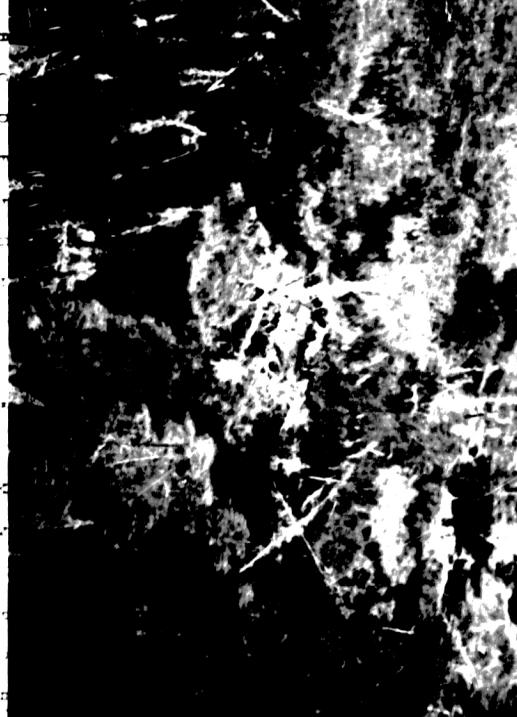


Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



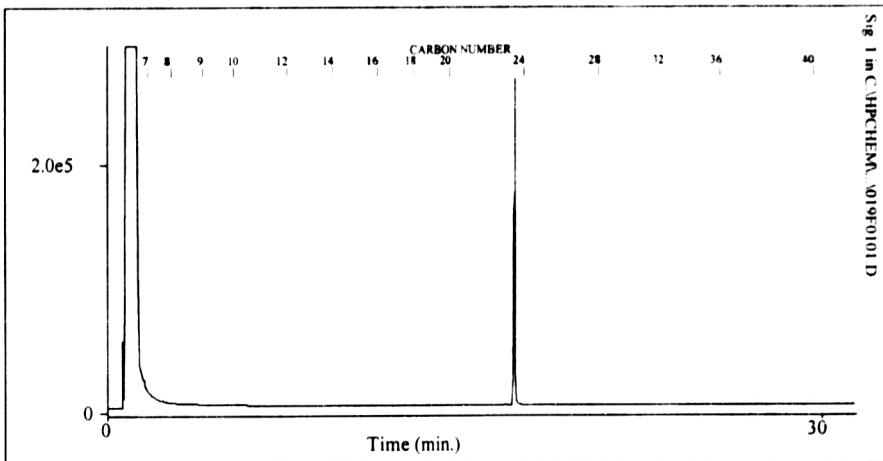


**NORWEST
LABS**

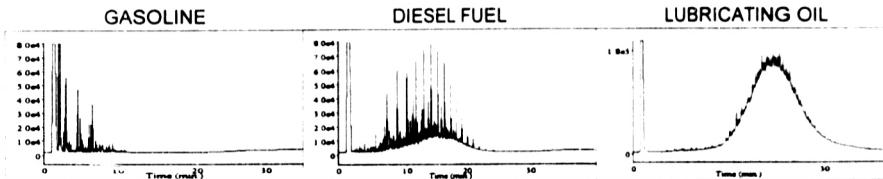
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #21A
Lab No.: 3169-21W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS

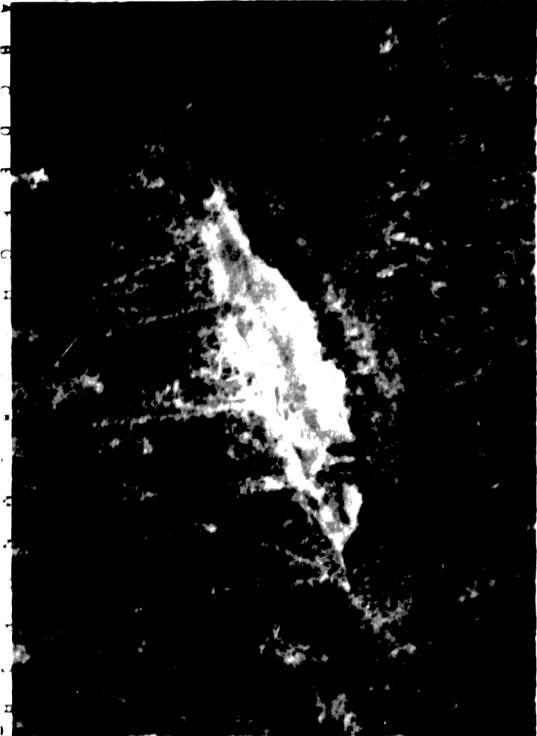


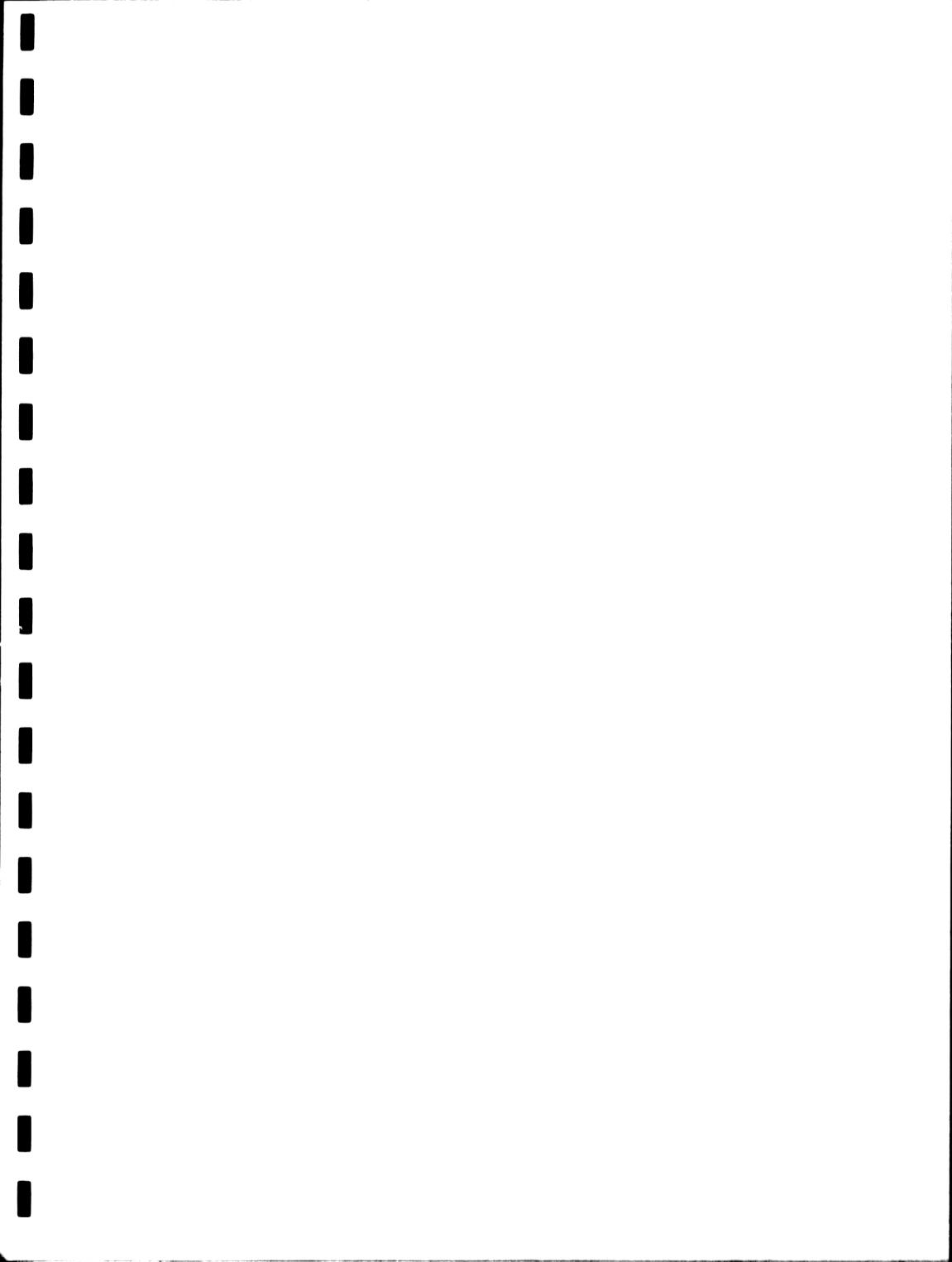
Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.





