GEOCHEMICAL & ENVIRONMENTAL RESEARCH GROUP

GERG

College of Geosciences
Texas A&M University

State of Delaware

Department of natural resources and Environmental Control

Project: DE-1325

Case Narrative: PAH Analyses

GERG SDG G4375

I. Background

Two (2) sediment samples were received on April 26, 2006. Samples were logged in under custody and stored at –20^{o}C. Samples were extracted in QC batch M3403 on May 18, 2006. Samples were analyzed for polynuclear aromatic hydrocarbons (PAHs). Samples were dried in an oven at 40^{o}C and analyzedotal organic carbon. The results for these samples are reported here.

II. Analysis Request

A. Standard Operating Procedures

The sediment samples were extracted and analyzed following the protocol contained in the following SOPs used at GERG:

SOP-9805

Extraction of Sediment Samples Using Accelerated Solvent Extractor for the Analyses of Organochlorine Pesticides, Polychlorinated Biphenyls, and Aromatic Hydrocarbons. Rev. 2 as of September 4, 1998.

SOP-9733

Quantitative Determination Of Polynuclear Aromatic Hydrocarbons By Gas Chromatography/Mass Spectrometry Using The Selected Ion Monitoring Mode. Rev. 3 As of October 16, 1998.

SOP-9730

Determination of the Total Carbon, Total Organic Carbon, and Total Inorganic Carbon of Sediments. Rev. 2 as of July 3, 1998.

B. SOP Modifications

Alkylated homologues were calculated based on the parent compound's response factor. The only exception was for the C1-naphthalenes, which were calculates as the sum of the two C1-homologues, using the response factor of the authentic C1-naphthalenes..

II. Quality Control

Laboratory Qualifiers

All of the analytical data have been qualified based on the most recent method detection limits determined. Concentrations which were less than the MDL, adjusted for sample size and dilution, were qualified "J" and those analytes not detected were qualified "ND". Concentrations that exceeded the calibration limits were qualified "EC". The concentrations that were determined by analyses of a diluted aliquot are qualified "D". If the quantification of an analyte is interfered with by another analyte due to its high concentration the data will be left blank and qualified "I" to denote this interference. Analytes may be found above the three times the detection limits in the blank. These may cause possible contamination in samples that are less than ten times the observed level in the blank. These data are qualified "B" to denote this possible contamination.

The GERG Reference Oil (REF Oil) is run on the instrument prior to each analytical batch. The sample is a solution of petroleum in methylene chloride with a concentration of about 800 mg/liter of solution. The analysis is compared to the running average for the laboratory for all single analyte peaks, which are primarily non-alkylated analytes. The control limits for the GERG STD Check samples (REF Oil) are plus or minus 35% of the laboratory average for each single component analyte. No control limits are applied to the alkylated PAH homologue clusters (multi-peak analytes) because the variation in the analytical results (and associated uncertainty) increases with increased alkylation and increased number of homologues within the cluster. This effect can be seen in the data table that includes the laboratory average and one standard deviation for each analyte. The GERG STD Check is used to define the retention time windows for the alkylated PAH homologue clusters; it is not a certified reference material.

Analytical Difficulties

PAH Analyses

In the procedural blank (GERG ID Q22687), no analytes were measured greater than the MDL. No further action was required.

For the duplicatee sample 0412013-001 A (GERG ID Q22690), the average relative percent difference was 9.7%. All individual RPDs were within the QC criteria. The overall QC objectives were met. No further action was taken.

For the matrix spike sample 0412013-001 A (GERG ID Q22691), the average spike recovery was 311%. The recoveries were not within the QC criteria due to the native concentration of PAHs in the sediments compared to the spike level. No further action was taken.

The recoveries for all analytes for the GERG Reference Oil (GERG ID P65B) were with the QC criteria. The overall QA objectives were met. No further action was required.

No further variances or difficulties were observed.

TOC Analyses

In the procedural blank (GERG ID PB062305E), carbon was measured but less than the MDL. No further action was required.

For the SRM NIST 1944 (GERG ID SRM053006D), the recovery for organic carbon were 88.4 and 77.0%. The relative percent difference (RPD) was calculated at 13.7%. The recoveries and RPD were within the QC criteria. No further action was required.

The RPD for the duplicate sample SED-RC-01 (GERG IDs C45280 & C45280D) was 6.3%. This meets the QC criteria. No further action was required.

No further variances or difficulties were observed.

No further variances or difficulties were observed.

Reviewed and Approved: Guy J Denoux 30 X 06

Guy J. Denoux Ph.D.
Laboratory Manager

Sample Integrity Report
& Chains of Custody

Storage Location: B15B
2 jars

GERG SAMPLE RECEIVING/ INTEGRITY REPORT G4375

Catalog: _____ Date Received: 4/26/06 SDG#: ~~B15B~~

Sender: Delaware Oil spill
Athos I

Proj Invest: G Deroux Notif. by (Name/Date): C Starr

1. Number of Shipping Containers: 1

Comments:

2. Airbill Present?
No Yes

Shipping Company:
Fedex UPS Airborne Express Other

Airbill Number: Comments:

3. Custody Seals on Container?
No Yes Intact Not Intact

Comments:

4. Chain of Custody Records?
No Yes

Comments:

5. General Sample Condition:
Frozen Cool Unrefrigerated
Dry Ice Blue Ice Ice

Temperature/Comments:
14°C

6. List of Broken Containers:

7. Number of Waters:_____ Number of Tissues:_____ Number of Sediments:_____
Number of Other:_____ Total Number of Samples Received:_____

8. Problems/ Discrepancies:

9. Resolutions:

10. Checked in by: Cindy Starr Date: 4/26/06

Environmental Laboratory Section - Division of Water Resources
Department of Natural Resources and Environmental Control
89 Kings Highway, Dover, DE 19901 (302) 739-4771

FIELD CHAIN OF CUSTODY

(Complete in BLUE ink)

Client : Richard Greene
Address : 820 Silver Lake Blvd, Silver Lake Office Plaza - Suite 220
Dover, DE 19904
Phone No.: (302)739-4590

Report To : Richard Greene
Invoice To : Randall S. Wolfe
Account : PO06542
ELS Order ID :

PROJECT NAME DE-1325

SAMPLERS (Please Print)

(ELS Use Only) Lab Log No.	Client Sample Description	Sample Date	Sample Time	Matrix*	Comp	Grab	No. Of Con-tainers	ANALYSES: see below								REMARKS
	0412013-001 A	12/15/04	1130	SE			1	✓								SVOC
	0502020-001 A	2/17/05	0930	SE			1	✓								SVOC

RELINQUISHED BY: (signature)	DATE	TIME	RECEIVED BY: (signature)
Renee L. Heinen	4/25/06	1600	Cindy Starr 4/26/06 1100

COMMENTS:
PAH (including alkylated homologues) by GC/MS using SIM, and TOC analysis requested.

DW - drinking water
ER - equip. rinseate
GW - ground water
Lab - lab water
LW - liquid waste
SE - sediment
SL - sludge
SO - soil
SW - surface water
TI - tissue
WS - solid waste
WW - waste water

Is laboratory chain-of-custody required?
Yes / No

ELS USE ONLY
Sample Conditions (circle response):
1. Samples match COC? Yes/No 2. Bottles supplied by ELS? Yes/No 3. Samples received broken/leaking? Yes/No 4. Cooler temp bottle 2-6 degrees? Yes/No/NA
5. Properly preserved? Yes/No 6. VOA/DO containers free of headspace? Yes/No/NA 7. Holding times expired? Yes/No 8. Volume sufficient for analysis? Yes/No

Friday, April 28, 2006

SAMPLE INFORMATION SHEET

Subproject Name :

Client Name : Athos I

Subproject ID : 20060407 Project No :

Receive Date : 4/26/2006 Due Date :

PO A :

PO B :

PO C :

PO D :

				FID					ECD		FPD	MS				HRMS		LABORATORY								AA			IRMS		OTHER			
Gerg ID	Client ID	SDG	M	TP	AL	CF	WO	HS	OC	AC	TB	AR	VO	BS	BA	CP	DF	SP	DW	PL	OG	GS	AV	TV	CN	CV	AM	PM	FM	IS	BM	FL	TC	UL
C51701	0412013-001 A	G4375	Sed															A	A															A
C51702	0502020-001 A	G4375	Sed															A	A															A
Total Samples:	2			0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

Friday, April 28, 2006

SAMPLE IDENTIFICATION

Subproject Name :

Client Name : Athos I

Subproject ID : 20060407

Receive Date : 4/26/2006 Due Date :

PO A :

PO B :

PO C :

PO D :

Gerg ID	Sample ID	SDG	Matrix	Sample Description
C51701	0412013-001 A	G4375	Sediment	11:30
C51702	0502020-001 A	G4375	Sediment	09:00

Total Samples : 2

Total Organic Carbon Data

Delaware Dept of Natural Resources and Environmental Control

GERG ID	Sample Description	Matrix	Sample Type	Collection Date	Collection Time	SDG	Receipt Date	QC Batch	Preparation Date	Analysis Date	% Dry Wt	Dry Wt	% TOC	DL	Qual	RPD	% Recov
Samples																	
C51701	0412013-001 A	Sediment	SAMP	12/15/2004	11:30	G4345	4/26/2006	TOC548	5/27/2006	5/30/2006	68.3	0.081	4.94	0.15			
C51702	0502020-001 A	Sediment	SAMP	12/17/2004	09:00	G4345	4/26/2006	TOC548	5/27/2006	5/30/2006	68.4	0.084	4.59	0.14			
QA																	
Proc Blanks																	
PB053006	Preparation Blank	Sediment	BLANK					TOC548	5/27/2006	5/30/2006		0.300	0.04	0.04	J		
Duplicates																	
C51701	0412013-001 A	Sediment	SAMP	12/15/2004	11:30	G4345	4/26/2006	TOC548	5/27/2006	5/30/2006	68.3	0.081	4.94	0.15			
C51701D	0412013-001 A	Sediment	DUP	12/15/2004	11:30	G4345	4/26/2006	TOC548	5/27/2006	5/30/2006	68.3	0.085	5.26	0.14		6.2%	
SRM	(Certified value 4.4%)																
SRM053006D	NIST 1944	Sediment	SRM					TOC548	5/27/2006	5/30/2006		0.103	3.78	0.12			85.9%

Aromatic Hydrocarbon Data

Delaware Dept of Natural Resources and Environmental Control

Client Sample ID	0412013-001 A	0502020-001 A
Sample Descriptor	11:30	09:00
Original Sample		
GERG ID	C51701	C51702
Sample Type	SAMP	SAMP
SDG	G4375	G4375
Dry Weight	13.75	13.74
Wet Weight	20.13	20.08
Sample Size Units	Grams	Grams
Matrix	Sediment	Sediment
% solid	68.3	68.4
% Lipid		
Reporting Units	ng/g	ng/g
Calculation Basis (dry/wet)	Dry	Dry
QC Batch ID	M3403	M3403
Method	GCMS	GCMS
Collection Date	12/15/04	02/17/05
Receive Date	04/26/06	04/26/06
Extraction Date	05/18/06	05/18/06
Analysis Date	05/25/06	05/25/06
Surrogate Compounds	**%Recovery**	**%Recovery**
d8-Naphthalene	43.2	50.7
d10-Acenaphthene	49.6	74.5
d10-Phenanthrene	59.3	93.8
d12-Chrysene	73.2	57.1
d12-Perylene	57.9	56.7
Total PAHs	**Concentration**	**Concentration**
Total PAHs with Perylene	34913.3	15748.2
Total PAHs without Perylene	34421.9	15445.6
Total NS&T PAHs	14035.4	6815.9

ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
D Dilution

Delaware Dept of Natural Resources and Environmental Control

Client Sample ID	0412013-001 A	0502020-001 A
Sample Descriptor	11:30	09:00
Original Sample		
GERG ID	C51701	C51702
Sample Type	SAMP	SAMP
SDG	G4375	G4375

