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March 15, 2002

Mr. William Jones, P.E.
Niagara Mohawk
A National Grid Company
300 Erie Blvd West
Syracuse, NY 13202

Subject: **Troy/Water Street (Area 2)**
Supplemental Phase II Data

Dear Bill:

In accordance to the Supplemental Phase II Investigation work plan dated January 29, 2001, field work was conducted at the Troy/Water Street (Area 2) site from January 29 through March 13, 2001. This letter transmits the results from this investigation.

1.0 Gauging of Existing Monitoring Wells

The following wells were gauged to determine the presence/absence of NAPL:

MW-3	MW-6
MW-12	MW-21
MW-22	MW-23
MW-24	MW-25
MW-26	MW-27
MW-28	

Gauging of MW-10 was proposed in the scope of work, however, the well was obstructed at approximately four feet below grade. The remaining wells were gauged during three separate events (February 2, March 3, and March 23, 2001). The results are presented as **Attachment A**. As specified in the work plan, the wells were not purged prior to gauging. Both light and dense NAPLs were investigated.

2.0 Groundwater Area A

Three soil borings were installed in the area between King Fuel's former USTs and SB-19 and MW-12. These borings were completed as monitoring wells (MW-29, MW-30, and MW-31). The wells were installed to an average depth of 38 feet below grade. Continuous split spoon samples were collected and screened at two foot intervals from each soil boring. The drill logs are presented as **Attachment B**. Four soil samples were collected from each soil boring and sent to Severn Trent Laboratories (STL) in Buffalo for analysis of BTEX by Method 8240 (95-1) and PAHs by Method 8270 (95-2). Analytical results are presented in **Table 1** and **Table 2** (**Attachment C**). Additionally, a soil sample from each soil boring (two samples from MW-31) was sent to Worldwide Geosciences, Inc.

(Worldwide) for fingerprint analysis. The results of the fingerprint analyses are presented as **Attachment D.**

The wells were developed in accordance with the GQAPP/FSP on February 8, 2001. The wells were allowed to equilibrate, and were then purged and sampled. On March 2, 2001, MW-13, MW-15, MW-29, and MW-31 were gauged, purged and sampled. Groundwater samples were sent to STL in Buffalo for analysis of BTEX by Method 8240 and PAHs by Method 8270. Analytical results are presented in **Table 3** and **Table 4** (**Attachment C**). Additionally, a total of three groundwater samples were sent to Worldwide for fingerprint analysis. The results of the fingerprint analysis are presented in **Attachment D.**

The roadbox covering MW-12 was completely filled with ice and was therefore inaccessible. Initially, MW-30 could not be located. MW-30 was subsequently located, purged and sampled on March 13, 2001.

3.0 Former Wynantskill Channel

The scope of work required the installation of two piezometers (PZ-1 and PZ-2) in the location of the former Wynantskill Channel. Both of these borings were advanced to bedrock. Continuous split spoon samples were collected and screened with a PID. Due to a lack of impacts in the location of PZ-2, the boring was not completed as a piezometer and subsequently renamed as SB-40. PZ-1 encountered tar-like material from 21 to 30 feet below grade. This boring was cased to 32 feet below grade to avoid dragging the impacts to a deeper depth. The completed drill logs for these wells are presented in **Attachment B**. Five soil samples were collected from each soil boring and sent to STL for analysis of BTEX by Method 8240 (95-1) and PAHs by Method 8270 (95-2). Analytical results are presented in **Table 1** and **Table 2**. Additionally, a soil sample from each soil boring was sent to Worldwide for fingerprint analysis. The results of the fingerprint analysis are presented in **Attachment D**.

Subsequent to its installation, PZ-1 was included in the NAPL gauging events on March 9 and 23, 2001.

Please feel free to contact me with any questions at (518) 783-1996.

Sincerely,
IT Corporation

Cecelia Campbell

Cecelia Campbell
Project Geologist

IT Corporation

for

Bruce W. Ahrens, CHMM
Sr. Project Manager

Attachments:
- A NAPL Gauging Form
- B Drilling Logs
- C Analytical Results
- D Worldwide Geosciences, Inc. Report
- E Site Figure

APPENDIX A

NAPL GAUGING

Attachment A

NAPL GAUGING
Niagara Mohawk - Area 2
Troy, New York

Well Number	Date	Depth of Well	Depth to Water	Depth to Product	Product Thickness	Comments
MW-3	02/01/01	33.45	22.19	NA	NA	
	03/09/01	32.80	22.94	NA	NA	
	03/23/01	32.60	21.40	NA	NA	
MW-6	02/01/01	29.05	15.11	NA	NA	
	03/09/01	-	-	-	-	Well not accessable due to snow
	03/23/01	29.10	14.71	NA	NA	
MW-12	02/01/01	38.20	25.76	NA	NA	
	03/09/01	-	-	-	-	Roadbox full of ice
	03/23/01	38.25	24.37	NA	NA	
MW-21	02/01/01	29.40	19.90	NA	NA	Drops of tar-like material on IP tape; material on outside of bailer- no measureable thickness on 2/1 or 3/9/01
	03/09/01	29.40	19.37	NA	NA	
	03/23/01	29.35	19.26	29.17	0.18	Confirmed DNAPL with bailer
MW-22	02/05/01	25.40	18.43	NA	NA	Located with a metal detector
	03/09/01	25.40	18.40	NA	NA	
	03/23/01	25.40	18.28	NA	NA	
MW-23	02/01/01	28.80	22.45	NA	NA	
	03/09/01	28.79	22.17	NA	NA	
	03/23/01	28.85	21.86	NA	NA	
MW-24	02/01/01	29.50	22.39	NA	NA	
	03/09/01	29.65	22.18	NA	NA	
	03/23/01	29.75	21.70	NA	NA	
MW-25	02/01/01	30.80	22.55	NA	NA	
	03/09/01	30.60	22.42	NA	NA	
	03/23/01	30.25	21.79	NA	NA	
MW-26	02/01/01	30.25	22.50	NA	NA	
	03/09/01	30.00	22.28	NA	NA	
	03/23/01	30.15	20.88	NA	NA	
MW-27	02/01/01	31.80	17.56	NA	NA	
	03/09/01	32.80	17.32	NA	NA	
	03/23/01	32.80	16.21	NA	NA	
MW-28	02/01/01	23.35	13.93	NA	NA	
	03/09/01	-	-	-	-	Roadbox full of ice
	03/23/01	23.30	13.71	NA	NA	
PZ-1	03/09/01	26.10	21.25	NA	NA	
	03/23/01	26.00	21.18	NA	NA	

Attachment A (cont.)

Well Gauging Data
Niagara Mohawk - Area 2

Well Number	Date	Depth of Well	Depth to Water	Depth to Product	Product Thickness	COMMENTS
MW-12	03/02/01	-	-	-	-	Roadbox full of ice
MW-13	03/02/01	30.23	25.63	NA	NA	
MW-15	03/02/01	36.36	26.79	NA	NA	
MW-29	03/02/01	40.15	25.75	NA	NA	Odor
MW-30	03/13/01	37.24	25.53	25.51	0.02	Odor
MW-31	03/13/01	34.89	26.29	26.12	0.17	Strong odor/ Yellow liquid LNAPL

APPENDIX B

TABLES

Table 1
Subsurface Soils
Volatiles (mg/kg)
Niagara Mohawk - Area 2

Analyte	Analytical Method	Recommend. Soil Cleanup Objective (1)	MW-29					MW-30						MW-31				
			13-15'	23-25'*	23-25' DL	33-35'	37-39'	7-9'	17-19'	25-27'*	25-27' DL	35-37	DUP 35-37'	7-9'	15-17'	23-25'*	23-25' RE	33-35'
Benzene	NYSDEC 91-2	0.06	0.011U	**.48B**	**.39DJ**	0.013U	0.011U	.011U	.031BJ	**2.9U**	**5.9D**	**.063J**	**.19J**	.027B	.016U	1.4U	1.4U	.012U
Toluene	NYSDEC 91-2	1.5	0.011U	0.36U	1.6U	0.013U	0.011U	0.011U	0.011U	1.4U	1.2DJ	0.011U	0.011U	0.011U	.029U	.26J	.44J	0.011U
Ethylbenzene	NYSDEC 91-2	5.5	0.011U	8.9DJ	8.9D	0.013U	.033B	0.011U	0.011U	**51D**	**51D**	.03B	.044B	.11B	0.011U	**10J**	**12**	0.011U
Xylenes (Total)	NYSDEC 91-2	1.2	0.011U	**3B**	**9.5D**	0.013U	.063B	0.011U	0.011U	**37**	**46D**	.033B	.06B	.1B	0.011U	**2.3J**	**27**	0.011U
Benzene Isomers	NYSDEC 91-2	NA	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Methylene Chloride	NYSDEC 91-2	0.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Acetone	NYSDEC 91-2	0.2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
1,1,1-Trichloroethane	NYSDEC 91-2	0.8	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Styrene	NYSDEC 91-2	NA	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
2 - Butanone	NYSDEC 91-2	0.3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Carbon Disulfide	NYSDEC 91-2	2.7	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
2 - Hexanone	NYSDEC 91-2	NA	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total BTEX	-	NA	BDL	11.42BDJ	20.39DJ	BDL	0.096B	BDL	0.031BJ	88D	104.1DJ	0.126BJ	0.294BJ	0.237B	BDL	12.56J	39.44J	BDL
Total Volatiles (2)	-	NA	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

Analyte	Analytical Method	Recommend. Soil Cleanup Objective (1)	SB-40						PZ-1					
			5-7'	11-13'	23-25'	31-33'	53-55'*	DUP 53-55'	17-19'	23-25'*	23-25' RE	27-29'	31-33'	53-55'
Benzene	NYSDEC 91-2	0.06	0.011U	0.012U	0.012U	0.012U	0.048J	0.013J	.011U	1.5U	1.5U	0.012U	.015U	.002J
Toluene	NYSDEC 91-2	1.5	0.011U	0.012U	.012U	0.012U	0.011U	.011U	0.011U	1.5U	1.5U	.012U	.015U	.01U
Ethylbenzene	NYSDEC 91-2	5.5	.011U	.012U	.012U	.012U	.011U	.011U	.011U	1.5U	1.5U	0.012U	.015U	.01U
Xylenes (Total)	NYSDEC 91-2	1.2	0.011U	.012U	.012U	.012U	.011U	11U	.011U	1.5U	1.5U	0.012U	.015U	.01U
Benzene Isomers	NYSDEC 91-2	NA	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Methylene Chloride	NYSDEC 91-2	0.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Acetone	NYSDEC 91-2	0.2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
1,1,1-Trichloroethane	NYSDEC 91-2	0.8	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Styrene	NYSDEC 91-2	NA	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
2 - Butanone	NYSDEC 91-2	0.3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Carbon Disulfide	NYSDEC 91-2	2.7	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
2 - Hexanone	NYSDEC 91-2	NA	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total BTEX	-	NA	BDL	BDL	BDL	BDL	0.048J	0.013J	BDL	BDL	BDL	BDL	BDL	.002J
Total Volatiles (2)	-	NA	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

(1) NYSDEC TAGM HWR-94-4046, January 24, 1994
(2) Total volatiles do not include TICs.
* Indicates the values used when a re-analysis of the sample was run by laboratory.

Table 2
Subsurface Soils
Semivolatiles (mg/kg)
Niagara Mohawk - Area 2

Analyte	Analytical Method	Recomm. Objective (1)	Sample Location									
			MW-29				MW-30					
			13-15'	23-25'	33-35'	37-39'	7-9'	17-19'	25-27'*	25-27DL	35-37'	DUP 35-37'
Phenol	NYSDEC 91-2 or EPA 8270	0.03	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
2-Methylphenol	NYSDEC 91-2 or EPA 8270	0.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
4-Methylphenol	NYSDEC 91-2 or EPA 8270	0.9	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
2,4-Dimethylphenol	NYSDEC 91-2 or EPA 8270	NA	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Naphthalene	NYSDEC 91-2 or EPA 8270	13	.35U	0.95	.43U	.032J	0.35U	0.37U	**24D**	**24D**	.4U	.39U
2-Methylnaphthalene	NYSDEC 91-2 or EPA 8270	36.4	.35U	0.89	.43U	.033J	0.35U	0.37U	31D	22D	.4U	.39U
Acenaphthylene	NYSDEC 91-2 or EPA 8270	41	.35U	.42U	.43U	.4U	.35U	.37U	.39U	7.8U	.4U	.39U
Acenaphthene	NYSDEC 91-2 or EPA 8270	50	.35U	.12J	.43U	.036J	.35U	.37U	0.97	1.2DJ	.4U	.39U
4-Nitrophenol	NYSDEC 91-2 or EPA 8270	0.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Dibenzofuran	NYSDEC 91-2 or EPA 8270	6.2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Fluorene	NYSDEC 91-2 or EPA 8270	50	.35U	.19J	.43U	.062J	.35U	.37U	1.4	2.4DJ	.4U	.39U
N-Nitrosodiphenylamine	NYSDEC 91-2 or EPA 8270	NA	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Phenantherene	NYSDEC 91-2 or EPA 8270	50	.028J	0.7	.43U	0.4	.057J	.033J	2.4	2.8DJ	.4U	.39U
Anthracene	NYSDEC 91-2 or EPA 8270	50	.35U	.18J	.43U	.11J	.35U	.37U	0.68	1.1DJ	.4U	.39U
Carbazole	NYSDEC 91-2 or EPA 8270	NA	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Fluoranthene	NYSDEC 91-2 or EPA 8270	50	.35U	0.52	.43U	.34J	.097J	.37U	0.6	.52DJ	.4U	.39U
Pyrene	NYSDEC 91-2 or EPA 8270	50	.019J	0.77	.43U	.34J	.1J	.37U	0.64	.83DJ	.4U	.39U
Benzo{a}anthracene	NYSDEC 91-2 or EPA 8270	0.22	**.024J**	**.41J**	.43U	.19J	.1J	.37U	.17J	7.8U	.4U	.39U
Chrysene	NYSDEC 91-2 or EPA 8270	0.4	.051J	.28J	.43U	.18J	.14J	0.05	.21J	7.8U	.4U	.39U
Benzo{b}fluoranthene	NYSDEC 91-2 or EPA 8270	1.1	.044J	.3J	.43U	.21J	.17J	.021J	.13J	7.8U	.4U	.39U
Benzo{k}fluoranthene	NYSDEC 91-2 or EPA 8270	1.1	.35U	.1J	.43U	.4U	.046J	.37U	.033J	7.8U	.4U	.39U
Benzo{a}pyrene	NYSDEC 91-2 or EPA 8270	0.061	.019J	**.26J**	.43U	**.14J**	**.089J**	.37U	**.085J**	7.8U	.027J	.027J
Indeno{1,2,3-cd}pyrene	NYSDEC 91-2 or EPA 8270	3.2	.35U	.12J	.43U	.06J	.051J	.37U	.021J	7.8U	.4U	.39U
Dibenz{a,h}anthracene	NYSDEC 91-2 or EPA 8270	0.014	.35U	**.038J**	.43U	.4U	.35U	.37U	.39U	7.8U	.4U	.39U
Benzo{g,h,i}perylene	NYSDEC 91-2 or EPA 8270	50	.025J	.14J	.43U	.066J	.062J	.37U	.024J	7.8U	.4U	.39U
bis{2-ethylhexylphthalate)	NYSDEC 91-2 or EPA 8270	50	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Di-n-butylphthalate	NYSDEC 91-2 or EPA 8270	8.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total PAHs		NA	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total semivolatiles (2)		500	0.21J	5.968J	BDL	2.199J	0.912J	0.104J	53.363JD	54.85DJ	.027J	.027J

(1) NYSDEC TAGM HWR-94-4046, January 24, 1994

(2) Total semivolatiles do not include TICs.

* Indicates the values used when a re-analysis of the sample was run by laboratory

Table 2
Subsurface Soils
Semivolatiles (mg/kg)
Niagara Mohawk - Area 2

Analyte	Analytical Method	Recomm. Objective (1)	Sample Location										
			MW-31					SB-40					
			7-9'	15-17'	23-25'*	23-25 DL'	33-35'	5-7'	11-13'	23-25'	31-33'	53-55'	DUP 53 -55'
Phenol	NYSDEC 91-2 or EPA 8270	0.03	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
2-Methylphenol	NYSDEC 91-2 or EPA 8270	0.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
4-Methylphenol	NYSDEC 91-2 or EPA 8270	0.9	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
2,4-Dimethylphenol	NYSDEC 91-2 or EPA 8270	NA	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Naphthalene	NYSDEC 91-2 or EPA 8270	13	.043J	.37U	2.2D	2.2D	0.4U	3.8U	.38U	1.1J	.4U	.38U	.37U
2-Methylnaphthalene	NYSDEC 91-2 or EPA 8270	36.4	.079J	.37U	22D	22D	0.4U	3.8U	.38U	3.8U	.4U	.38U	.37U
Acenaphthylene	NYSDEC 91-2 or EPA 8270	41	.35U	.37U	.38U	7.5U	.4U	3.8U	.38U	.5J	.4U	.38U	.37U
Acenaphthene	NYSDEC 91-2 or EPA 8270	50	.35U	.37U	0.75	.96DJ	.4U	3.8U	.38U	.95J	.4U	.38U	.37U
4-Nitrophenol	NYSDEC 91-2 or EPA 8270	0.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Dibenzofuran	NYSDEC 91-2 or EPA 8270	6.2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Fluorene	NYSDEC 91-2 or EPA 8270	50	.35U	.37U	1.3	1.6DJ	.4U	3.8U	.38U	.96J	.4U	.38U	.37U
N-Nitrosodiphenylamine	NYSDEC 91-2 or EPA 8270	NA	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Phenantherene	NYSDEC 91-2 or EPA 8270	50	.072J	.37U	0.9	1.6DJ	.043J	.38J	.38U	.43J	.4U	.38U	.37U
Anthracene	NYSDEC 91-2 or EPA 8270	50	.35U	.37U	0.45	.61DJ	.4U	3.8U	.38U	.51J	.4U	.38U	.37U
Carbazole	NYSDEC 91-2 or EPA 8270	NA	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Fluoranthene	NYSDEC 91-2 or EPA 8270	50	.034J	.37U	.23J	7.5U	.061J	.88J	.14J	1.7J	.4U	.38U	.37U
Pyrene	NYSDEC 91-2 or EPA 8270	50	.034J	.37U	0.45	.49DJ	.11J	.66J	.14J	1.6J	.4U	.38U	.37U
Benzo{a}anthracene	NYSDEC 91-2 or EPA 8270	0.22	**.026J**	.37U	.16J	7.5U	**.056J**	**.63J**	.11J	**.58J**	.4U	.38U	.37U
Chrysene	NYSDEC 91-2 or EPA 8270	0.4	.038J	.023J	.1J	7.5U	.04J	**.58J**	.1J	**.6J**	.4U	.38U	.37U
Benzo{b}fluoranthene	NYSDEC 91-2 or EPA 8270	1.1	.039J	.37U	.099J	7.5U	.054J	**1.2J**	.18J	.42J	.4U	.38U	.37U
Benzo{k}fluoranthene	NYSDEC 91-2 or EPA 8270	1.1	.35U	.37U	.039J	7.5U	.4U	.42J	.093J	3.8U	.4U	.38U	.37U
Benzo{a}pyrene	NYSDEC 91-2 or EPA 8270	0.061	.02J	.37U	**.073J**	7.5U	.036J	**.9J**	**.14J**	**.45J**	**.1J**	.38U	.37U
Indeno{1,2,3-cd}pyrene	NYSDEC 91-2 or EPA 8270	3.2	.35U	.37U	.032J	7.5U	.4U	.71J	.084J	3.8U	.4U	.38U	.37U
Dibenz{a,h}anthracene	NYSDEC 91-2 or EPA 8270	0.014	.35U	.37U	.38U	7.5U	.4U	3.8U	.38U	3.8U	.4U	.38U	.37U
Benzo{g,h,i}perylene	NYSDEC 91-2 or EPA 8270	50	.35U	.37U	.039J	7.5U	.4U	.6J	.088J	3.8U	.4U	.38U	.37U
bis{2-ethylhexylphthalate)	NYSDEC 91-2 or EPA 8270	50	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Di-n-butylphthalate	NYSDEC 91-2 or EPA 8270	8.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total PAHs		NA	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total semivolatiles (2)		500	0.385J	.023J	28.822DJ	29.46DJ	0.4J	6.96J	1.075J	9.8J	BDL	BDL	BDL

(1) NYSDEC TAGM HWR-94-4046, January 24, 1994

(2) Total semivolatiles do not include TICs.

* Indicates the values used when a re-analysis of the sample was run by laborato

Table 2
Subsurface Soils
Semivolatiles (mg/kg)

Niagara Mohawk - Area 2

Analyte	Analytical Method	Recomm. Objective (1)	Sample Location				
			PZ-1				
			17'-19'	23'-25'	27'-29'	31'-33'	53'-55'
Phenol	NYSDEC 91-2 or EPA 8270	0.03	NT	NT	NT	NT	NT
2-Methylphenol	NYSDEC 91-2 or EPA 8270	0.1	NT	NT	NT	NT	NT
4-Methylphenol	NYSDEC 91-2 or EPA 8270	0.9	NT	NT	NT	NT	NT
2,4-Dimethylphenol	NYSDEC 91-2 or EPA 8270	NA	NT	NT	NT	NT	NT
Naphthalene	NYSDEC 91-2 or EPA 8270	13	3.7 U	4 U	1.8 J	0.44 U	0.36 U
2-Methylnaphthalene	NYSDEC 91-2 or EPA 8270	36.4	3.7 U	15	3.9 U	0.44 U	0.36 U
Acenaphthylene	NYSDEC 91-2 or EPA 8270	41	3.7 U	1.3 J	0.92 J	0.44 U	0.36 U
Acenaphthene	NYSDEC 91-2 or EPA 8270	50	3.7 U	5.9	4.1J	0.44 U	0.36 U
4-Nitrophenol	NYSDEC 91-2 or EPA 8270	0.1	NT	NT	NT	NT	NT
Dibenzofuran	NYSDEC 91-2 or EPA 8270	6.2	NT	NT	NT	NT	NT
Fluorene	NYSDEC 91-2 or EPA 8270	50	3.7 U	6	2.6 J	0.44 U	0.36 U
N-Nitrosodiphenylamine	NYSDEC 91-2 or EPA 8270	NA	NT	NT	NT	NT	NT
Phenantherene	NYSDEC 91-2 or EPA 8270	50	3.7 U	7.4	6.4	0.44 U	0.36 U
Anthracene	NYSDEC 91-2 or EPA 8270	50	3.7 U	2.9 J	2.2 J	0.44 U	0.36 U
Carbazole	NYSDEC 91-2 or EPA 8270	NA	NT	NT	NT	NT	NT
Fluoranthene	NYSDEC 91-2 or EPA 8270	50	3.7 U	6	3.6 J	0.44 U	0.36 U
Pyrene	NYSDEC 91-2 or EPA 8270	50	3.7 U	7.4	4.7J	0.44 U	0.36 U
Benzo{a}anthracene	NYSDEC 91-2 or EPA 8270	0.22	3.7 U	2.6 J	2.5 J	0.44 U	0.36 U
Chrysene	NYSDEC 91-2 or EPA 8270	0.4	3.7 U	2.3 J	2.3 J	0.44 U	0.36 U
Benzo{b}fluoranthene	NYSDEC 91-2 or EPA 8270	1.1	3.7 U	1.4 J	1.8 J	0.44 U	0.36 U
Benzo{k}fluoranthene	NYSDEC 91-2 or EPA 8270	1.1	3.7 U	0.49 J	0.91 J	0.44 U	0.36 U
Benzo{a}pyrene	NYSDEC 91-2 or EPA 8270	0.061	3.7 U	1.9 J	2.1 J	0.44 U	0.36 U
Indeno{1,2,3-cd}pyrene	NYSDEC 91-2 or EPA 8270	3.2	3.7 U	0.51 J	0.54 J	0.44 U	0.36 U
Dibenz{a,h}anthracene	NYSDEC 91-2 or EPA 8270	0.014	3.7 U	4	3.9	0.44 U	0.36 U
Benzo{g,h,i}perylene	NYSDEC 91-2 or EPA 8270	50	3.7 U	0.61 J	0.58 J	0.44 U	0.36 U
bis{2-ethylhexylphthalate)	NYSDEC 91-2 or EPA 8270	50	NT	NT	NT	NT	NT
Di-n-butylphthalate	NYSDEC 91-2 or EPA 8270	8.1	NT	NT	NT	NT	NT
Total PAHs		NA	NT	NT	NT	NT	NT
Total semivolatiles (2)		500	BDL	61.71 J	37.05 J	BDL	BDL

(1) NYSDEC TAGM HWR-94-4046, January 24, 1994

(2) Total semivolatiles do not include TICs.

* Indicates the values used when a re-analysis of the sample was run by laborato

Table 3
Groundwater
Volatiles (mg/l)
Niagara Mohawk - Area 2

Analyte	Analytical Method	NYSDEC Std./Guidance Value (1)	Sample Location						
			MW-12			MW-13			
			June 1997	July 1997	June 2000	June 1997	July 1997	July 2000	March'01
1,1-Dichloroethane	NYSDEC 91-1	0.005	0.01U	0.01U	NT	0.01U	0.01U	NT	NT
1,1-Dichloroethene	NYSDEC 91-1	0.005	0.01U	0.01U	NT	0.01U	0.01U	NT	NT
1,1,1-Trichloroethane	NYSDEC 91-1	0.005	0.01U	0.01U	NT	0.01U	0.01U	NT	NT
1,2-Dichloroethene (Total)	NYSDEC 91-1	0.005	0.01U	0.01U	NT	0.01U	0.01U	NT	NT
2-Butanone	NYSDEC 91-1	0.05 (GV)	0.01UJ	0.01U	NT	0.01U	0.01U	NT	NT
Acetone	NYSDEC 91-1	0.05 (GV)	0.096U	0.092U	NT	0.036U	0.01U	NT	NT
Benzene	NYSDEC 91-1	0.007	**0.12**	**0.16**	**0.72**	0.01U	0.01U	0.005 U	0.002 U
Bromoform	NYSDEC 91-1	0.05 (GV)	0.01U	0.01U	NT	0.01U	0.01U	NT	NT
Carbon Disulfide	NYSDEC 91-1	NA	0.01U	0.01U	NT	0.01U	0.01U	NT	NT
Chloroform	NYSDEC 91-1	0.007	0.01U	0.01U	NT	0.01U	0.01U	NT	NT
Chlorobenzene	NYSDEC 91-1	0.005	0.01U	0.01U	NT	0.01U	0.01U	NT	NT
Chloromethane	NYSDEC 91-1	NA	0.01U	0.01U	NT	0.01U	0.01U	NT	NT
Ethylbenzene	NYSDEC 91-1	0.005	**0.019**	**0.15**	**0.15**	0.01U	0.01U	0.005 U	0.002 U
Methylene Chloride	NYSDEC 91-1	0.005	0.01U	0.01U	NT	0.01U	0.01U	NT	NT
Styrene	NYSDEC 91-1	0.005	0.01U	0.01U	NT	0.01U	0.01U	NT	NT
Toluene	NYSDEC 91-1	0.005	**0.029**	**0.045**	**0.048 J**	0.01U	0.01U	0.005 U	0.002 U
Trichloroethene	NYSDEC 91-1	0.005	0.01U	0.01U	NT	0.01U	0.01U	NT	NT
Vinyl Chloride	NYSDEC 91-1	0.002	0.01U	0.01U	NT	0.01U	0.01U	NT	NT
Xylene (Total)	NYSDEC 91-1	0.005	**0.3**	**0.8 D**	**1.7**	0.01U	0.01U	0.005 U	0.002 U
Total BTEX	-	NA	0.468	1.155	2.618 J	BDL	BDL	BDL	BDL
Total Volatiles (2)	-	NA	0.468	1.155	NT	BDL	BDL	NT	NT

(1) NYSDEC Division of Water TOGS (1.1.1), Ambient Water
Quality Standards and Guidance Values", October 22, 1993
(2) Total volatiles do not include TICs.
GV - Guidance Value
[4] Duplicate of MW-15

Table 3

Groundwater

Volatiles (mg/l)

Niagara Mohawk - Area 2

Analyte	Analytical Method	NYSDEC Std./Guidance Value (1)	Sample Location							
			MW-15				MW-29	MW-30	MW-31	Dup A [4]
			June 1997	July 1997	July 2000	March'01	March'01	March'01	March'01	March'01
1,1-Dichloroethane	NYSDEC 91-1	0.005	0.005 J	**0.012**	NT	NT	NT	NT	NT	NT
1,1-Dichloroethene	NYSDEC 91-1	0.005	0.01U	0.01U	NT	NT	NT	NT	NT	NT
1,1,1-Trichloroethane	NYSDEC 91-1	0.005	0.01U	0.01U	NT	NT	NT	NT	NT	NT
1,2-Dichloroethene (Total)	NYSDEC 91-1	0.005	**0.026**	**0.044**	NT	NT	NT	NT	NT	NT
2-Butanone	NYSDEC 91-1	0.05 (GV)	0.01UJ	0.01U	NT	NT	NT	NT	NT	NT
Acetone	NYSDEC 91-1	0.05 (GV)	0.078U	0.046U	NT	NT	NT	NT	NT	NT
Benzene	NYSDEC 91-1	0.007	**0.9 D**	**0.24 D**	0.002 J	0.002	**0.78**	**1.2**	**2.1**	0.002
Bromoform	NYSDEC 91-1	0.05 (GV)	0.01UJ	0.01U	NT	NT	NT	NT	NT	NT
Carbon Disulfide	NYSDEC 91-1	NA	0.01U	0.01U	NT	NT	NT	NT	NT	NT
Chloroform	NYSDEC 91-1	0.007	0.01U	0.003 J	NT	NT	NT	NT	NT	NT
Chlorobenzene	NYSDEC 91-1	0.005	0.01U	0.01U	NT	NT	NT	NT	NT	NT
Chloromethane	NYSDEC 91-1	NA	0.01U	0.01U	NT	NT	NT	NT	NT	NT
Ethylbenzene	NYSDEC 91-1	0.005	0.003J	**0.006 J**	0.005 U	0.004	**0.031 J**	**2.0**	**0.60**	0.005
Methylene Chloride	NYSDEC 91-1	0.005	0.01U	0.01U	NT	NT	NT	NT	NT	NT
Styrene	NYSDEC 91-1	0.005	0.01U	0.01U	NT	NT	NT	NT	NT	NT
Toluene	NYSDEC 91-1	0.005	**0.016**	**0.032**	0.005 U	0.002 U	**0.018 J**	**0.054 J**	**0.034 J**	0.001 U
Trichloroethene	NYSDEC 91-1	0.005	0.01U	**0.013**	NT	NT	NT	NT	NT	NT
Vinyl Chloride	NYSDEC 91-1	0.002	0.01U	**0.017**	NT	NT	NT	NT	NT	NT
Xylene (Total)	NYSDEC 91-1	0.005	**0.14**	**0.25**	0.005 U	**0.008**	**0.052**	**0.62**	**1.10**	**0.009**
Total BTEX	-	NA	1.059	0.528	0.002 J	0.014	0.881	2.474 J	3.83 J	0.016
Total Volatiles (2)	-	NA	1.09	0.6	NT	NT	NT	NT	NT	NT

(1) NYSDEC Division of Water TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values", October 22, 1993

(2) Total volatiles do not include TICs.

GV - Guidance Value

[4] Duplicate of MW-15

Table 4
Groundwater
Semivolatiles (mg/l)
Niagara Mohawk - Area 2

Analyte	Analytical Method	NYSDEC Grdwtr. Std./Guidance Value (1)	Sample Location						
			MW-12			MW-13			
			June 1997	July 1997	June 2000	June1997	July1997	June 00	March'01
2-Methylnaphthalene	NYSDEC 91-2	ND	**0.008 J**	**0.01**	**0.039**	0.01U	0.01U	0.01 U	0.009 U
2-Methylphenol	NYSDEC 91-2	ND	0.01U	0.01U	NT	0.01U	0.01U	NT	NT
2,4-Dimethylphenol	NYSDEC 91-2	ND	**0.005 J**	**0.004 J**	NT	0.01U	0.01U	NT	NT
2,4-Dinitrophenol	NYSDEC 91-2	NA	0.025U	0.025U	NT	0.025UJ	0.025U	NT	NT
3,3'-Dichlorobenzidine	NYSDEC 91-2	0.005	0.01U	0.01UJ	NT	0.01U	0.01U	NT	NT
4-Methylphenol	NYSDEC 91-2	NA	0.001J	0.002J	NT	0.01U	0.01U	NT	NT
4-Nitrophenol	NYSDEC 91-2	NA	0.025U	0.025U	NT	0.025UJ	0.025U	NT	NT
Acenaphthene	NYSDEC 91-2	0.02 (GV)	0.01U	0.01U	0.01 U	0.01U	0.01U	0.01 U	0.009 U
Acenaphthylene	NYSDEC 91-2	ND	0.01U	0.01U	0.02 U	0.01U	0.01U	0.01 U	0.009 U
Anthracene	NYSDEC 91-2	0.05 (GV)	0.01U	0.01U	0.01 U	0.01U	0.01U	0.01 U	0.009 U
Benzo (a) anthracene	NYSDEC 91-2	ND	0.01U	0.01U	0.02 U	0.01U	0.01U	0.01 U	0.009 U
Benzo (a) pyrene	NYSDEC 91-2	ND	0.01U	0.01U	0.02 U	0.01U	0.01U	0.01 U	0.009 U
Benzo (b) fluoranthene	NYSDEC 91-2	0.000002 (GV)	0.01U	0.01U	0.02 U	0.01U	0.01U	0.01 U	0.009 U
Benzo (g,h,i) perylene	NYSDEC 91-2	ND	0.01U	0.01U	0.02 U	0.01U	0.01U	0.01 U	0.009 U
Benzo (k) fluoranthene	NYSDEC 91-2	0.000002 (GV)	0.01U	0.01U	0.02 U	0.01U	0.01U	0.01 U	0.009 U
bis (2-Ethylhexyl) phthalate	NYSDEC 91-2	0.05	0.01U	0.01U	NT	0.01U	0.01U	NT	NT
Carbazole	NYSDEC 91-2	ND	0.01U	0.01U	NT	0.01U	0.01U	NT	NT
Chrysene	NYSDEC 91-2	0.000002 (GV)	0.01U	0.01U	0.02 U	0.01U	0.01U	0.01 U	0.009 U
Dibenzo(a,h)anthracene	NYSDEC 91-2	ND	0.01U	0.01U	0.02 U	0.01U	0.01U	0.01 U	0.009 U
Dibenzofuran	NYSDEC 91-2	ND	0.01U	0.01U	NT	0.01U	0.01U	NT	NT
Fluoranthene	NYSDEC 91-2	0.05 (GV)	0.01U	0.01U	0.01 U	0.01U	0.01U	0.01 U	0.009 U
Fluorene	NYSDEC 91-2	0.05 (GV)	0.01U	0.01U	0.01 U	0.01U	0.01U	0.01 U	0.009 U
Hexachlorocyclopentadiene	NYSDEC 91-2	0.005	0.01UJ	0.01UJ	NT	0.01UJ	0.01UJ	NT	NT
Indeno(1,2,3-cd)pyrene	NYSDEC 91-2	0.000002	0.01UJ	0.01UJ	0.02 U	0.01UJ	0.01UJ	0.01 U	0.009 U
Naphthalene	NYSDEC 91-2	0.01 (GV)	**0.025**	**0.034**	**0.12**	0.01U	0.01U	0.01 U	0.009 U
Penta chlorophenol	NYSDEC 91-2	0.001	0.025U	0.025U	NT	0.025UJ	0.025U	NT	NT
Phenanthrene	NYSDEC 91-2	0.05 (GV)	0.01U	0.01U	0.01 U	0.01U	0.01U	0.01 U	0.009 U
Phenol	NYSDEC 91-2	0.001	**0.012**	0.01U	NT	0.01U	0.01U	NT	NT
Pyrene	NYSDEC 91-2	0.05 (GV)	0.01U	0.01U	0.01 U	0.01U	0.01U	0.01 U	0.009 U
Total PAHs	NYSDEC 91-2	-	0.051	0.034	0.159	BDL	BDL	BDL	BDL
Total Semivolatiles (2)	NYSDEC 91-2	-	0.026	0.05	NT	BDL	BDL	NT	NT

(1) NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1),
"Ambient Water Quality Standards and Guidance Values", October 22, 1993

(2) Total semivolatiles do not include TICs.

GV - Guidance Value

BDL - Below Detection Limits

* Indicates the values used when a reanalysis of the sample was run by laboratory

Table 4
Groundwater
Semivolatiles (mg/l)
Niagara Mohawk - Area 2

Analyte	Analytical Method	NYSDEC Grdwtr. Std./Guidance Value (1)	Sample Location									
			MW-15						MW-29	MW-30	MW-30 DL	MW-31
			June1997	July 1997	June 00*	June 00 RE	Mar '01	Dup A* Mar'01	Mar '01	Mar '01	Mar '01*	Mar '01
2-Methylnaphthalene	NYSDEC 91-2	ND	0.01U	0.01U	0.01 U	0.01 U	**0.002 J**	**0.001 J**	**0.002 J**	**0.41 E**	**0.48 D**	**0.100**
2-Methylphenol	NYSDEC 91-2	ND	0.01U	0.01U	NT	NT	NT	NT	NT	NT	NT	NT
2,4-Dimethylphenol	NYSDEC 91-2	ND	0.01U	**0.002 J**	NT	NT	NT	NT	NT	NT	NT	NT
2,4-Dinitrophenol	NYSDEC 91-2	NA	0.025U	0.025U	NT	NT	NT	NT	NT	NT	NT	NT
3,3'-Dichlorobenzidine	NYSDEC 91-2	0.005	0.01U	0.01U	NT	NT	NT	NT	NT	NT	NT	NT
4-Methylphenol	NYSDEC 91-2	NA	0.01U	0.01U	NT	NT	NT	NT	NT	NT	NT	NT
4-Nitrophenol	NYSDEC 91-2	NA	0.025U	0.025U	NT	NT	NT	NT	NT	NT	NT	NT
Acenaphthene	NYSDEC 91-2	0.02 (GV)	0.01U	0.01U	0.01 U	0.01 U	0.0007 J	0.010 U	0.001 J	**0.66 E**	**.084 DJ**	0.100 U
Acenaphthylene	NYSDEC 91-2	ND	0.01U	0.01U	0.01 U	0.01 U	0.009 U	0.010 U	0.010 U	0.01 U	0.01 U	0.100 U
Anthracene	NYSDEC 91-2	0.05 (GV)	0.01U	0.01U	0.01 U	0.01 U	0.0005 J	0.010 U	0.010 U	**0.170 E**	0.031 DJ	0.100 U
Benzo (a) anthracene	NYSDEC 91-2	ND	0.01U	0.01U	0.01 U	0.01 U	**0.001 J**	**0.0008 J**	0.010 U	**0.025**	**0.027 DJ**	0.100 U
Benzo (a) pyrene	NYSDEC 91-2	ND	0.01U	0.01U	0.01 U	0.01 U	**0.0006 J**	0.010 U	0.010 U	**0.015**	**0.015 DJ**	0.100 U
Benzo (b) fluoranthene	NYSDEC 91-2	0.000002 (GV)	0.01U	0.01U	0.01 UJ	0.01 U	**0.0006 J**	**0.0004 J**	0.010 U	**0.025**	**0.011 DJ**	0.100 U
Benzo (g,h,i) perylene	NYSDEC 91-2	ND	0.01U	0.01U	0.01 UJ	0.01 U	0.009 U	0.010 U	0.010 U	0.005 J	0.200 U	0.100 U
Benzo (k) fluoranthene	NYSDEC 91-2	0.000002 (GV)	0.01U	0.01U	0.01 UJ	0.01 U	**0.0004 J**	**0.0003 J**	0.010 U	0.01 U	**0.017 DJ**	0.100 U
bis (2-Ethylhexyl) phthalate	NYSDEC 91-2	0.05	0.01U	0.01U	NT	NT	NT	NT	NT	NT	NT	NT
Carbazole	NYSDEC 91-2	ND	0.01U	0.01U	NT	NT	NT	NT	NT	NT	NT	NT
Chrysene	NYSDEC 91-2	0.000002 (GV)	0.01U	0.01U	0.01 U	0.01 U	**0.0009 J**	**0.0006 J**	0.010 U	**0.020**	**0.027 DJ**	0.100 U
Dibenzo(a,h)anthracene	NYSDEC 91-2	ND	0.01U	0.01U	0.01 UJ	0.01 U	0.009 U	0.010 U	0.010 U	0.003 J	0.200 U	0.100 U
Dibenzofuran	NYSDEC 91-2	ND	0.01U	0.01U	NT	NT	NT	NT	NT	NT	NT	NT
Fluoranthene	NYSDEC 91-2	0.05 (GV)	0.01U	0.01U	0.01 U	0.01 U	0.003 J	0.002 J	0.0009 J	**0.091 E**	0.048 DJ	0.100 U
Fluorene	NYSDEC 91-2	0.05 (GV)	0.01U	0.01U	0.01 U	0.01 U	0.001 J	0.0005 J	0.0007 J	**0.160 E**	**0.120 DJ**	0.100 U
Hexachlorocyclopentadiene	NYSDEC 91-2	0.005	0.01UJ	0.01UJ	0.01 U	NT	NT	NT	NT	NT	NT	NT
Indeno(1,2,3-cd)pyrene	NYSDEC 91-2	0.000002	0.01UJ	0.01UJ	0.01 UJ	0.01 U	0.009 U	0.010 U	0.010 U	**0.006 J**	0.200 U	0.100 U
Naphthalene	NYSDEC 91-2	0.01 (GV)	0.002J	0.003J	0.01 U	0.01 U	0.002 J	0.001 J	0.003 J	**0.360 E**	**0.310 D**	**0.340**
Penta chlorophenol	NYSDEC 91-2	0.001	0.025U	0.025U	NT	NT	NT	NT	NT	NT	NT	NT
Phenanthrene	NYSDEC 91-2	0.05 (GV)	0.01U	0.01U	0.01 U	0.01 U	0.001 J	0.0006 J	0.002 J	**0.170 E**	**0.190 DJ**	0.100 U
Phenol	NYSDEC 91-2	0.001	**0.021**	0.01U	NT	NT	NT	NT	NT	NT	NT	NT
Pyrene	NYSDEC 91-2	0.05 (GV)	0.01U	0.01U	0.01 U	0.01 U	0.008 J	0.005 J	0.0009 J	0.045	**0.099 DJ**	0.100 U
Total PAHs	NYSDEC 91-2	-	0.023	0.003	BDL	BDL	0.020 J	0.012 J	0.011 J	2.165 EJ	1.459 DJ	0.440
Total Semivolatiles (2)	NYSDEC 91-2	-	0.044	0.005	NT	NT	NT	NT	NT	NT	NT	NT

(1) NYSDEC Division of Water Technical and Operational Guidance Series
"Ambient Water Quality Standards and Guidance Values", October 22, 1

Dup A is a duplicate sample of MW-15 (QA/QC)

(2) Total semivolatiles do not include TICs.

GV - Guidance Value

BDL - Below Detection Limits

* Indicates the values used when a reanalysis of the sample was run by lab

APPENDIX C

DRILLING LOGS

Drilling Log

IT CORPORATION
A Member of the IT Group

Monitoring Well **MW-29**

Project *NMPC-Troy* Owner *King Fuels*
Location *Area 2* Proj. No. *11100422*
Surface Elev. ______ Total Hole Depth *40 ft.* Diameter *6 1/4 in.*
Top of Casing ______ Water Level Initial *29 ft.* Static ______
Screen: Dia *2 in.* Length *20 ft.* Type/Size *PVC/20 slot in.*
Casing: Dia *2 in.* Length *20 ft.* Type *PVC*
Fill Material *Sand* Rig/Core *CME B-59*
Drill Co. *ADT* Method *HSA*
Driller *M. Harrington* Log By *C. Campbell* Date *02/02/01* Permit # ______
Checked By ______ License No. ______

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	Well Completion	PID (ppm)	Sample ID / Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2						Packed gravel parking lot.
0						0-3': Hand dug.
2						3-5': Black/dark brown medium/fine sand (fill), 4.5' hard packed clay/ silt layer, crushed brick.
4		2.0	21-12-14-15 80%			5-7': Black/brown medium corase sand, crushed (fill), brick,slag, etc, moist-piece of shale.
6		4.0	8-15-17-23 50%			7-9': Black/brown medium/coarse sands and crushed fill, 9' red brick crushed layer.
8		5.1	22-13-40-27/40%			9-10': Black/brown medium/coarse sands & crushed fill.
10		9.2	11-13-10-9 50%			10-11': Cinders & ash. 11-13': Same as above, w/crushed brick.
12		9.8	14-13-21-50/1-30%		Fill	13-15': Ash/cinders, slag, some crushed brick, piece of coal, dark brown/black.
14		2.0	14-12-8-19 80%			15-17': Same as above, piece of coal.
16		2.0	18-7-8-9 40%			17-19': Same as above, more ash and cinder.
18		6.9	8-3-3-9 30%			19-21': Same as above, slight odor, more coal pieces.
20		43.1	2-9-5-5 40%			21-23': Same as above, moist, odor at 23' trace clay in matrix and crushed brick.
22		394	4-4-8-9 40%			23-24': Same as above, odor, layer of crushed brick.
24		1808	12-14-1-2 80%			

Drilling Log

Monitoring Well **MW-29**

Project *NMPC-Troy* Owner *King Fuels*
Location *Area 2* Proj. No. *11100422*

Depth (ft.)	Well Completion	PID (ppm)	Sample ID / Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24		1608	12-14-1-2 80%		Fill	24-25': Sandy silt, gray/green, strong odor, moist. 25-27': Silty sand and clay, gray/green, slight odor, black mottles w/in clay.
26		173	1-1-2-3 100%			27-29': Silty/clay and sand, gray green, organics and layering in sediments, wet.
28		196	4-4-3-11 100%			∇ 29-31': Silty sand, gray organics, odor, layering of sediments and organic, wet.
30		136	3-6-8-12 80%			31-33': Saturated, silty sand grading to sandy clay, layering, organics.
32		35.7	5-8-9-9 100%		CL/OL	33-35': Medium sand, gray/brown and mixed organics, saturated.
34		11.2	5-2-5-7 100%			35-37': Saturated, sand beginning to coarsen to a fine gravel.
36		113	WR-WR-WR-3 100%			37-40': Saturated, coarse sand, grading to medium/coarse gravel--gray.
38		110	4-4-8-6 100%			
40						
42						
44						
46						
48						
50						
52						
54						
56						

Drilling Log

IT CORPORATION
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Monitoring Well **MW-30**

Project *NMPC-Troy* Owner *King Fuels*
Location *Area 2* Proj. No. *11100422*
Surface Elev. ______ Total Hole Depth *38 ft.* Diameter *6 1/4 in.*
Top of Casing ______ Water Level Initial *28 ft.* Static ______
Screen: Dia *2 in.* Length *20 ft.* Type/Size *PVC/20 slot in.*
Casing: Dia *2 in.* Length *18 ft.* Type *PVC*
Fill Material *Sand* Rig/Core *CME B-59*
Drill Co. *ADT* Method *HSA*
Driller *M. Harrington* Log By *C. Campbell* Date *02/05/01* Permit # ______
Checked By ______ License No. ______

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	PID (ppm)	Sample ID / Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2				
				Packed dirt (bus parking lot).
0				Hand dig to 3'.
2				3-5': Fill, slag, brick (crushed), dark black/brown.
4	6.0	5-7-1-11 30%		5-7': Dark black/brown fill (slag and brick).
6	2.0	16-11-15-23 5%		7-9': Same as above, w/more crushed brick.
8	1.0	3-5-9-9 20%		9-11': Same as above, w/refractory brick layer at 13'.
10	1.5	7-7-5-12 30%		11-13': (fill) Coarse sand, crushed slay and grick (medium and refractory).
12	1.0	2-17-23-21 20%	Fill	13-15': Same as above, w/a packed clay layer at 15'.
14	1.0	7-15-12-16 20%		15-17': Dark brown/black, coarse sand, ash and cinder, crushed brick and slag, come coke.
16	1.5	16-50/3 75%		17-19': Same as above w/coal and more brick and coke.
18	4.0	37-10-14-10 80%		19-21': Same as above w/coarse pieces of iron works bits.
20	6.0	16-12-10-17 40%		21-23': Same as above, more slag.
22	1.7	12-13-9-11		23-25': Same as above, odor in tip.
24	258	20-13-11-5 50%		

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Drilling Log

Monitoring Well **MW-30**

Project *NMPC-Troy* Owner *King Fuels*
Location *Area 2* Proj. No. *11100422*

Depth (ft.)	PID (ppm)	Sample ID / Blow Count / % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24	258	20-13-11-5 50%	Fill	25-27': Moist, odor, sheen, coarse black/brown slag, crushed rock, brick, pockets of product like material.
26	645	5-17-16-8 60%	Fill	27-28': Wet, odor, same as above.
28	530	4-6-8-8 100%	Fill	28-29': Silty sand/clay w/pieces of wood, gray/brown.
30	88.0	3-8-10-13 40%	GC	29-31': Wet, fine/medium sand, river washed gravel (multi-colored and rounded).
32	35.0	3-7-7-18 100%	GC	31-33': Medium sand, saturated, gray/brown w/river type sediments and organics.
34		WR	GC	33-35': No recovery.
36		5-3-5-7 60%	GC	35-38': Medium fine sand, river type sediment (multi-colored rounded rocks).
38				
40				
42				
44				
46				
48				
50				
52				
54				
56				

Drilling Log

IT CORPORATION
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Monitoring Well **MW-31**

Project *NMPC-Troy* Owner *King Fuels*
Location *Area 2* Proj. No. *1100422*
Surface Elev. ______ Total Hole Depth *35 ft.* Diameter *6 1/4 in.*
Top of Casing ______ Water Level Initial *28 ft.* Static ______
Screen: Dia *2 in.* Length *20 ft.* Type/Size *PVC/20 slot in.*
Casing: Dia *2 in.* Length *15 ft.* Type *PVC*
Fill Material *Sand* Rig/Core *CME B-59*
Drill Co. *ADT* Method *HSA*
Driller *M. Harrington* Log By *C. Campbell* Date *02/02-02/05/01* Permit # ______
Checked By ______ License No. ______

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	PID (ppm)	Sample ID / Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2 to 0				Packed dirt and gravel.
0				0-3': Hand dig.
2				3-5': Dark black/brown, fine/medium sand (fill), crushed brick and gravel.
4	2.0	8-22-14-12 50%		5-7': Same as above, layer of crushed refractory brick at 6'.
6	18.0	6-19-27-17 40%		7-9': Same as above, less refractory brick.
8	4.0	15-16-50/4 30%		9-11': Coarse sand/crushed slag, coke, brick, moist, black/brown, odor in tip.
10	15.0	3-14-10-25 40%	GM	11-13': Coarse sand/crushed slag, coke, brick, moist, black/brown, w/ ash & cinders.
12	5.0	14-12-14-12 40%	GM	13-15': Coarse sand/crushed slag, coke, brick, moist, black/brown, more refractory brick pieces, silty sand (13-14').
14	12.0	11-12-14-10 70%	GM	15-17': Coarse sands/crushed brick, coke, slag, black/brown & orange, coal in tip (shiny and hard).
16	405	9-11-15-26 80%	GM	17-19': Same as above minus coal,coke & refractory brick layers.
18	160	12-18-27-41/80%	GM	19-21': Same as above, more coke, more slag & brick.
20	137	18-16-21-27/60%	GM	21-23': Same as above.
22	57.0	18-19-21-23/20%	GM	23-25': Dark gray, wet, slag, brick, sheen on spoon.
24	890	12-23-11-15 40%	OH	

Drilling Log

IT CORPORATION
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Monitoring Well **MW-31**

Project *NMPC-Troy* Owner *King Fuels*
Location *Area 2* Proj. No. *11100422*

Depth (ft.)	Well Completion	PID (ppm)	Sample ID / Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24		890	12-23-11-15 40%			
25						25-27': Odor, dark black/brown, silty/clayey sand, wet w/trace brick.
26		1408	2-1-2-9 50%			
27						27-29': Odor, wet, same as above.
28		822	3-5-5-7 40%			
29					OH	29-31': Black/brown, silty sand w/clay, pieces of wood, trace brick.
30		160	3-9-9-10 50%			
31						31-32': Same as above.
32		180	12-15-18-18/100%			32-33': Sandy/silt, layers w/organics.
33						33-35': Same as above, fractured black shale.
34		128	3-5-12-50/3 40%			
35						Refusal at 35'.
36						
38						
40						
42						
44						
46						
48						
50						
52						
54						
56						

Drilling Log

IT CORPORATION
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Soil Boring **SB-40**

Project *NMPC-Troy* Owner *King Fuels*
Location *Area 2* Proj. No. *11100422*
Surface Elev. ____ Total Hole Depth *55 ft.* Diameter *6 1/4 in.*
Top of Casing ____ Water Level Initial *21 ft.* Static ____
Screen: Dia ____ Length ____ Type/Size ____
Casing: Dia ____ Length ____ Type ____
Fill Material *Grout* Rig/Core *CME B-59*
Drill Co. *ADT* Method *HSA*
Driller *M. Harrington* Log By *C. Campbell* Date *01/29-01/30/01* Permit # ____
Checked By ____ License No. ____

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	PID (ppm)	Sample ID / Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2					Asphalt parking lot.
0					0-3': Hand dug.
2					3-5': Coarse sand, crushed brick, slag, orange/brown to black.
4	45.6	11-10-10-13 60%			5-7': Coarse sand, crushed brick, refractory brick, pieces of slag at tip.
6	0.0	5-8-9-13 60%			7-9': Refractory brick, medium/coarse sand, crushed, slag, red brick, moist at 9'.
8	0.0	14-11-9-6 50%			9-11': Large pieces of slag and coke, orange/brown, crushed pieces of red brick, moist.
10	0.0	7-15-51-46 30%			11-13': Gray-crushed concrete, pieces of slag, medium sand and silt, dry.
12	0.0	22-100/1 25%		Fill	13-15': Dark brown/gray-coarse sand, crushed slag, brick (red and refractory), few pieces crushed, concrete.
14	5.8	12-14-15-11 25%			15-17': Dark brown-coarse sand, crushed slag and concrete, moist.
16	5.7	2-6-6-5 10%			17-19': Dark brown, coarse sands, crushed slag, trace concrete, moist.
18	0.9	18-26-50 /3/15%			19-21': No recovery.
20	-	15-10-14- 13/0%		▽	21-23': Water/saturated, crushed pieces, slag, rock and brick (cobble sized), odor, light sheen.
22	1.0	3-13-24- 38/35%			23-24.5': Saturated, odor.
24	20.5	33-10-7-6 70%			

Drilling Log

IT CORPORATION
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Soil Boring **SB-40**

Project *NMPC-Troy* Owner *King Fuels*
Location *Area 2* Proj. No. *11100422*

Depth (ft.)	PID (ppm)	Sample ID / Blow Count / % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24	20.5	33-10-7-8 70%		Fill	24.5-25': Loose, gravel, slag, brick, trace light sheen, gray medium sand w/silt interbedded.
					25-27': Gray/brown silty sand and clay (trace), light sheen, odor.
26	7.3	3-4-4-5 70%			27-29': Sandy clay w/trace silt brown/gray, wet, light sheen on water, slight odor.
28	8.0	4-8-7-11 10%			29-31': Gray/brown, medium sand and silt, organic material (roots).
30	2.7	5-8-84-38 90%			31-33': Gray/brown, silty clay uniform, 33' medium rounded sand.
32	0.0	8-3-4-8 90%			33-35': Gray clay w/sand, grading to a medium/coarse sand at 35'.
34	8.4	11-8-5-8 80%			35-37': Gray sand and rounded washed gravel.
36	2.8	13-5-7-12 50%			37-39': Gray sand and rounded gravel.
38	1.0	21-21-21-29			39-41': Gray sand and silt and gravel (angular).
40	0.8	20-15-10-15 40%		SW	41-43': Coarse sand/fine gravel, river sediments rounded multi colored washed sand and gravel.
42	1.3	WR-WR-3-5 90%			43-45': Medium gran sand w/rounded cobbles (river origin).
44	1.1	9-24-20-14/20%			45-47': Cobble in tip, medium gray sand and gravel.
46	1.4	9-9-9-4 30%			47-49': Medium gray river sands and gravel.
48	1.0	14-12-8-14 25%			49-51': Same as above.
50	0.7	17-14-19-20/70%			51-53': Same as above, more clay at 53'.
52	1.0	8-12-13-18 80%			53-55': Silty/clay, medium sand and rocks, weathered shale at 55'.
54	2.4	24-21-25-22			
56					

Drilling Log

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Monitoring Well **PZ-1**

Project *NMPC-Troy* Owner *King Fuels*
Location *Area 2* Proj. No. *11100422*
Surface Elev. ____ Total Hole Depth *57 ft.* Diameter *6 1/4 in.*
Top of Casing ____ Water Level Initial *24 ft.* Static ____
Screen: Dia *2 in.* Length *17 ft.* Type/Size *PVC/30 slot in.*
Casing: Dia *2 in.* Length *15 ft.* Type *PVC*
Fill Material *Sand* Rig/Core *CME B-59*
Drill Co. *ADT* Method *HSA*
Driller *M. Harrington* Log By *C. Campbell* Date *01/30/01* Permit # ____
Checked By ____ License No. ____

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	PID (ppm)	Sample ID	Blow Count/ % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2					Asphalt parking lot.
0					0-3': Hand dug.
2					3-5': Sand, crushed slag, pieces.
4	1.6		2-1-1-1 5%		5-7': Crushed brick slag, dark black/brown.
6	3.7		4-6-5-5 100%		7-9': Dark black/brown, bits of thin wire, silty sand and slag-brick.
8	2.7		4-3-1-1 20%		9-11': Slag, coke pieces, dark black brown.
10	1.4		3-2-2-9 10%		11-13': Crushed rock and gravel, brick, slag, dark brown/black, refractory brick.
12	2.3		6-4-6-9 20%	Fill	13-15': Slag in tip, dark black brown, coarse sand and crushed slag.
14	2.6		20-8-4-4 5%		15-17': Slag crushed brick, coarse sand, dark black/brown.
16	2.5		5-4-4-14 20%		17-19': Same as above w/ash and cinders.
18	3.7		14-10-87 40%		19-21': Ash and cinders, brown/yellow/gray, moist.
20	2.7		3-1-2-3 20%		21-23': Same as above, moist, dark, viscous material, odor, sheen.
22	62.8		2-3-4-31		23-25': Saturated, black/green/gray sheen (heavy), odor, crushed slag and gravel.
24	131		4-7-5-2 30%	∇	

Drilling Log

IT CORPORATION
A Member of the IT Group

Monitoring Well **PZ-1**

Project *NMPC-Troy* Owner *King Fuels*
Location *Area 2* Proj. No. *11100422*

Depth (ft.)	PID (ppm)	Sample ID / Blow Count / % Recovery	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24	131	4-7-5-2 30%	Fill	25-27': Same as above.
26	45.7	6-3-9-7 10%		27-29': Medium sand/slag/brick, sheen, strong odor, beading in spoon, pockets of product.
28	78.2	13-14-18-12 90%		29-30': Same as above.
30	57.0	15-10-11-12 80%	OH	30-31': Clay, silty sand. 31-33': Medium sand and silty clay, layering throughout spoon, wood and organics, saturated, gray/brown.
32	0.0	1-1-1-2 100%		33-35': Same as above, coarsening to a medium sand (river type sediments) at 35', wood and organics.
34	1.1	WR-1-1-3 100%		35-37': Medium sand w/silty clay layers, wood layer, washed river type gravel at 37'.
36	2.1	1-2-2-4 80%		37-39': Silty clay w/organics, gray/brown w/some rounded washed gravel.
38	0.4	1-1-2-5 80%		39-41': No recovery.
40	-	4-4-3-4 0%		41-43': Silty clay w/medium sand layers, gray.
42	1.1	5-7-6-6 60%		43-45': Gravel and cobbles, rounded washed river sediments.
44	0.0	50/4 20%		45-47': Gravel and crushed cobbles, rounded, pieces of shale.
46	0.0	14-10-7-11 40%		47-49': Quartzite cobble and gravel, fine cobbles.
48	2.2	34-15-12-14/10%		49-51': Gravel and cobbles rounded.
50	0.0	8-10-14-16 5%		51-53': Same as above, w/clay matrix.
52	0.3	15-12-15-18 5%		53-55': Gravel cobbles, w/clay matrix, 54.5' bedrock, black shale.
54	0.4	17-25-3-18 20%		
56				

Drilling Log

IT CORPORATION
A Member of the IT Group

Monitoring Well **PZ-1**

Project *NMPC-Troy* Owner *King Fuels*
Location *Area 2* Proj. No. *11100422*

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/	% Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
56								
58								
60								
62								
64								
66								
68								
70								
72								
74								
76								
78								
80								
82								
84								
86								
88								

APPENDIX D

WORLDWIDE GEOSCIENCES, INC. REPORT (DATED MARCH 2001)

WORLDWIDE
GEOSCIENCES, INC.

6100 Corporate Drive
Suite 320
Houston, Texas 77036
Phone: 713 / 988-9401
FAX: 713 / 988-8784

RECEIVED
Route To:

APR 1 9

Proj:
File Code:

March 27, 2001

Mr. Bruce Ahrens
IT Corp.
13 British American Blvd.
Latham, NY 12110

Dear Mr. Ahrens:

Enclosed is our report on samples submitted from your Troy Area 2 site. Please refer to the report summary for a condensed statement of our findings.

If there are any questions please do not hesitate to contact me. We appreciate being of service.

Sincerely,

Neil F. Petersen

Neil F. Petersen

WORLDWIDE
GEOSCIENCES, INC.

6100 Corporate Drive
Suite 320
Houston, Texas 77036
Phone: 713 / 988-9401
FAX: 713 / 988-8784

CHARACTERIZATION OF SOIL SAMPLES
NMPC - TROY AREA 2 SITE

PREPARED FOR
IT CORP.
MARCH, 2001

CHARACTERIZATION OF SOIL SAMPLES
NMPC – TROY AREA 2 SITE

SUMMARY

Six soil samples were analyzed by high resolution capillary gas chromatography to determine the type or types of parent products associated with these samples, and to provide any indications of parent product age. Two of the samples had concentration levels too low to determine the parent products associated with these samples. These were the MW 29 (23-25) and MW 31 (15-17) samples. The low amplitude peaks present in the chromatograms of these samples are not consistent with coal tar as the parent product.

The MW 30 (25-27) and MW 31 (23-25) samples have signature characteristics indicating mixtures of gasoline and diesel/fuel oil. Diesel/fuel oil is the dominant product. The characteristics of the gasoline derived hydrocarbons indicate parent gasolines most probably produced between 1975 and 1980. The diesel/fuel oils are significantly biodegraded with most probable exposure times of 16 to 20 years for the MW 30 (25-27) sample and twenty years or more for the MW 31 (23-25) sample.

The SB-40 (23-25) sample signature shows characteristics indicating a very severely biodegraded residual grade, such as #6 grade, fuel oil assemblage with a most probable exposure time of at least fifty years. The PZ-1 (27-29) sample has compositional characteristics indicating a mixture that consists predominantly of a moderately biodegraded diesel/fuel oil with a most probable exposure time of 14 to 18 years, and a subordinate coal tar contribution.

INTRODUCTION

Two soil samples from the Troy Area 2 site were received at the offices of Worldwide Geosciences, Inc. on January 31, 2001 via Federal Express overnight delivery. Each sample was contained in a single, eight ounce, glass jar which were packed in an insulated plastic cooler with ice used as a preservative. Sample identifications as per the attached chain of custody form and their assigned laboratory numbers are as follows:

Sample ID	Lab No.
NMPC/AREA 2/MW33(23-25)	010202007
NMPC/AREA 2/PZ-1(27-29)	010202008

Worldwide was advised after receipt of the samples that the MW33 sample should be identified as SB-40 (23-25).

Four soil samples from the Troy Area 2 site were received at the offices of Worldwide Geosciences, Inc. on February 6, 2001 via Federal Express overnight delivery. Each sample was contained in a single, eight ounce, glass jar which were packed in an insulated plastic cooler with ice used as a preservative. Sample identifications as per the attached chain of custody form and their assigned laboratory numbers are as follows:

Sample ID	Lab No.
NMPC/AREA 2/MW30(25-27)	010209001
NMPC/AREA 2/MW31(15-17)	010209002
NMPC/AREA 2/MW31(23-25)	010209003
NMPC/AREA 2/MW29(23-25)	010209004

Thirty grams of each soil sample were extracted with 100 milliliters of methylene chloride solvent. The extractions were carried out by sonication. After separating each solvent and soil, each solvent was reduced in volume to two milliliters to increase the concentration level of the extracted hydrocarbons in the solvent. Each solvent was spiked with androstane as an internal standard. The concentration level of the internal standard relative to the weight of soil extracted is 3.4 parts per million. Each spiked solvent containing the extracted hydrocarbons was then analyzed by high-resolution gas chromatography using a 30-meter DB1 column and a flame ionization detector. A Perkin-Elmer Autosystem was utilized. The analysis procedure can be viewed as a modification of ASTM method D-3328. The modifications allow for the analysis of hydrocarbons in solvent and improve the resolution of the lighter hydrocarbons. Two procedural methods are routinely used for product in solvent characterization. One provides better resolution of the gasoline range hydrocarbons but has a more limited carbon number range. This is Method 3 as defined in the procedural description provided in Appendix II. The second method is routinely used to characterize product in solvents heavier than gasoline. The gasoline range hydrocarbons are compressed as a result of a more rapid increase in column temperature. This is Method 4 as described in Appendix II.

The extracts obtained on the January 31, 2001 samples were diluted with methylene chloride on a ten to one basis and were analyzed under Method 4 conditions on February 6, 2001. The chromatograms indicated the extracts analyzed were over-diluted. An undiluted set of extracts were analyzed under Method 4 conditions on March 13, 2001.

The extracts obtained on the February 6, 2001 samples were analyzed under Method 4 conditions on February 13, 2001.

The only difference in operating conditions between Methods 1 and 2, which are used for actual product samples, and between Methods 3 and 4 is in the injection conditions. When products are run neat, or as received, a split injection method is used and if the hydrocarbons are in solvent phase a splitless injection system is used.

Display copies of the chromatograms, both labeled and unlabeled, are incorporated into the report as Appendix I. A full-scale display in which all the peaks have been kept onscale for accurate visualization of the relative proportions of the hydrocarbons present is provided. Also included in Appendix I is a table listing the abbreviations used to identify peaks on the chromatograms and their corresponding names.

Peak area tables derived from the chromatograms are included as Appendix III.

RESULTS

In discussing the compositional characteristics of the samples analyzed and analog signatures, the various peaks present in the chromatograms will be referred to in terms of the hydrocarbons they represent. As a general aid to visualizing the types of hydrocarbons involved, Figure 1 is provided to illustrate the structural characteristics of the main classes of hydrocarbons.

The concentration levels of hydrocarbons present in the MW 29 (23-25) and MW 31 (15-17) samples were too low to produce chromatograms which could be interpreted in detail in terms of parent product type or age. Neither chromatogram is consistent with coal tar as the product type. The complex assemblage of low amplitude peaks in the MW 29 (23-25) sample between eight and fourteen minutes elution time is consistent with a residual 10 to 15% fraction of gasoline. The chromatograms obtained on these samples are included in Appendix I.

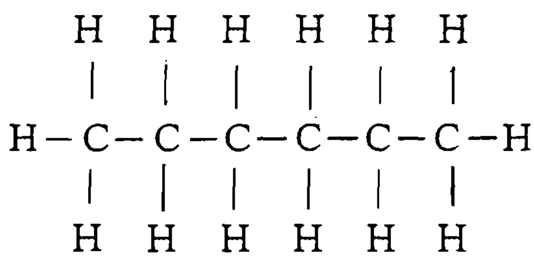
Figure 2 compares the chromatographic signature of the MW 30 (25-27) soil sample with the signature of a gasoline. The gasoline signature shown is that of American Petroleum Institute petroleum standard 6 (API PS6). The MW30 (25-27) sample signature shows a hydrocarbon range extending from the C7 (seven carbon atoms) to the C23 (twenty three carbon atom) range. Gasoline derived hydrocarbons would extend only to NC13. The relative prominence of multibranched isoparaffins among the early eluting peaks indicates a gasoline contribution to the MW 30 hydrocarbon assemblage. These multibranched isoparaffins are collectively termed alkylates. Alkylates are derived from a specific refinery processing stream and are added to gasolines to raise the octane number of a gasoline. The structures of the alkylate hydrocarbons are shown in Figure 3. The relative prominence of the trimethylpentane (224TMP, 234TMP, and 233TMP) peaks compared to bracketing non-alkylate saturate peaks indicates a gasoline contribution to the MW30 (25-27) soil sample.

The gasoline associated with the MW30 (25-27) sample is significantly volatilized. The volatilization losses are reflected in the low proportions of the lighter hydrocarbons, which elute first or to the left on the chromatogram. The signature characteristics of the MWE-30 (25027)

FIGURE I
TYPES OF HYDROCARBONS

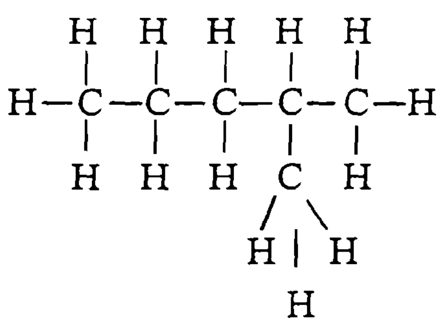
SATURATES

CARBON ATOMS CONNECTED BY SINGLE BONDS
PARAFFINS OR ALKANES
NORMAL PARAFFINS OR ALKANES
STRAIGHT CHAINS



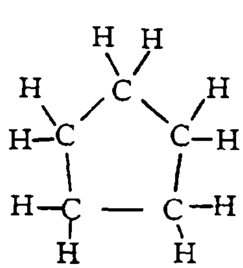
NORMAL HEXANE (NC6)

ISO-PARAFFINS OR ALKANES
BRANCHED CHAIN PARAFFINS

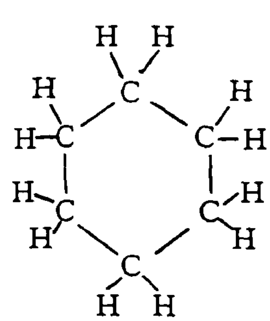


2METHYL PENTANE (2MP)

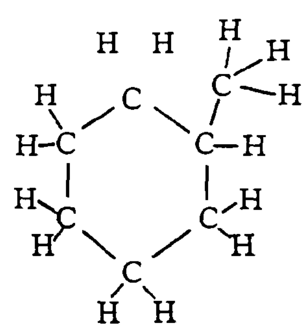
NAPTHENES OR CYCLOPARAFFINS OR CYCLOALKANES
RING OR CYCLIC STRUCTURE



CYCLOPENTANE
(CCP)



CYCLOHEXANE
(CH)



METHYLCYCLOHEXANE
(MCH)

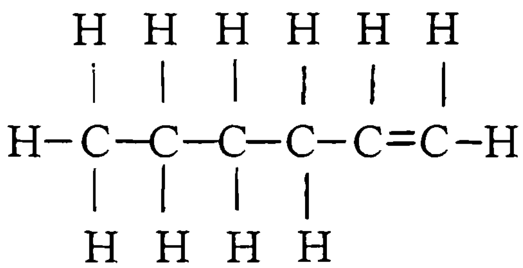
FIGURE 1 (CONT.)
TYPES OF HYDROCARBONS

UNSATURATES

HAVE ONE OR MORE CARBON DOUBLE BONDS

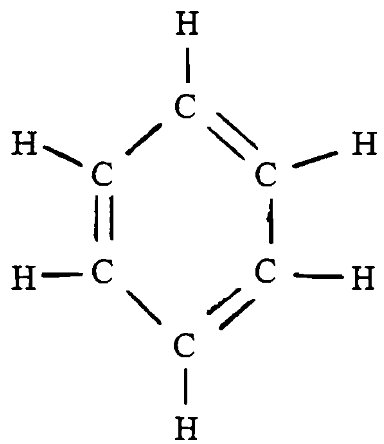
OLEFINS OR ALKENES

CAN BE STRAIGHT CHAIN, BRANCHED CHAIN, OR CYCLIC

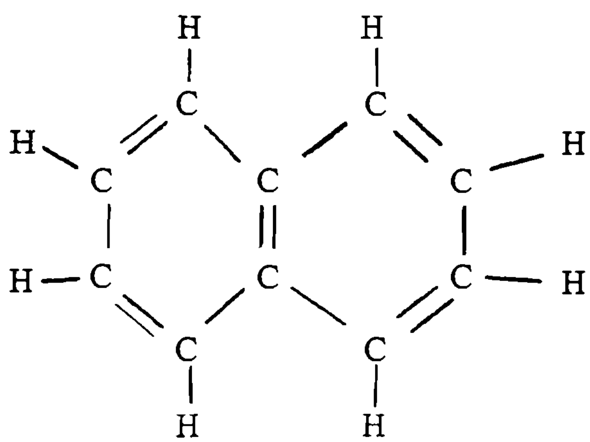


NORMAL HEXENE

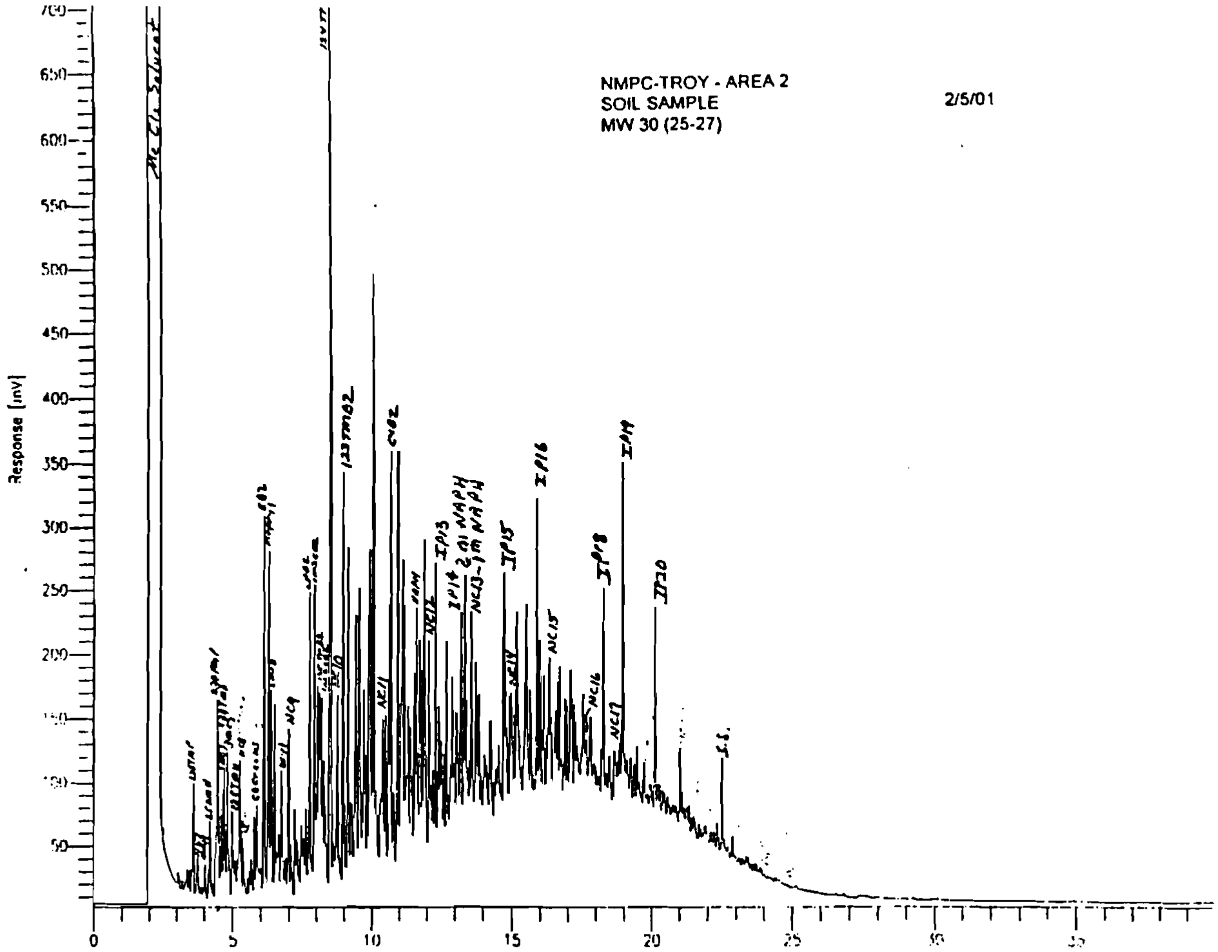
AROMATICS



BENZENE



NAPHTHALENE



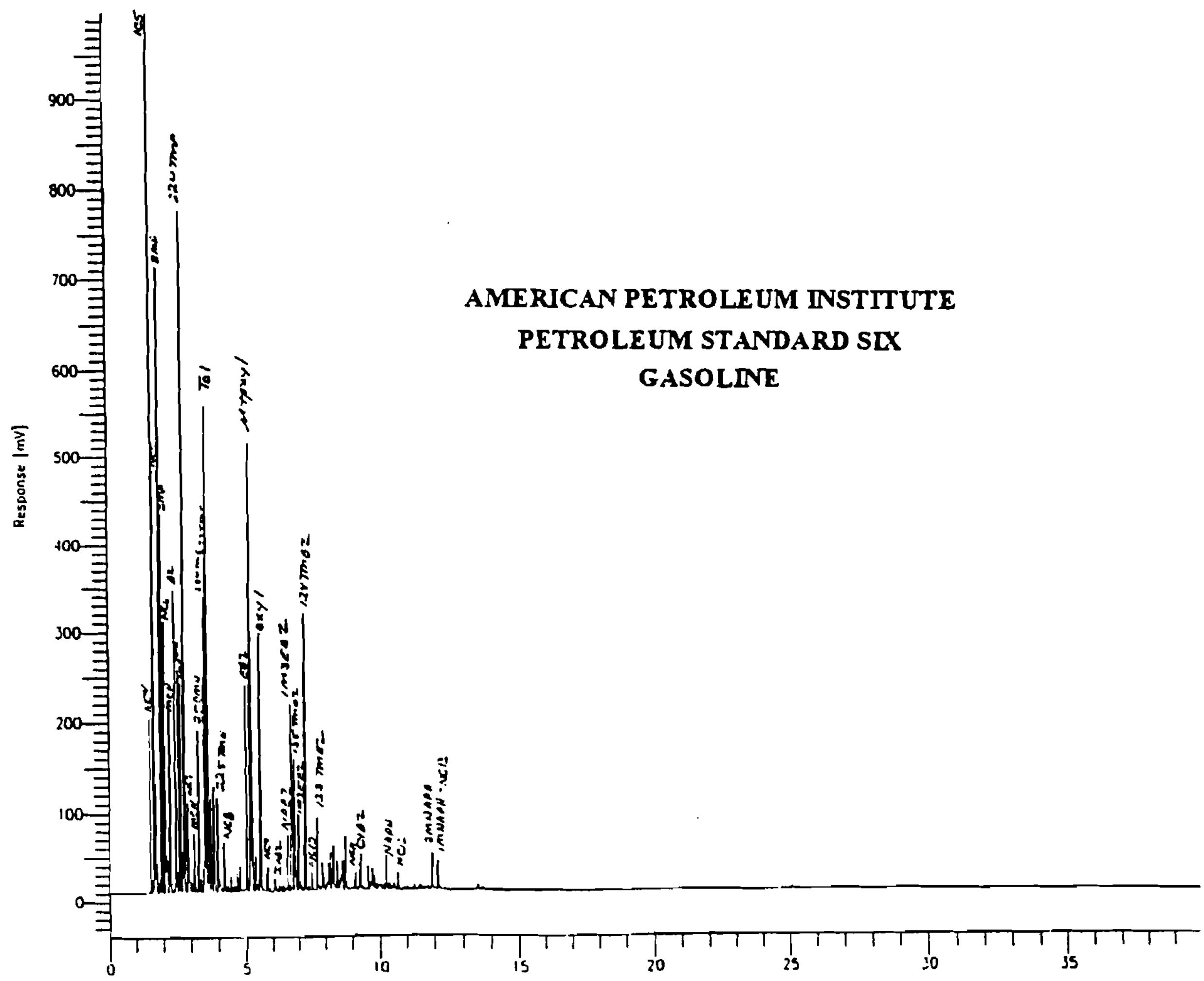
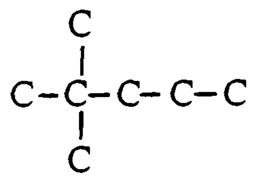


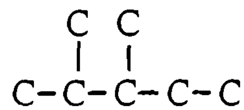
FIGURE 2: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 30 (25-27) SOIL SAMPLE AND API PS6 GASOLINE

FIGURE 3

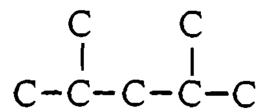
ALKYLATE HYDROCARBONS



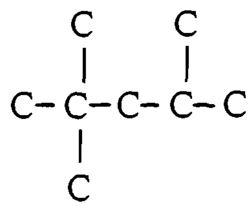
22DIMETHYLPENTANE
(22DMP)



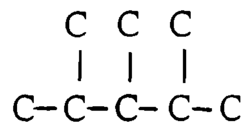
23DIMETHYLPENTANE
(23DMP)



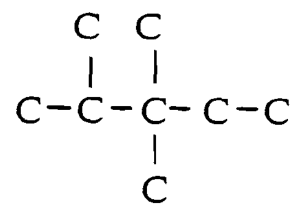
24DIMETHYLPENTANE
(24DMP)



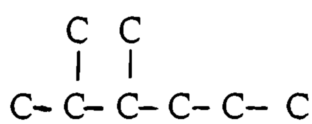
224TRIMETHYLPENTANE
(224TMP)



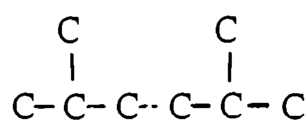
234TRIMETHYLPENTANE
(234TMP)



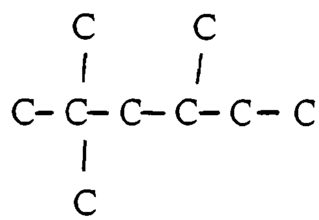
233TRIMETHYLPENTANE
(233TMP)



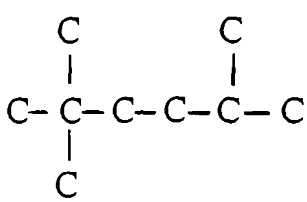
23DIMETHLYHEXANE
(23DMH)



25DIMETHYLHEXANE
(25DMH)



224TRIMETHYLHEXAN
(224TMH)



225TRIMETHYLHEXANE
(225TMH)

sample also indicate gasoline as the dominant parent product through the C9 aromatic range or approximately nine minutes elution time.

