Mountain States ACCUTEST LABORATORIES

10/09/13

Technical Report for

XTO Energy

FRU 197-31A

1111-02A Cut 2 Subliner Comp

Accutest Job Number: D51202

Sampling Date: 09/30/13

Report to:

KRW Consulting, Inc.
8000 West 14th Avenue
Lakewood, CO 80214
dknudson@krwconsulting.com; jhess@krwconsulting.com;
crachak@krwconsulting.com; rrasnic@krwconsulting.com;
ATTN: Dwayne Knudson

Total number of pages in report: **141**

ACCREDITED IN ACCORDANCE WITH nelac

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Scott Heideman
Laboratory Director

Client Service contact: Renea Jackson 303-425-6021

Certifications: CO (CO00049), ID, NE (CO00049), ND (R-027), NJ (CO 0007), OK (D9942), UT (NELAP CO00049), TX (T104704511)

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Sample Summary

XTO Energy

Job No: D51202

FRU 197-31A
Project No: 1111-02A Cut 2 Subliner Comp

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
D51202-1	09/30/13	12:05	DS	10/02/13	SO	Soil	CUT 2 SUBLINER COMP
D51202-1A	09/30/13	12:05	DS	10/02/13	SO	Soil	CUT 2 SUBLINER COMP

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	XTO Energy	**Job No**	D51202
Site:	FRU 197-31A	**Report Date**	10/9/2013 1:42:13 PM

On 10/02/2013, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 3.6 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D51202 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix: SO **Batch ID:** V5V1764

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D51084-1MS, D51084-1MSD were used as the QC samples indicated.

Extractables by GCMS By Method SW846 8270C BY SIM

Matrix: SO **Batch ID:** OP8670

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D51039-1MS, D51039-1MSD were used as the QC samples indicated.

Volatiles by GC By Method SW846 8015B

Matrix: SO **Batch ID:** GGB1231

- All samples were analyzed within the recommended method holding time.
- Sample(s) D51200-1MS, D51200-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GC By Method SW846-8015B

Matrix: SO **Batch ID:** OP8682

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D51224-3MS, D51224-3MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike (MS) and matrix spike duplicate (MSD) recovery(s) of TPH-DRO (C10-C28) are outside control limits. Probable cause due to matrix interference.

Metals By Method SW846 6010C

Matrix: AQ **Batch ID:** MP11305

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D51224-6AMS, D51224-6AMSD, D51224-6ASDL were used as the QC samples for the metals analysis.

Matrix: SO **Batch ID:** MP11290

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D51202-1MS, D51202-1MSD, D51202-1SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD(s) for Cadmium, Copper, Lead, Silver are outside control limits for sample MP11290-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- MP11290-SD1 for Barium, Chromium, Nickel, Zinc: Serial dilution indicates possible matrix interference.

Metals By Method SW846 6020A

Matrix: SO **Batch ID:** MP11291

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D51202-1MS, D51202-1MSD, D51202-1SDL were used as the QC samples for the metals analysis.

Metals By Method SW846 7471B

Matrix: SO **Batch ID:** MP11292

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D51148-1MS, D51148-1MSD were used as the QC samples for the metals analysis.

Wet Chemistry By Method ASTM D1498-76M

Matrix: SO **Batch ID:** GN22168

- Sample(s) D51122-1DUP were used as the QC samples for the Redox Potential Vs H2 analysis.

Wet Chemistry By Method SM2540B-2011 M

Matrix: SO **Batch ID:** GN22130

- The data for SM2540B-2011 M meets quality control requirements.

Wet Chemistry By Method SW846 3060A/7196A

Matrix: SO **Batch ID:** GP11117

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D51202-1MS, D51202-1MSD, D51202-1DUP were used as the QC samples for the Chromium, Hexavalent analysis.
- The duplicate RPD(s) for Chromium, Hexavalent are outside control limits for sample GP11117-D1. RPD acceptable due to low duplicate and sample concentrations.

Wet Chemistry By Method SW846 3060A/7196A M

Matrix: SO **Batch ID:** R18968

- The data for SW846 3060A/7196A M meets quality control requirements.
- D51202-1 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Wet Chemistry By Method SW846 9045D

Matrix:	SO	Batch ID:	GN22154

- The following samples were run outside of holding time for method SW846 9045D: D51202-1

Wet Chemistry By Method USDA HANDBOOK 60

Matrix:	SO	Batch ID:	MP11305

- D51202-1A for Sodium Adsorption Ratio: Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+(Mg meq/L)/2]