PAH Compounds	Concentration	MDL	Concentration	MDL
Naphthalene	977.53	0.38	663.24	0.38
C1-Naphthalenes	1097.58	1.23	767.95	1.23
C2-Naphthalenes	1065.82	0.32	708.19	0.32
C3-Naphthalenes	1054.35	0.67	574.96	0.67
C4-Naphthalenes	842.61	0.67	304.27	0.67
Biphenyl	213.45	0.26	84.84	0.26
Acenaphthylene	306.34	0.37	107.50	0.37
Acenaphthene	159.35	0.64	95.77	0.64
Fluorene	513.34	0.33	269.82	0.33
C1-Fluorenes	697.66	0.66	338.30	0.66
C2-Fluorenes	1153.92	0.66	360.57	0.66
C3-Fluorenes	1247.24	0.66	342.42	0.66
Phenanthrene	1279.88	0.32	547.35	0.32
Anthracene	1170.71	0.35	574.67	0.35
C1-Phenanthrenes/Anthracenes	1372.56	0.63	515.87	0.63
C2-Phenanthrenes/Anthracenes	1578.03	0.63	473.49	0.63
C3-Phenanthrenes/Anthracenes	1366.09	0.63	352.46	0.63
C4-Phenanthrenes/Anthracenes	580.73	0.63	187.75	0.63
Dibenzothiophene	150.36	0.21	72.99	0.21
C1-Dibenzothiophenes	377.58	0.42	132.46	0.42
C2-Dibenzothiophenes	800.46	0.42	212.15	0.42
C3-Dibenzothiophenes	844.61	0.42	220.03	0.42
Fluoranthene	1974.44	0.58	564.84	0.58
Pyrene	1931.36	0.66	617.05	0.66
C1-Fluoranthenes/Pyrenes	2030.27	1.24	701.89	1.24
C2-Fluoranthenes/Pyrenes	1403.29	1.24	618.67	1.24
C3-Fluoranthenes/Pyrenes	853.96	1.24	420.39	1.24
Benzo(a)anthracene	1010.44	0.34	482.40	0.34
Chrysene	721.81	0.40	498.94	0.40
C1-Chrysenes	896.76	0.80	568.13	0.80
C2-Chrysenes	513.69	0.80	445.36	0.80
C3-Chrysenes	190.00	0.80	226.81	0.80
C4-Chrysenes	42.46	0.80	50.31	0.80
Benzo(b)fluoranthene	1057.82	0.37	600.13	0.37
Benzo(k)fluoranthene	343.12	0.32	201.21	0.32
Benzo(e)pyrene	505.91	0.34	331.64	0.34
Benzo(a)pyrene	1227.72	0.57	677.65	0.57
Perylene	491.33	0.81	302.59	0.81
Indeno(1,2,3-c,d)pyrene	425.15	0.47	251.35	0.47
Dibenz(a,h)anthracene	132.34	0.23	81.56	0.23
Benzo(g,h,i)perylene	311.18	0.44	200.18	0.44
2-Methylnaphthalene	818.77	0.70	576.53	0.70
1-Methylnaphthalene	278.81	0.53	191.42	0.53
2,6-Dimethylnaphthalene	408.81	0.16	155.16	0.16
1,6,7-Trimethylnaphthalene	82.74	0.33	49.34	0.33
1-Methylphenanthrene	219.38	0.32	100.44	0.32

ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
D Dilution

Delaware Dept of Natural Resources and Environmental Control

Client Sample ID		0412013-001 A
Sample Descriptor	Proc Blank	Duplicate
Original Sample		
GERG ID	Q22687	Q22690
Sample Type	BLANK	DUP
SDG		G4375
Dry Weight	20.00	13.69
Wet Weight		20.05
Sample Size Units	Grams	Grams
Matrix	Sediment	Sediment
% solid		68.3
% Lipid		
Reporting Units	ng/g	ng/g
Calculation Basis (dry/wet)	Dry	Dry
QC Batch ID	M3403	M3403
Method	GCMS	GCMS
Collection Date		12/15/04
Receive Date		04/26/06
Extraction Date	05/18/06	05/18/06
Analysis Date	05/24/06	05/24/06
Surrogate Compounds	**%Recovery**	**%Recovery**
d8-Naphthalene	68.0	41.4
d10-Acenaphthene	81.1	40.9
d10-Phenanthrene	84.7	65.6
d12-Chrysene	71.5	59.8
d12-Perylene	69.7	47.2
Total PAHs	**Concentration**	**Concentration**
Total PAHs with Perylene	0.3	33024.8
Total PAHs without Perylene	0.3	32553.0
Total NS&T PAHs	0.3	13251.1

ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
D Dilution

Delaware Dept of Natural Resources and Environmental Control

Client Sample ID			0412013-001 A	
Sample Descriptor	Proc Blank		Duplicate	
Original Sample				
GERG ID	Q22687		Q22690	
Sample Type	BLANK		DUP	
SDG			G4375	

PAH Compounds	Concentration	MDL		Concentration	MDL
Naphthalene	0.15	0.26	J	891.95	19.27
C1-Naphthalenes	0.15	0.84	J	1027.56	61.66
C2-Naphthalenes		0.22	ND	1046.26	15.92
C3-Naphthalenes		0.46	ND	1066.72	33.52
C4-Naphthalenes		0.46	ND	799.92	33.52
Biphenyl		0.18	ND	227.80	13.02
Acenaphthylene		0.25	ND	338.57	18.56
Acenaphthene		0.44	ND	199.38	32.22
Fluorene		0.23	ND	599.84	16.46
C1-Fluorenes		0.45	ND	839.54	32.93
C2-Fluorenes		0.45	ND	1200.67	32.93
C3-Fluorenes		0.45	ND	1508.79	32.93
Phenanthrene		0.22	ND	1199.72	15.90
Anthracene		0.24	ND	1049.81	17.74
C1-Phenanthrenes/Anthracenes		0.43	ND	1289.57	31.69
C2-Phenanthrenes/Anthracenes		0.43	ND	1381.86	31.69
C3-Phenanthrenes/Anthracenes		0.43	ND	1157.30	31.69
C4-Phenanthrenes/Anthracenes		0.43	ND	502.87	31.69
Dibenzothiophene		0.15	ND	142.19	10.62
C1-Dibenzothiophenes		0.29	ND	321.13	21.24
C2-Dibenzothiophenes		0.29	ND	697.08	21.24
C3-Dibenzothiophenes		0.29	ND	726.17	21.24
Fluoranthene		0.40	ND	1838.53	29.02
Pyrene		0.45	ND	1771.76	33.13
C1-Fluoranthenes/Pyrenes		0.85	ND	1742.16	62.15
C2-Fluoranthenes/Pyrenes		0.85	ND	1244.55	62.15
C3-Fluoranthenes/Pyrenes		0.85	ND	814.48	62.15
Benzo(a)anthracene		0.23	ND	920.53	16.90
Chrysene		0.27	ND	687.03	20.06
C1-Chrysenes		0.55	ND	792.76	40.13
C2-Chrysenes		0.55	ND	452.20	40.13
C3-Chrysenes		0.55	ND	230.67	40.13
C4-Chrysenes		0.55	ND	40.70	40.13
Benzo(b)fluoranthene		0.25	ND	984.82	18.44
Benzo(k)fluoranthene		0.22	ND	314.52	16.08
Benzo(e)pyrene		0.23	ND	486.82	17.13
Benzo(a)pyrene		0.39	ND	1156.90	28.58
Perylene		0.55	ND	471.87	40.45
Indeno(1,2,3-c,d)pyrene		0.32	ND	416.87	23.54
Dibenz(a,h)anthracene		0.16	ND	124.33	11.63
Benzo(g,h,i)perylene		0.30	ND	318.64	22.04
2-Methylnaphthalene	0.15	0.48	J	760.34	35.02
1-Methylnaphthalene		0.36	ND	267.22	26.64
2,6-Dimethylnaphthalene		0.11	ND	354.76	7.96
1,6,7-Trimethylnaphthalene		0.23	ND	101.61	16.76
1-Methylphenanthrene		0.22	ND	242.46	15.85

ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
D Dilution

Delaware Dept of Natural Resources and Environmental Control

Client Sample ID	0412013-001 A
Sample Descriptor	Matrix Spike
Original Sample	
GERG ID	Q22691
Sample Type	MS
SDG	G4375
Dry Weight	13.67
Wet Weight	20.02
Sample Size Units	Grams
Matrix	Sediment
% solid	68.3
% Lipid	
Reporting Units	ng/g
Calculation Basis (dry/wet)	Dry
QC Batch ID	M3403
Method	GCMS
Collection Date	12/15/04
Receive Date	04/26/06
Extraction Date	05/18/06
Analysis Date	05/24/06

Surrogate Compounds	**%Recovery**
d8-Naphthalene	41.8
d10-Acenaphthene	58.0
d10-Phenanthrene	64.6
d12-Chrysene	68.6
d12-Perylene	56.4

Total PAHs	**Concentration**
Total PAHs with Perylene	40590.5
Total PAHs without Perylene	40121.3
Total NS&T PAHs	14764.6

ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
D Dilution

Delaware Dept of Natural Resources and Environmental Control

Client Sample ID	0412013-001 A
Sample Descriptor	Matrix Spike
Original Sample	
GERG ID	Q22691
Sample Type	MS
SDG	G4375

PAH Compounds	Concentration	MDL	
Naphthalene	1104.62	19.30	
C1-Naphthalenes	1263.04	61.76	
C2-Naphthalenes	1224.51	15.95	
C3-Naphthalenes	1225.93	33.57	
C4-Naphthalenes	1119.10	33.57	
Biphenyl	207.31	13.04	
Acenaphthylene	237.03	18.58	
Acenaphthene	173.60	32.27	
Fluorene	528.65	16.49	
C1-Fluorenes	706.31	32.98	
C2-Fluorenes	1150.19	32.98	
C3-Fluorenes	1281.41	32.98	
Phenanthrene	1361.26	15.93	
Anthracene	1229.21	17.77	
C1-Phenanthrenes/Anthracenes	1421.43	31.74	
C2-Phenanthrenes/Anthracenes	1610.56	31.74	
C3-Phenanthrenes/Anthracenes	1328.61	31.74	
C4-Phenanthrenes/Anthracenes	567.91	31.74	
Dibenzothiophene	170.03	10.64	
C1-Dibenzothiophenes	366.92	21.27	
C2-Dibenzothiophenes	894.43	21.27	
C3-Dibenzothiophenes	944.06	21.27	
Fluoranthene	2116.49	29.06	
Pyrene	2068.69	33.18	
C1-Fluoranthenes/Pyrenes	2226.10	62.24	
C2-Fluoranthenes/Pyrenes	1466.94	62.24	
C3-Fluoranthenes/Pyrenes	887.06	62.24	
Benzo(a)anthracene	999.94	16.93	
Chrysene	759.12	20.09	
C1-Chrysenes	853.05	40.19	
C2-Chrysenes	481.71	40.19	
C3-Chrysenes	192.08	40.19	
C4-Chrysenes	29.69	40.19	J
Benzo(b)fluoranthene	1025.85	18.47	
Benzo(k)fluoranthene	349.68	16.11	
Benzo(e)pyrene	491.71	17.15	
Benzo(a)pyrene	1212.12	28.62	
Perylene	469.24	40.51	
Indeno(1,2,3-c,d)pyrene	415.41	23.58	
Dibenz(a,h)anthracene	132.30	11.65	
Benzo(g,h,i)perylene	311.37	22.08	
2-Methylnaphthalene	932.98	35.08	
1-Methylnaphthalene	330.06	26.68	
2,6-Dimethylnaphthalene	403.69	7.97	
1,6,7-Trimethylnaphthalene	83.99	16.79	
1-Methylphenanthrene	243.65	15.87	

ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
D Dilution

Delaware Dept of Natural Resources and Environmental Control

Client Sample ID	
Sample Descriptor	Proc Blank
Original Sample	
GERG ID	Q22687
Sample Type	BLANK
SDG	

Dry Weight	20.00
Wet Weight	
Sample Size Units	Grams
Matrix	Sediment
% solid	
% Lipid	
Reporting Units	ng/g
Calculation Basis (dry/wet)	Dry

QC Batch ID	M3403
Method	GCMS
Collection Date	
Receive Date	
Extraction Date	05/18/06
Analysis Date	05/24/06

Surrogate Compounds	**% Recovery**
d8-Naphthalene	68.0
d10-Acenaphthene	81.1
d10-Phenanthrene	84.7
d12-Chrysene	71.5
d12-Perylene	69.7

Total PAHs	**Concentration**
Total PAHs with Perylene	0.3
Total PAHs without Perylene	0.3
Total NS&T PAHs	0.3

ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
D Dilution

Delaware Dept of Natural Resources and Environmental Control

Client Sample ID	
Sample Descriptor	Proc Blank
Original Sample	
GERG ID	Q22687
Sample Type	BLANK
SDG	

PAH Compounds	Concentration	MDL	
Naphthalene	0.15	0.26	J
C1-Naphthalenes	0.15	0.84	J
C2-Naphthalenes		0.22	ND
C3-Naphthalenes		0.46	ND
C4-Naphthalenes		0.46	ND
Biphenyl		0.18	ND
Acenaphthylene		0.25	ND
Acenaphthene		0.44	ND
Fluorene		0.23	ND
C1-Fluorenes		0.45	ND
C2-Fluorenes		0.45	ND
C3-Fluorenes		0.45	ND
Phenanthrene		0.22	ND
Anthracene		0.24	ND
C1-Phenanthrenes/Anthracenes		0.43	ND
C2-Phenanthrenes/Anthracenes		0.43	ND
C3-Phenanthrenes/Anthracenes		0.43	ND
C4-Phenanthrenes/Anthracenes		0.43	ND
Dibenzothiophene		0.15	ND
C1-Dibenzothiophenes		0.29	ND
C2-Dibenzothiophenes		0.29	ND
C3-Dibenzothiophenes		0.29	ND
Fluoranthene		0.40	ND
Pyrene		0.45	ND
C1-Fluoranthenes/Pyrenes		0.85	ND
C2-Fluoranthenes/Pyrenes		0.85	ND
C3-Fluoranthenes/Pyrenes		0.85	ND
Benzo(a)anthracene		0.23	ND
Chrysene		0.27	ND
C1-Chrysenes		0.55	ND
C2-Chrysenes		0.55	ND
C3-Chrysenes		0.55	ND
C4-Chrysenes		0.55	ND
Benzo(b)fluoranthene		0.25	ND
Benzo(k)fluoranthene		0.22	ND
Benzo(e)pyrene		0.23	ND
Benzo(a)pyrene		0.39	ND
Perylene		0.55	ND
Indeno(1,2,3-c,d)pyrene		0.32	ND
Dibenzo(a,h)anthracene		0.16	ND
Benzo(g,h,i)perylene		0.30	ND
2-Methylnaphthalene	0.15	0.48	J
1-Methylnaphthalene		0.36	ND
2,6-Dimethylnaphthalene		0.11	ND
1,6,7-Trimethylnaphthalene		0.23	ND
1-Methylphenanthrene		0.22	ND

ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
D Dilution

Delaware Dept of Natural Resources and Environmental Control

Client Sample ID	0412013-001 A	0412013-001 A
Sample Descriptor	11:30	Duplicate
Original Sample		C51701
GERG ID	C51701	Q22690
Sample Type	0412013-001 A	DUP
SDG	G4375	G4375
Dry Weight	13.75	13.69
Wet Weight	20.13	20.05
Sample Size Units	Grams	Grams
Matrix	Sediment	Sediment
% solid	68.3	68.3
% Lipid		
Reporting Units	ng/g	ng/g
Calculation Basis (dry/wet)	Dry	Dry
QC Batch ID	M3403	M3403
Method	GCMS	GCMS
Collection Date	12/15/04	12/15/04
Receive Date	04/26/06	04/26/06
Extraction Date	05/18/06	05/18/06
Analysis Date	05/25/06	05/24/06
Surrogate Compounds	**% Recovery**	**% Recovery**
d8-Naphthalene	43.2	41.4
d10-Acenaphthene	49.6	40.9
d10-Phenanthrene	59.3	65.6
d12-Chrysene	73.2	59.8
d12-Perylene	57.9	47.2
Total PAHs	**Concentration**	**Concentration**
Total PAHs with Perylene	34913.3	33024.8
Total PAHs without Perylene	34421.9	32553.0
Total NS&T PAHs	14035.4	13251.1

ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
D Dilution

Delaware Dept of Natural Resources and Environmental Control

Client Sample ID	0412013-001 A	0412013-001 A
Sample Descriptor	11:30	Duplicate
Original Sample		C51701
GERG ID	C51701	Q22690
Sample Type	0412013-001 A	DUP
SDG	G4375	G4375

PAH Compounds	Concentration	MDL		Concentration	MDL		RPD	
Naphthalene	977.53	0.38		891.95	0.39		9.2	
C1-Naphthalenes	1097.58	1.23		1027.56	1.23		6.6	
C2-Naphthalenes	1065.82	0.32		1046.26	0.32		1.9	
C3-Naphthalenes	1054.35	0.67		1066.72	0.67		1.2	
C4-Naphthalenes	842.61	0.67		799.92	0.67		5.2	
Biphenyl	213.45	0.26		227.80	0.26		6.5	
Acenaphthylene	306.34	0.37		338.57	0.37		10.0	
Acenaphthene	159.35	0.64		199.38	0.64		22.3	
Fluorene	513.34	0.33		599.84	0.33		15.5	
C1-Fluorenes	697.66	0.66		839.54	0.66		18.5	
C2-Fluorenes	1153.92	0.66		1200.67	0.66		4.0	
C3-Fluorenes	1247.24	0.66		1508.79	0.66		19.0	Q
Phenanthrene	1279.88	0.32		1199.72	0.32		6.5	
Anthracene	1170.71	0.35		1049.81	0.35		10.9	
C1-Phenanthrenes/Anthracenes	1372.56	0.63		1289.57	0.63		6.2	
C2-Phenanthrenes/Anthracenes	1578.03	0.63		1381.86	0.63		13.3	
C3-Phenanthrenes/Anthracenes	1366.09	0.63		1157.30	0.63		16.5	
C4-Phenanthrenes/Anthracenes	580.73	0.63		502.87	0.63		14.4	Q
Dibenzothiophene	150.36	0.21		142.19	0.21		5.6	
C1-Dibenzothiophenes	377.58	0.42		321.13	0.42		16.2	
C2-Dibenzothiophenes	800.46	0.42		697.08	0.42		13.8	
C3-Dibenzothiophenes	844.61	0.42		726.17	0.42		15.1	
Fluoranthene	1974.44	0.58		1838.53	0.58		7.1	Q
Pyrene	1931.36	0.66		1771.76	0.66		8.6	
C1-Fluoranthenes/Pyrenes	2030.27	1.24		1742.16	1.24		15.3	
C2-Fluoranthenes/Pyrenes	1403.3	1.24	ND	1244.6	1.24	ND	12.0	
C3-Fluoranthenes/Pyrenes	854.0	1.24	ND	814.5	1.24	ND	4.7	
Benzo(a)anthracene	1010.44	0.34		920.53	0.34		9.3	
Chrysene	721.81	0.40		687.03	0.40		4.9	
C1-Chrysenes	896.76	0.80		792.76	0.80		12.3	
C2-Chrysenes	513.69	0.80		452.20	0.80		12.7	
C3-Chrysenes	190.00	0.80		230.67	0.80		19.3	
C4-Chrysenes	42.46	0.80		40.70	0.80		4.2	
Benzo(b)fluoranthene	1057.82	0.37		984.82	0.37		7.1	
Benzo(k)fluoranthene	343.12	0.32		314.52	0.32		8.7	
Benzo(e)pyrene	505.91	0.34		486.82	0.34		3.8	
Benzo(a)pyrene	1227.72	0.57		1156.90	0.57		5.9	
Perylene	491.33	0.81		471.87	0.81		4.0	
Indeno(1,2,3-c,d)pyrene	425.15	0.47		416.87	0.47		2.0	
Dibenzo(a,h)anthracene	132.34	0.23		124.33	0.23		6.2	
Benzo(g,h,i)perylene	311.18	0.44		318.64	0.44		2.4	
2-Methylnaphthalene	818.77	0.70		760.34	0.70		7.4	
1-Methylnaphthalene	278.81	0.53		267.22	0.53		4.2	
2,6-Dimethylnaphthalene	408.81	0.16		354.76	0.16		14.2	
1,6,7-Trimethylnaphthalene	82.74	0.33		101.61	0.34		20.5	
1-Methylphenanthrene	219.38	0.32		242.46	0.32		10.0	
					Average %RPD		9.7	

ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
D Dilution

Delaware Dept of Natural Resources and Environmental Control

Client Sample ID	0412013-001 A	0412013-001 A
Sample Descriptor	11:30	Matrix Spike
Original Sample		C51701
GERG ID	C51701	Q22691
Sample Type	0412013-001 A	MS
SDG	G4375	G4375
Dry Weight	13.75	13.67
Wet Weight	20.13	20.02
Sample Size Units	Grams	Grams
Matrix	Sediment	Sediment
% solid	68.3	68.3
% Lipid		
Reporting Units	ng/g	%
Calculation Basis (dry/wet)	Dry	Dry
QC Batch ID	M3403	M3403
Method	GCMS	GCMS
Collection Date	12/15/04	12/15/04
Receive Date	04/26/06	04/26/06
Extraction Date	05/18/06	05/18/06
Analysis Date	05/25/06	05/24/06
Surrogate Compounds	**% Recovery**	**% Recovery**
d8-Naphthalene	43.2	41.8
d10-Acenaphthene	49.6	58.0
d10-Phenanthrene	59.3	64.6
d12-Chrysene	73.2	68.6
d12-Perylene	57.9	56.4
Total PAHs	**Concentration**	**Concentration**
Total PAHs with Perylene	34913.3	NA
Total PAHs without Perylene	34421.9	NA
Total NS&T PAHs	14035.4	NA

ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
D Dilution

Delaware Dept of Natural Resources and Environmental Control

Client Sample ID	0412013-001 A	0412013-001 A
Sample Descriptor	11:30	Matrix Spike
Original Sample		C51701
GERG ID	C51701	Q22691
Sample Type	0412013-001 A	MS
SDG	G4375	G4375