The gasoline derived portion of the MW 30 (25-27) sample signature also indicates the parent gasoline was an older formulation gasoline. The C8 aromatics (ethylbenzene and the xylenes) have comparable solubilities in water and comparable degradation rates (Yang et al, 1995). The proportions of the C8 aromatics compared to one another will reflect their proportions compared to one another in the parent product. The signature of the MW 30 (25-27) sample shows a predominance of ethylbenzene over both the meta-para xylene peak and the ortho-xylene peak. This is a characteristic restricted to gasolines produced prior to 1980. The proportions of the C9 aromatics compared to one another also will reflect their proportions compared to one another in the parent product. The proportions of the C9 aromatics compared to one another also are atypical of more recent gasolines, and also indicate a parent gasoline produced prior to 1980. The MW 30 (25-27) signature shows a high proportion of the normal propyl benzene (NPBZ) peak compared to the following C9 aromatic peaks (1M3EBZ, 135TMBZ, and 1M2EBZ).

The gasoline derived hydrocarbons also show proportions of low octane number hydrocarbons which are more indicative of an unleaded gasoline rather than a leaded gasoline. The low octane number hydrocarbons include the cycloparaffins, normal paraffins, and monobranched isoparaffins. Unleaded gasolines were required to be in use as of 1975. Combining this characteristic with the other age related gasoline characteristics, indicates the parent gasoline most probably was produced between 1975 and 1980.

The next higher carbon number group of petroleum derived products are referred to collectively as the middle distillates. Kerosenes, diesels, and fuel oils are the most common middle distillate products. Standard (#2) grade fuel oil and diesel are similar products. Figure 4 provides a comparison of the chromatographic signatures of a kerosene product sample and a diesel/fuel oil product sample. The normal paraffins are the most prominent individual hydrocarbon type in middle distillate products. The normal paraffins are straight chain molecules in which all the carbon atoms are attached to one another in an end to end manner. The structure of normal hexane in Figure 1 is an example of a normal paraffin. The normal paraffins are annotated on the chromatograms with a NC designation followed by the number of carbon atoms in the molecule. The overall carbon number range and normal paraffin distribution of diesels and fuel oils extends to higher carbon numbers than in kerosenes.

Diesels and fuel oils also can be differentiated from kerosene products on the basis of their isoprenoid proportions. The isoprenoids are the second most prominent individual hydrocarbon type in middle distillate products. The isoprenoids are a unique type of branched chain or isoparaffin in which a side methyl (CH3) group is attached to every fourth carbon atom of the main carbon chain. The structure of methylpentane in

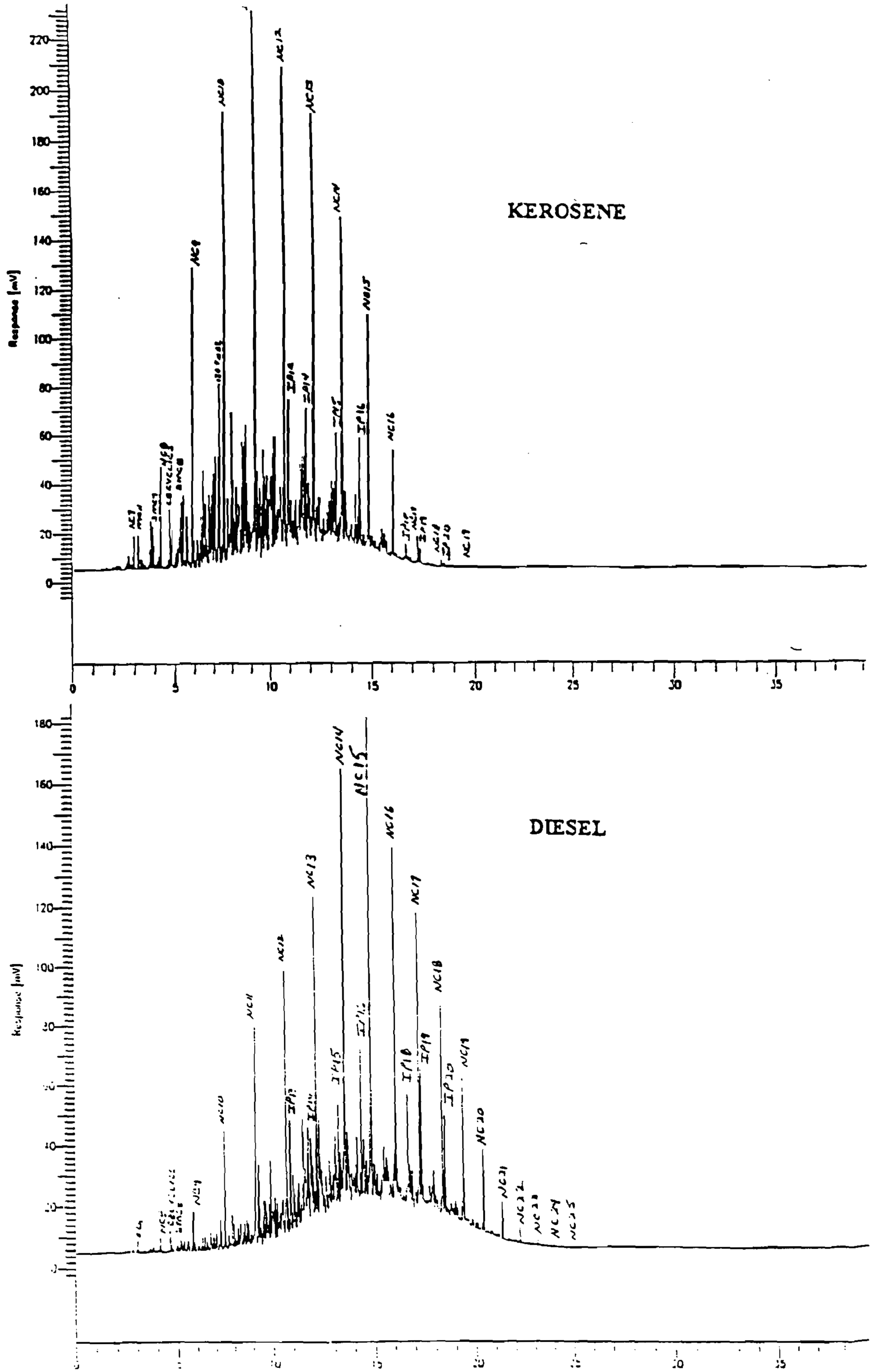


FIGURE 4: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF A KEROSENE SAMPLE AND A DIESEL PRODUCT SAMPLE

Figure 1 is an example of an isoparaffin with a single, side, methyl group. The isoprenoids are annotated on the chromatograms with an IP designation followed by the number of carbon atoms in the molecule. In kerosenes, the lower carbon number isoprenoids (IP13, IP14, IP15, and IP16) significantly exceed the higher carbon number isoprenoids (IP18, IP19, and IP20). In diesels and fuel oils, the higher carbon number isoprenoids are present at more comparable proportions to the lower carbon number isoprenoids, and in some instances may exceed the lower carbon number isoprenoids.

With increasing exposure time, the normal paraffin peaks are preferentially reduced compared to the isoprenoid peaks and ultimately lost as a result of biodegradation. Figure 5 illustrates the effects of biodegradation on a kerosene product sample. In Figure 5, the chromatogram of a kerosene sample is shown. The same signature is then shown artificially biodegraded by whiting out the normal paraffin peaks. Figure 6 provides a similar comparison for a diesel/fuel oil product sample signature. As the vertically prominent normal paraffin peaks are lost, the underlying baseline rise or hump becomes an increasingly prominent feature of the chromatographic signature. The baseline rise or hump represents a complex mixture of individual hydrocarbons which are not present in sufficient individual abundance to elute as discrete peaks. Biodegraded diesels and fuel oils can be distinguished from biodegraded kerosene products on the basis of the carbon number limits of the baseline rise or hump and the proportions of the isoprenoids.

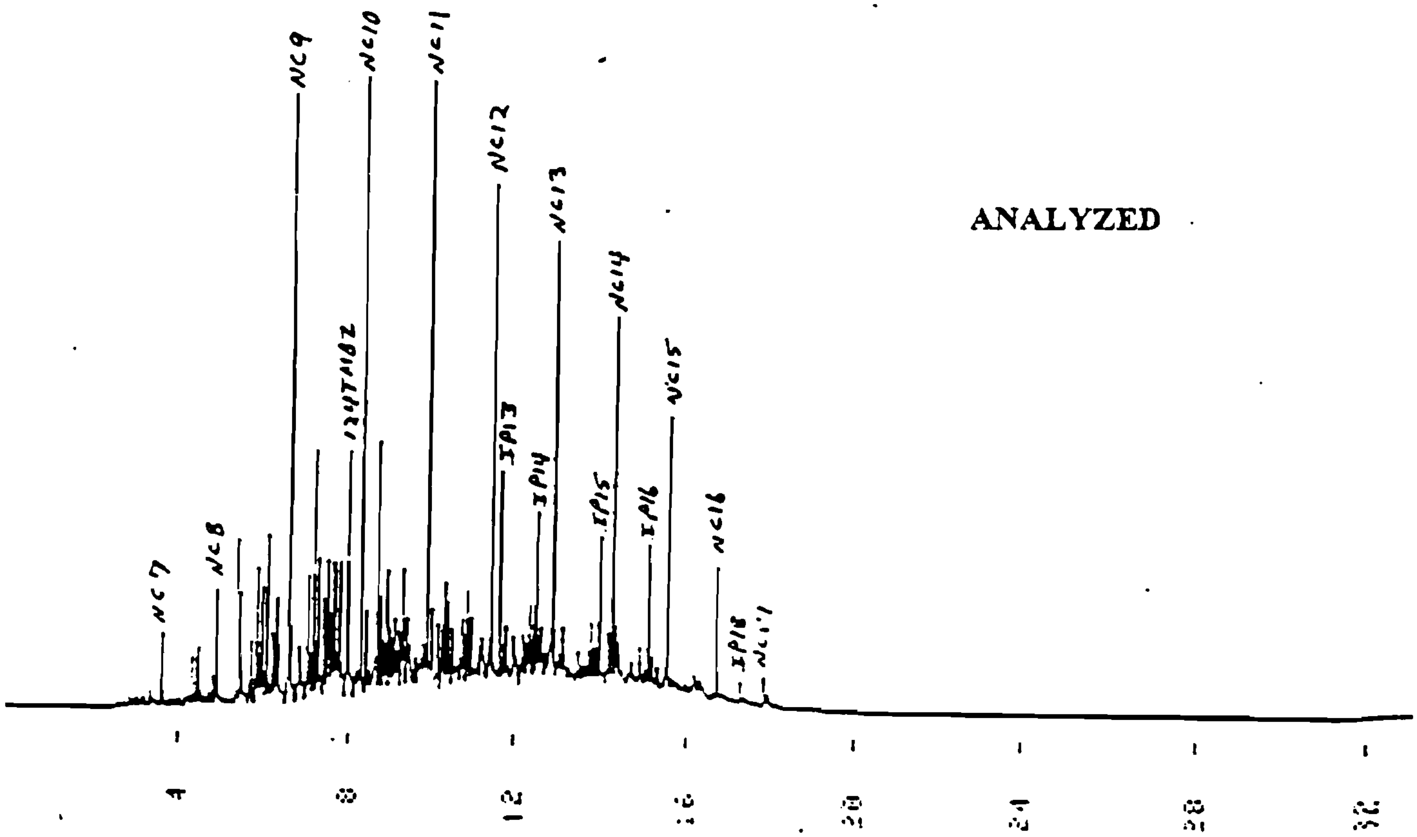
Figure 7 compares the chromatographic signature of the MW 30 (25-27) soil sample with the signature of a kerosene product sample. Figure 8 provides a similar comparison with a diesel/fuel oil product sample. The baseline rise limits, isoprenoid proportions, and overall carbon number range are consistent with a diesel/fuel oil product and not a kerosene product.

The low proportions of normal paraffin peaks and prominence of isoprenoid peaks indicates the diesel/fuel oil associated with the MW 30 (25-27) sample is severely biodegraded. Figure 9 compares the chromatographic signature of the MW 30 (25-27) sample to a biodegraded diesel/fuel oil signature.

Christensen and Larsen (1993) correlated the level of biodegradation with exposure times for samples analyzed from sites with known loss dates. The ratio of NC17/IP19 (pristane) was used as a measure of the level of biodegradation. The NC17/IP19 ratio for the MW 30 (25-27) sample is 0.1. Based on the criteria of Christensen and Larsen, an exposure time of 16 to 20 years is indicated.

15% of the MW30 (25-27) sample signature is represented by the hydrocarbons eluting up to NC10, which are dominantly gasoline derived. The C10 to C13 range consists of both gasoline derived and diesel/fuel oil derived hydrocarbons. An additional 5 to 10% of the total hydrocarbons are estimated to also be gasoline derived. On this basis, the hydrocarbon

ANALYZED



ARTIFICIALLY DEGRADED (NORMALS WHITED OUT)

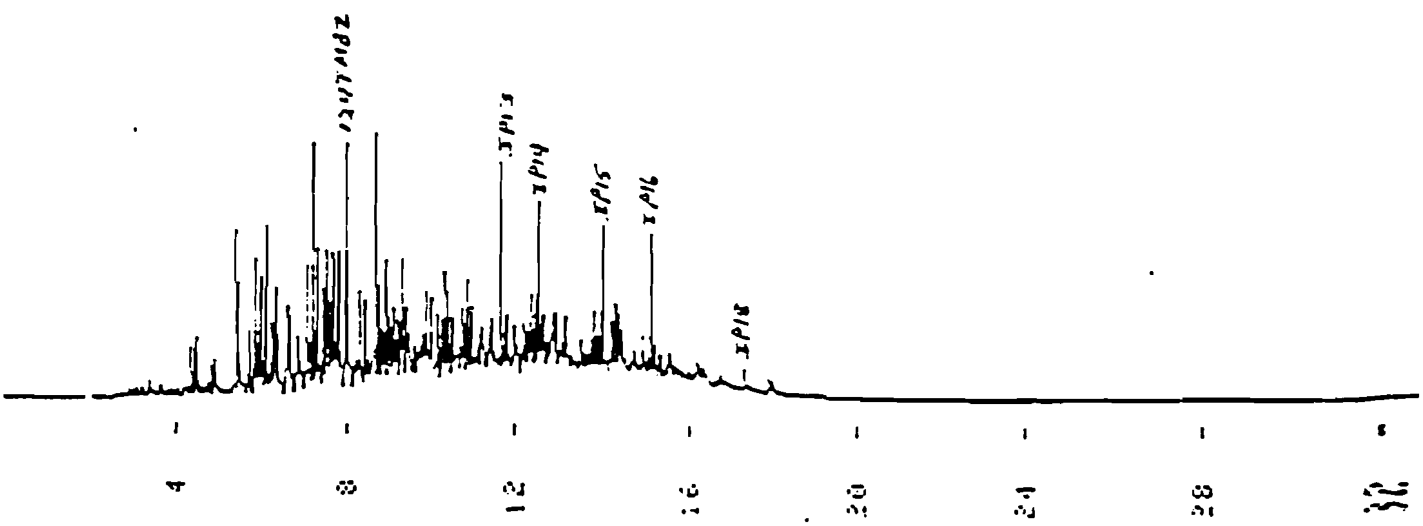


FIGURE 5: CHROMATOGRAPHIC SIGNATURE OF A KEROSENE PRODUCT AS ANALYZED AND ARTIFICIALLY DEGRADED (NORMALS WHITED OUT)

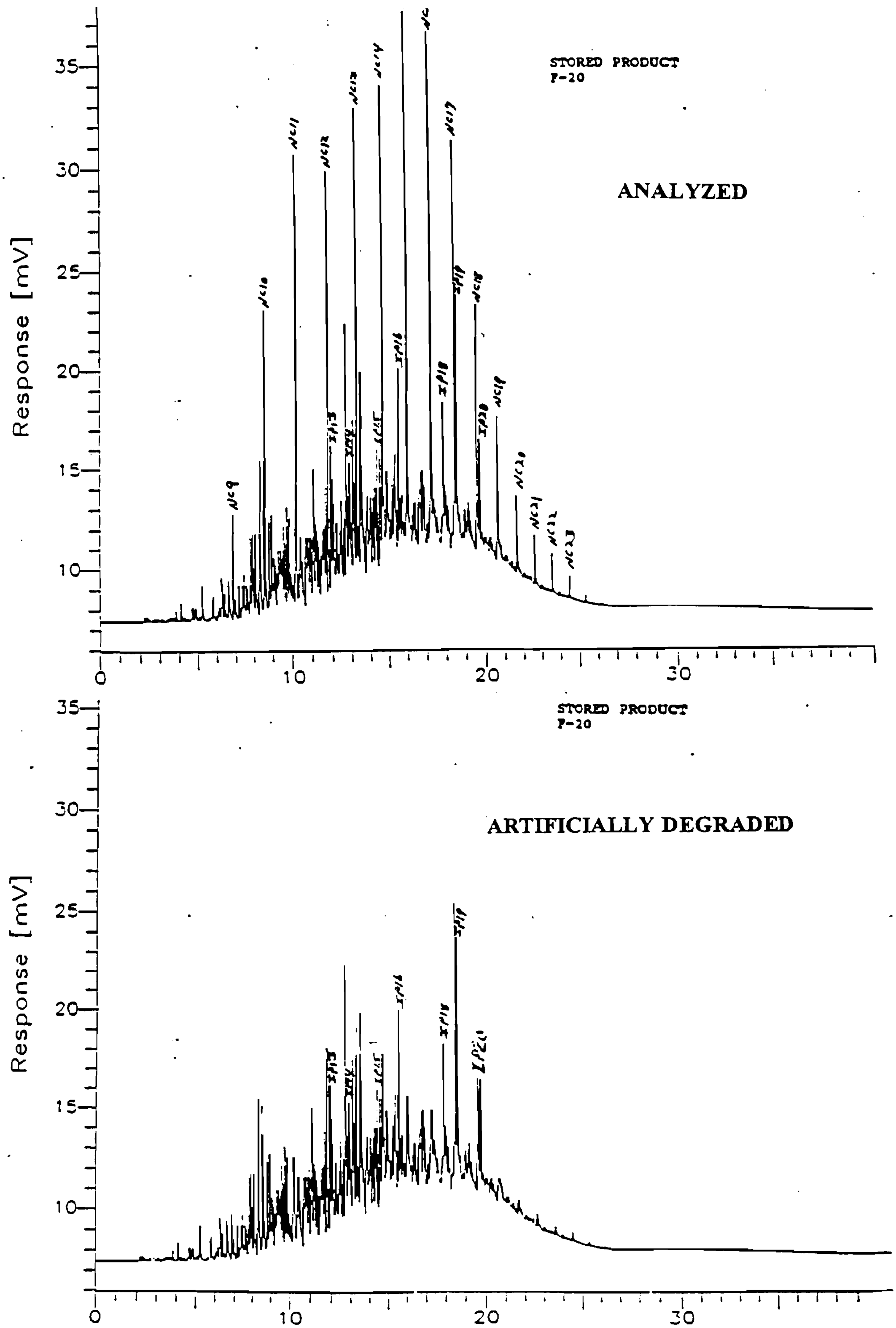
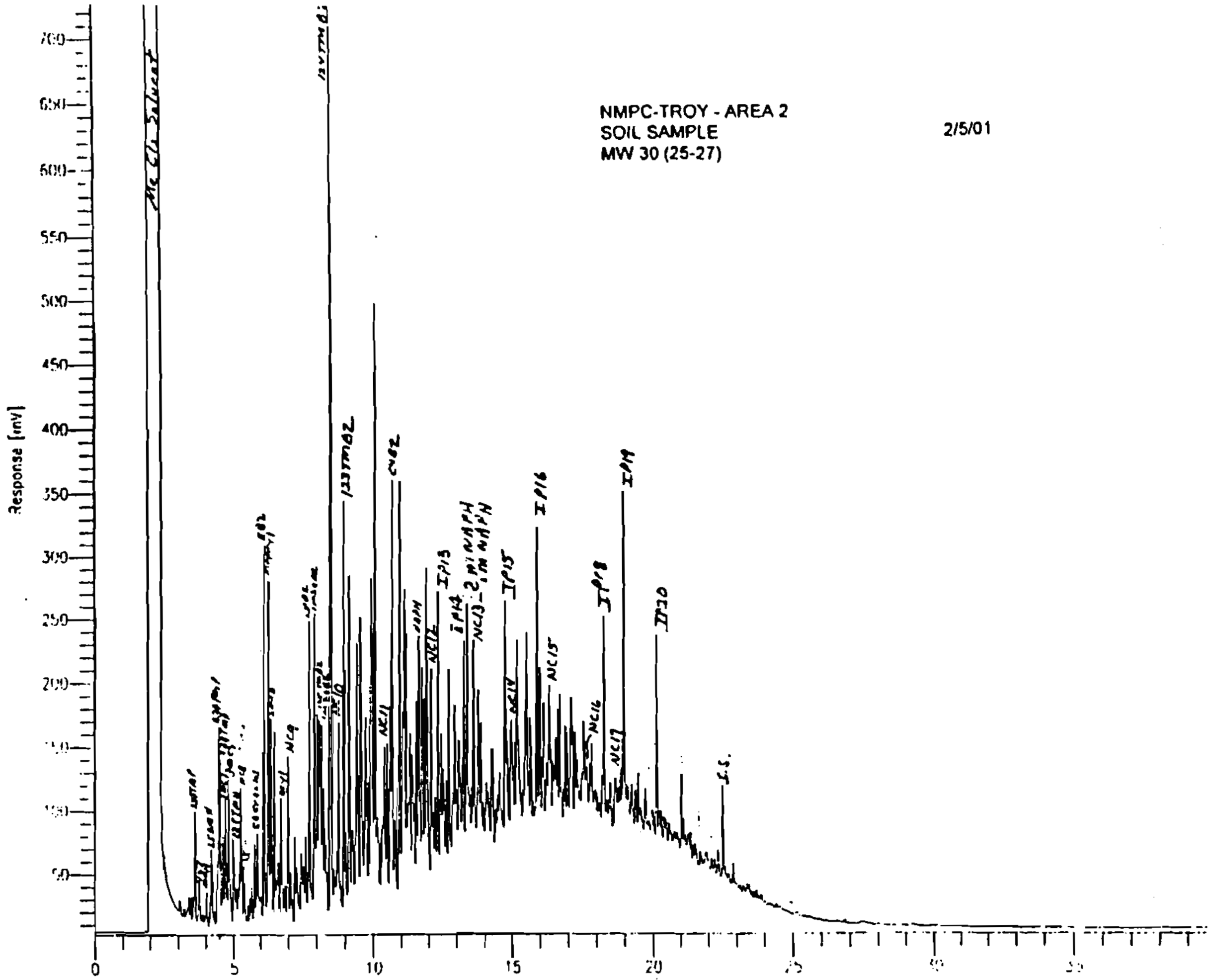


FIGURE 6: CHROMATOGRAPHIC SIGNATURE OF A DIESEL PRODUCT AS ANALYZED AND ARTIFICIALLY DEGRADED (NORMALS WHITED OUT)



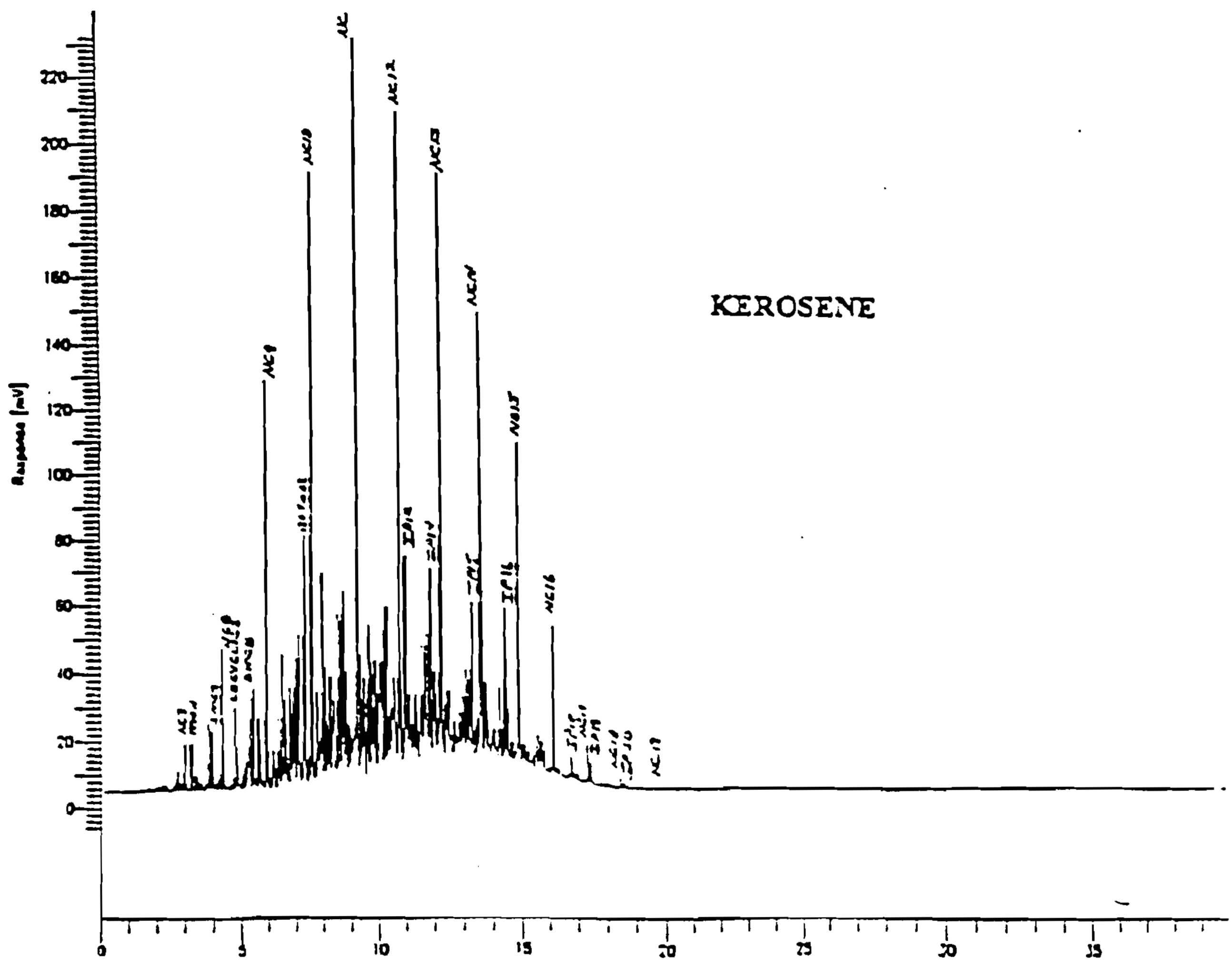
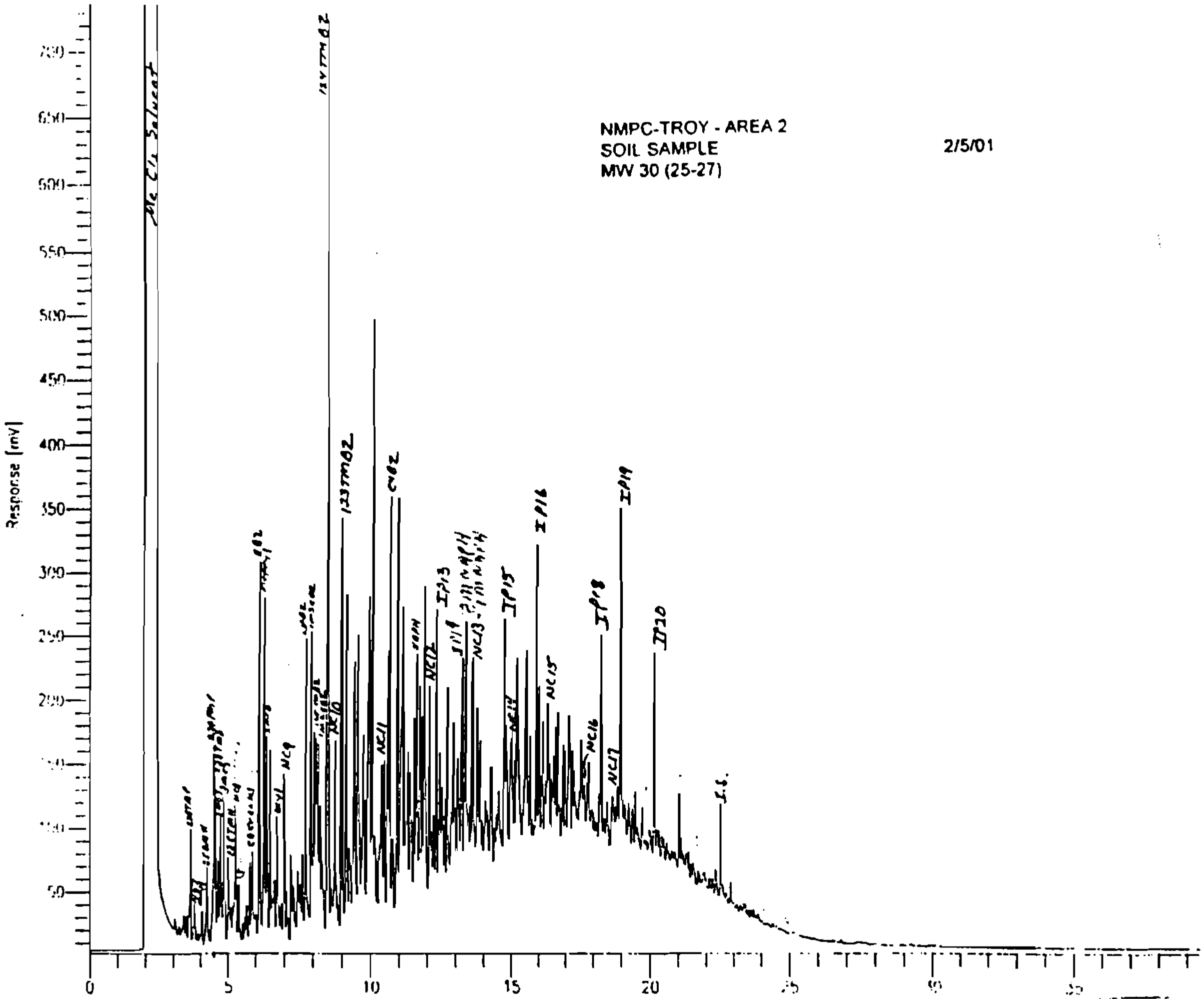


FIGURE 7: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 30 (25-



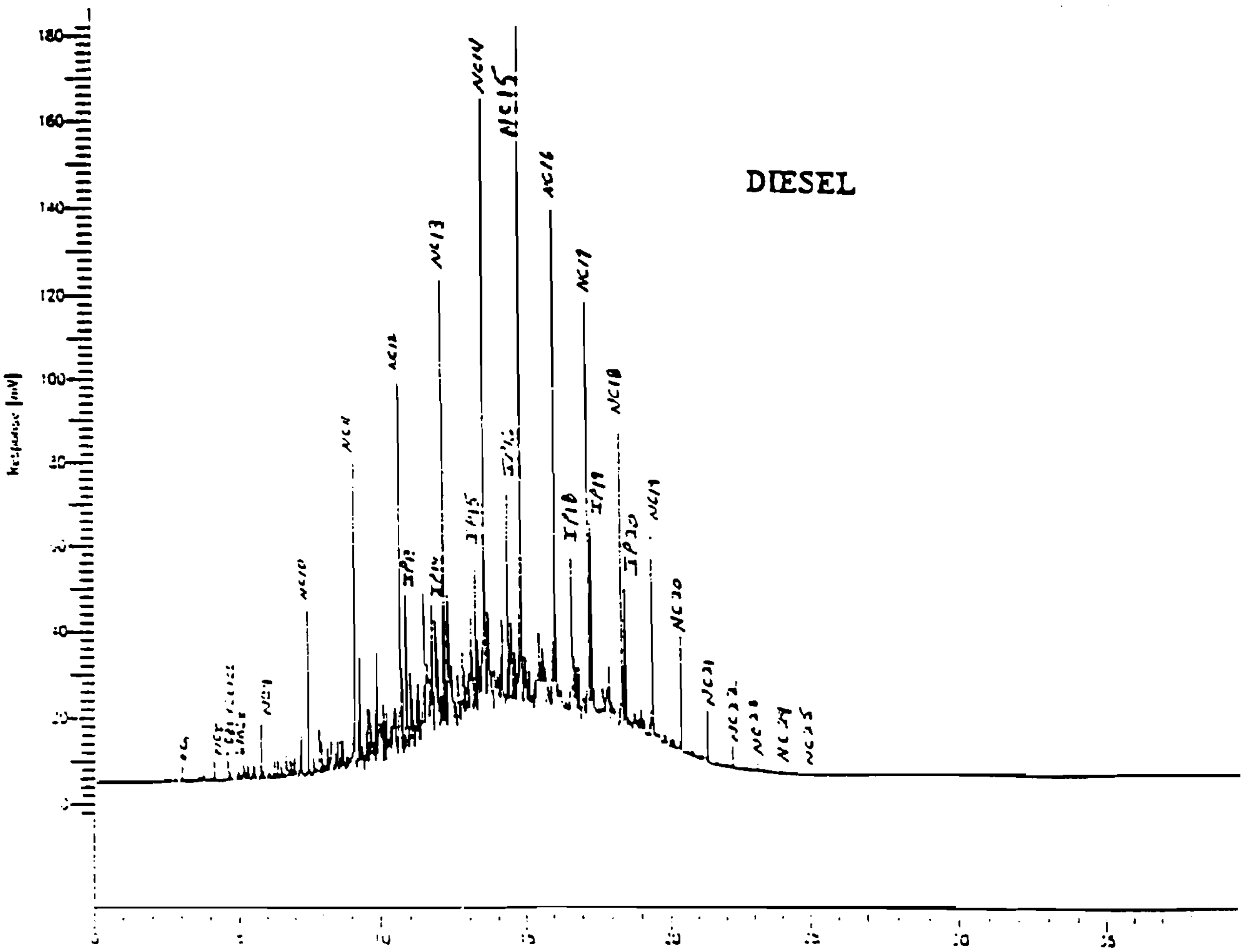
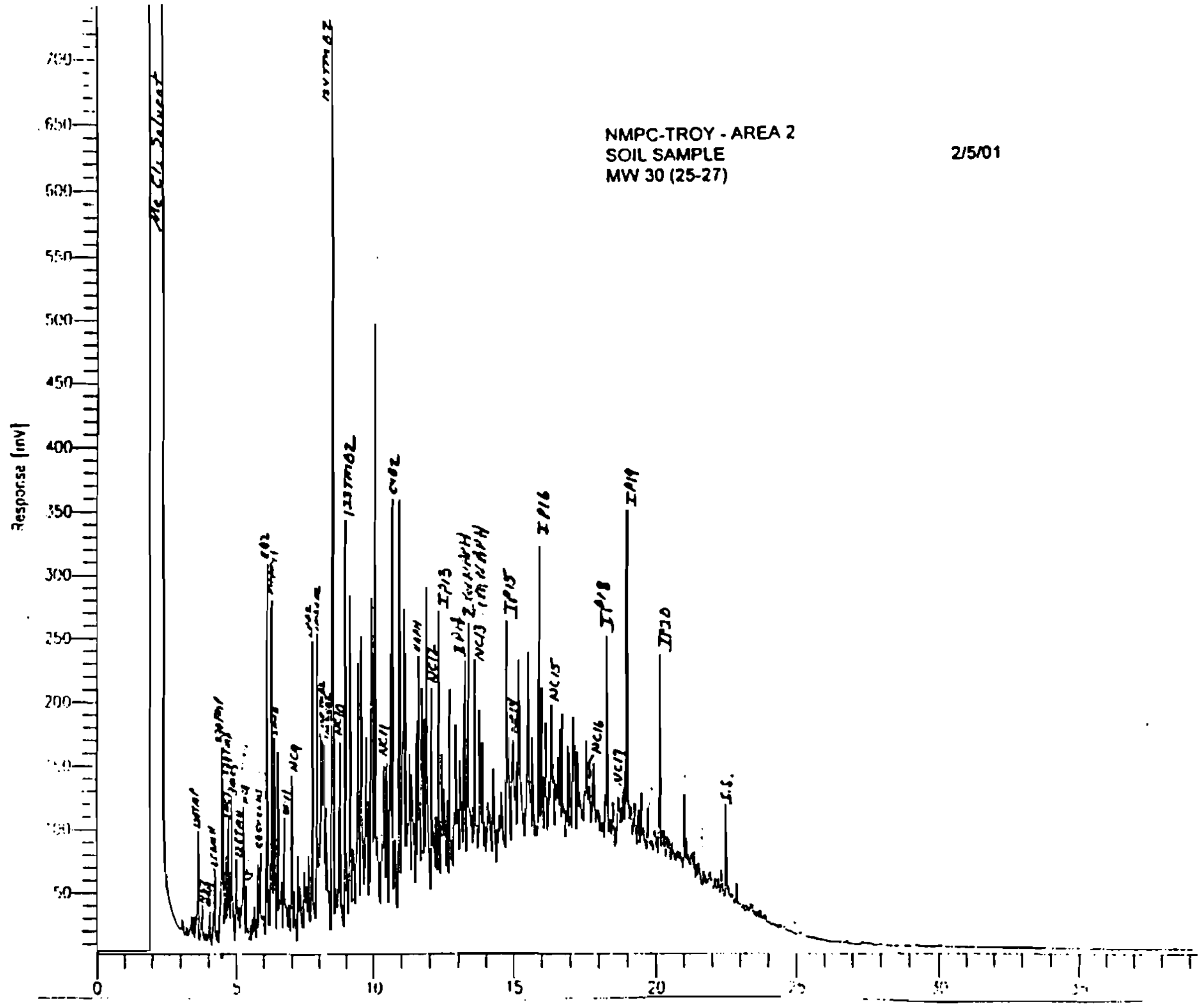


FIGURE 8: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW-30 (25-



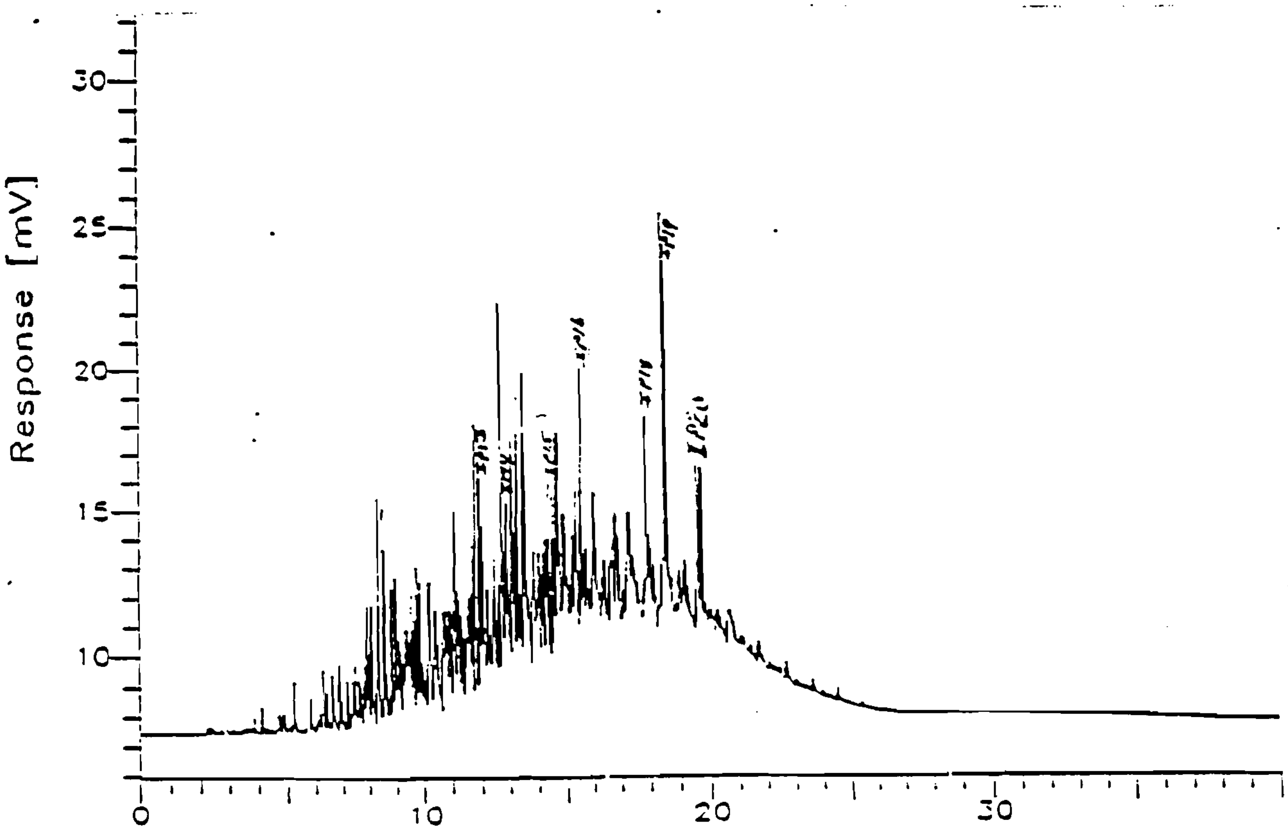


FIGURE 9: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 30 (25-27) SOIL SAMPLE AND A BIODEGRADED DIESEL/FUEL OIL PRODUCT SAMPLE

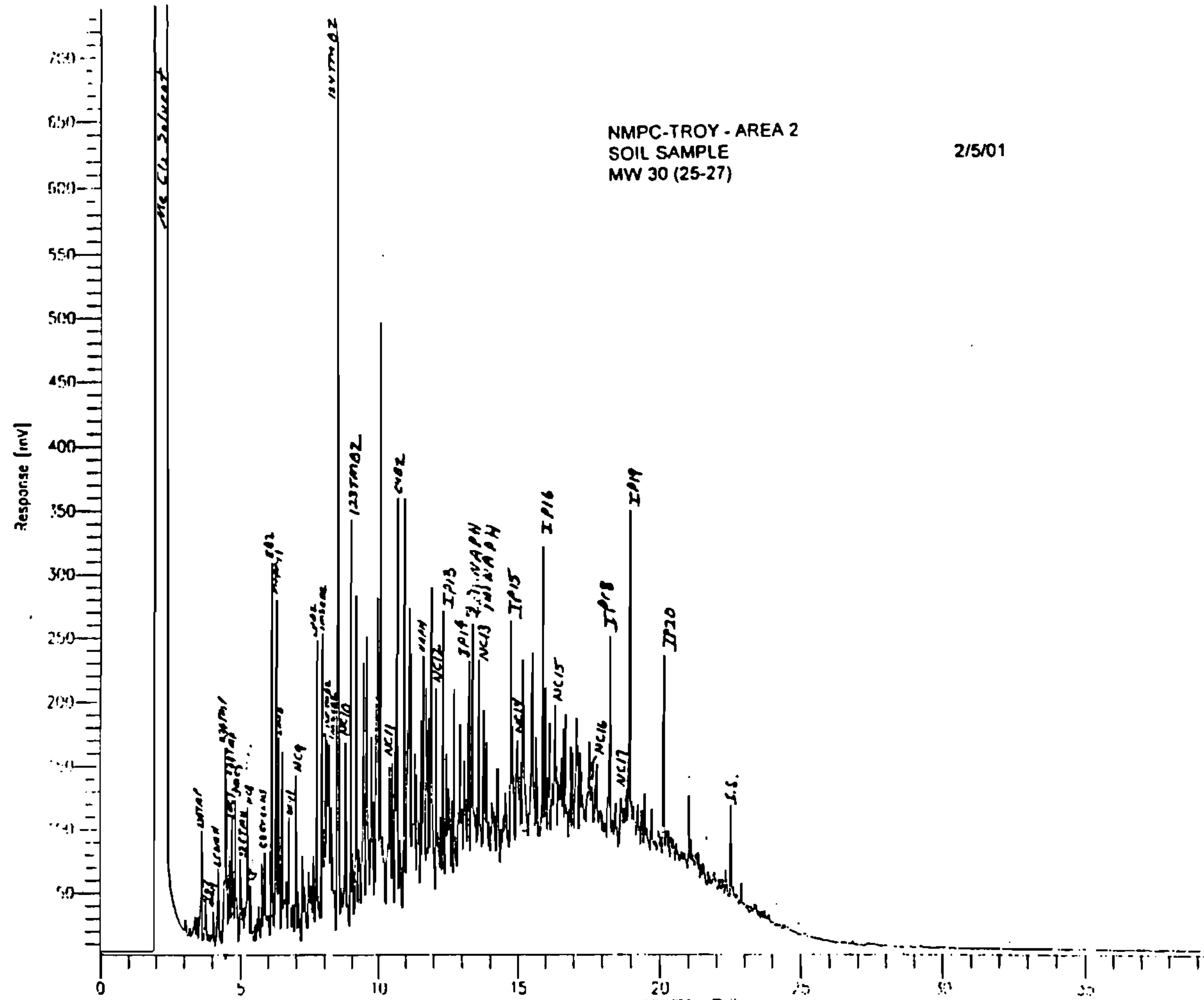
assemblage present in the MW30 (25-27) sample represents 20 to 25% gasoline and 75 to 80% diesel or fuel oil. The gasoline portion of the sample shows compositional characteristics which would restrict the age of the parent gasoline to a gasoline produced prior to 1980, and most probably represents an unleaded gasoline produced between 1975 and 1980. The diesel/fuel oil is significantly biodegraded, with a most probable exposure time of 16 to 20 years.

Figure 10 compares the chromatographic signatures of the MW 30 (25-27) and MW 31 (23-25) soil samples. The MW 31 (23-25) soil sample signature also represents a mixture of gasoline derived and diesel/fuel oil derived hydrocarbons. The gasoline associated with the MW 31 (23-25) sample is more volatilized than the gasoline associated with the MW 30 (27-27) sample. The C8 hydrocarbons have been nearly completely lost in the MW 31 sample, and the proportions of the C9 aromatics to one another are affected by volatilization losses. Within the geographic limitations of a single site, it is likely the more weathered gasoline associated with the MW 31 (23-25) sample has had at least as long an exposure time as the gasoline associated with the MW 30 (25-27) sample. On this basis, the parent gasoline associated with the MW 30 (25-27) sample was produced prior to 1980 as well.

The diesel/fuel oil associated with the MW 31 (23-25) sample also is significantly biodegraded. The NC17/IP19 ratio for the MW 31 (23-25) sample is 0.0, with an indicated most probable exposure time of twenty years or more.

12% of the MW 31 (23-25) signature is represented by hydrocarbons eluting up to NC10, which are dominantly gasoline derived. The C10-C13 range consists of hydrocarbons which are both gasoline derived and diesel/fuel oil derived. An additional five to ten percent of the total hydrocarbons are estimated to be gasoline derived. On this basis approximately 20% of the hydrocarbons associated with the MW 31 (23-25) sample are gasoline derived, and 80% are diesel/fuel oil derived. The gasoline associated with the MW 31 (23-25) sample is considerably more severely volatilized than the gasoline associated with the MW 30 (25-27) sample. On this basis, a pre-1980 gasoline is also indicated for the MW 31 (23-25) sample. The diesel/fuel oil is significantly biodegraded, with a most probably exposure time of twenty years or more.

The signature characteristics of coal tar differ considerably from those of the MW 30 (25-27) and MW 31 (23-25) samples. Figures 11 and 12 compare the chromatographic signatures of these soil samples to the signatures of a coal tar. Coal tar signatures are dominated by prominent polynuclear aromatic peaks extending from naphthalene through benzo(g,h,I) perylene. This peak sequence is not evident in either the MW 30 (25027) or the MW 31 (23-25) samples. Coal tar signatures also do not display a prominent baseline rise or hump, which are evident in the MW 30 (25-27) and MW 31 (23-25) sample signatures.



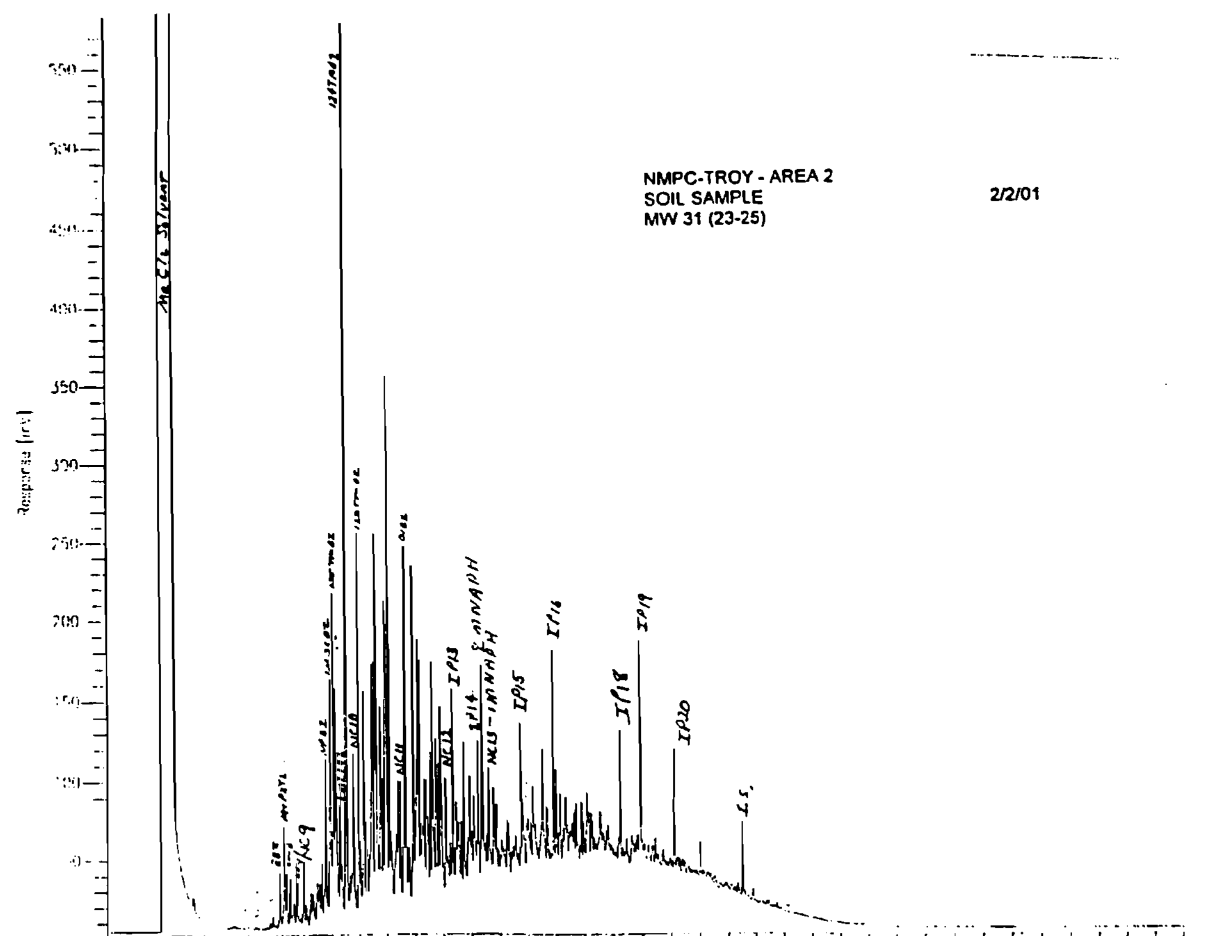


FIGURE 10: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 30 (25-27) AND MW 31 (23-25) SOIL SAMPLES

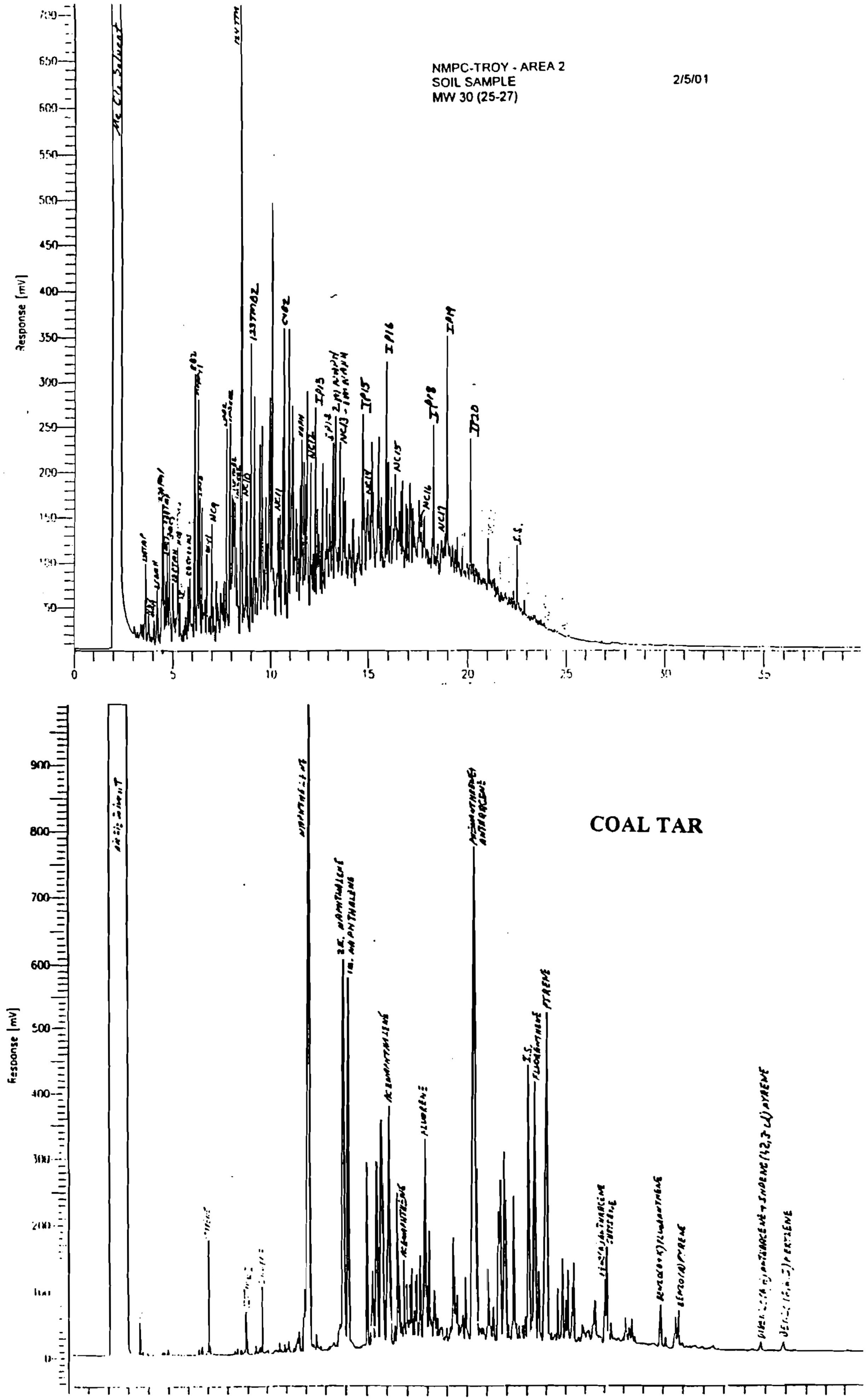


FIGURE 11: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 30 (25-27) SOIL SAMPLE AND A COAL TAR

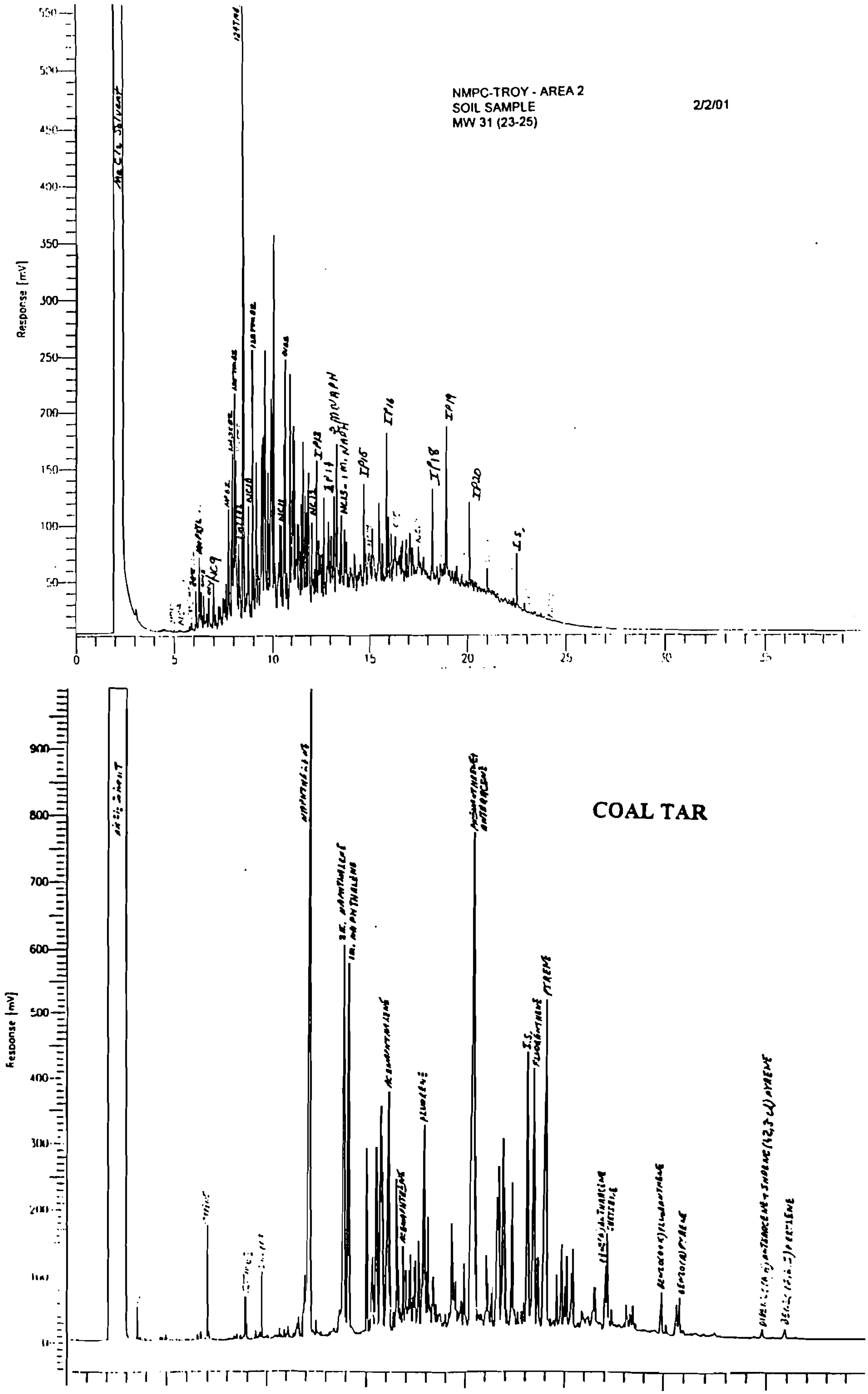


FIGURE 12: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 31 (23-25) SOIL SAMPLE AND A COAL TAR

Figure 13 compares the chromatographic signatures of the SB-40 (23-25) and the MW 31 (23-25) soil samples. The SB-40 (23-25) sample signature does not show a gasoline contribution to the hydrocarbons extracted from this soil sample. This is illustrated in Figure 14, which compares the signature of the SB-40 (23-25) sample with the signature of API PS6 gasoline. The baseline rise of the SB-40 (23-25) sample also extends to higher carbon atoms than the MW 31(23-25) sample. The baseline rise of the SB-40 (23-25) sample is more extensive than would be associated with a standard (#2) grade fuel oil or diesel. Figure 15 compares the chromatographic signature of the SB-40 soil sample with a biodegraded diesel/fuel oil signature.

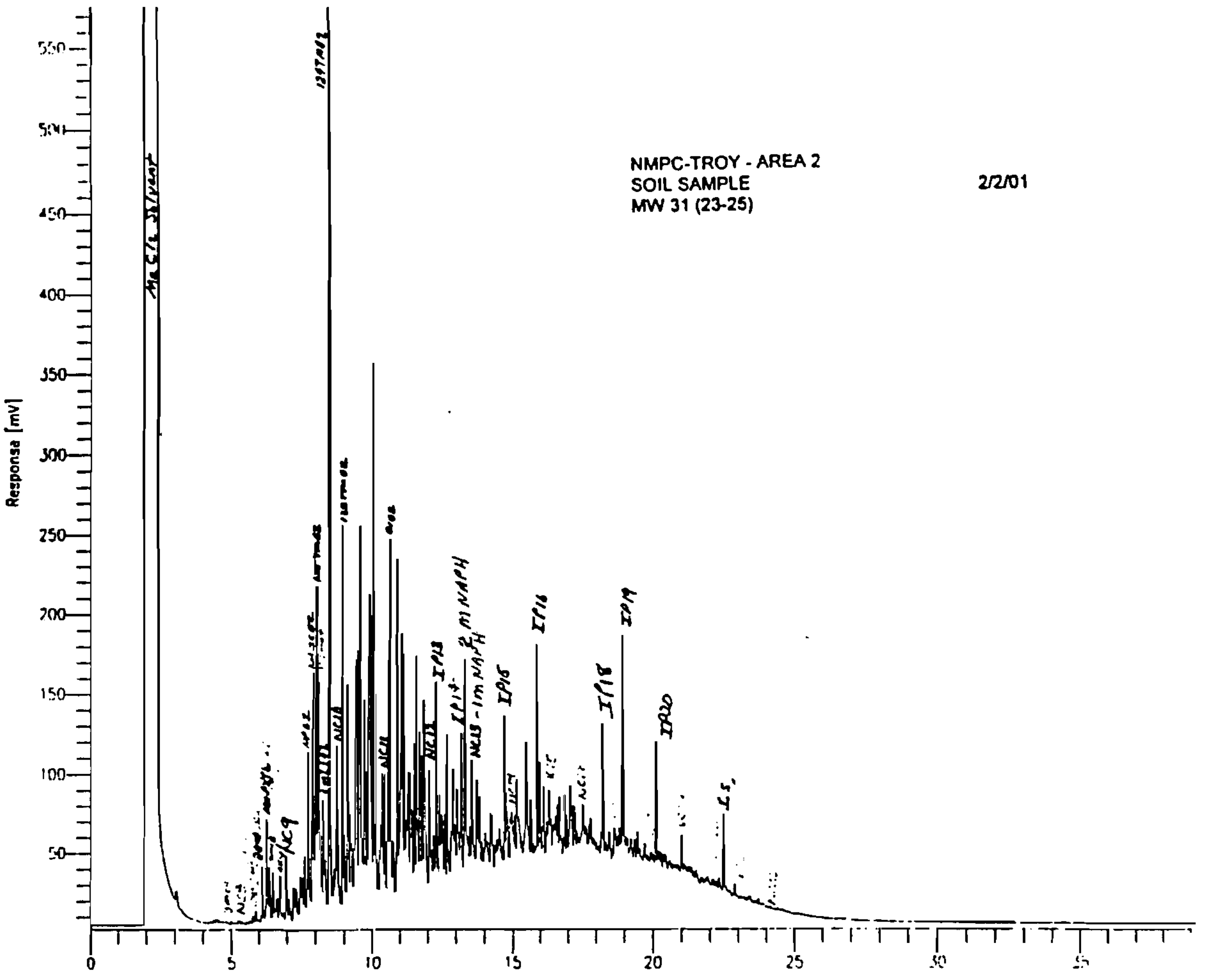
The baseline rise characteristics of the SB-40 (23-25) sample are consistent with a residual grade or #6 fuel oil. Figure 16 compares the chromatographic signature of the SB-40 (23-25) sample with the signature of a residual grade fuel oil. The absence of normal paraffin peaks indicates the residual fuel oil associated with the SB-40 (23-25) sample is severely biodegraded. However, the absence of isoprenoid peaks as well indicates the level of biodegradation is even more severe.

Kennicutt (1988) in studies of crude oil biodegradation found the isoprenoids to be relatively unaffected by biodegradation until the normal paraffins had been lost. It took approximately double the amount of time after the normal paraffins had been lost for the isoprenoids to be significantly lost. On the basis that the SB-40 (23-25) sample signature shows neither a prominent sequence of normal paraffin peaks nor a prominent sequence of isoprenoid peaks, an exposure time of at least fifty to sixty years is most probable for the residual fuel oil product associated with the SB-40 (23-25) soil sample.

The SB-40 (23-25) sample signature shows several peaks which elute at the positions of certain polynuclear aromatic hydrocarbons (PAH's). However, a full suite of PAH peaks are not present, and the proportions are not consistent with the PAH peaks present in the coal tar impacted samples. This is illustrated in Figure 17, which compares the chromatographic signature of the SB-40 (23-25) sample with a coal tar signature. For example, the phenanthrene peak would be expected to be present at considerably higher proportions than the acenaphthalene peak, but is absent. Both the atypical proportions and absence of the majority of the PAH peaks eluting after acenaphthalene indicate these peaks more likely are associated with the residual grade fuel oil than with coal tar.

The signature characteristics of the SB-40 (23-25) soil sample are consistent with a residual grade fuel oil. The fuel oil is very severely biodegraded; both the normal paraffins and isoprenoids have been lost. An exposure time of at least fifty years is indicated for the fuel oil.