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

Summary of Hits

Job Number: D51202
Account: XTO Energy
Project: FRU 197-31A
Collected: 09/30/13

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
D51202-1	**CUT 2 SUBLINER COMP**					
TPH-DRO (C10-C28)		23.7	7.8	5.8	mg/kg	SW846-8015B
Arsenic		7.0	0.12		mg/kg	SW846 6020A
Barium		227	1.2		mg/kg	SW846 6010C
Chromium		41.5	1.2		mg/kg	SW846 6010C
Copper		7.0	1.2		mg/kg	SW846 6010C
Lead		8.1	5.8		mg/kg	SW846 6010C
Nickel		13.1	3.5		mg/kg	SW846 6010C
Zinc		34.8	3.5		mg/kg	SW846 6010C
Specific Conductivity		821	1.0		umhos/cm	SM 2510B-2011 MOD
Chromium, Trivalent [a]		41.1	2.2		mg/kg	SW846 3060A/7196A M
Redox Potential Vs H2		241			mv	ASTM D1498-76M
pH		10.25			su	SW846 9045D
D51202-1A	**CUT 2 SUBLINER COMP**					
Calcium		7.96	2.0		mg/l	SW846 6010C
Magnesium		6.94	1.0		mg/l	SW846 6010C
Sodium		204	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio [b]		12.8			ratio	USDA HANDBOOK 60

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)
(b) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

Mountain States ACCUTEST LABORATORIES

Sample Results

Report of Analysis

Accutest Laboratories

Report of Analysis

Client Sample ID:	CUT 2 SUBLINER COMP		
Lab Sample ID:	D51202-1	**Date Sampled:**	09/30/13
Matrix:	SO - Soil	**Date Received:**	10/02/13
Method:	SW846 8260B	**Percent Solids:**	85.2
Project:	FRU 197-31A		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V29361.D	1	10/02/13	BD	n/a	n/a	V5V1764
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.06 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.067	0.033	mg/kg	
108-88-3	Toluene	ND	0.13	0.067	mg/kg	
100-41-4	Ethylbenzene	ND	0.13	0.025	mg/kg	
1330-20-7	Xylene (total)	ND	0.27	0.13	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	98%		64-130%
460-00-4	4-Bromofluorobenzene	100%		62-131%
17060-07-0	1,2-Dichloroethane-D4	97%		70-130%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID: CUT 2 SUBLINER COMP
Lab Sample ID: D51202-1
Matrix: SO - Soil
Method: SW846 8270C BY SIM SW846 3546
Project: FRU 197-31A

Date Sampled: 09/30/13
Date Received: 10/02/13
Percent Solids: 85.2

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G16536.D	1	10/03/13	DC	10/03/13	OP8670	E3G817
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.0098	0.0051	mg/kg	
120-12-7	Anthracene	ND	0.0098	0.0051	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.0098	0.0051	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.0098	0.0051	mg/kg	
207-08-9	Benzo(k)fluoranthene	ND	0.0098	0.0051	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.0098	0.0051	mg/kg	
218-01-9	Chrysene	ND	0.0098	0.0051	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	0.0098	0.0051	mg/kg	
206-44-0	Fluoranthene	ND	0.0098	0.0051	mg/kg	
86-73-7	Fluorene	ND	0.0098	0.0059	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.0098	0.0051	mg/kg	
91-20-3	Naphthalene	ND	0.014	0.012	mg/kg	
129-00-0	Pyrene	ND	0.0098	0.0051	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	73%		10-175%
321-60-8	2-Fluorobiphenyl	74%		25-130%
1718-51-0	Terphenyl-d14	103%		41-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CUT 2 SUBLINER COMP		
Lab Sample ID:	D51202-1	**Date Sampled:**	09/30/13
Matrix:	SO - Soil	**Date Received:**	10/02/13
Method:	SW846 8015B	**Percent Solids:**	85.2
Project:	FRU 197-31A		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB22394.D	1	10/02/13	EV	n/a	n/a	GGB1231
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.1 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	13	6.7	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	81%		60-140%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID: CUT 2 SUBLINER COMP
Lab Sample ID: D51202-1
Matrix: SO - Soil
Method: SW846-8015B SW846 3546
Project: FRU 197-31A

Date Sampled: 09/30/13
Date Received: 10/02/13
Percent Solids: 85.2

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH013758.D	1	10/05/13	TU	10/04/13	OP8682	GFH723
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	23.7	7.8	5.8	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	67%		20-130%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: CUT 2 SUBLINER COMP
Lab Sample ID: D51202-1
Matrix: SO - Soil
Project: FRU 197-31A