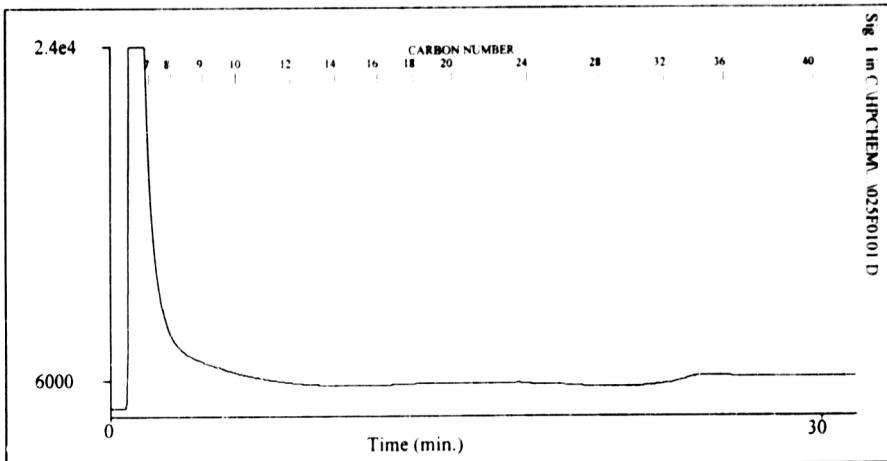


**NORWEST
LABS**

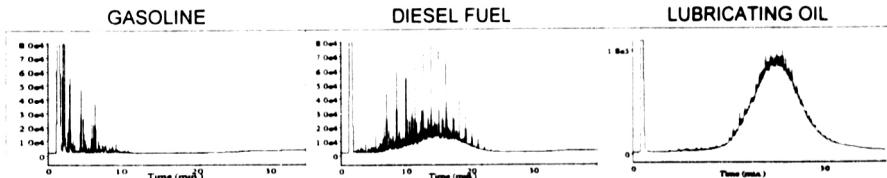
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #22A
Lab No.: 3169-22W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



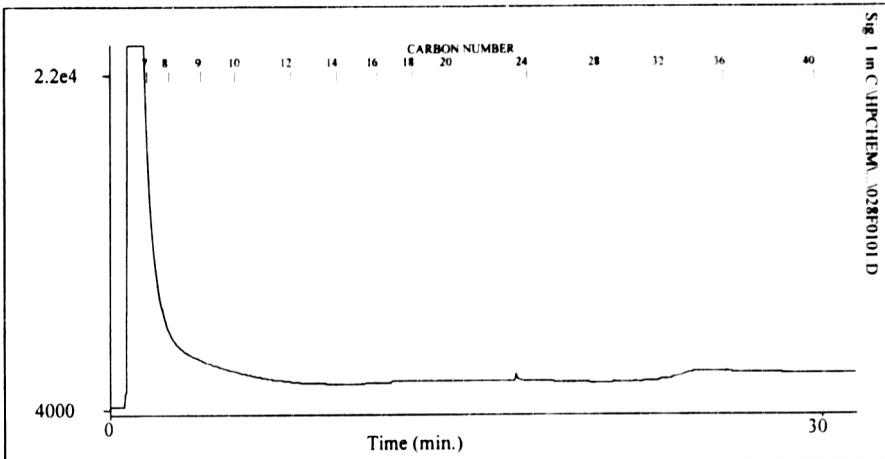


**NORWEST
LABS**

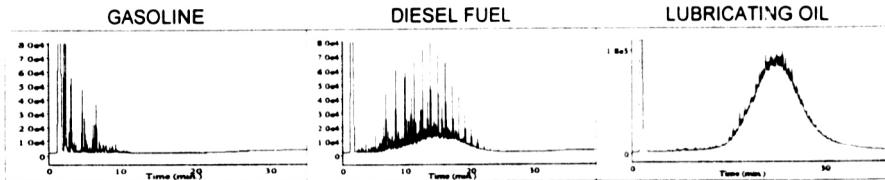
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #23A
Lab No.: 3169-23W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS

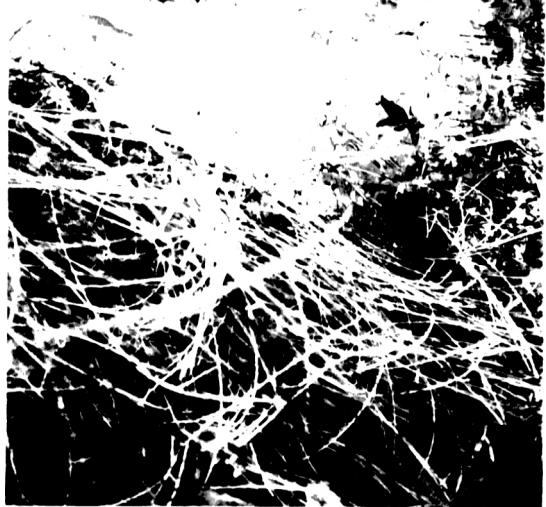
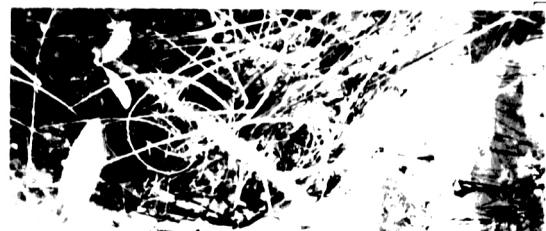


Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



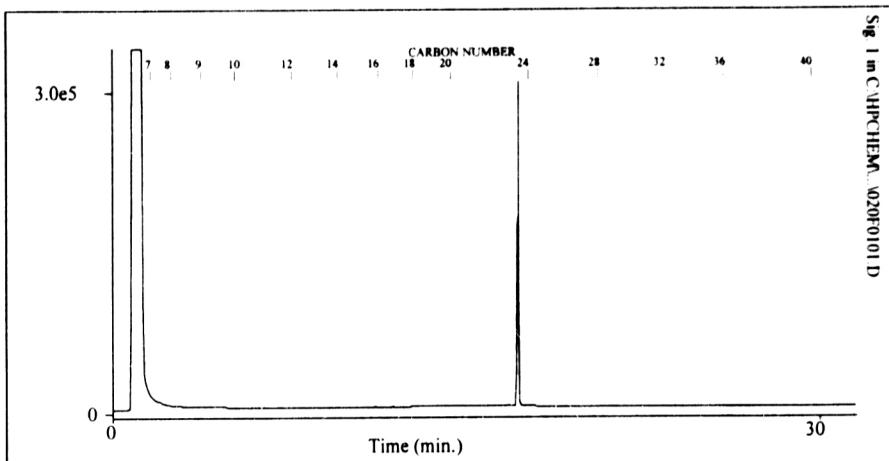


**NORWEST
LABS**

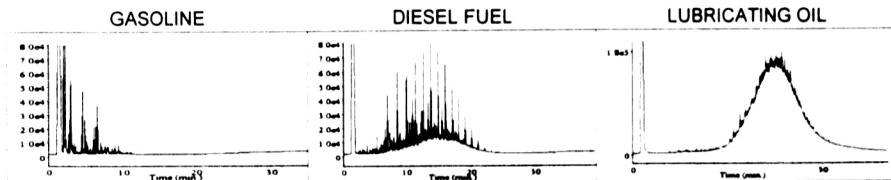
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #24A
Lab No.: 3169-24W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS

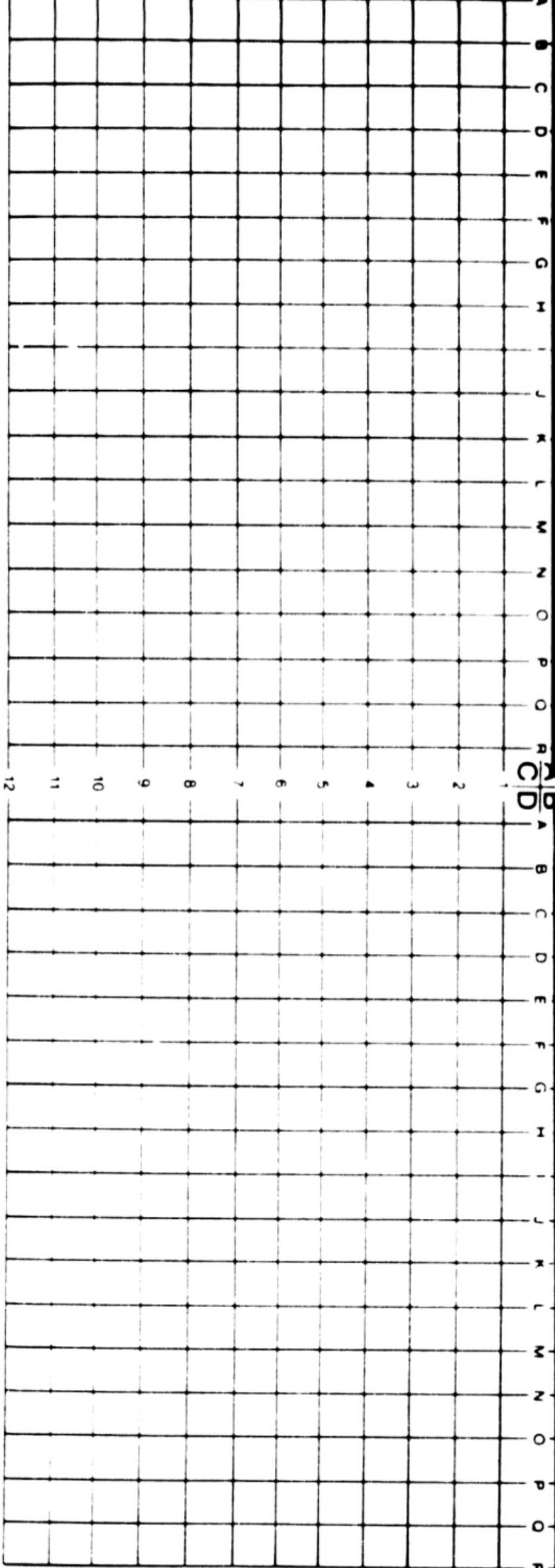


Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



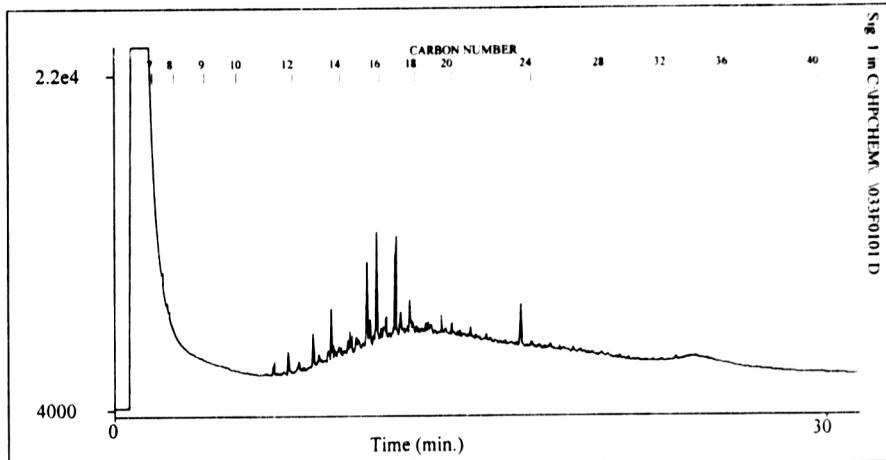


**NORWEST
LABS**

HYDROCARBON CHARACTERIZATION

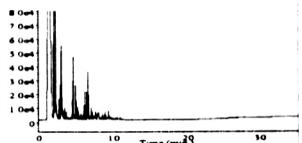
Client: E.D.M
Sample ID: Sample #25A
Lab No.: 3169-25W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97

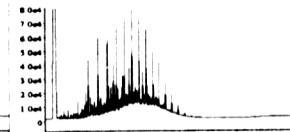


TYPICAL PRODUCT CHROMATOGRAMS

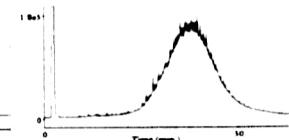
GASOLINE



DIESEL FUEL



LUBRICATING OIL



Product Carbon Number Ranges

Gasoline

C4-C12

Diesel

C8-C22

Varsol

C8-C12

Lubricating Oils

C20-C40

Kerosene

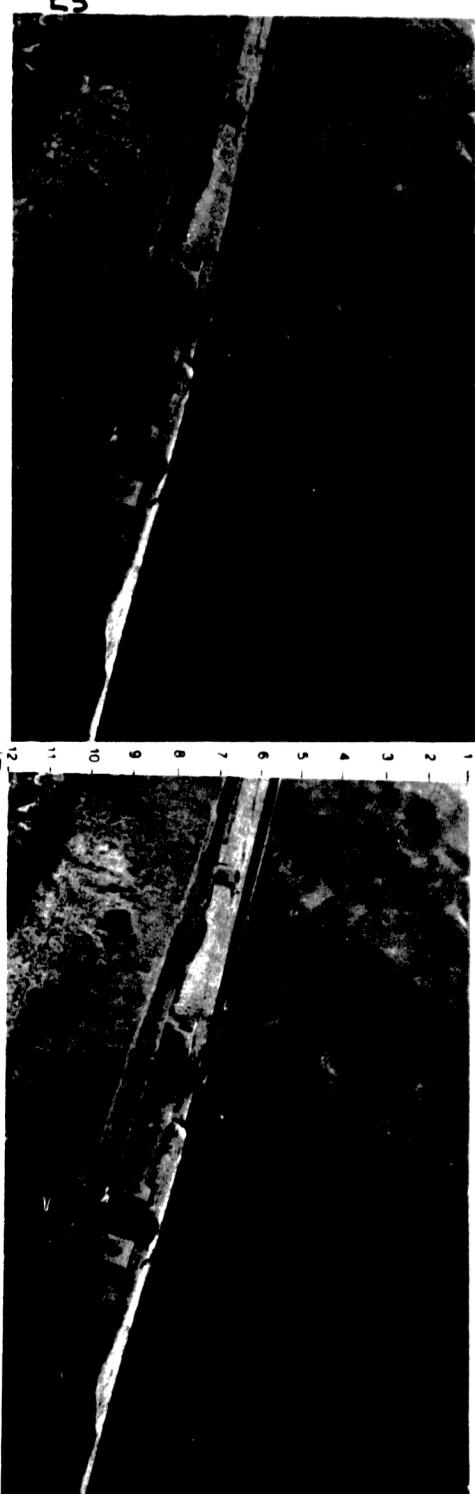
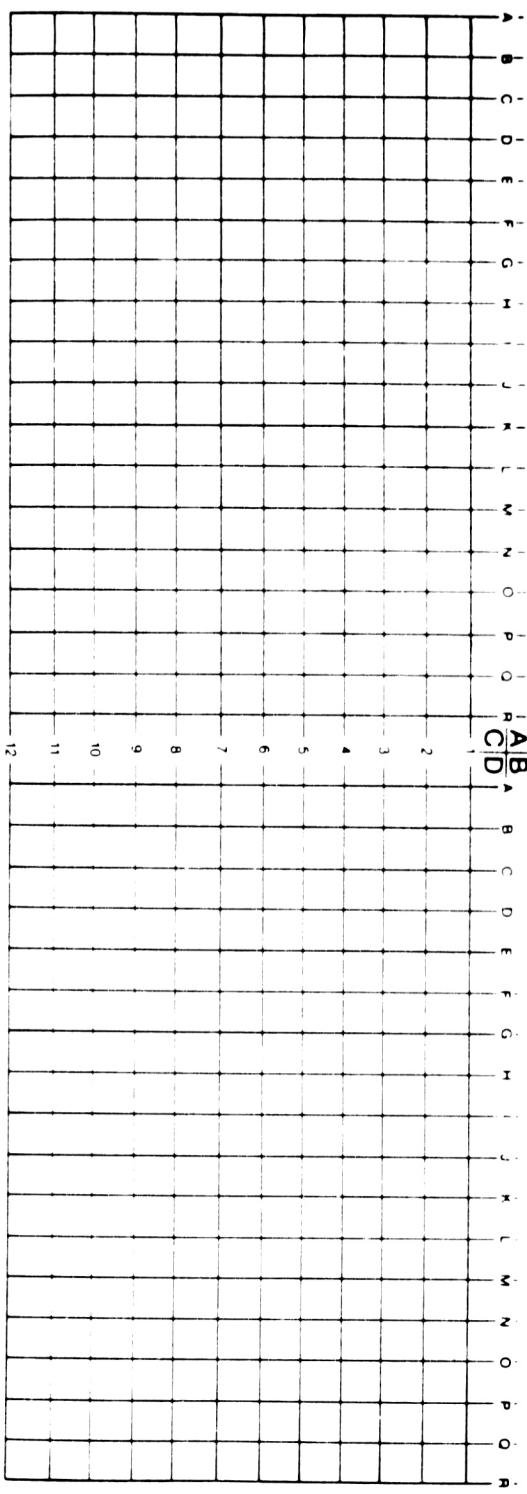
C7-C16

Crude Oils

C3-C60+

Sample Hydrocarbon Product Type Assessment

The sample contains some hydrocarbons from C11 to C30+ which would indicate possible diesel.



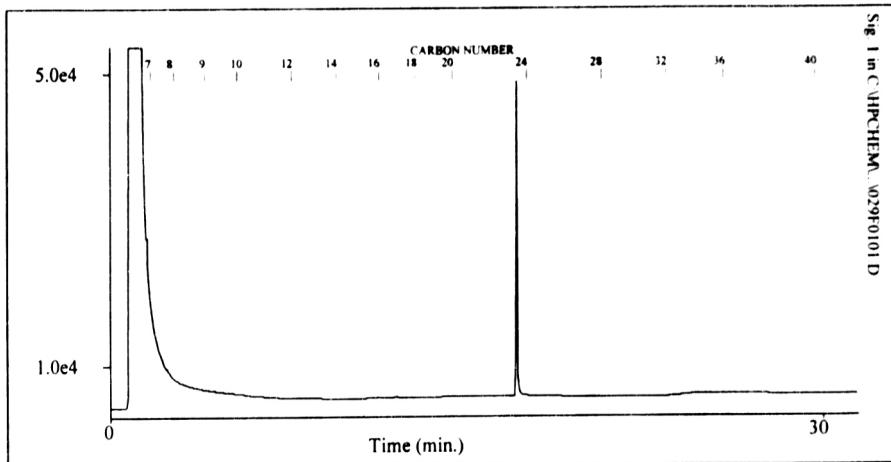


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LABS**

HYDROCARBON CHARACTERIZATION

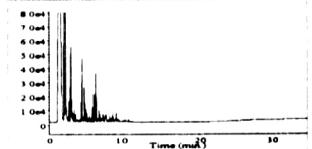
Client: E.D.M
Sample ID: Sample #26A
Lab No.: 3169-26W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97