The PZ-1 (27-29) sample signature indicates the hydrocarbon assemblage present in this sample represents a mixture of diesel/fuel oil and coal tar. The diesel/fuel oil contribution predominates. Figure 18 compares the chromatographic signature of the PZ-1 (27-29) sample signature with



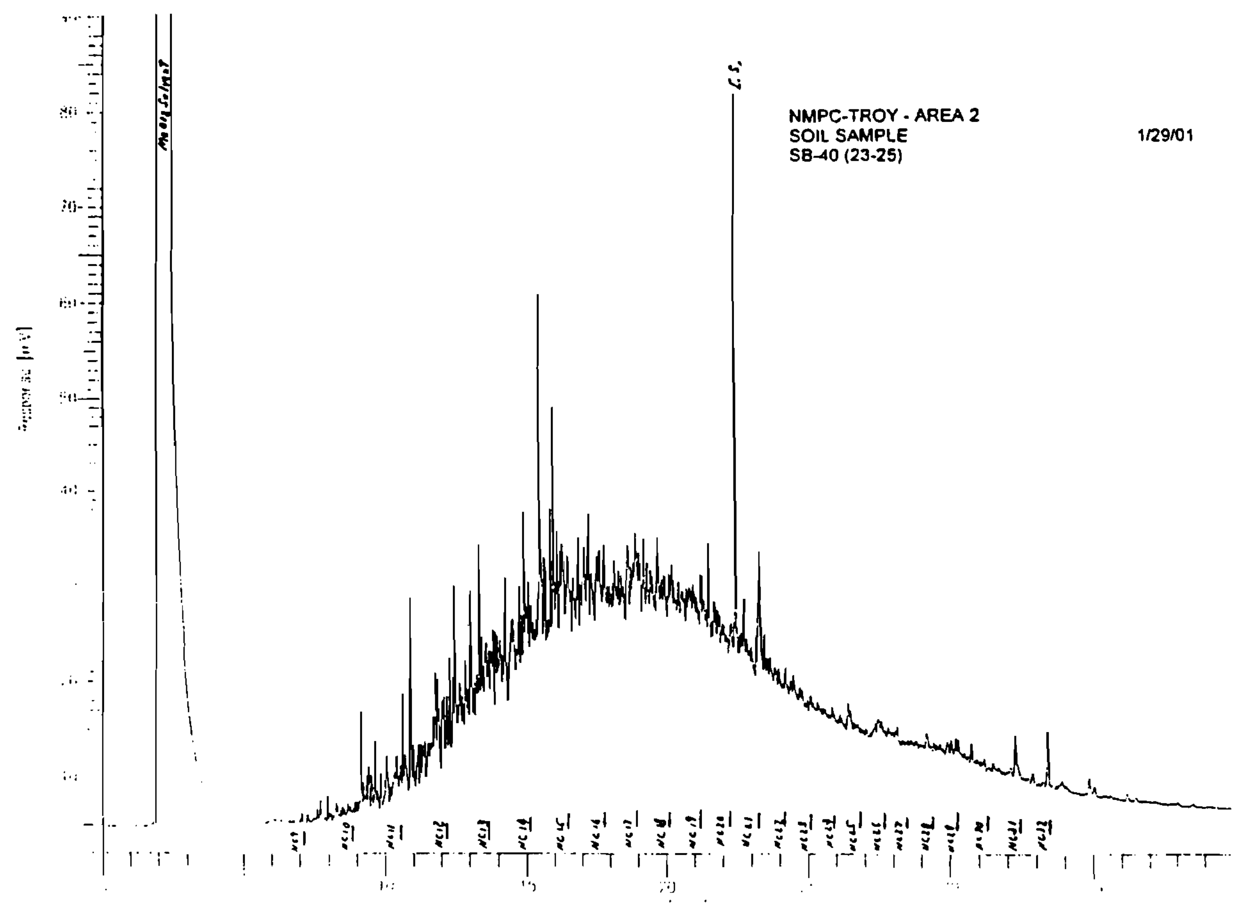
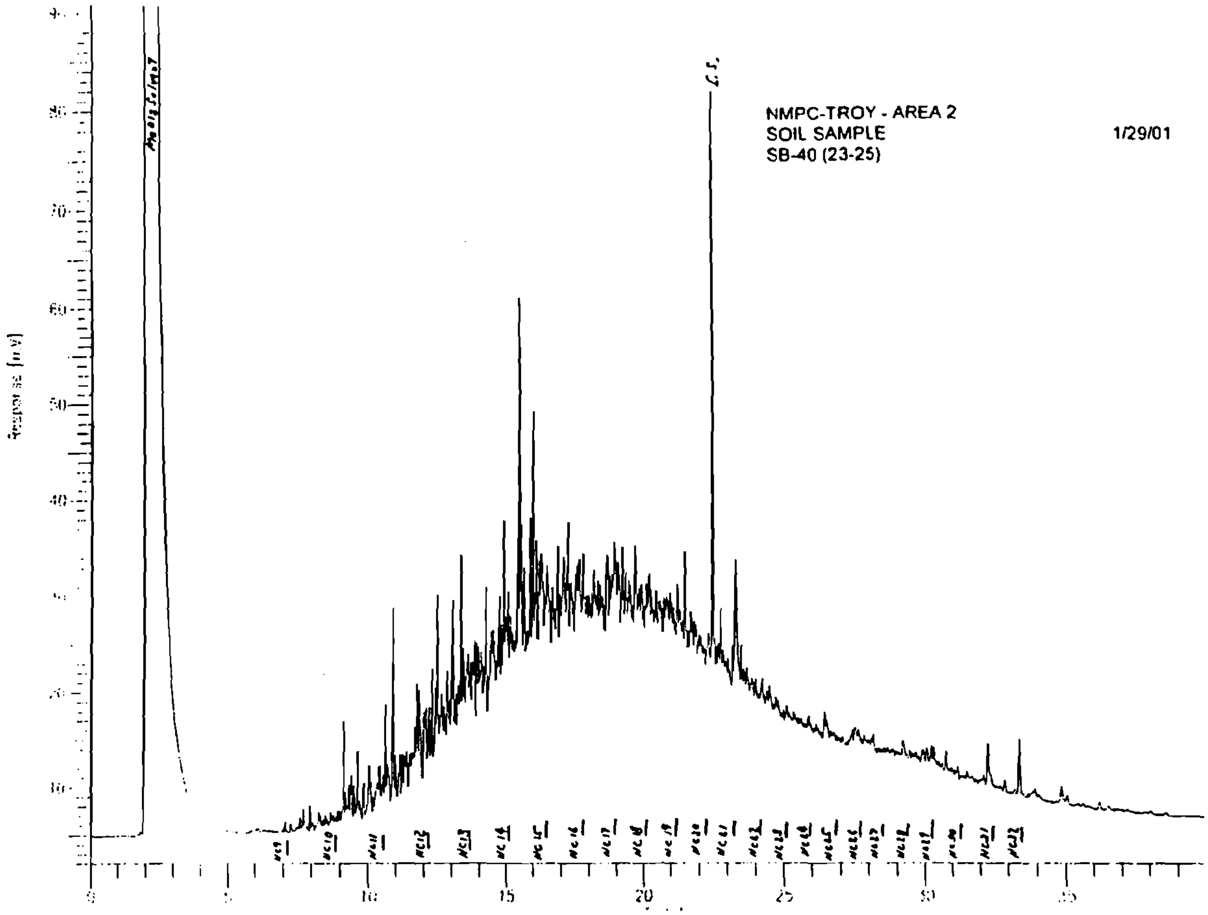


FIGURE 13: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 31 (23-25) AND SB-40 (23-25) SOIL SAMPLES



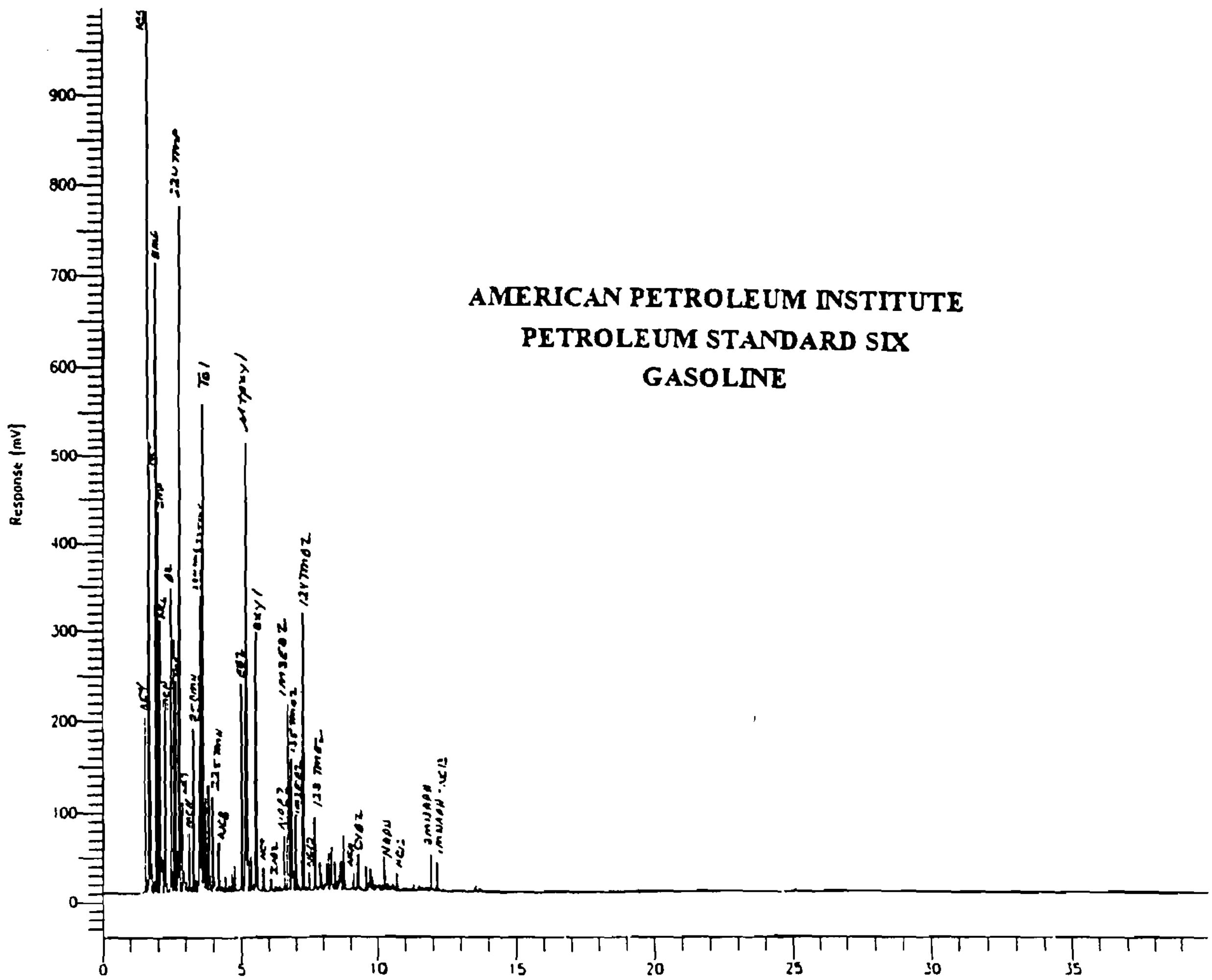
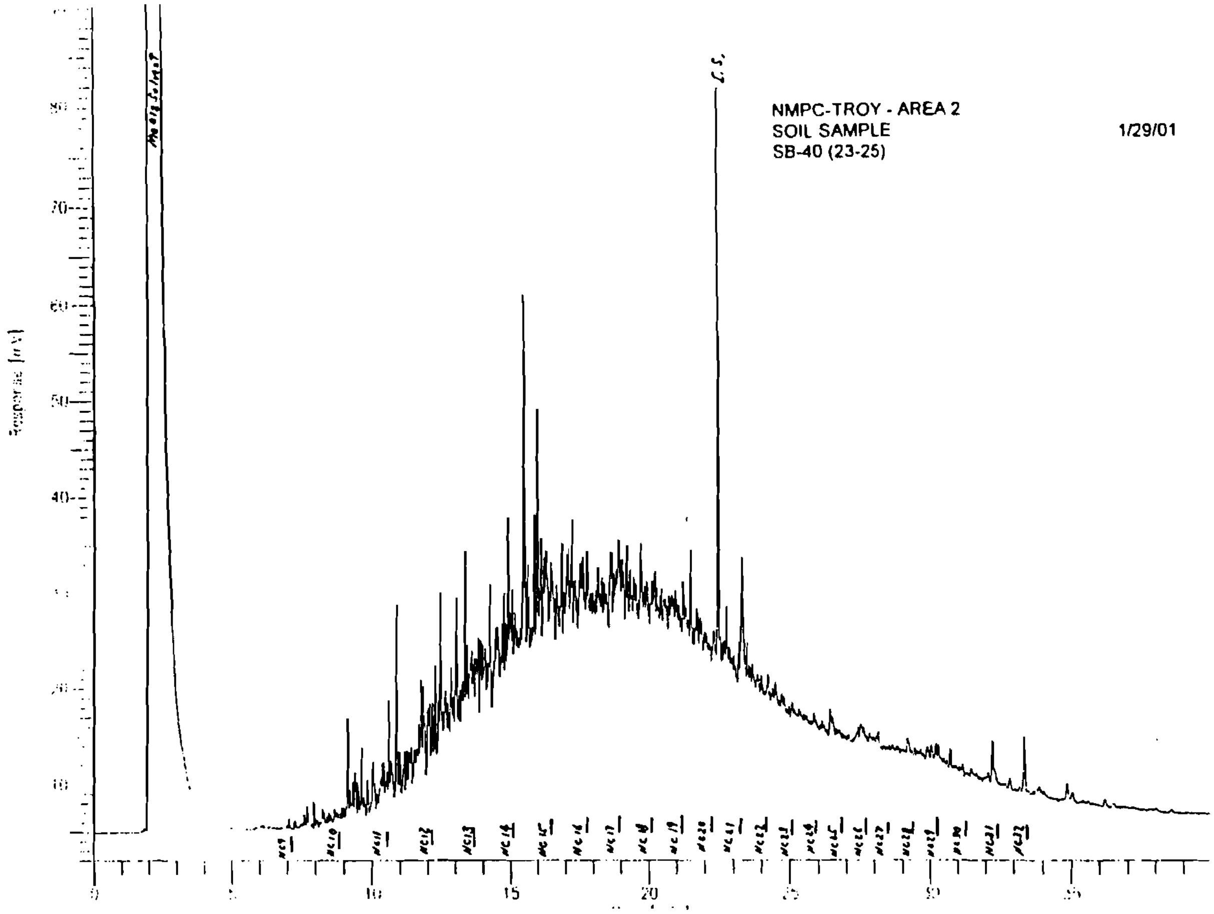


FIGURE 14: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE SB-40 (23-25) SOIL SAMPLE AND API PS6 GASOLINE



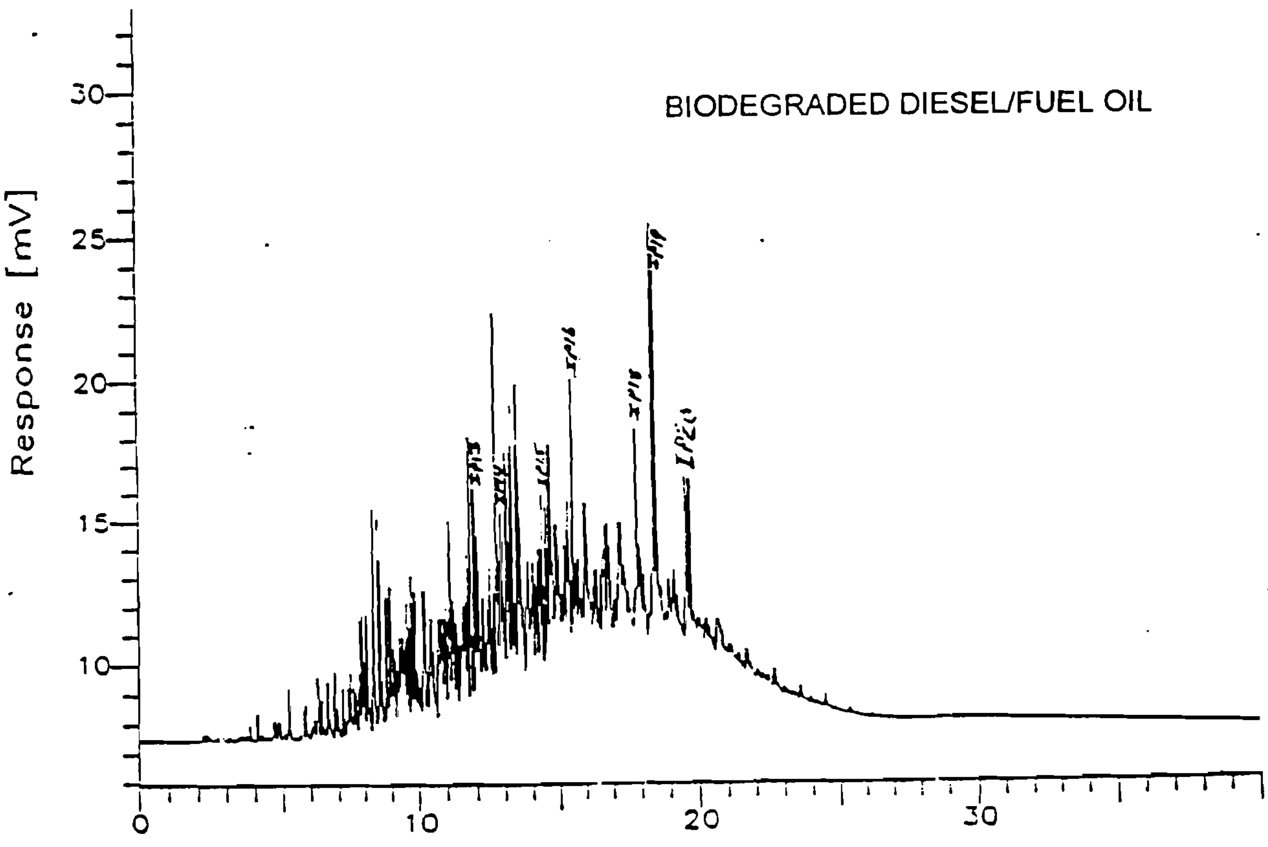


FIGURE 15: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE SB-40 (23-25) SOIL SAMPLE AND A BIODEGRADED DIESEL/FUEL OIL SIGNATURE

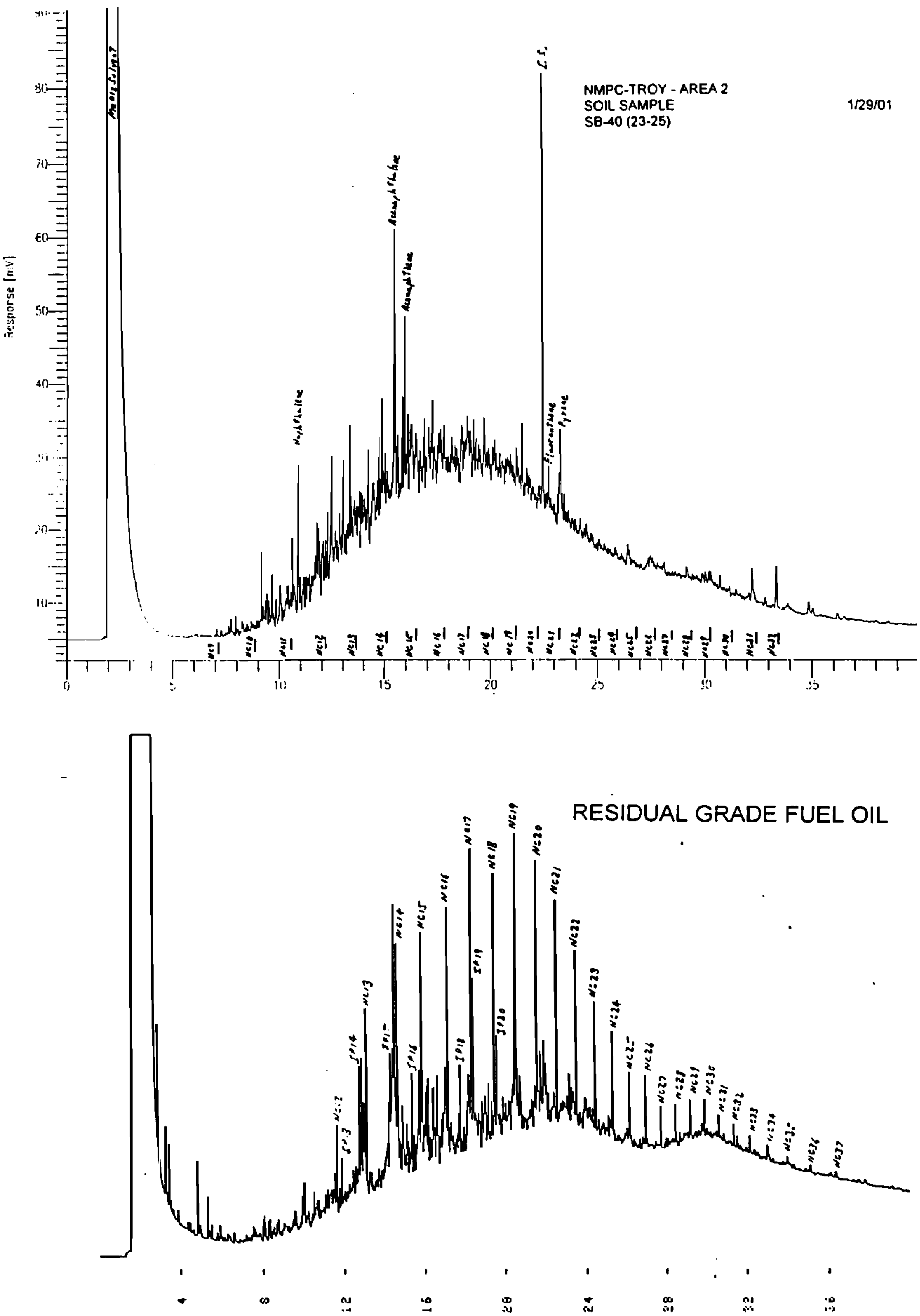
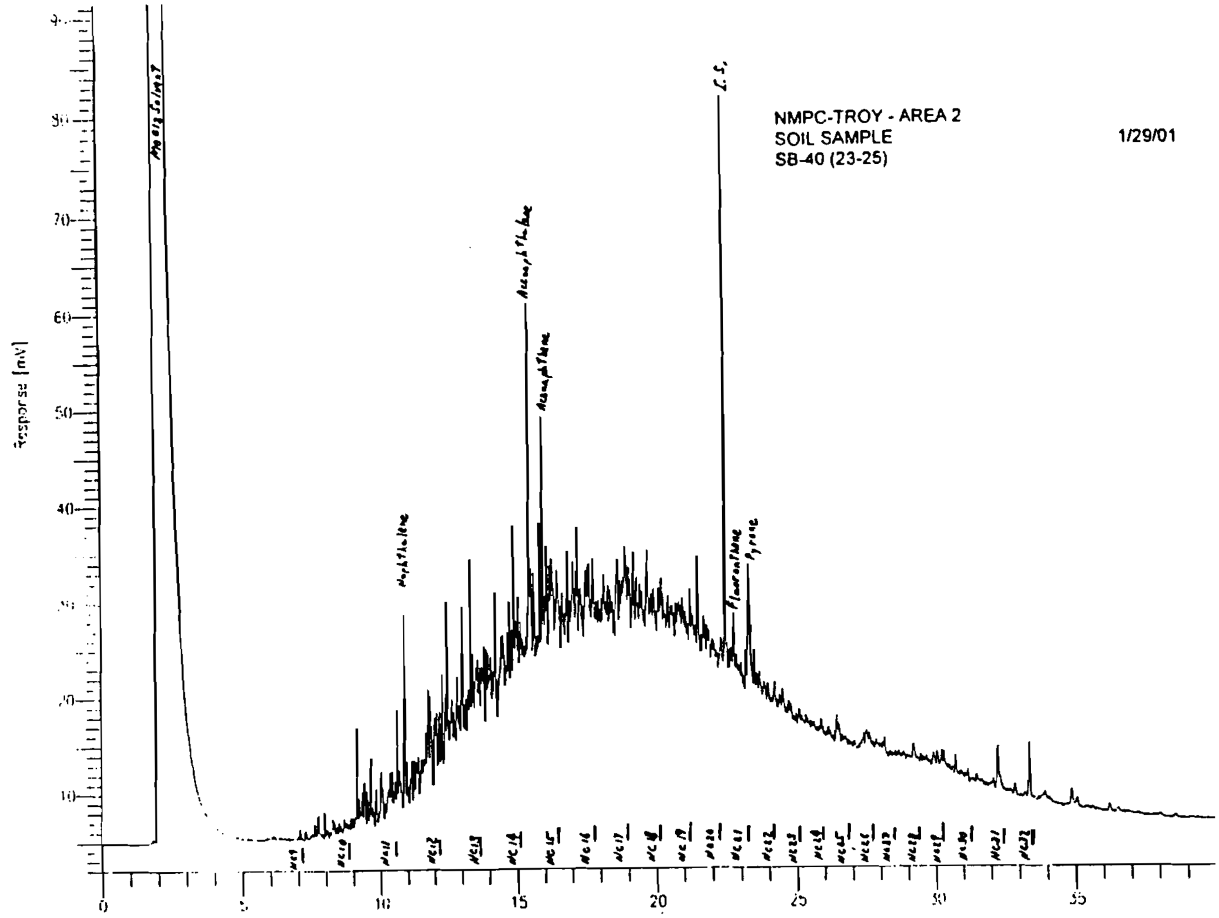


FIGURE 16: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE SB-40 (23-25) SOIL SAMPLE AND A RESIDUAL GRADE FUEL OIL SIGNATURE



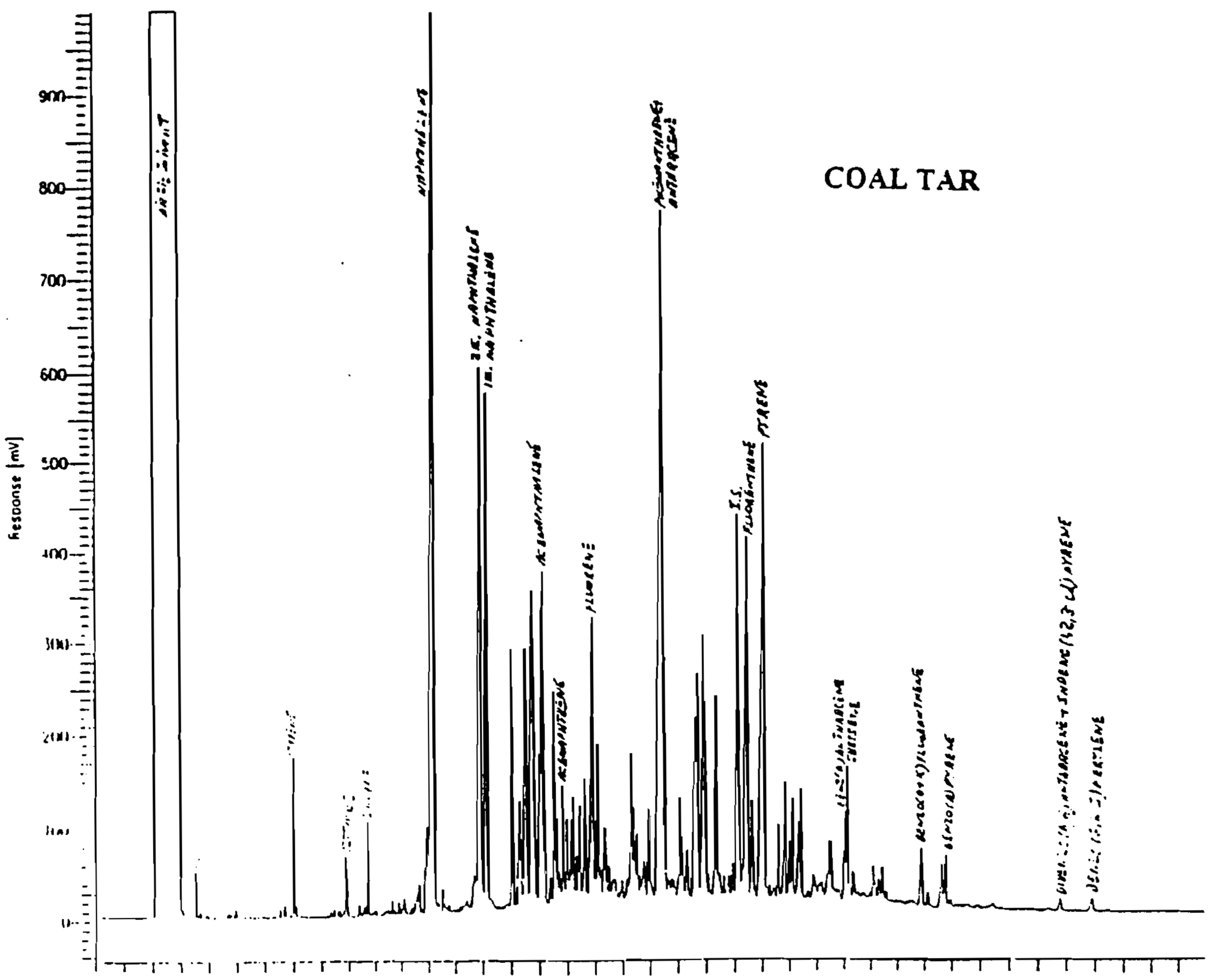


FIGURE 17: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE SB-40 (23-25) SOIL SAMPLE AND A COAL TAR SIGNATURE

the signature of a coal tar. The sequence of polynuclear aromatic peaks is indicative of a coal tar contribution and would not be expected to be present in diesel or fuel oil. In addition to the coal tar contribution, the PZ-1 sample signature also shows a sequence of normal paraffin and isoprenoid peaks, as well as a large baseline rise or hump consistent with a diesel/fuel oil. The normal paraffin peaks, isoprenoid peaks, and baseline rise would not be associated with a coal tar product as illustrated in Figure 18. These characteristics are consistent with a diesel/fuel oil product.

Figure 19 compares the chromatographic signature of the PZ-1 (27-29) sample with a diesel/fuel oil product signature. The PZ-1 (27-29) signature shows reduced proportions of normal paraffin peaks compared to the isoprenoid peaks. A moderate level of biodegradation is indicated for the diesel/fuel oil contribution to the PZ-1 sample. The NC17/IP19 ratio for the PZ-1 sample signature is 0.4. Based on the criteria of Christensen and Larsen (1993), the most probable exposure time is 14 to 18 years.

REFERENCES

Christensen, L. B. and T. Larsen (1993) Method for determining the age of diesel spills in the environment: Ground Water Mon. & Remed., Vol. 13, No. 2, p. 142-149.

Kennicutt, M. C. II (1988) The effect of biodegradation on crude oil bulk and molecular composition: Oil & Chem. Pollution, Vol. 4, p. 89-112.

Yang, Y.J., R.D. Spencer, M.A. Morsmann, and T.A. Gates (1995) Ground-water contamination plume differentiation and source determination using BTEX concentration ratios: GroundWater, Vol.33, No.6, p. 927-935.

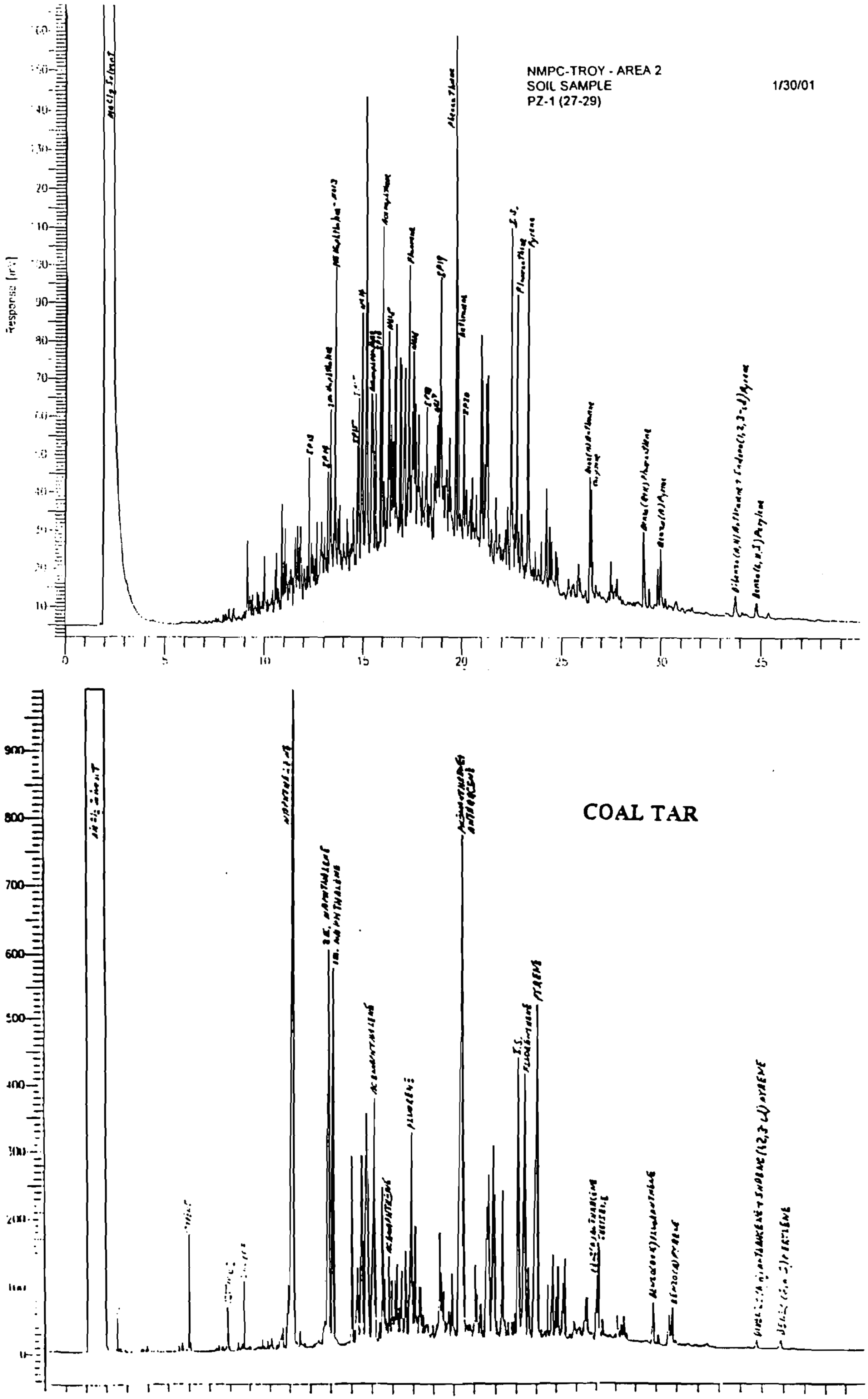


FIGURE 18: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF PZ-1(27-29) SOIL SAMPLE AND A COAL TAR SIGNATURE

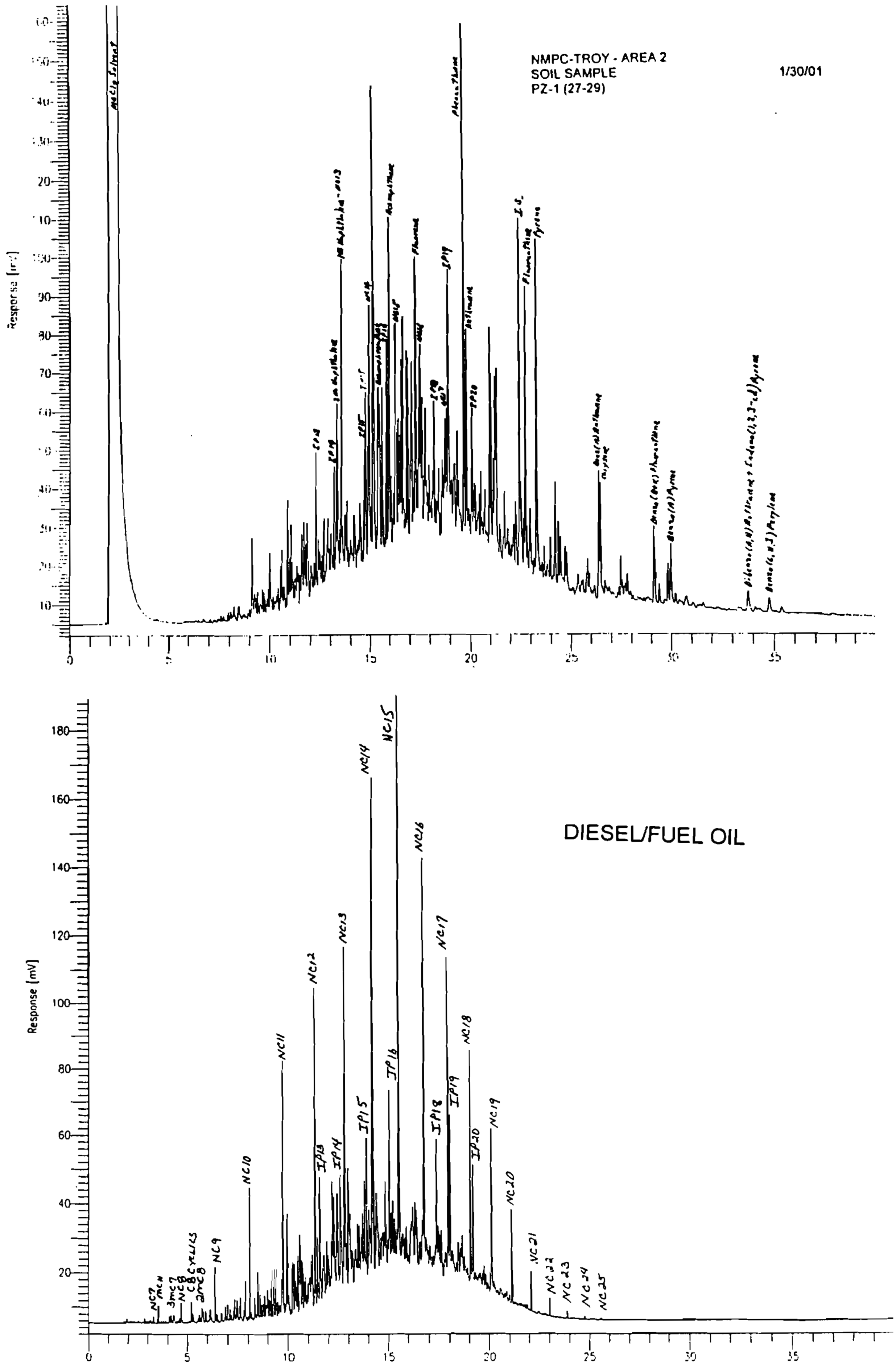


FIGURE 19: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF PZ-1(27-29) SOIL SAMPLE AND A DIESEL/FUEL OIL SIGNATURE

STL
Committed To *Your* Success

Report To: Brian Ahrens
Contact: Brian Ahrens
Company: IT Corp
Address: 13 British American Blvd
Latham NY 12110
Phone: (518) 783-1996
Fax: (518) 783-3397
E-Mail: bahrens@theitgroup.com

Bill To: Brian Ahrens
Contact: [illegible]
Company: IT Corp
Address: 13 British American
Latham NY 12110
Phone: (518) 783-1996
Fax: (518) 783 8397
POI:
Quote:

Internal Use Only

Sampler Name:	Signature:
[illegible]	
Project Name:	Project Number:
[illegible]	
Project Location:	Date Required:
[illegible]	

STL Sample No.	Client Sample ID	Sampling Date	Sampling Time	MATRIX	COMP / GRAB	Signature GC	Additional Analyses / Remarks
	[illegible]	1/29/01	1615	S	G	X	
	[illegible]	1/30/01	1030	S	G	X	

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[illegible]	IT Corp	1-30-01	1700	Fed-Ex		1-30-01	1700
Fed-Ex		1-31-01	~~1200~~ 09.05	[illegible]	WWCCS, Inc.	1-31-01	~~1200~~

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous Solids
OL = Oil
A = Air

Container Key
1. Plastic
2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn Acetate, Cool to 4°
6. Cool to 4°
7. None

COMMENTS:

Courier:

Bill of Lading:

IT Corporation
13 British American Boulevard
Latham, NY 12110-1405
Tel. 518.783.1996
Fax. 518.783.8397

A Member of The IT Group

group

March 26, 2001

Neil Peterson
Worldwide GeoSciences
6100 Corporate Drive, Suite 320
Houston, TX 77036
(713) 988-9401

Subject: **Sample Identification**
NMPC- Area 2
Troy, NY

Dear Mr. Peterson:

Please change the sample identification for sample labeled NMPC/Area2/MW-33/23-25 to NMPC/Area2/SB-40/23-25.

Sincerely,

Cecelia Campbell

Cecelia Campbell
IT Corporation

CHEMTECH

CHAIN OF CUSTODY RECORD

Englewood, NJ 07631
(201) 567-6868
Fax (201) 567-1333

Edison, NJ 08837
(732) 225-4111
Fax (732) 225-4110

CHEMTECH QUOTE NO.:

CLIENT INFORMATION	PROJECT INFORMATION	BILLING INFORMATION
REPORT TO BE SENT TO:		
COMPANY: IT Corporation	PROJECT NAME: NMPC Area 2	BILL TO: IT Corp. PO #:
ADDRESS: 13 British American Blvd	PROJECT NO.:	ADDRESS: 13 British American Blvd
CITY: Latham STATE: NY ZIP: 12110	PROJECT MANAGER:	CITY: Latham STATE: NY ZIP: 12110
ATTENTION: Bruce Ahrens	LOCATION: Troy NY	ATTENTION: Bruce Ahrens PHONE: (518) 783-1996
PHONE: (518) 783-1996 FAX: (518) 783-8397	PHONE: FAX:	

DATA TURNAROUND INFORMATION

FAX: ______ DAYS *
HARD COPY: ______ DAYS *
EDD: ______ DAYS *
* TO BE APPROVED BY CHEMTECH
** NORMAL TURNAROUND TIME – 14 DAYS

DATA DELIVERABLE INFORMATION

☐ RESULTS ONLY ☐ USEPA CLP
☐ RESULTS + QC ☐ NYS ASP "B"
☐ NJ REDUCED ☐ NYS ASP "A"
☐ NJ CLP ☐ EDD
☐ EDD FORMAT: ______

ANALYSIS

1. Signature GC

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1 (Ice)	2	3	4	5	6	7	8	9	COMMENTS
1.	NMPC/Area 2/MW 30 (25-27)	S		X	2/5/01	1420	1	X									
2.	NMPC/Area 2/MW 31 (15-17)	S		X	2/2/01	1530	1	X									
3.	NMPC/Area 2/MW 31 (33-35)	S		X	2/2/01	1540	1	X									
4.	NMPC/Area 2/MW 29 (33-35)	S		X	2/2/01	1035	1	X									
5.																	
6.																	
7.																	
8.																	

PRESERVATIVES — * Specify Preservatives: A – HCl, B – HNO_3, C – H_2SO_4, D – NaOH, E – ICE, F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. [signature]	2-5-01 1530	1. Fed-EX
RELINQUISHED BY: 2. Fed-EX	DATE/TIME: 2-6-01	RECEIVED BY: 2. [signature]
RELINQUISHED BY: 3.	DATE/TIME:	RECEIVED FOR LAB BY: 3.

Conditions of bottles or coolers at receipt: ☐ Compliant ☐ Non-Compliant ☐ Temp. of Cooler ______
Comments:

Page ______ of ______ Shipment Complete: Yes ______ No ______

Vol. 02000 WHITE – CHEMTECH COPY FOR RETURN TO CLIENT YELLOW – CHEMTECH COPY PINK – SAMPLER COPY

20702

APPENDIX I

DISPLAY CHROMATOGRAMS

ABBREVIATIONS USED TO IDENTIFY PEAKS

ABBREVIATION	HYDROCARBON
C1	METHANE
C2	ETHANE
C3	PROPANE
IC4	ISOBUTANE
NC4	NORMAL BUTANE
ETH	ETHANOL
22C3	2 2 DIMETHYL PROPANE
IC5	ISOPENTANE
NC5	NORMAL PENTANE
MeC2	METHYLENE CHLORIDE
22DMB	2 2 DIMETHYL BUTANE
23DMB	2 3 DIMETHYL BUTANE
2MP	2 METHYLPENTANE
3MP	3 METHYLPENTANE
NC6	NORMAL HEXANE
22DMP	2,2 DIMETHYLPENTANE
MCP	METHYLCYCLOPENTANE
24DMP	2,4 DIMETHYLPENTANE
BZ	BENZENE
CH	CYCLOHEXANE
2MH	2 METHYLHEXANE
23DMP	2,3 DIMETHYLPENTANE
3MH	3 METHYLHEXANE
T13DMCP	T13DIMETHYLCYCLOPENTANE
C13DMCP	C13DIMETHYLCYCLOPENTANE
224TMP	2,2,4 TRIMETHYLPENTANE (PRINCIPAL ISO-OCTANE)
NC7	NORMAL HEPTANE
234TMP	2,3,4 TRIMETHYLPENTANE (ISO-OCTANE)
233TMP	2,3,3 TRIMETHYLPENTANE (ISO-OCTANE)
MCH	METHYLCYCLOHEXANE
TOL	TOLUENE
23DMH	2,3,DIMETHYLHEXANE
2MC7	2METHYLHEPTANE
3MC7	3METHYLHEPTANE
225TMH	2,2,4 TRIMETHYLHEXANE
223TMH	2,2,3 TRIMETHYLHEXANE
NC8	NORMAL OCTANE
EBZ	ETHYL BENZENE
M+P XYL	META AND PARA XYLENES
2MC8	2METHYLOCTANE
3MC8	3METHYLOCTANE
O XYL	ORTHO XYLENE
NC9	NORMAL NONANE

ABBREVIATIONS USED TO IDENTIFY PEAKS (cont.)

ABBREVIATION	HYDROCARBON
IPBZ	ISOPROPYLBENZENE
NPBZ	NORMAL PROPYL BENZENE
1M3EBZ	1METHYL3ETHYLBENZENE
135TMBZ	1,3,5 TRIMETHYLBENZENE
1M2EBZ	1METHYL2ETHYLBENZENE
124TMBZ	1,2,4 TRIMETHYLBENZENE
NC10	NORMAL DECANE
123TMBZ	1,2,3 TRIMETHYLBENZENE (TERT BUTYL BENZENE CO-ELUTES AT THIS POSITION)
C4BZ	TETRAMETHYLBENZENE
NAPH	NAPHTHALENE
2M. NAPH	2METHYL NAPHTHALENE
1M. NAPH	1METHYL NAPHTHALENE

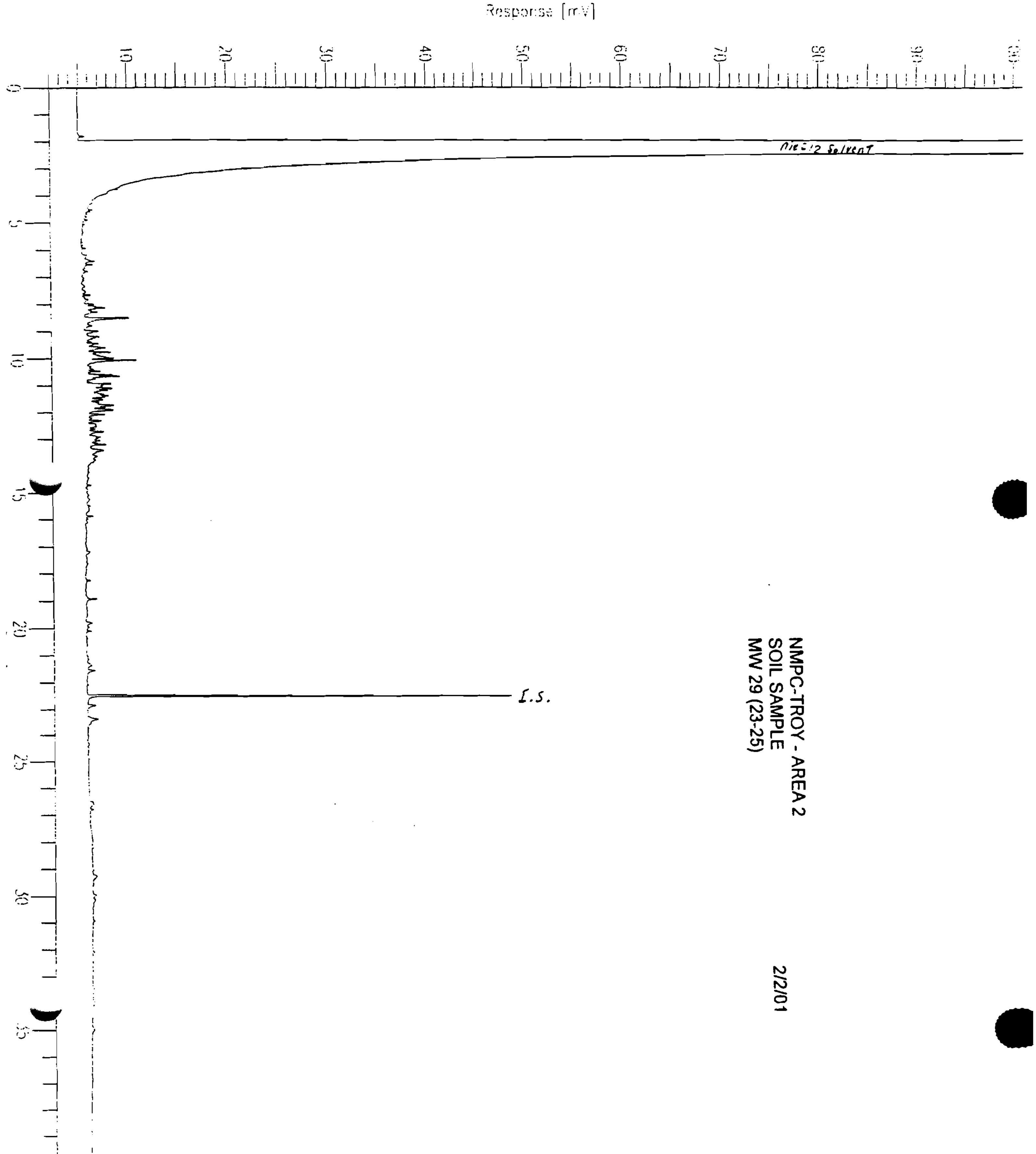
NC____ Normal paraffin with number of carbon atoms in molecule shown

IP_____ Isoprenoid iso-paraffin with number of C atoms in molecule shown

WORLD WIDE GEOSCIENCES - I

ple Name : J-01010-B MW-29
eName : C:\TC4\41WW\41WW164.RAW
hod : WWG.MTH
rt : 0.00 min End Time : 40.00 min
le Factor: 0.0 Plot Offset: 2 mV

Sample #: 10209004
Date : 2/21/01 04:41 PM
Time of Injection: 2/13/01 10:57 PM
Low Point : 2.00 mV High Point : 102.00 mV
Plot Scale: 100.0 mV



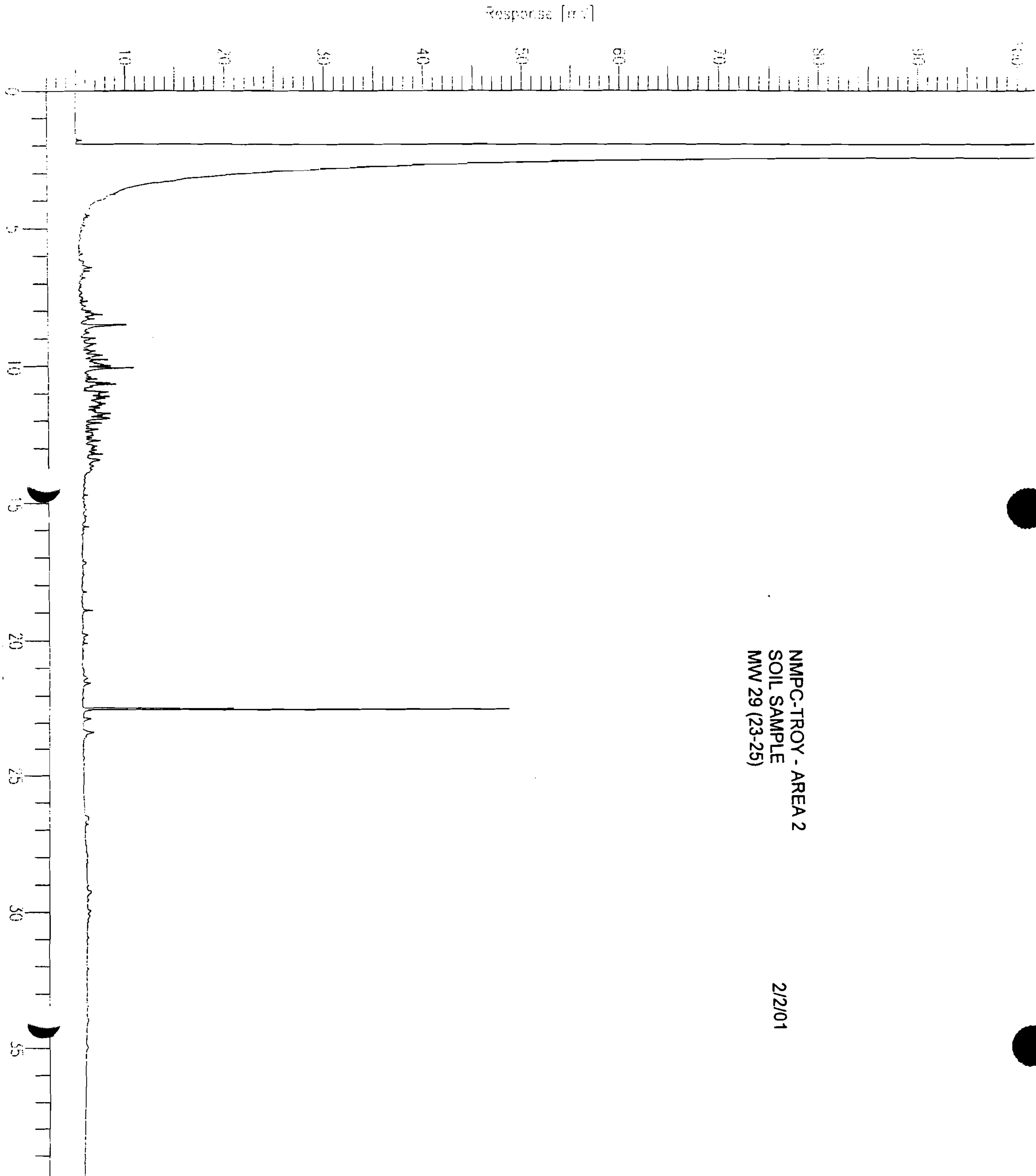
WORLD WIDE GEOSCIENCES - I

.ple Name : J-01010-B MW-29
eName : C:\TC4\41WW\41WW164.RAW
hod : WWG.MTH
rt : 0.00 min
le Factor: 0.0

End Time : 40.00 min
Plot Offset: 2 mV

Sample #: 10209004
Date : 2/21/01 04:41 PM
Time of Injection: 2/13/01 10:57 PM
Low Point : 2.00 mV
Plot Scale: 100.0 mV

High Point : 102.00 mV



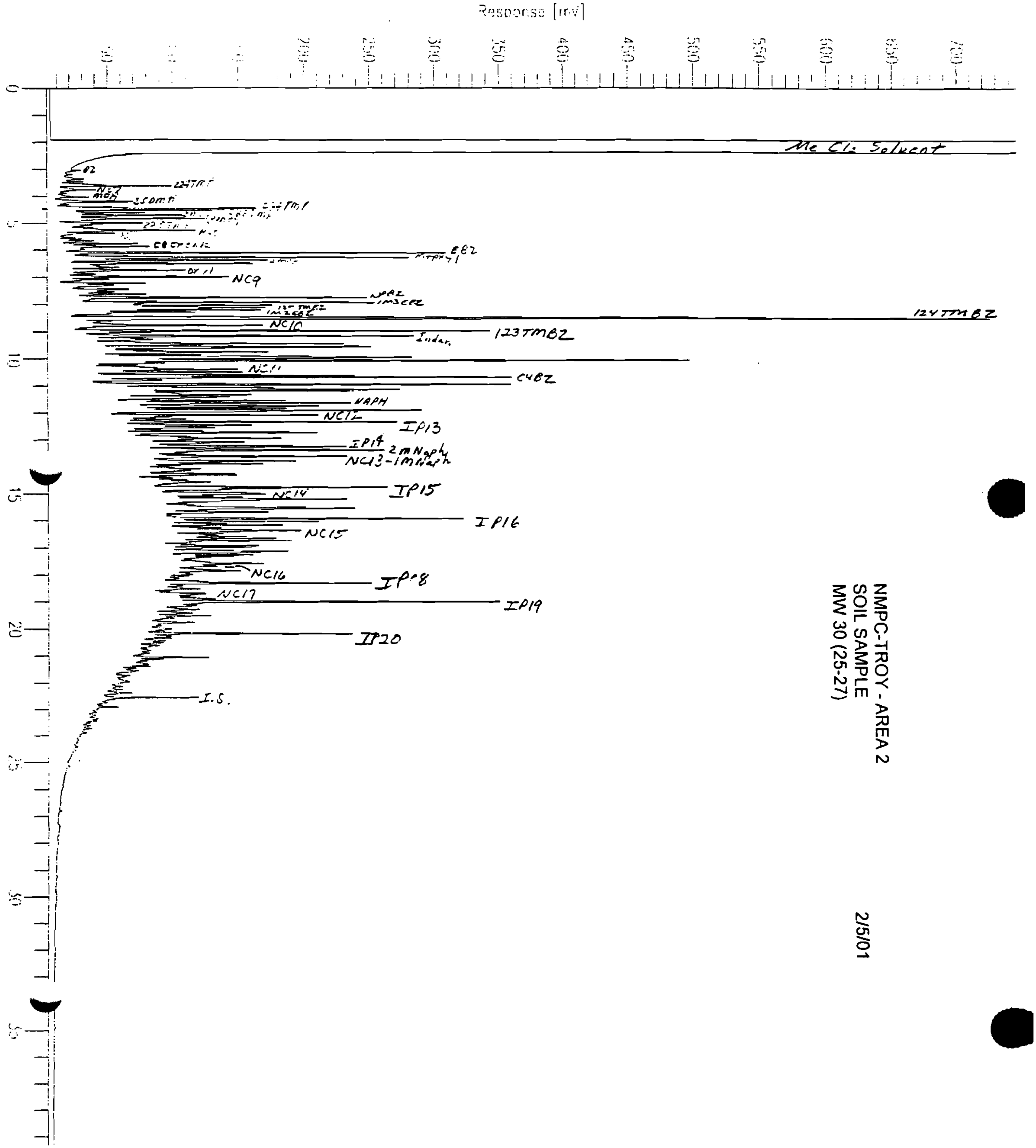
WORLD WIDE GEOSCIENCES - I

ple Name : J-01010-B MW-30
eName : C:\TC4\41WW\41WW161.RAW
hod : WWG.MTH
rt Time : 0.00 min
le Factor: 0.0

End Time : 40.00 min
Plot Offset: 2 mV

Sample #: 10209001
Date : 2/21/01 04:39 PM
Time of Injection: 2/13/01 07:55 PM
Low Point : 2.00 mV
Plot Scale: 750.0 mV

High Point : 752.00 mV



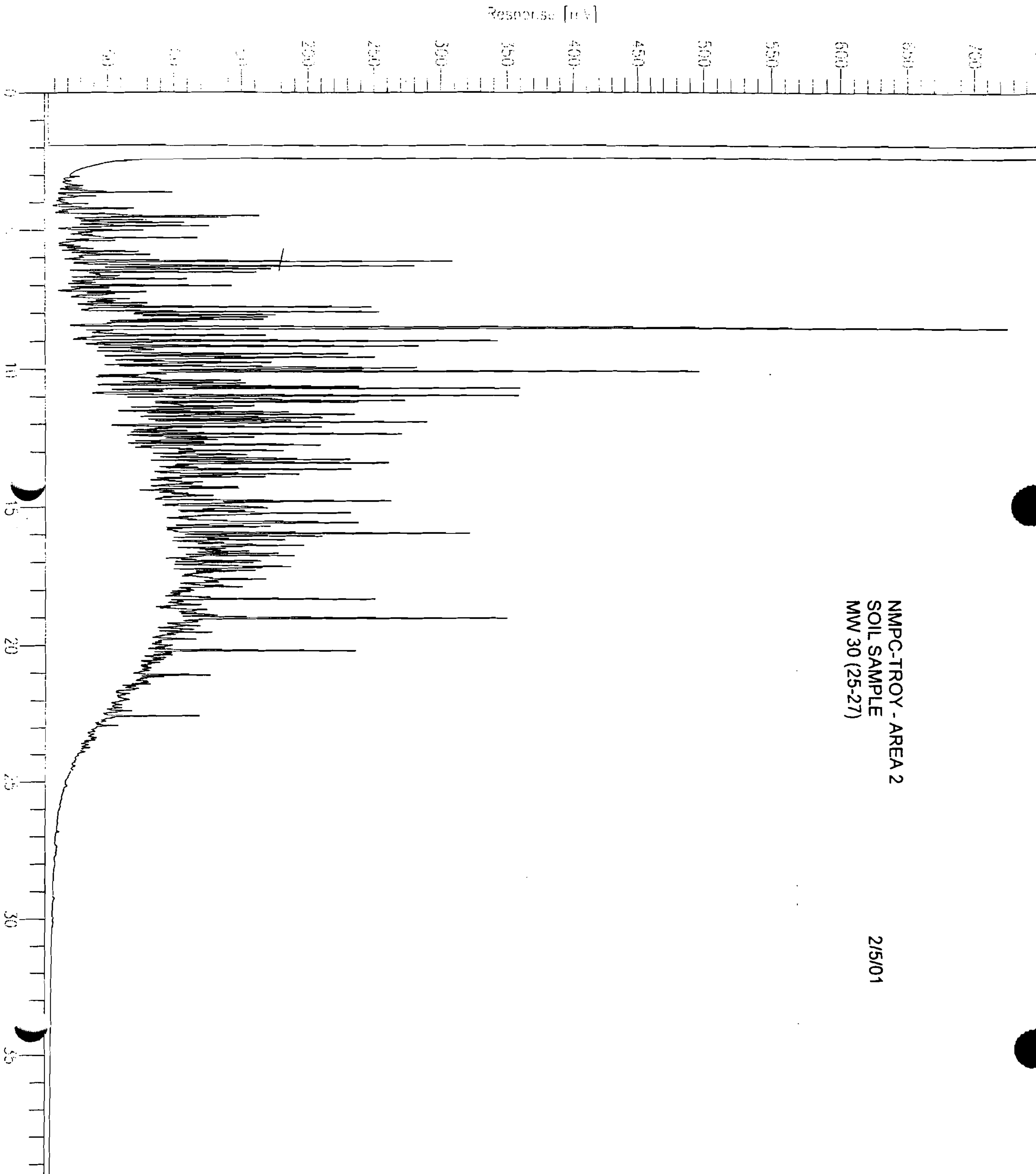
WORLD WIDE GEOSCIENCES - I

Sample Name : J-01010-B MW-30
FileName : C:\TC4\41WW\41WW161.RAW
Method : WWG.MTH
Start Time : 0.00 min
Scale Factor: 0.0

End Time : 40.00 min
Plot Offset: 2 mV

Sample #: 10209001
Date : 2/21/01 04:39 PM
Time of Injection: 2/13/01 07:55 PM
Low Point : 2.00 mV
Plot Scale: 750.0 mV

High Point : 752.00 mV



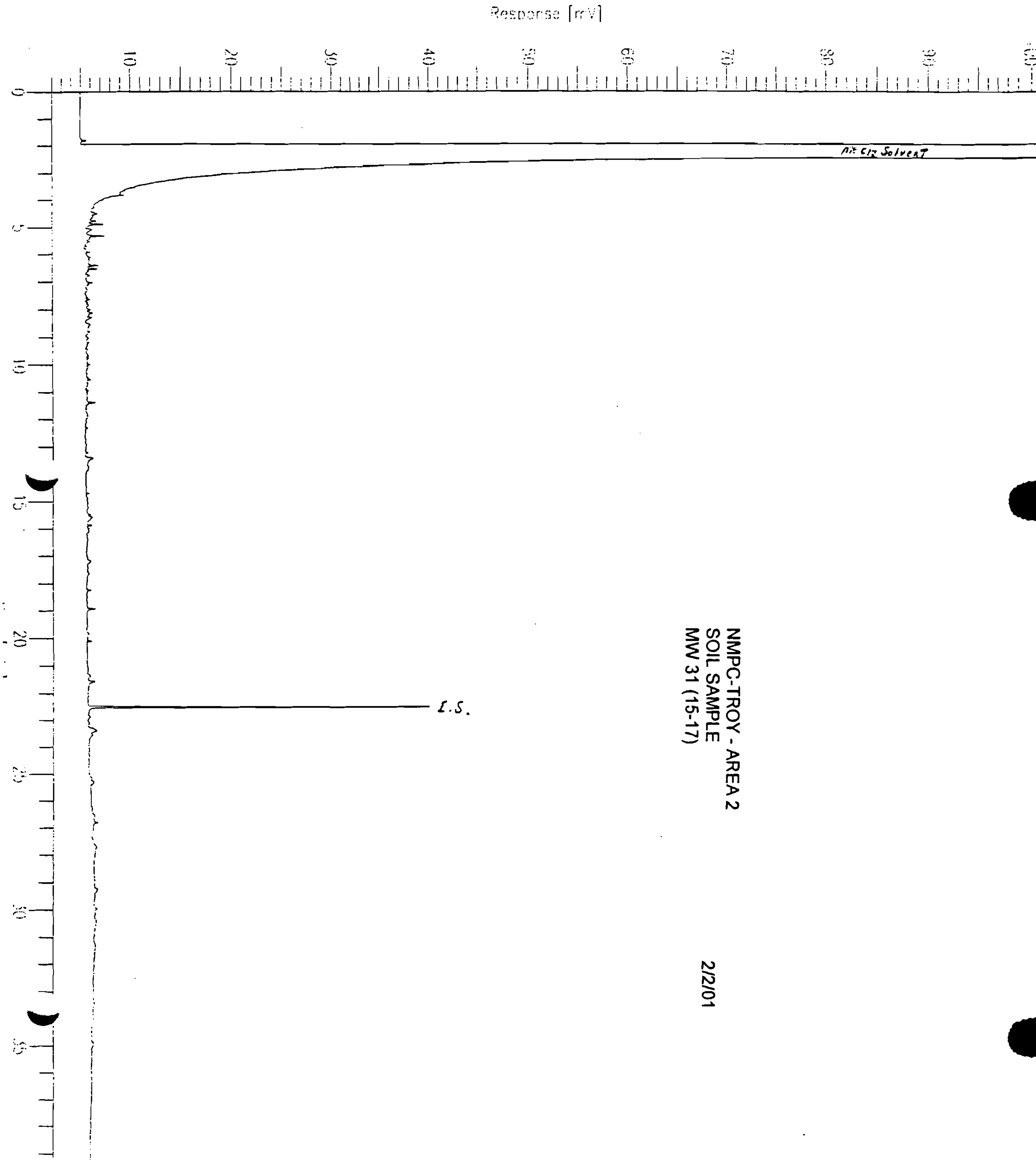
WORLD WIDE GEOSCIENCES - I

mple Name : J-01010-B MW-31 (15'-17')
leN : C:\TC4\41WW\41WW162.RAW
tho : WWG.MTH
art Time : 0.00 min
ale Factor: 0.0

End Time : 40.00 min
Plot Offset: 2 mV

Sample #: 10209002
Date : 2/21/01 04:39 PM
Time of Injection: 2/13/01 08:56 PM
Low Point : 2.00 mV
Plot Scale: 100.0 mV

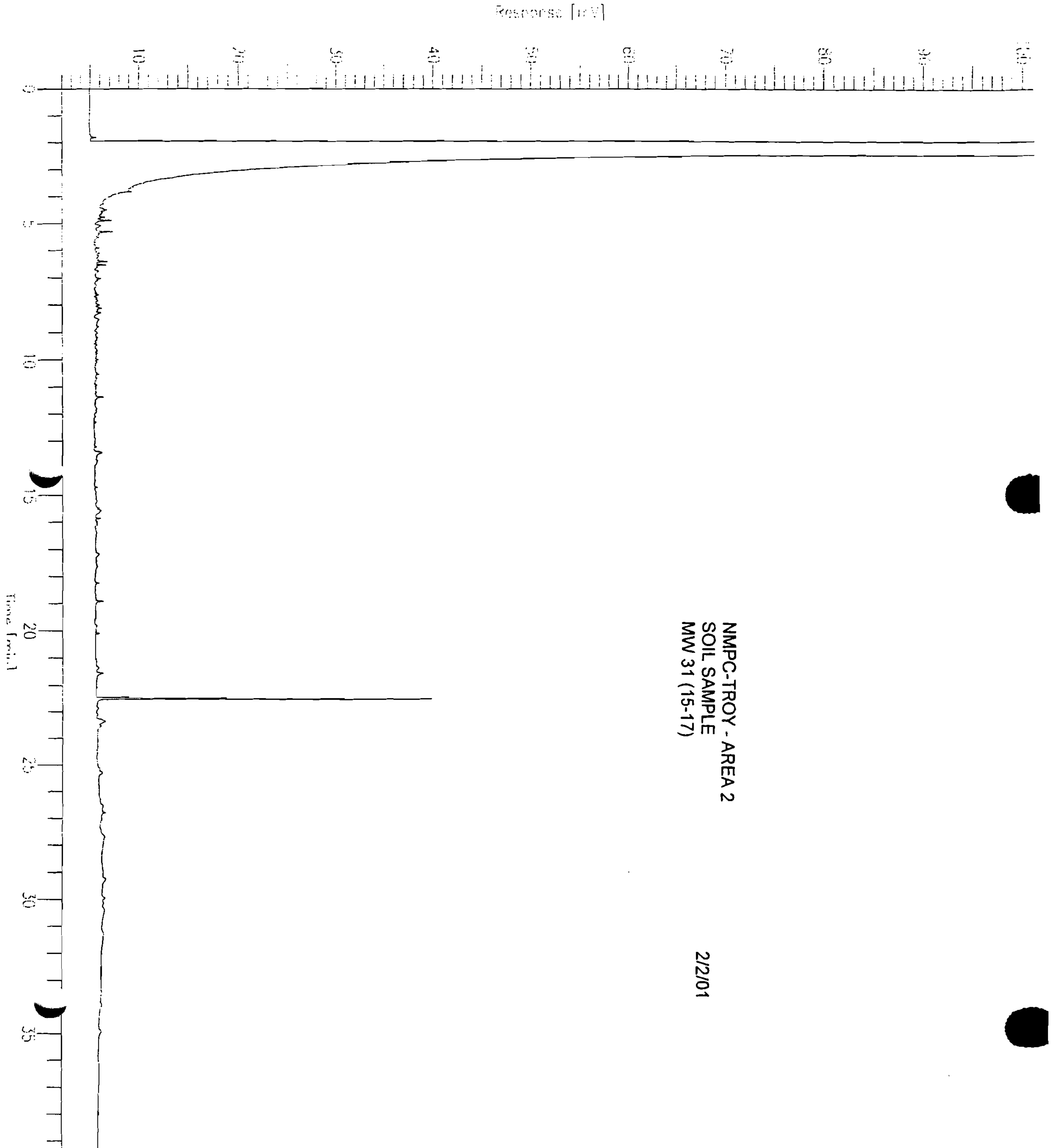
High Point : 102.00 mV



WORLD WIDE GEOSCIENCES - I

ample Name : J-01010-B MW-31 (15'-17')
ileN e : C:\TC4\41WW\41WW162.RAW
eth : WWG.MTH
tart ime : 0.00 min End Time : 40.00 min
cale Factor: 0.0 Plot Offset: 2 mV

Sample #: 10209002 Page 1 of 1
Date : 2/21/01 04:39 PM
Time of Injection: 2/13/01 08:56 PM
Low Point : 2.00 mV High Point : 102.00 mV
Plot Scale: 100.0 mV



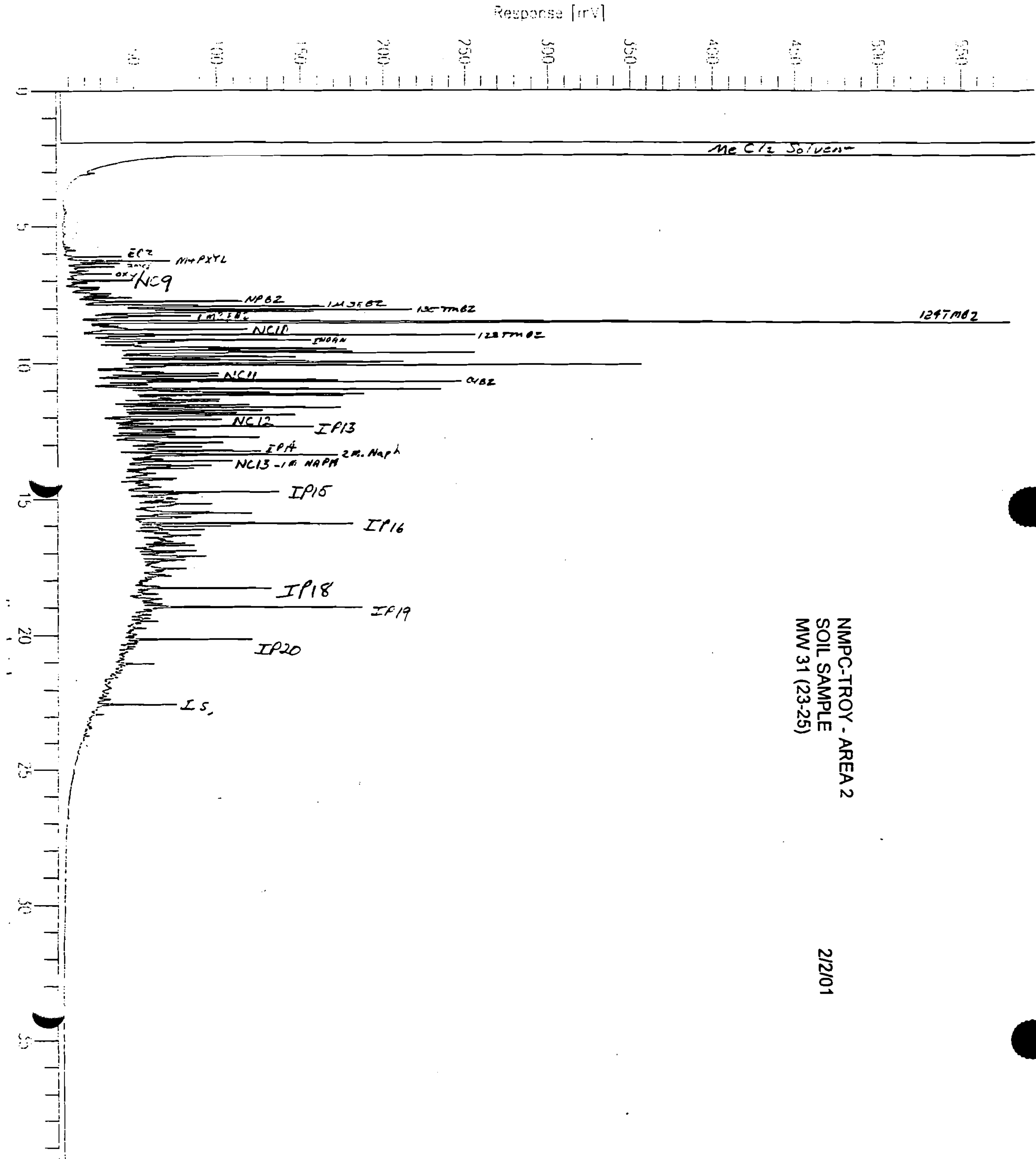
WORLD WIDE GEOSCIENCES - I

mple Name : J-01010-B MW-31 (23'-25')
leName : C:\TC4\41WW\41WW163.RAW
tho : WWG.MTH
art e : 0.00 min
ale Factor: 0.0

End Time : 40.00 min
Plot Offset: 2 mV

Sample #: 10209003
Date : 2/21/01 04:40 PM
Time of Injection: 2/13/01 09:56 PM
Low Point : 2.00 mV
Plot Scale: 600.0 mV

High Point : 602.00 mV



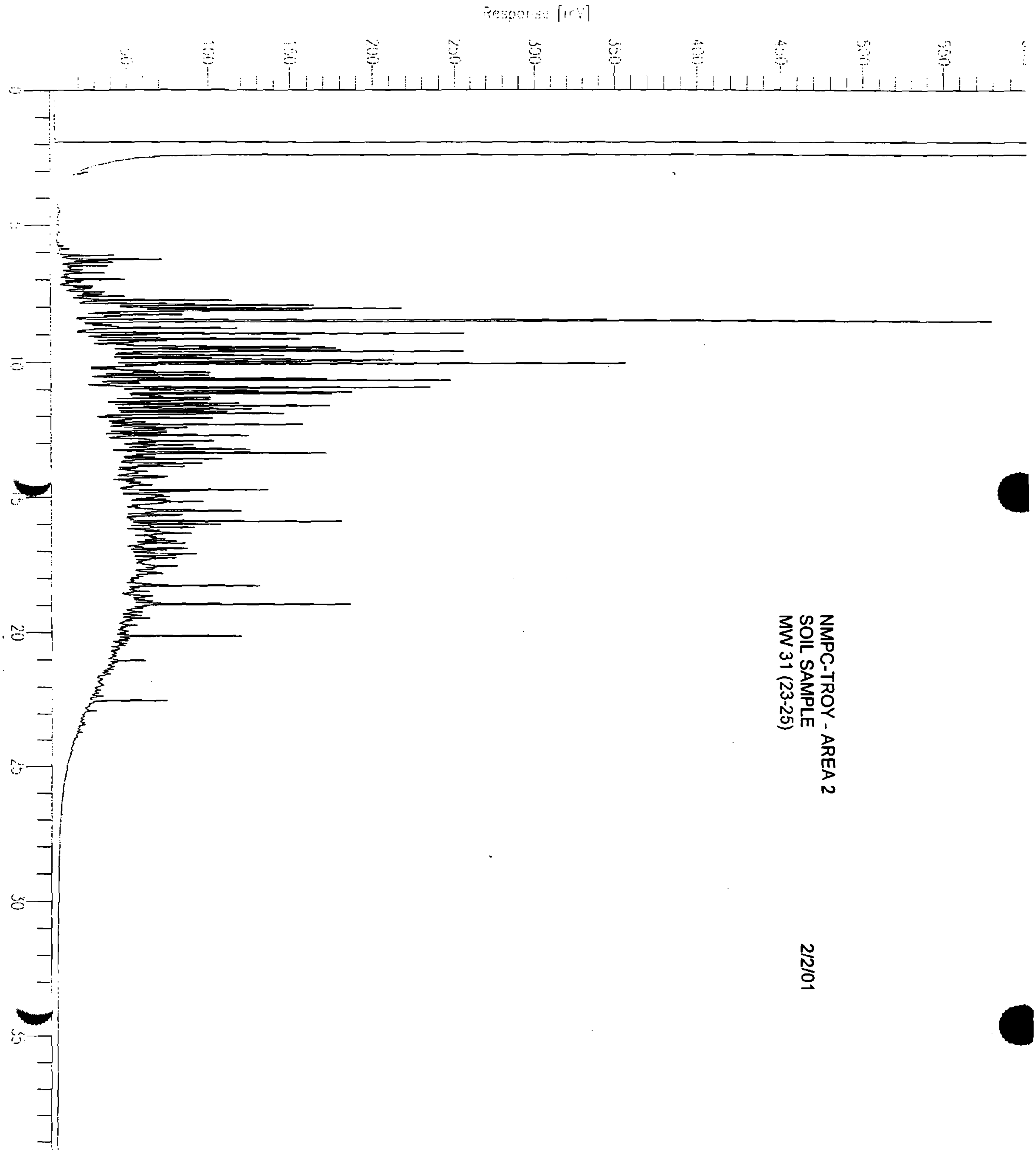
NMPC-TROY - AREA 2
SOIL SAMPLE
MW 31 (23-25)

2/2/01

WORLD WIDE GEOSCIENCES - I

mple Name : J-01010-B MW-31 (23'-25')
leName : C:\TC4\41WW\41WW163.RAW
th : WWG.MTH
art Time : 0.00 min   End Time : 40.00 min
ale Factor: 0.0   Plot Offset: 2 mV

Sample #: 10209003   Page 1 of 1
Date : 2/21/01 04:40 PM
Time of Injection: 2/13/01 09:56 PM
Low Point : 2.00 mV   High Point : 602.00 mV
Plot Scale: 600.0 mV



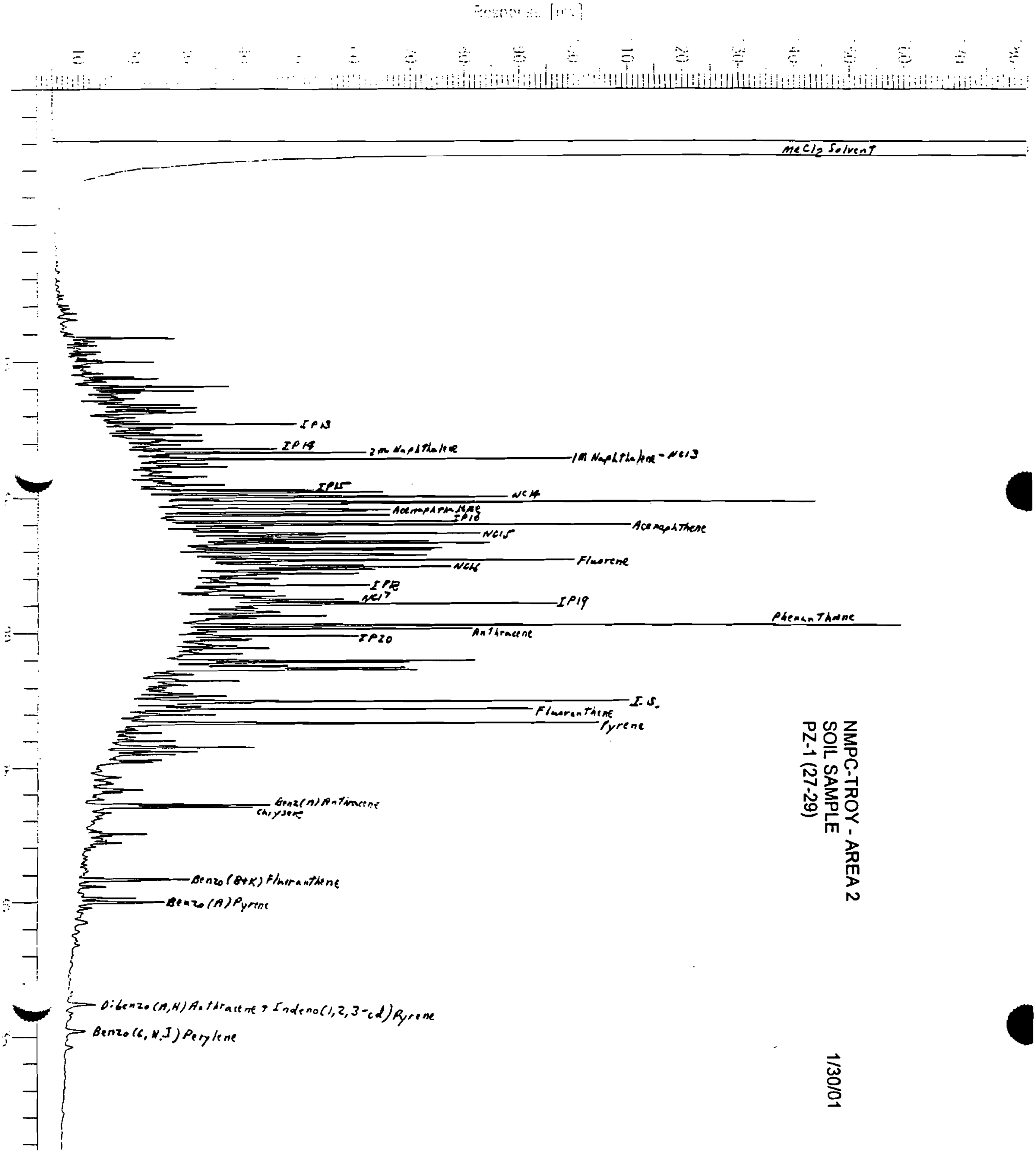
NMPC-TROY - AREA 2
SOIL SAMPLE
MW 31 (23-25)

2/2/01

WORLD WIDE GEOSCIENCES - I

e Name : G-01010 NMPC PZ-1 (27-29')
lam : C:\TC4\41WK\41WK079.RAW
: WWG.MTH
: 0.00 min End Time : 40.00 min
Factor: 0.0 Plot Offset: 2 mV

Sample #: 10202008 Page 1 of 1
Date : 3/15/01 12:36 PM
Time of Injection: 3/13/01 04:19 PM
Low Point : 2.00 mV High Point : 182.00 mV
Plot Scale: 180.0 mV