Date Sampled: 09/30/13
Date Received: 10/02/13
Percent Solids: 85.2

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	7.0	0.12	mg/kg	5	10/03/13	10/04/13	JB	SW846 6020A [2]	SW846 3050B [6]
Barium	227	1.2	mg/kg	1	10/03/13	10/04/13	JM	SW846 6010C [3]	SW846 3050B [5]
Cadmium	< 1.2	1.2	mg/kg	1	10/03/13	10/04/13	JM	SW846 6010C [3]	SW846 3050B [5]
Chromium	41.5	1.2	mg/kg	1	10/03/13	10/04/13	JM	SW846 6010C [3]	SW846 3050B [5]
Copper	7.0	1.2	mg/kg	1	10/03/13	10/07/13	JM	SW846 6010C [4]	SW846 3050B [5]
Lead	8.1	5.8	mg/kg	1	10/03/13	10/04/13	JM	SW846 6010C [3]	SW846 3050B [5]
Mercury	< 0.095	0.095	mg/kg	1	10/04/13	10/04/13	JB	SW846 7471B [1]	SW846 7471B [7]
Nickel	13.1	3.5	mg/kg	1	10/03/13	10/04/13	JM	SW846 6010C [3]	SW846 3050B [5]
Selenium	< 5.8	5.8	mg/kg	1	10/03/13	10/04/13	JM	SW846 6010C [3]	SW846 3050B [5]
Silver	< 3.5	3.5	mg/kg	1	10/03/13	10/04/13	JM	SW846 6010C [3]	SW846 3050B [5]
Zinc	34.8	3.5	mg/kg	1	10/03/13	10/04/13	JM	SW846 6010C [3]	SW846 3050B [5]

(1) Instrument QC Batch: MA4035
(2) Instrument QC Batch: MA4036
(3) Instrument QC Batch: MA4038
(4) Instrument QC Batch: MA4043
(5) Prep QC Batch: MP11290
(6) Prep QC Batch: MP11291
(7) Prep QC Batch: MP11292

RL = Reporting Limit

Report of Analysis

Client Sample ID: CUT 2 SUBLINER COMP
Lab Sample ID: D51202-1
Matrix: SO - Soil
Project: FRU 197-31A

Date Sampled: 09/30/13
Date Received: 10/02/13
Percent Solids: 85.2

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
prep: DEPT.OF AG, BOOK N9							
Specific Conductivity	821	1.0	umhos/cm	1	10/08/13	JD	SM 2510B-2011 MOD
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	10/08/13	RW	SW846 3060A/7196A
Chromium, Trivalent [a]	41.1	2.2	mg/kg	1	10/08/13	RW	SW846 3060A/7196A M
Redox Potential Vs H2	241		mv	1	10/04/13	AK	ASTM D1498-76M
Solids, Percent	85.2		%	1	10/03/13	SWT	SM2540B-2011 M
pH	10.25		su	1	10/03/13 12:30	AK	SW846 9045D

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: CUT 2 SUBLINER COMP
Lab Sample ID: D51202-1A
Matrix: SO - Soil
Project: FRU 197-31A

Date Sampled: 09/30/13
Date Received: 10/02/13
Percent Solids: 85.2

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	7.96	2.0	mg/l	1	10/04/13	10/04/13	JM	SW846 6010C [1]	SW846 3010A/M [2]
Magnesium	6.94	1.0	mg/l	1	10/04/13	10/04/13	JM	SW846 6010C [1]	SW846 3010A/M [2]
Sodium	204	2.0	mg/l	1	10/04/13	10/04/13	JM	SW846 6010C [1]	SW846 3010A/M [2]

(1) Instrument QC Batch: MA4038
(2) Prep QC Batch: MP11305

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CUT 2 SUBLINER COMP		
Lab Sample ID:	D51202-1A	**Date Sampled:**	09/30/13
Matrix:	SO - Soil	**Date Received:**	10/02/13
		Percent Solids:	85.2
Project:	FRU 197-31A		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	12.8		ratio	1	10/04/13 20:59	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Mountain States ACCUTEST LABORATORIES

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

ACCUTEST LABORATORIES

CHAIN OF CUSTODY

4036 Youngfield Street, Wheat Ridge, CO 80033
TEL. 303-425-6021 FAX: 303-425-6854
www.accutest.com

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FED-EX Tracking # | Bottle Order Control #
Accutest Quote # | Accutest Job # D51202

Client / Reporting Information

Company Name: KRW Consulting
Street Address: 8000 West 14th Street; Suite 200
City: Lakewood, CO 80214
Project Contact: Dwayne Knudson
Phone #: 970-488-1098
Sampler(s) Name(s): David Sanders 970-488-1098

Project Information

Project Name: XTO FRU 197-31A
Street:
City: State:
Project #: 1111-02A
Client Purchase Order #:
Project Manager: Joe Hess

Billing Information (If different from Report to)
Company Name: XTO Energy
Street Address: 21459 CR 5
City: Rifle, CO 81650
Attention: Jessica Dooling