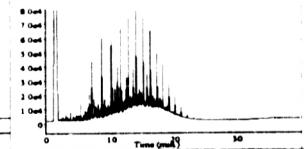


TYPICAL PRODUCT CHROMATOGRAMS

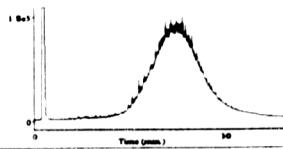
GASOLINE



DIESEL FUEL



LUBRICATING OIL



Product Carbon Number Ranges

Gasoline

C4-C12

Diesel

C8-C22

Varsol

C8-C12

Lubricating Oils

C20-C40

Kerosene

C7-C16

Crude Oils

C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



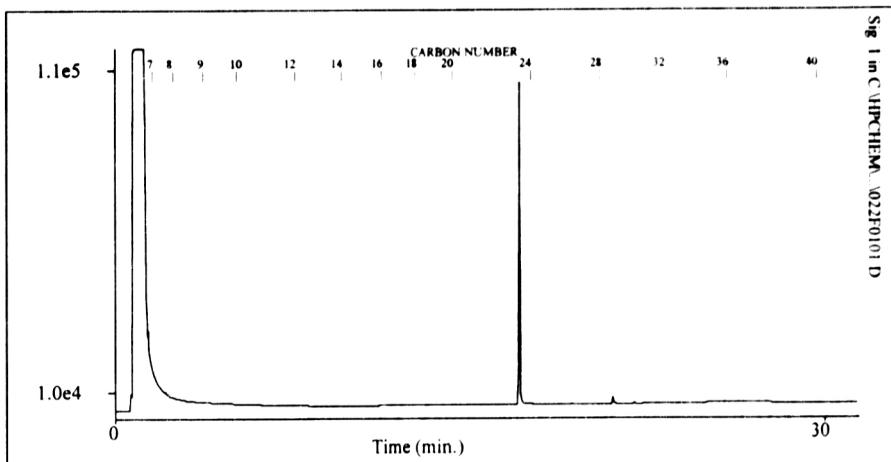


**NORWEST
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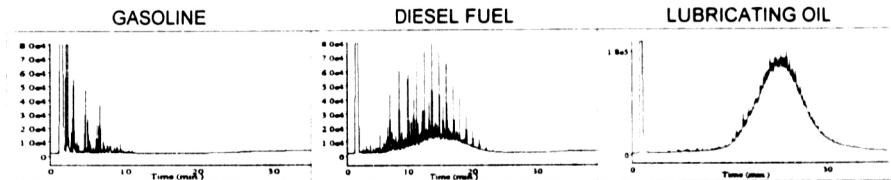
HYDROCARBON CHARACTERIZATION

Client: E.D.M
Sample ID: Sample #27A
Lab No.: 3169-27W

Work Order No.: 97-08-3169
Date Sampled
Date Reported: 11-Sep-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



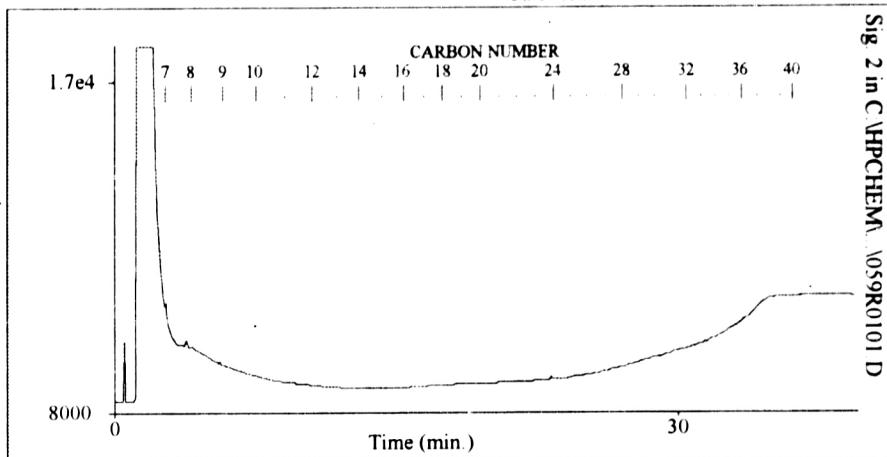


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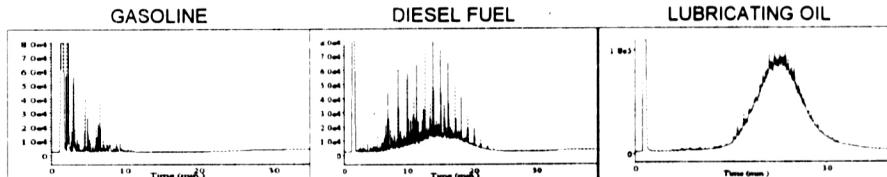
HYDROCARBON CHARACTERIZATION

Client: E.D.M. Inc.
Sample ID: Sample #28A
Lab No.: 3169-28W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 10-Sep-97
Other WO No.



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline
Varsol
Kerosene

C4-C12
C8-C12
C7-C16

Diesel
Lubricating Oils
Crude Oils

C8-C22
C20-C40
C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



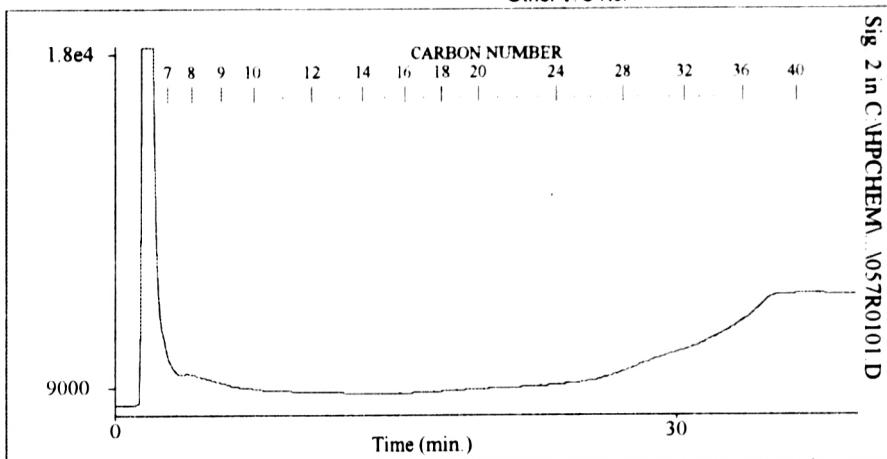


NORWEST LABS

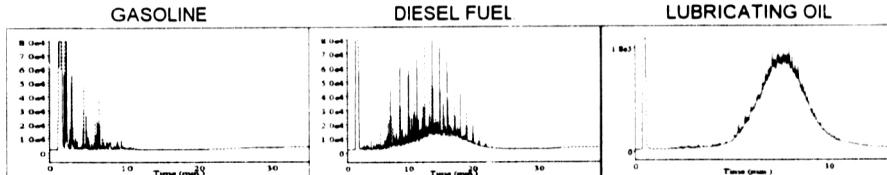
HYDROCARBON CHARACTERIZATION

Client: E.D.M. Inc.
Sample ID: Sample #29A
Lab No.: 3169-29W

Work Order No.: 97-08-31u9
Date Sampled:
Date Reported: 10-Sep-97
Other WO No.:



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



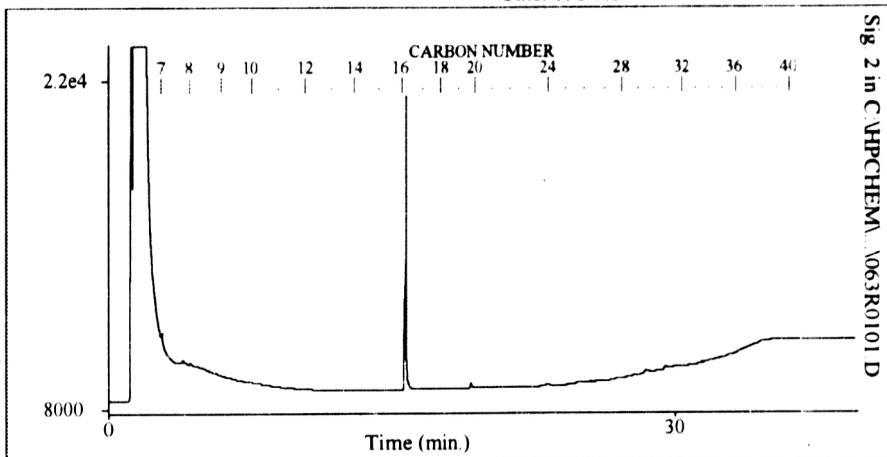


**NORWEST
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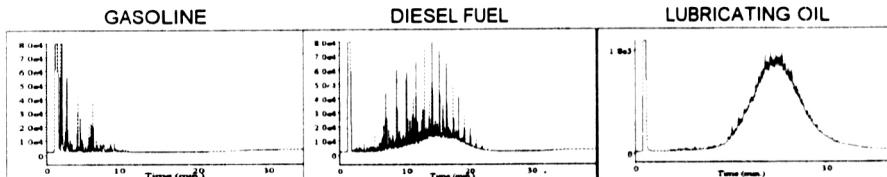
HYDROCARBON CHARACTERIZATION

Client: E.D.M. Inc.
Sample ID: Sample #30A
Lab No.: 3169-30W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 10-Sep-97
Other WO No.