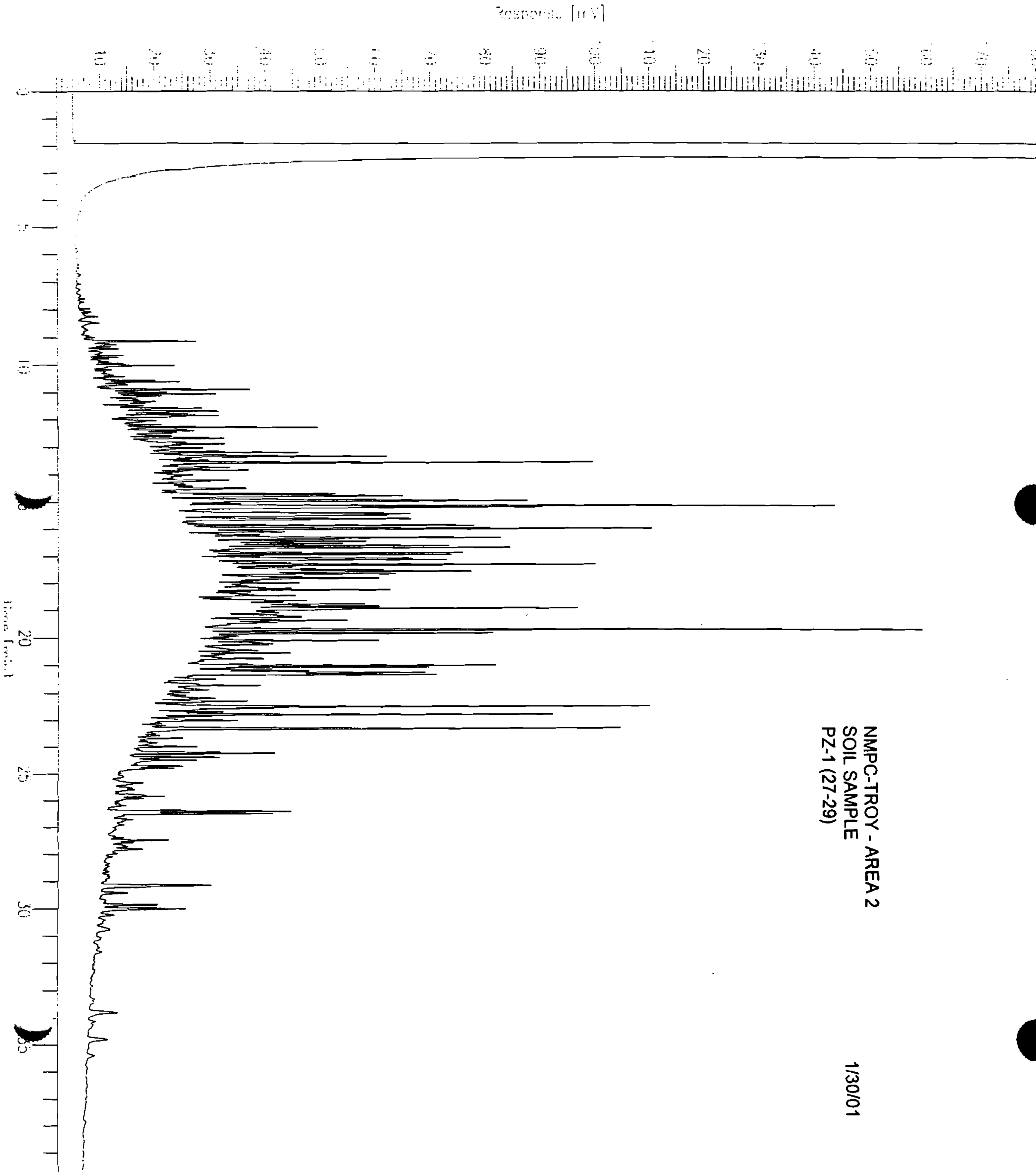
NMPC-TROY - AREA 2
SOIL SAMPLE
PZ-1 (27-29)

1/30/01

WORLD WIDE GEOSCIENCES - I

ample Name : J-01010 NMPC PZ-1 (27-29')
ileName : C:\TC4\41WW\41WW179.RAW
eth : WWG.MTH
ta me : 0.00 min   End Time : 40.00 min
cale Factor: 0.0   Plot Offset: 2 mV

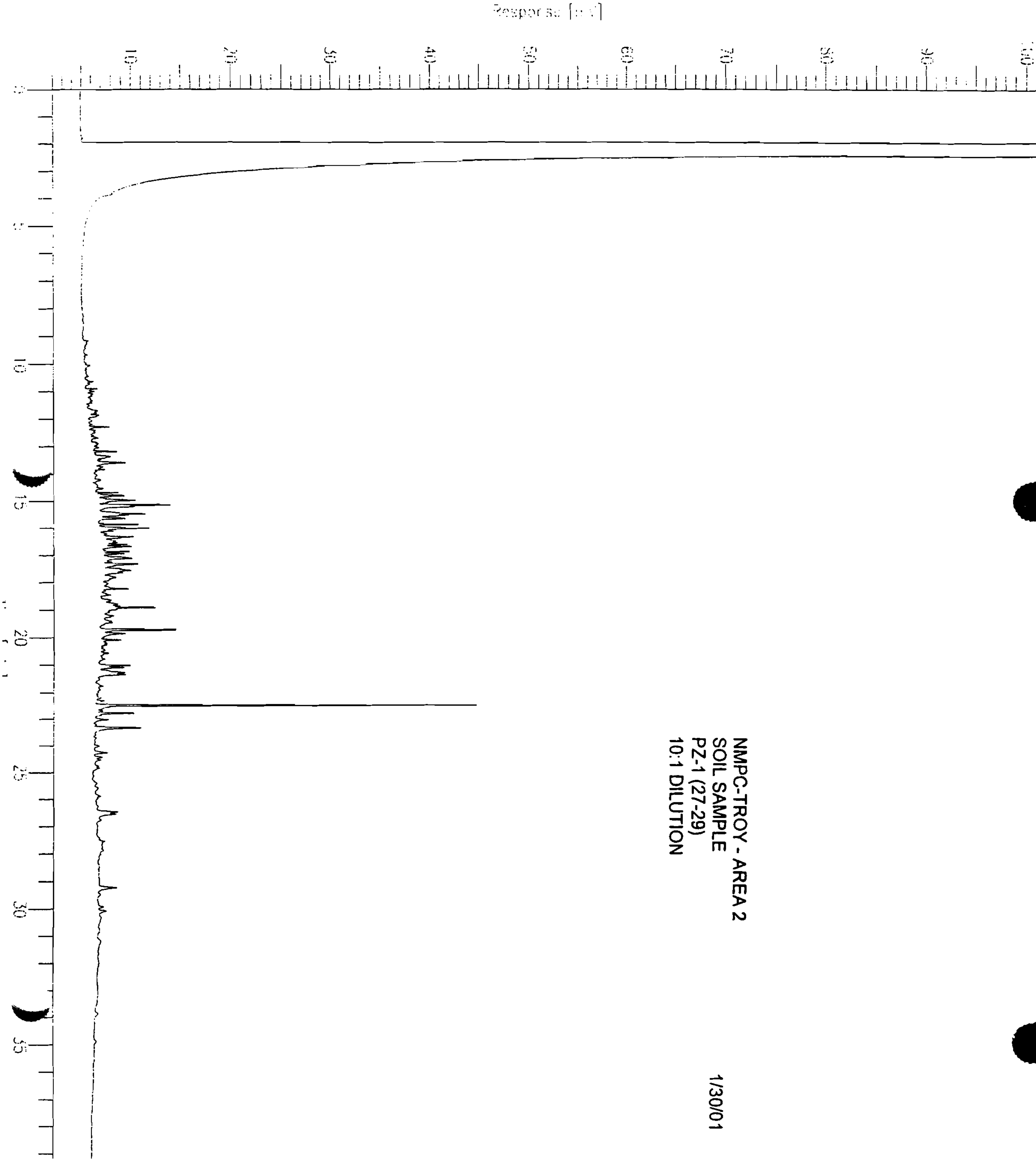
Sample #: 10202008   Page 1 of 1
Date : 3/15/01 12:38 PM
Time of Injection: 3/13/01 04:19 PM
Low Point : 2.00 mV   High Point : 182.00 mV
Plot Scale: 180.0 mV



WORLD WIDE GEOSCIENCES - I

mp]- Name : J-01010 PZ-1 (27'-29') 10:1
i(: C:\TC4\41WW\41WW150.RAW
th : WWG.MTH
art Time : 0.00 min End Time : 40.00 min
ale Factor: 0.0 Plot Offset: 2 mV

Sample #: 10202008
Date : 2/13/01 09:52 AM
Time of Injection: 2/6/01 08:41 AM
Low Point : 2.00 mV High Point : 102.00 mV
Plot Scale: 100.0 mV



WORLD WIDE GEOSCIENCES - I

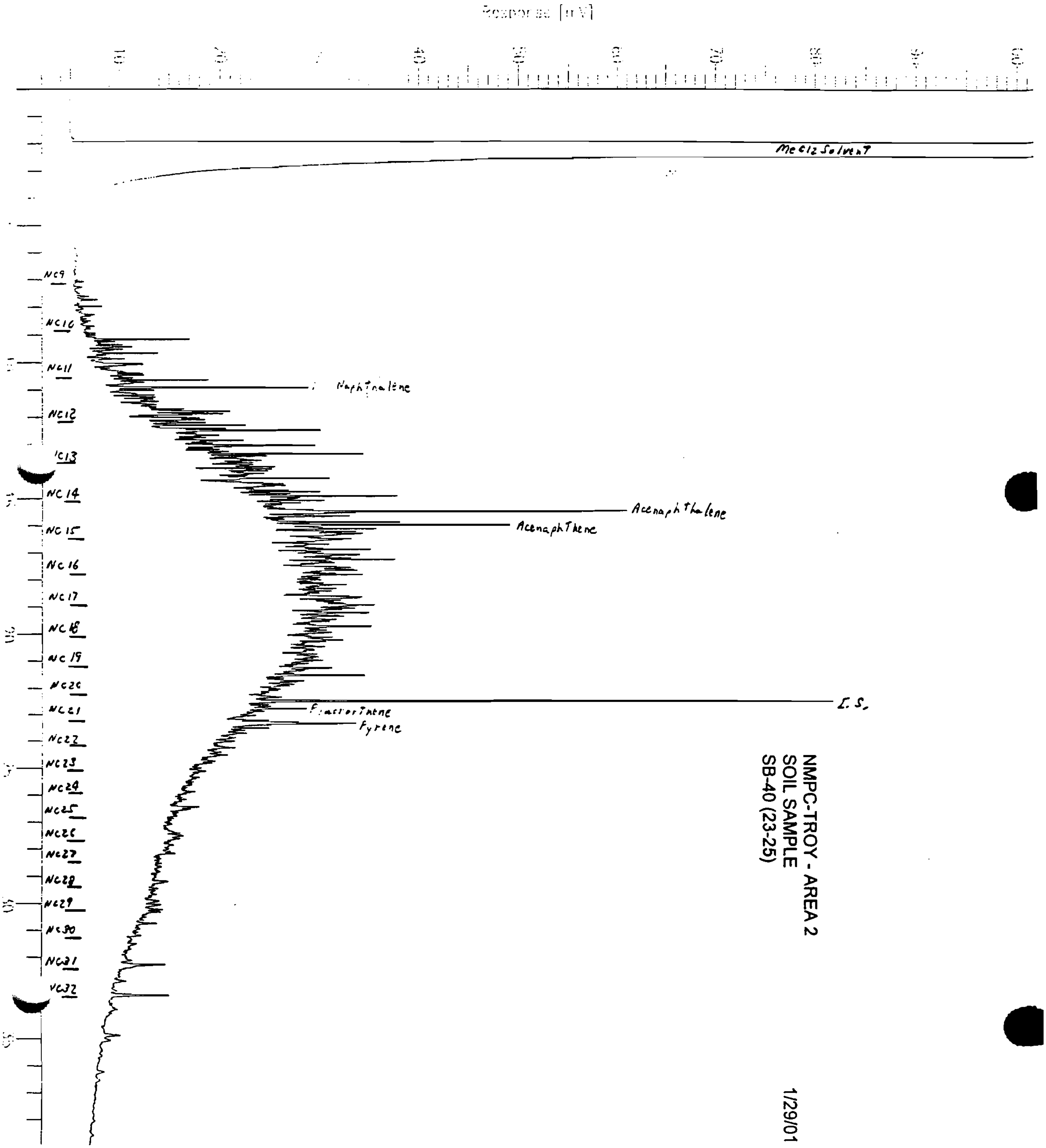
.e Name : J-01010 NMPC MW-33 (23-25')
Da : C:\TC4\41WW\41WW178.RAW
od : WWG.MTH
: Time : 0.00 min
e Factor: 0.0

End Time : 40.00 min
Plot Offset: 0 mV

Sample #: 10202007
Date : 3/15/01 12:37 PM
Time of Injection: 3/13/01 03:28 PM
Low Point : 0.00 mV
Plot Scale: 100.0 mV

Page 1 of 1

High Point : 100.00 mV



NMPC-TROY - AREA 2
SOIL SAMPLE
SB-40 (23-25)

1/29/01

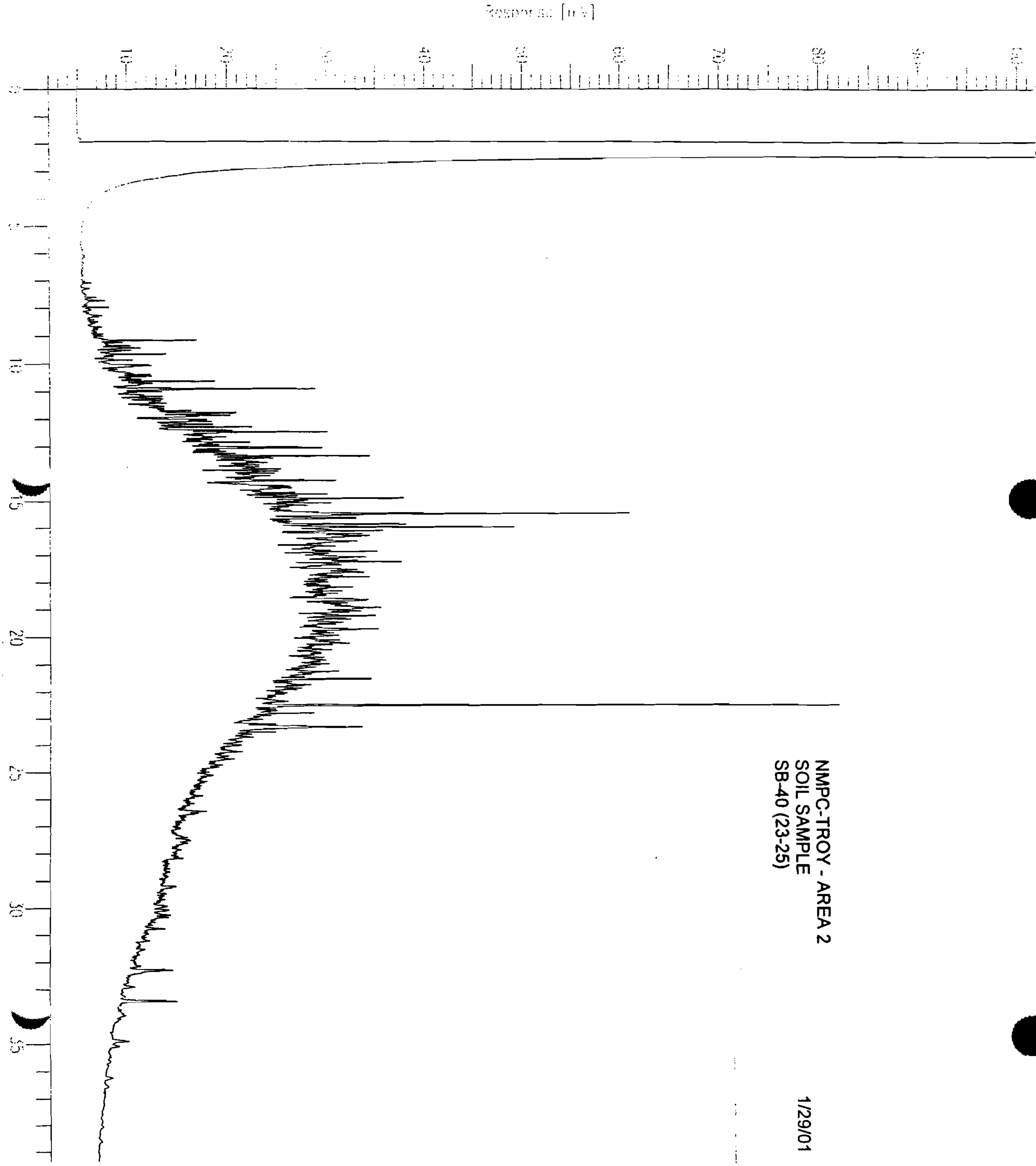
WORLD WIDE GEOSCIENCES - I

ıple Name : J-01010 NMPC MW-33 (23-25')
eN : C:\TC4\41WW\41WW178.RAW
h : WWG.MTH
rt me : 0.00 min
le Factor: 0.0

End Time : 40.00 min
Plot Offset: 2 mV

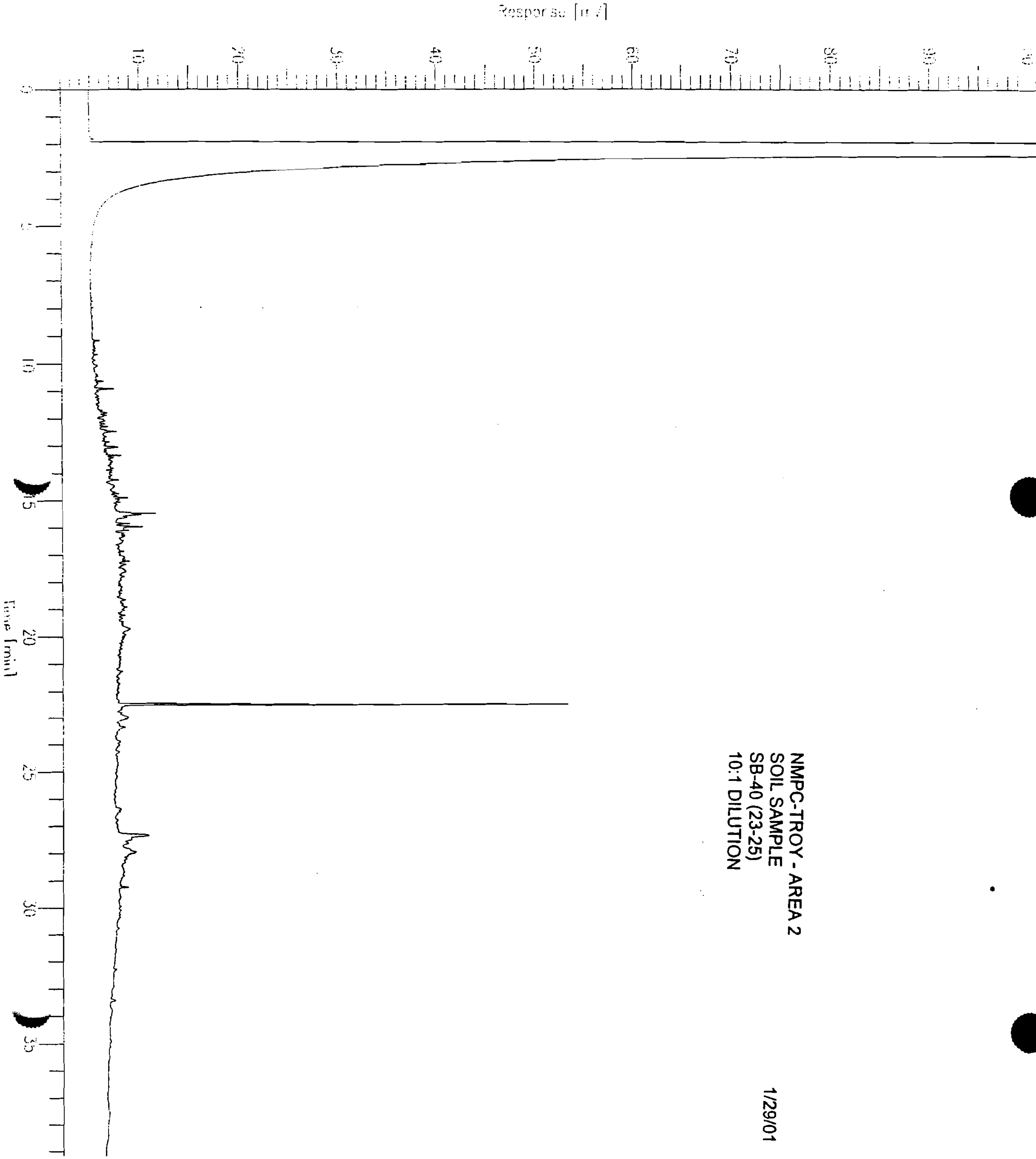
Sample #: 10202007
Date : 3/15/01 12:37 PM
Time of Injection: 3/13/01 03:28 PM
Low Point : 2.00 mV
Plot Scale: 100.0 mV

High Point : 102.00 mV



WORLD WIDE GEOSCIENCES - I

ample Name : J-01010 MW-33 (23'-25') 10:1		Sample #: 10202007	Page 1 of 1
.l. .e : C:\TC4\41WW\41WW149.RAW		Date : 2/13/01 09:52 AM	
: WWG.MTH		Time of Injection: 2/6/01 07:42 AM	
:a. ime : 0.00 min	End Time : 40.00 min	Low Point : 2.00 mV	High Point : 102.00 mV
cale Factor: 0.0	Plot Offset: 2 mV	Plot Scale: 100.0 mV	



APPENDIX II

OPERATING CONDITIONS

GC OPERATING CONDITIONS

Instrument: Perkin-Elmer Autosystem

Column: 30m*0.25mm ID*0.25u Methyl Silicon, Restek Rtx-1
(Cat# 10138, Fused Silica Column; Bonded,
Non-Polar, Silicone Based Polymer Liquid Phase)

Carrier Gas: Helium
Linear Velocity = 30 cm/sec
Column Pressure 16.9 psig.

Injection Port: Split/Splitless Type
Temperature 300 deg C

Detector: Flame Ionization Type
Temperature 300 deg C
Range 1, Attn.4

	Method 1	**Method 2**	**Method 3**	**Method 4**
Injection Type	Split	Split	Splitless	Splitless
Acronym	5/s	10/s	5/sl	10/sl
Split Vent	On	On	Off	Off
Split Vent Time,min	---	---	0.5	0.5
Split Rate ml/min	100	100	100	100
Initial Temp, deg C	30	30	30	30
Initial Time, min	5	1	5	1
Ramp Rate, deg C/min	5	10	5	10
Final Temp, deg C	300	300	300	300
Final Time, min	0	15	0	15
Run Time, min	40	40	40	40

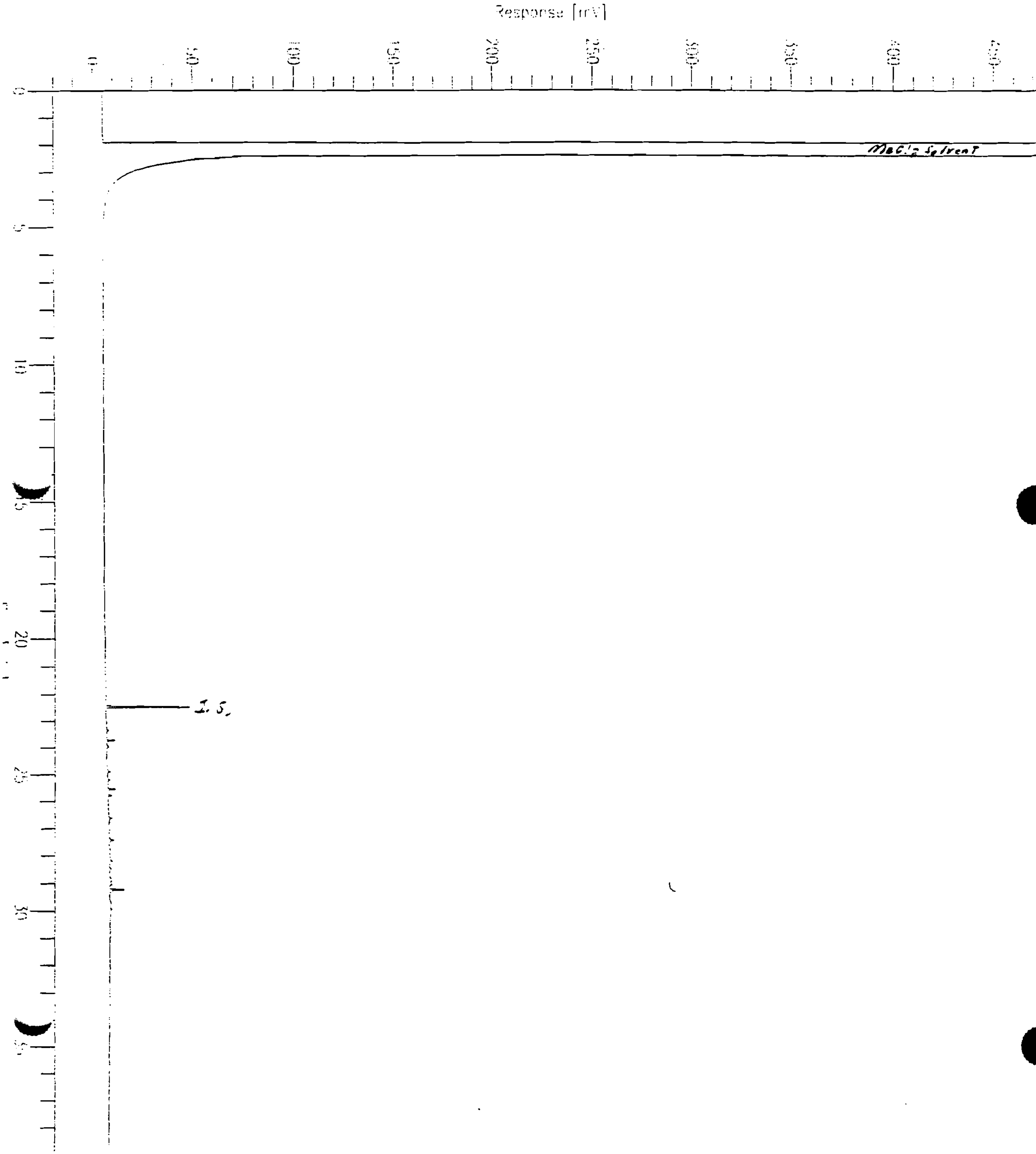
WWG I - 10 SL

ample Name : ~~SOLVENT~~ METHOD BLANK
ile Name : C:\TC4\41WW\41WW140.raw
Method : WWG1__10
Start Time : 0.00 min
Scale Factor: -1.0

End Time : 40.00 min
Plot Offset: -20 mV

Sample #: BLANK
Date : 2/12/01 04:18 PM
Time of Injection: 2/5/01 10:56 PM
Low Point : -20.11 mV
Plot Scale: 500.0 mV

Page 1 of 1
High Point : 479.89 mV



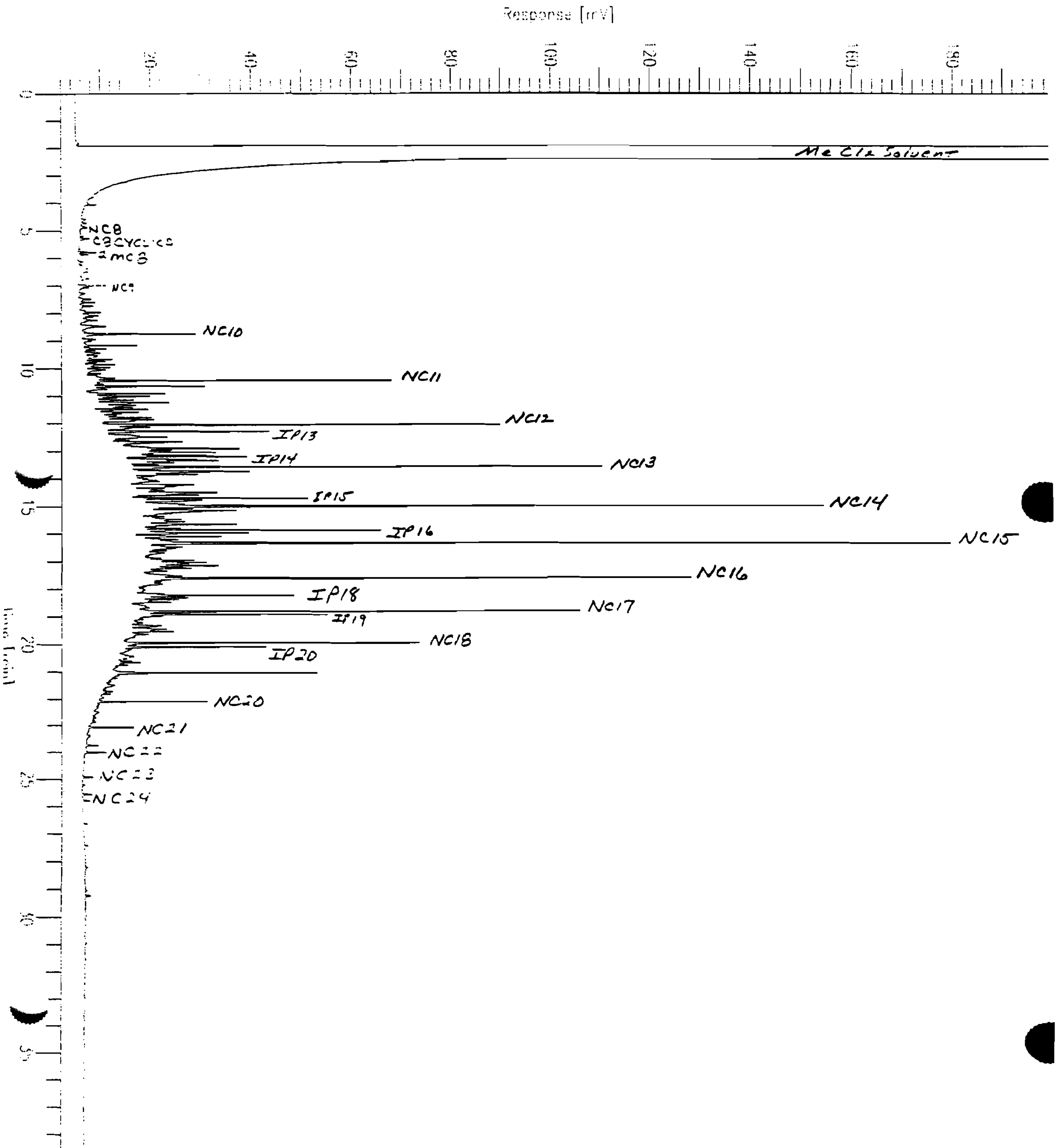
WORLD WIDE GEOSCIENCES - I

mp' Name : D-2
1 : C:\TC4\41WW\41WW141.RAW
th : WWG.MTH
art Time : 0.00 min
ale Factor: 0.0

End Time : 40.00 min
Plot Offset: 2 mV

Sample #: STANDARD
Date : 2/13/01 09:47 AM
Time of Injection: 2/5/01 11:55 PM
Low Point : 2.00 mV
Plot Scale: 200.0 mV

High Point : 202.00 mV



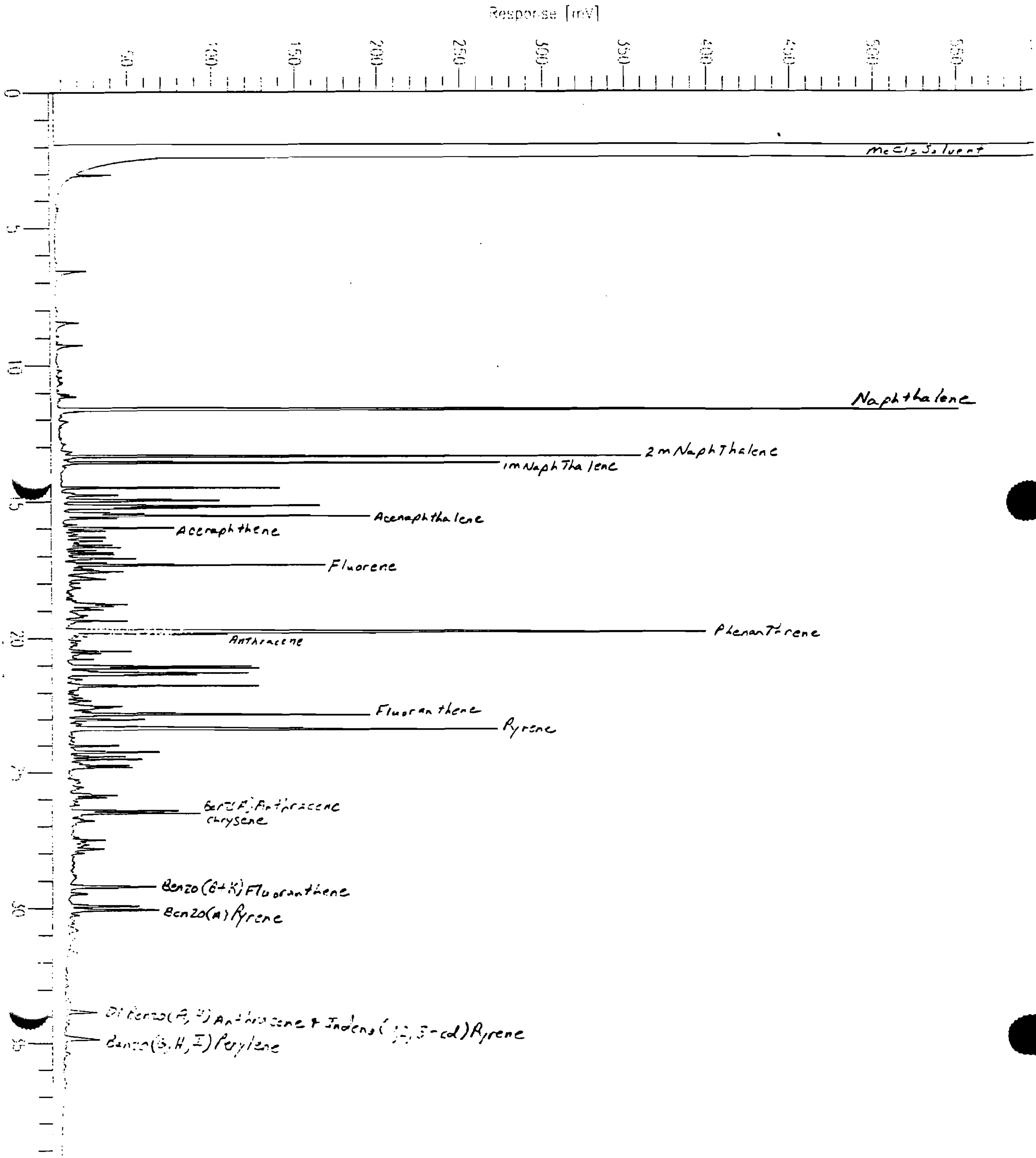
WORLD WIDE GEOSCIENCES - I

ple Name : PAH
eN : C:\TC4\41WW\41WW146.RAW
: WWG.MTH
le : 0.00 min
le Factor: 0.0

End Time : 40.00 min
Plot Offset: 2 mV

Sample #: STANDARD
Date : 2/13/01 09:50 AM
Time of Injection: 2/6/01 04:47 AM
Low Point : 2.00 mV
Plot Scale: 600.0 mV

High Point : 602.00 mV



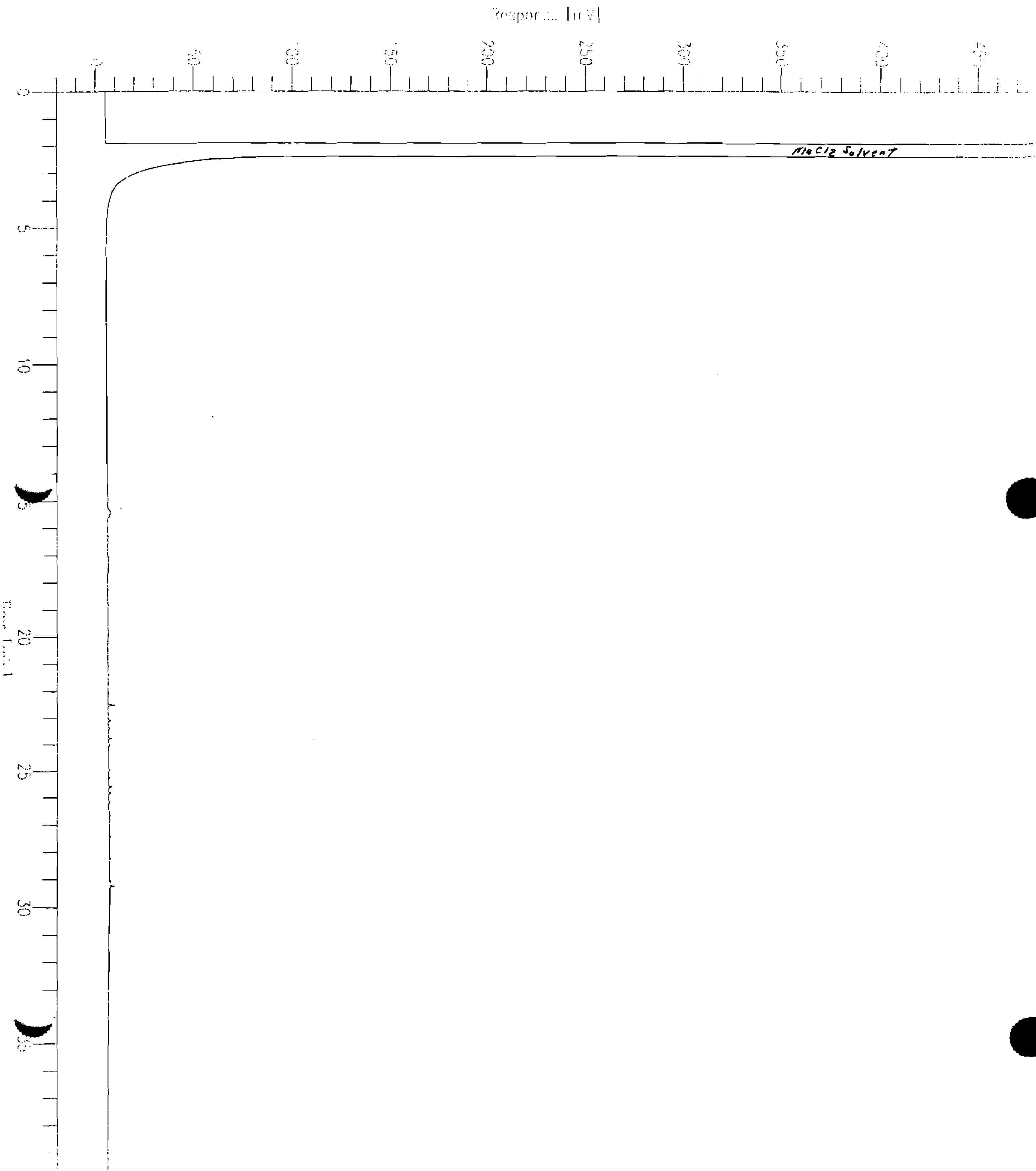
WWG I - 10 SL

ample Name : BLANK
ile'' 'e : C:\TC4\41WW\41WW151.raw
et : WWG1__10
ta ime : 0.00 min
cale Factor: -1.0

End Time : 40.00 min
Plot Offset: -20 mV

Sample #: BLANK
Date : 2/12/01 04:18 PM
Time of Injection: 2/6/01 11:24 AM
Low Point : -20.05 mV
Plot Scale: 500.0 mV

High Point : 479.95 mV



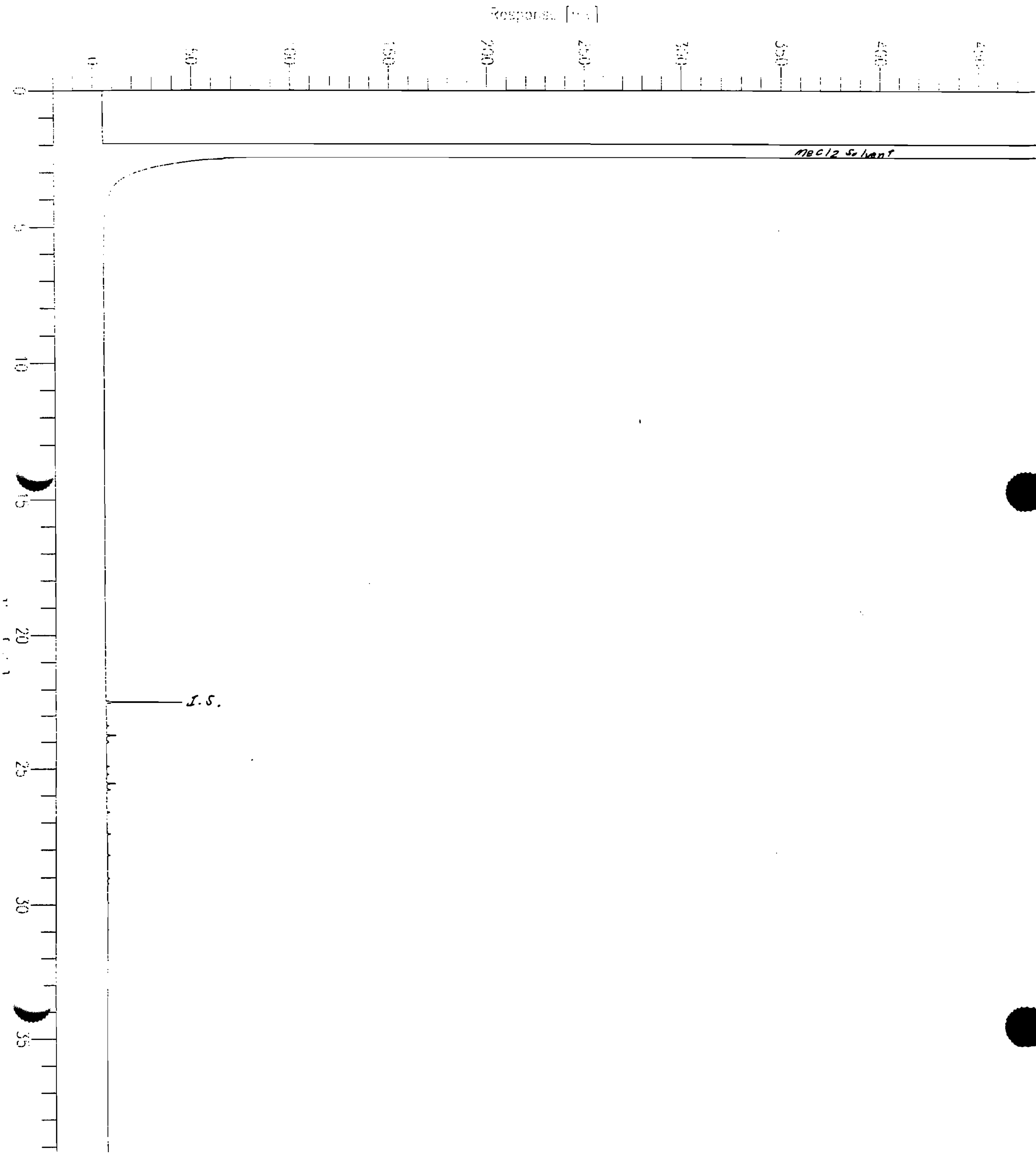
WWG I - 10 SL

ıple Name : ~~SOLVENT~~ METHOD BLANK
.e' : C:\TC4\41WW\41WW152.raw
:h : WWG1__10
ırt Time : 0.00 min
ıle Factor: -1.0

End Time : 40.00 min
Plot Offset: -20 mV

Sample #: BLANK
Date : 2/12/01 04:18 PM
Time of Injection: 2/6/01 12:25 PM
Low Point : -20.04 mV
Plot Scale: 500.0 mV

High Point : 479.96 mV



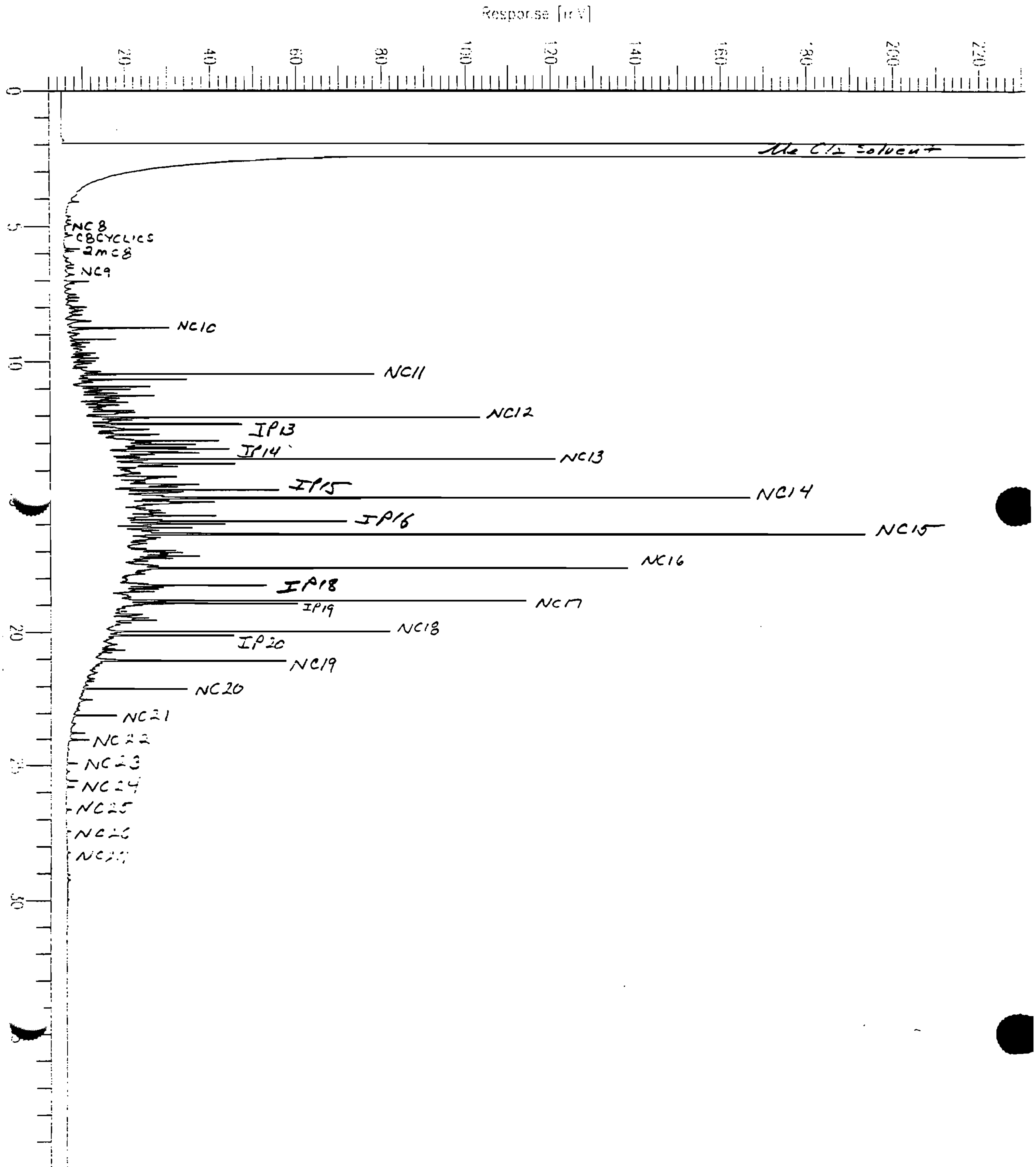
WORLD WIDE GEOSCIENCES - I

ɔle Name : D-2
ɘName : C:\TC4\41WW\41WW153.RAW
ɔod : WWG.MTH
rt e : 0.00 min
1 tor: 0.0

End Time : 40.00 min
Plot Offset: 2 mV

Sample #: STANDARD
Date : 2/13/01 09:57 AM
Time of Injection: 2/6/01 01:24 PM
Low Point : 2.00 mV
Plot Scale: 230.0 mV

High Point : 232.00 mV



WWG I - 10 SL

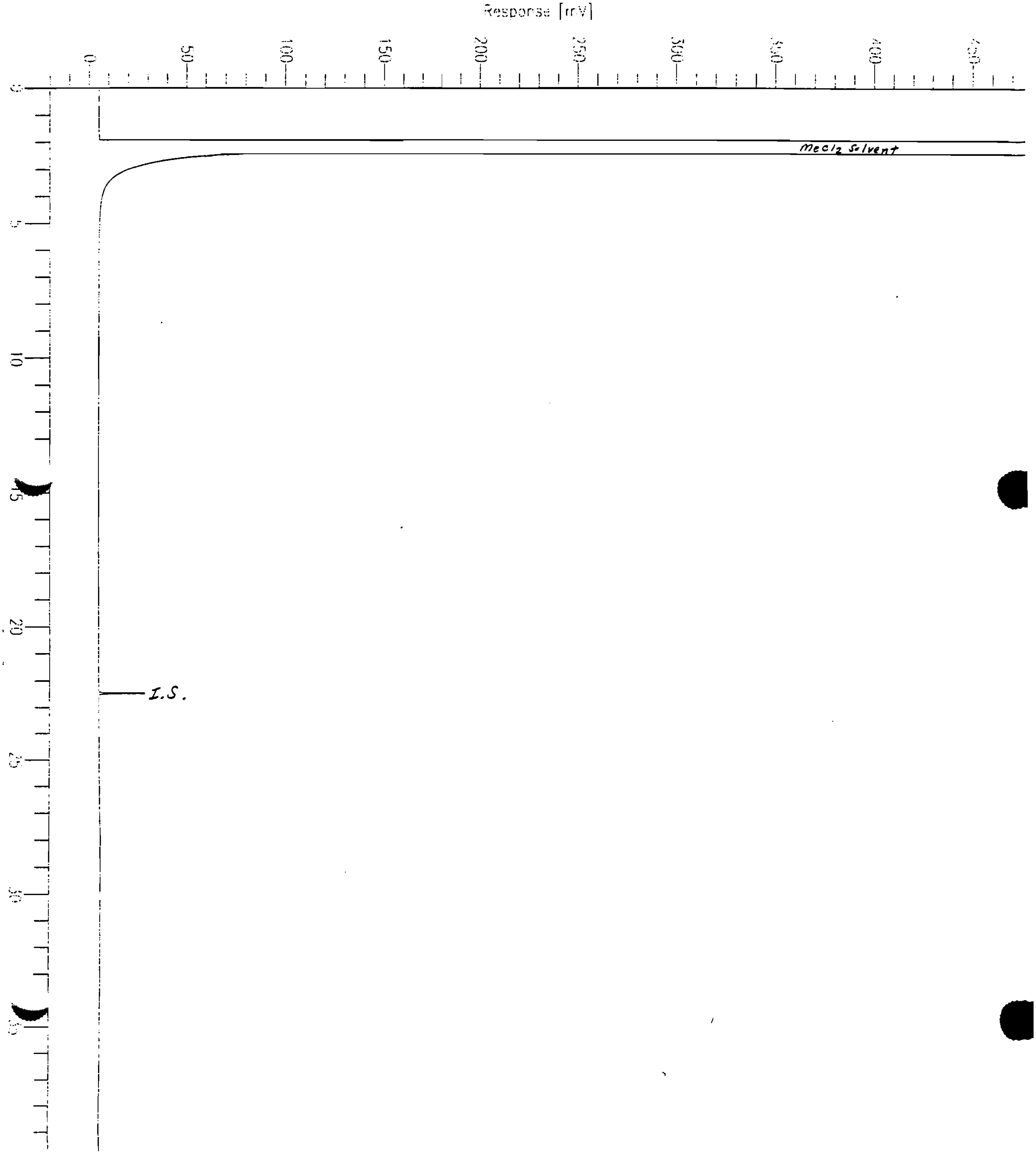
ple Name : ~~SOLVENT~~ METHOD BLANK
.eName : C:\TC4\41WW\41WW158.raw
:hc : WWGi__10
ar e : 0.00 min
le actor: -1.0

End Time : 40.00 min
Plot Offset: -20 mV

Sample #: BLANK
Date : 2/21/01 04:27 PM
Time of Injection: 2/13/01 04:58 PM
Low Point : -20.25 mV
Plot Scale: 500.0 mV

Page 1 of 1

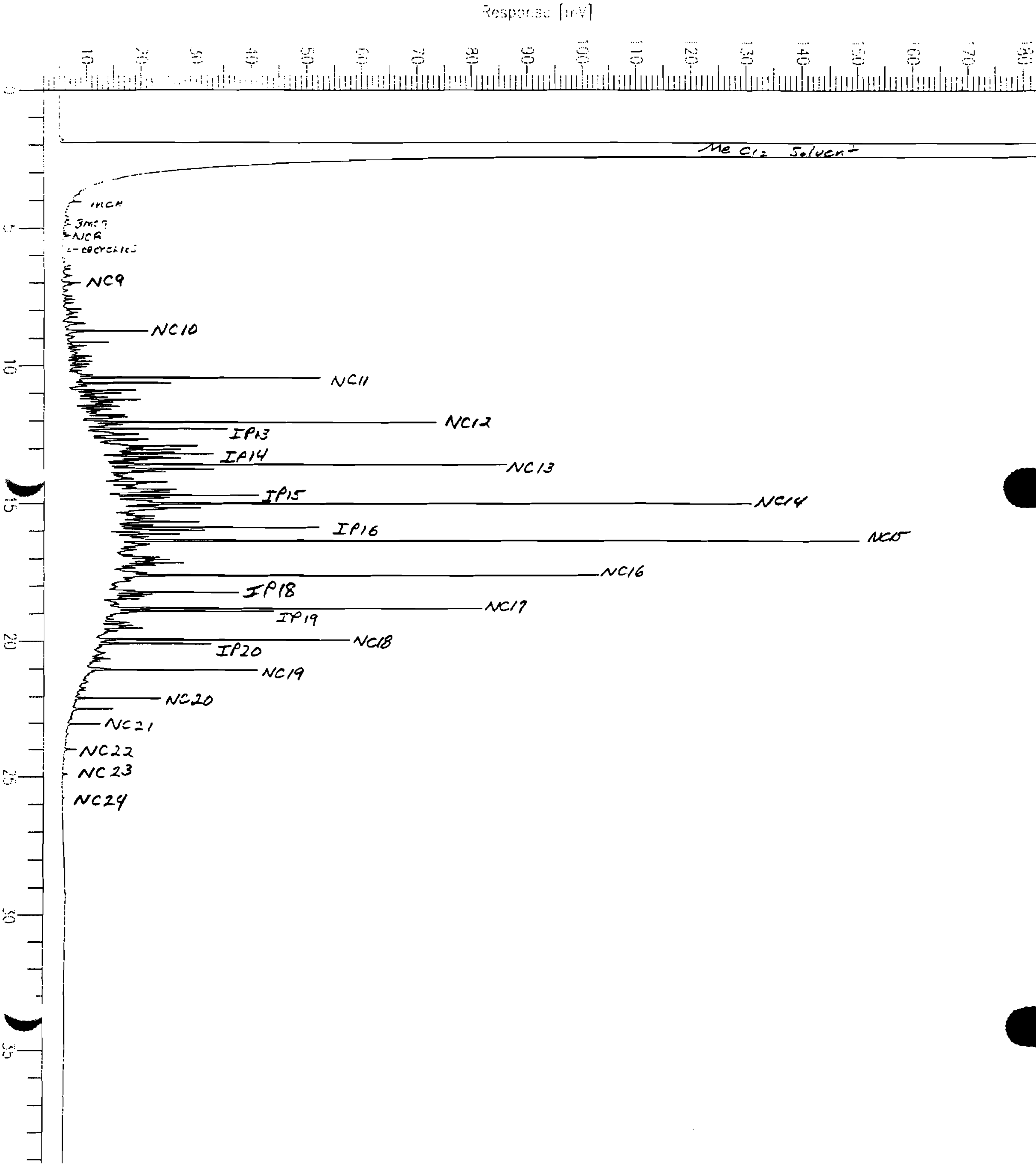
High Point : 479.75 mV



WORLD WIDE GEOSCIENCES - I

mple Name : D-2
ile : C:\TC4\41WW\41WW159.RAW
th : WWG.MTH
art me : 0.00 min   End Time : 40.00 min
ale Factor: 0.0   Plot Offset: 2 mV

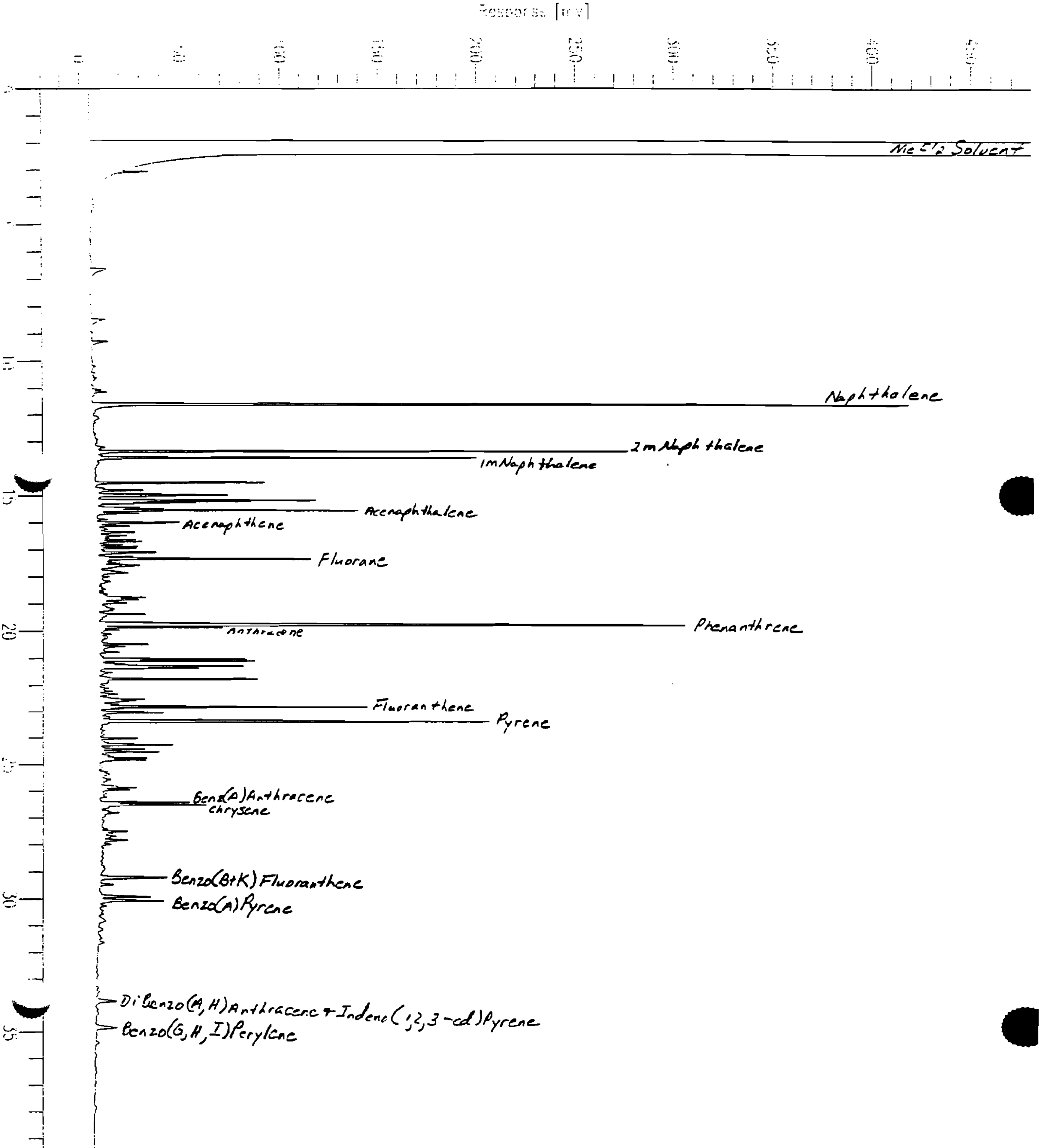
Sample #: STANDARD
Date : 2/21/01 04:38 PM
Time of Injection: 2/13/01 05:57 PM
Low Point : 2.00 mV   High Point : 182.00 mV
Plot Scale: 180.0 mV



WWG I - 10 SL

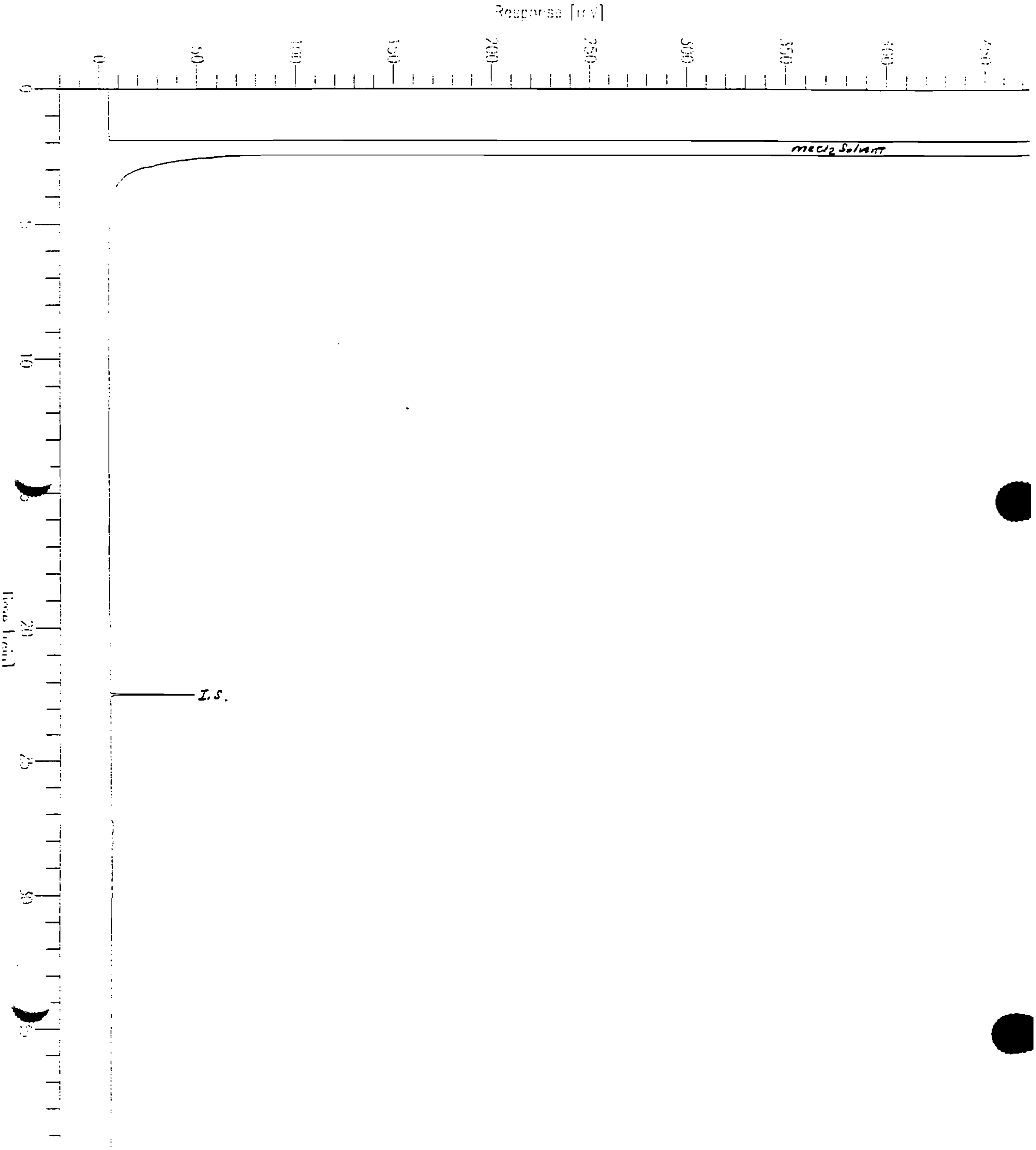
le Name : PAH
Nam- : C:\TC4\41WW\41WW16C.raw
o : WWG1__10
t : 0.00 min End Time : 40.00 min
e Factor: -1.0 Plot Offset: -20 mV

Sample #: STANDARD
Date : 2/21/01 04:27 PM
Time of Injection: 2/13/01 06:56 PM
Low Point : -20.10 mV High Point : 479.90 mV
Plot Scale: 500.0 mV



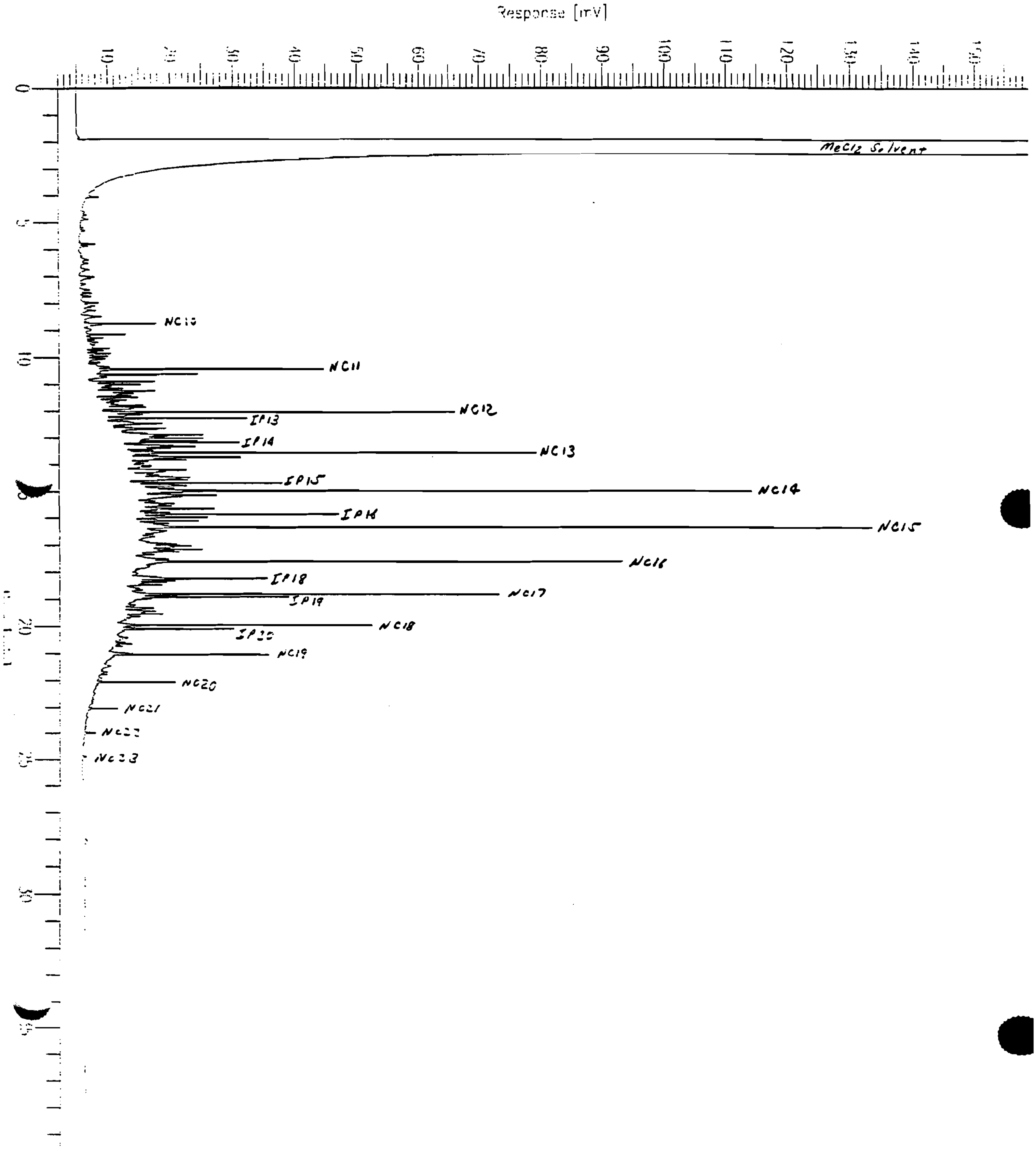
WWG I - 10 SL

mple Name : ~~SOLVENT~~ METHOD BLANK		Sample #: BLANK	Page 1 of 1
leName : C:\TC4\41WW\41WW180.raw		Date : 3/15/01 12:30 PM	
t' : WWG1__10		Time of Injection: 3/13/01 05:11 PM	
a me : 0.00 min	End Time : 40.00 min	Low Point : -20.22 mV	High Point : 479.78 mV
ale Factor: -1.0	Plot Offset: -20 mV	Plot Scale: 500.0 mV	



WORLD WIDE GEOSCIENCES - I

...ple Name : D-2		Sample #: STANDARD	
...eName : C:\TC4\41WW\41WW176.RAW		Date : 3/15/01 12:36 PM	
...r : WWG.MTH		Time of Injection: 3/13/01 01:40 PM	
...me : 0.00 min	End Time : 40.00 min	Low Point : 2.00 mV	High Point : 162.00 mV
...ale Factor: 0.0	Plot Offset: 2 mV	Plot Scale: 160.0 mV	

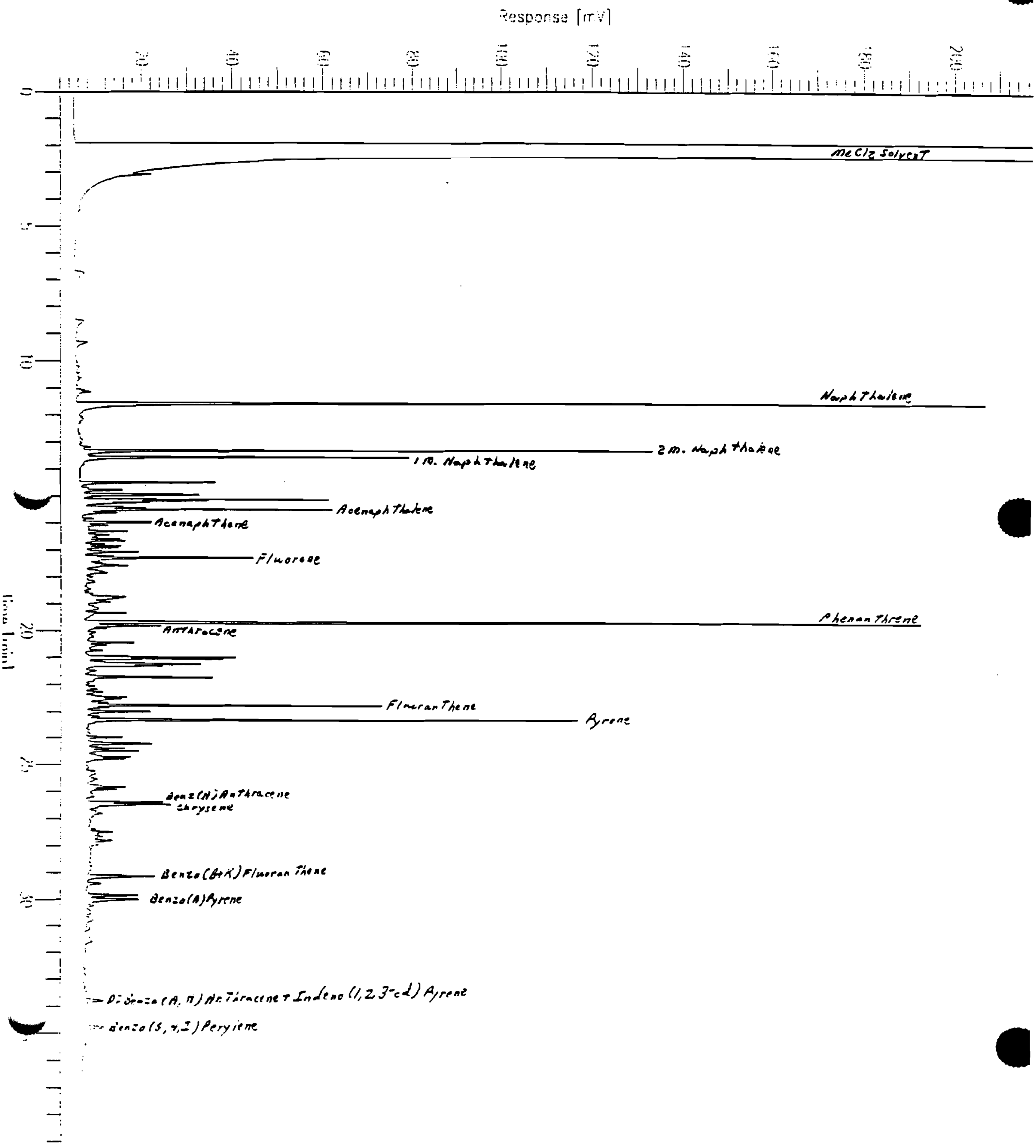


WORLD WIDE GEOSCIENCES - 1

nple Name : PAH
LeName : C:\TC4\41WW\41WW177.RAW
ch : WWG.MTH
a me : 0.00 min
a ctor: 0.0
End Time : 40.00 min
Plot Offset: 2 mV

Sample #: STANDARD
Date : 3/15/01 12:37 PM
Time of Injection: 3/13/01 02:35 PM
Low Point : 2.00 mV
Plot Scale: 220.0 mV

High Point : 222.00 mV



APPENDIX III

CHROMATOGRAM PEAK AREA TABLES

oftware Version: 4.1<2F12>
ample Name : J-01010-B MW-30 Time : 3/14/01 11:11 AM
ample Number: 10209001 Study : WWG
pe··ator :

nstrument : WWG_EXTRACTS Channel : A A/D mV Range : 1000
utoSampler : BUILT-IN
ack/Vial : 0/5

nterface Serial # : NONE Data Acquisition Time: 2/13/01 07:55 PM
elay Time : 0.00 min.
nd Time : 40.00 min.
ampling Rate : 6.2500 pts/sec

aw Data File : C:\TC4\41WW\41WW161.RAW
esult File : C:\WINDOWS\TEMP\~RST002A.RST
nst Method : G:\GC4\4A-SEQ\WWG1__10 from C:\WINDOWS\TEMP\~RST002A.RST
roc Method : C:\TC4\WWGINT.MTH
alib Method : C:\TC4\WWGINT.MTH
equence File : G:\GC4\4A-SEQ\41WW.SEQ

ample Volume : 1.0000 ul Area Reject : 2000.000000
ample Amount : 1.0000 Dilution Factor : 1.00