PAH Compounds	Concentration	MDL		% Recovery	
Naphthalene	977.53	0.38		1395.8	Q
C1-Naphthalenes	1097.58	1.23			
C2-Naphthalenes	1065.82	0.32			
C3-Naphthalenes	1054.35	0.67			
C4-Naphthalenes	842.61	0.67			
Biphenyl	213.45	0.26		-65.4	Q
Acenaphthylene	306.34	0.37		-613.2	Q
Acenaphthene	159.35	0.64		106.0	
Fluorene	513.34	0.33		107.2	
C1-Fluorenes	697.66	0.66			
C2-Fluorenes	1153.92	0.66			
C3-Fluorenes	1247.24	0.66			
Phenanthrene	1279.88	0.32		987.1	Q
Anthracene	1170.71	0.35		587.9	Q
C1-Phenanthrenes/Anthracenes	1372.56	0.63			
C2-Phenanthrenes/Anthracenes	1578.03	0.63			
C3-Phenanthrenes/Anthracenes	1366.09	0.63			
C4-Phenanthrenes/Anthracenes	580.73	0.63			
Dibenzothiophene	150.36	0.21		290.0	Q
C1-Dibenzothiophenes	377.58	0.42			
C2-Dibenzothiophenes	800.46	0.42			
C3-Dibenzothiophenes	844.61	0.42			
Fluoranthene	1974.44	0.58		1818.6	Q
Pyrene	1931.36	0.66		1764.1	Q
C1-Fluoranthenes/Pyrenes	2030.27	1.24			
C2-Fluoranthenes/Pyrenes	1403.3	1.24	ND		
C3-Fluoranthenes/Pyrenes	854.0	1.24	ND		
Benzo(a)anthracene	1010.44	0.34		-127.6	Q
Chrysene	721.81	0.40		440.7	Q
C1-Chrysenes	896.76	0.80			
C2-Chrysenes	513.69	0.80			
C3-Chrysenes	190.00	0.80			
C4-Chrysenes	42.46	0.80			
Benzo(b)fluoranthene	1057.82	0.37		-400.8	Q
Benzo(k)fluoranthene	343.12	0.32		84.2	
Benzo(e)pyrene	505.91	0.34		-155.3	Q
Benzo(a)pyrene	1227.72	0.57		-133.3	Q
Perylene	491.33	0.81		-355.0	Q
Indeno(1,2,3-c,d)pyrene	425.15	0.47		-137.1	Q
Dibenzo(a,h)anthracene	132.34	0.23		-0.7	Q
Benzo(g,h,i)perylene	311.18	0.44		2.5	Q
2-Methylnaphthalene	818.77	0.70		1355.8	Q
1-Methylnaphthalene	278.81	0.53		570.9	Q
2,6-Dimethylnaphthalene	408.81	0.16		-56.4	Q
1,6,7-Trimethylnaphthalene	82.74	0.33		16.0	Q
1-Methylphenanthrene	219.38	0.32		312.2	Q
				311.8	

ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
D Dilution

Delaware Dept of Natural Resources and Environmental Control

Client Sample ID	
Sample Descriptor	GERG STD Check
Original Sample	
GERG ID	P65B
Sample Type	REF
SDG	

Dry Weight	
Wet Weight	
Sample Size Units	Milliliter
Matrix	Oil
% solid	
% Lipid	
Reporting Units	ng/mL
Calculation Basis (dry/wet)	

QC Batch ID	M3403
Method	GCMS
Collection Date	
Receive Date	
Extraction Date	
Analysis Date	05/24/06

Surrogate Compounds	**% Recovery**
d8-Naphthalene	77.1
d10-Acenaphthene	82.7
d10-Phenanthrene	93.4
d12-Chrysene	75.0
d12-Perylene	67.6

Total PAHs	**Concentration**
Total PAHs with Perylene	11685.4
Total PAHs without Perylene	11670.9
Total NS&T PAHs	3639.0

ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
D Dilution

Delaware Dept of Natural Resources and Environmental Control

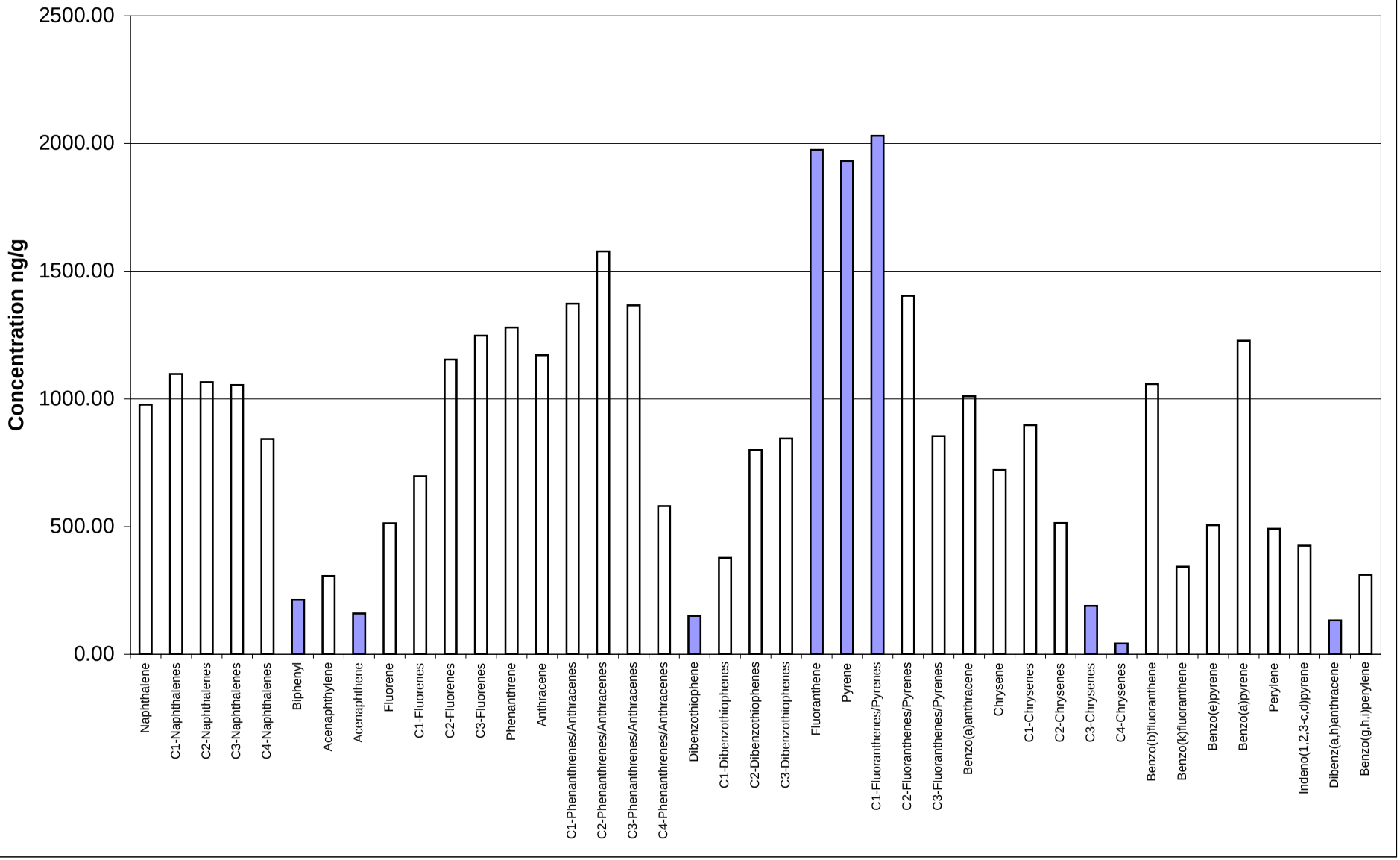
Client Sample ID	
Sample Descriptor	GERG STD Check
Original Sample	
GERG ID	P65B
Sample Type	REF
SDG	

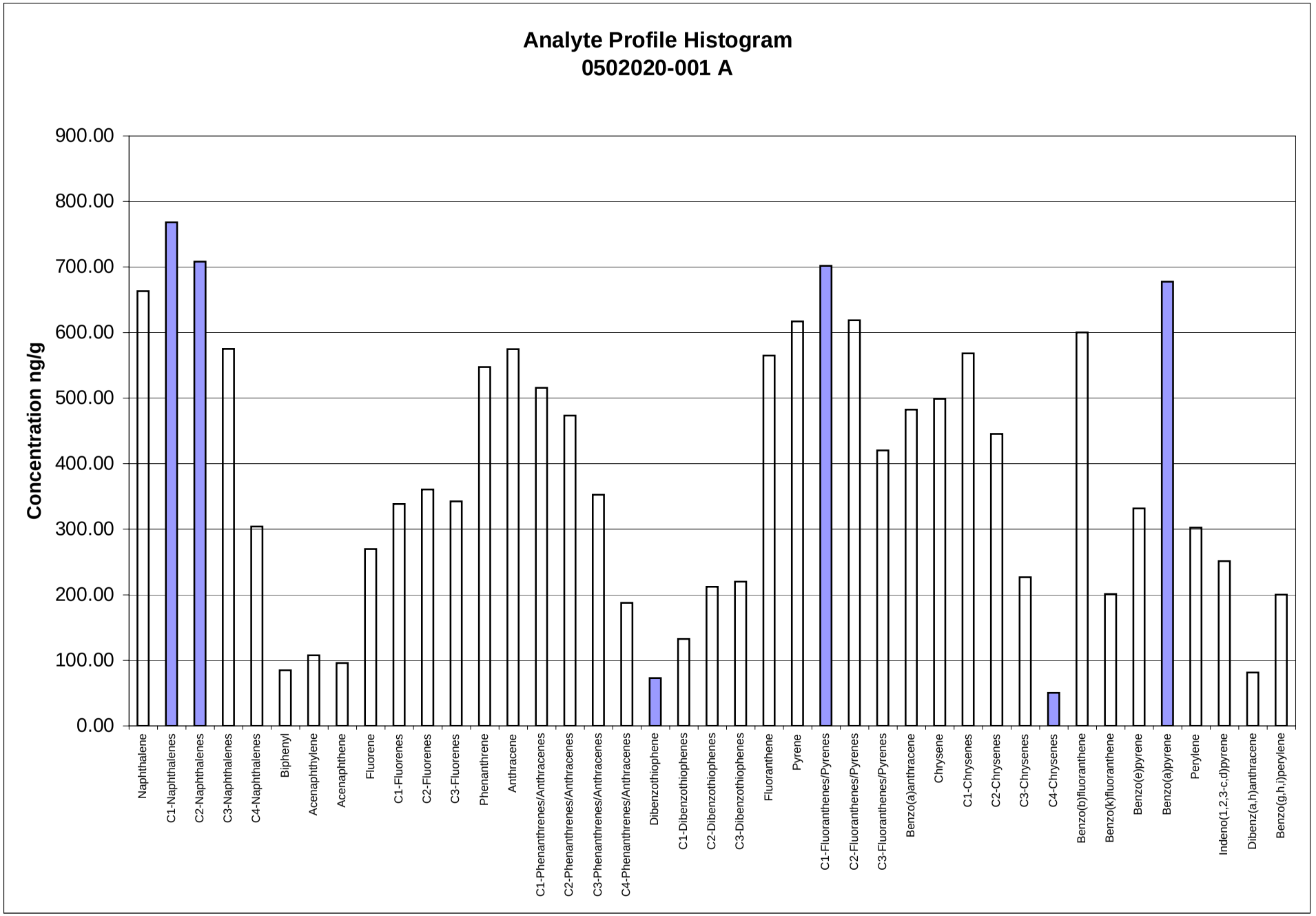
				QC Acceptance Range			Mean Lab Values	
PAH Compounds	**Concentration**	**MDL**		**-35% to +35%**			**Concentration**	**SD**
Naphthalene	645.2	20.00		**271.2**	**to**	**898.6**	541.4	124.2
C1-Naphthalenes	2025.0	20.00		**736.8**	**to**	**2645.0**	1546.4	412.9
C2-Naphthalenes	2210.5	20.00		**744.9**	**to**	**2916.2**	1653.1	507.1
C3-Naphthalenes	2135.8	20.00		**584.9**	**to**	**2227.3**	1274.9	375.0
C4-Naphthalenes	1077.4	20.00		**306.5**	**to**	**1124.0**	652.1	180.5
Biphenyl	78.9	20.00		**33.3**	**to**	**93.1**	60.1	8.9
Acenaphthylene	0.7	20.00		**12.2**	**to**	**68.6**	34.8	16.0
Acenaphthene	34.9	20.00	J	**1.3**	**to**	**15.4**	6.7	4.7
Fluorene	109.2	20.00		**52.9**	**to**	**155.8**	98.4	17.0
C1-Fluorenes	378.4	20.00		**134.8**	**to**	**411.5**	256.1	48.7
C2-Fluorenes	583.5	20.00		**212.0**	**to**	**589.1**	381.3	55.1
C3-Fluorenes	480.5	20.00		**146.9**	**to**	**523.7**	307.0	81.0
Phenanthrene	147.2	20.00		**74.5**	**to**	**201.1**	131.8	17.2
Anthracene	8.2	20.00	J	**-3.9**	**to**	**61.6**	19.8	25.8
C1-Phenanthrenes/Anthracenes	335.9	20.00		**164.1**	**to**	**450.7**	293.2	40.7
C2-Phenanthrenes/Anthracenes	427.8	20.00		**188.3**	**to**	**544.6**	346.5	56.9
C3-Phenanthrenes/Anthracenes	285.4	20.00		**129.9**	**to**	**399.1**	247.8	47.9
C4-Phenanthrenes/Anthracenes	101.9	20.00		**66.8**	**to**	**209.7**	129.0	26.3
Dibenzothiophene	19.6	20.00		**9.4**	**to**	**26.5**	17.1	2.6
C1-Dibenzothiophenes	77.2	20.00		**32.1**	**to**	**97.3**	60.7	11.3
C2-Dibenzothiophenes	80.2	20.00		**29.8**	**to**	**91.9**	57.0	11.1
C3-Dibenzothiophenes	56.0	20.00		**20.6**	**to**	**65.7**	40.1	8.5
Fluoranthene	6.0	20.00	J	**1.5**	**to**	**17.4**	7.6	5.3
Pyrene	7.2	20.00	J	**-3.8**	**to**	**35.9**	10.3	16.2
C1-Fluoranthenes/Pyrenes	69.5	20.00		**25.4**	**to**	**114.0**	61.8	22.7
C2-Fluoranthenes/Pyrenes	69.3	20.00		**36.1**	**to**	**112.4**	69.4	13.9
C3-Fluoranthenes/Pyrenes	78.0	20.00		**37.5**	**to**	**117.0**	72.2	14.4
Benzo(a)anthracene	5.5	20.00	J	**0.7**	**to**	**14.4**	5.9	4.8
Chrysene	6.7	20.00	J	**5.6**	**to**	**19.8**	11.7	3.0
C1-Chrysenes	32.8	20.00		**14.0**	**to**	**48.3**	28.7	7.1
C2-Chrysenes	47.9	20.00		**20.4**	**to**	**71.6**	42.2	10.8
C3-Chrysenes	35.5	20.00	J	**1.9**	**to**	**13.3**	6.4	3.5
C4-Chrysenes	6.0	20.00	J	**-0.1**	**to**	**5.0**	1.8	1.9
Benzo(b)fluoranthene	1.6	20.00	J	**0.7**	**to**	**5.7**	2.7	1.6
Benzo(k)fluoranthene	0.5	20.00	J	**-0.1**	**to**	**5.1**	1.8	2.0
Benzo(e)pyrene	1.7	20.00	J	**0.3**	**to**	**8.3**	3.3	2.8
Benzo(a)pyrene	2.4	20.00	J	**0.3**	**to**	**7.2**	2.9	2.4
Perylene	14.5	20.00	J	**6.6**	**to**	**20.2**	12.6	2.4
Indeno(1,2,3-c,d)pyrene	0.2	20.00	J	**0.0**	**to**	**2.8**	1.1	1.0
Dibenzo(a,h)anthracene	0.3	20.00	J	**0.2**	**to**	**1.7**	0.7	0.5
Benzo(g,h,i)perylene	0.7	20.00	J	**-1.8**	**to**	**15.6**	4.3	7.2
2-Methylnaphthalene	1224.7	20.00		**478.5**	**to**	**1587.4**	956.0	219.9
1-Methylnaphthalene	800.2	20.00		**344.4**	**to**	**1129.4**	683.2	153.4
2,6-Dimethylnaphthalene	448.7	20.00		**398.2**	**to**	**1101.7**	714.3	101.8
1,6,7-Trimethylnaphthalene	299.0	20.00		**278.0**	**to**	**749.8**	491.6	63.8
1-Methylphenanthrene	97.5	20.00		**43.3**	**to**	**169.2**	96.0	29.4