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



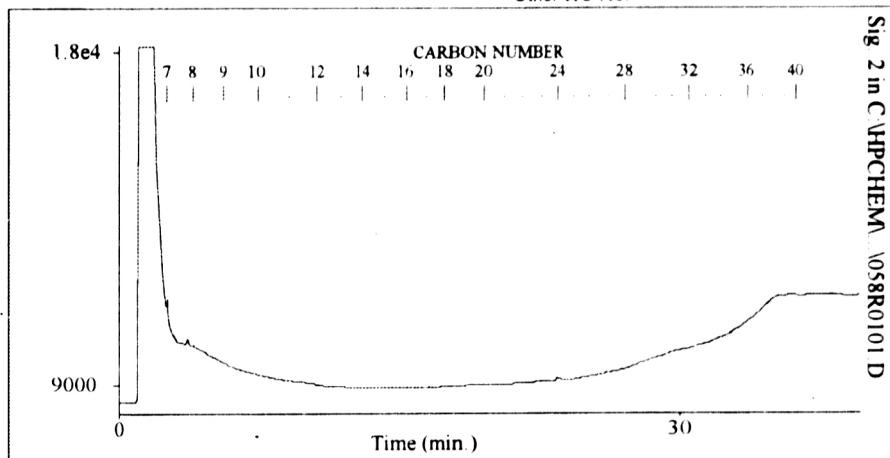


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LABS**

HYDROCARBON CHARACTERIZATION

Client: E.D.M. Inc.
Sample ID: Sample #31A
Lab No.: 3169-31W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 12-Sep-97
Other WO No.:





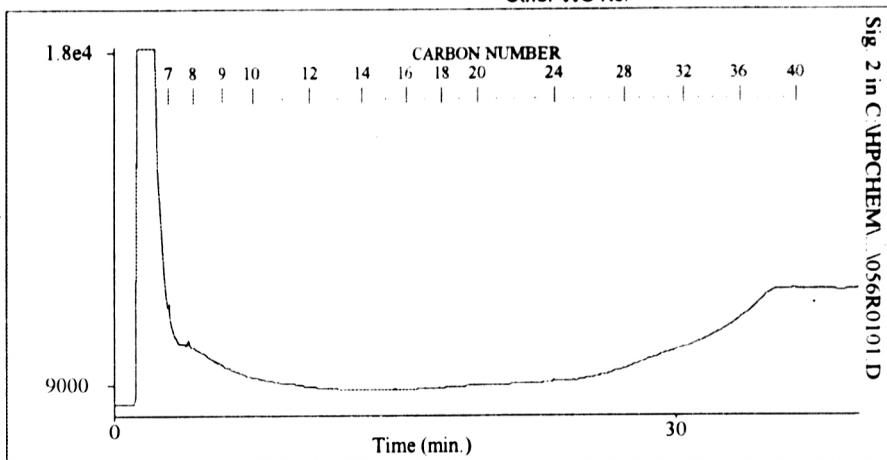


**NORWEST
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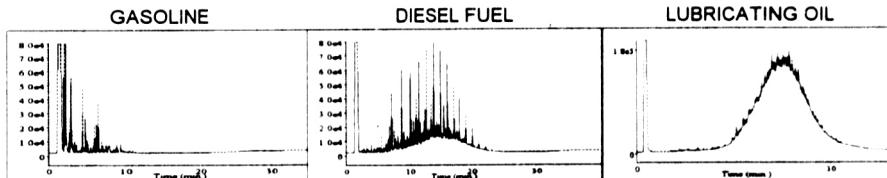
HYDROCARBON CHARACTERIZATION

Client: E.D.M. Inc.
Sample ID: Sample #32A
Lab No.: 3169-32W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 10-Sep-97
Other WO No.



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



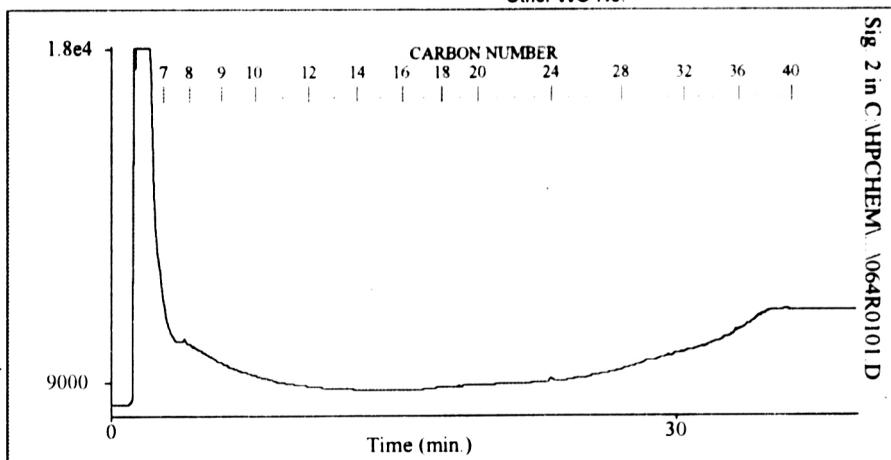


**NORWEST
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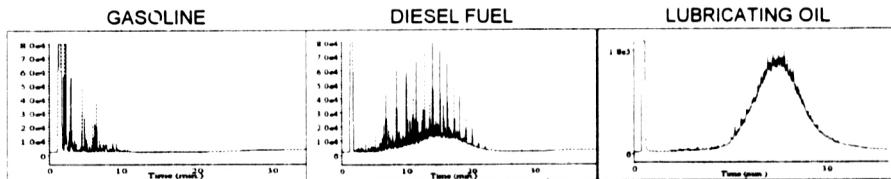
HYDROCARBON CHARACTERIZATION

Client: E.D.M. Inc.
Sample ID: Sample #33A
Lab No.: 3169-33W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 10-Sep-97
Other WO No.:



TYPICAL PRODUCT CHROMATOGRAMS

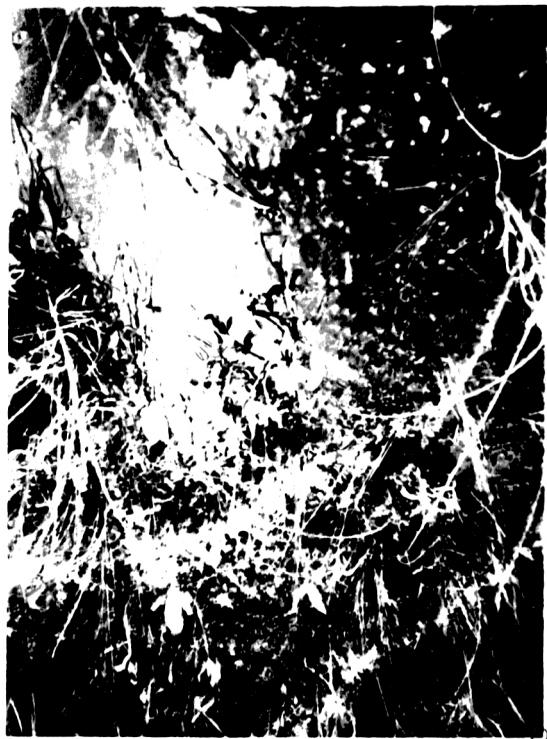


Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C80+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



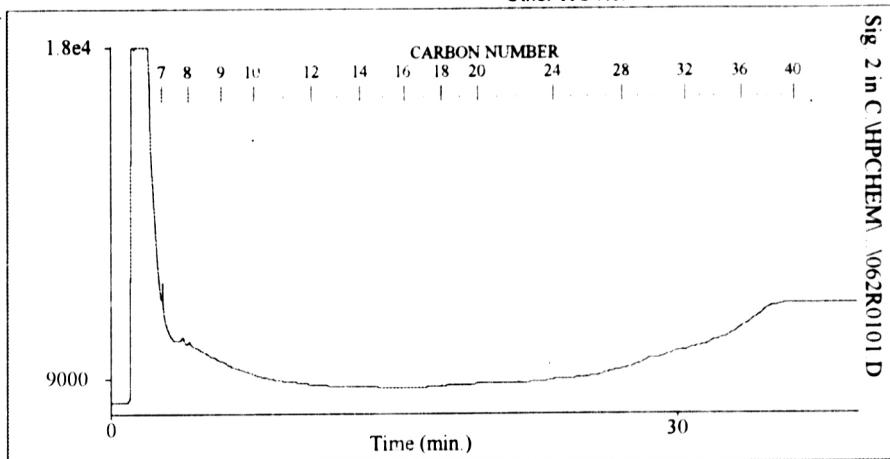


**NORWEST
LABS**

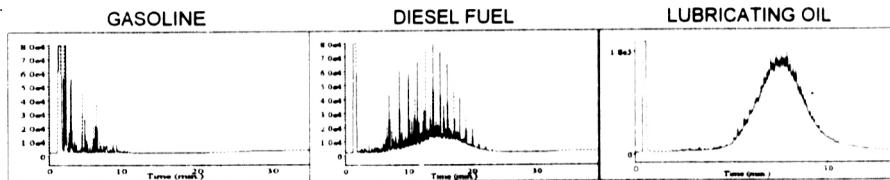
HYDROCARBON CHARACTERIZATION

Client: E.D.M. Inc.
Sample ID: Sample #34A
Lab No.: 3169-34W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 10-Sep-97
Other WO No.:



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No hydrocarbons were detected.