WWG-INT REPORT

eak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	2.421	3590.38	11517.91	0.00	0.00	BB	0.31
2	2.490	3143.05	5590.10	0.00	0.00	BB	0.56
3	3.048	11728.94	9228.86	0.01	0.01	*BV	1.27
4	3.085	7811.91	7114.25	0.01	0.01	*VB	1.10
5	3.212	11307.88	6672.08	0.01	0.01	*BB	1.69
6	3.340	8816.08	5958.13	0.01	0.01	*BV	1.48
7	3.376	24900.08	15397.71	0.02	0.02	*VV	1.62
8	3.397	15675.39	13886.87	0.01	0.01	*VV	1.13
9	3.435	6603.08	4099.14	0.01	0.01	*VV	1.61
10	3.475	19982.81	17332.33	0.02	0.02	*VB	1.15
11	3.597	118706.54	36479.75	0.11	0.11	*BV	3.25
	3.630	110678.89	87531.57	0.10	0.10	*VB	1.26
13	3.770	30937.32	18377.48	0.03	0.03	*BB	1.68
14	3.858	4336.17	3308.29	0.00	0.00	*BV	1.31
15	3.902	11246.62	7001.35	0.01	0.01	*VB	1.61
16	3.949	3837.87	3316.72	0.00	0.00	*BV	1.16
17	4.040	58287.10	23933.97	0.05	0.05	*VB	2.44

eak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
[illegible]	4.200	139775.52	61596.09	0.13	0.13	*BV	2.27
19	4.228	92534.38	57205.75	0.09	0.09	*VV	1.62
20	4.318	23659.47	12412.16	0.02	0.02	*VV	1.91
21	4.467	480879.36	156452.43	0.45	0.45	*VV	3.07
22	4.532	206520.13	133246.95	0.19	0.19	*VE	1.55
23	4.578	32973.01	20336.96	0.03	0.03	*EV	1.62
24	4.626	173848.96	72375.64	0.16	0.16	*VV	2.40
25	4.717	315990.49	100110.56	0.30	0.30	*VV	3.16
26	4.838	304050.91	119043.14	0.29	0.29	*VV	2.55
27	4.880	85605.78	40685.84	0.08	0.08	*VV	2.10
28	5.002	157373.30	70045.25	0.15	0.15	*VV	2.25
29	5.043	68784.34	39329.12	0.06	0.06	*VV	1.75
30	5.083	100974.56	30664.80	0.09	0.09	*VV	3.29
31	5.170	88379.66	31362.39	0.08	0.08	*VV	2.82
32	5.266	370822.93	110549.14	0.35	0.35	*VV	3.35
33	5.373	152165.59	47948.78	0.14	0.14	*VV	3.17
34	5.528	50747.25	17417.34	0.05	0.05	*VV	2.91
35	5.589	57803.42	22616.67	0.05	0.05	*VV	2.56
36	5.658	71380.57	31898.31	0.07	0.07	*VV	2.24
37	5.691	31327.17	17662.10	0.03	0.03	*VV	1.77
38	5.768	183269.32	66060.50	0.17	0.17	*VV	2.77
[illegible]	5.878	262510.42	74319.33	0.25	0.25	*VV	3.53
[illegible]	5.945	51574.57	22939.23	0.05	0.05	*VV	2.25
41	5.995	93469.30	24882.36	0.09	0.09	*VV	3.76
42	6.125	819055.16	301437.04	0.77	0.77	*VV	2.72
43	6.297	832100.28	272860.62	0.78	0.78	*VV	3.05
44	6.391	552562.85	164144.80	0.52	0.52	*VV	3.37
45	6.516	390253.90	153999.72	0.37	0.37	*VV	2.53
46	6.579	121780.91	36224.47	0.11	0.11	*VV	3.36
47	6.647	167575.79	51622.02	0.16	0.16	*VV	3.25
48	6.757	385083.91	102092.64	0.36	0.36	*VV	3.77
49	6.885	126258.12	33179.29	0.12	0.12	*VV	3.81
50	7.004	392931.80	135272.47	0.37	0.37	*VV	2.90
51	7.086	121771.23	43603.74	0.11	0.11	*VV	2.79
52	7.134	50105.94	21585.55	0.05	0.05	*VV	2.32
53	7.235	176433.38	71401.42	0.17	0.17	*VV	2.47
54	7.301	136142.68	47294.30	0.13	0.13	*VV	2.88
55	7.329	79086.24	42285.62	0.07	0.07	*VV	1.87
56	7.380	53063.84	20512.46	0.05	0.05	*VV	2.59
57	7.467	230994.98	58477.47	0.22	0.22	*VV	3.95
58	7.551	160804.16	47867.02	0.15	0.15	*VV	3.36
59	7.629	227813.18	71821.71	0.21	0.21	*VV	3.17
60	7.772	797854.24	240763.24	0.75	0.75	*VV	3.31
[illegible]	7.950	620970.72	246327.59	0.58	0.58	*VV	2.52
[illegible]	7.994	175537.01	67705.66	0.16	0.16	*VV	2.59
63	8.059	423990.37	168033.07	0.40	0.40	*VV	2.52
64	8.135	527659.80	163018.33	0.50	0.50	*VV	3.24
65	8.172	209210.49	122123.71	0.20	0.20	*VV	1.71
66	8.228	373804.32	159468.57	0.35	0.35	*VV	2.34

eak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]	
[illegible]	8.297	351986.89	109803.47	0.33	0.33	*VV	3.21	
58	8.357	154239.76	44401.70	0.14	0.14	*VV	3.47	
69	8.551	2743688.34	719808.48	2.58	2.58	*VE	3.81	
70	8.610	143089.94	45471.62	0.13	0.13	*EV	3.15	
71	8.665	80374.43	35807.40	0.08	0.08	*VV	2.24	
72	8.790	594235.80	160635.11	0.56	15,25 0.56	*VV	3.70	NC10
73	8.841	73161.41	32692.76	0.07	0.07	*VV	2.24	
74	8.895	63966.84	25750.07	0.06	0.06	*VV	2.48	
75	8.990	848384.00	336188.28	0.80	0.80	*VV	2.52	
76	9.038	212734.16	75711.43	0.20	0.20	*VV	2.81	
77	9.177	875316.56	276637.54	0.82	0.82	*VV	3.16	
78	9.247	137130.44	68737.37	0.13	0.13	*VV	1.99	
79	9.282	307754.31	77034.15	0.29	0.29	*VV	4.00	
80	9.452	763731.06	223520.80	0.72	0.72	*VV	3.42	
81	9.487	222234.93	115278.98	0.21	0.21	*VV	1.93	
82	9.572	683878.29	244085.21	0.64	0.64	*VV	2.80	
83	9.615	295731.97	166934.66	0.28	0.28	*VV	1.77	
84	9.650	124662.11	76311.68	0.12	0.12	*VV	1.63	
85	9.703	235768.06	84725.48	0.22	0.22	*VV	2.78	
86	9.758	629448.87	165304.53	0.59	0.59	*VV	3.81	
87	9.861	256190.23	114459.55	0.24	0.24	*VV	2.24	
[illegible]	9.959	1003088.73	274696.82	0.94	0.94	*VV	3.65	
[illegible]	9.987	353619.35	230539.54	0.33	0.33	*VV	1.53	
90	10.030	194104.99	119794.92	0.18	0.18	*VV	1.62	
91	10.093	1371886.71	488830.69	1.29	1.29	*VE	2.81	
92	10.144	133119.06	70526.47	0.12	0.12	*EV	1.89	
93	10.174	177879.19	86583.25	0.17	0.17	*VV	2.05	
94	10.235	157412.73	65506.86	0.15	0.15	*VV	2.40	
95	10.301	164709.82	70176.40	0.15	0.15	*VV	2.35	
96	10.336	143528.22	80061.44	0.13	0.13	*VV	1.79	
97	10.359	114077.26	81131.46	0.11	0.11	*VV	1.41	
98	10.402	454780.73	141476.85	0.43	0.43	*VV	3.21	
99	10.507	521545.22	145428.13	0.49	0.49	*VV	3.59	
00	10.631	760655.89	230980.93	0.71	0.71	*VV	3.29	
01	10.701	911114.72	351593.35	0.86	0.86	*VV	2.59	
02	10.770	198730.80	83563.73	0.19	0.19	*VV	2.38	
03	10.811	244089.43	84224.22	0.23	0.23	*VV	2.90	
04	10.967	1278535.93	351008.03	1.20	1.20	*VV	3.64	
05	11.039	184272.52	95109.05	0.17	0.17	*VV	1.94	
06	11.083	381477.12	169442.77	0.36	0.36	*VV	2.25	
07	11.144	802990.83	265471.71	0.75	0.75	*VV	3.02	
08	11.200	579156.22	230361.42	0.54	0.54	*VV	2.51	
09	11.301	409396.25	98665.30	0.38	0.38	*VV	4.15	
[illegible]	11.340	436996.94	152332.99	0.41	0.41	*VV	2.87	
1	11.414	435073.04	135799.63	0.41	0.41	*VV	3.20	
12	11.440	195871.78	125219.09	0.18	0.18	*VV	1.56	
13	11.481	195143.14	96872.16	0.18	0.18	*VV	2.01	
14	11.557	502864.34	178080.06	0.47	0.47	*VV	2.82	
15	11.642	680492.46	228582.51	0.64	0.64	*VV	2.98	

eak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
[illegible]	11.685	215079.75	105126.20	0.20	0.20	*VV	2.05
17	11.764	850806.84	203906.27	0.80	0.80	*VV	4.17
18	11.846	482804.22	179360.81	0.45	0.45	*VV	2.69
19	11.922	1260678.20	282507.08	1.18	1.18	*VV	4.46
20	12.102	602671.41	202623.97	0.57	0.57	*VV	2.97
21	12.153	209083.96	90425.14	0.20	0.20	*VV	2.31
22	12.190	138095.26	78534.10	0.13	0.13	*VV	1.76
23	12.242	348356.24	102463.51	0.33	0.33	*VV	3.40
24	12.353	826200.60	263269.88	0.78	0.78	*VV	3.14
25	12.467	710186.64	151831.04	0.67	0.67	*VV	4.68
26	12.555	546442.23	124706.38	0.51	0.51	*VV	4.38
27	12.650	418373.06	114864.59	0.39	0.39	*VV	3.64
28	12.745	767815.91	202173.28	0.72	0.72	*VV	3.80
29	12.794	214108.00	74634.66	0.20	0.20	*VV	2.87
30	12.886	422191.98	105865.17	0.40	0.40	*VV	3.99
31	12.952	572690.78	174371.54	0.54	0.54	*VV	3.28
32	13.003	389360.61	107716.82	0.37	0.37	*VV	3.61
33	13.097	844625.25	146857.63	0.79	0.79	*VV	5.75
34	13.232	502474.79	183515.21	0.47	0.47	*VV	2.74
35	13.270	456990.31	223912.22	0.43	0.43	*VV	2.04
36	13.330	280286.36	109274.62	0.26	0.26	*VV	2.56
37	13.395	1142553.31	253357.37	1.07	1.07	*VV	4.51
[illegible]	13.485	320433.61	103230.11	0.30	0.30	*VV	3.10
39	13.547	282711.65	109691.18	0.27	0.27	*VV	2.58
40	13.627	1022794.62	224723.19	0.96	0.96	*VV	4.55
41	13.731	180045.44	83057.96	0.17	0.17	*VV	2.17
42	13.795	904018.97	185398.99	0.85	0.85	*VV	4.88
43	13.904	511772.07	160350.66	0.48	0.48	*VV	3.19
44	13.960	388968.67	97813.45	0.37	0.37	*VV	3.98
45	14.039	246900.06	93184.99	0.23	0.23	*VV	2.65
46	14.079	490017.54	113794.96	0.46	0.46	*VV	4.31
47	14.149	469669.73	105983.74	0.44	0.44	*VV	4.43
48	14.263	445298.03	139586.34	0.42	0.42	*VV	3.19
49	14.310	541760.94	140329.06	0.51	0.51	*VV	3.86
50	14.412	417694.96	92262.93	0.39	0.39	*VV	4.53
51	14.495	349494.23	103157.25	0.33	0.33	*VV	3.39
52	14.572	696397.68	121460.62	0.65	0.65	*VV	5.73
53	14.649	230216.79	90103.98	0.22	0.22	*VV	2.56
54	14.685	140812.26	82259.86	0.13	0.13	*VV	1.71
55	14.776	805018.60	255380.32	0.76	0.76	*VV	3.15
56	14.817	476666.74	174547.63	0.45	0.45	*VV	2.73
57	14.864	487553.88	134888.51	0.46	0.46	*VV	3.61
58	14.987	599024.12	158638.16	0.56	0.56	*VV	3.78
[illegible]	15.026	464859.20	162027.55	0.44	0.44	*VV	2.87
[illegible]	15.083	320390.68	123071.76	0.30	0.30	*VV	2.60
61	15.136	378311.97	144885.09	0.36	0.36	*VV	2.61
62	15.210	869512.89	224755.73	0.82	0.82	*VV	3.87
63	15.262	768512.54	157665.89	0.72	0.72	*VV	4.87
64	15.371	243656.03	102688.04	0.23	0.23	*VV	2.37

eak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
[illegible]	15.445	383223.06	108840.93	0.36	0.36	*VV	3.52
66	15.534	736355.56	201270.22	0.69	0.69	*VV	3.66
67	15.563	710942.88	230793.93	0.67	0.67	*VV	3.08
68	15.627	260548.04	118242.07	0.24	0.24	*VV	2.20
69	15.695	829120.11	164746.67	0.78	0.78	*VV	5.03
70	15.780	223943.22	98286.80	0.21	0.21	*VV	2.28
71	15.865	386336.89	94935.96	0.36	0.36	*VV	4.07
72	15.950	1144123.69	314158.35	1.07	1.07	*VV	3.64
73	16.050	914003.44	203199.34	0.86	0.86	*VV	4.50
74	16.127	399559.97	133756.00	0.38	0.38	*VV	2.99
75	16.183	534360.19	175478.27	0.50	0.50	*VV	3.05
76	16.239	185043.16	98079.75	0.17	0.17	*VV	1.89
77	16.286	505546.89	129184.13	0.47	0.47	*VV	3.91
78	16.375	834286.23	190255.94	0.78	0.78	*VV	4.39
79	16.427	381280.91	142995.39	0.36	0.36	*VV	2.67
80	16.493	370206.62	130969.22	0.35	0.35	*VV	2.83
81	16.543	286917.17	127267.50	0.27	0.27	*VV	2.25
82	16.591	475563.75	148549.24	0.45	0.45	*VV	3.20
83	16.667	645611.53	170766.67	0.61	0.61	*VV	3.78
84	16.751	1017749.18	182528.07	0.96	0.96	*VV	5.58
85	16.881	351293.75	108527.64	0.33	0.33	*VV	3.24
86	16.939	522825.62	157156.27	0.49	0.49	*VV	3.33
[illegible]	17.002	426097.76	152051.47	0.40	0.40	*VV	2.80
88	17.038	286340.41	114652.84	0.27	0.27	*VV	2.50
89	17.141	766095.64	179597.26	0.72	0.72	*VV	4.27
90	17.188	494586.58	159041.72	0.46	0.46	*VV	3.11
91	17.278	545117.26	153557.71	0.51	0.51	*VV	3.55
92	17.321	352223.39	138477.17	0.33	0.33	*VV	2.54
93	17.365	511284.66	121502.62	0.48	0.48	*VV	4.21
94	17.462	347513.77	105967.75	0.33	0.33	*VV	3.28
95	17.557	539704.67	121601.10	0.51	0.51	*VV	4.44
96	17.596	670737.98	160968.98	0.63	0.63	*VV	4.17
97	17.666	286522.93	124545.20	0.27	0.27	*VV	2.30
98	17.704	408441.63	125785.19	0.38	0.38	*VV	3.25
99	17.814	602036.67	128705.20	0.57	0.57	*VV	4.68
00	17.867	548203.25	143610.12	0.51	0.51	*VV	3.82
01	17.931	195548.66	104472.40	0.18	0.18	*VV	1.87
02	17.955	98094.43	103956.54	0.09	0.09	*VV	0.94
03	17.994	357936.24	107195.93	0.34	0.34	*VV	3.34
04	18.047	400809.64	104580.89	0.38	0.38	*VV	3.83
05	18.117	315865.69	97080.01	0.30	0.30	*VV	3.25
06	18.160	303382.67	96386.90	0.28	0.28	*VV	3.15
07	18.239	379921.31	118829.66	0.36	0.36	*VV	3.20
08	18.320	869958.08	243265.90	0.82	0.82	*VV	3.58
[illegible]	18.382	320587.84	99561.01	0.30	0.30	*VV	3.22
10	18.419	238494.25	99189.83	0.22	0.22	*VV	2.40
11	18.522	797879.24	112687.97	0.75	0.75	*VV	7.08
12	18.614	258695.99	89368.58	0.24	0.24	*VV	2.89
13	18.705	503770.26	117297.00	0.47	0.47	*VV	4.29

eak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
[illegible]	18.737	378957.10	108880.84	0.36	0.36	*VV	3.48
[illegible]	18.794	94142.90	99296.47	0.09	0.09	*VV	0.95
16	18.826	296653.98	109578.97	0.28	0.28	*VV	2.71
17	18.903	627639.38	124758.52	0.59	0.59	*VV	5.03
18	19.019	1329898.91	342795.67	1.25	1.25	*VV	3.88
19	19.060	359660.17	114982.92	0.34	0.34	*VV	3.13
20	19.130	614807.62	110026.26	0.58	0.58	*VV	5.59
21	19.233	206075.45	94704.76	0.19	0.19	*VV	2.18
22	19.287	626978.34	112083.63	0.59	0.59	*VV	5.59
23	19.418	644532.01	107520.81	0.60	0.60	*VV	5.99
24	19.520	533012.65	120784.43	0.50	0.50	*VV	4.41
25	19.603	422957.71	93446.00	0.40	0.40	*VV	4.53
26	19.650	317713.82	83666.49	0.30	0.30	*VV	3.80
27	19.775	623358.40	108614.79	0.59	0.59	*VV	5.74
28	19.842	244880.01	82928.61	0.23	0.23	*VV	2.95
29	19.897	266994.61	83264.30	0.25	0.25	*VV	3.21
30	19.992	608351.59	90933.06	0.57	0.57	*VV	6.69
31	20.076	290735.90	85476.72	0.27	0.27	*VV	3.40
32	20.181	845124.75	228571.63	0.79	0.79	*VV	3.70
33	20.288	492910.63	90548.25	0.46	0.46	*VV	5.44
34	20.343	298899.10	91000.47	0.28	0.28	*VV	3.28
35	20.439	493924.58	86490.81	0.46	0.46	*VV	5.71
[illegible]	20.502	326601.82	84423.94	0.31	0.31	*VV	3.87
37	20.622	426658.82	81496.06	0.40	0.40	*VV	5.24
38	20.668	229726.32	74828.77	0.22	0.22	*VV	3.07
39	20.709	166159.45	72132.63	0.16	0.16	*VV	2.30
40	20.755	145304.51	72528.09	0.14	0.14	*VV	2.00
41	20.795	397260.24	75175.22	0.37	0.37	*VV	5.28
42	20.900	518582.02	73839.97	0.49	0.49	*VV	7.02
43	21.063	505217.27	119497.09	0.47	0.47	*VV	4.23
44	21.131	335115.66	84879.97	0.31	0.31	*VV	3.95
45	21.189	319631.15	72014.26	0.30	0.30	*VV	4.44
46	21.286	261075.18	72153.04	0.25	0.25	*VV	3.62
47	21.327	215653.93	73136.66	0.20	0.20	*VV	2.95
48	21.397	241445.43	74574.38	0.23	0.23	*VV	3.24
49	21.467	291692.52	63815.88	0.27	0.27	*VV	4.57
50	21.545	428899.98	65448.33	0.40	0.40	*VV	6.55
51	21.667	125433.18	50279.22	0.12	0.12	*VV	2.49
52	21.723	386331.40	58946.89	0.36	0.36	*VV	6.55
53	21.839	191111.96	51876.16	0.18	0.18	*VV	3.68
54	21.916	232568.43	57297.27	0.22	0.22	*VV	4.06
55	21.954	401579.21	58508.78	0.38	0.38	*VV	6.86
56	22.129	343369.27	53188.97	0.32	0.32	*VV	6.46
57	22.243	291346.68	53088.61	0.27	0.27	*VV	5.49
[illegible]	22.348	414774.59	60534.44	0.39	0.39	*VV	6.85
59	22.461	126478.35	40929.18	0.12	0.12	*VV	3.09
60	22.540	409400.64	111536.01	0.38	0.38	*VV	3.67
61	22.609	120272.41	47517.58	0.11	0.11	*VV	2.53
62	22.651	144713.82	41122.59	0.14	0.14	*VV	3.52

eak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
[illegible]	22.731	239731.77	41270.50	0.23	0.23	*VV	5.81
64	22.826	112877.28	37133.28	0.11	0.11	*VV	3.04
65	22.906	431098.81	49797.67	0.40	0.40	*VV	8.66
66	23.077	78668.01	31872.39	0.07	0.07	*VV	2.47
67	23.130	144469.15	32994.19	0.14	0.14	*VV	4.38
68	23.239	235685.52	32140.68	0.22	0.22	*VV	7.33
69	23.365	171642.35	33811.02	0.16	0.16	*VV	5.08
70	23.447	151159.68	32857.63	0.14	0.14	*VV	4.60
71	23.529	143292.45	27663.66	0.13	0.13	*VV	5.18
72	23.624	151338.15	27844.65	0.14	0.14	*VV	5.44
73	23.733	124223.37	28954.48	0.12	0.12	*VV	4.29
74	23.803	116407.02	23721.33	0.11	0.11	*VV	4.91
75	23.885	167559.66	25050.12	0.16	0.16	*VV	6.69
76	24.027	343458.09	19895.19	0.32	0.32	*VV	17.26
77	24.408	181999.07	17428.98	0.17	0.17	*VV	10.44
78	24.552	335031.59	16030.70	0.31	0.31	*VV	20.90
79	25.126	604662.43	10984.20	0.57	0.57	*VV	55.05
80	26.806	25378.56	5038.91	0.02	0.02	*VB	5.04
		1.07e+08	3.14e+07	100.00	100.00		

WORLD WIDE GEOSCIENCES - I

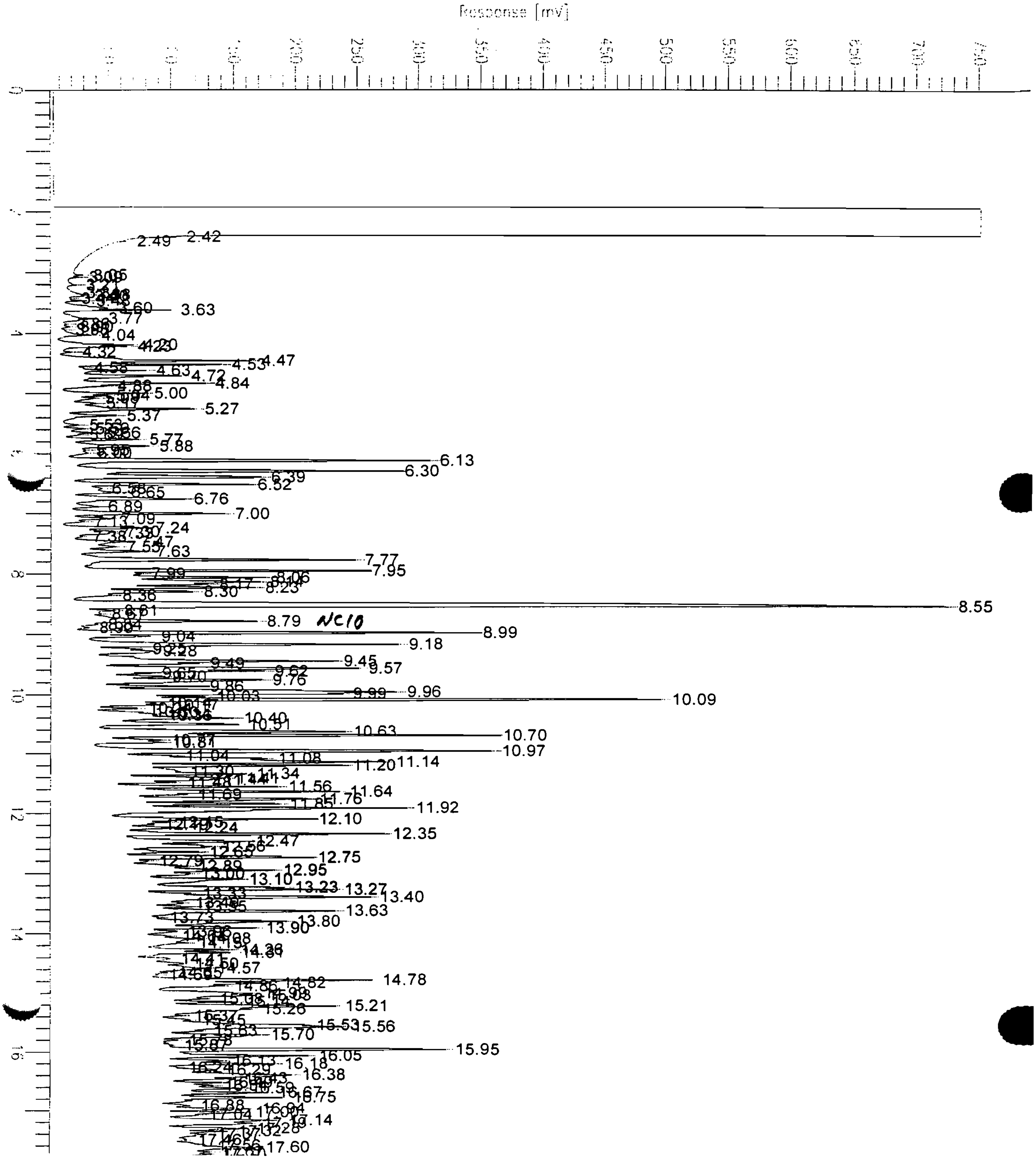
ple Name : J-01010-B MW-30
Sample #: 10209001

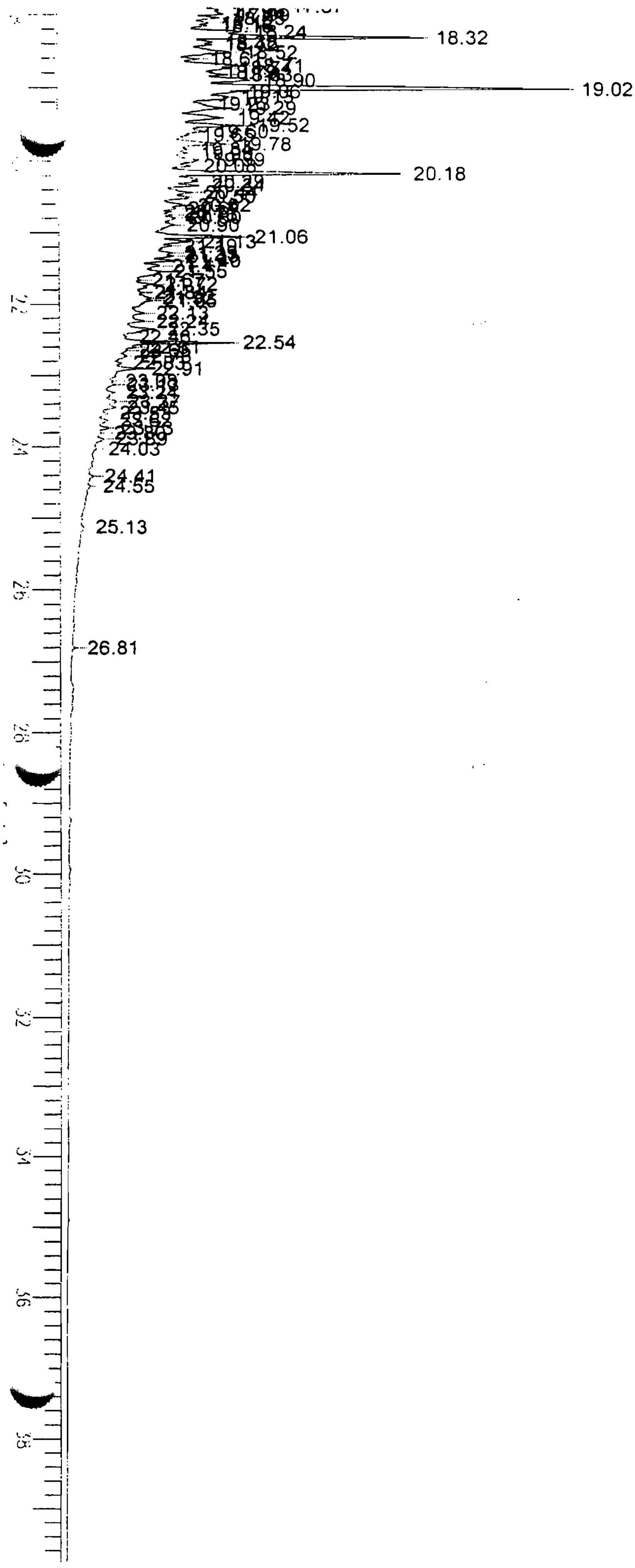
e : C:\TC4\41WW\41WW161.RAW
Date : 3/14/01 11:11 AM

r : WWGINT.MTH
Time of Injection: 2/13/01 07:55 PM

me : 0.00 min End Time : 40.00 min
Low Point : 2.00 mV High Point : 752.00 mV

le Factor: 0.0 Plot Offset: 2 mV
Plot Scale: 750.0 mV





oftware Version: 4.1<2F12>
ample Name : J-01010-B MW-31 (23'-25') Time : 3/14/01 11:12 AM
ample Number: 10209003 Study : WWG
perator :

nstrument : WWG_EXTRACTS Channel : A A/D mV Range : 1000
utoSampler : BUILT-IN
ack/Vial : 0/7

Flat

nterface Serial # : NONE Data Acquisition Time: 2/13/01 09:56 PM
elay Time : 0.00 min.
nd Time : 40.00 min.
ampling Rate : 6.2500 pts/sec

aw Data File : C:\TC4\41WW\41WW163.RAW
esult File : C:\WINDOWS\TEMP\~RST2C56.RST
nst Method : G:\GC4\4A-SEQ\WWG1__10 from C:\WINDOWS\TEMP\~RST2C56.RST
roc Method : C:\TC4\WWGINT.MTH
alib Method : C:\TC4\WWGINT.MTH
equence File : G:\GC4\4A-SEQ\41WW.SEQ

ample Volume : 1.0000 ul Area Reject : 2000.000000
ample Amount : 1.0000 Dilution Factor : 1.00

WWG-INT REPORT

eak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	2.496	3112.06	5542.11	0.01	0.01	BB	0.56
2	3.051	8624.44	6064.05	0.02	0.02	*BV	1.42
3	3.087	5056.85	4581.45	0.01	0.01	*VB	1.10
5	4.461	13868.80	2337.09	0.03	0.03	*VV	5.93
6	5.760	9350.27	4495.56	0.02	0.02	*VV	2.08
7	5.871	30612.57	8146.63	0.06	0.06	*VV	3.76
8	6.111	93348.83	36167.68	0.17	0.17	*VV	2.58
9	6.276	198169.18	65461.26	0.37	0.37	*VV	3.03
10	6.375	106118.99	35157.15	0.20	0.20	*VV	3.02
11	6.498	80182.54	32205.24	0.15	0.15	*VV	2.49
12	6.565	24372.57	8893.64	0.05	0.05	*VV	2.74
[illegible]	6.634	47998.49	16180.06	0.09	0.09	*VV	2.97
14	6.748	130129.02	30072.49	0.24	0.24	*VV	4.33
15	6.989	124408.09	42560.99	0.23	0.23	*VV	2.92
16	7.077	38022.15	15295.36	0.07	0.07	*VV	2.49
17	7.126	17207.72	7249.63	0.03	0.03	*VV	2.37
18	7.229	57023.20	22708.91	0.11	0.11	*VV	2.51

ak	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
	7.295	56621.77	21993.74	0.11	0.11	*VV	2.57
0	7.324	58319.88	20571.81	0.11	0.11	*VV	2.83
1	7.456	109820.81	29759.76	0.20	0.20	*VV	3.69
2	7.537	89389.57	28090.58	0.17	0.17	*VV	3.18
3	7.616	115545.32	42378.10	0.21	0.21	*VV	2.73
4	7.758	368889.15	108356.70	0.68	0.68	*VV	3.40
5	7.906	193217.25	85672.36	0.36	0.36	*VV	2.26
6	7.938	309864.13	157885.82	0.57	0.57	*VV	1.96
7	7.989	83264.23	41490.57	0.15	0.15	*VV	2.01
8	8.055	527402.69	211446.43	0.98	0.98	*VV	2.49
9	8.121	456926.14	152249.10	0.85	0.85	*VV	3.00
0	8.159	112538.70	90682.36	0.21	0.21	*VV	1.24
1	8.217	91590.92	39267.45	0.17	0.17	*VV	2.33
2	8.281	233557.98	78118.72	0.43	0.43	*VV	2.99
3	8.348	137913.22	40186.61	0.26	0.26	*VV	3.43
4	8.530	1920582.52	573750.99	3.56	3.56	*VE	3.35
5	8.598	87695.46	28469.46	0.16	0.16	*EV	3.08
6	8.656	82175.24	33953.03	0.15	0.15	*VV	2.42
7	8.729	116373.58	38483.96	0.22	0.22	*VV	3.02
8	8.777	291321.79	111751.75	0.54 11.95	0.54	*VV	2.61 NC10
39	8.827	43710.70	23570.47	0.08	0.08	*VV	1.85
	8.882	44723.98	17737.37	0.08	0.08	*VV	2.52
1	8.969	547309.98	250728.55	1.02	1.02	*VV	2.18
42	9.025	161719.80	56038.84	0.30	0.30	*VV	2.89
43	9.158	507474.55	149860.75	0.94	0.94	*VV	3.39
44	9.237	145194.23	68388.44	0.27	0.27	*VV	2.12
45	9.277	180766.36	51243.17	0.34	0.34	*VV	3.53
46	9.372	122500.22	47896.43	0.23	0.23	*VV	2.56
47	9.439	433572.71	165335.55	0.80	0.80	*VV	2.62
48	9.485	367671.35	171320.28	0.68	0.68	*VV	2.15
49	9.559	453364.87	174524.60	0.84	0.84	*VV	2.60
50	9.614	564751.00	249862.68	1.05	1.05	*VV	2.26
51	9.688	145182.66	52895.34	0.27	0.27	*VV	2.74
52	9.769	507719.36	140732.20	0.94	0.94	*VV	3.61
53	9.848	234854.52	95612.00	0.44	0.44	*VV	2.46
54	9.937	661366.43	206444.49	1.23	1.23	*VV	3.20
55	9.972	329840.23	192410.67	0.61	0.61	*VV	1.71
56	10.009	154149.46	102557.50	0.29	0.29	*VV	1.50
57	10.076	847174.66	351159.81	1.57	1.57	*VE	2.41
58	10.132	128785.34	60614.02	0.24	0.24	*EV	2.12
59	10.157	100839.51	53989.70	0.19	0.19	*VV	1.87
60	10.221	94558.96	36468.12	0.18	0.18	*VV	2.59
6	10.283	91638.61	41625.84	0.17	0.17	*VV	2.20
	10.321	101685.02	59706.33	0.19	0.19	*VV	1.70
3	10.339	107177.41	61552.66	0.20	0.20	*VV	1.74
64	10.388	269198.80	94964.70	0.50	0.50	*VV	2.83
65	10.483	279575.01	93964.71	0.52	0.52	*VV	2.98
66	10.609	470322.03	165853.62	0.87	0.87	*VV	2.84
67	10.675	562156.04	241291.78	1.04	1.04	*VV	2.33

ak	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
[illegible]	10.751	112154.27	51090.69	0.21	0.21	*VV	2.20
9	10.785	144466.39	51813.78	0.27	0.27	*VV	2.79
0	10.883	101251.55	37315.62	0.19	0.19	*VV	2.71
1	10.944	663144.42	228078.47	1.23	1.23	*VV	2.91
2	11.014	178229.23	73626.21	0.33	0.33	*VV	2.42
3	11.061	293618.14	124723.22	0.54	0.54	*VV	2.35
4	11.118	440656.92	181224.14	0.82	0.82	*VV	2.43
5	11.179	389852.57	168794.49	0.72	0.72	*VV	2.31
6	11.268	273354.10	65883.30	0.51	0.51	*VV	4.15
7	11.321	248683.68	94989.18	0.46	0.46	*VV	2.62
8	11.393	392269.43	94810.72	0.73	0.73	*VV	4.14
9	11.458	155460.91	71363.53	0.29	0.29	*VV	2.18
0	11.533	322688.54	112986.12	0.60	0.60	*VV	2.86
1	11.620	450489.51	168418.44	0.84	0.84	*VV	2.67
2	11.665	133628.75	63884.70	0.25	0.25	*VV	2.09
3	11.737	445095.40	120596.97	0.83	0.83	*VV	3.69
4	11.821	288210.23	105334.93	0.53	0.53	*VV	2.74
5	11.898	645150.28	140146.22	1.20	1.20	*VV	4.60
36	12.076	299358.32	96517.54	0.56	0.56	*VV	3.10
37	12.128	107811.66	46011.68	0.20	0.20	*VV	2.34
38	12.167	78803.00	41917.32	0.15	0.15	*VV	1.88
3(	12.219	191670.58	54969.39	0.36	0.36	*VV	3.49
0	12.325	488646.19	151344.45	0.91	0.91	*VV	3.23
91	12.448	317442.19	80779.92	0.59	0.59	*VV	3.93
92	12.507	141772.51	65699.58	0.26	0.26	*VV	2.16
93	12.537	164962.46	68234.82	0.31	0.31	*VV	2.42
94	12.623	240246.81	68468.89	0.45	0.45	*VV	3.51
95	12.721	520375.93	118608.93	0.97	0.97	*VV	4.39
96	12.866	229918.23	57623.92	0.43	0.43	*VV	3.99
97	12.925	296315.10	96707.48	0.55	0.55	*VV	3.06
98	12.985	241776.35	62098.66	0.45	0.45	*VV	3.89
99	13.070	423200.41	84594.85	0.79	0.79	*VV	5.00
00	13.168	82083.43	54721.05	0.15	0.15	*VV	1.50
01	13.230	401682.37	119384.16	0.75	0.75	*VV	3.36
02	13.297	155350.01	54624.92	0.29	0.29	*VV	2.84
03	13.367	638928.26	165888.27	1.19	1.19	*VV	3.85
04	13.458	163475.52	53808.65	0.30	0.30	*VV	3.04
05	13.519	160581.39	60674.92	0.30	0.30	*VV	2.65
06	13.595	491325.93	102293.92	0.91	0.91	*VV	4.80
07	13.694	84543.01	41664.94	0.16	0.16	*VV	2.03
08	13.769	445723.67	90042.71	0.83	0.83	*VV	4.95
09	13.873	249620.33	79478.12	0.46	0.46	*VV	3.14
1(	13.932	199714.35	50693.06	0.37	0.37	*VV	3.94
[illegible]	14.003	117627.14	46092.78	0.22	0.22	*VV	2.55
2	14.054	168760.08	56139.44	0.31	0.31	*VV	3.01
13	14.121	317672.50	50904.44	0.59	0.59	*VV	6.24
14	14.236	209833.38	68781.83	0.39	0.39	*VV	3.05
15	14.278	275168.21	66687.64	0.51	0.51	*VV	4.13
116	14.375	169955.03	48630.76	0.32	0.32	*VV	3.49

ak	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
[illegible]	14.454	212961.75	52183.70	0.40	0.40	*VV	4.08
8	14.545	341933.44	59182.18	0.63	0.63	*VV	5.78
9	14.617	111579.68	47258.83	0.21	0.21	*VV	2.36
20	14.665	84780.74	42344.88	0.16	0.16	*VV	2.00
21	14.732	346730.96	130812.74	0.64	0.64	*VV	2.65
22	14.786	241038.40	82525.98	0.45	0.45	*VV	2.92
23	14.830	241990.41	70068.69	0.45	0.45	*VV	3.45
24	14.939	293479.95	66428.00	0.54	0.54	*VV	4.42
25	14.993	190914.75	69883.01	0.35	0.35	*VV	2.73
26	15.043	151510.65	60875.47	0.28	0.28	*VV	2.49
27	15.098	212008.91	68055.29	0.39	0.39	*VV	3.12
28	15.172	312256.20	90361.71	0.58	0.58	*VV	3.46
29	15.226	134985.03	66974.25	0.25	0.25	*VV	2.02
30	15.253	388725.70	65320.43	0.72	0.72	*VV	5.95
31	15.402	147638.30	51208.83	0.27	0.27	*VV	2.88
32	15.519	697907.06	113767.02	1.29	1.29	*VV	6.13
33	15.587	129654.50	57233.56	0.24	0.24	*VV	2.27
34	15.658	181492.50	77695.45	0.34	0.34	*VV	2.34
35	15.678	199409.61	75026.75	0.37	0.37	*VV	2.66
36	15.741	147467.61	49481.99	0.27	0.27	*VV	2.98
37	15.820	204530.95	47603.73	0.38	0.38	*VV	4.30
3[illegible]	15.904	506259.01	174767.26	0.94	0.94	*VV	2.90
[illegible]	16.007	429351.40	101615.22	0.80	0.80	*VV	4.23
40	16.080	180574.36	60303.68	0.34	0.34	*VV	2.99
41	16.141	258378.41	86006.19	0.48	0.48	*VV	3.00
42	16.248	321059.20	63680.38	0.60	0.60	*VV	5.04
43	16.344	405585.55	83572.28	0.75	0.75	*VV	4.85
44	16.389	193187.48	66191.11	0.36	0.36	*VV	2.92
45	16.454	162679.89	61616.05	0.30	0.30	*VV	2.64
46	16.497	151202.35	62201.33	0.28	0.28	*VV	2.43
47	16.556	251119.19	67155.60	0.47	0.47	*VV	3.74
48	16.626	261170.58	74079.83	0.48	0.48	*VV	3.53
49	16.706	273012.54	79687.68	0.51	0.51	*VV	3.43
50	16.750	214781.30	54372.73	0.40	0.40	*VV	3.95
51	16.839	158786.36	53084.84	0.29	0.29	*VV	2.99
52	16.898	271894.48	81056.76	0.50	0.50	*VV	3.35
53	16.962	205821.01	68424.49	0.38	0.38	*VV	3.01
54	17.000	132704.10	57741.38	0.25	0.25	*VV	2.30
55	17.094	393530.15	86610.53	0.73	0.73	*VV	4.54
56	17.147	207775.21	74247.19	0.39	0.39	*VV	2.80
57	17.240	262694.73	74095.32	0.49	0.49	*VV	3.55
158	17.278	137480.22	68606.88	0.26	0.26	*VV	2.00
159	17.326	259105.08	58063.95	0.48	0.48	*VV	4.46
[illegible]	17.399	98893.58	53000.61	0.18	0.18	*VV	1.87
[illegible]	17.426	90051.62	52231.78	0.17	0.17	*VV	1.72
162	17.478	141428.59	53913.75	0.26	0.26	*VV	2.62
163	17.555	443909.42	74482.43	0.82	0.82	*VV	5.96
164	17.634	334615.51	60656.92	0.62	0.62	*VV	5.52
165	17.775	300972.70	62233.03	0.56	0.56	*VV	4.84

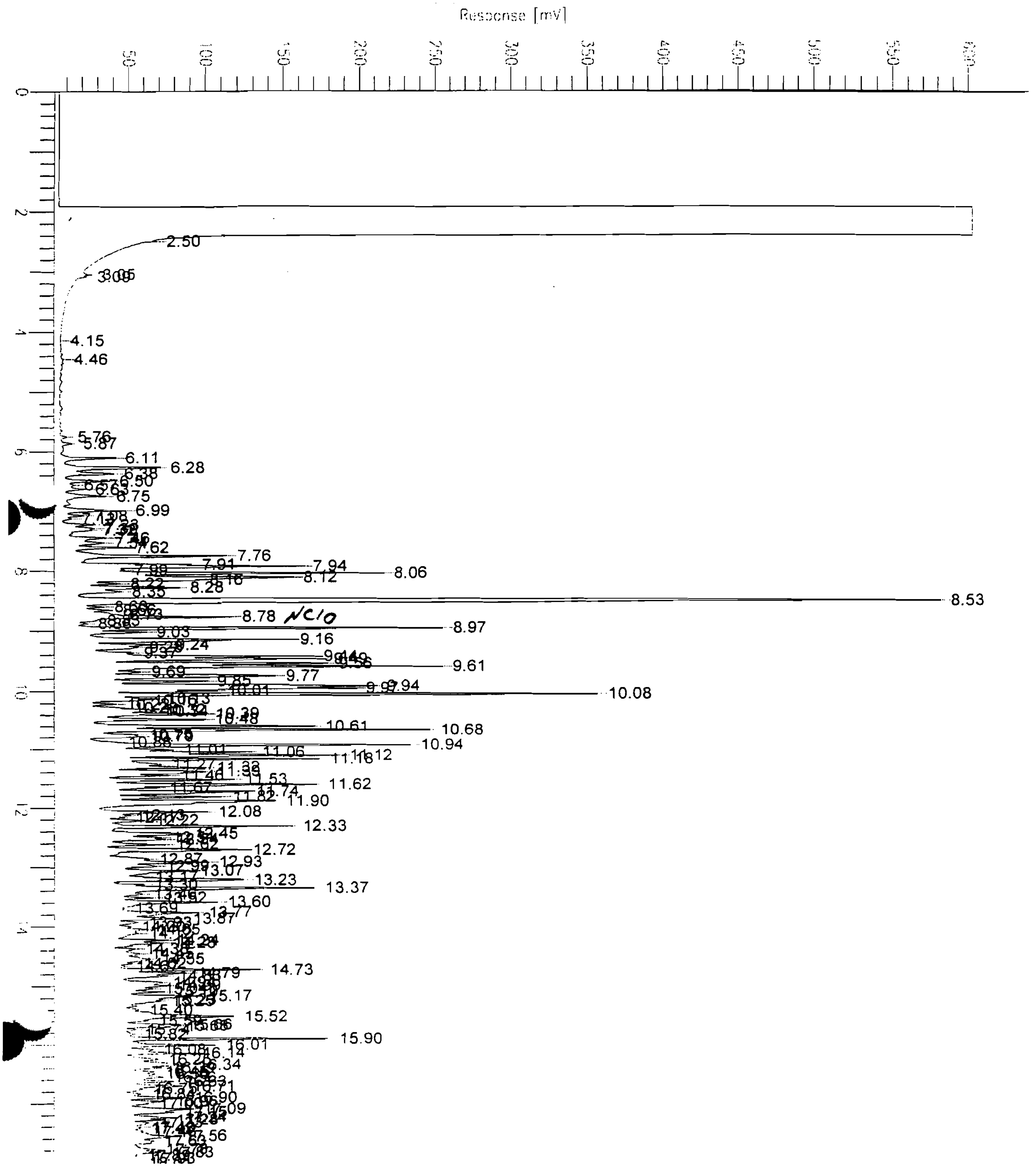
ak	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
[illegible]	17.831	267930.49	65972.96	0.50	0.50	*VV	4.06
67	17.886	102465.01	49923.65	0.19	0.19	*VV	2.05
68	17.929	237651.24	53522.37	0.44	0.44	*VV	4.44
69	18.005	196803.01	51022.58	0.37	0.37	*VV	3.86
70	18.078	148255.85	47885.64	0.28	0.28	*VV	3.10
71	18.128	137574.59	47715.46	0.26	0.26	*VV	2.88
72	18.198	175949.55	57927.80	0.33	0.33	*VV	3.04
73	18.272	441189.85	125387.99	0.82	0.82	*VV	3.52
74	18.345	278210.25	51093.29	0.52	0.52	*VV	5.45
75	18.441	136557.69	48821.10	0.25	0.25	*VV	2.80
76	18.485	235454.39	57197.41	0.44	0.44	*VV	4.12
77	18.581	162825.74	44265.87	0.30	0.30	*VV	3.68
78	18.660	403018.02	59743.95	0.75	0.75	*VV	6.75
79	18.782	214692.00	54521.86	0.40	0.40	*VV	3.94
80	18.840	282462.21	59515.15	0.52	0.52	*VV	4.75
81	18.970	610512.29	180406.68	1.13	1.13	*VV	3.38
82	19.024	162465.95	56829.18	0.30	0.30	*VV	2.86
83	19.084	146752.23	53722.47	0.27	0.27	*VV	2.73
84	19.122	204457.32	53069.82	0.38	0.38	*VV	3.85
85	19.248	399029.87	52906.26	0.74	0.74	*VV	7.54
86	19.378	338312.14	52587.96	0.63	0.63	*VV	6.43
[illegible]	19.475	303523.59	57107.21	0.56	0.56	*VV	5.31
8	19.560	287917.73	46536.27	0.53	0.53	*VV	6.19
89	19.734	437384.41	49664.70	0.81	0.81	*VV	8.81
90	19.866	169643.98	41040.17	0.31	0.31	*VV	4.13
91	19.958	277082.57	44224.79	0.51	0.51	*VV	6.27
92	20.042	133577.71	42800.09	0.25	0.25	*VV	3.12
93	20.139	407514.60	113941.41	0.76	0.76	*VV	3.58
94	20.219	235439.00	45015.50	0.44	0.44	*VV	5.23
95	20.307	153119.88	43980.93	0.28	0.28	*VV	3.48
96	20.411	239196.19	43436.13	0.44	0.44	*VV	5.51
97	20.487	200822.56	42153.21	0.37	0.37	*VV	4.76
98	20.595	276756.97	38622.12	0.51	0.51	*VV	7.17
99	20.670	95236.93	37186.29	0.18	0.18	*VV	2.56
00	20.779	240417.64	36682.83	0.45	0.45	*VV	6.55
01	20.866	299743.40	36761.43	0.56	0.56	*VV	8.15
02	21.033	261216.98	55002.25	0.48	0.48	*VV	4.75
03	21.108	324806.55	37175.09	0.60	0.60	*VV	8.74
04	21.249	191114.25	35367.56	0.35	0.35	*VV	5.40
05	21.362	150790.92	34390.16	0.28	0.28	*VV	4.38
06	21.438	113549.63	31620.87	0.21	0.21	*VV	3.59
07	21.538	329254.57	32630.51	0.61	0.61	*VV	10.09
08	21.694	194179.16	28146.01	0.36	0.36	*VV	6.90
[illegible]	21.929	323434.36	28715.54	0.60	0.60	*VV	11.26
10	22.005	37850.87	24702.80	0.07	0.07	*VV	1.53
11	22.103	217752.60	26959.12	0.40	0.40	*VV	8.08
12	22.206	110726.15	25839.45	0.21	0.21	*VV	4.29
13	22.276	40910.12	22431.79	0.08	0.08	*VV	1.82
14	22.325	242079.17	28283.95	0.45	0.45	*VV	8.56

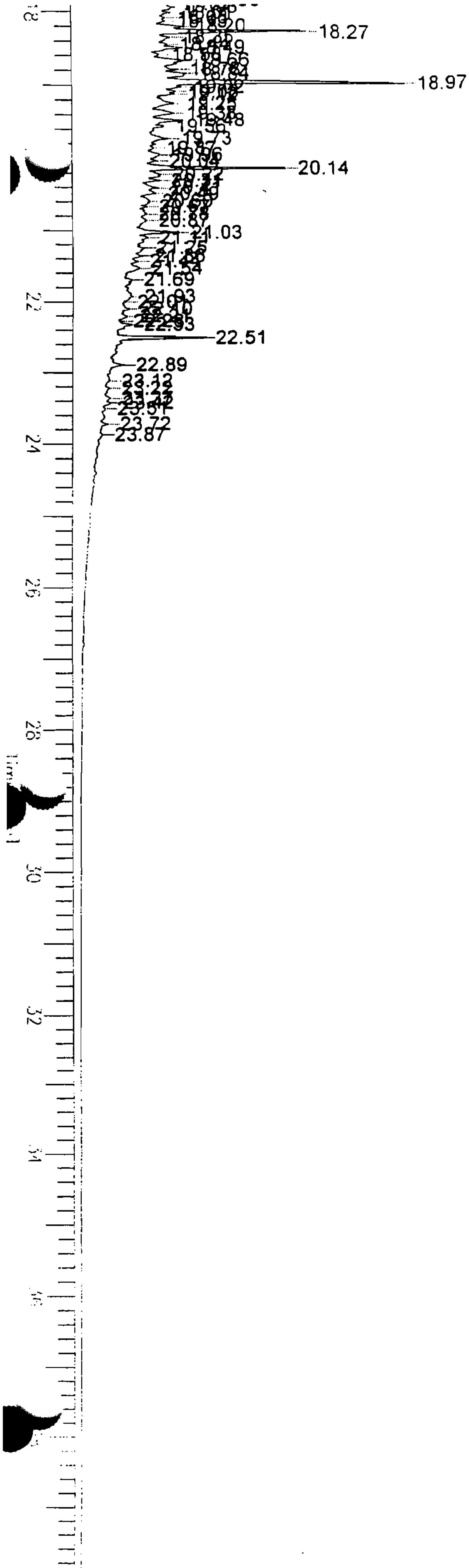
ak	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
5	22.512	487505.62	68273.09	0.90	0.90	*VV	7.14
6	22.892	269894.45	24120.41	0.50	0.50	*VV	11.19
7	23.119	132826.91	16254.68	0.25	0.25	*VV	8.17
8	23.224	97625.71	15917.89	0.18	0.18	*VV	6.13
9	23.365	85102.06	16335.42	0.16	0.16	*VV	5.21
0	23.424	68467.17	16670.78	0.13	0.13	*VV	4.11
1	23.505	154602.08	13657.37	0.29	0.29	*VV	11.32
2	23.723	109064.61	15238.87	0.20	0.20	*VV	7.16
3	23.873	47732.63	12134.81	0.09	0.09	*VB	3.93
		53893803.15	1.61e+07	100.00	100.00		

WORLD WIDE GEOSCIENCES - I

ple Name : J-01010-B MW-31 (23'-25')
eName : C:\TC4\41WW\41WW163.RAW
hod : WWGINT.MTH
rt ·e : 0.00 min
:or: 0.0
End Time : 40.00 min
Plot Offset: 2 mV

Sample #: 10209003
Date : 3/14/01 11:12 AM
Time of Injection: 2/13/01 09:56 PM
Low Point : 2.00 mV
Plot Scale: 600.0 mV
High Point : 602.00 mV





18.27
18.97
20.14
21.03
21.69
22.51
22.89
23.72
23.87

WORLDWIDE
GEOSCIENCES, INC.

6100 Corporate Drive
Suite 320
Houston, Texas 77036
Phone: 713 / 988-9401
FAX: 713 / 988-8784

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Route To:
APR 19
Proj:
File Code:

April 16, 2001

Mr. Bruce Ahrens
IT Corp.
13 British American Blvd.
Latham, NY 12110

Dear Mr. Ahrens:

Enclosed is our Report 2 on samples submitted from your Troy Area 2 site. Please refer to the report summary for a condensed statement of our findings.

If there are any questions please do not hesitate to contact me. We appreciate being of service.

Sincerely,

Neil F. Petersen

Neil F. Petersen

WORLDWIDE
GEOSCIENCES, INC.

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Suite 320
Houston, Texas 77036
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CHARACTERIZATION OF SAMPLES NMPC - TROY AREA 2 SITE REPORT 2

PREPARED FOR
IT CORP.
APRIL, 2001

CHARACTERIZATION OF SAMPLES
NMPC – TROY AREA 2 SITE
REPORT 2

SUMMARY

Six soil samples, two water samples, and a product sample were analyzed by high resolution capillary gas chromatography to determine the type or types of parent products associated with these samples, and to provide any indications of parent product age. Two of the samples had concentration levels too low to determine the parent product associated with these samples. These were the MW 29 (23-25) and MW 31 (15-17) samples. The low amplitude peaks present in the chromatograms of these samples are not consistent with coal tar as the parent product.

The MW 30 water sample, the MW 30 (25-27) and the MW 31 (23-25) soil samples have signature characteristics indicating mixtures of gasoline and diesel/fuel oil. Diesel/fuel oil is the dominant product. The characteristics of the gasoline derived hydrocarbons indicate parent gasolines most probably produced between 1975 and 1980. The diesel/fuel oils are significantly biodegraded with most probable exposure times of 16 to 20 years for the MW 30 (25-27) soil sample and twenty years or more for the MW 30 water sample and the MW 31 (23-25) soil sample. The MW 31 product sample also contains a mixture of gasoline range and diesel/fuel oil derived hydrocarbons. The diesel/fuel oil product contribution dominates, and is severely biodegraded with a most probable exposure time of twenty years or more. The gasoline range assemblage is not clearly indicative of gasoline as the parent product. Either the gasoline is so severely weathered that the characteristic pattern of gasoline peaks is no longer evident or the gasoline range hydrocarbons could have been derived from a mixed hydrocarbon solvent or naphtha.

The MW-29 water sample signature is dominated by a single peak at the elution position of benzene, and also contains a very low amplitude, severely biodegraded diesel/fuel oil assemblage. The SB-40 (23-25) soil sample signature shows characteristics indicating a very severely biodegraded residual grade, such as #6 grade, fuel oil assemblage with a most probable exposure time of at least fifty years. The PZ-1 (27-29) soil sample has compositional characteristics indicating a mixture that consists predominantly of a moderately biodegraded diesel/fuel oil with a most probable exposure time of 14 to 18 years, and a subordinate coal tar contribution.

INTRODUCTION

A water sample and a product sample from the Troy Area 2 site were received at the offices of Worldwide Geosciences, Inc. on March 6, 2001 via Federal Express overnight delivery. Each sample was contained in a single, liter, amber glass jar which were packed in an insulated plastic cooler with ice used as a preservative. Sample identifications as per the attached chain of custody form and their assigned laboratory numbers are as follows:

Sample ID		Lab No.
NMPC/AREA 2/MW29	Water	010309008
NMPC/AREA 2/MW31	Product	010309009

A water sample from the Troy Area 2 site was received at the offices of Worldwide Geosciences, Inc. on March 14, 2001 via Federal Express overnight delivery. The sample was contained in a single, liter, amber glass jar which was packed in an insulated plastic cooler with ice used as a preservative. Sample identification as per the attached chain of custody form and its assigned laboratory number is as follows:

Sample ID	Lab No.
NMPC/AREA 2/MW30	010315007

1,000 milliliters of each water sample were extracted with 100 milliliters of methylene chloride solvent. The extractions were carried out by agitation in a separatory funnel. After separating each solvent and soil, each solvent was reduced in volume to two milliliters to increase the concentration level of the extracted hydrocarbons in the solvent. Each solvent was spiked with androstane as an internal standard. The concentration level of the internal standard relative to the weight of water extracted is 120 parts per billion. Each spiked solvent containing the extracted hydrocarbons was then analyzed by high-resolution gas chromatography using a 30-meter DB1 column and a flame ionization detector. A Perkin-Elmer Autosystem was utilized. The analysis procedure can be viewed as a modification of ASTM method D-3328. The modifications allow for the analysis of hydrocarbons in solvent and improve the resolution of the lighter hydrocarbons. Two procedural methods are routinely used for product in solvent characterization. One provides better resolution of the gasoline range hydrocarbons but has a more limited carbon number range. This is Method 3 as defined in the procedural description provided in Appendix II. The second method is routinely used to characterize product in solvents heavier than gasoline. The gasoline range hydrocarbons are compressed as a result of a more rapid increase in column temperature. This is Method 4 as described in Appendix II.

The extracts obtained on these samples were analyzed under Method 4 conditions on March 21, 2001. There was an inadvertent reversal in computer file identifications involving the MW 30 sample on the March 21st run. The MW 30 extract was reanalyzed on March 28 to confirm the signature was correct.

The product sample was analyzed directly under Method 2 conditions on March 21, 2001.

The only difference in operating conditions between Methods 1 and 2, which are used for actual product samples, and between Methods 3 and 4 is in the injection conditions. When products are run neat, or as received, a split injection method is used and if the hydrocarbons are in solvent phase a splitless injection system is used.

Display copies of the chromatograms, both labeled and unlabeled, are incorporated into the report as Appendix I. A full-scale display in which all the peaks have been kept onscale for accurate visualization of the relative proportions of the hydrocarbons present is provided. Also included in Appendix I is a table listing the abbreviations used to identify peaks on the chromatograms and their corresponding names.

Peak area tables derived from the chromatograms are included as Appendix III.

The characteristics of these samples are discussed in the results section along with the characteristics of samples previously analyzed under this project and reported out under cover letter of March 27, 2001.

RESULTS

In discussing the compositional characteristics of the samples analyzed and analog signatures, the various peaks present in the chromatograms will be referred to in terms of the hydrocarbons they represent. As a general aid to visualizing the types of hydrocarbons involved, Figure 1 is provided to illustrate the structural characteristics of the main classes of hydrocarbons.

The concentration levels of hydrocarbons present in the MW 29 (23-25) and MW 31 (15-17) samples were too low to produce chromatograms which could be interpreted in detail in terms of parent product type or age. Neither chromatogram is consistent with coal tar as the product type. The complex assemblage of low amplitude peaks in the MW 29 (23-25) sample between eight and fourteen minutes elution time is consistent with a residual 10 to 15% fraction of gasoline.

Figure 2 compares the chromatographic signature of the MW 30 (25-27) soil sample with the signature of a gasoline. The gasoline signature shown is that of American Petroleum Institute petroleum standard 6 (API PS6). The MW30 (25-27) sample signature shows a hydrocarbon range extending from the C7 (seven carbon atoms) to the C23 (twenty three carbon atom) range. Gasoline derived hydrocarbons would extend only to NC13. The relative prominence of multibranched isoparaffins among the early eluting peaks indicates a gasoline contribution to the MW 30 hydrocarbon assemblage. These multibranched isoparaffins are collectively termed alkylates. Alkylates are derived from a specific refinery processing stream and are added to gasolines to raise the octane number of a gasoline. The structures of the alkylate hydrocarbons are shown in Figure 3. The

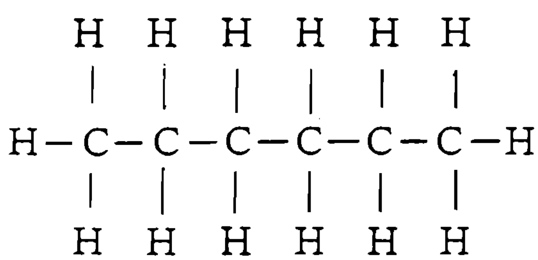
FIGURE I
TYPES OF HYDROCARBONS

SATURATES

CARBON ATOMS CONNECTED BY SINGLE BONDS

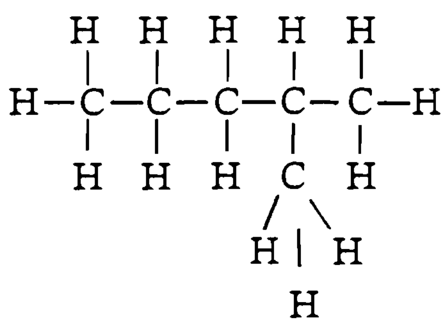
PARAFFINS OR ALKANES

NORMAL PARAFFINS OR ALKANES
STRAIGHT CHAINS



NORMAL HEXANE (NC6)

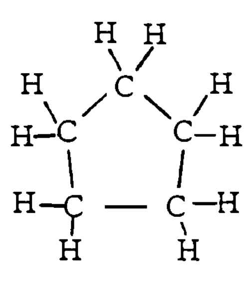
ISO-PARAFFINS OR ALKANES
BRANCHED CHAIN PARAFFINS



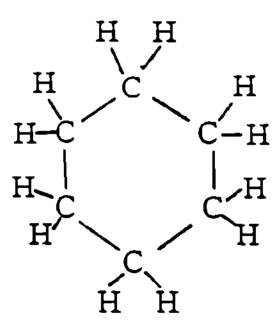
2METHYL PENTANE (2MP)

NAPTHENES OR CYCLOPARAFFINS OR CYCLOALKANES

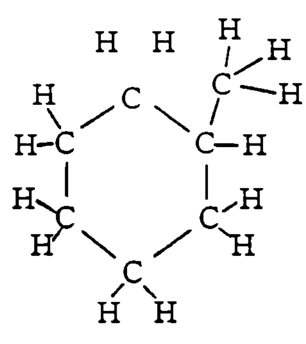
RING OR CYCLIC STRUCTURE



CYCLOPENTANE
(CCP)



CYCLOHEXANE
(CH)



METHYLCYCLOHEXANE
(MCH)

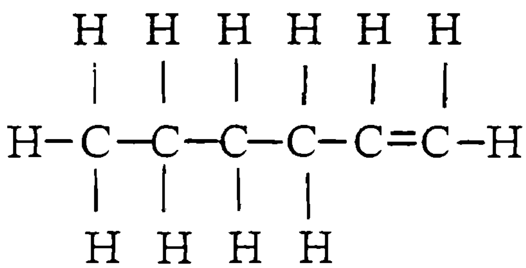
FIGURE 1 (CONT.)
TYPES OF HYDROCARBONS

UNSATURATES

HAVE ONE OR MORE CARBON DOUBLE BONDS

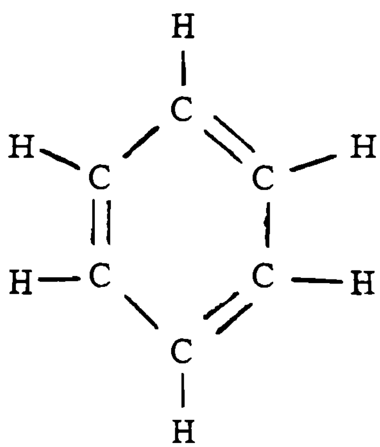
OLEFINS OR ALKENES

CAN BE STRAIGHT CHAIN, BRANCHED CHAIN, OR CYCLIC

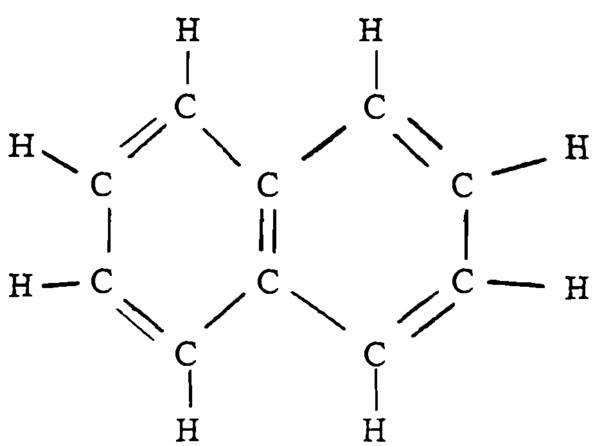


NORMAL HEXENE

AROMATICS



BENZENE



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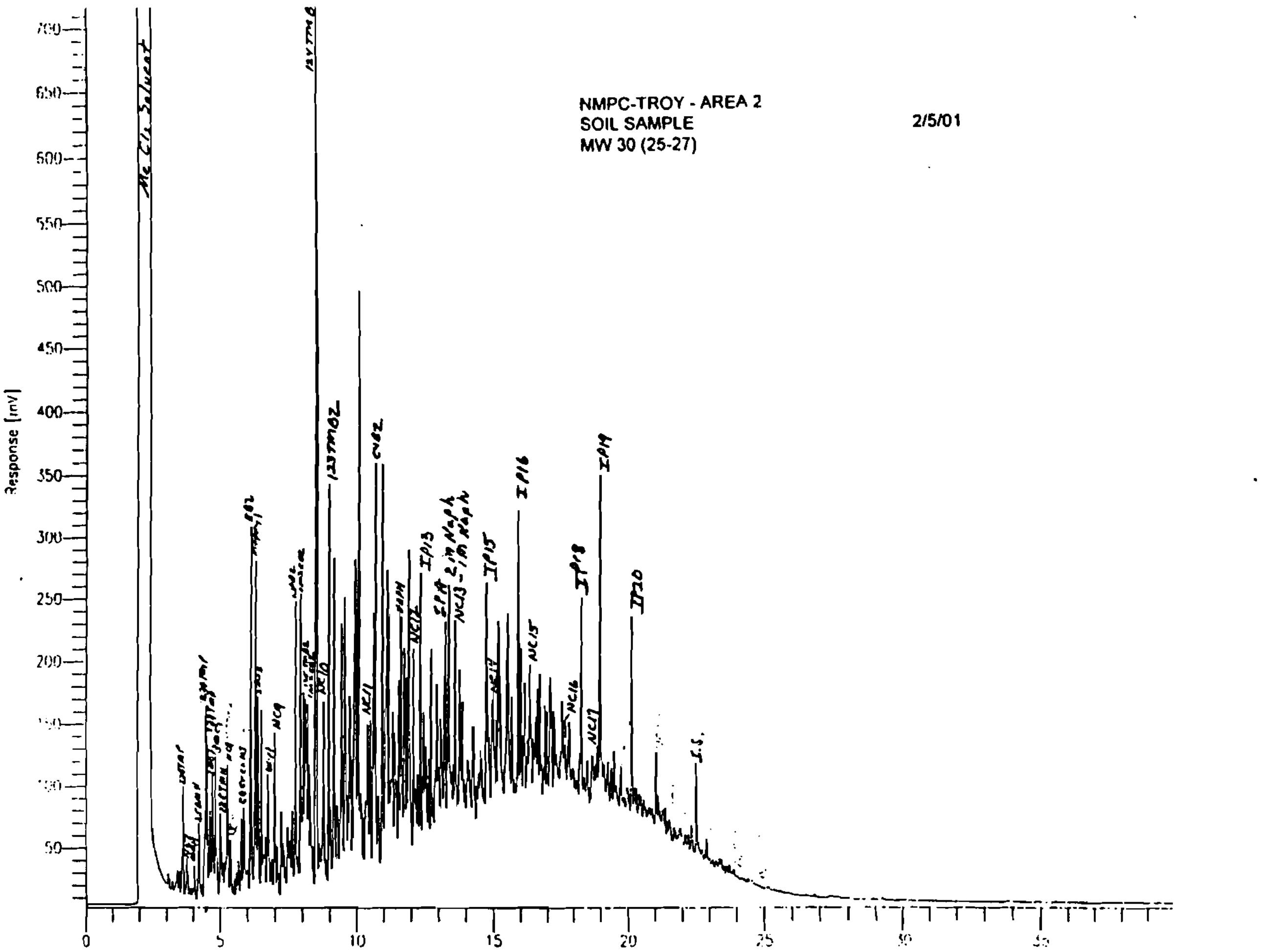


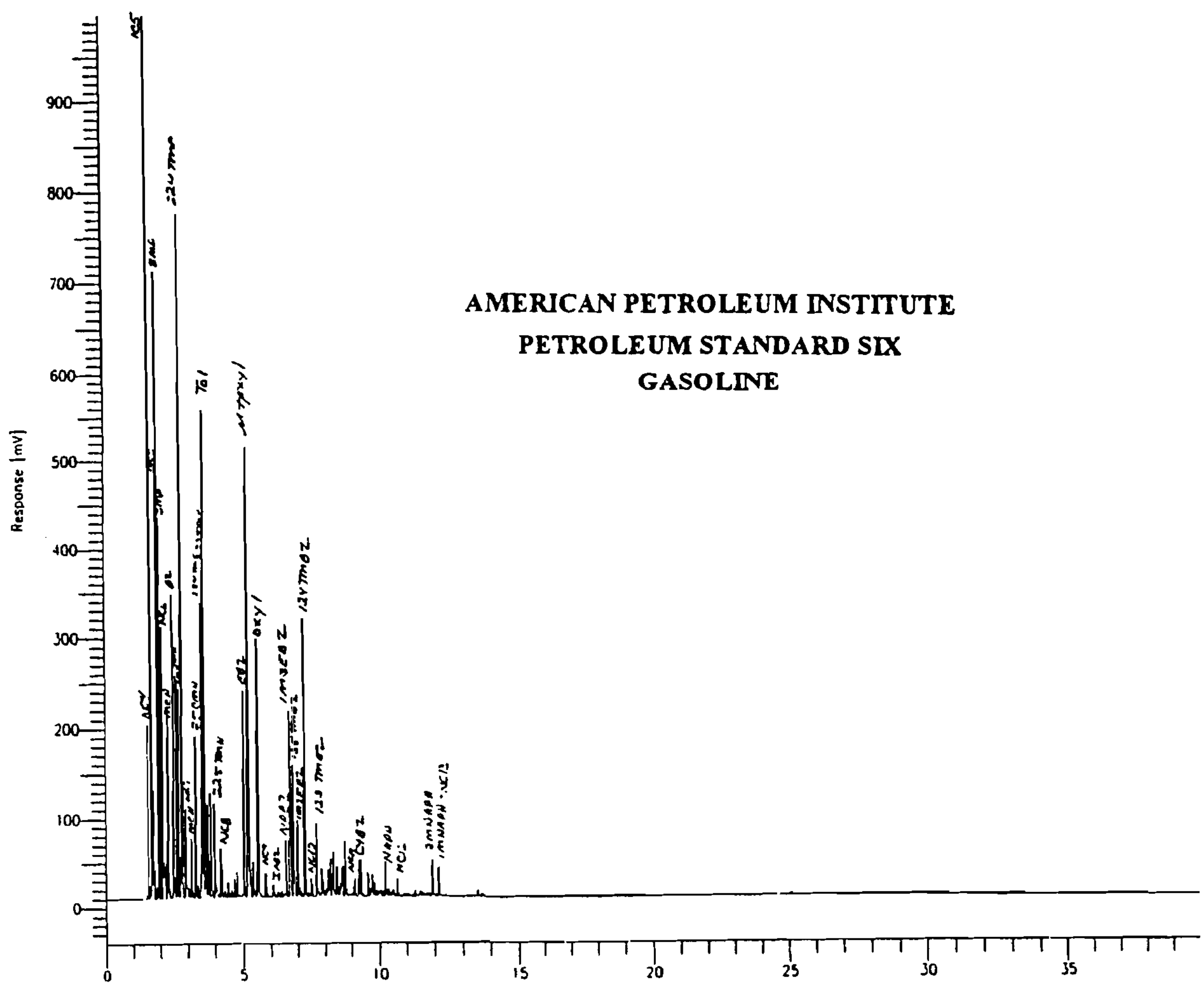
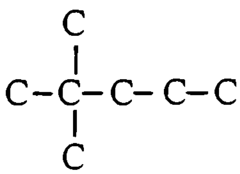


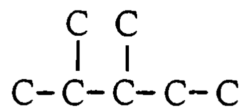
FIGURE 2: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 30 (25-27) SOIL SAMPLE AND API PS6 GASOLINE

FIGURE 3

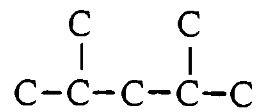
ALKYLATE HYDROCARBONS



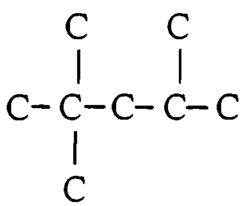
22DIMETHYLPENTANE
(22DMP)



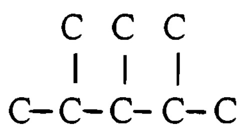
23DIMETHYLPENTANE
(23DMP)



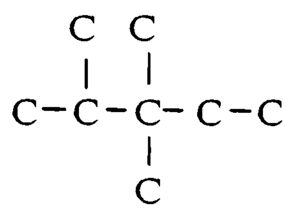
24DIMETHYLPENTANE
(24DMP)



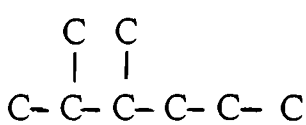
224TRIMETHYLPENTANE
(224TMP)



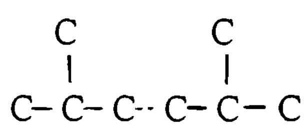
234TRIMETHYLPENTANE
(234TMP)



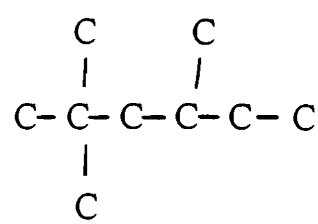
233TRIMETHYLPENTANE
(233TMP)



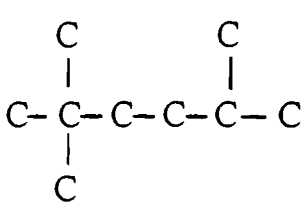
23DIMETHLYHEXANE
(23DMH)



25DIMETHYLHEXANE
(25DMH)



224TRIMETHYLHEXAN
(224TMH)



225TRIMETHYLHEXANE
(225TMH)

relative prominence of the trimethylpentane (224TMP, 234TMP, and 233TMP) peaks compared to bracketing non-alkylate saturate peaks indicates a gasoline contribution to the MW30 (25-27) soil sample.

The gasoline associated with the MW30 (25-27) sample is significantly volatilized. The volatilization losses are reflected in the low proportions of the lighter hydrocarbons, which elute first or to the left on the chromatogram. The signature characteristics of the MW-30 (25-27) sample also indicate gasoline as the dominant parent product through the C9 aromatic range or approximately nine minutes elution time.

The gasoline derived portion of the MW 30 (25-27) sample signature also indicates the parent gasoline was an older formulation gasoline. The C8 aromatics (ethylbenzene and the xylenes) have comparable solubilities in water and comparable degradation rates (Yang et al, 1995). The proportions of the C8 aromatics compared to one another will reflect their proportions compared to one another in the parent product. The signature of the MW 30 (25-27) sample shows a predominance of the ethylbenzene peak over both the meta-para xylene peak and the ortho-xylene peak. This is a characteristic restricted to gasolines produced prior to 1980. The proportions of the C9 aromatics compared to one another also will reflect their proportions compared to one another in the parent product. The proportions of the C9 aromatics compared to one another also are atypical of more recent gasolines, and also indicate a parent gasoline produced prior to 1980. The MW 30 (25-27) signature shows a high proportion of the normal propyl benzene (NPBZ) peak compared to the following C9 aromatic peaks (1M3EBZ, 135TMBZ, and 1M2EBZ).

The gasoline derived hydrocarbons also show proportions of low octane number hydrocarbons which are more indicative of an unleaded gasoline rather than a leaded gasoline. The low octane number hydrocarbons include the cycloparaffins, normal paraffins, and monobranched isoparaffins. Unleaded gasolines were required to be in use as of 1975. Combining this characteristic with the other age related gasoline characteristics indicates the parent gasoline most probably was produced between 1975 and 1980.

The next higher carbon number group of petroleum derived products are referred to collectively as the middle distillates. Kerosenes, diesels, and fuel oils are the most common middle distillate products. Standard (#2) grade fuel oil and diesel are similar products. Figure 4 provides a comparison of the chromatographic signatures of a kerosene product sample and a diesel/fuel oil product sample. The normal paraffins are the most prominent individual hydrocarbon type in middle distillate products. The normal paraffins are straight chain molecules in which all the carbon atoms are attached to one another in an end to end manner. The structure of normal hexane in Figure 1 is an example of a normal paraffin. The normal paraffins are annotated on the chromatograms with a NC designation followed by the number of carbon atoms in the molecule. The overall

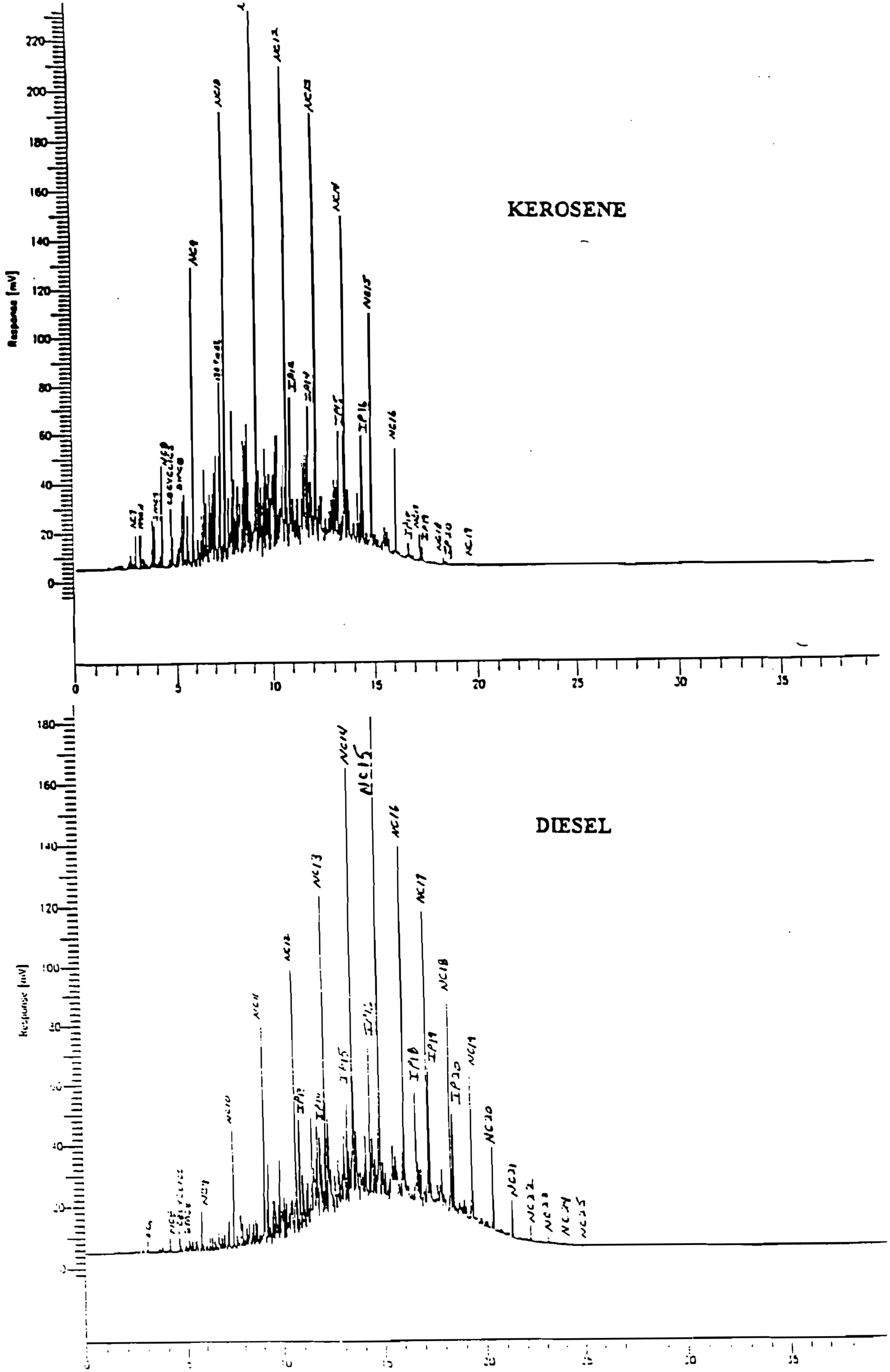


FIGURE 4: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF A KEROSENE SAMPLE AND A DIESEL PRODUCT SAMPLE

carbon number range and normal paraffin distribution of diesels and fuel oils extends to higher carbon numbers than in kerosenes.