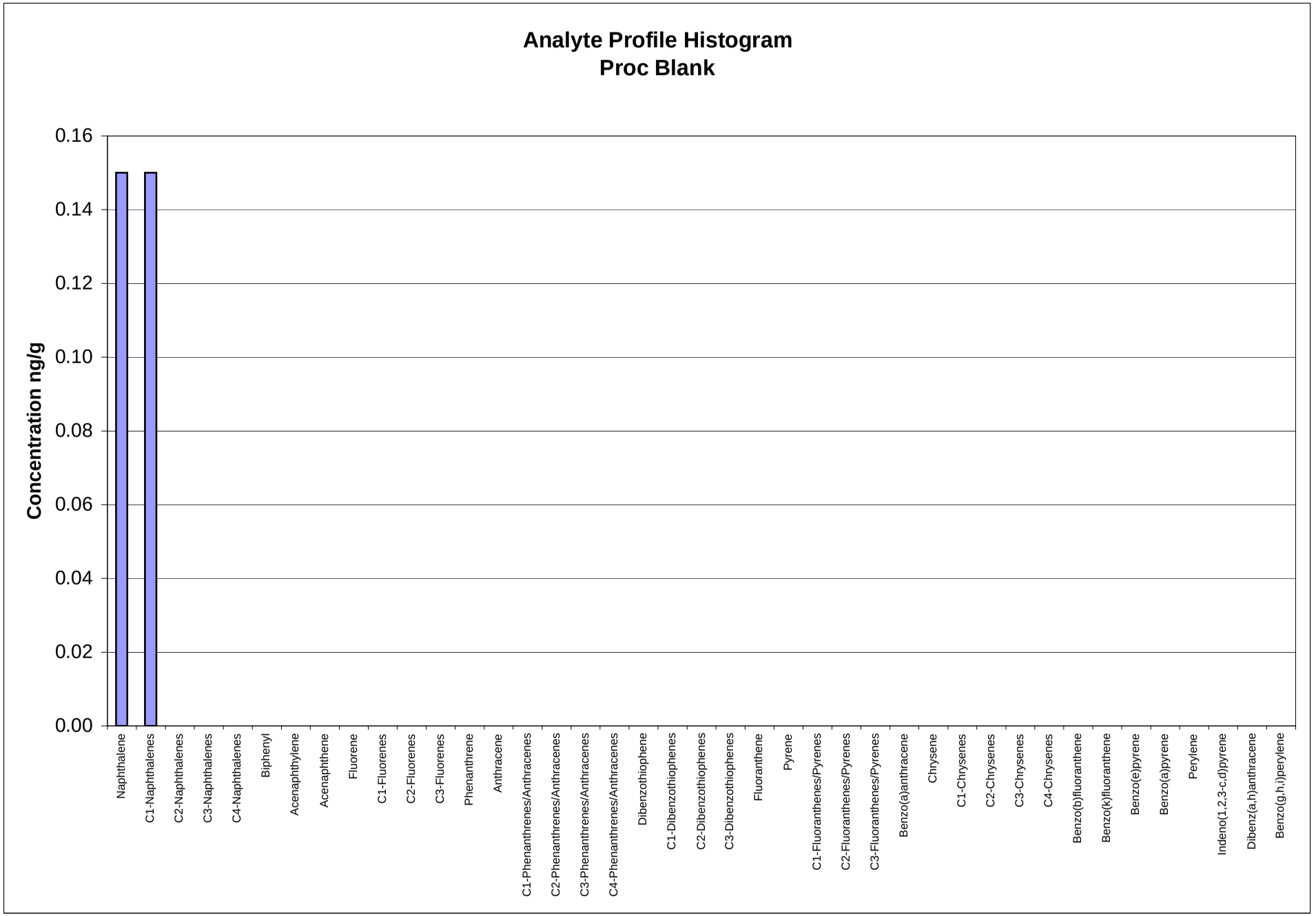
ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
D Dilution