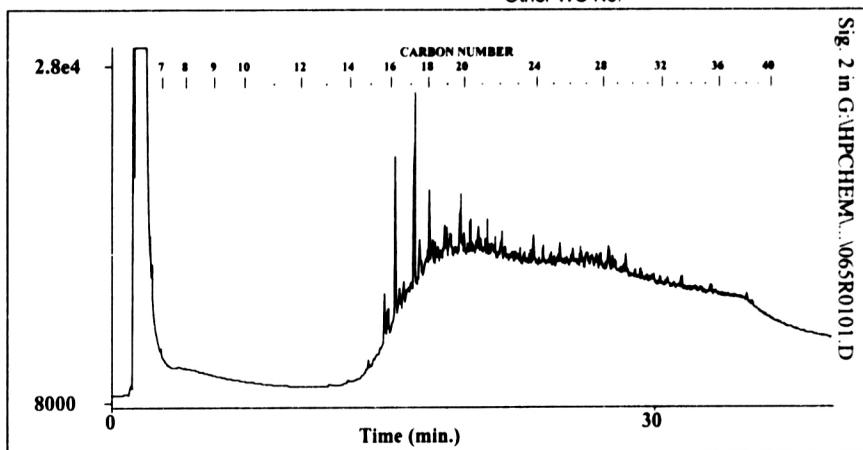


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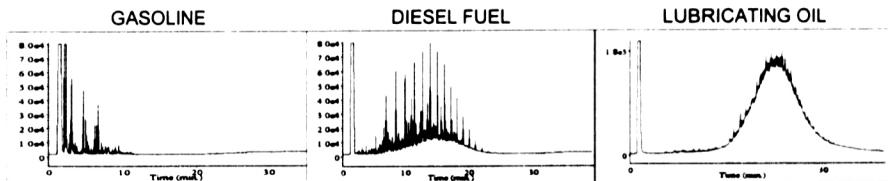
HYDROCARBON CHARACTERIZATION

Client: E.D.M. Inc.
Sample ID: Sample #35
Lab No.: 3169-35W

Work Order No.: 97-08-3169
Date Sampled:
Date Reported: 11-Sep-97
Other WO No.



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

Hydrocarbons were detected in the C14-C40+ range indicating the presence of weathered crude oil.



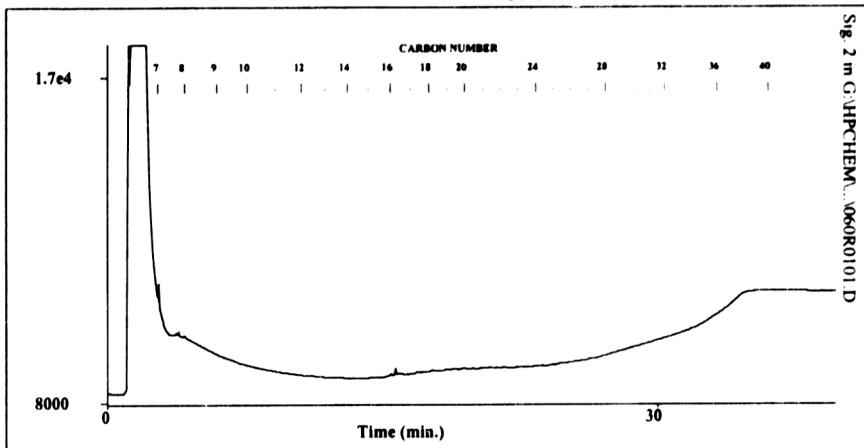


**NORWEST
LABS**

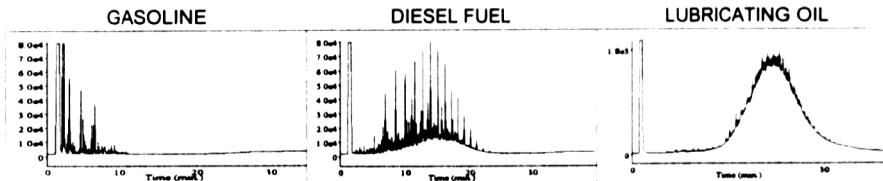
HYDROCARBON CHARACTERIZATION

Client: E.D.M.
Sample ID: Sample #36A
Lab No.: 3169-36W

Work Order No.: 97-08-3169
Date Sampled: 11-Sep-97
Date Reported: 24-Sep-97
Other WO No.:



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

No petroleum hydrocarbons were detected.



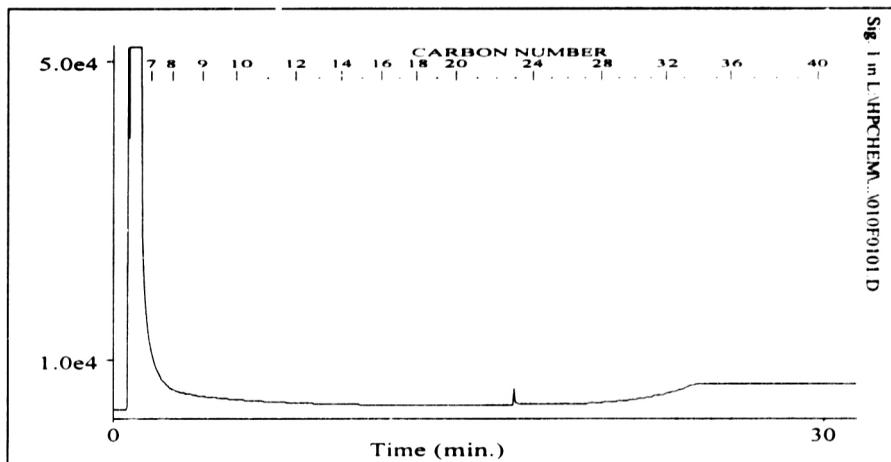


NORWEST LABS

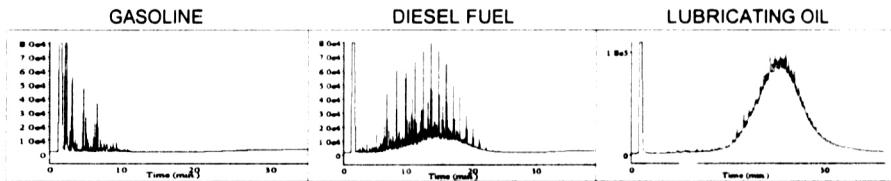
HYDROCARBON CHARACTERIZATION

Client: E.D.M. Inc.
Sample ID: 37A
Lab No.: 4245-1W

Work Order No.: 97-10-4245
Date Sampled: NA
Date Reported: 22-Oct-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline

C4-C12

Diese

C8-C22

Varsol

C8-C12

Lubricating Oils

C20-C40

Kerosene

C7-C16

Crude Oils

Sample Hydrocarbon Product Type Assessment

There are no detectable hydrocarbons present.

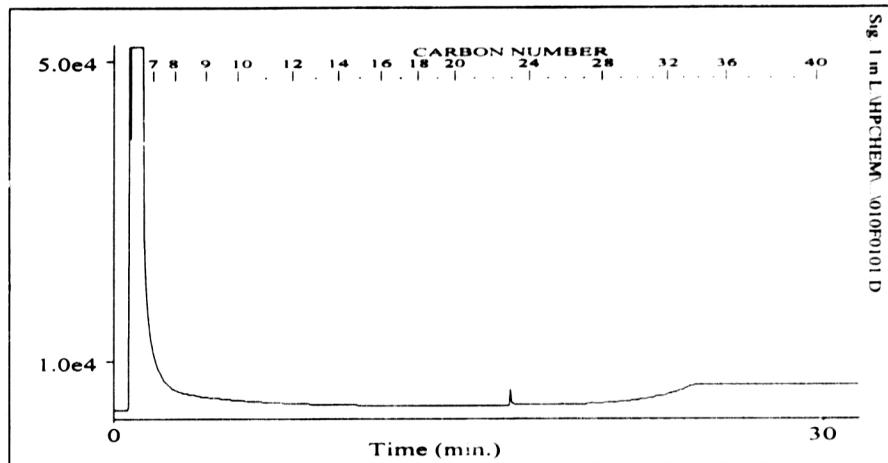


**NORWEST
LABS**

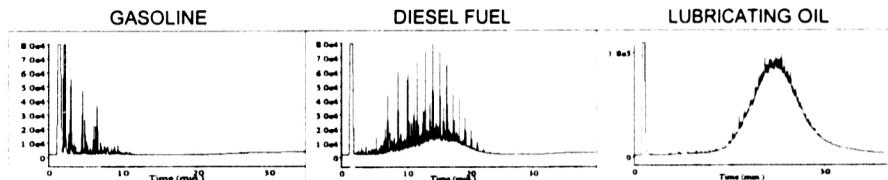
HYDROCARBON CHARACTERIZATION

Client: E.D.M. Inc.
Sample ID: 38A
Lab No.: 4245-4W

Work Order No.: 97-10-4245
Date Sampled: NA
Date Reported: 22-Oct-97



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

Sample Hydrocarbon Product Type Assessment

There are no detectable hydrocarbons present.