Diesels and fuel oils also can be differentiated from kerosene products on the basis of their isoprenoid proportions. The isoprenoids are the second most prominent individual hydrocarbon type in middle distillate products. The isoprenoids are a unique type of branched chain or isoparaffin in which a side methyl (CH3) group is attached to every fourth carbon atom of the main carbon chain. The structure of methylpentane in Figure 1 is an example of an isoparaffin with a single, side, methyl group. The isoprenoids are annotated on the chromatograms with an IP designation followed by the number of carbon atoms in the molecule. In kerosenes, the lower carbon number isoprenoids (IP13, IP14, IP15, and IP16) significantly exceed the higher carbon number isoprenoids (IP18, IP19, and IP20). In diesels and fuel oils, the higher carbon number isoprenoids are present at more comparable proportions to the lower carbon number isoprenoids, and in some instances may exceed the lower carbon number isoprenoids.

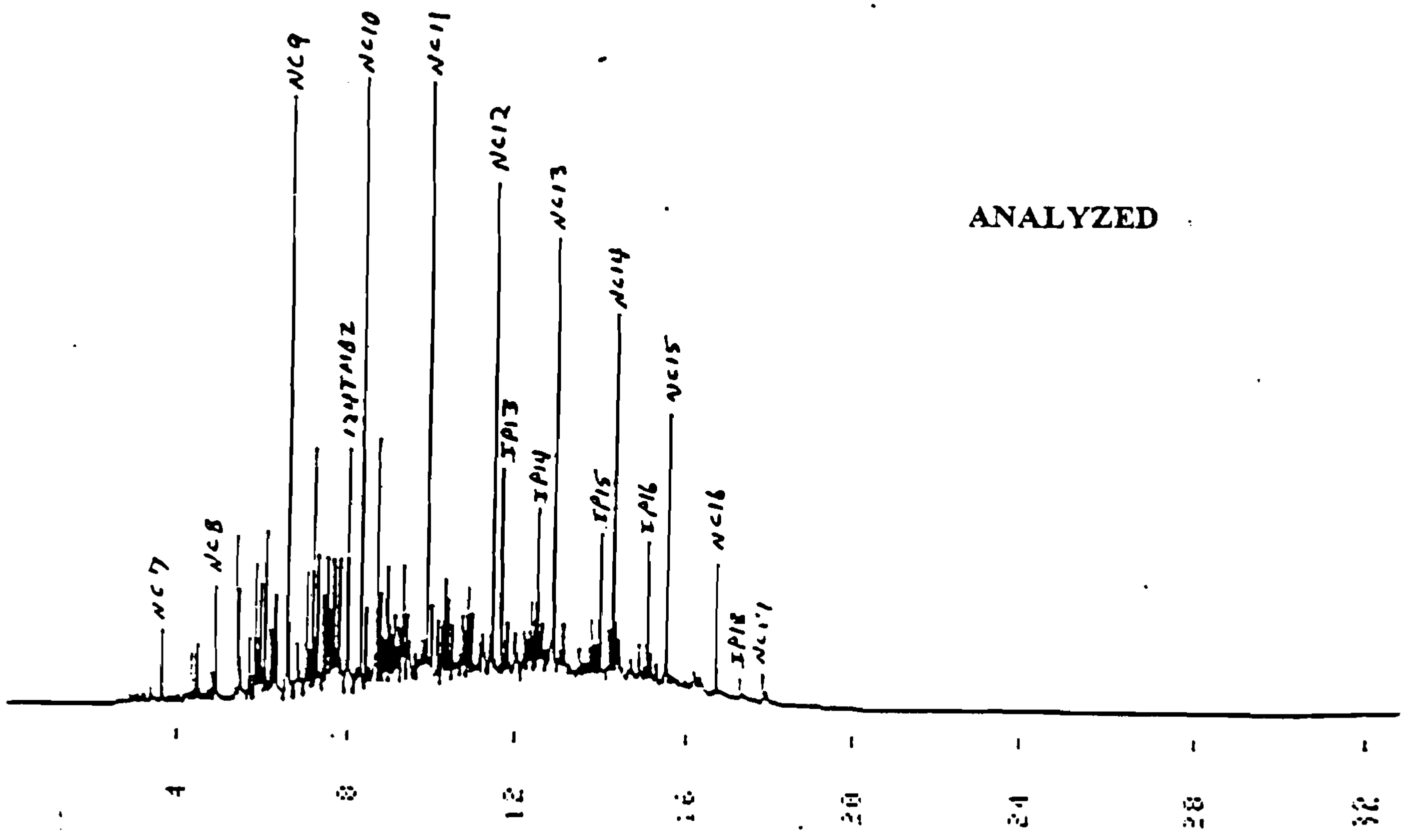
With increasing exposure time, the normal paraffin peaks are preferentially reduced compared to the isoprenoid peaks and ultimately lost as a result of biodegradation. Figure 5 illustrates the effects of biodegradation on a kerosene product sample. In Figure 5, the chromatogram of a kerosene sample is shown. The same signature is then shown artificially biodegraded by whiting out the normal paraffin peaks. Figure 6 provides a similar comparison for a diesel/fuel oil product sample signature. As the vertically prominent normal paraffin peaks are lost, the underlying baseline rise or hump becomes an increasingly prominent feature of the chromatographic signature. The baseline rise or hump represents a complex mixture of individual hydrocarbons which are not present in sufficient individual abundance to elute as discrete peaks. Biodegraded diesels and fuel oils can be distinguished from biodegraded kerosene products on the basis of the carbon number limits of the baseline rise or hump and the proportions of the isoprenoids.

Figure 7 compares the chromatographic signature of the MW 30 (25-27) soil sample with the signature of a kerosene product sample. Figure 8 provides a similar comparison with a diesel/fuel oil product sample. The baseline rise limits, isoprenoid proportions, and overall carbon number range are consistent with a diesel/fuel oil product and not a kerosene product.

The low proportions of normal paraffin peaks and prominence of isoprenoid peaks indicate the diesel/fuel oil associated with the MW 30 (25-27) sample is severely biodegraded. Figure 9 compares the chromatographic signature of the MW 30 (25-27) sample to a biodegraded diesel/fuel oil signature.

Christensen and Larsen (1993) correlated the level of biodegradation with exposure times for samples analyzed from sites with known loss dates. The ratio of NC17/IP19 (pristane) was used as a measure of the level of

ANALYZED



ARTIFICIALLY DEGRADED (NORMALS WHITED OUT)

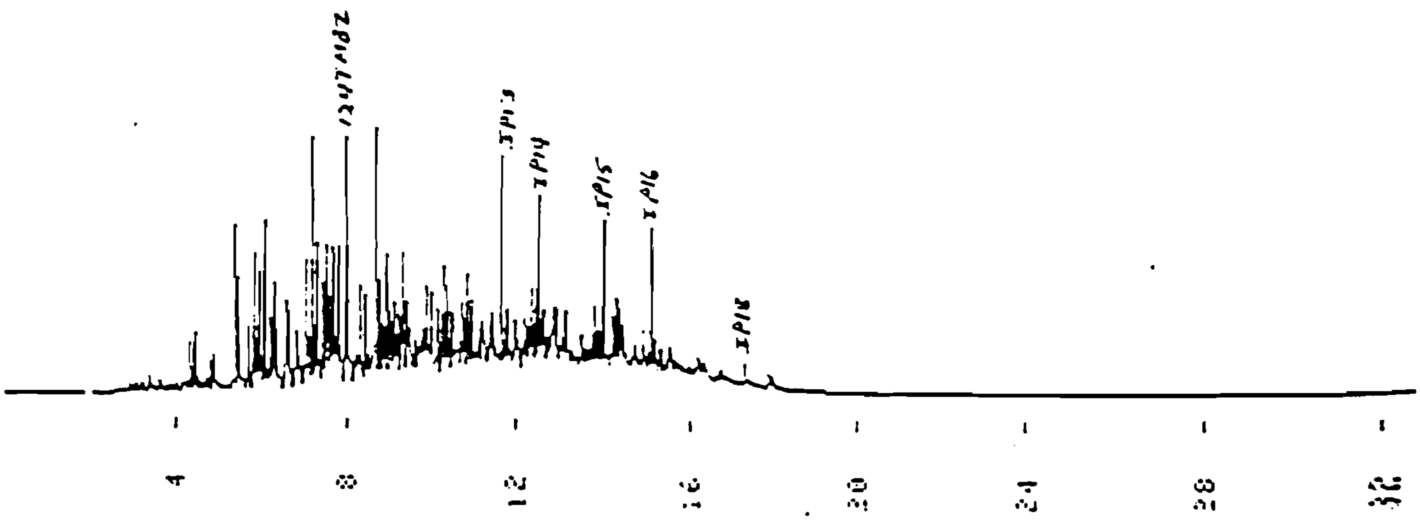


FIGURE 5: CHROMATOGRAPHIC SIGNATURE OF A KEROSENE PRODUCT AS ANALYZED AND ARTIFICIALLY DEGRADED (NORMALS WHITED OUT)

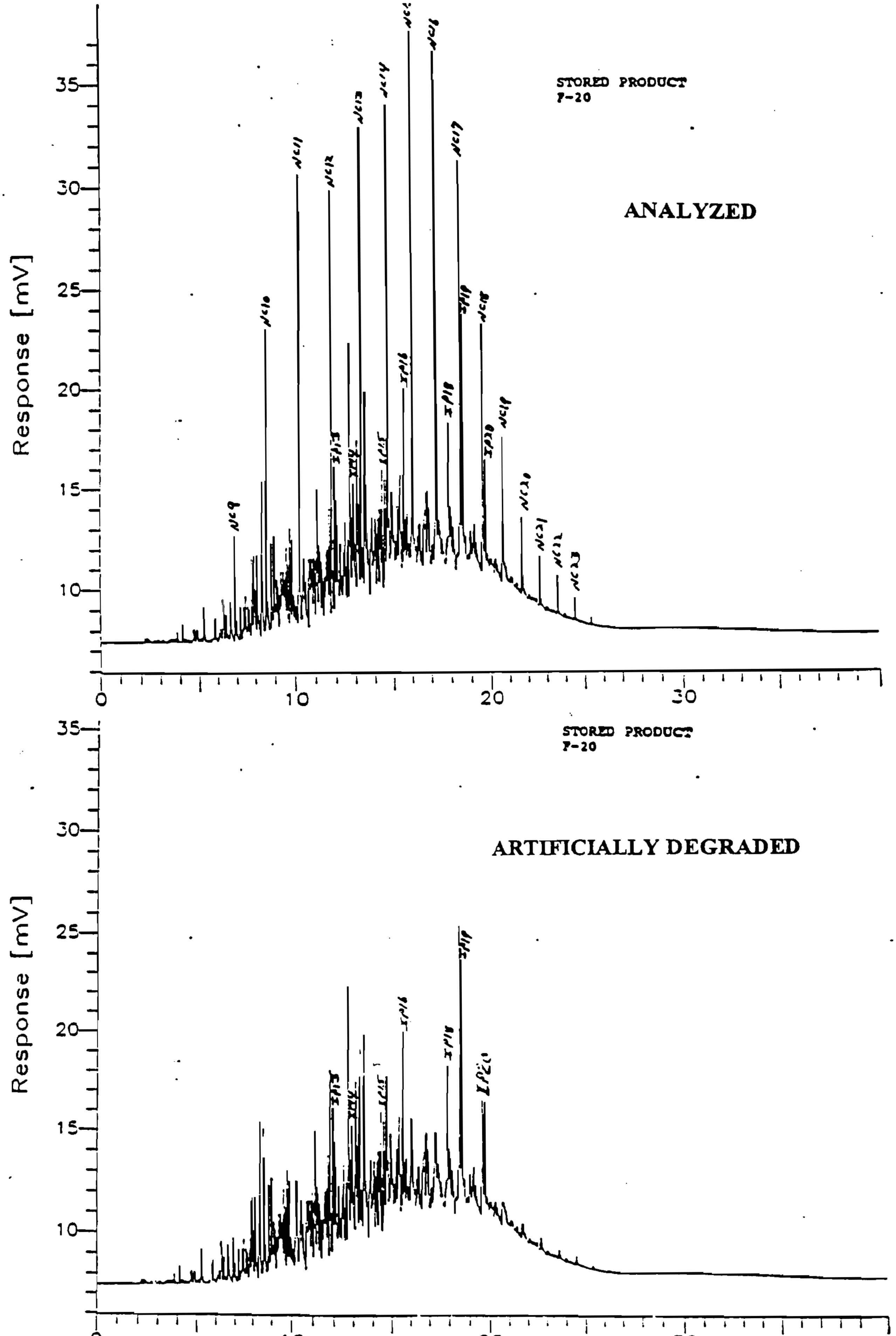
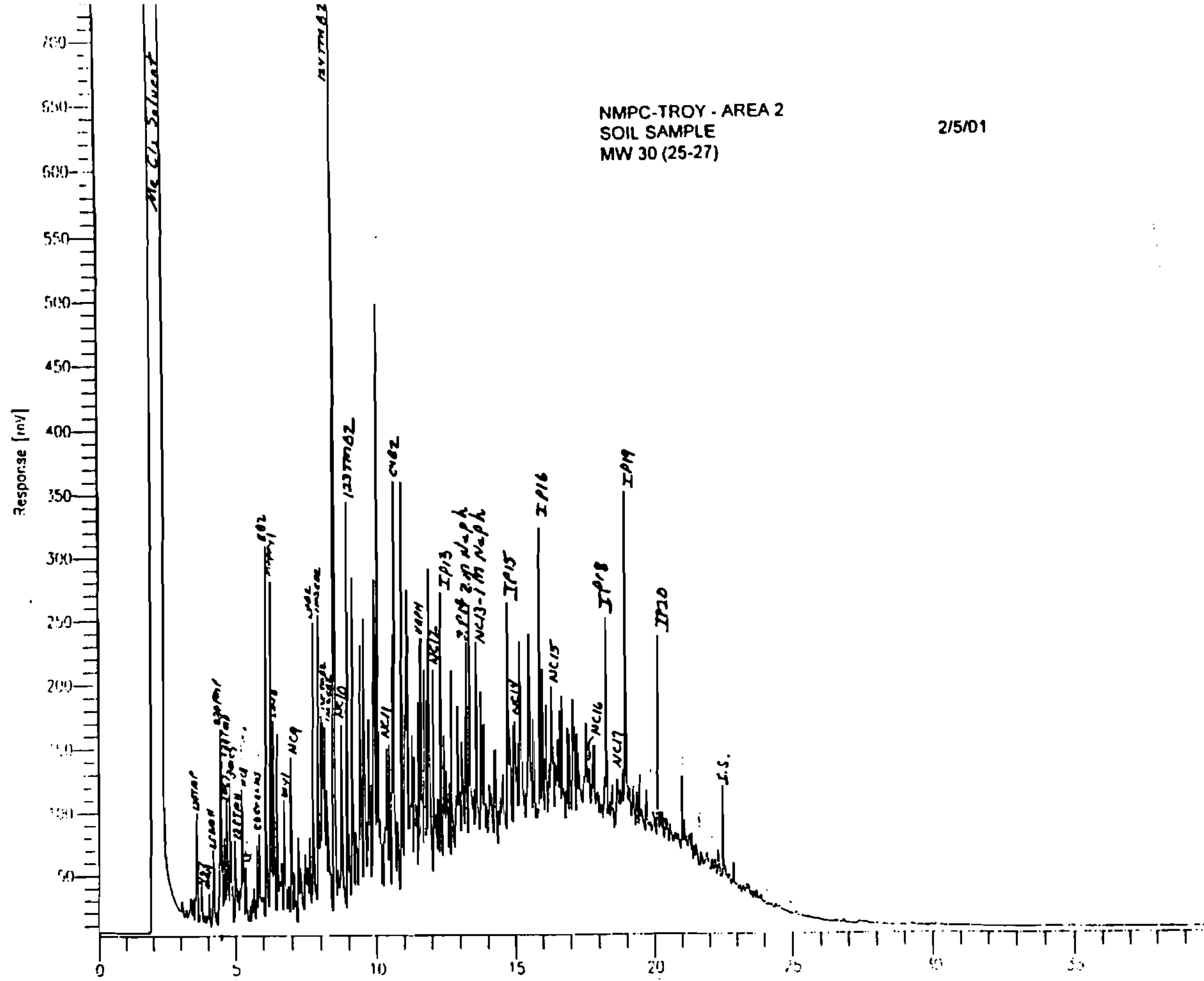


FIGURE 6: CHROMATOGRAPHIC SIGNATURE OF A DIESEL PRODUCT AS ANALYZED AND ARTIFICIALLY DEGRADED (NORMALS WHITED OUT)



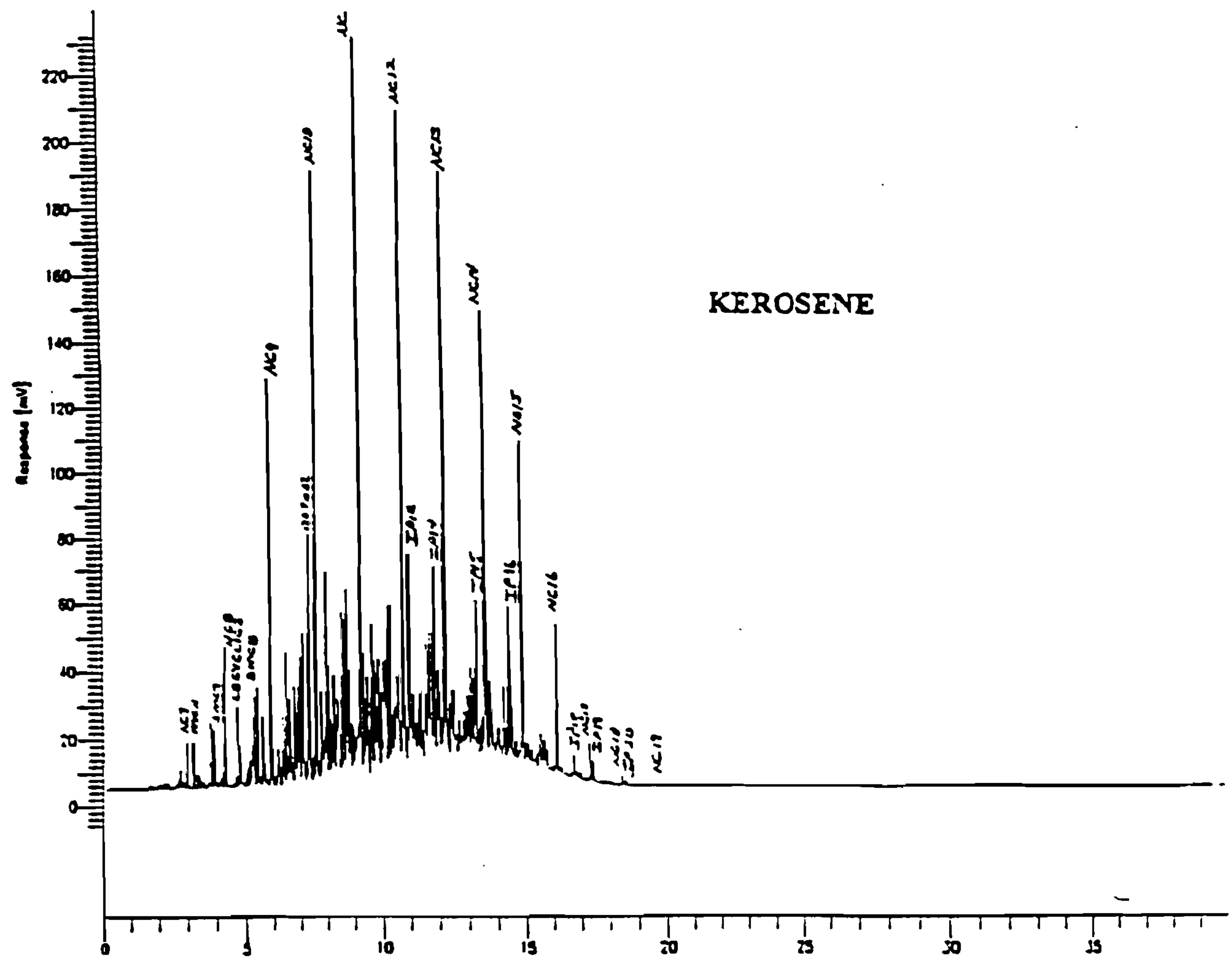
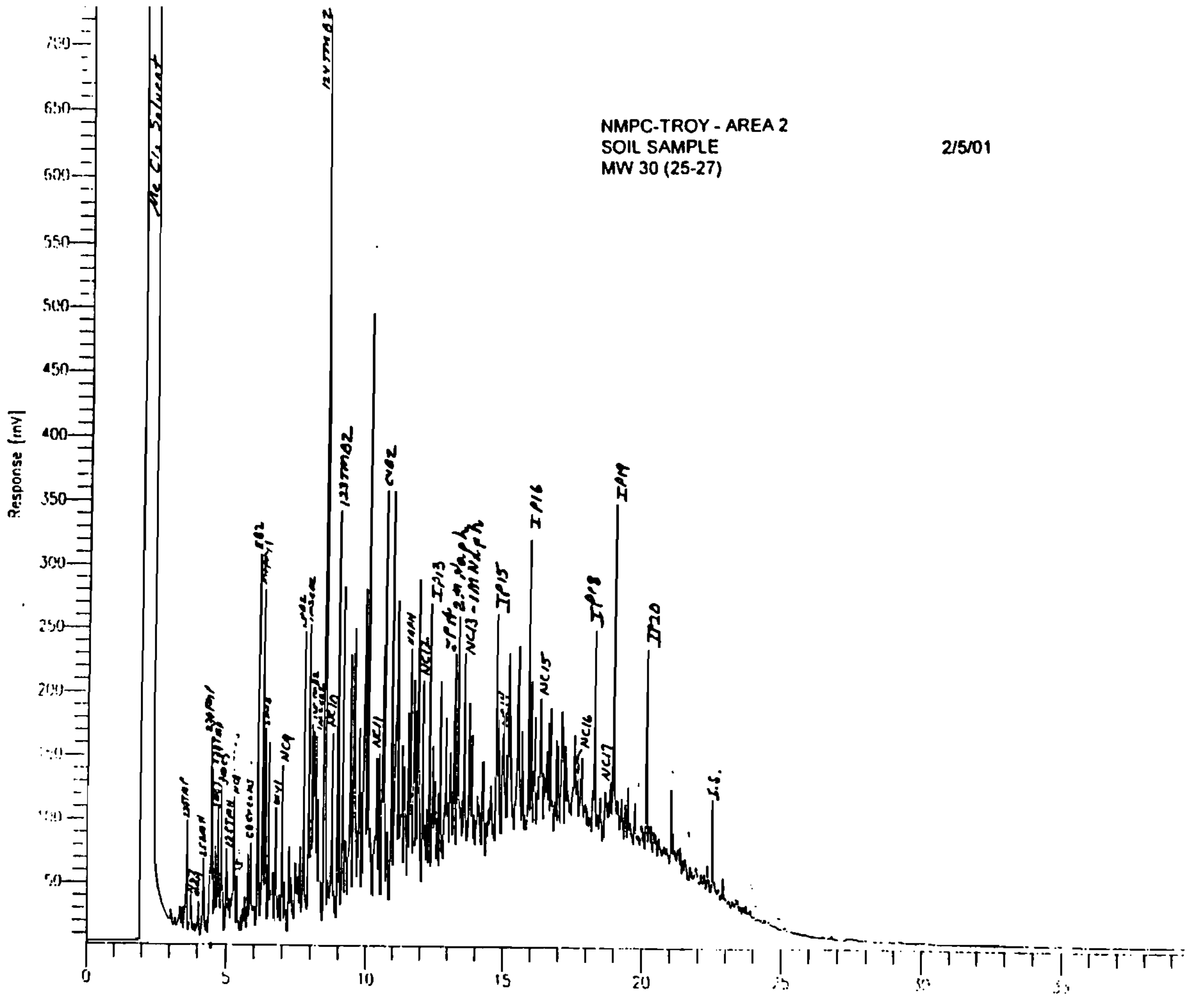


FIGURE 7: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 30 (25-27) SOIL SAMPLE AND A KEROSENE PRODUCT SAMPLE



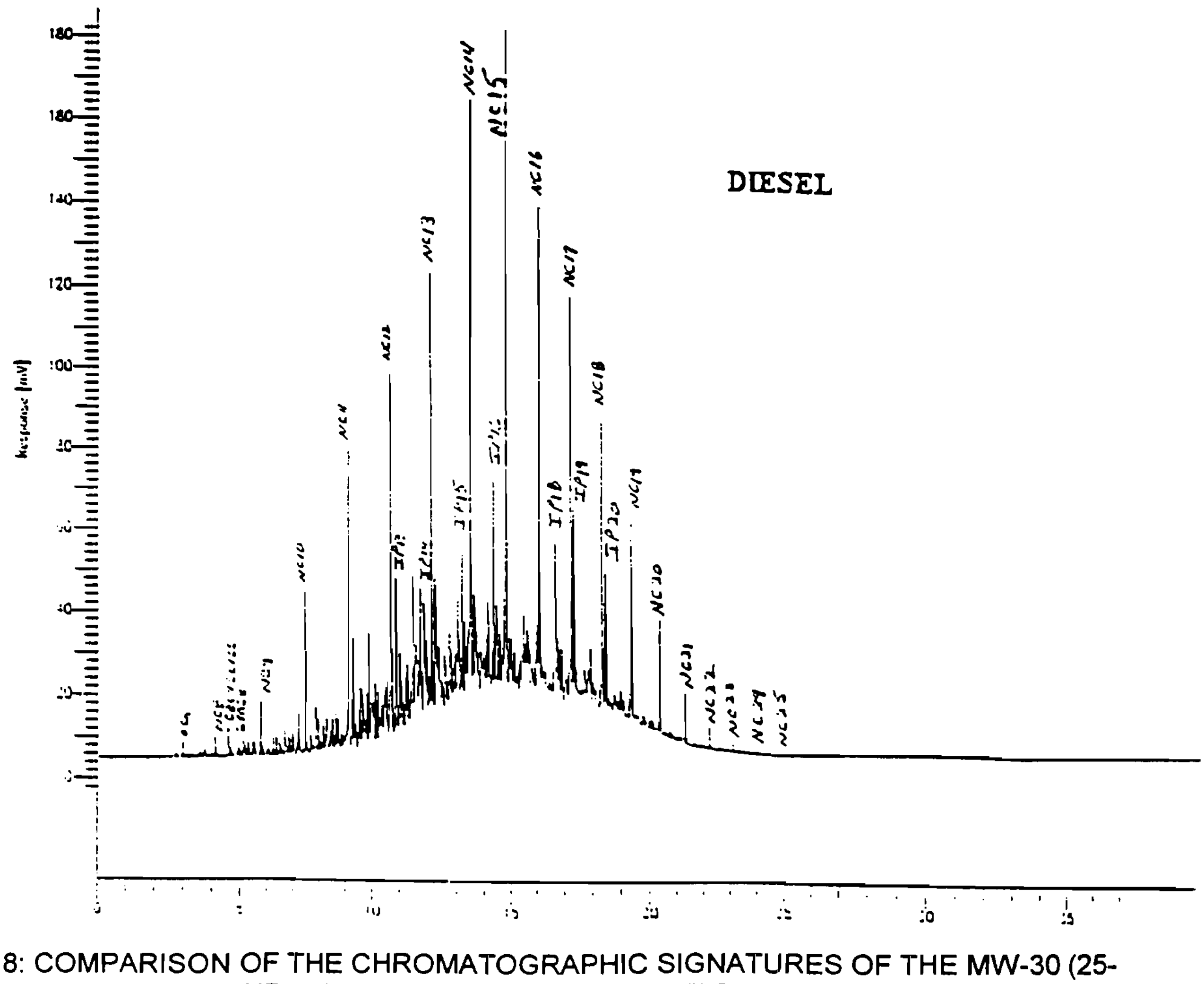


FIGURE 8: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW-30 (25-27) AND A DIESEL/FUEL OIL PRODUCT SAMPLE

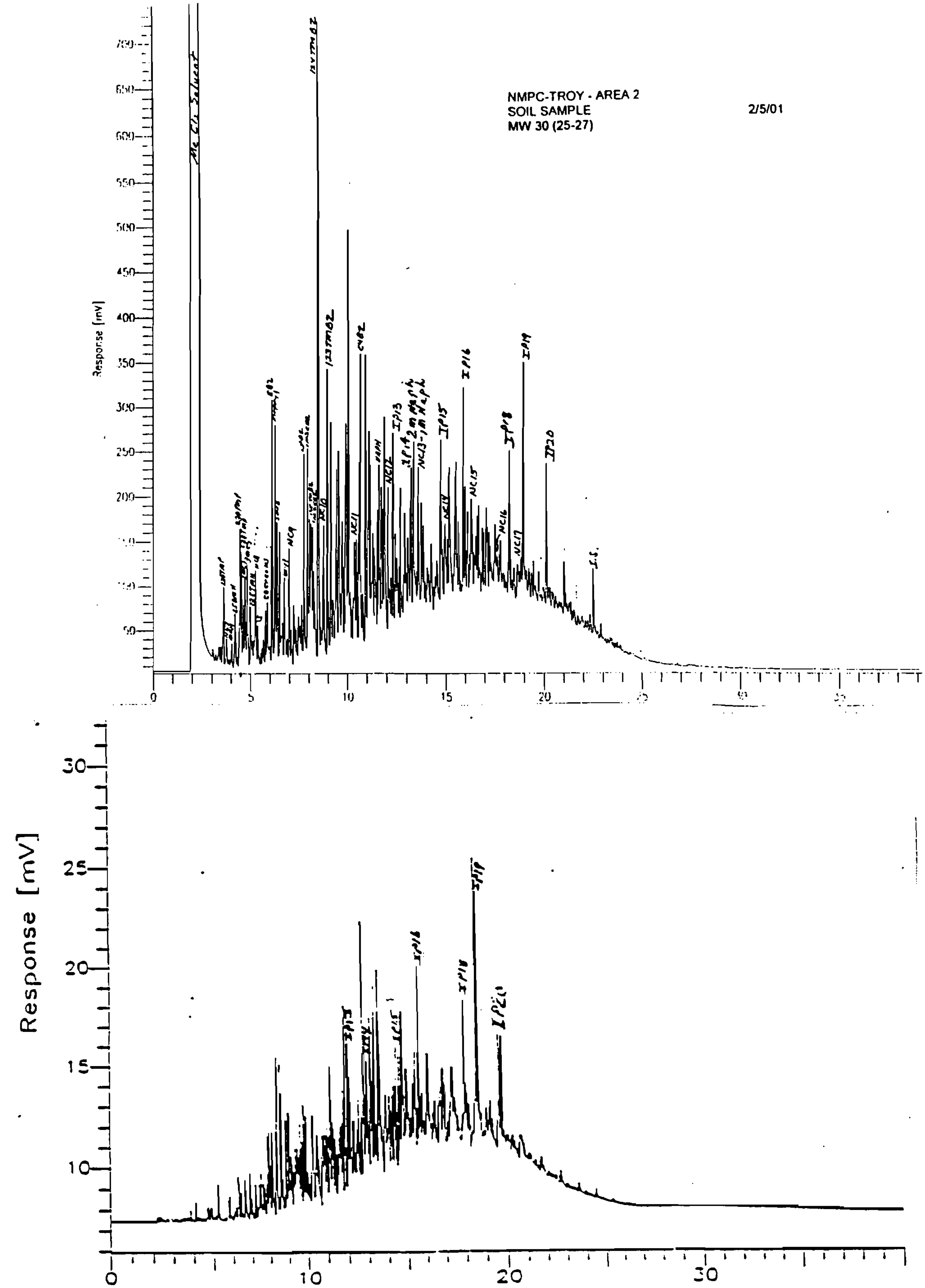


FIGURE 9: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 30 (25-27) SOIL SAMPLE AND A BIODEGRADED DIESEL/FUEL OIL PRODUCT SAMPLE

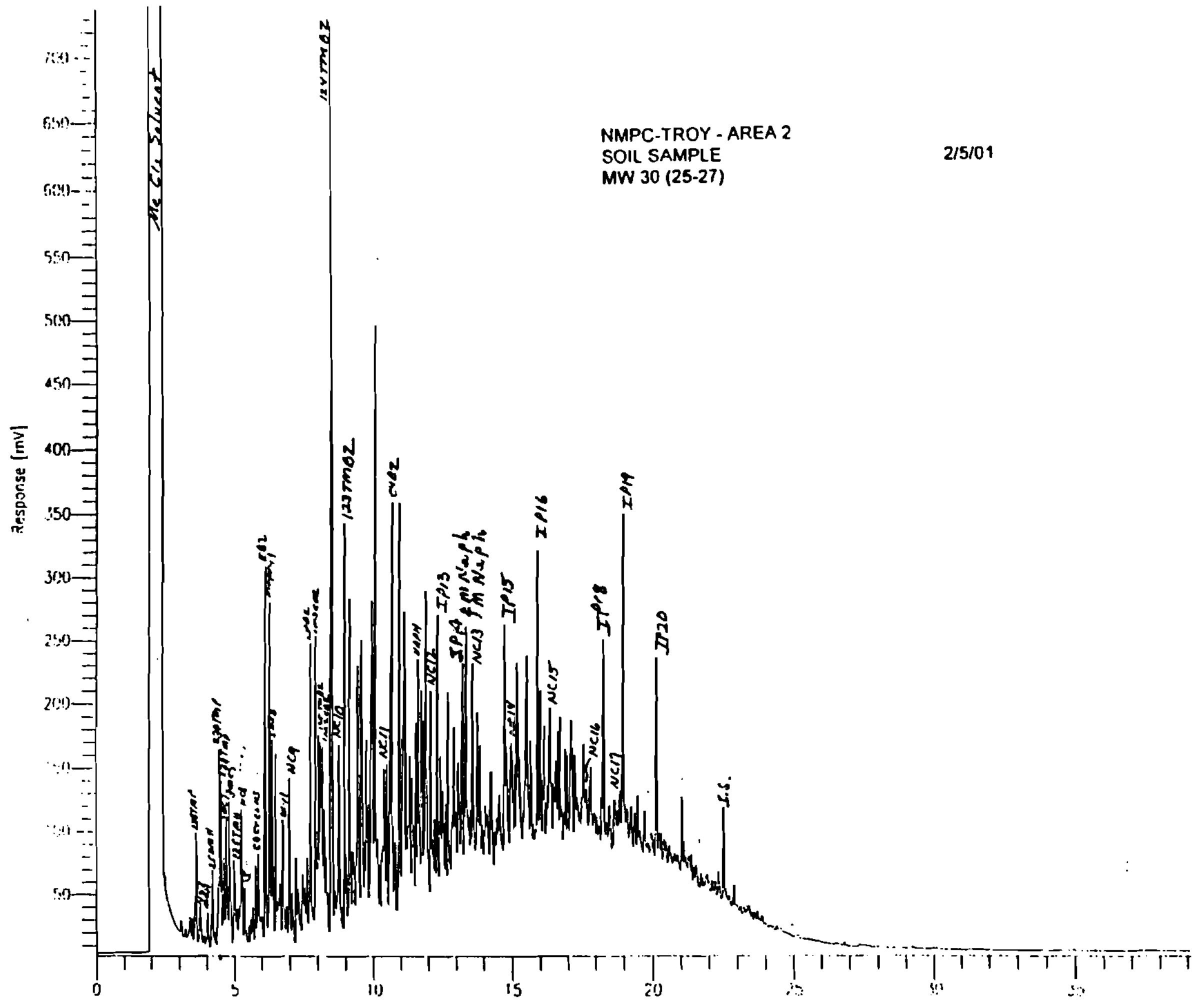
biodegradation. The NC17/IP19 ratio for the MW 30 (25-27) sample is 0.1. Based on the criteria of Christensen and Larsen, an exposure time of 16 to 20 years is indicated.

15% of the MW30 (25-27) sample signature is represented by the hydrocarbons eluting up to NC10, which are dominantly gasoline derived. The C10 to C13 range consists of both gasoline derived and diesel/fuel oil derived hydrocarbons. An additional 5 to 10% of the total hydrocarbons are estimated to also be gasoline derived. On this basis, the hydrocarbon assemblage present in the MW30 (25-27) sample represents 20 to 25% gasoline and 75 to 80% diesel or fuel oil. The gasoline portion of the sample shows compositional characteristics which would restrict the age of the parent gasoline to a gasoline produced prior to 1980, and most probably represents an unleaded gasoline produced between 1975 and 1980. The diesel/fuel oil is significantly biodegraded, with a most probable exposure time of 16 to 20 years.

Figure 10 compares the chromatographic signatures of the MW 30 (25-27) and MW 31 (23-25) soil samples. The MW 31 (23-25) soil sample signature also represents a mixture of gasoline derived and diesel/fuel oil derived hydrocarbons. The gasoline associated with the MW 31 (23-25) sample is more volatilized than the gasoline associated with the MW 30 (27-27) sample. The C8 hydrocarbons have been nearly completely lost in the MW 31 sample, and the proportions of the C9 aromatics to one another are affected by volatilization losses. Within the geographic limitations of a single site, it is likely the more weathered gasoline associated with the MW 31 (23-25) sample has had at least as long an exposure time as the gasoline associated with the MW 30 (25-27) sample. On this basis, the parent gasoline associated with the MW 30 (25-27) sample was produced prior to 1980 as well.

The diesel/fuel oil associated with the MW 31 (23-25) sample also is significantly biodegraded. The NC17/IP19 ratio for the MW 31 (23-25) sample is 0.0, with an indicated most probable exposure time of twenty years or more.

12% of the MW 31 (23-25) signature is represented by hydrocarbons eluting up to NC10, which are dominantly gasoline derived. The C10-C13 range consists of hydrocarbons which are both gasoline derived and diesel/fuel oil derived. An additional five to ten percent of the total hydrocarbons are estimated to be gasoline derived. On this basis approximately 20% of the hydrocarbons associated with the MW 31 (23-25) sample are gasoline derived, and 80% are diesel/fuel oil derived. The gasoline associated with the MW 31 (23-25) sample is considerably more severely volatilized than the gasoline associated with the MW 30 (25-27) sample. On this basis, a pre-1980 gasoline is also indicated for the MW 31 (23-25) sample. The diesel/fuel oil is significantly biodegraded, with a most probably exposure time of twenty years or more.



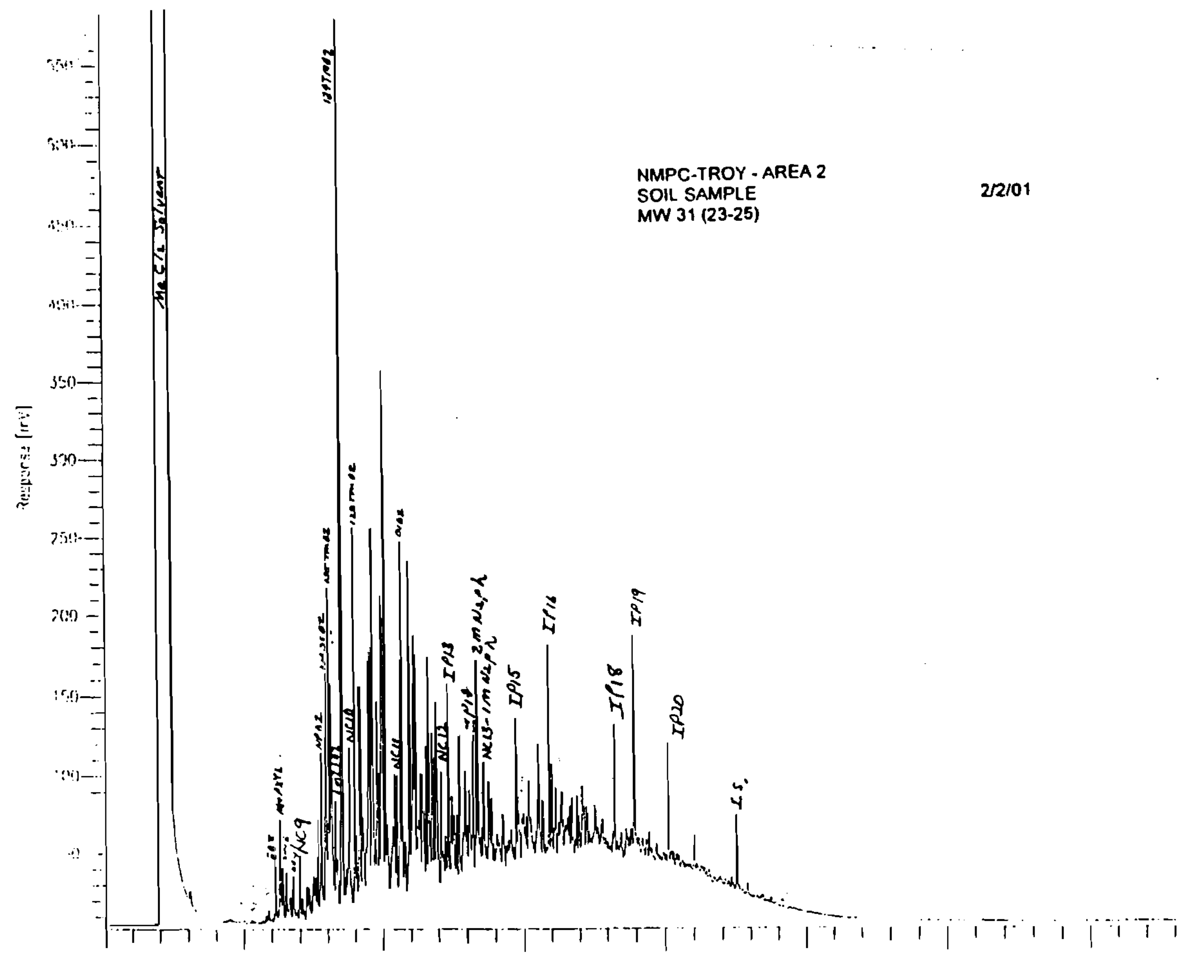


FIGURE 10: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 30 (25-27) AND MW 31 (23-25) SOIL SAMPLES

Figures 11 and 12 compare the chromatographic signatures of the MW 30 (25-27) and MW 31 (23-25) samples with the MW 31 free product sample signature. The MW 31 free product sample also is a mixture of gasoline range hydrocarbons and diesel/fuel oil derived hydrocarbons. The absence of normal paraffin peaks in the diesel/fuel oil range again indicates a severely biodegraded diesel/fuel oil with a most probable exposure time of twenty years or more.

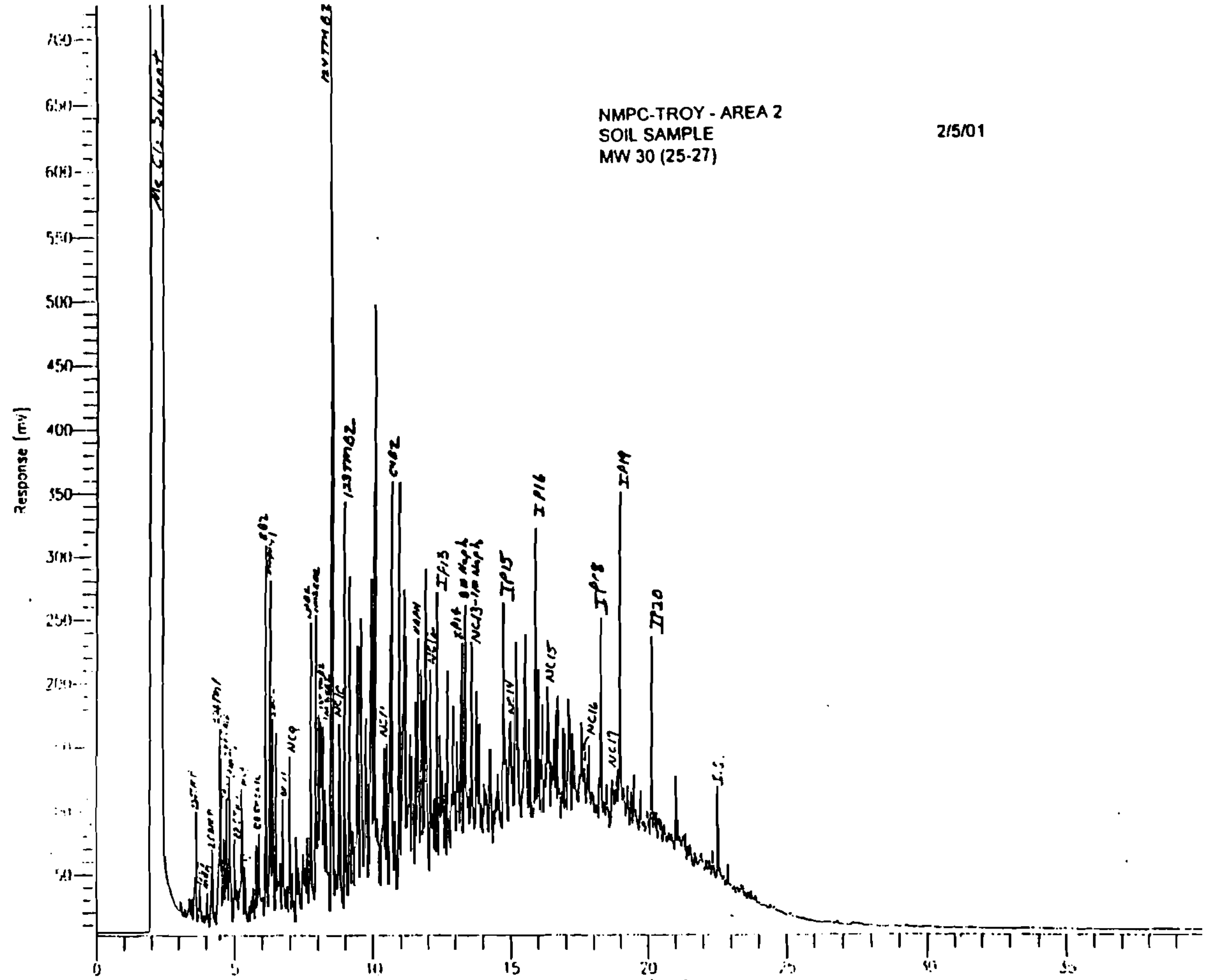
The gasoline range hydrocarbons present in the MW 31 free product are distinctly different than those present in either the MW 30 (25-27) or MW 31 (23-25) samples. The gasoline range hydrocarbon assemblage is not distinctly consistent with gasoline. Either the gasoline associated with the MW 31 free product is so severely weathered that the peak assemblage is no longer recognizable as gasoline or the parent product was a gasoline range, mixed hydrocarbon solvent, such as naphtha.

The gasoline range hydrocarbons up to NC10 represent 12% of the MW 31 free product. Both gasoline and diesel/fuel oil derived hydrocarbons occur in the C10 to 13 range. It is estimated that up to 20% of the MW 31 free product could contain gasoline derived hydrocarbons. The remaining 80% or more of the MW 31 free product represents a severely biodegraded diesel/fuel oil product.

The signature characteristics of coal tar differ considerably from those of the MW 30 (25-27), MW 31 (23-25), and MW 31 free product samples. Figures 13, 14, and 15 compare the chromatographic signatures of these samples to the signature of a coal tar. Coal tar signatures are dominated by prominent polynuclear aromatic peaks extending from naphthalene through benzo(g,h,I) perylene. This peak sequence is not evident in either the MW 30 (25-27) or the MW 31 (23-25) samples. Coal tar signatures also do not display a prominent baseline rise or hump, which are evident in the MW 30 (25-27) and MW 31 (23-25) sample signatures.

The MW 30 water sample signature also indicates the dissolved hydrocarbons are a mixture of gasoline derived and diesel/fuel oil derived hydrocarbons. The more water soluble single ring aromatic hydrocarbons associated with gasoline predominate. Figure 16 compares the chromatographic signatures of the MW 30 water sample and the MW 30 (25-27) soil sample. The prominence of C9 and higher aromatic hydrocarbons among the gasoline derived hydrocarbons in the MW30 water sample signature indicate the gasoline from which these hydrocarbons were derived was very significantly weathered.

The proportions of the C8 aromatic hydrocarbons compared to one another and the C9 aromatic hydrocarbons compared to one another again indicate a parent gasoline produced no later than 1980. Figure 17 compares the chromatographic signature of the MW 30 water sample with the signature of API PS6 gasoline. The very high proportion of ethylbenzene to ortho-xylene in the MW 30 sample signature is a characteristic restricted to gasolines produced prior to 1980. As discussed previously, the C8



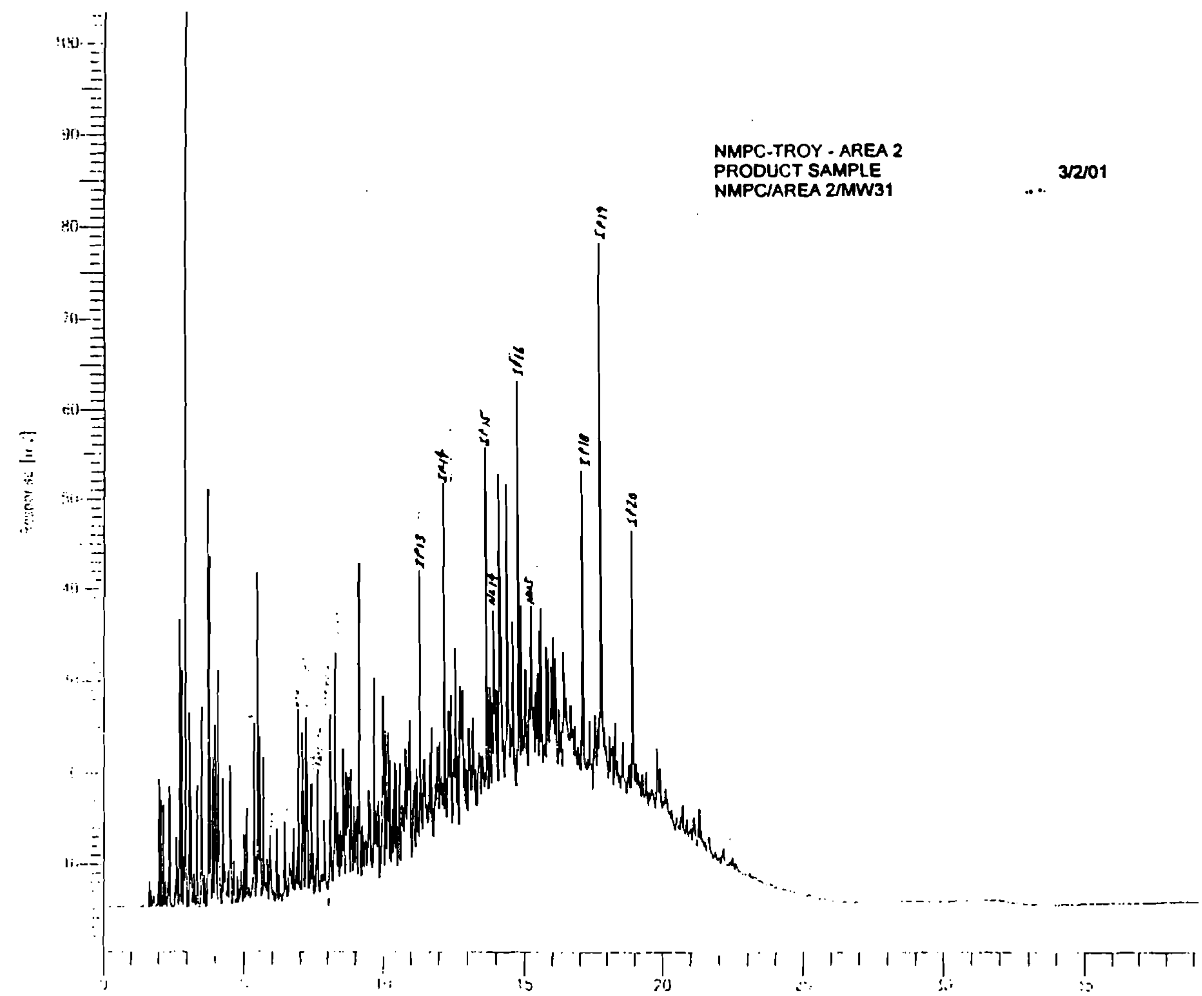
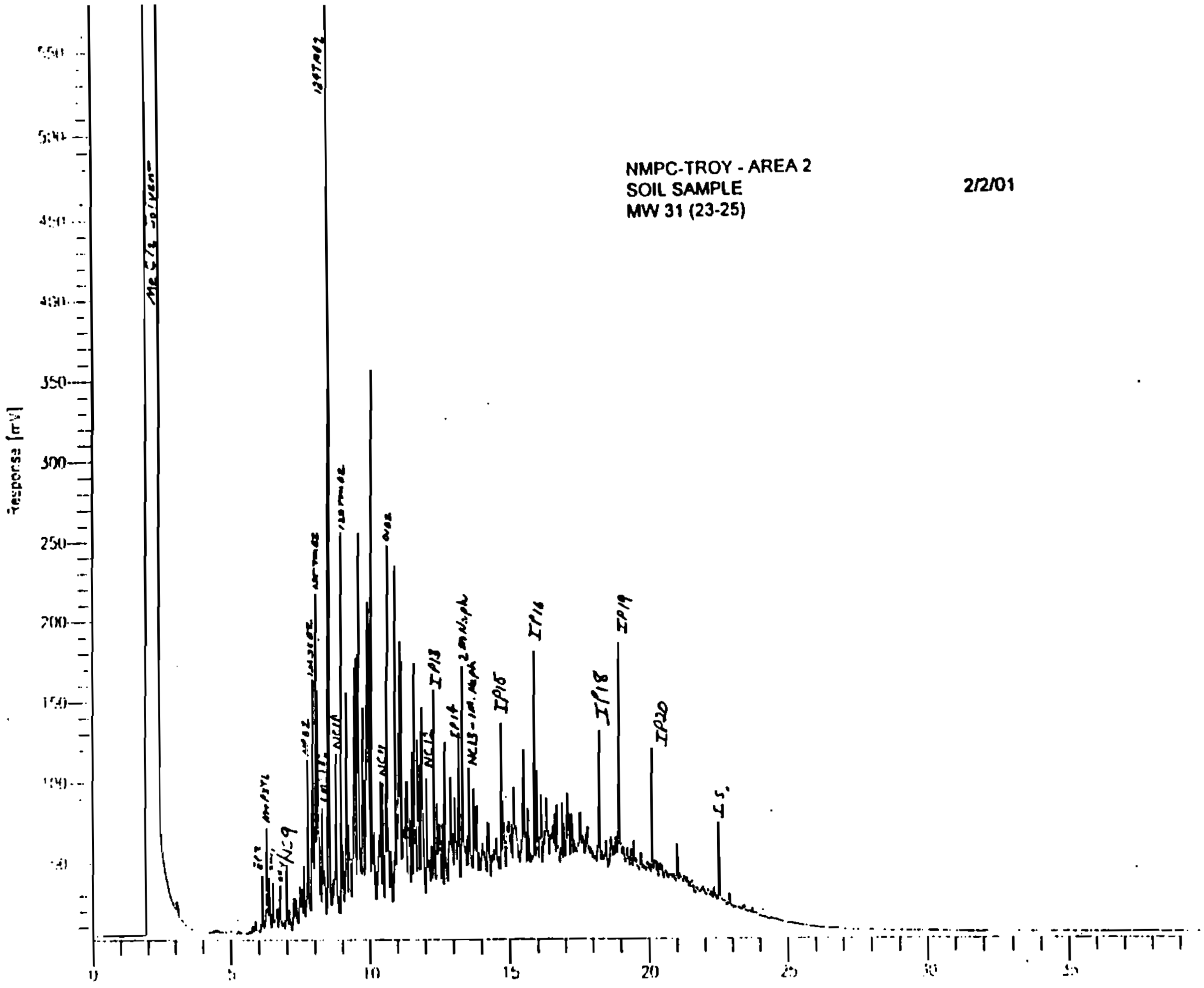


FIGURE 11: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 30 (25-27) SOIL SAMPLE AND THE MW 31 FREE PRODUCT SAMPLE



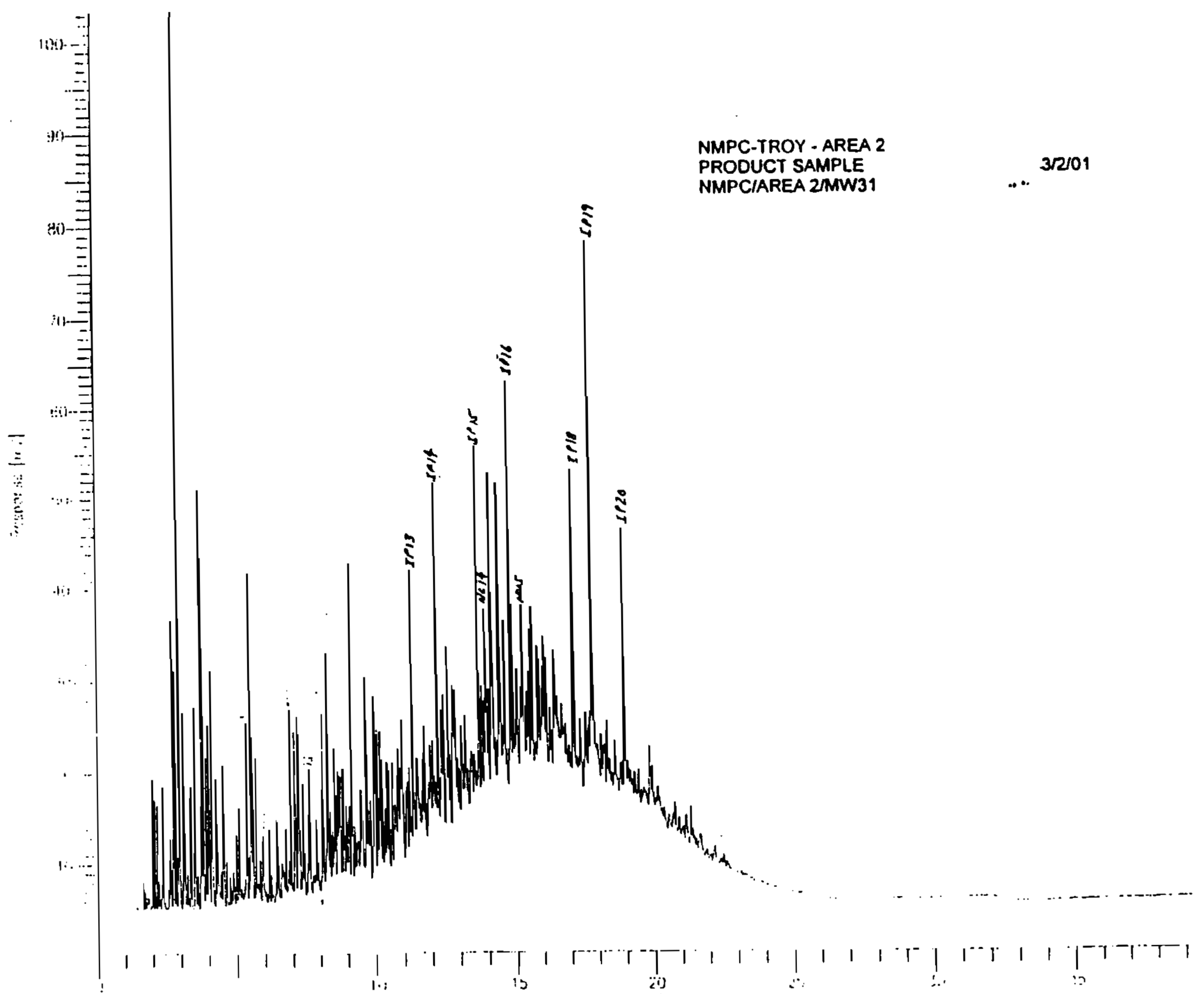
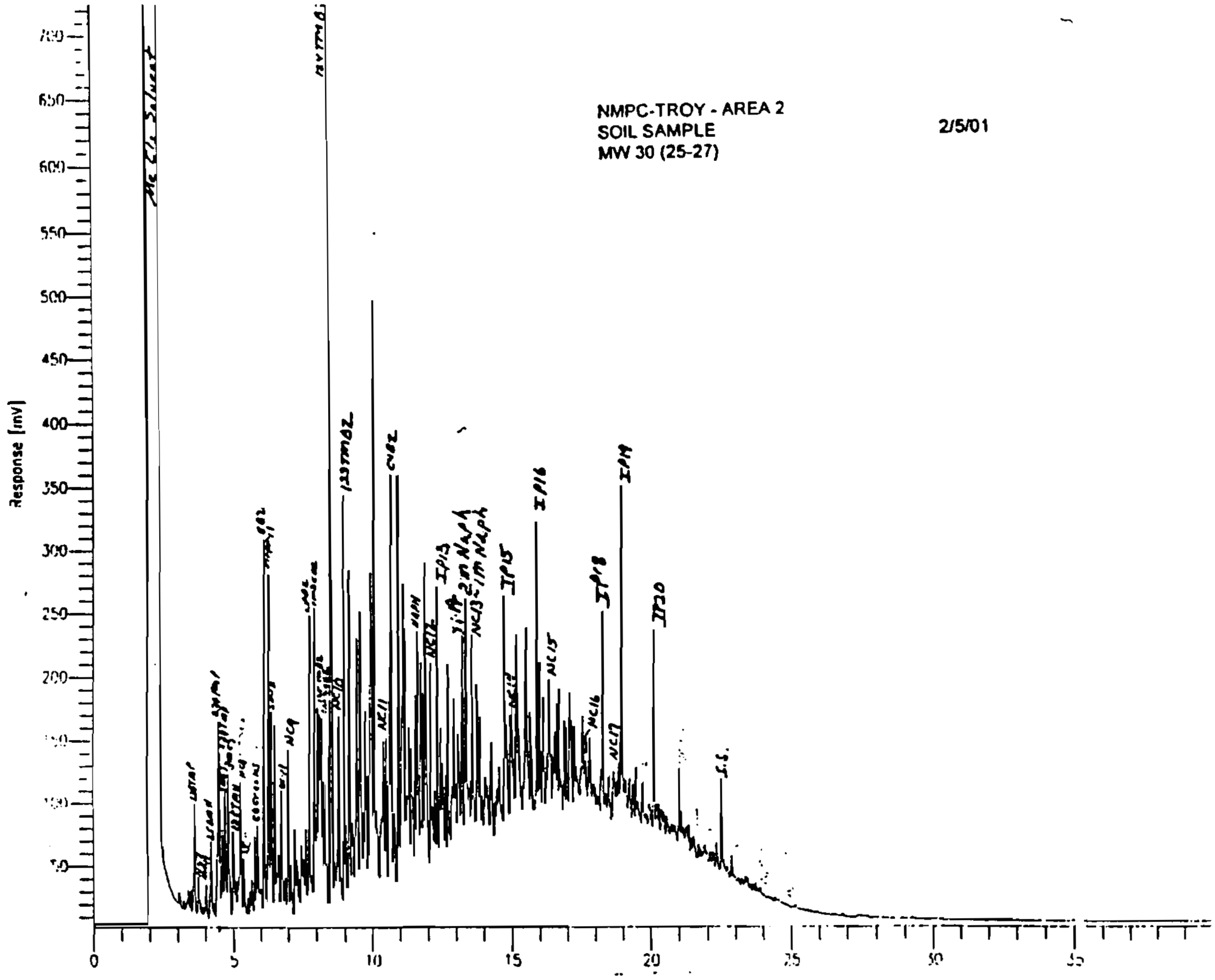


FIGURE 12: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 31 (23-25) SOIL SAMPLE AND THE MW 31 FREE PRODUCT SAMPLE



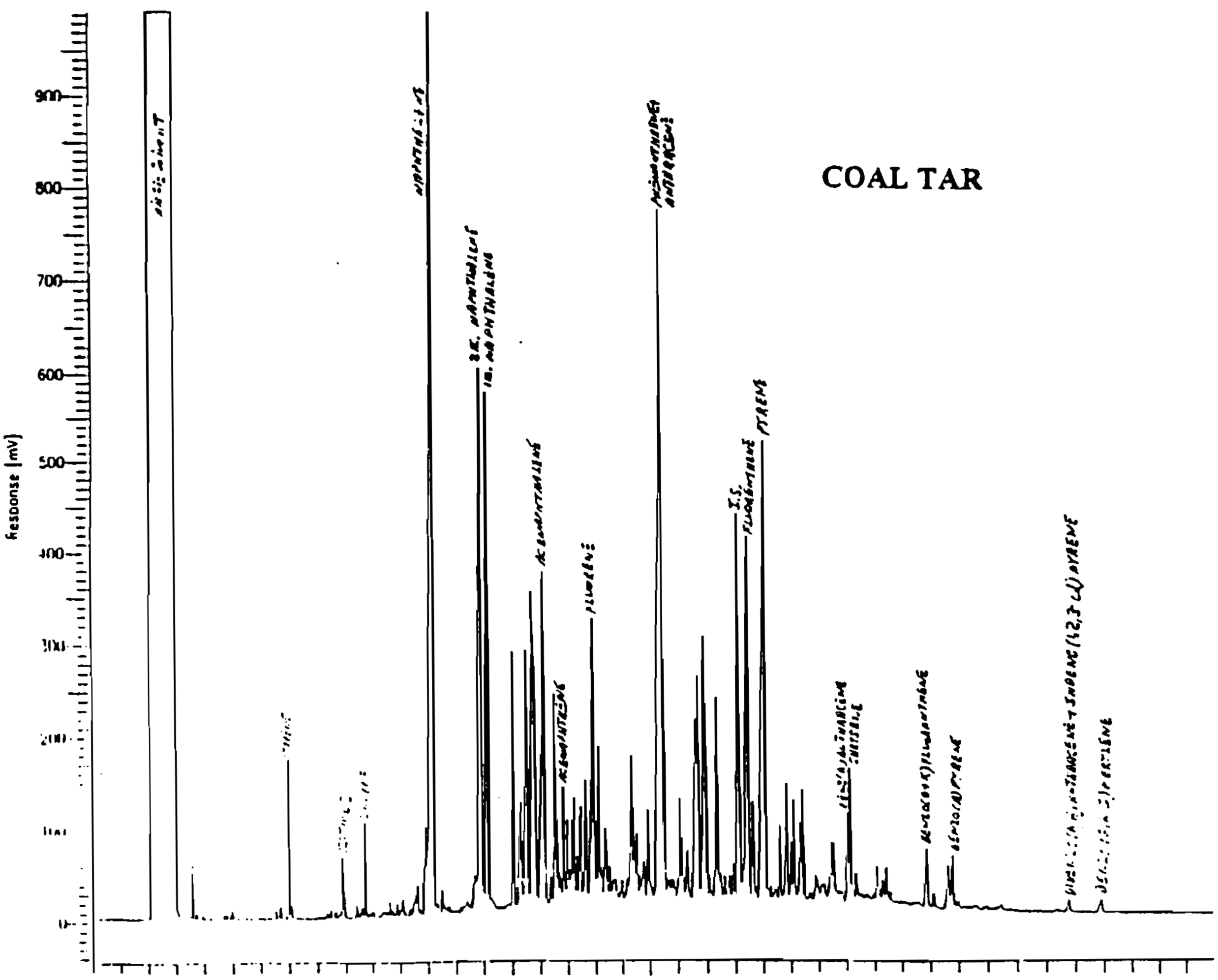


FIGURE 13: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 30 (25-27) SOIL SAMPLE AND A COAL TAR

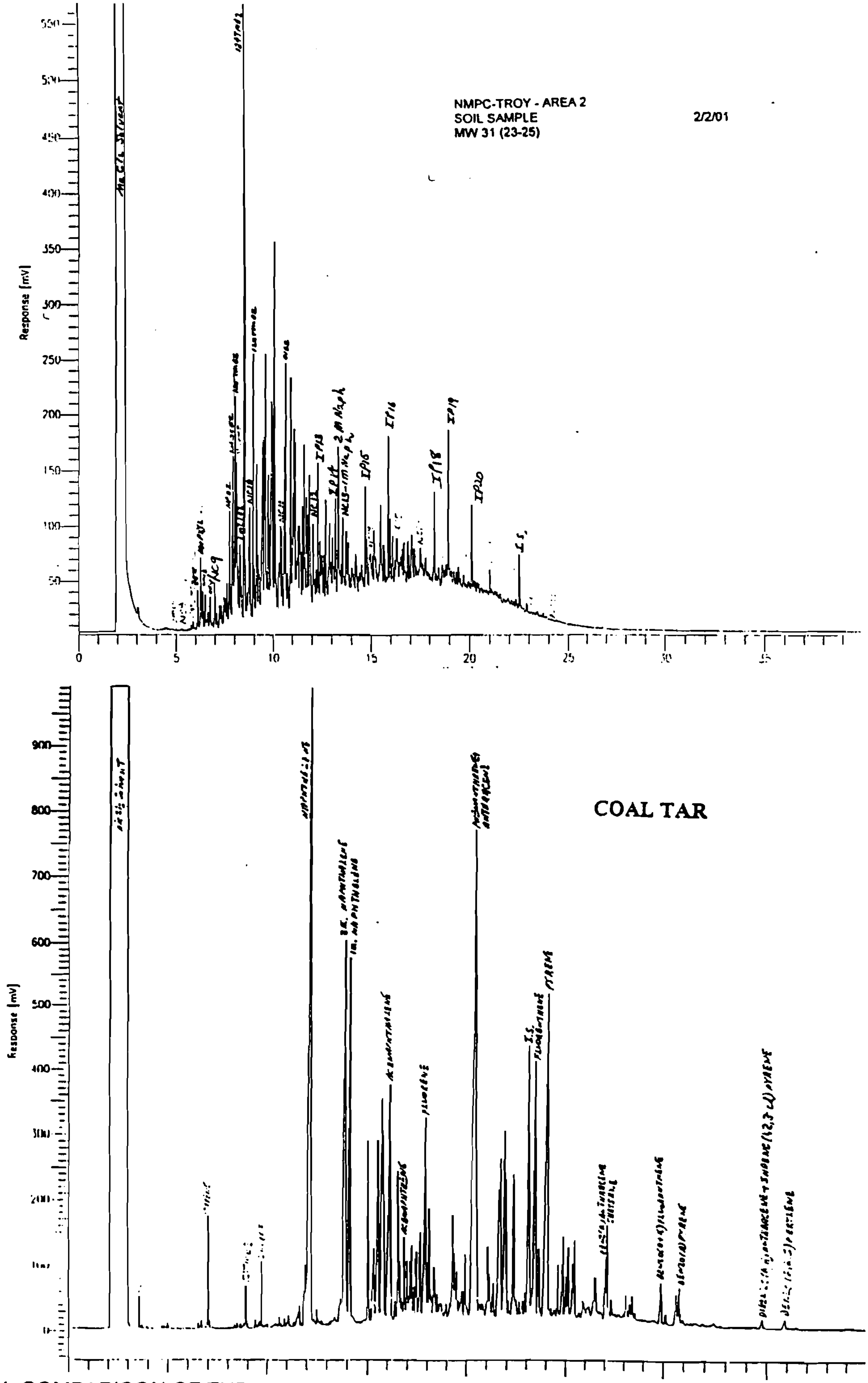


FIGURE 14: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 31 (23-25) SOIL SAMPLE AND A COAL TAR

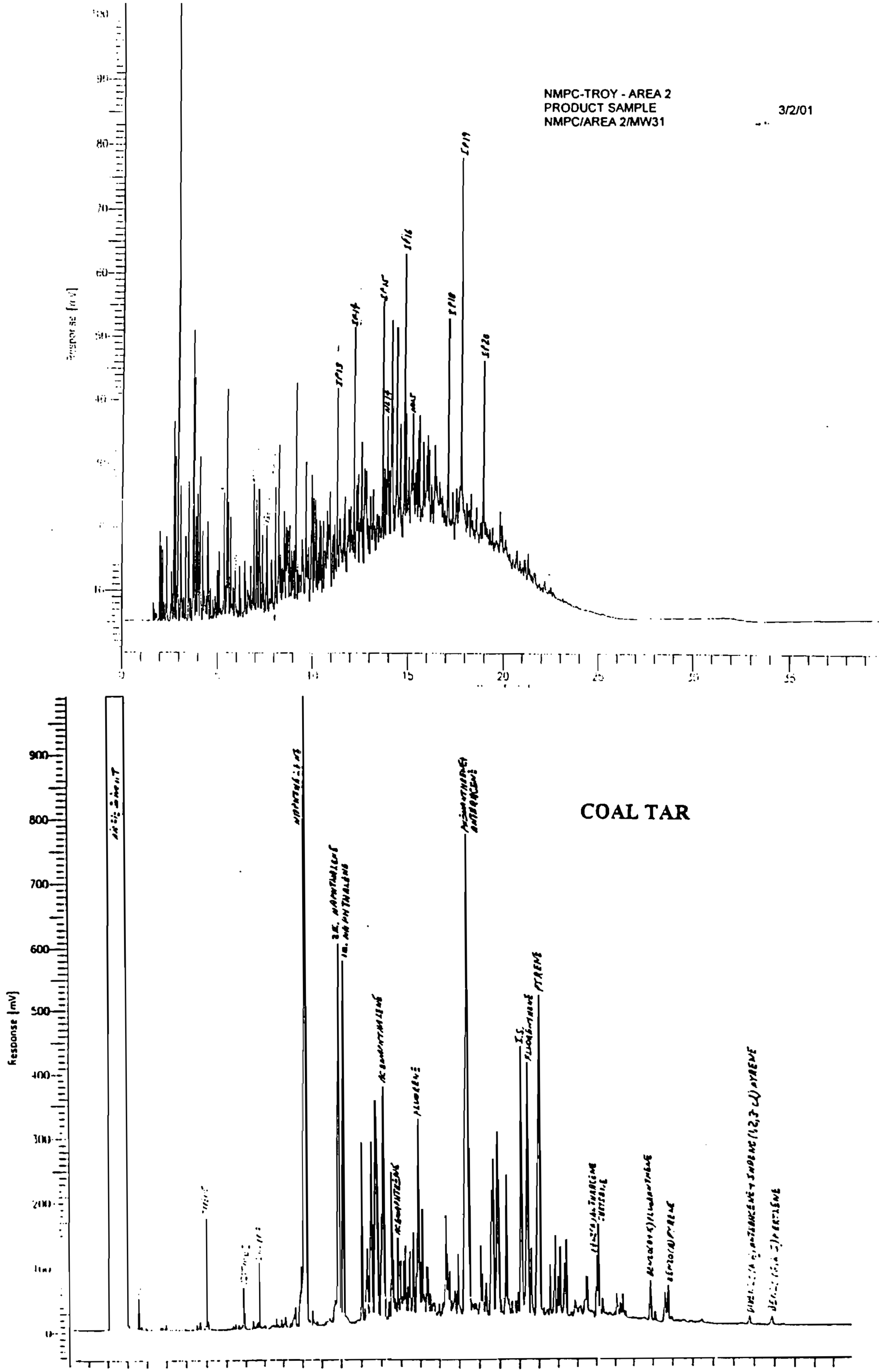


FIGURE 15: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 31 FREE PRODUCT AND A COAL TAR

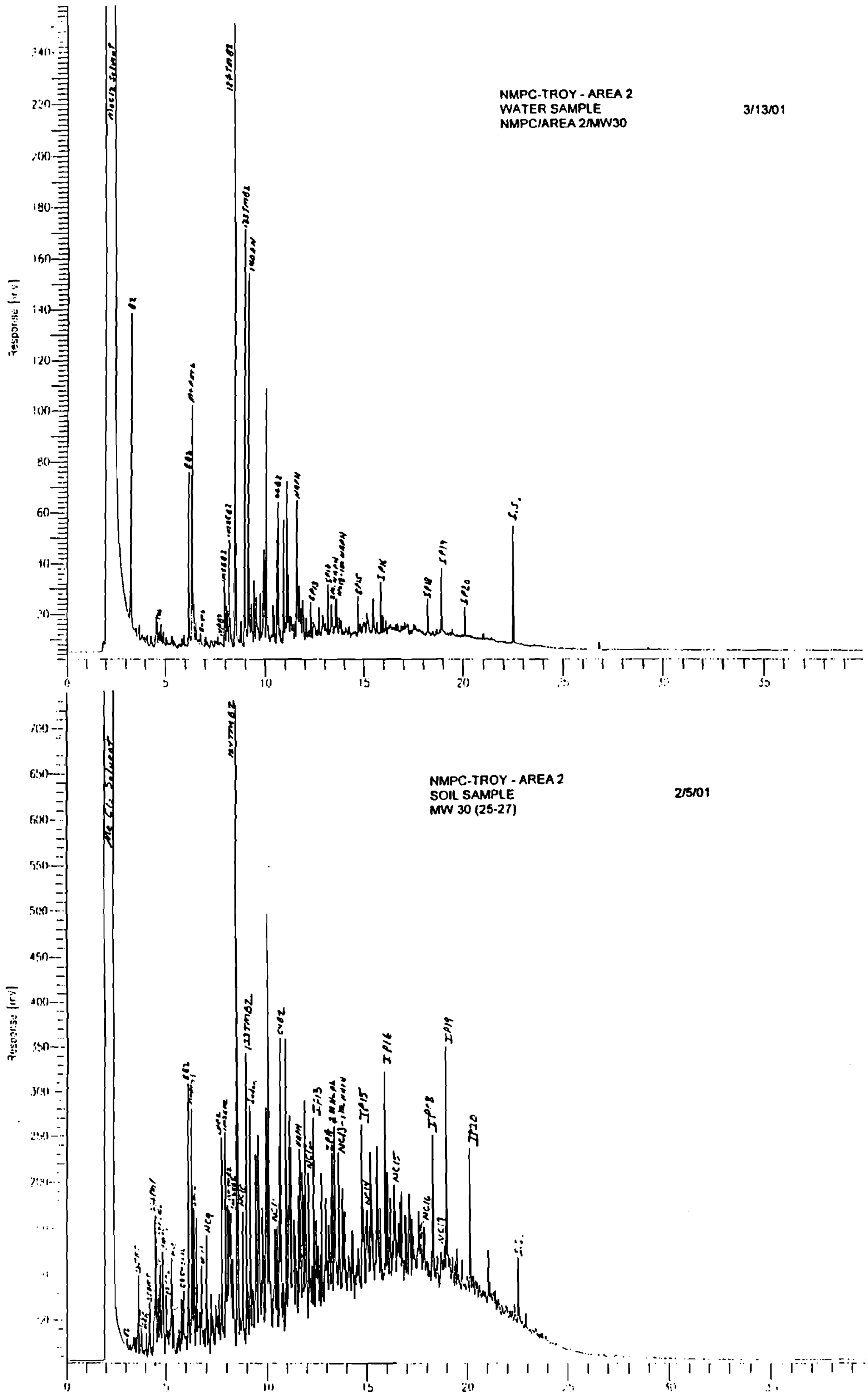


FIGURE 16: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 30 WATER SAMPLE AND THE MW-30(25-27) SOIL SAMPLE

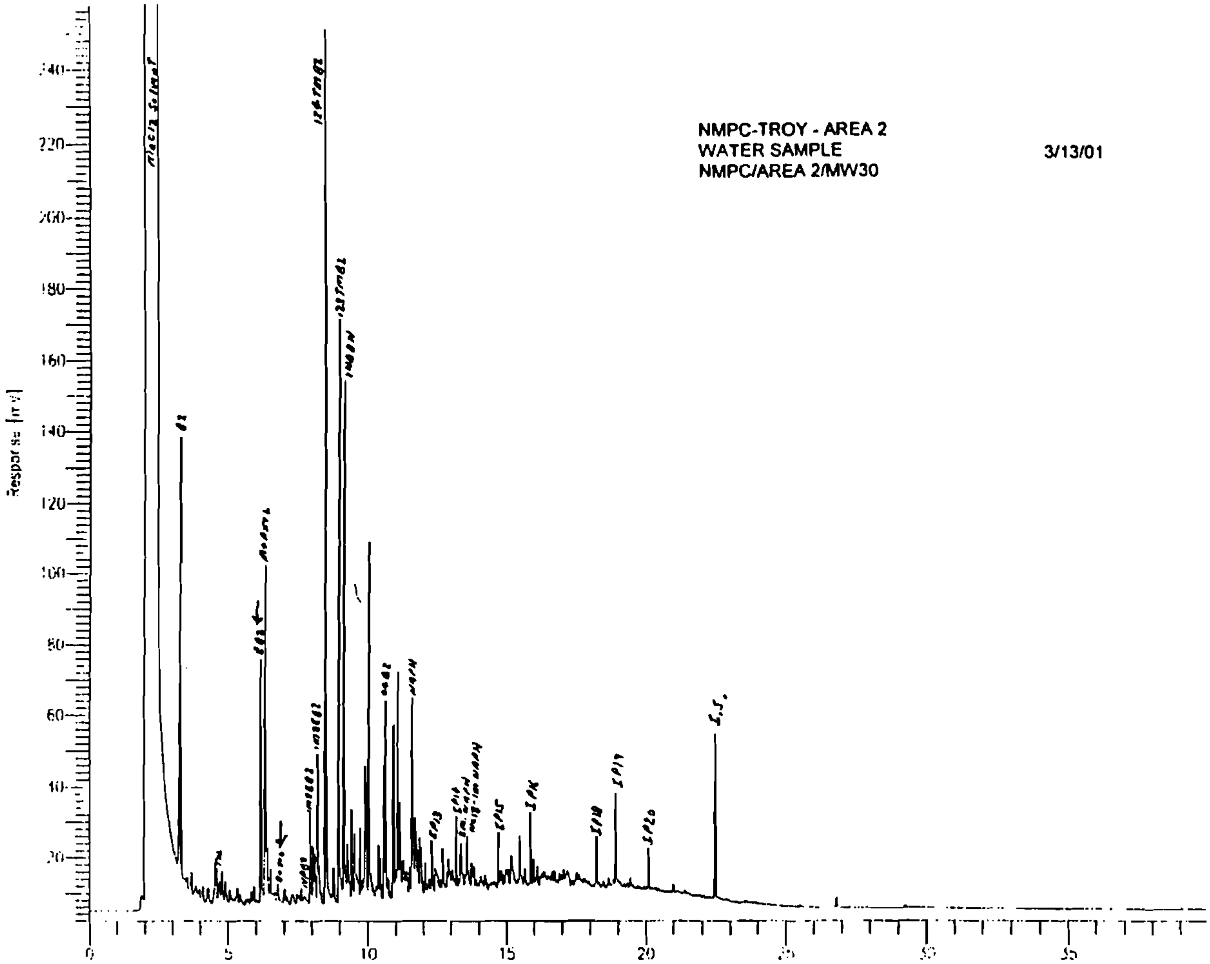
aromatics have comparable solubilities in water and comparable degradation rates. Their proportions compared to one another will reflect their proportions compared to one another whether present as gasoline (either sorbed on soil or as free phase) or dissolved in ground water. The MW 30 water sample also shows atypical proportions of C9 aromatics compared to one another, also indicating a 1980 or older gasoline as the parent product. Differences in the proportions of the C8 aromatics compared to one another and the C9 aromatics compared to one another between the MW 30 water sample and the MW 30 (25-27) soil sample also indicate two different 1980 or older gasolines are associated with these samples.