Analyte Profile Histograms
For the PAH Analysis

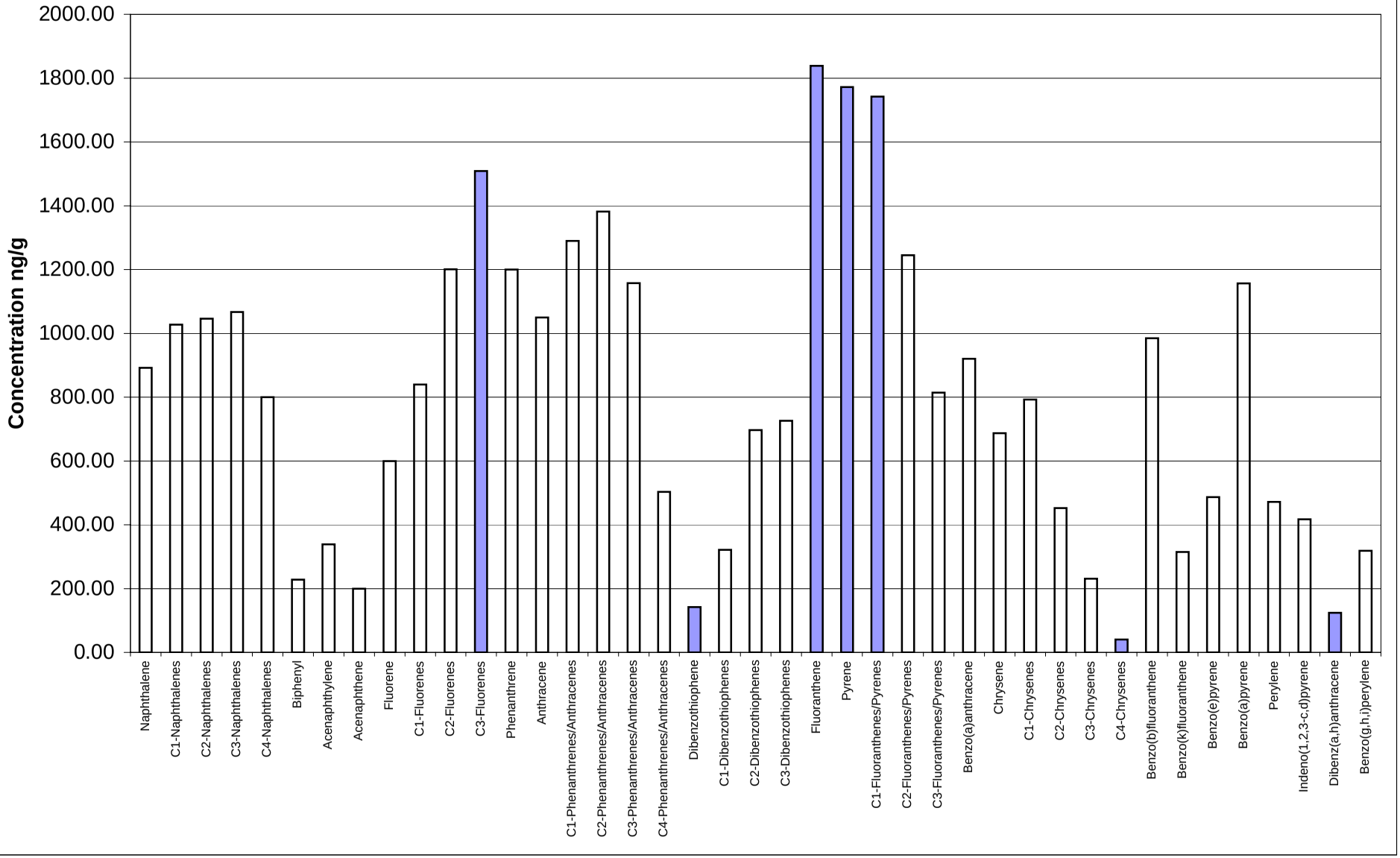
Analyte Profile Histogram
0412013-001 A

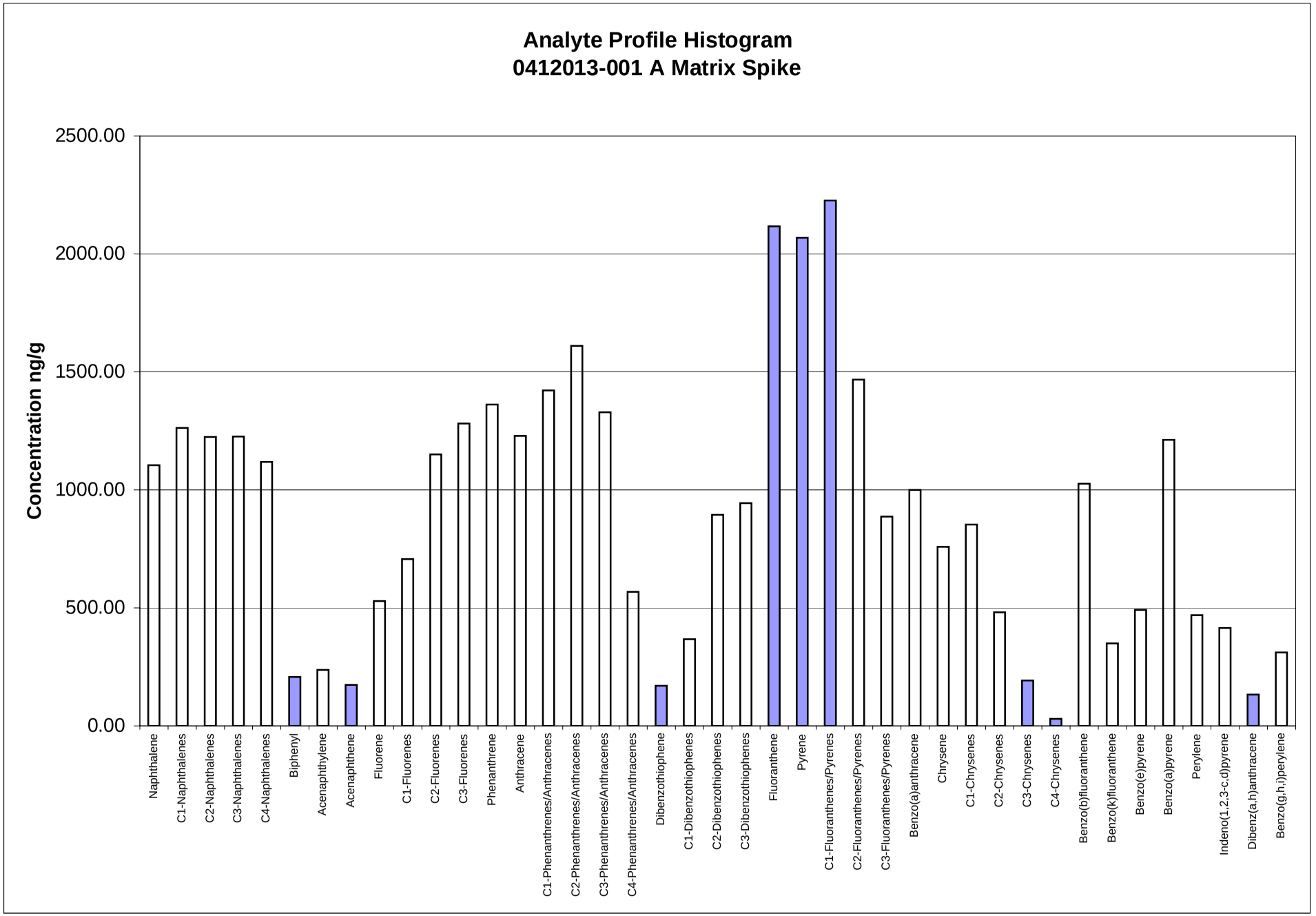



Analyte Profile Histogram
0502020-001 A
Concentration ng/g
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
Naphthalene
C1-Naphthalenes
C2-Naphthalenes
C3-Naphthalenes
C4-Naphthalenes
Biphenyl
Acenaphthylene
Acenaphthene
Fluorene
C1-Fluorenes
C2-Fluorenes
C3-Fluorenes
Phenanthrene
Anthracene
C1-Phenanthrenes/Anthracenes
C2-Phenanthrenes/Anthracenes
C3-Phenanthrenes/Anthracenes
C4-Phenanthrenes/Anthracenes
Dibenzothiophene
C1-Dibenzothiophenes
C2-Dibenzothiophenes
C3-Dibenzothiophenes
Fluoranthene
Pyrene
C1-Fluoranthenes/Pyrenes
C2-Fluoranthenes/Pyrenes
C3-Fluoranthenes/Pyrenes
Benzo(a)anthracene
Chrysene
C1-Chrysenes
C2-Chrysenes
C3-Chrysenes
C4-Chrysenes
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Benzo(e)pyrene
Benzo(a)pyrene
Perylene
Indeno(1,2,3-c,d)pyrene
Dibenz(a,h)anthracene
Benzo(g,h,i)perylene

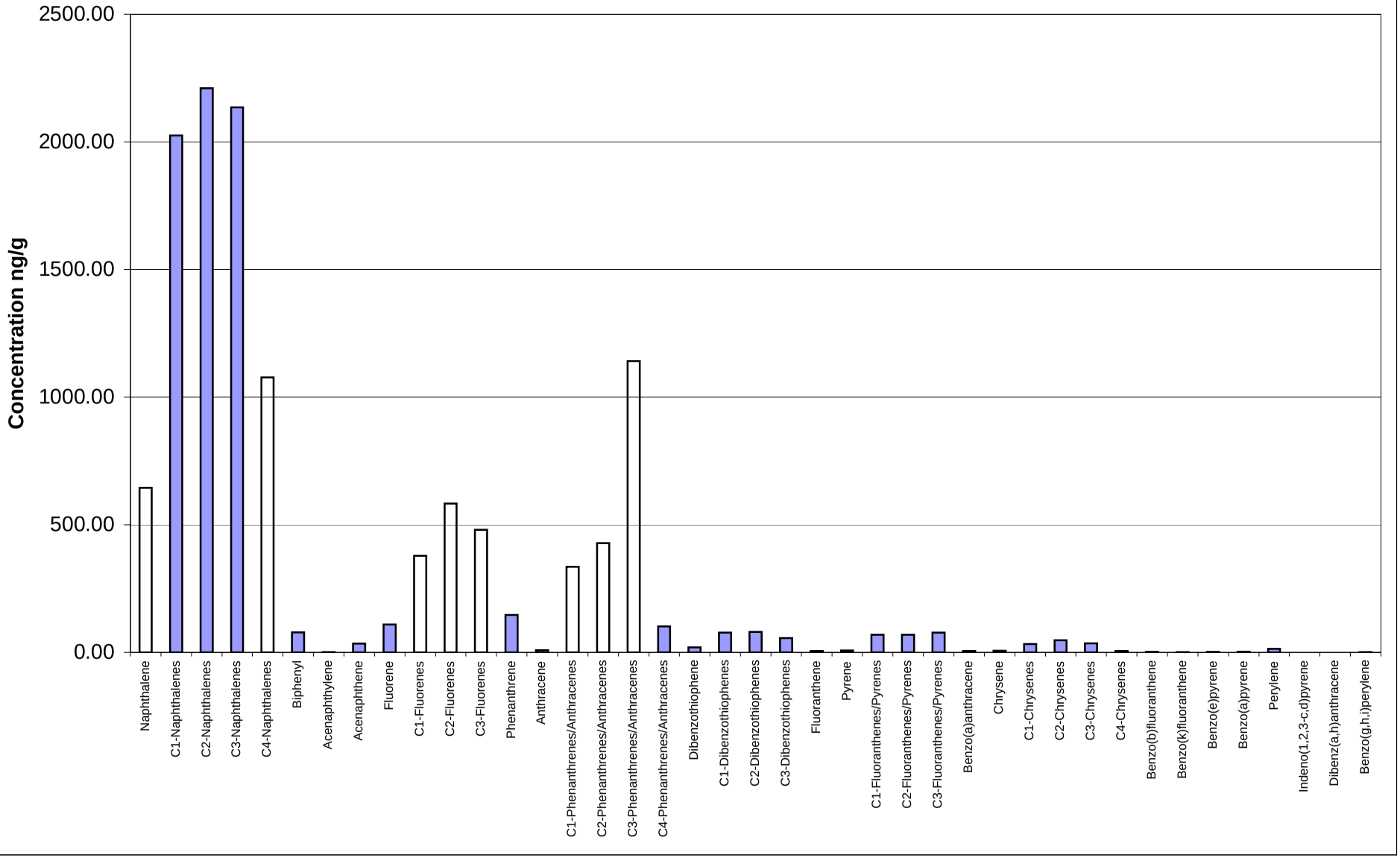

Analyte Profile Histogram
Proc Blank
Concentration ng/g
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Naphthalene
C1-Naphthalenes
C2-Naphthalenes
C3-Naphthalenes
C4-Naphthalenes
Biphenyl
Acenaphthylene
Acenaphthene
Fluorene
C1-Fluorenes
C2-Fluorenes
C3-Fluorenes
Phenanthrene
Anthracene
C1-Phenanthrenes/Anthracenes
C2-Phenanthrenes/Anthracenes
C3-Phenanthrenes/Anthracenes
C4-Phenanthrenes/Anthracenes
Dibenzothiophene
C1-Dibenzothiophenes
C2-Dibenzothiophenes
C3-Dibenzothiophenes
Fluoranthene
Pyrene
C1-Fluoranthenes/Pyrenes
C2-Fluoranthenes/Pyrenes
C3-Fluoranthenes/Pyrenes
Benzo(a)anthracene
Chrysene
C1-Chrysenes
C2-Chrysenes
C3-Chrysenes
C4-Chrysenes
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Benzo(e)pyrene
Benzo(a)pyrene
Perylene
Indeno(1,2,3-c,d)pyrene
Dibenz(a,h)anthracene
Benzo(g,h,i)perylene