**NORWEST
LABS**

Calgary, AB Phone (403) 291-2022 Fax (403) 291-2021
Edmonton, AB Phone (403) 438-5522 Fax (403) 434-8586
Lethbridge, AB Phone (403) 329-9266 Fax (403) 327-8527
Langley, B.C. Phone (604) 530-4344 Fax (604) 534-9996
Winnipeg, MB Phone (204) 982-8630 Fax (204) 275-6019

TO: Enviro. Data Management Inc.
AEC West
ATTN: Dermot McCaw
Glen Andrews

DATE SAMPLED: 25-Aug-97
DATE RECEIVED: 28-Aug-97
DATE REPORTED: 25-Nov-97
LAB FILE#: 97-08-3169

Project: E97-254

HYDROCARBON ASSESSMENT - WATER

LAB #	12	16	24	25	Detection Limit
CLIENT #	Sample	Sample	Sample	Sample	
	#12A	#16A	#24A	#25A	
*Total Extractables (C₁₁ - C₃₀ +)	0.3	0.6	0.3	0.9	0.1


R. Corbet, M.Sc., P. Ag.
Manager - Organics

Results expressed in mg/L (ppm)

¹Assessment as per US EPA Method 8020

²Assessment as per Alta. Env. Method A108.0



**NORWEST
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Lethbridge, AB Phone (403) 329-9266 Fax (403) 327-8527
Langley, B.C. Phone (604) 530-4344 Fax (604) 534-9996
Winnipeg, MB Phone (204) 982-0630 Fax (204) 275-6019

TO: Enviro. Data Management Inc.
AEC West
ATTN: Dermot McCaw
Glen Andrews

DATE SAMPLED: 25-Aug-97
DATE RECEIVED: 28-Aug-97
DATE REPORTED: 25-Nov-97
LAB FILE#: 97-08-3169

Project: E97-254

Page 2

HYDROCARBON ASSESSMENT - WATER

LAB #	35	Detection
CLIENT #	Sample #35A	Limit
²Total Extractables (C₁₁ - C₃₀ +)	2.5	0.1

Results expressed in mg/L (ppm)

¹Assessment as per US EPA Method 8020

²Assessment as per Alta. Env. Method A108.0

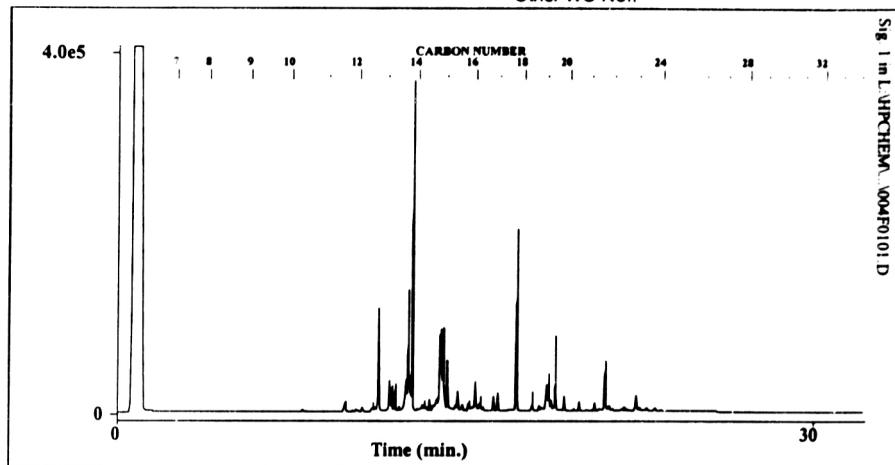


NORWEST LABS

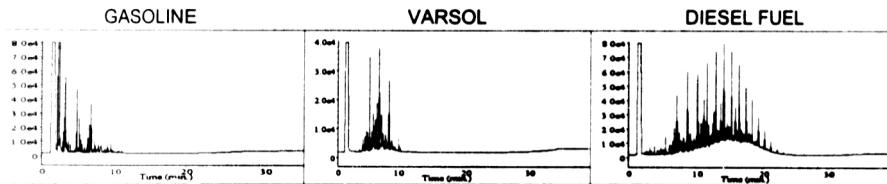
HYDROCARBON CHARACTERIZATION

Client: E.D.M.
Sample ID: Sample #12
Lab No.: 3169-12W

Work Order No.: 97-08-3169
Date Sampled: NA
Date Reported: 25-Nov-97
Other WO No.:



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline
Varsol
Kerosene

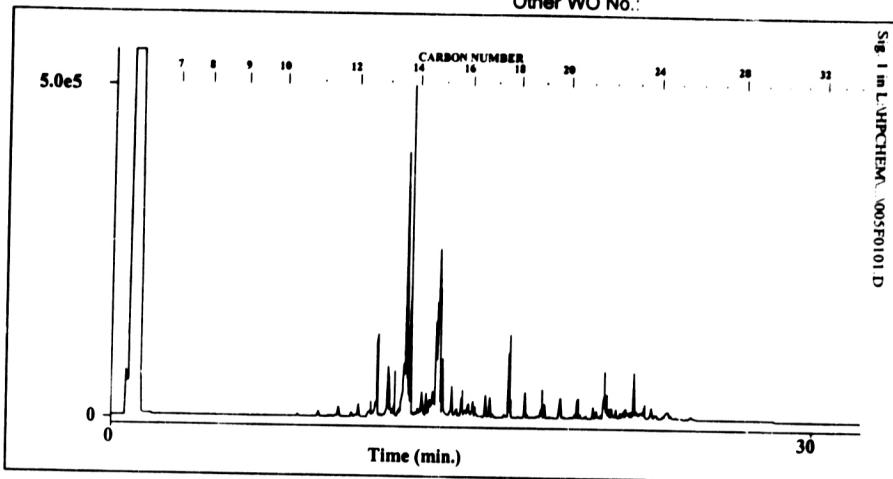


**NORWEST
LABS**

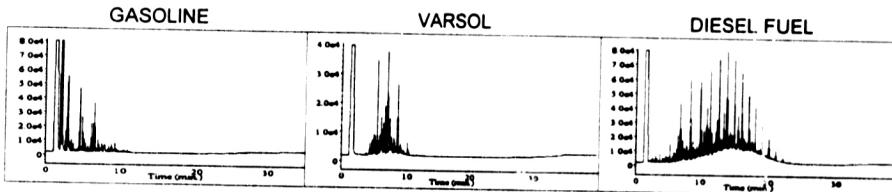
HYDROCARBON CHARACTERIZATION

Client: E.D.M.
Sample ID: Sample #16
Lab No.: 3169-16W

Work Order No.: 97-08-3169
Date Sampled: NA
Date Reported: 25-Nov-97
Other WO No.:



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

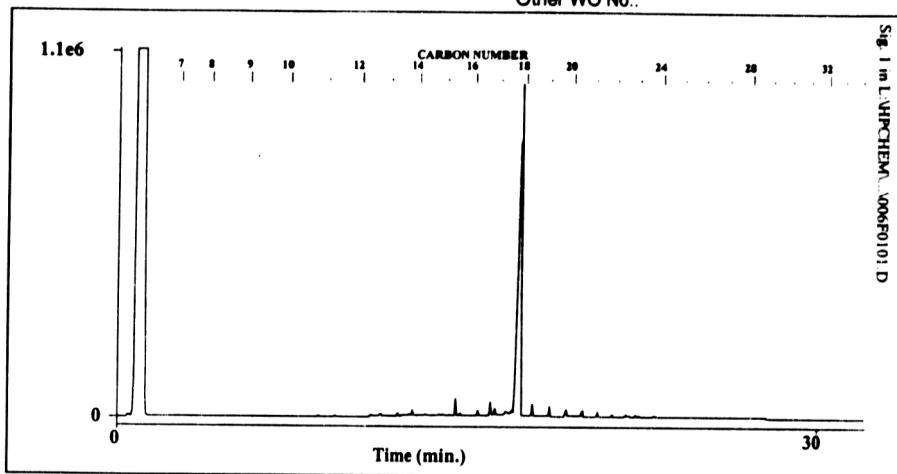


NORWEST LABS

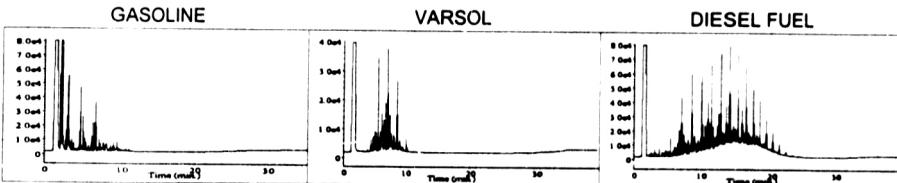
HYDROCARBON CHARACTERIZATION

Client: E.D.M.
Sample ID: Sample #24
Lab No.: 3169-24W

Work Order No.: 97-08-3169
Date Sampled: NA
Date Reported: 25-Nov-97
Other WO No.:



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

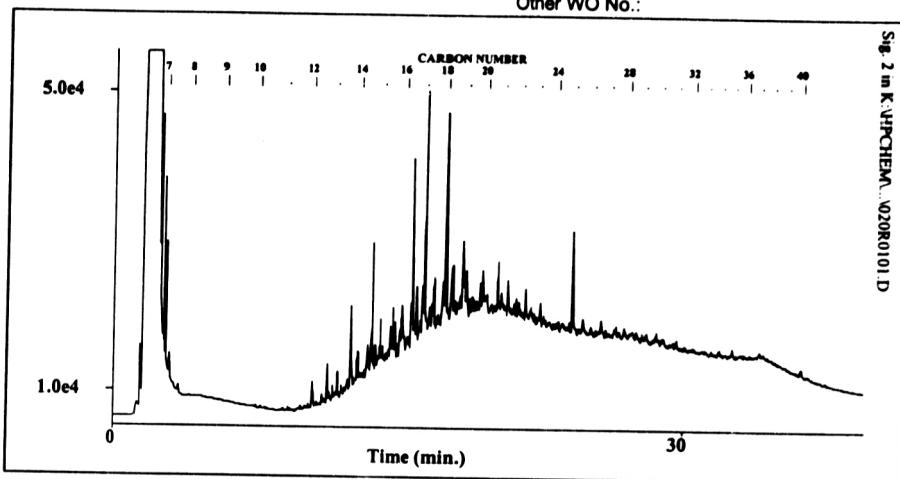


**NORWEST
LABS**

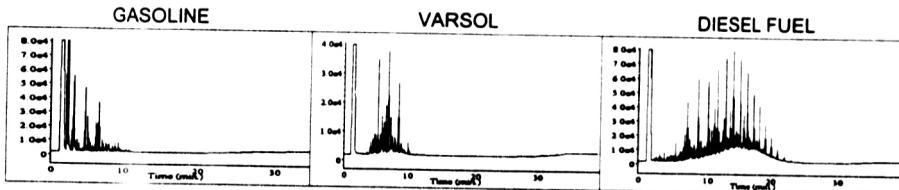
HYDROCARBON CHARACTERIZATION

Client: E.D.M.
Sample ID: Sample #25
Lab No.: 3169-25W

Work Order No.: 97-08-3169
Date Sampled: NA
Date Reported: 25-Nov-97
Other WO No.:



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+

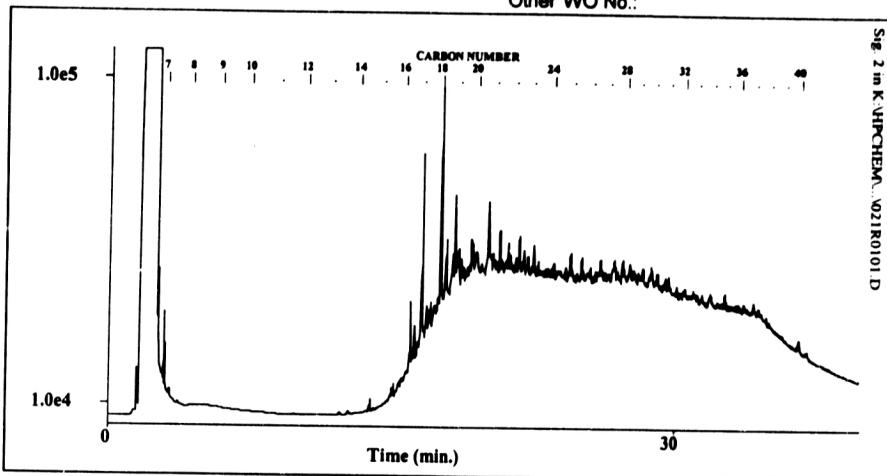


**NORWEST
LABS**

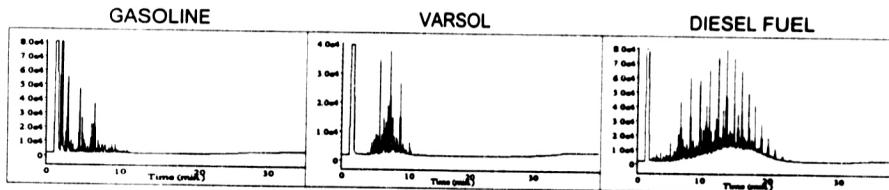
HYDROCARBON CHARACTERIZATION

Client: E.D.M.
Sample ID: Sample #35
Lab No.: 3169-35W

Work Order No.: 97-08-3169
Date Sampled: NA
Date Reported: 25-Nov-97
Other WO No.:



TYPICAL PRODUCT CHROMATOGRAMS



Product Carbon Number Ranges

Gasoline	C4-C12	Diesel	C8-C22
Varsol	C8-C12	Lubricating Oils	C20-C40
Kerosene	C7-C16	Crude Oils	C3-C60+



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Langley, B.C. Phone (604) 530-4344
Winnipeg, MB Phone (204) 982-6630

Fax (403) 291-2021
Fax (403) 434-8566
Fax (403) 327-8527
Fax (604) 534-9996
Fax (204) 275-9019

TO: Enviro Data Management Inc.
AEC West
ATTN: Dermot McCaw

DATE SAMPLED: 17-Oct-97
DATE RECEIVED: 18-Oct-97
DATE REPORTED: 22-Oct-97
LAB FILE#: 97-10-4245

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TOTAL EXTRACTABLE HYDROCARBONS QUALITY ASSURANCE DATA

*(This QA/QC data is representative of the lab based quality
assurance program and is not to be utilized as field data.)
Calibration Check (CC)*

	Actual Amt. (ng)	Detected Amt. (ng)	% Rec.
DIESEL	2812	2823.9	100
Accuracy	$\frac{\text{Ave \% Rec. MS} + \text{Ave \% Rec. MSD}}{2}$	=	97 % Accuracy
% RSD	$\frac{\text{Ave \% Rec. MS} - \text{Ave \% Rec. MSD}}{\% \text{ Accuracy}}$	=	3.6 % RSD

The calculated values are based on matrix spike and duplicate recovery
data performed on your samples at the time of analysis.

Date Acquired: Oct20/97

Analyst: Gavin January



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Winnipeg, MB Phone (204) 982-9830 Fax (204) 275-6019

TO:	Enviro. Data Management Inc. AEC West	DATE SAMPLED:	25-Aug-97
ATTN:	Dermot McCaw Glen Andrews	DATE RECEIVED:	28-Aug-97
		DATE REPORTED:	24-Sep-97
		LAB FILE#:	97-08-3169

Project: E97-254

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TOTAL EXTRACTABLE HYDROCARBONS QUALITY ASSURANCE DATA

(This QA/QC data is representative of the lab based quality assurance program and is not to be utilized as field data.)

Calibration Check (CC)

	Actual Amt. (ng)	Detected Amt. (ng)	% Rec.
DIESEL	2812	2995	107
<hr/>			
Accuracy	= $\frac{\text{Ave \% Rec. MS} + \text{Ave \% Rec. MSD}}{2}$	= 118	% Accuracy
% RSD	= $\frac{\text{Ave \% Rec. MS} - \text{Ave \% Rec. MSD}}{\% \text{ Accuracy}}$	= 6.4	% RSD

The calculated values are based on matrix spike and duplicate recovery data performed on your samples at the time of analysis.

Date Acquired: 97-09-23

Analyst: GAVIN JANUARY

**AEC West Ltd.
New Ventures
Geochemical Fieldwork Report
on EL 387
Norman Wells Area - N.W.T.**

**Field work performed
August 22 - 27, 1997**

List of Geochemical References

1. Feinstein, S. et al. *Families of oils and source rocks in the central Mackenzie corridor: a geochemical oil-oil and oil-source rock correlation*. In Sequences, Stratigraphy, Sedimentology: surface and subsurface (CSPG Memoir 15), pp. 543-552, 1988.
2. Feinstein, S. et al. *Organic and geochemical characterization and hydrocarbon generation potential of mid-late Devonian Horn River bituminous shales, southern NWT*. Bulletin of Canadian Petroleum Geology v.39 no.2, pp. 192-202, June, 1991.
3. Feinstein S. et al. *Thermal maturation of organic matter in the middle Devonian to Tertiary section, for Norman area (Central Mackenzie Plain)*. Canadian Journal of Earth Sciences v.28 no.7, pp. 1009-1018, July, 1991.
4. Feinstein, S. et al. *Thermal Maturity in the Mackenzie Corridor, Northwest and Yukon Territories, Canada*. GSC Open File Report 1944, 1990.
5. Snowdon, L.R. et al. *Correlation of the Canol Formation source rock with oil from Norman Wells*. Organic Geochemistry v.11 no.6, pp. 529-548, 1987.
6. Sans Sault Rapids NTS 106 H GSC Map #1453A
Lat.65-66 Long.128-130 Scale 1:250,000
7. Norman Wells NTS 96 E GSC Open File #304
Mahony Lake NTS 96 F
(mylars) Lat.65-66 Long.124-128 Scale 1:250,000