The diesel/fuel oil assemblage associated with the MW 30 water sample shows an absence of normal paraffin peaks and a predominance of isoprenoid peaks. A severe level of biodegradation is indicated for the diesel/fuel oil from which these hydrocarbons were derived. The absence of normal paraffins and a NC17/IP19 ratio of 0.0, indicates a most probable exposure time of twenty years or more for the diesel/fuel oil from which these hydrocarbons were derived. The proportions of the isoprenoids compared to one another are similar to the isoprenoid proportions of the MW 30 (25-27) soil sample. The signature of the MW 30 water sample shows no similarity to that of a coal tar, as illustrated in Figure 18.

Figure 19 compares the chromatographic signatures of the SB-40 (23-25) and the MW 31 (23-25) soil samples. The SB-40 (23-25) sample signature does not show a gasoline contribution to the hydrocarbons extracted from this soil sample. This is illustrated in Figure 20, which compares the signature of the SB-40 (23-25) sample with the signature of API PS6 gasoline. The baseline rise of the SB-40 (23-25) sample also extends to a higher carbon atom range than the MW 31(23-25) sample. The baseline rise of the SB-40 (23-25) sample is more extensive than would be associated with a standard (#2) grade fuel oil or diesel. Figure 21 compares the chromatographic signature of the SB-40 soil sample with a biodegraded diesel/fuel oil signature.

The baseline rise characteristics of the SB-40 (23-25) sample are consistent with a residual grade or #6 fuel oil. Figure 22 compares the chromatographic signature of the SB-40 (23-25) sample with the signature of a residual grade fuel oil. The absence of normal paraffin peaks indicates the residual fuel oil associated with the SB-40 (23-25) sample is severely biodegraded. However, the absence of isoprenoid peaks as well indicates the level of biodegradation is even more severe.

Kennicutt (1988), in studies of crude oil biodegradation, found the isoprenoids to be relatively unaffected by biodegradation until the normal paraffins had been lost. It took approximately double the amount of time after the normal paraffins had been lost for the isoprenoids to be significantly lost. On the basis that the SB-40 (23-25) sample signature shows neither a prominent sequence of normal paraffin peaks nor a prominent sequence of isoprenoid peaks, an exposure time of at least fifty



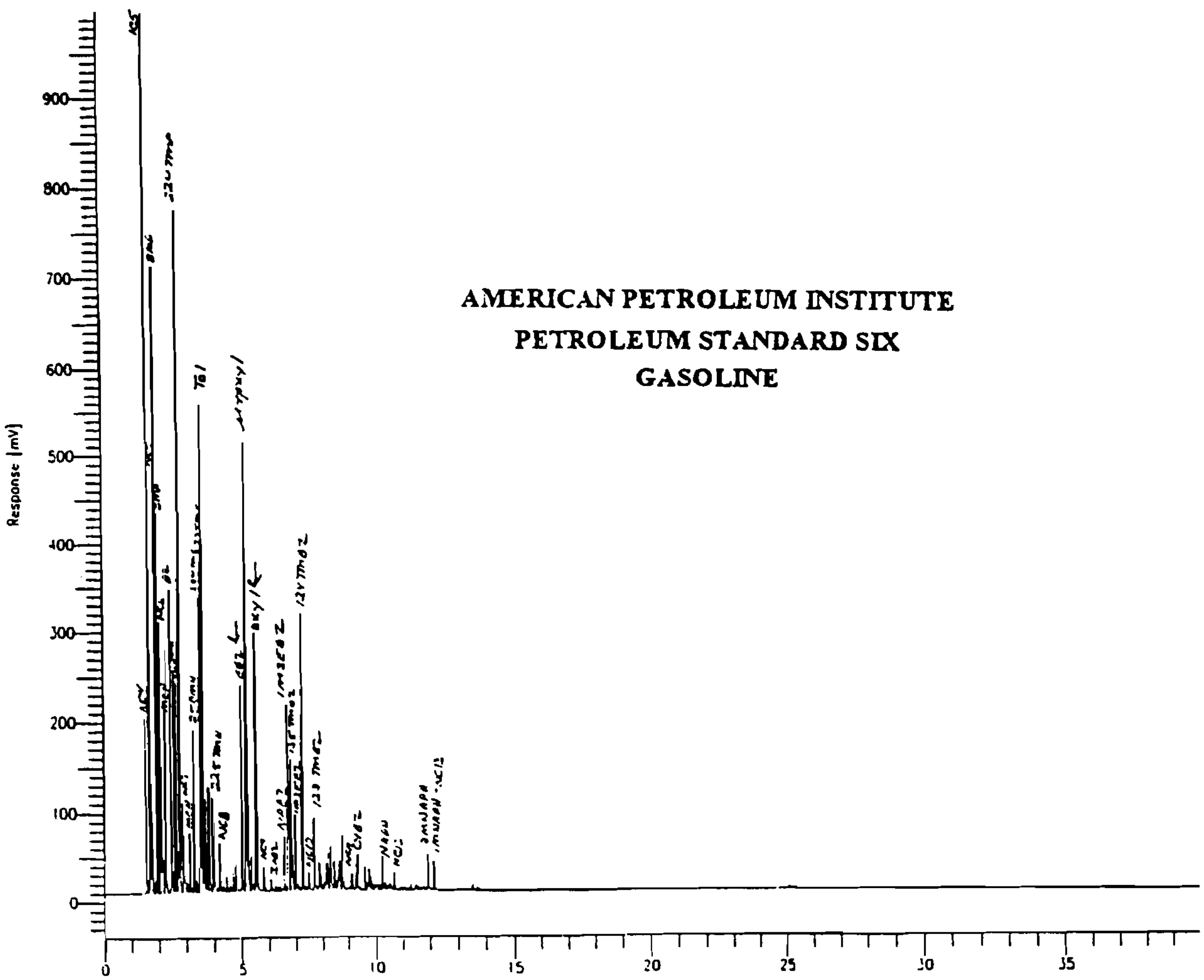


FIGURE 17: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 30 WATER SAMPLE AND API PS6 GASOLINE

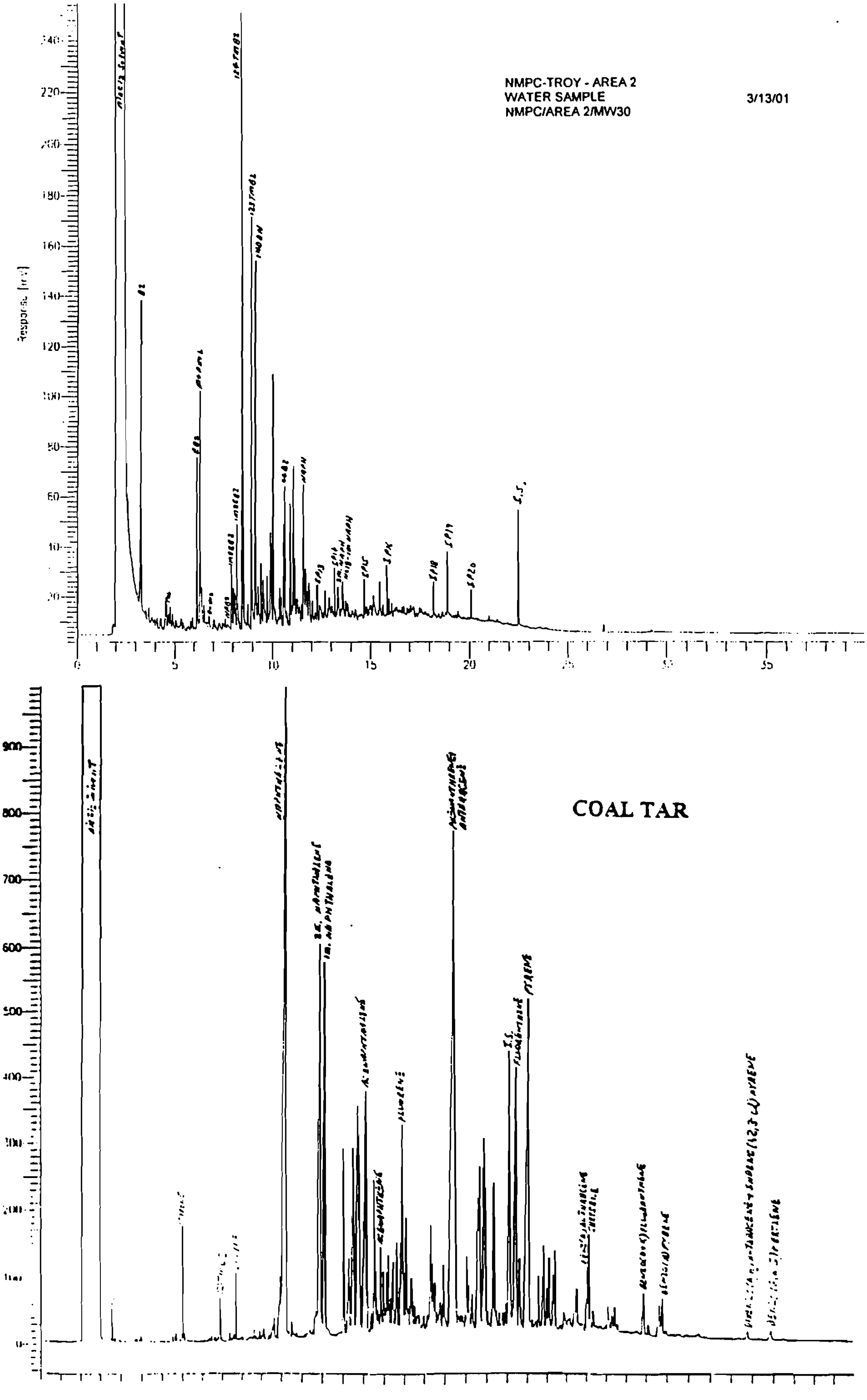


FIGURE 18: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 30 WATER SAMPLE AND A COAL TAR

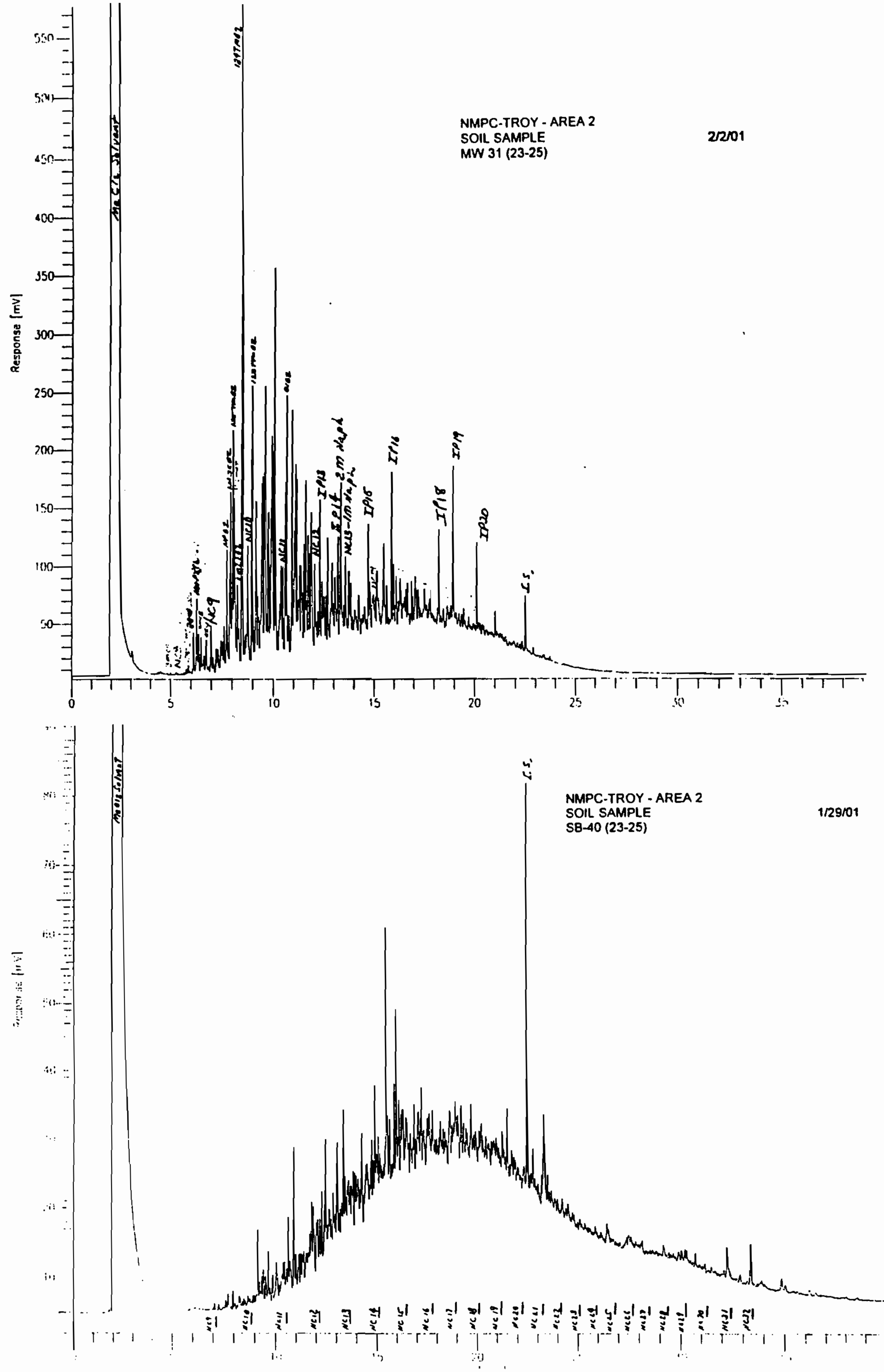
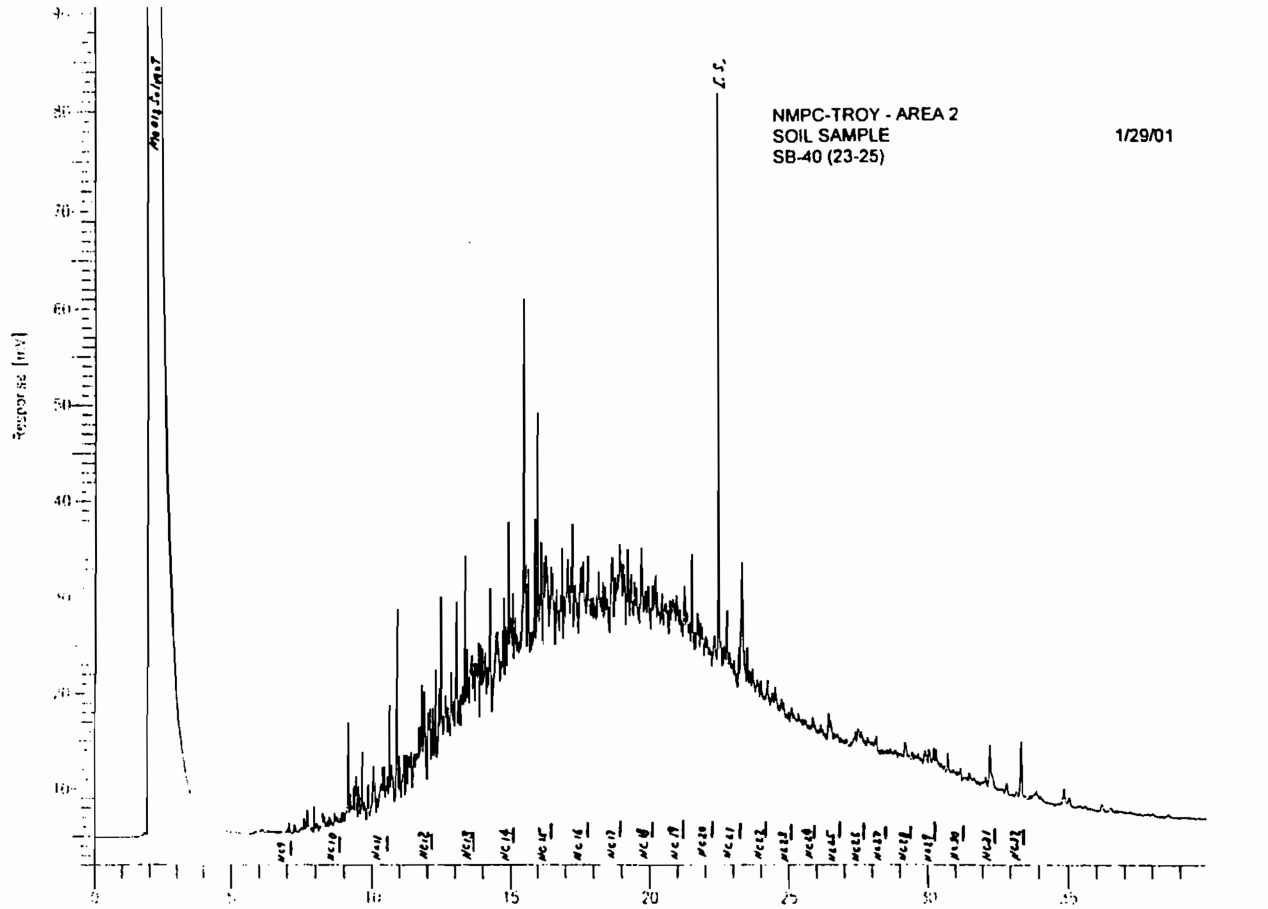


FIGURE 19: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 31 (23-25) AND SB-40 (23-25) SOIL SAMPLES



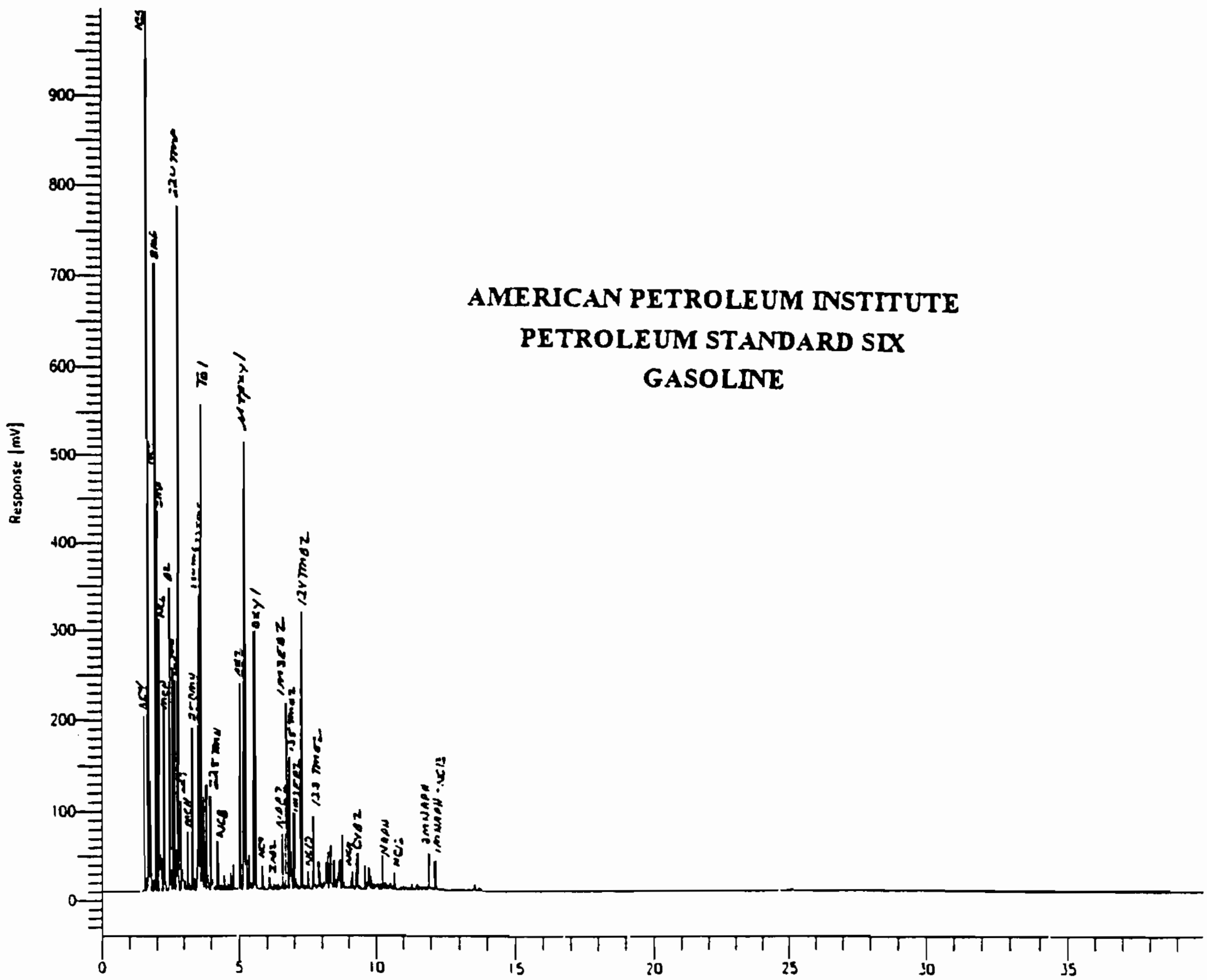


FIGURE 20: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE SB-40 (23-25) SOIL SAMPLE AND API PS6 GASOLINE

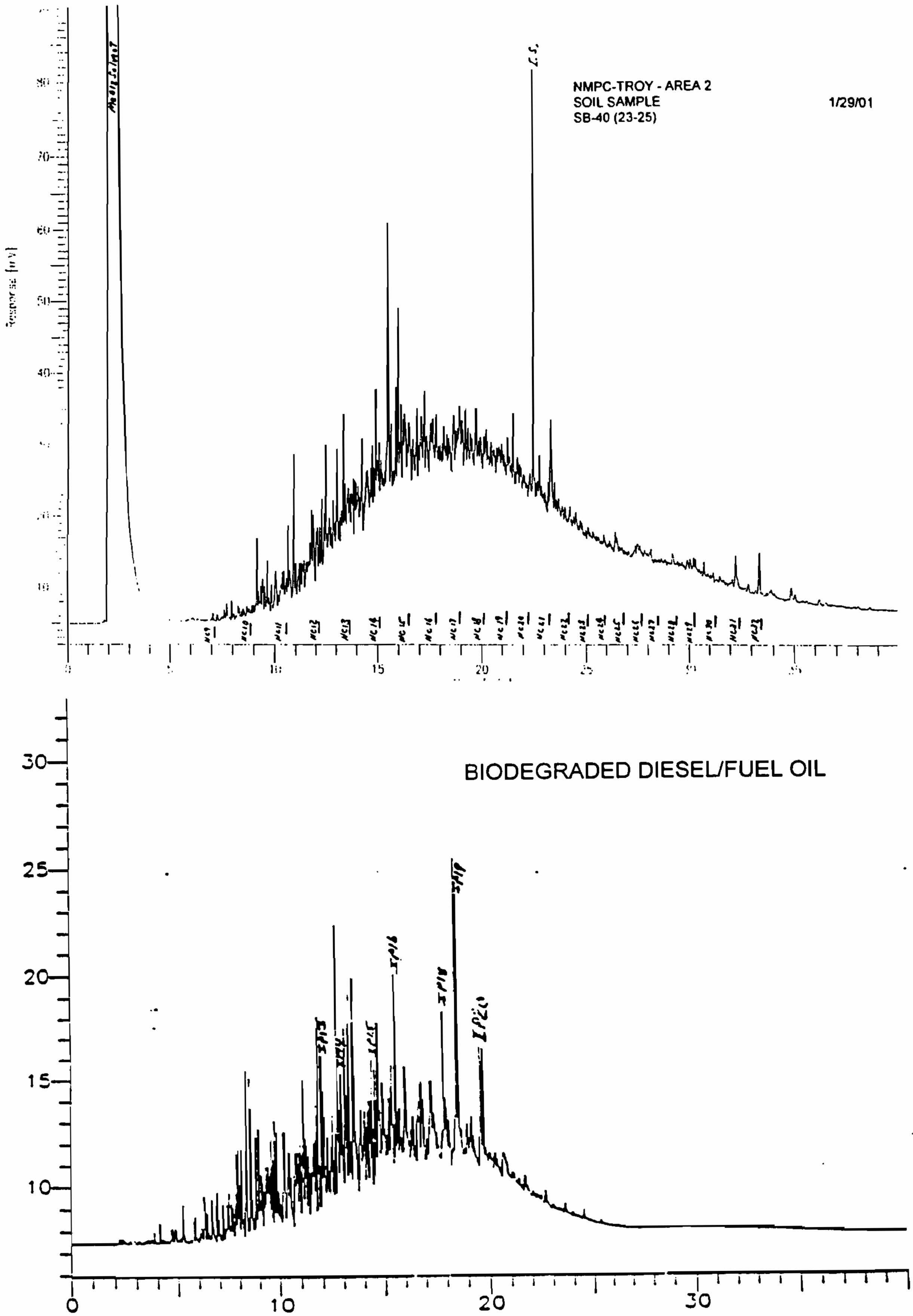


FIGURE 21: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE SB-40 (23-25) SOIL SAMPLE AND A BIODEGRADED DIESEL/FUEL OIL SIGNATURE

to sixty years is most probable for the residual fuel oil product associated with the SB-40 (23-25) soil sample.

The SB-40 (23-25) sample signature shows several peaks which elute at the positions of certain polynuclear aromatic hydrocarbons (PAH's). However, a full suite of PAH peaks are not present, and the proportions are not consistent with the PAH peaks present in the coal tar impacted samples. This is illustrated in Figure 23, which compares the chromatographic signature of the SB-40 (23-25) sample with a coal tar signature. For example, the phenanthrene peak would be expected to be present at considerably higher proportions than the acenaphthalene peak, but is absent. Both the atypical proportions and absence of the majority of the PAH peaks eluting after acenaphthalene indicate these peaks more likely are associated with a residual grade fuel oil than with coal tar.

The signature characteristics of the SB-40 (23-25) soil sample are consistent with a residual grade fuel oil. The fuel oil is very severely biodegraded; both the normal paraffins and isoprenoids have been lost. An exposure time of at least fifty years is indicated for the fuel oil.

The PZ-1 (27-29) sample signature indicates the hydrocarbon assemblage present in this sample represents a mixture of diesel/fuel oil and coal tar. The diesel/fuel oil contribution predominates. Figure 24 compares the chromatographic signature of the PZ-1 (27-29) sample signature with the signature of a coal tar. The sequence of polynuclear aromatic peaks is indicative of a coal tar contribution and would not be expected to be present in diesel or fuel oil. In addition to the coal tar contribution, the PZ-1 sample signature also shows a sequence of normal paraffin and isoprenoid peaks, as well as a large baseline rise or hump consistent with a diesel/fuel oil. The normal paraffin peaks, isoprenoid peaks, and baseline rise would not be associated with a coal tar product as illustrated in Figure 24. These characteristics are consistent with a diesel/fuel oil product.

Figure 25 compares the chromatographic signature of the PZ-1 (27-29) sample with a diesel/fuel oil product signature. The PZ-1 (27-29) signature shows reduced proportions of normal paraffin peaks compared to the isoprenoid peaks. A moderate level of biodegradation is indicated for the diesel/fuel oil contribution to the PZ-1 sample. The NC17/IP19 ratio for the PZ-1 sample signature is 0.4. Based on the criteria of Christensen and Larsen (1993), the most probable exposure time is 14 to 18 years.

The MW 29 water sample signature is dominated by a single peak in the six carbon atom range, at the elution position of benzene. The signature characteristics of the MW 29 water ample are not consistent with coal tar, as shown by the chromatographic comparison provided in Figure 26. The benzene peak also was not evident in the MW 29 (23-25) soil sample. Figure 27 compares the chromatographic signatures of the MW 29 water sample and the MW 29 (23-25) soil sample. The MW29 (23-25) soil sample signature consisted predominantly of a complex pattern of peaks in the C9 to C13 range, which could represent a residual fraction of gasoline.

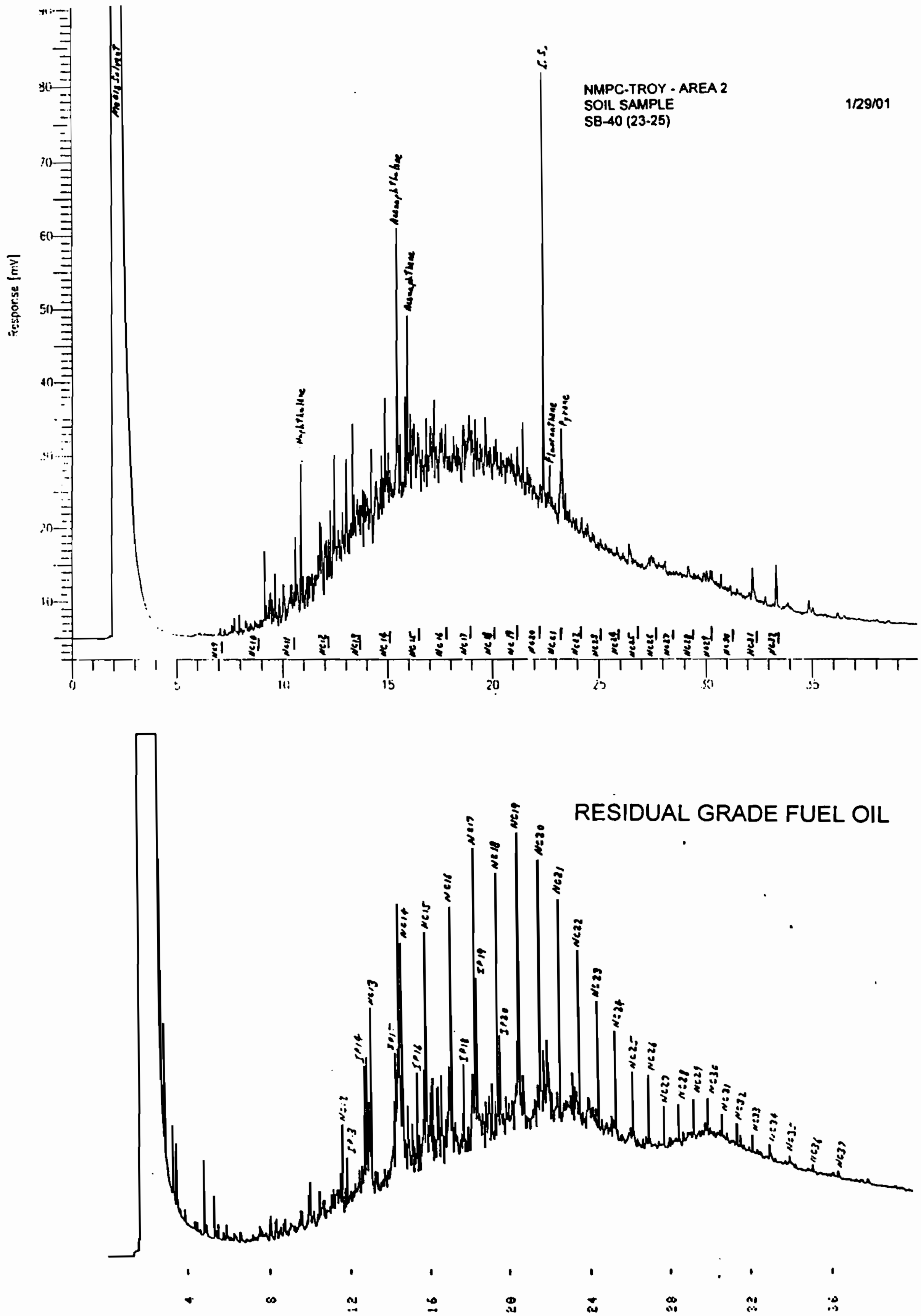
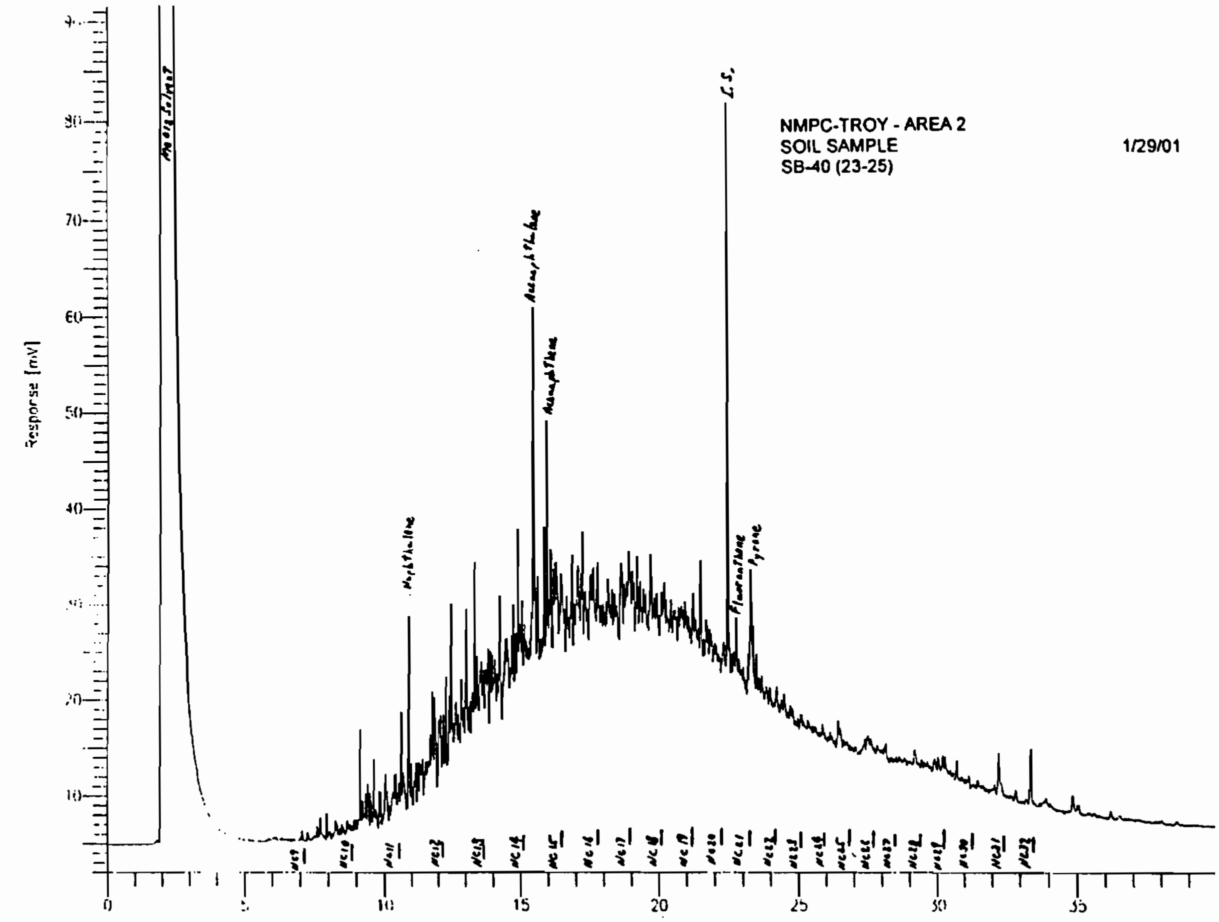


FIGURE 22: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE SB-40 (23-25) SOIL SAMPLE AND A RESIDUAL GRADE FUEL OIL SIGNATURE



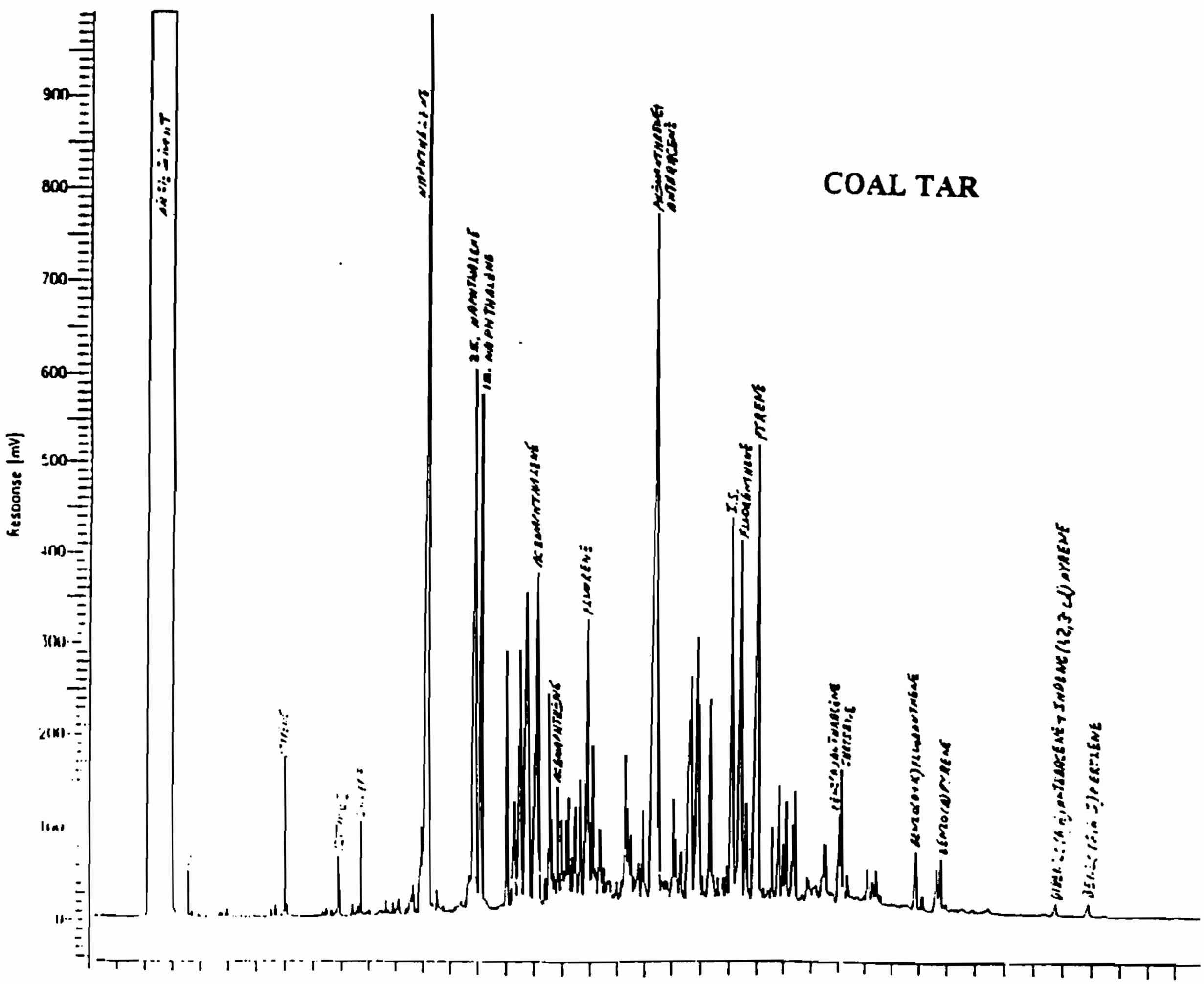
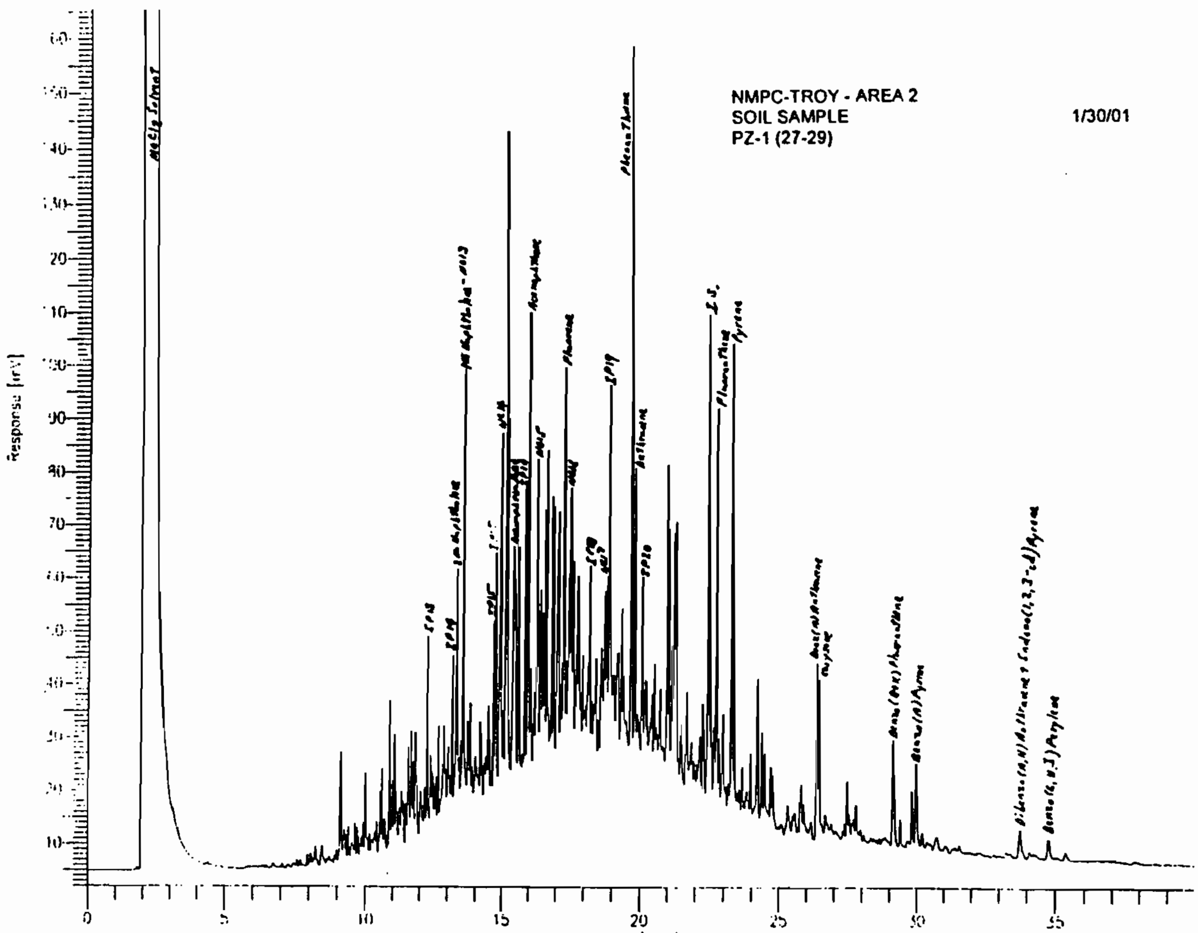


FIGURE 23: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE SB-40 (23-25) SOIL SAMPLE AND A COAL TAR SIGNATURE



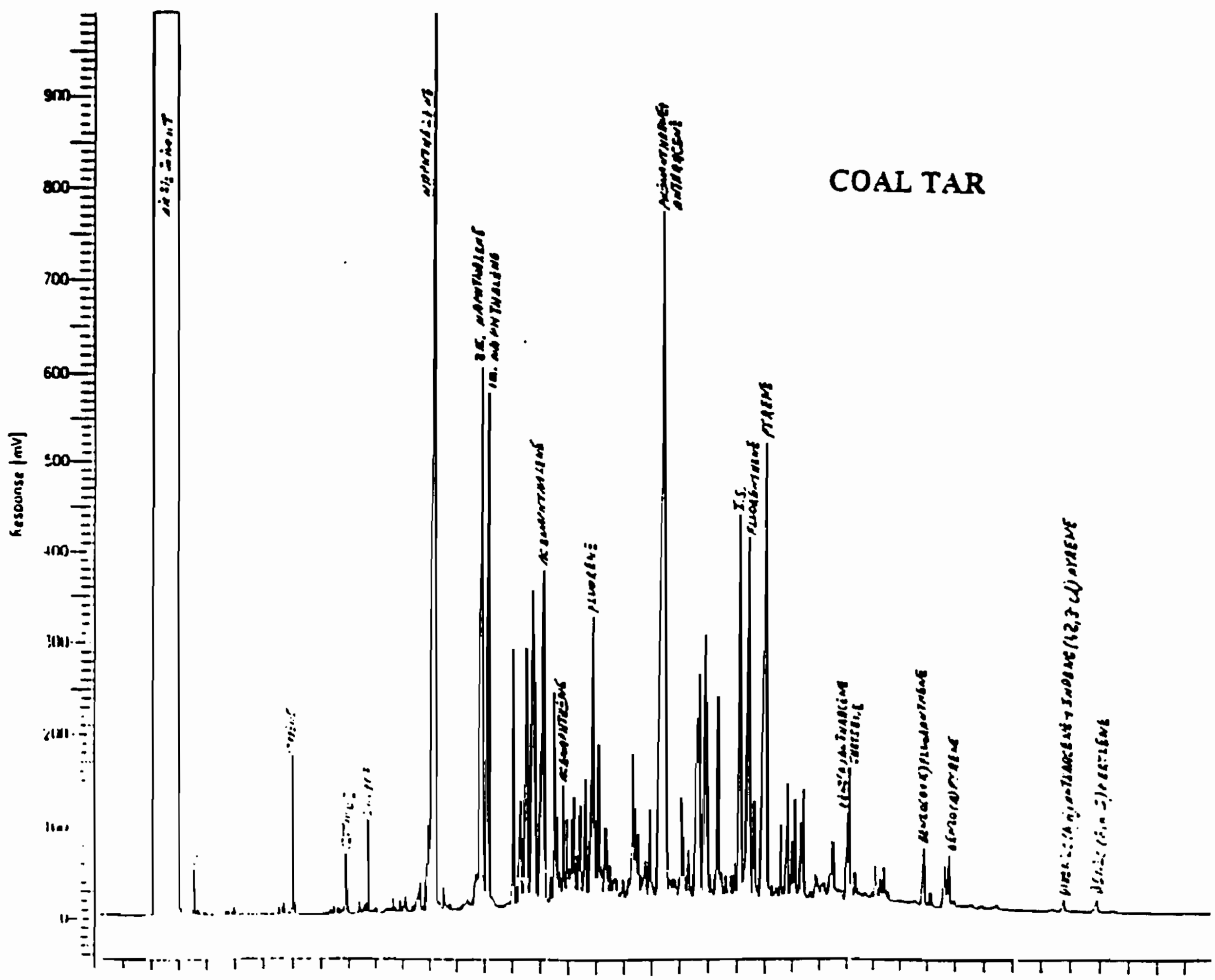


FIGURE 24: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF PZ-1(27-29) SOIL SAMPLE AND A COAL TAR SIGNATURE

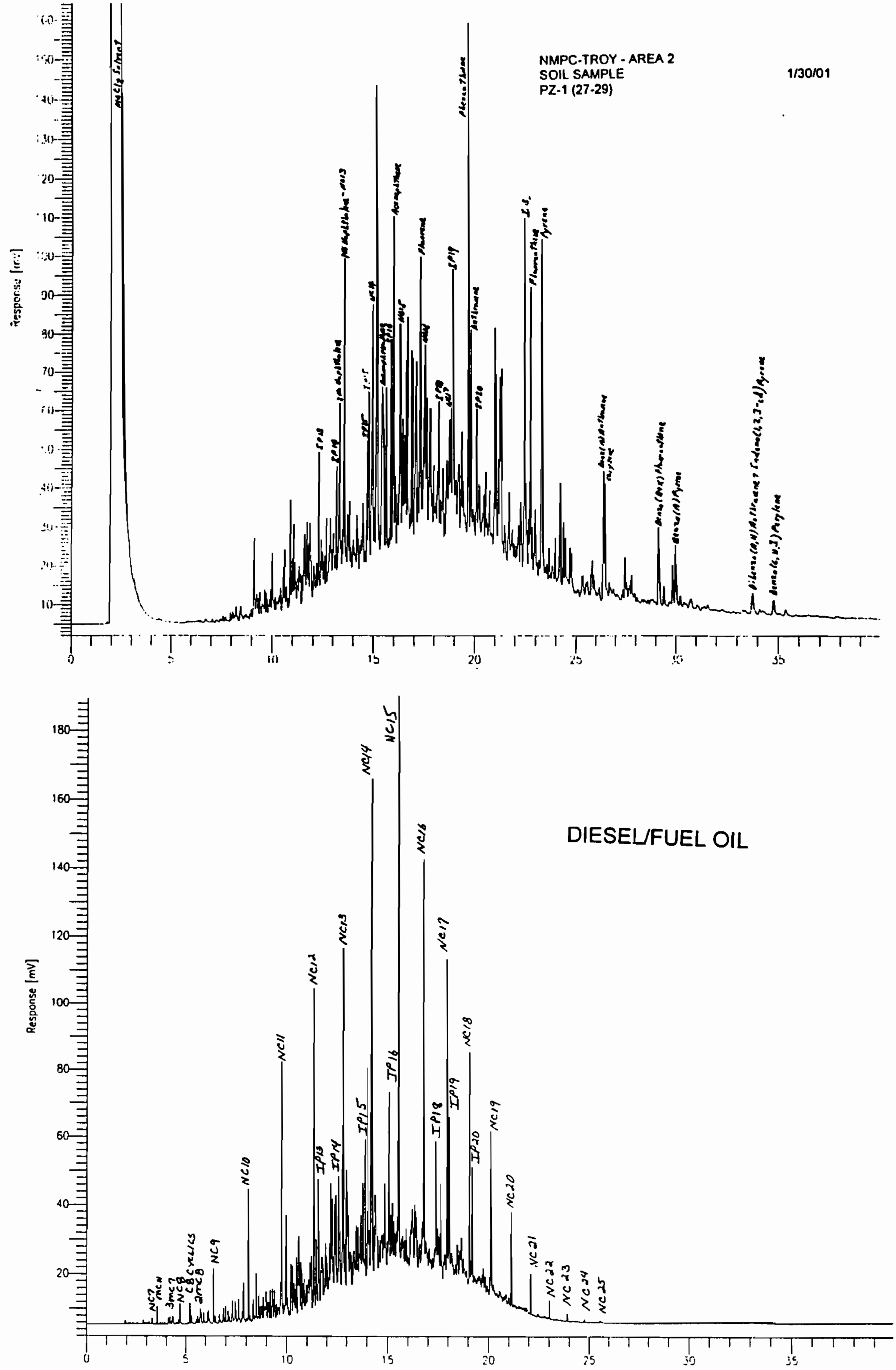


FIGURE 25: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF PZ-1(27-29) SOIL SAMPLE AND A DIESEL/FUEL OIL SIGNATURE

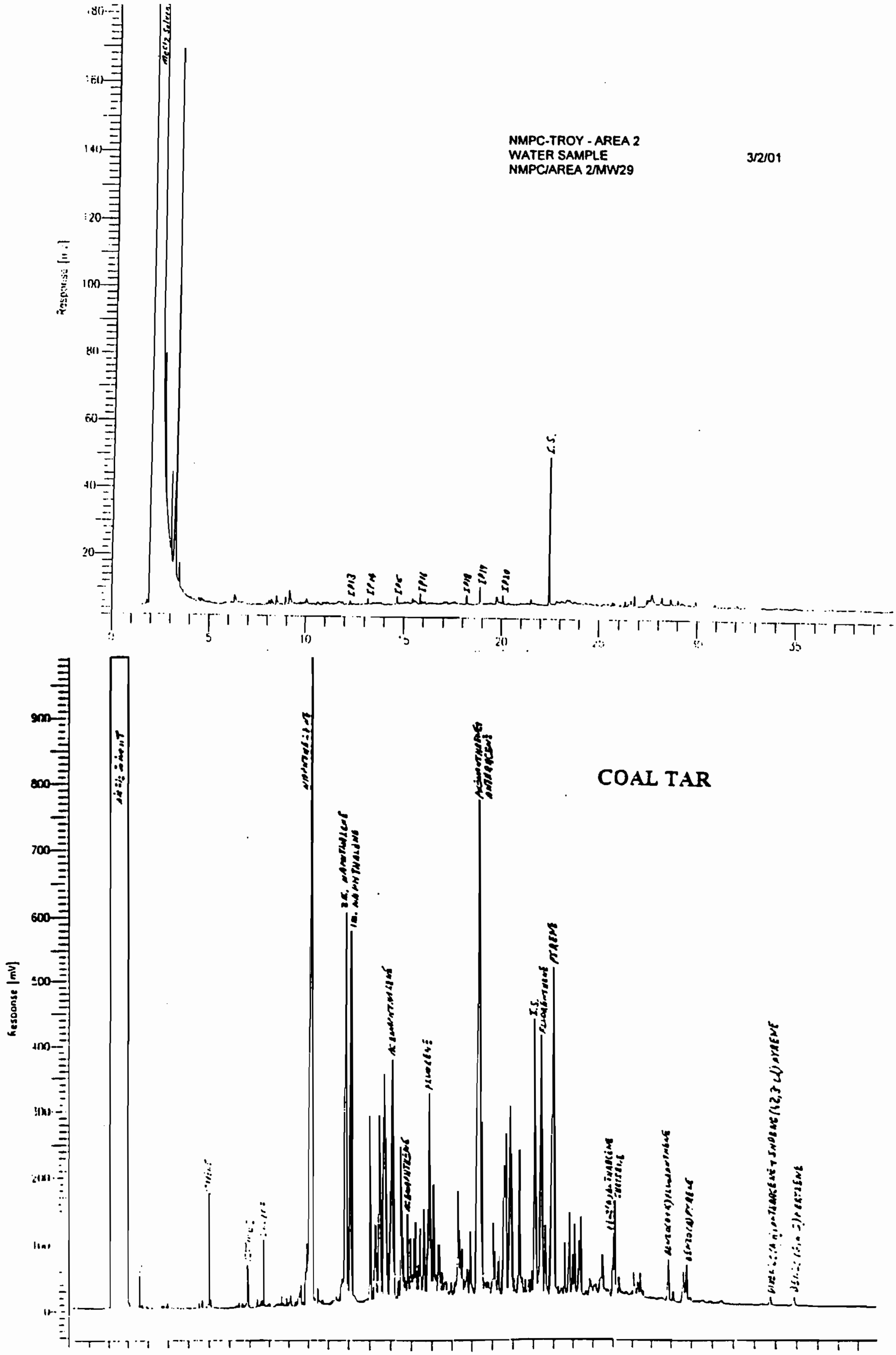


FIGURE 26: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 29 WATER SAMPLE AND A COAL TAR

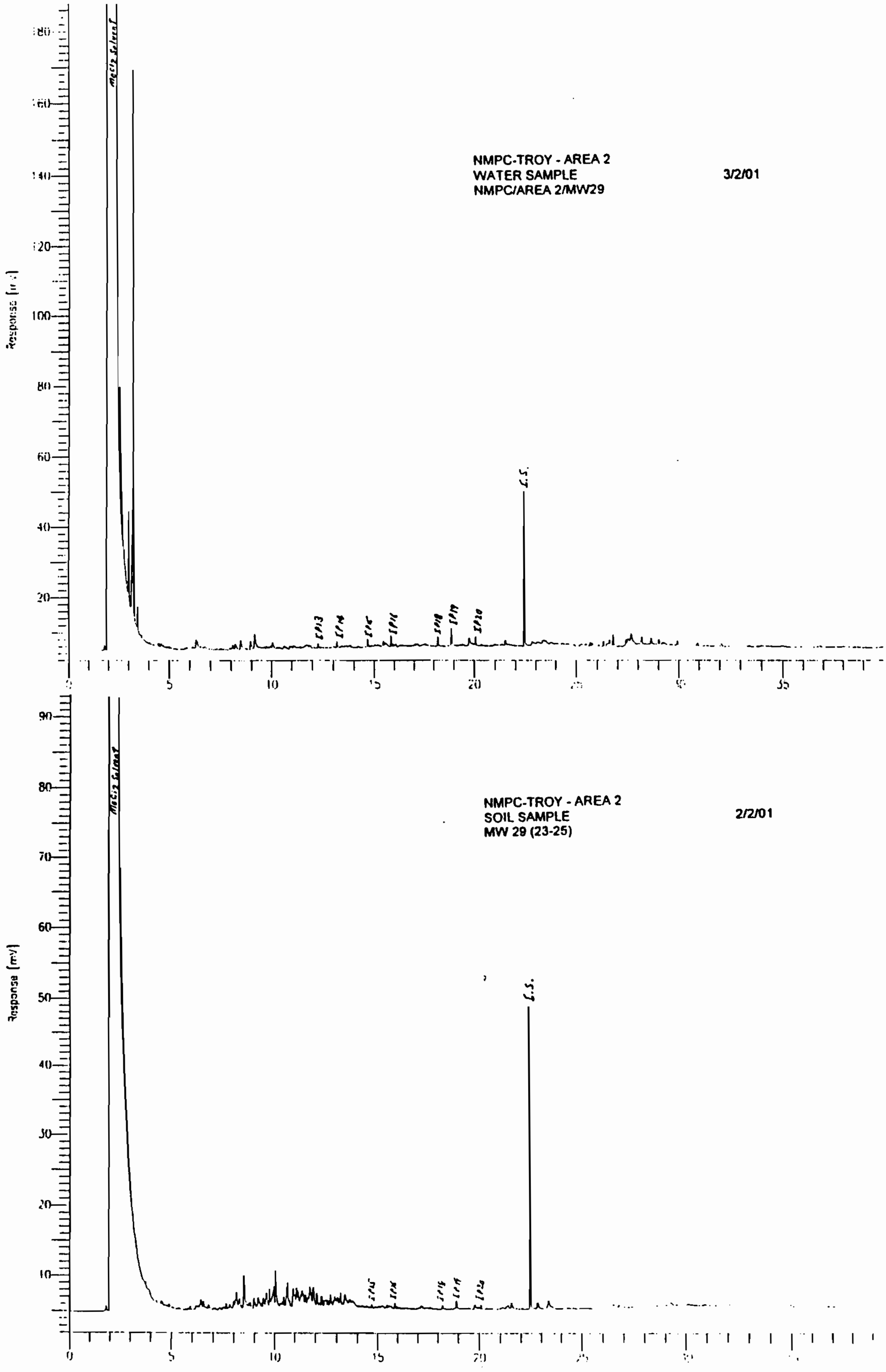


FIGURE 27: COMPARISON OF THE CHROMATOGRAPHIC SIGNATURES OF THE MW 29 WATER SAMPLE AND THE MW29(23-25) SOIL SAMPLE

The MW29 water sample signature is dominated by benzene. The most prominent of the very low amplitude peaks in the MW29 water sample is a sequence of isoprenoid peaks, indicating a severely biodegraded diesel/fuel oil contribution to the MW 29 water sample. The MW 29 (23-25) soil sample is not indicated to be the source of the hydrocarbons dissolved in the MW 29 water sample

REFERENCES

Christensen, L. B. and T. Larsen (1993) Method for determining the age of diesel spills in the environment: Ground Water Mon. & Remed., Vol. 13, No. 2, p. 142-149.

Kennicutt, M. C. II (1988) The effect of biodegradation on crude oil bulk and molecular composition: Oil & Chem. Pollution, Vol. 4, p. 89-112.

Yang, Y.J., R.D. Spencer, M.A. Morsmann, and T.A. Gates (1995) Ground-water contamination plume differentiation and source determination using BTEX concentration ratios: GroundWater, Vol.33, No.6, p. 927-935.

SERVICES Severn Trent Laboratories, Inc.

STL-4124 (0700)

Client: IT Corp.	Project Manager: Bruce Ahrens	Date: 3/2/01	Chain of Custody Number: 010056
Address: 13 British American Blvd	Telephone Number (Area Code)/Fax Number: (518) 783-1996 / (518) 783-8397	Lab Number:	Page 1 of 1
City: Latham · State: NY · Zip Code: 12110	Site Contact: · Lab Contact:		
Project Name and Location (State): NMPC - Area 2 Troy NY	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.:			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis (Attach list if more space is needed): Signature GC	Special Instructions/ Conditions of Receipt
NMPC/Area 2/MW29 ✓	3/2/01	1330		✓			✓						✓	
NMPC/Area 2/MW31 ✓	3/2/01	14.30		✓			✓						✓	potentially hot.

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other as discussed w/ Bruce Ahrens

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: [illegible signature]	3/5/01	1200	1. Received By: Fed - Ex	3/5/01	1200
2. Relinquished By: Fed - Ex	3/6/01	10:30	2. Received By: [signature] WWGS.	3/6/01	10.30
3. Relinquished By:			3. Received By:		

Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Custody Record

STL-4124 (0700)

SERVICES **Severn Trent Laboratories, Inc.**

Client	Project Manager	Date	Chain of Custody Number
TT Corp	Bruce Ahren	3/13/01	010055

Address	Telephone Number (Area Code)/Fax Number	Lab Number	Page
13 British American Blvd	(518) 783-1996 / (518) 783-8397		Page 1 of 1

City	State	Zip Code	Site Contact	Lab Contact
Latham	NY	12110		

Project Name and Location (State): NMPC Area 2 Troy NY

Carrier/Waybill Number:

Contract/Purchase Order/Quote No.:

Analysis (Attach list if more space is needed)

Special Instructions/ Conditions of Receipt

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil		Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	~~Signature~~	Signature GC										Special Instructions/ Conditions of Receipt
NMPC/Area 2/MW-20	3/13/01	1230		X				X							X										

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☑ Other: As discussed with Bruce Ahren

QC Requirements (Specify)

	Relinquished By	Date	Time	Received By	Date	Time
1	Cynthia Campbell	3/13/01	200	Fed-Ex	3/13/01	200
2	Fed-Ex.	3/14/01	850	C. H.	3/14/01	8:50 am
3						

Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

APPENDIX I

DISPLAY CHROMATOGRAMS

ABBREVIATIONS USED TO IDENTIFY PEAKS

ABBREVIATION	HYDROCARBON
C1	METHANE
C2	ETHANE
C3	PROPANE
IC4	ISOBUTANE
NC4	NORMAL BUTANE
ETH	ETHANOL
22C3	2 2 DIMETHYL PROPANE
IC5	ISOPENTANE
NC5	NORMAL PENTANE
MeC2	METHYLENE CHLORIDE
22DMB	2 2 DIMETHYL BUTANE
23DMB	2 3 DIMETHYL BUTANE
2MP	2 METHYLPENTANE
3MP	3 METHYLPENTANE
NC6	NORMAL HEXANE
22DMP	2,2 DIMETHYLPENTANE
MCP	METHYLCYCLOPENTANE
24DMP	2,4 DIMETHYLPENTANE
BZ	BENZENE
CH	CYCLOHEXANE
2MH	2 METHYLHEXANE
23DMP	2,3 DIMETHYLPENTANE
3MH	3 METHYLHEXANE
T13DMCP	T13DIMETHYLCYCLOPENTANE
C13DMCP	C13DIMETHYLCYCLOPENTANE
224TMP	2,2,4 TRIMETHYLPENTANE (PRINCIPAL ISO-OCTANE)
NC7	NORMAL HEPTANE
234TMP	2,3,4 TRIMETHYLPENTANE (ISO-OCTANE)
233TMP	2,3,3 TRIMETHYLPENTANE (ISO-OCTANE)
MCH	METHYLCYCLOHEXANE
TOL	TOLUENE
23DMH	2,3,DIMETHYLHEXANE
2MC7	2METHYLHEPTANE
3MC7	3METHYLHEPTANE
225TMH	2,2,4 TRIMETHYLHEXANE
223TMH	2,2,3 TRIMETHYLHEXANE
NC8	NORMAL OCTANE
EBZ	ETHYL BENZENE
M+P XYL	META AND PARA XYLENES
2MC8	2METHYLOCTANE
3MC8	3METHYLOCTANE
O XYL	ORTHO XYLENE
NC9	NORMAL NONANE

ABBREVIATIONS USED TO IDENTIFY PEAKS (cont.)