Analyte Profile Histogram
0412013-001 A Duplicate



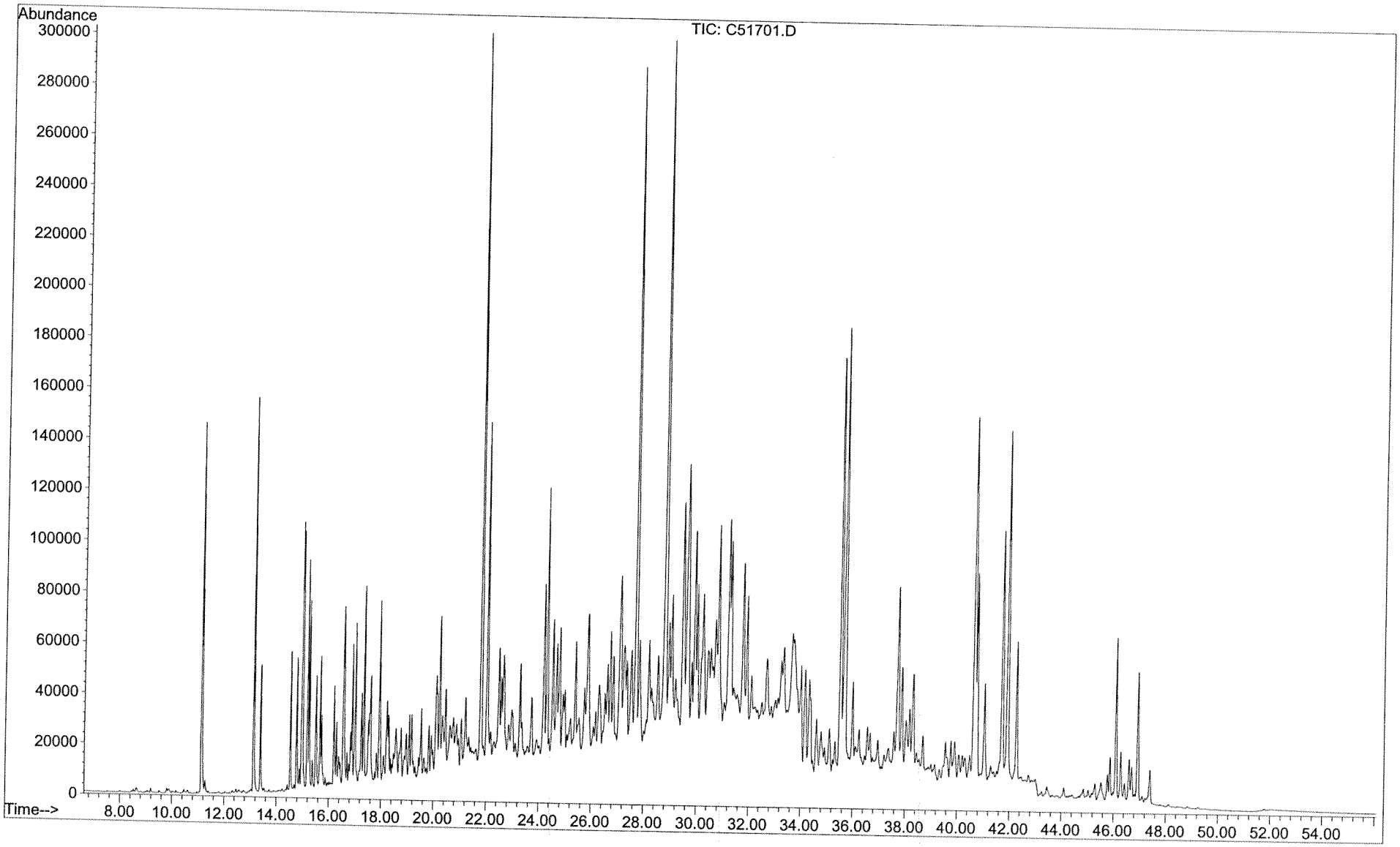

Analyte Profile Histogram
0412013-001 A Matrix Spike
Concentration ng/g
2500.00
2000.00
1500.00
1000.00
500.00
0.00
Naphthalene
C1-Naphthalenes
C2-Naphthalenes
C3-Naphthalenes
C4-Naphthalenes
Biphenyl
Acenaphthylene
Acenaphthene
Fluorene
C1-Fluorenes
C2-Fluorenes
C3-Fluorenes
Phenanthrene
Anthracene
C1-Phenanthrenes/Anthracenes
C2-Phenanthrenes/Anthracenes
C3-Phenanthrenes/Anthracenes
C4-Phenanthrenes/Anthracenes
Dibenzothiophene
C1-Dibenzothiophenes
C2-Dibenzothiophenes
C3-Dibenzothiophenes
Fluoranthene
Pyrene
C1-Fluoranthenes/Pyrenes
C2-Fluoranthenes/Pyrenes
C3-Fluoranthenes/Pyrenes
Benzo(a)anthracene
Chrysene
C1-Chrysenes
C2-Chrysenes
C3-Chrysenes
C4-Chrysenes
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Benzo(e)pyrene
Benzo(a)pyrene
Perylene
Indeno(1,2,3-c,d)pyrene
Dibenz(a,h)anthracene
Benzo(g,h,i)perylene

Analyte Profile Histogram
W44247 - GERG REF OIL

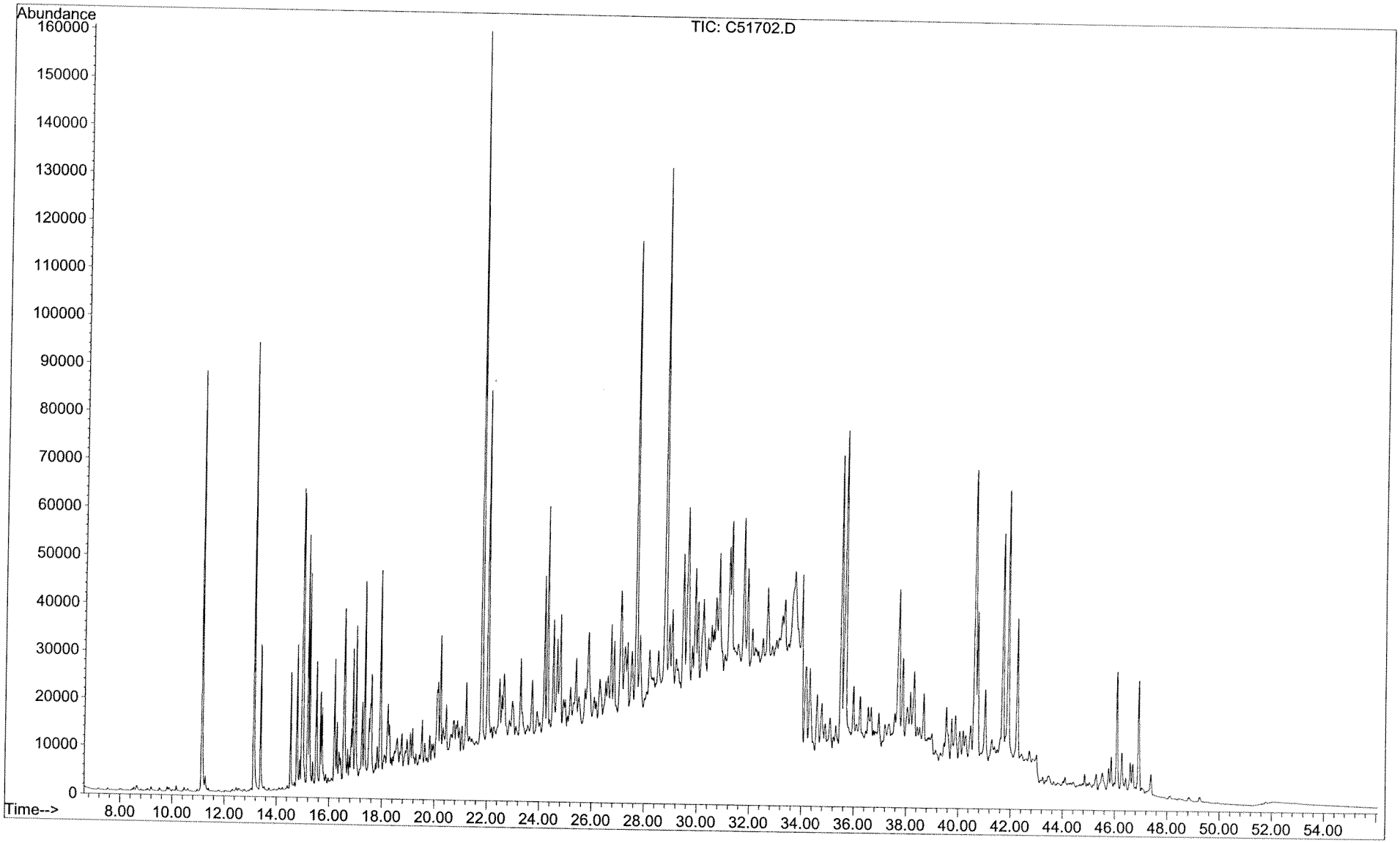


Total Ion Chromatograms
For the PAH Analysis

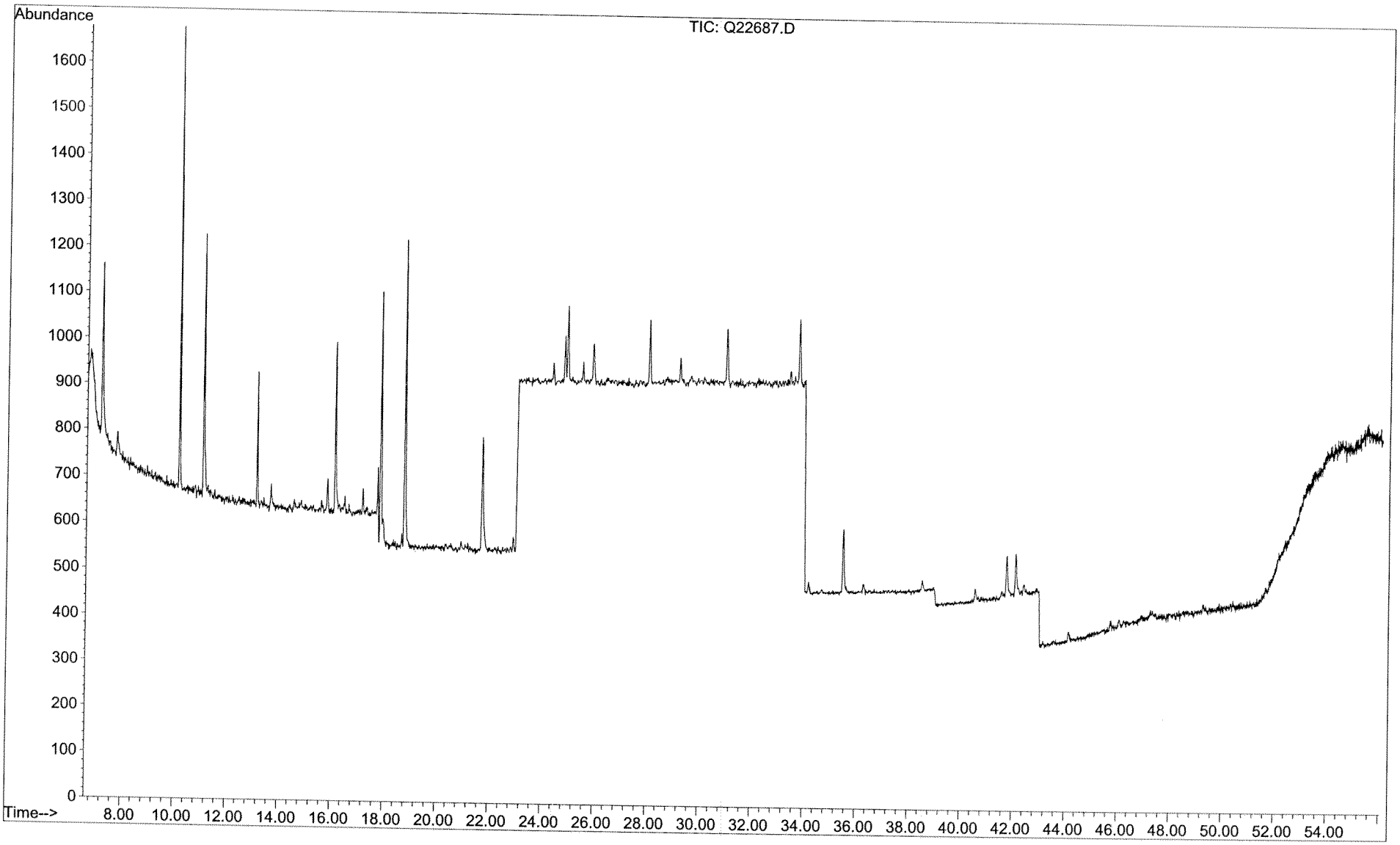
File : G:\1\DATA\M3403AR\C51701.D
Operator : STS
Acquired : 25 May 2006 3:17 using AcqMethod MR8105M7
Instrument : GC/MS Ins
Sample Name: 0412013-001 A
Misc Info : M3403
Vial Number: 16