ABBREVIATION	HYDROCARBON
IPBZ	ISOPROPYLBENZENE
NPBZ	NORMAL PROPYL BENZENE
1M3EBZ	1METHYL3ETHYLBENZENE
135TMBZ	1,3,5 TRIMETHYLBENZENE
1M2EBZ	1METHYL2ETHYLBENZENE
124TMBZ	1,2,4 TRIMETHYLBENZENE
NC10	NORMAL DECANE
123TMBZ	1,2,3 TRIMETHYLBENZENE (TERT BUTYL BENZENE CO-ELUTES AT THIS POSITION)
C4BZ	TETRAMETHYLBENZENE
NAPH	NAPHTHALENE
2M. NAPH	2METHYL NAPHTHALENE
1M. NAPH	1METHYL NAPHTHALENE

NC____ Normal paraffin with number of carbon atoms in molecule shown

IP_____ Isoprenoid iso-paraffin with number of C atoms in molecule shown

WORLD WIDE GEOSCIENCES - I

ımple Name : 3-01010-C NMPC/MW-29 AREA 2
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actor: 0.0

End Time : 40.00 min
Plot Offset: 0 mV

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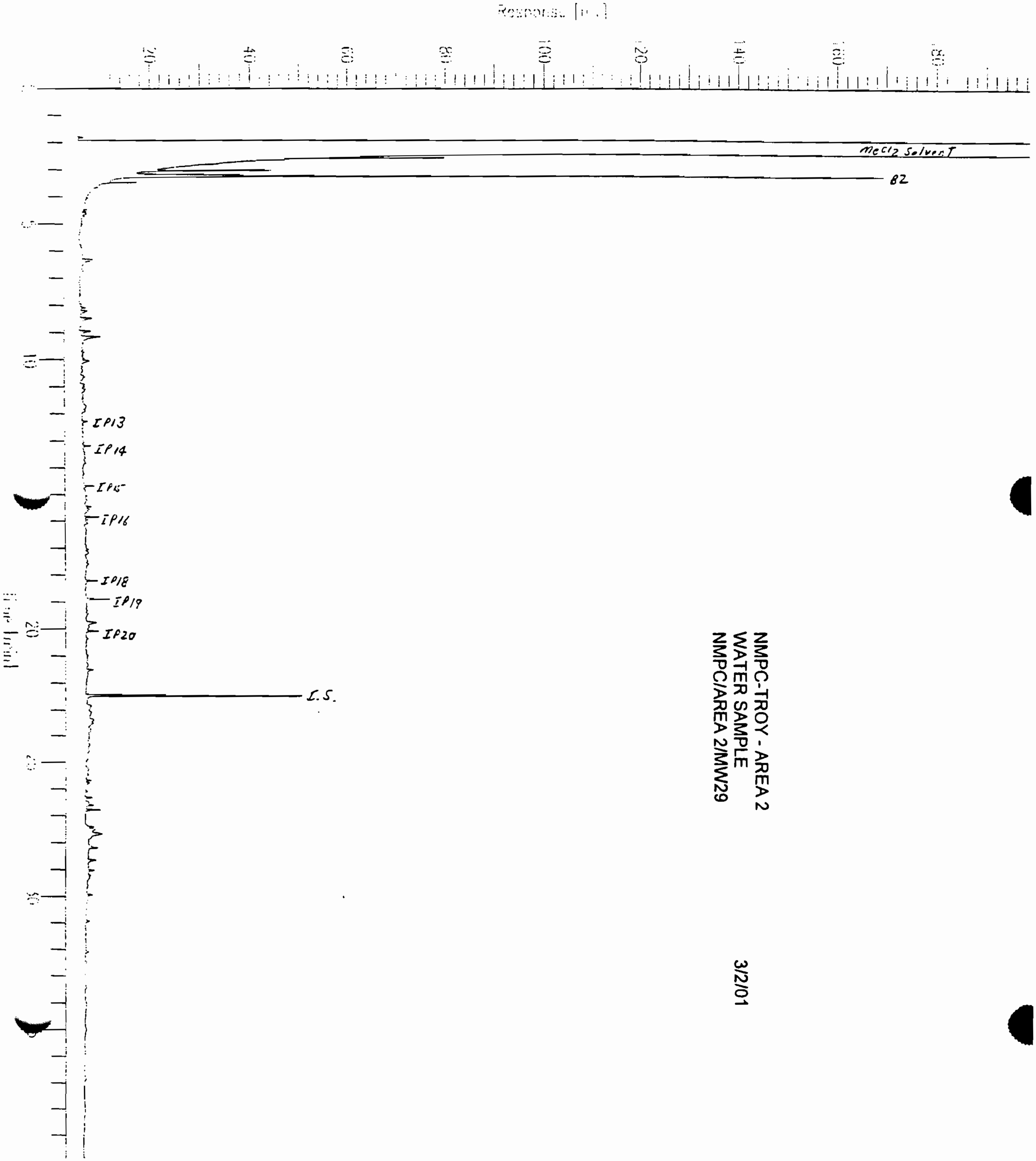
Time of Injection: 3/21/01 11:42 AM
Low Point : 0.00 mV
Plot Scale: 200.0 mV

High Point : 200.00 mV



NMPC-TROY - AREA 2
WATER SAMPLE
NMPC/AREA 2/MW29

3/2/01

WORLD WIDE GEOSCIENCES - I

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.eName : C:\TC4\41WW\41WW219A.RAW
:r : WWG.MTH
me : 0.00 min   End Time : 40.00 min
actor: 0.0   Plot Offset: 0 mV

Sample #: 10309008   Page 1 of 1
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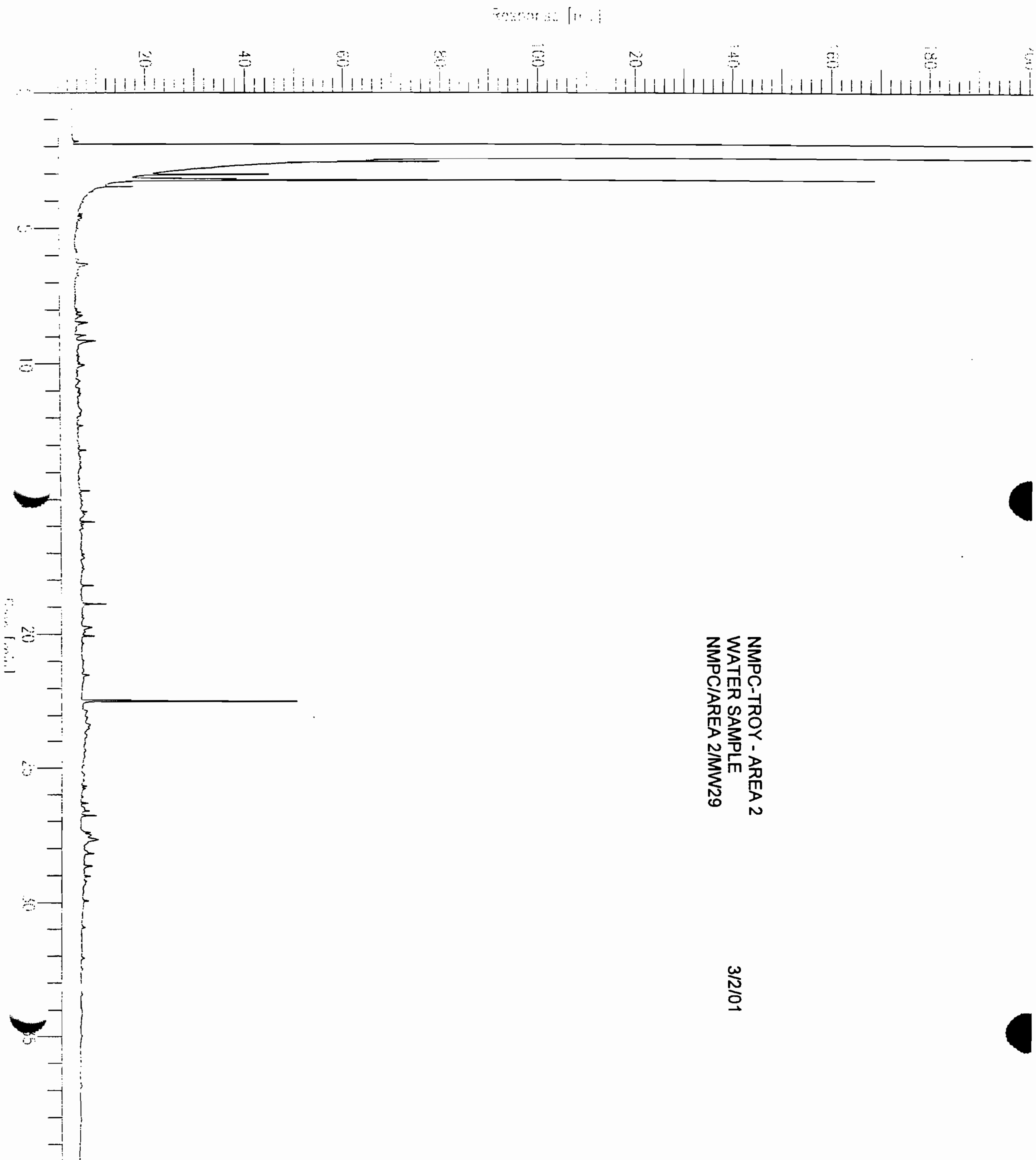
Time of Injection: 3/21/01 11:42 AM
Low Point : 2.00 mV   High Point : 202.00 mV
Plot Scale: 200.0 mV



WORLD WIDE GEOSCIENCES - I

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od : WWG.MTH
t : 0.00 min
e   cr: 0.0

End Time : 40.00 min
Plot Offset: 0 mV

Sample #: 10315007
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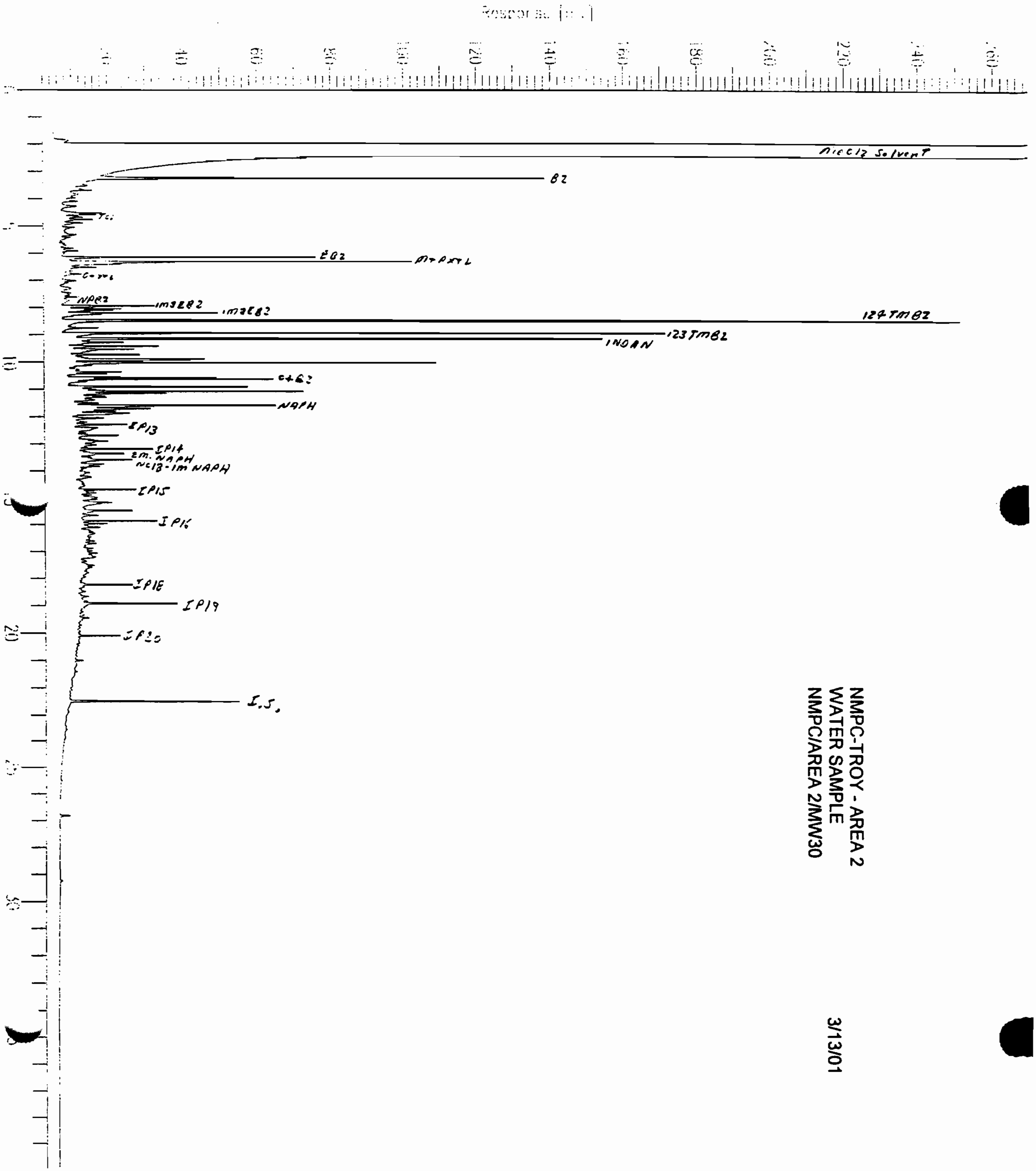
Time of Injection: 3/28/01 06:24 PM
Low Point : 2.00 mV
Plot Scale: 270.0 mV

Page 1 of 1
High Point : 272.00 mV

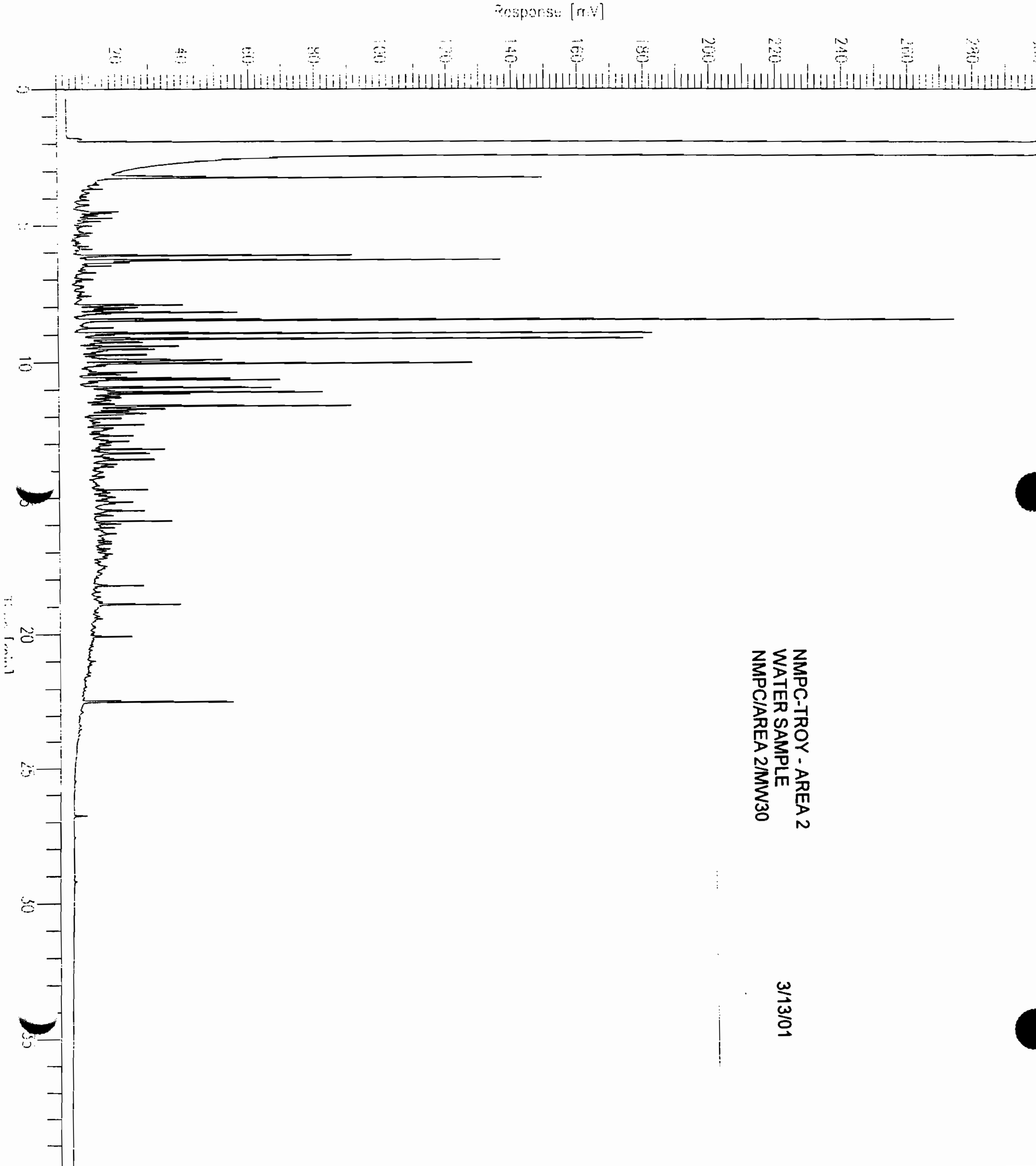


NMPC-TROY - AREA 2
WATER SAMPLE
NMPC/AREA 2/MW30

3/13/01

WORLD WIDE GEOSCIENCES - I

ımple Name : ~~J-01018 GW01~~ J-01016-G MW30		Sample #: 1031500Ø7	Page 1 of 1
.leName : C:\TC4\41WW\41WW221A.RAW		Date : 4/2/01 01:50 PM	
ɛt' : WWG.MTH		Time of Injection: 3/21/01 01:31 PM	
.a[illegible]me : 0.00 min	End Time : 40.00 min	Low Point : 2.00 mV	High Point : 302.00 mV
:ale Factor: 0.0	Plot Offset: 2 mV	Plot Scale: 300.0 mV	



NMPC-TROY - AREA 2
WATER SAMPLE
NMPC/AREA 2/MW30

3/13/01

WORLD WIDE GEOSCIENCES - I

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Method : WWG.MTH
Start Time : 0.00 min
Scale Factor: 0.0

End Time : 40.00 min
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Sample #: 10315007
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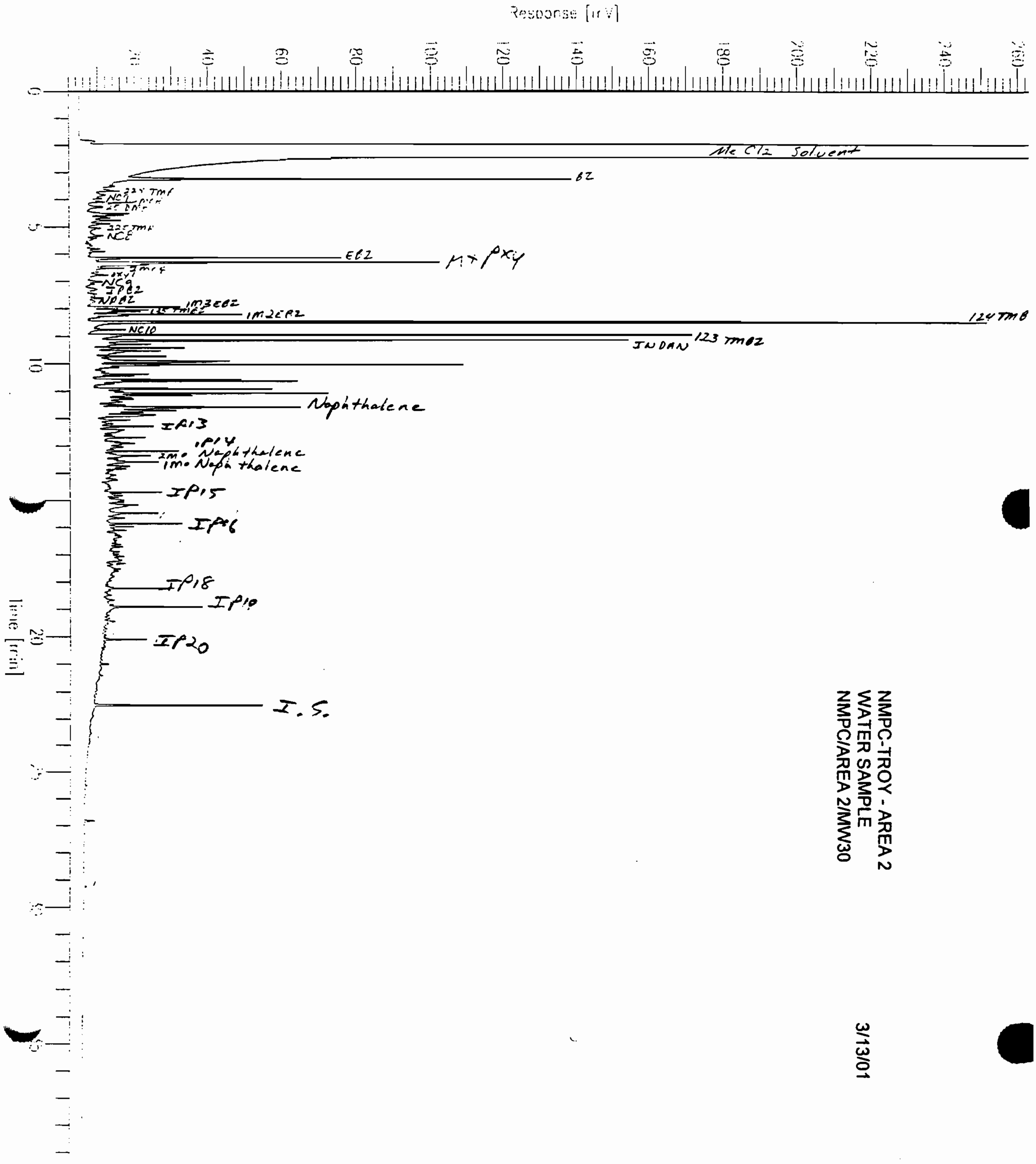
High Point : 272.00 mV



NMPC-TROY - AREA 2
WATER SAMPLE
NMPC/AREA 2/MW30

3/13/01

WORLD WIDE GEOSCIENCES - I

ample Name : J-01010-D NMPC/AREA 2/MW-80
ileName : C:\TC4\41WW\41WW246.RAW
et : WWG.MTH
tart Time : 1.00 min
cale Factor: 0.0

End Time : 40.00 min
Plot Offset: 2 mV

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Time of Injection: 3/28/01 06:24 PM
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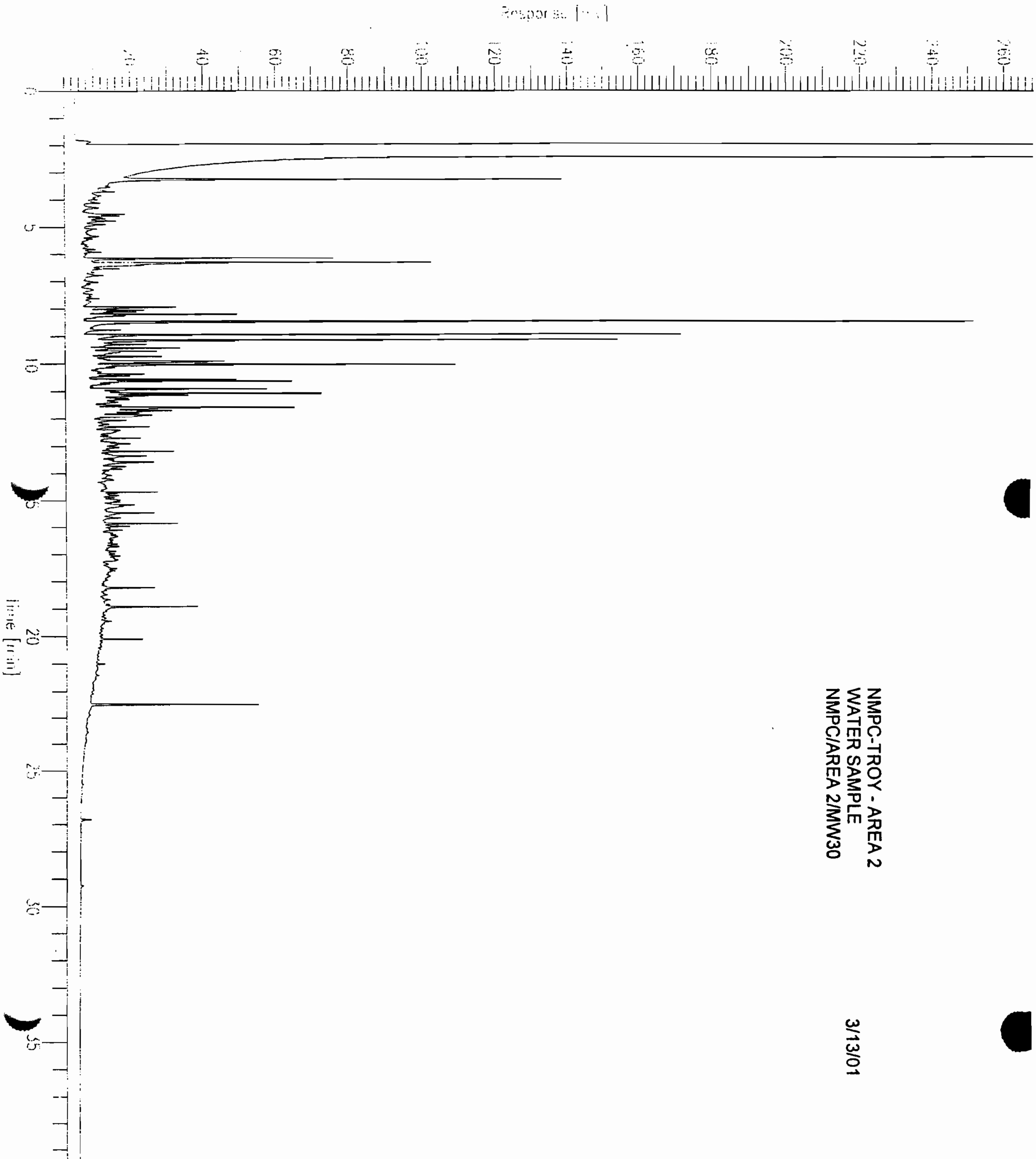
High Point : 272.00 mV



NMPC-TROY - AREA 2
WATER SAMPLE
NMPC/AREA 2/MW30

3/13/01

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End Time : 40.00 min
Plot Offset: 0 mV

Sample #: 10309009
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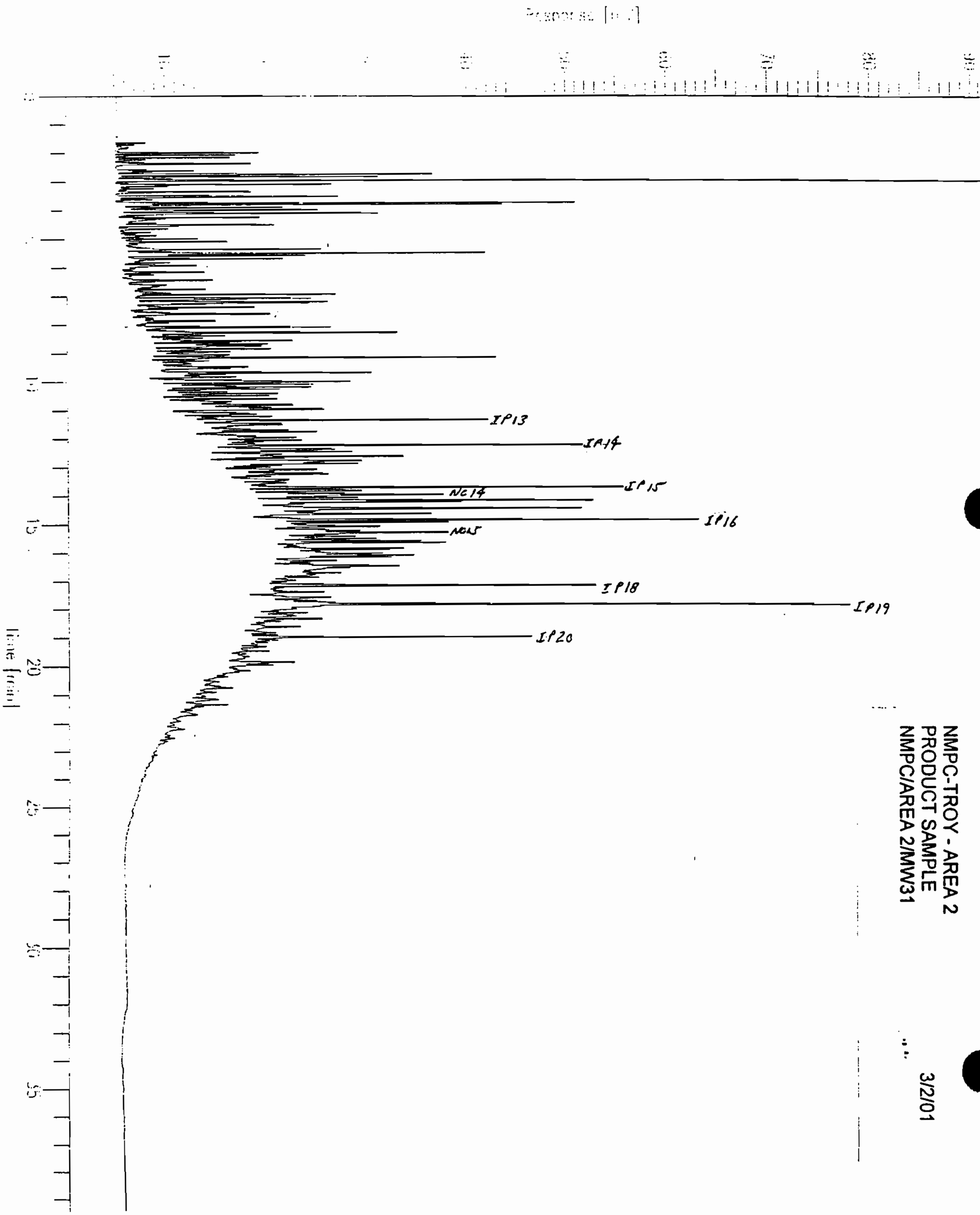
Time of Injection: 3/21/01 09:43 AM
Low Point : 0.17 mV
Plot Scale: 103.4 mV

High Point : 103.53 mV



NMPC-TROY - AREA 2
PRODUCT SAMPLE
NMPC/AREA 2/MW31

3/2/01

WORLD WIDE GEOSCIENCES - II

mple Name : J-01010-C NMPC/MW-31/ AREA 2
leN me : C:\TC4\96WW\96WW088.RAW
t : WWG2.MTH
a me : 0.00 min End Time : 40.00 min
ale Factor: 1.0 Plot Offset: 0 mV

Sample #: 10309009
Date : 4/9/01 01:31 PM
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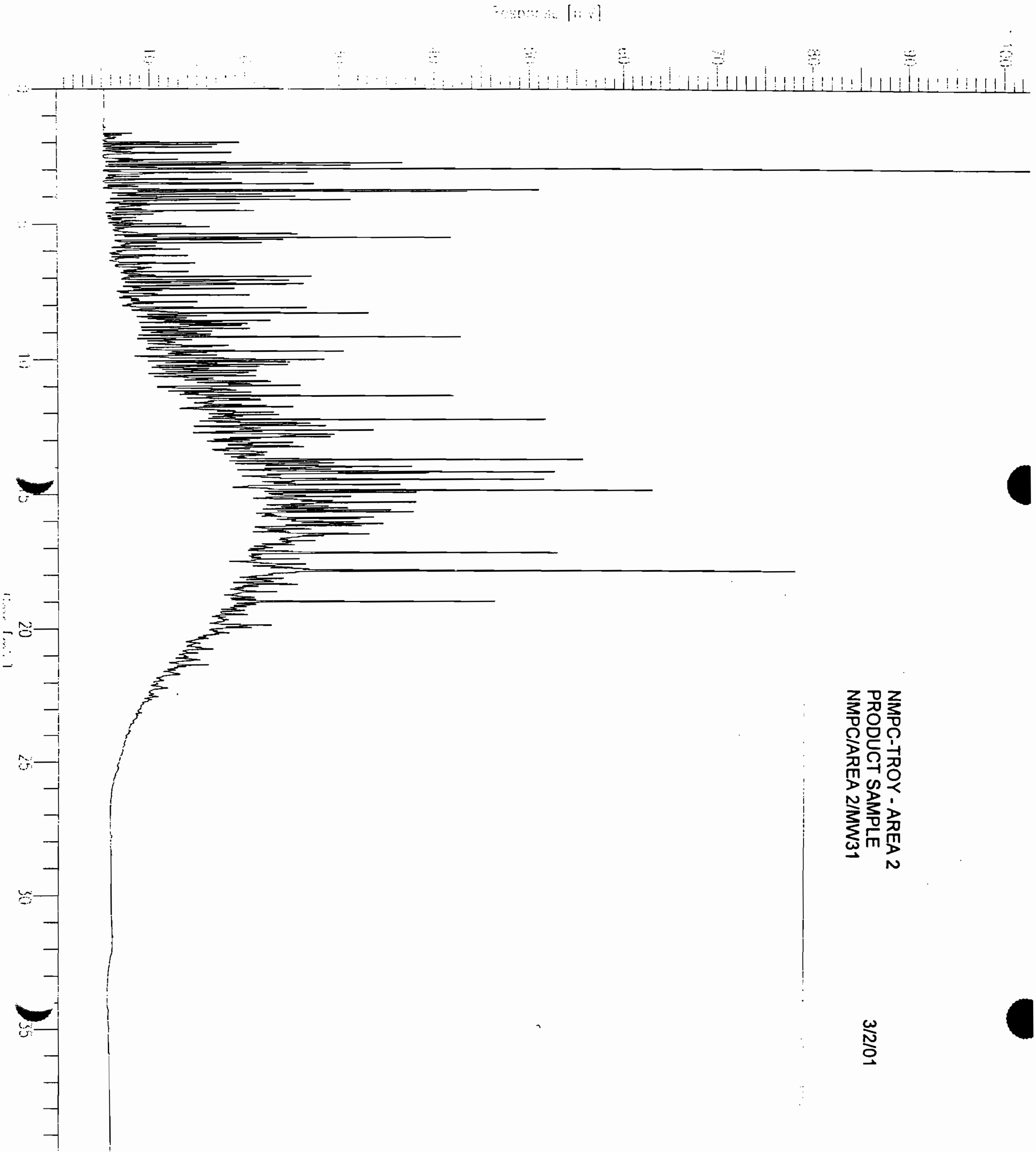
Low Point : 0.17 mV
Plot Scale: 103.4 mV

High Point : 103.53 mV



APPENDIX II

OPERATING CONDITIONS

GC OPERATING CONDITIONS

Instrument: Perkin-Elmer Autosystem

Column: 30m*0.25mm ID*0.25u Methyl Silicon, Restek Rtx-1
(Cat# 10138, Fused Silica Column; Bonded,
Non-Polar, Silicone Based Polymer Liquid Phase)

Carrier Gas: Helium
Linear Velocity = 30 cm/sec
Column Pressure 16.9 psig.

Injection Port: Split/Splitless Type
Temperature 300 deg C

Detector: Flame Ionization Type
Temperature 300 deg C
Range 1, Attn.4

	Method 1	**Method 2**	**Method 3**	**Method 4**
Injection Type	Split	Split	Splitless	Splitless
Acronym	5/s	10/s	5/sl	10/sl
Split Vent	On	On	Off	Off
Split Vent Time,min	---	---	0.5	0.5
Split Rate ml/min	100	100	100	100
Initial Temp, deg C	30	30	30	30
Initial Time, min	5	1	5	1
Ramp Rate, deg C/min	5	10	5	10
Final Temp, deg C	300	300	300	300
Final Time, min	0	15	0	15
Run Time, min	40	40	40	40

WORLD WIDE GEOSCIENCES - I

ıple Name : D-2
.eName : C:\TC4\41WW\41WW217A.RAW
:h : WWG.MTH
a[illegible]ne : 0.00 min
ale[illegible]actor: 0.0

End Time : 40.00 min
Plot Offset: 2 mV

Sample #: STANDARD
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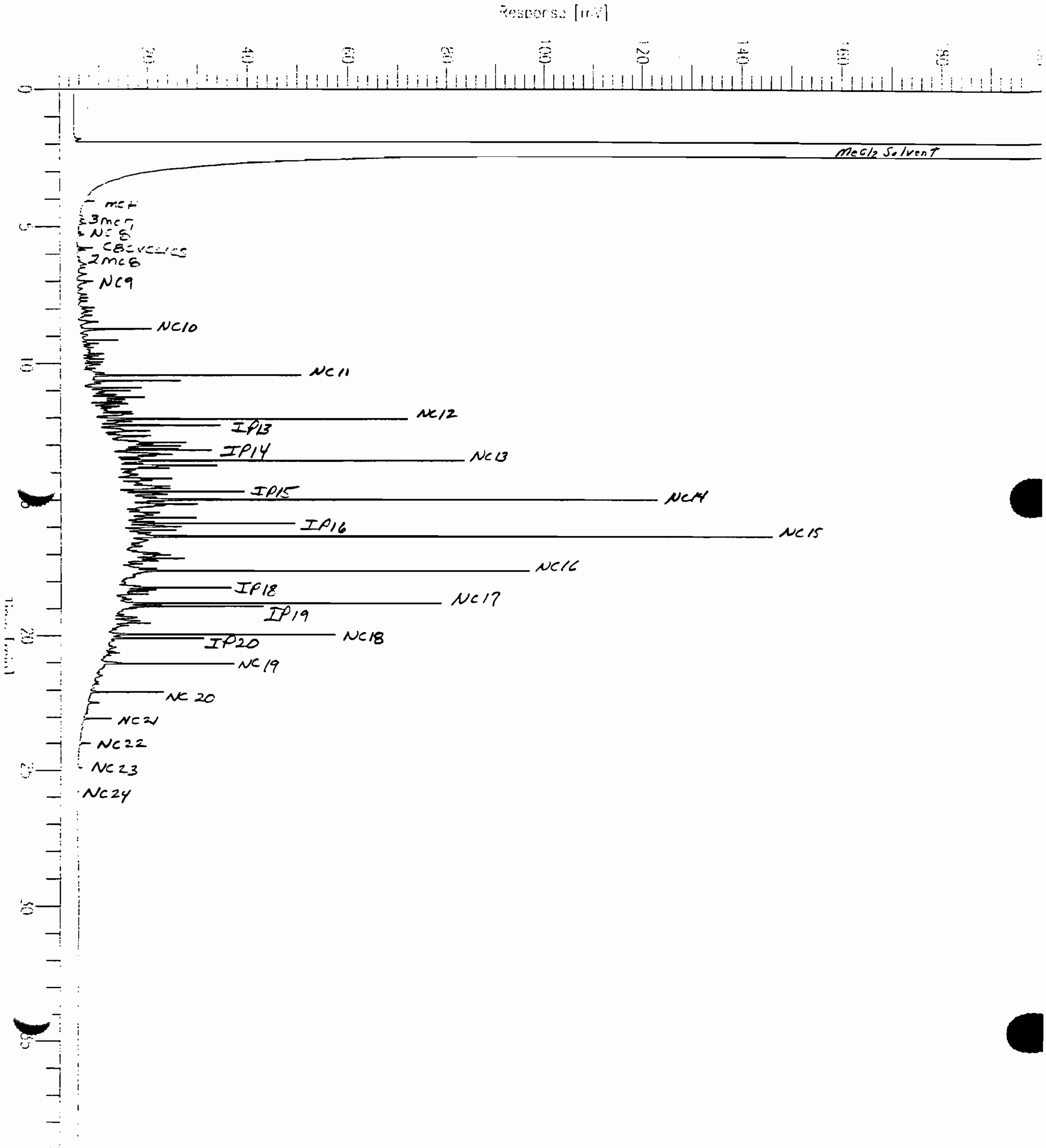
Plot Scale: 200.0 mV

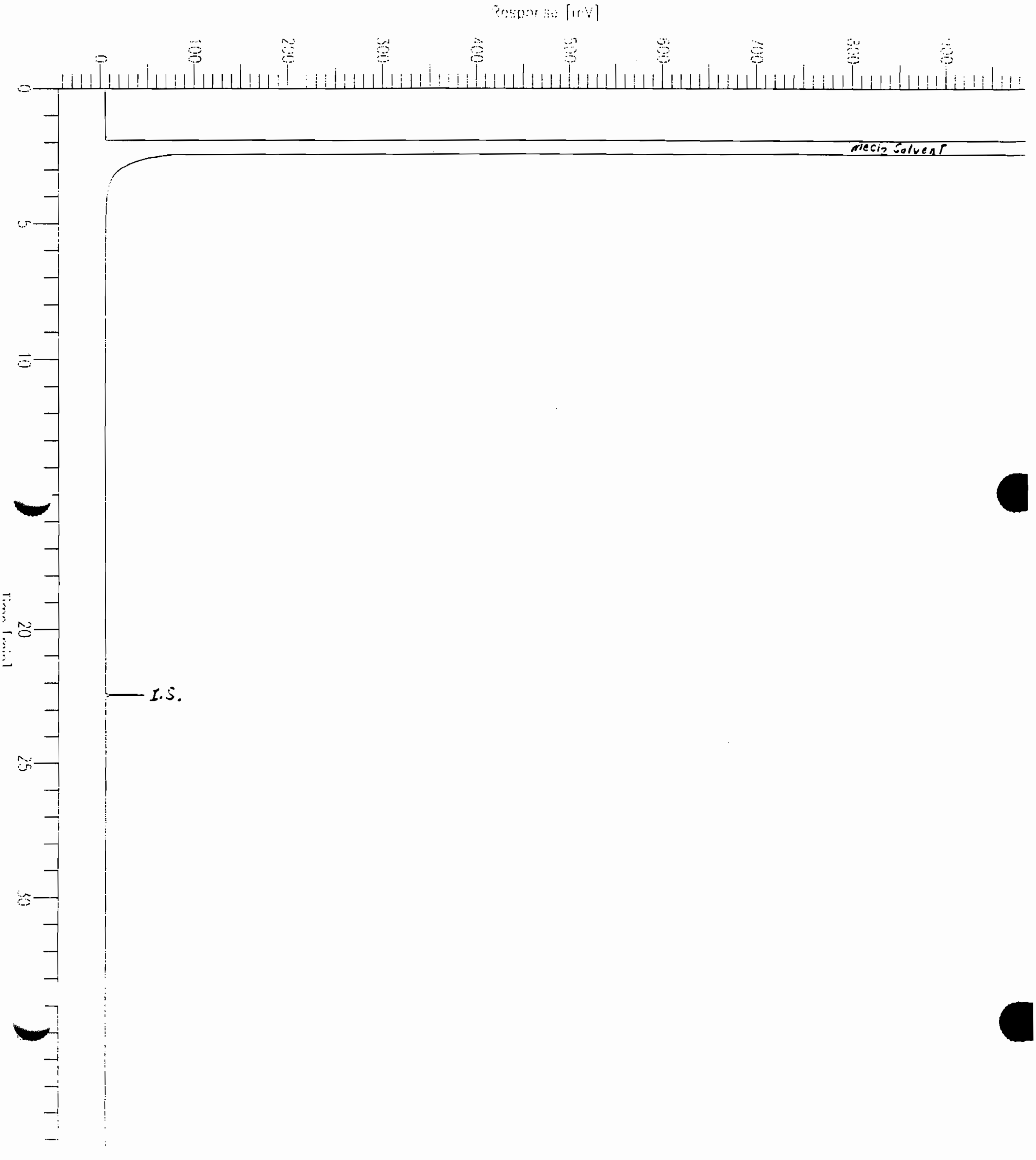
High Point : 202.00 mV



WORLD WIDE GEOSCIENCES - I

ample Name : SOLVENT BLANK
ileName : C:\TC4\41WW\41WW216A.RAW
ethod : WWG.MTH
ta 'ime : 0.00 min   End Time : 40.00 min
ca actor: 1.0   Plot Offset: -45 mV

Sample #: BLANK
Date : 3/30/01 02:39 PM
Time of Injection: 3/21/01 09:00 AM
Low Point : -44.76 mV   High Point : 993.88 mV
Plot Scale: 1038.6 mV

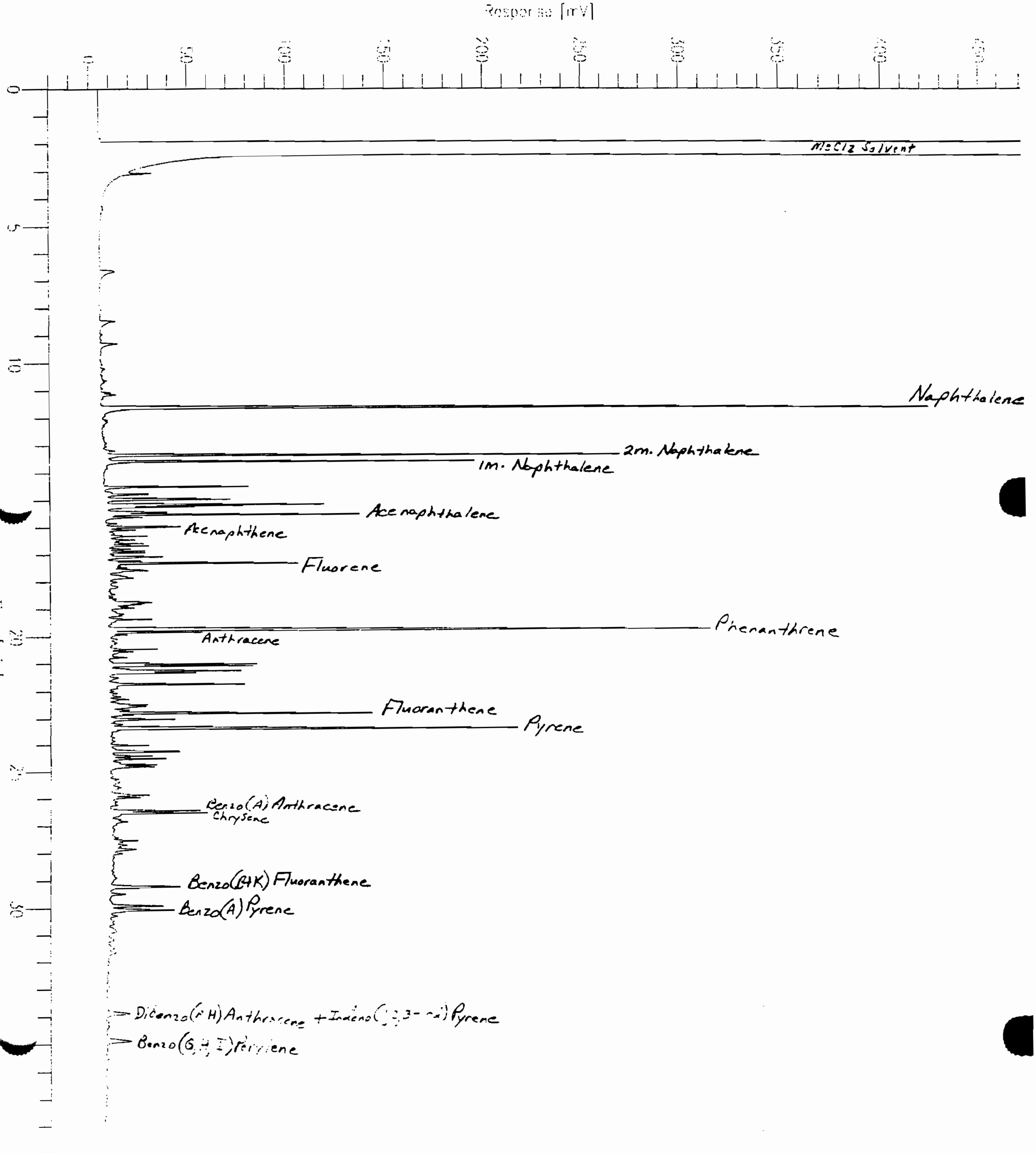


WWG I - 10 SL

Sample Name : PAH
FileName : C:\TC4\41WW\41WW218A.raw
Method : WWG1__10
S' Time : 0.00 min
S Factor: -1.0
End Time : 40.00 min
Plot Offset: -20 mV

Sample #: STANDARD
Date : 3/30/01 02:17 PM
Time of Injection: 3/21/01 10:48 AM
Low Point : -20.08 mV
Plot Scale: 500.0 mV

High Point : 479.92 mV



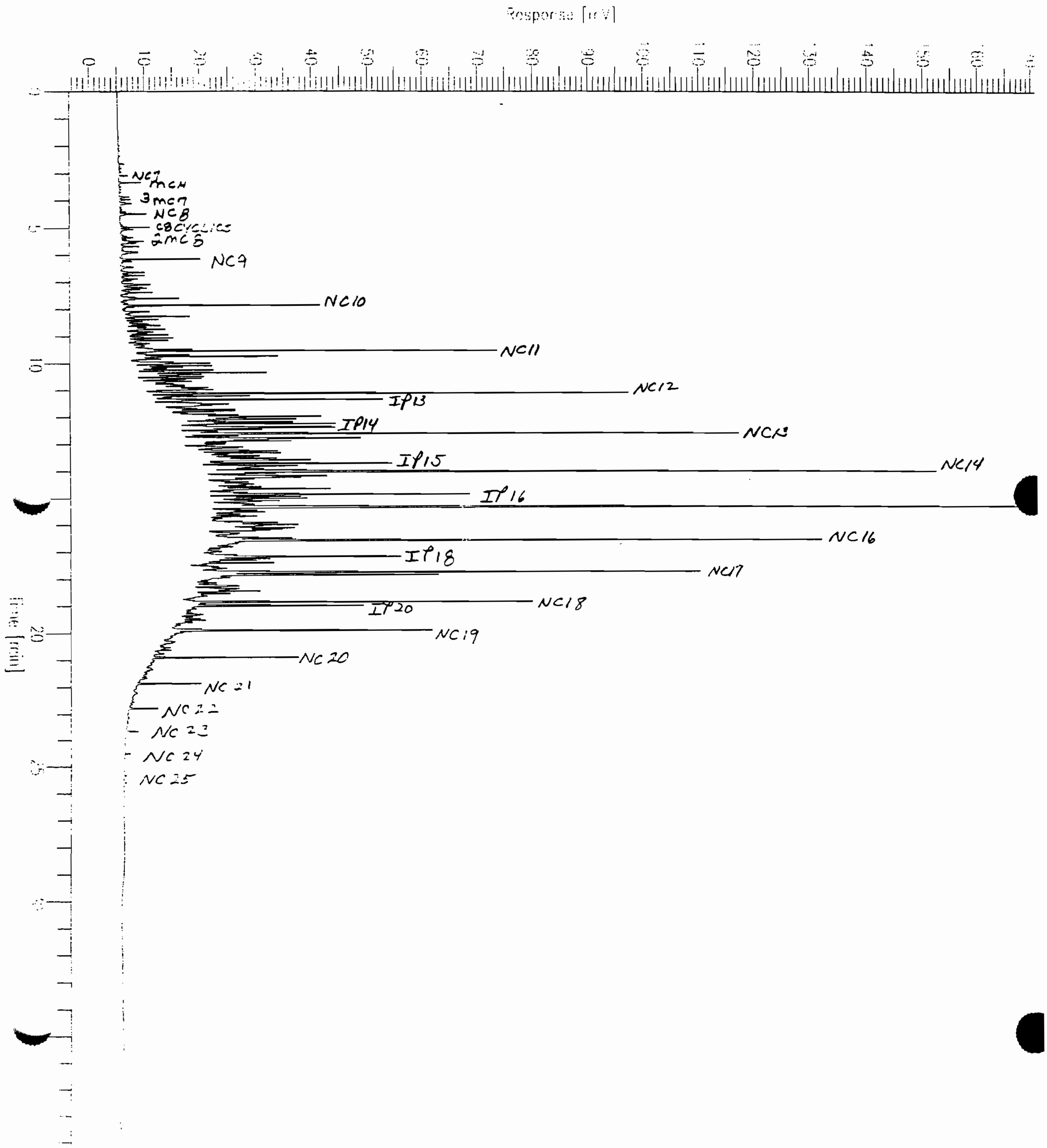
WORLD WIDE GEOSCIENCES - II

Sample Name : D-2
FileName : C:\TC4\96WW\96WW086.RAW
Method : WWG2.MTH
Start Time : 0.00 min
Scale Factor: 1.0

End Time : 40.00 min
Plot Offset: -3 mV

Sample #: STANDARD
Date : 4/9/01 01:31 PM
Time of Injection: 3/21/01 07:19 AM
Low Point : -3.50 mV
Plot Scale: 177.8 mV

High Point : 174.33 mV



WWG I - 10 SL

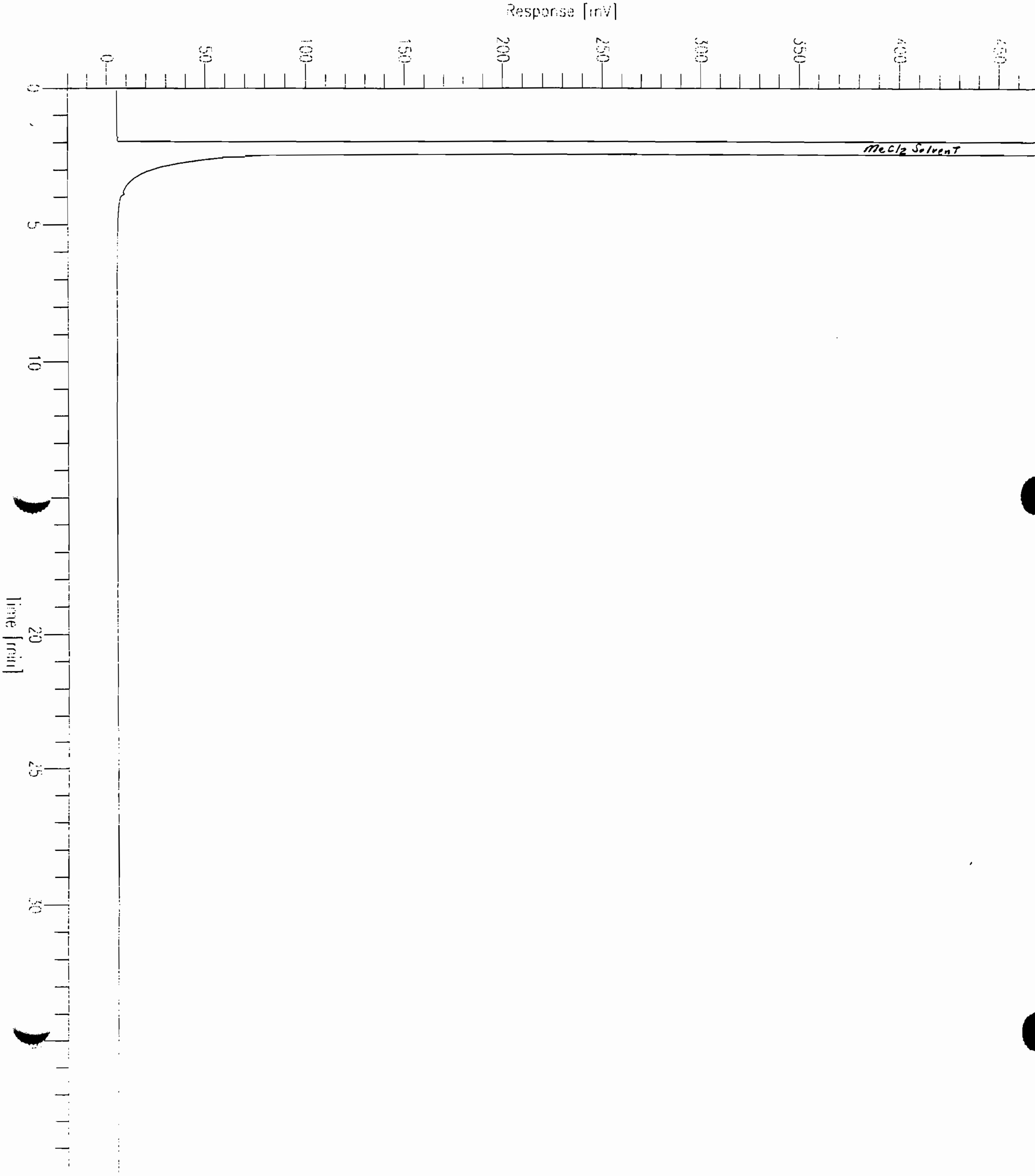
Sample Name : BLANK
FileName : C:\TC4\41WW\41WW244.raw
Method : WWG1__10
Start Time : 0.00 min
Scale Factor: -1.0

End Time : 40.00 min
Plot Offset: -20 mV

Sample #: BLANK
Date : 3/30/01 02:17 PM
Time of Injection; 3/28/01 04:13 PM
Low Point : -20.07 mV
Plot Scale: 500.0 mV

Page 1 of 1

High Point : 479.93 mV

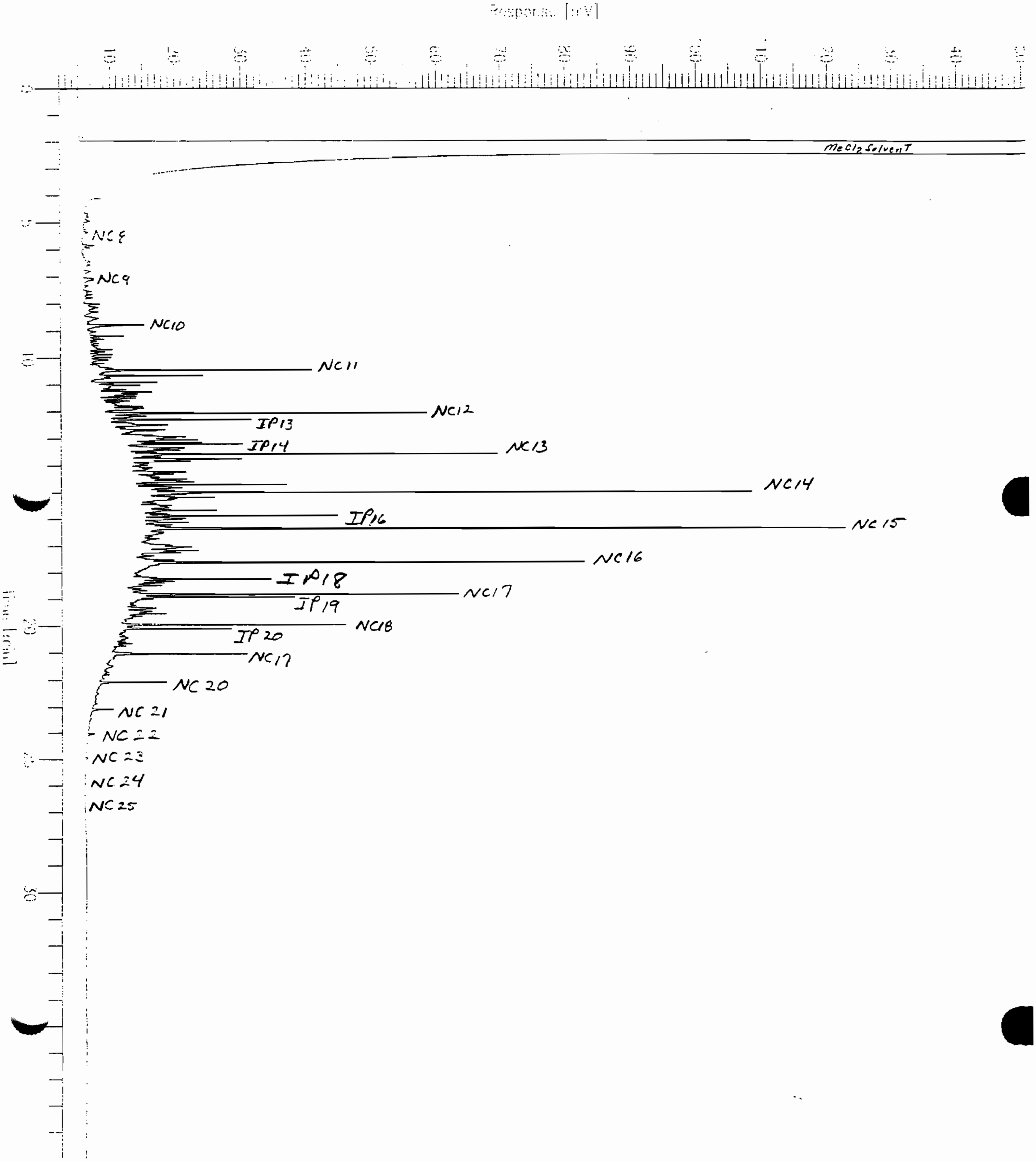


WORLD-WIDE GEOSCIENCES - I

mple Name : D-2
leName : C:\TC4\41WW\41WW245.RAW
thod : WWG.MTH
a ime : 0.00 min
End Time : 40.00 min
Plot Offset: 2 mV

Sample #: STANDARD
Date : 4/2/01 01:54 PM
Time of Injection: 3/28/01 05:18 PM
Low Point : 2.00 mV
Plot Scale: 150.0 mV

High Point : 152.00 mV



APPENDIX III

CHROMATOGRAM PEAK AREA TABLES

tware Version: 4.1<2F12>
ıple Name : J-01010-C NMPC/MW-31/ AREA 2 Time : 4/9/01 01:32 PM
ıple Number: 10309009 Study : WWG
:rator :

:trument : WWG_PRODUCTS Channel : A A/D mV Range : 1000
:oSampler : BUILT-IN
:k/Vial : 0/3

:erface Serial # : NONE Data Acquisition Time: 3/21/01 09:43 AM
.ay Time : 0.00 min.
l Time : 39.99 min.
ıpling Rate : 1.5625 pts/sec

v Data File : C:\TC4\96WW\96WW088.RAW
sult File : C:\WINDOWS\TEMP\~RST0862.RST
st Method : G:\GC4\4A-SEQ\WWG2__10 from C:\WINDOWS\TEMP\~RST0862.RST
oc Method : C:\TC4\WWGINT.MTH
Lib Method : C:\TC4\WWGINT.MTH
quence File : G:\GC4\4A-SEQ\96WWG.SEQ

nple Volume : 1.0000 ul Area Reject : 2000.000000
nple Amount : 1.0000 Dilution Factor : 1.00

WWG-INT REPORT

ak	Time [min]	Area [μV·s]	Height [μV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
2	1.728	2563.96	1960.24	0.02	0.02	*VV	1.31
3	2.007	24511.05	14430.93	0.18	0.18	*VV	1.70
4	2.241	7485.47	3108.57	0.05	0.05	*VV	2.41
5	2.384	36170.84	14196.08	0.26	0.26	*VV	2.55
6	2.627	23846.56	8170.45	0.17	0.17	*VV	2.92
7	2.748	78243.25	31681.12	0.56	0.56	*VV	2.47
8	2.834	42494.38	27111.63	0.30	0.30	*VV	1.57
9	2.912	7813.56	5622.46	0.06	0.06	*VV	1.39
0	2.965	149140.94	98372.01	1.07	1.07	*VV	1.52
1	3.107	46599.79	22268.95	0.33	0.33	*VV	2.09
2	3.253	7594.43	3779.96	0.05	0.05	*VV	2.01
3	3.360	25661.15	13415.90	0.18	0.18	*VV	1.91
	3.530	62600.24	22162.50	0.45	0.45	*VV	2.82
5	3.627	6638.77	3678.10	0.05	0.05	*VV	1.80
6	3.747	77300.87	48030.49	0.55	0.55	*VV	1.61
7	3.807	63116.40	38526.64	0.45	0.45	*VV	1.64
8	3.909	33716.81	18250.73	0.24	0.24	*VV	1.85

Peak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
19	3.994	54558.44	21833.56	0.39	0.39	*VV	2.50
	4.107	58281.23	26072.51	0.42	0.42	*VV	2.24
21	4.258	21801.01	14575.06	0.16	0.16	*VV	1.50
22	4.308	18707.67	4952.76	0.13	0.13	*VV	3.78
23	4.448	9992.41	4009.11	0.07	0.07	*VV	2.49
24	4.512	38034.74	15733.92	0.27	0.27	*VV	2.42
25	4.651	12819.23	5223.95	0.09	0.09	*VV	2.45
26	4.769	6000.18	3463.22	0.04	0.04	*VV	1.73
27	4.886	15656.49	4055.07	0.11	0.11	*VV	3.86
28	4.994	16797.80	8206.61	0.12	0.12	*VV	2.05
29	5.098	31405.96	11103.99	0.22	0.22	*VV	2.83
30	5.361	55446.36	21189.19	0.40	0.40	*VV	2.62
31	5.441	9254.43	5611.14	0.07	0.07	*VV	1.65
32	5.500	83703.43	37554.81	0.60	0.60	*VV	2.23
33	5.574	41327.45	19601.58	0.30	0.30	*VV	2.11
34	5.696	42791.46	16530.17	0.31	0.31	*VV	2.59
35	5.823	12553.21	5415.15	0.09	0.09	*VV	2.32
36	5.930	32257.20	7973.71	0.23	0.23	*VV	4.05
37	6.167	26029.48	8787.25	0.19	0.19	*VV	2.96
38	6.252	12097.81	3693.82	0.09	0.09	*VV	3.28
39	6.446	34670.64	9786.52	0.25	0.25	*VV	3.54
40	6.615	33850.12	5011.84	0.24	0.24	*VV	6.75
41	6.762	18627.52	8812.66	0.13	0.13	*VV	2.11
	6.889	20512.51	5301.95	0.15	0.15	*VV	3.87
43	6.937	49610.20	22747.84	0.35	0.35	*VV	2.18
44	7.072	64146.53	19405.86	0.46	0.46	*VV	3.31
45	7.201	85774.45	20978.75	0.61	0.61	*VE	4.09
46	7.340	12449.06	3212.75	0.09	0.09	*EV	3.87
47	7.389	30081.00	13841.73	0.21	0.21	*VV	2.17
48	7.453	14096.45	6204.69	0.10	0.10	*VV	2.27
49	7.510	6307.45	2545.96	0.05	0.05	*VV	2.48
50	7.573	9924.57	5292.21	0.07	0.07	*VV	1.88
51	7.622	41134.59	15806.63	0.29	0.29	*VE	2.60
52	7.699	6599.66	2491.21	0.05	12.32 0.05	*EV	2.65
53	7.759	20989.98	3666.60	0.15	0.15	*VV	5.72
54	7.873	21763.83	9740.23	0.16	0.16	*VV	2.23
55	7.931	19980.40	5278.57	0.14	0.14	*VV	3.79
56	8.087	65740.02	21384.50	0.47	0.47	*VV	3.07
57	8.279	91215.42	28064.96	0.65	0.65	*VV	3.25
58	8.382	31299.66	10727.12	0.22	0.22	*VV	2.92
59	8.463	26947.31	8770.04	0.19	0.19	*VV	3.07
60	8.554	47759.17	17416.60	0.34	0.34	*VV	2.74
61	8.601	25341.42	12623.93	0.18	0.18	*VV	2.01
62	8.662	39319.06	14959.04	0.28	0.28	*VV	2.63
63	8.713	28815.56	14505.53	0.21	0.21	*VV	1.99
	8.753	32367.12	14719.86	0.23	0.23	*VV	2.20
65	8.847	44022.12	15477.21	0.31	0.31	*VV	2.84
66	8.894	14754.60	7669.42	0.11	0.11	*VV	1.92
67	8.949	36108.75	11249.37	0.26	0.26	*VV	3.21

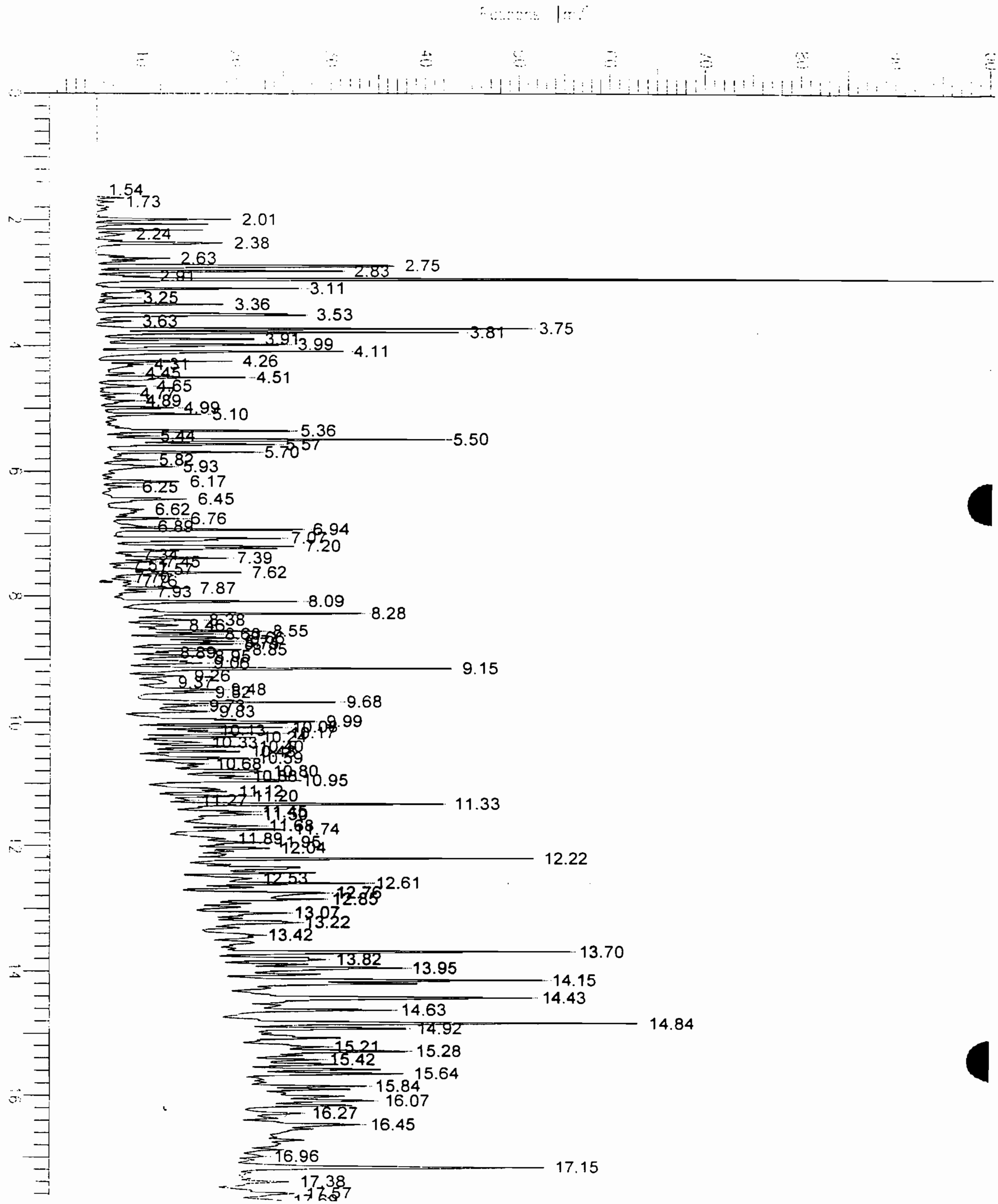
k	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
[illegible]	9.059	44825.87	11238.21	0.32	0.32	*VV	3.99
[illegible]	9.151	98133.60	37757.17	0.70	0.70	*VV	2.60
0	9.262	31676.07	9287.64	0.23	0.23	*VV	3.41
1	9.366	37156.80	7372.76	0.27	0.27	*VV	5.04
2	9.476	47974.38	13152.85	0.34	0.34	*VV	3.65
3	9.524	37520.55	11319.01	0.27	0.27	*VV	3.31
4	9.676	71467.63	25328.94	0.51	0.51	*VV	2.82
5	9.734	37118.67	10821.20	0.27	0.27	*VV	3.43
6	9.827	40076.61	11783.89	0.29	0.29	*VV	3.40
7	9.988	116587.54	23767.66	0.83	0.83	*VV	4.91
8	10.078	45736.12	19548.27	0.33	0.33	*VV	2.34
9	10.133	19698.20	11720.99	0.14	0.14	*VV	1.68
0	10.174	47074.90	19403.30	0.34	0.34	*VV	2.43
1	10.240	43869.85	16166.12	0.31	0.31	*VV	2.71
2	10.333	36776.05	11032.10	0.26	0.26	*VV	3.33
3	10.398	50472.00	15890.28	0.36	0.36	*VV	3.18
4	10.479	42456.74	15339.45	0.30	0.30	*VV	2.77
5	10.589	58172.15	15968.53	0.42	0.42	*VV	3.64
6	10.681	71077.46	11500.17	0.51	0.51	*VV	6.18
7	10.803	76888.17	17466.64	0.55	0.55	*VV	4.40
8	10.882	50602.47	15182.64	0.36	0.36	*VV	3.33
9	10.953	84121.17	20548.20	0.60	0.60	*VV	4.09
[illegible]	11.124	85535.13	13690.28	0.61	0.61	*VV	6.25
1	11.202	42813.03	15314.86	0.31	0.31	*VV	2.80
2	11.271	34354.91	9843.91	0.25	0.25	*VV	3.49
3	11.334	118800.50	38369.61	0.85	0.85	*VV	3.10
4	11.454	49559.73	16260.81	0.35	0.35	*VV	3.05
5	11.498	91090.66	16281.31	0.65	0.65	*VV	5.59
6	11.680	79766.06	16922.59	0.57	0.57	*VV	4.71
7	11.741	78152.04	19875.23	0.56	0.56	*VV	3.93
8	11.890	65871.36	13696.68	0.47	0.47	*VV	4.81
9	11.949	78764.28	17737.57	0.56	0.56	*VV	4.44
0	12.042	137629.21	18191.92	0.98	0.98	*VV	7.57
1	12.216	305659.52	46930.10	2.18	2.18	*VV	6.51
2	12.526	88607.42	16336.61	0.63	0.63	*VV	5.42
3	12.607	134187.62	28334.67	0.96	0.96	*VV	4.74
4	12.757	140594.13	24066.51	1.00	1.00	*VV	5.84
5	12.853	172474.41	23660.24	1.23	1.23	*VV	7.29
6	13.068	104486.51	19729.44	0.75	0.75	*VV	5.30
7	13.223	183807.23	20987.01	1.31	1.31	*VV	8.76
8	13.417	136651.03	16882.80	0.98	0.98	*VV	8.09
9	13.696	291238.00	50314.78	2.08	2.08	*VV	5.79
0	13.815	122910.75	24109.76	0.88	0.88	*VV	5.10
1	13.952	278257.83	32214.04	1.99	1.99	*VV	8.64
[illegible]	14.154	330397.12	47377.78	2.36	2.36	*VV	6.97
3	14.432	281510.27	46162.97	2.01	2.01	*VV	6.10
4	14.625	237460.07	31016.19	1.70	1.70	*VV	7.66
5	14.836	230924.73	57834.41	1.65	1.65	*VV	3.99
6	14.917	312888.16	33734.92	2.24	2.24	*VV	9.27

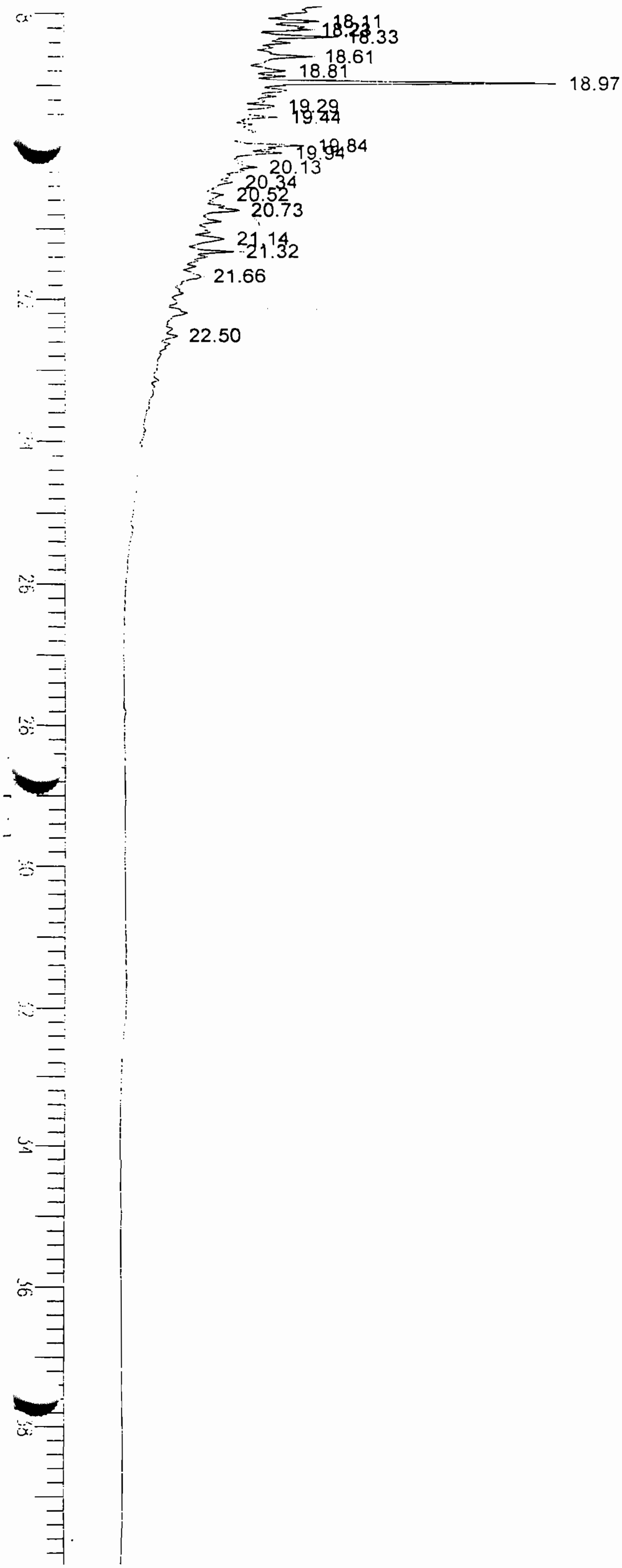
ak	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
7	15.212	130290.05	23916.21	0.93	0.93	*VV	5.45
8	15.283	192989.28	32739.58	1.38	1.38	*VV	5.89
9	15.420	89482.87	23681.59	0.64	0.64	*VV	3.78
0	15.641	312019.35	32881.35	2.23	2.23	*VV	9.49
1	15.840	264412.16	28208.89	1.89	1.89	*VV	9.37
2	16.074	384955.28	29199.29	2.75	2.75	*VV	13.18
3	16.272	172800.95	21766.84	1.23	1.23	*VV	7.94
4	16.451	627119.36	27902.22	4.48	4.48	*VV	22.48
5	16.963	153640.87	17481.61	1.10	1.10	*VV	8.79
6	17.148	269598.62	48426.97	1.93	1.93	*VV	5.57
7	17.377	183305.77	20242.55	1.31	1.31	*VV	9.06
8	17.568	182538.75	20874.19	1.30	1.30	*VV	8.74
9	17.687	80328.98	19507.43	0.57	0.57	*VV	4.12
0	17.821	492626.21	74068.35	3.52	3.52	*VV	6.65
1	18.110	83064.70	18610.93	0.59	0.59	*VV	4.46
2	18.230	111749.57	17505.59	0.80	0.80	*VV	6.38
3	18.328	221331.24	20107.52	1.58	1.58	*VV	11.01
4	18.605	182481.21	17863.82	1.30	1.30	*VV	10.22
5	18.808	96823.95	15413.57	0.69	0.69	*VV	6.28
6	18.965	393214.45	40930.08	2.81	2.81	*VV	9.61
7	19.293	83168.89	14394.56	0.59	0.59	*VV	5.78
8	19.444	298977.17	14652.07	2.14	2.14	*VV	20.41
[illegible]	19.837	105836.05	17333.90	0.76	0.76	*VV	6.11
0	19.936	86386.42	15037.23	0.62	0.62	*VV	5.74
1	20.134	188372.67	12854.29	1.35	1.35	*VV	14.65
2	20.344	88259.66	10505.91	0.63	0.63	*VV	8.40
3	20.521	89413.17	9683.68	0.64	0.64	*VV	9.23
4	20.734	223672.78	11010.57	1.60	1.60	*VV	20.31
5	21.139	77664.10	9676.37	0.55	0.55	*VV	8.03
6	21.316	144121.48	10628.33	1.03	1.03	*VV	13.56
7	21.662	253562.54	7491.52	1.81	1.81	*VV	33.85
8	22.499	56400.62	5170.74	0.40	0.40	*VB	10.91
		13993707.51	2.72e+06	100.00	100.00		

WORLD WIDE GEOSCIENCES - I

Sample Name : J-01010-C NMPC/MW-31/ AREA C
FileName : C:\TC4\96WW\96WW039.RAW
Method : WWGINT.MTH
Start Time : 0.00 min End Time : 40.00 min
Scale Factor: 1.0 Plot Offset: 0 mV

Sample #: 10309009
Date : 4/9/01 01:32 PM
Time of Injection: 3/21/01 09:43 AM
Low Point : 0.17 mV High Point : 103.53 mV
Plot Scale: 103.4 mV





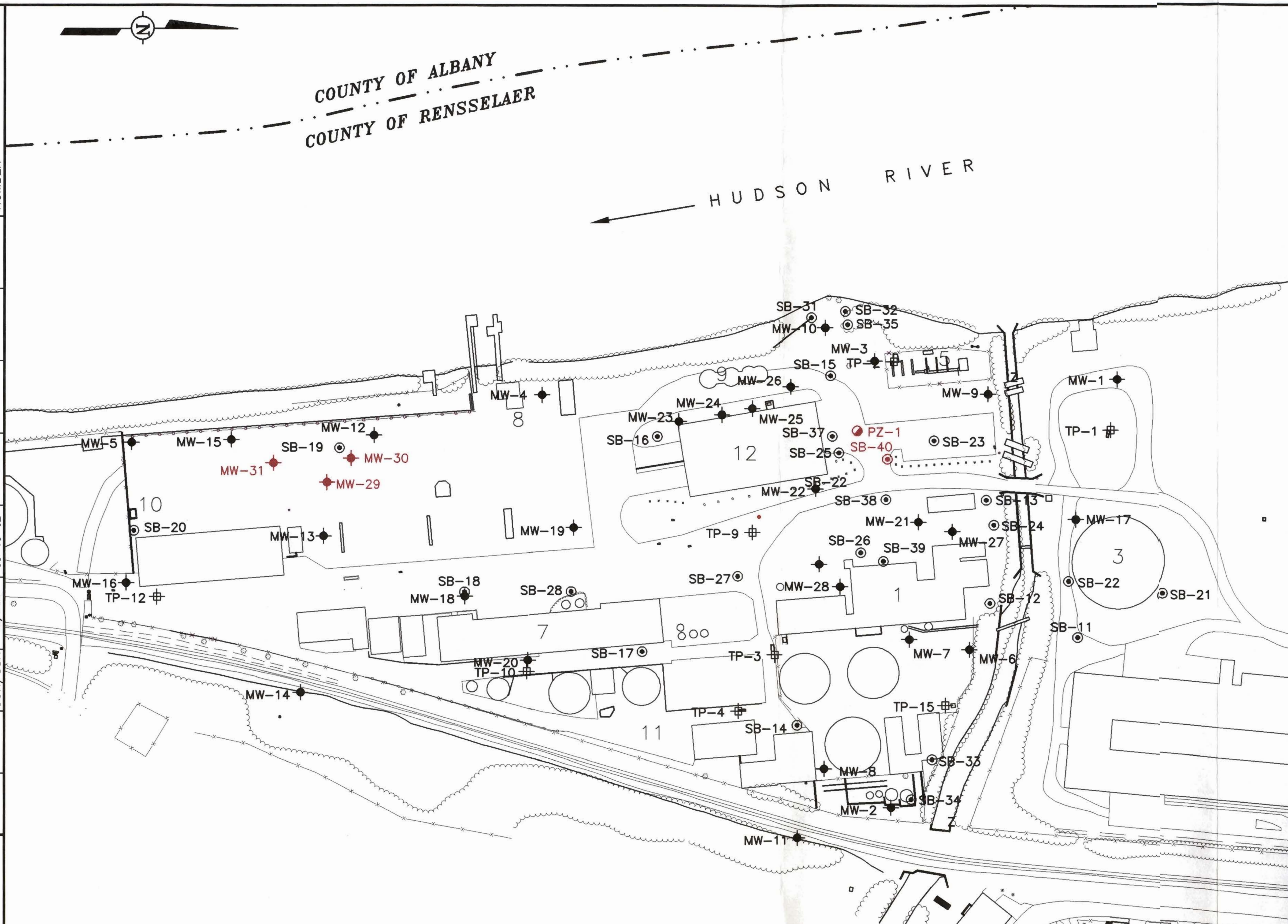
18.11
18.33
18.61
18.81
18.97
19.29
19.44
19.84
19.94
20.13
20.34
20.52
20.73
21.14
21.32
21.66
22.50

APPENDIX E

FIGURES

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY	APPROVED BY	DRAWING NUMBER	11100422-B15
---	---	CON/SSH	BJ/SSH	03-15-02				

FORMAT REVISION 2/26/99



REFERENCE:

BASE MAP SOURCE: NMPC SURVEY

PRIMARY SURVEY CONTROL FOR PHOTOGRAMMETIC MAPPING WAS ESTABLISHED FROM AN ON THE GROUND SURVEY, PERFORMED ON JUNE 1, 1994 USING THE GLOBAL POSITIONING SYSTEM (GPS) AND CONFORMS TO ORDER 2 CLASS 2 FGCS ACCURACY SPECIFICATIONS. THE HORIZONTAL REFERENCE DATUM NORTH AMERICAN DATUM OF 1983 (NAD 83) ON REFERENCE ELLIPSOID ASSOCIATED WITH THE GEODETIC REFERENCE SYSTEM OF 1980 (GRS 80). THE COORDINATES ARE BASED ON THE NEW YORK STATE PLANE GEODETIC SYSTEM OF 1983 (EASTERN ZONE 3101).

LEGEND

- PIEZOMETER
- MONITORING WELL
- SOIL BORING
- TEST PIT
- ----- APPROXIMATE LOCATION OF FORMER WYNANTS KILL CHANNEL

RED DENOTES ACTIVIES COMPLETED DURING SUPPLEMENTAL PHASE II INVESTIGATION

BUILDINGS AND STRUCTURE KEY

1	WATER GAS PLANT
3	2-MILLION ft³ GASHOLDER (EXISTING)
5	GAS REGULATOR BUILDING (NIAGARA MOHAWK)
7	KING FUELS OFFICE BUILDING AND GARAGE
8	COKE SCREENING STATION
9	COKE SILOS
10	LOCATION OF FORMER CREOSOTE OIL TANK
11	FORMER TANK FARM
12	"CORPORATE EXPRESS" BUILDING

SCALE

0 150 300 FEET

IT CORPORATION

NIAGARA MOHAWK
A NATIONAL GRID COMPANY

FIGURE 1-2

SITE MAP

WATER STREET (AREA 2)
TROY, NEW YORK