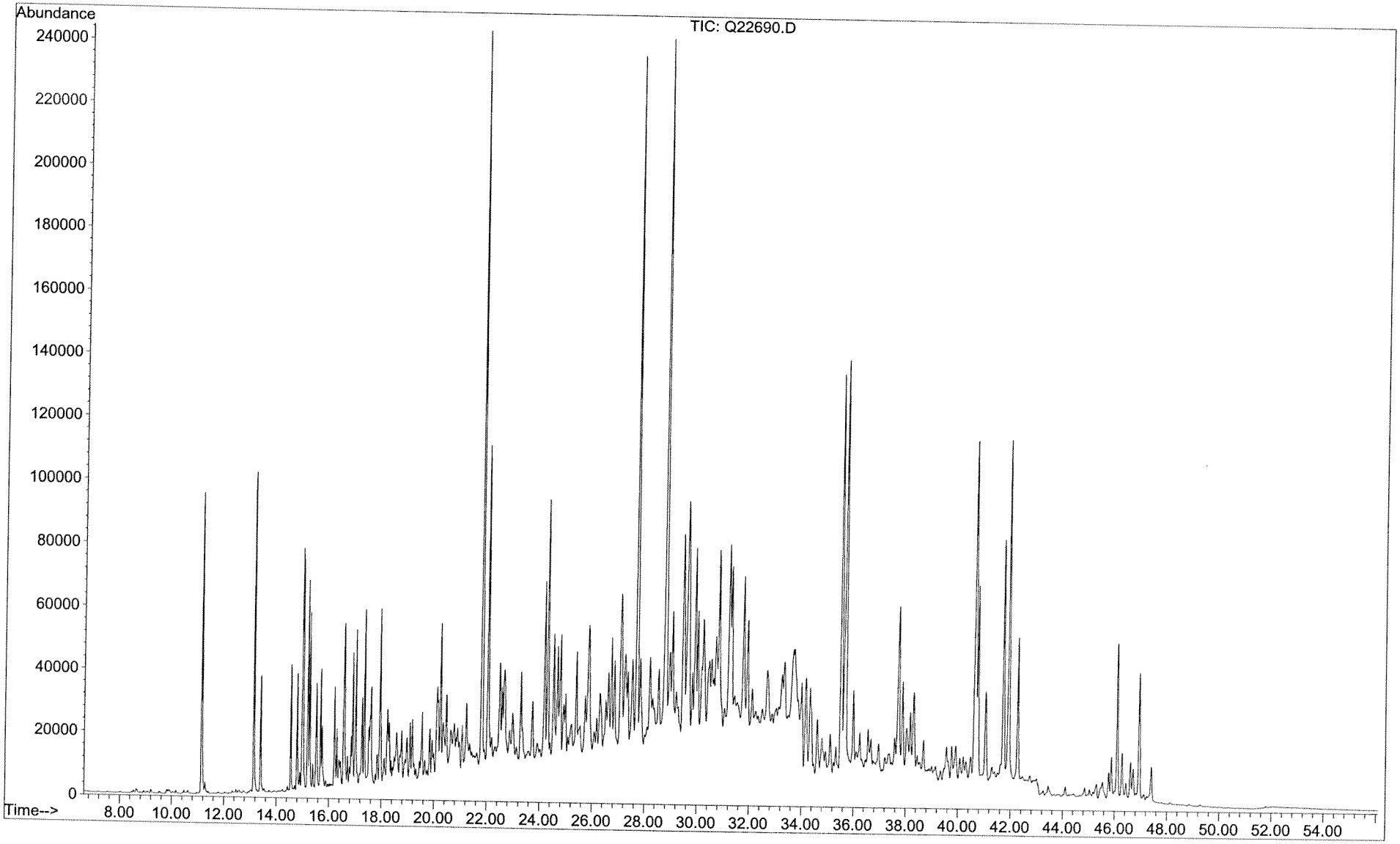
File : G:\1\DATA\M3403AR\C51702.D
Operator : STS
Acquired : 25 May 2006 4:26 using AcqMethod MR8105M7
Instrument : GC/MS Ins
Sample Name: 0502020-001 A
Misc Info : M3403
Vial Number: 17



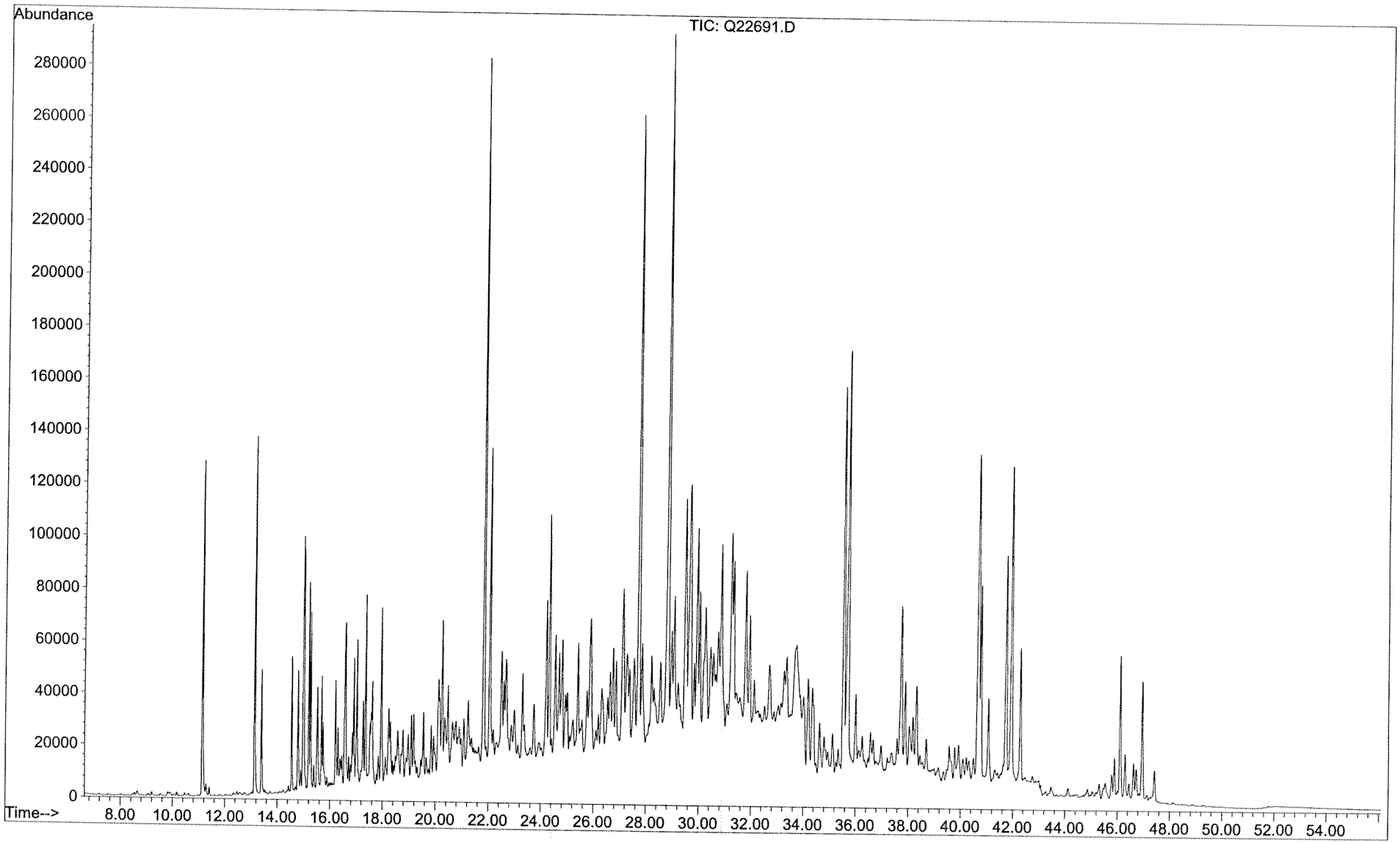
File : G:\1\DATA\M3403AR\Q22687.D
Operator : STS
Acquired : 24 May 2006 12:27 using AcqMethod MR8105M7
Instrument : GC/MS Ins
Sample Name: Blank
Misc Info : M3403
Vial Number: 4



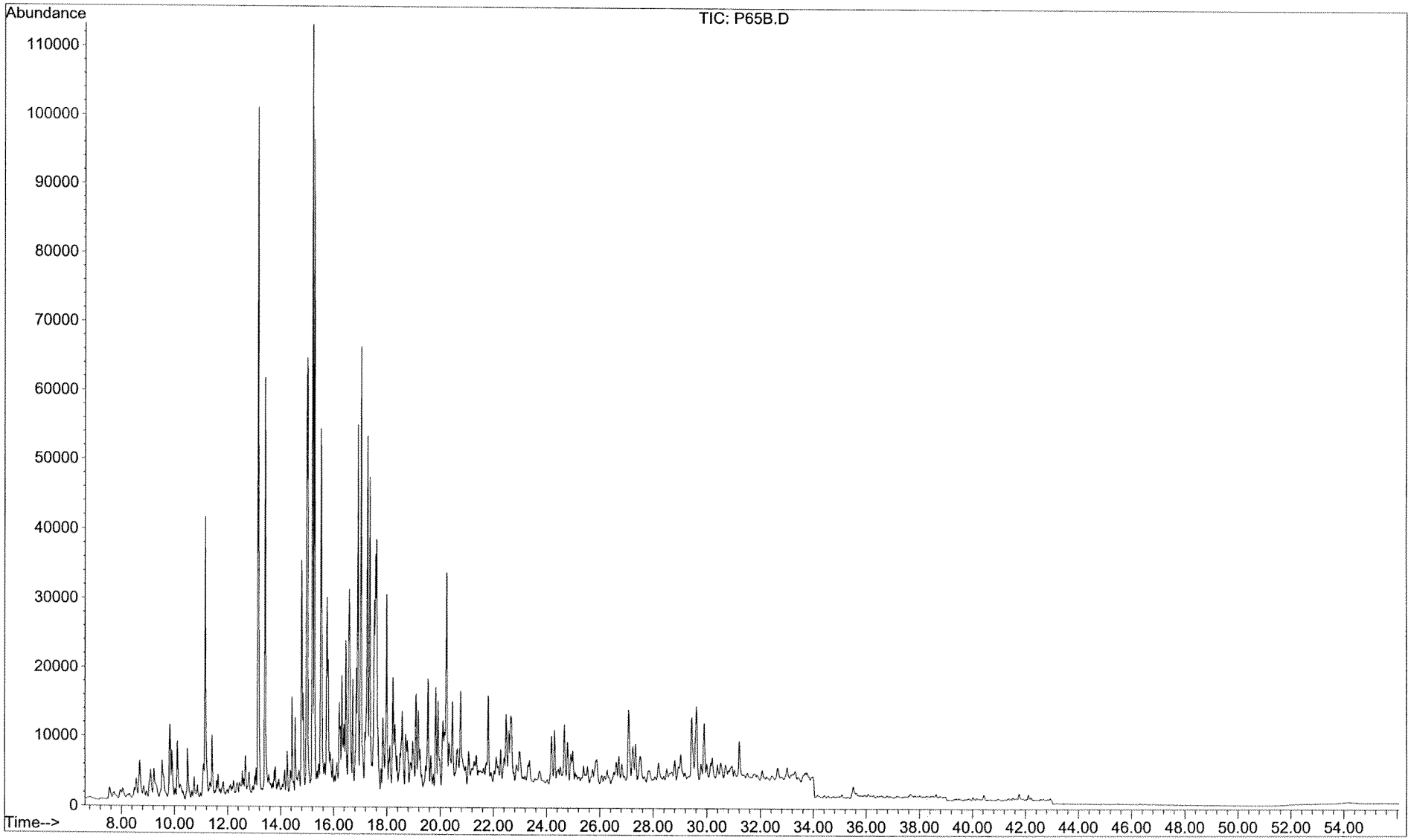
File : G:\1\DATA\M3403AR\Q22690.D
Operator : STS
Acquired : 24 May 2006 15:53 using AcqMethod MR8105M7
Instrument : GC/MS Ins
Sample Name: 0412013-001 A DUP (C51701)
Misc Info : M3403
Vial Number: 7



File : G:\1\DATA\M3403AR\Q22691.D
Operator : STS
Acquired : 24 May 2006 17:01 using AcqMethod MR8105M7
Instrument : GC/MS Ins
Sample Name: 0412013-001 A MS (C51701)
Misc Info : M3403
Vial Number: 8



File : G:\1\DATA\M3403AR\P65B.D
Operator : STS
Acquired : 24 May 2006 10:10 using AcqMethod MR8105M7
Instrument : GC/MS Ins
Sample Name: bonny oil
Misc Info : M3403
Vial Number: 2



This is the last page of this report