Requested Analysis (see TEST CODE sheet): Table 910

Matrix Codes: DW - Drinking Water, GW - Ground Water, WW - Water, SW - Surface Water, SO - Soil, SL- Sludge, SED-Sediment, OI - Oil, LIQ - Other Liquid, AIR - Air, SOL - Other Solid, WP - Wipe, FB-Field Blank, EB-Equipment Blank, RB- Rinse Blank, TB-Trip Blank

Accutest Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Bisulfate	Table 910	LAB USE ONLY
	Cut 2 Sublmer Comp		9/30/13	1205	DS	SO	5					X					X	01

(Date and Time under "Collection"; HCl through Bisulfate under "Number of preserved Bottles")

10/4/13

Turnaround Time (Business days)

- [ ] Std. 10 Business Days
- [x] Std. 5 Business Days (By contract only)
- [ ] 3 Day Emergency
- [ ] 2 Day Emergency
- [ ] 1 Day Emergency
- [ ] Emergency & Rush T/A data available VIA Lablink

Approved By (Accutest PM): / Date:

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] COMMBN
- [ ] COMMBN+
- [ ] State Forms Required
- [ ] Send Forms to State
- [ ] Report by Fax
- [x] Report by PDF ONLY
- [ ] EDD Format

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
Commercial BN = Results/QC/Narrative (+ = chromatograms)

Comments / Special Instructions

Please email to: KRW Piceance Team

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 [signature]	10/1/13 1530	1 Rifle Service Center	2		2 Jacob Porter 10/2/13 1300
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal # 410/10	[x] Intact [ ] Not intact	Preserved where applicable [x] On Ice [x] Cooler Temp. 3.6

5.1

5

D51202: Chain of Custody
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Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D51202 **Client:** KRW **Immediate Client Services Action Required:** No

Date / Time Received: 10/2/2013 1:00:00 PM **No. Coolers:** 1 **Client Service Action Required at Login:** No

Project: XTO **Airbill #'s:** CO

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	Infared gun		
3. Cooler media:	Ice (bag)		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☐	
2. Trip Blank listed on COC:	☐		☐	
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume rec'd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

Accutest Laboratories
V:(303) 425-6021
4036 Youngfield Street
F: (303) 425-6854
Wheat Ridge, CO
www/accutest.com

D51202: Chain of Custody
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Mountain States ACCUTEST LABORATORIES

GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D51202
Account: XTOKRWR XTO Energy
Project: FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V1764-MB	5V29351.D	1	10/02/13	BD	n/a	n/a	V5V1764

The QC reported here applies to the following samples: **Method:** SW846 8260B

D51202-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	50	25	ug/kg	
100-41-4	Ethylbenzene	ND	100	19	ug/kg	
108-88-3	Toluene	ND	100	50	ug/kg	
1330-20-7	Xylene (total)	ND	200	100	ug/kg	

CAS No.	Surrogate Recoveries		Limits
2037-26-5	Toluene-D8	101%	64-130%
460-00-4	4-Bromofluorobenzene	84%	62-131%
17060-07-0	1,2-Dichloroethane-D4	101%	70-130%

Blank Spike Summary

Job Number: D51202
Account: XTOKRWR XTO Energy
Project: FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V1764-BS	5V29352.D	1	10/02/13	BD	n/a	n/a	V5V1764

The QC reported here applies to the following samples: **Method:** SW846 8260B

D51202-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	2500	2560	102	70-130
100-41-4	Ethylbenzene	2500	2700	108	70-130
108-88-3	Toluene	2500	2660	106	70-130
1330-20-7	Xylene (total)	7500	8520	114	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	102%	64-130%
460-00-4	4-Bromofluorobenzene	100%	62-131%
17060-07-0	1,2-Dichloroethane-D4	96%	70-130%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: D51202
Account: XTOKRWR XTO Energy
Project: FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V1764-BS	5V29354.D	1	10/02/13	BD	n/a	n/a	V5V1764

The QC reported here applies to the following samples: **Method:** SW846 8260B

D51202-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	102%	64-130%
460-00-4	4-Bromofluorobenzene	91%	62-131%
17060-07-0	1,2-Dichloroethane-D4	90%	70-130%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D51202
Account: XTOKRWR XTO Energy
Project: FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D51084-1MS	5V29357.D	1	10/02/13	BD	n/a	n/a	V5V1764
D51084-1MSD	5V29358.D	1	10/02/13	BD	n/a	n/a	V5V1764
D51084-1	5V29356.D	1	10/02/13	BD	n/a	n/a	V5V1764

The QC reported here applies to the following samples: **Method:** SW846 8260B

D51202-1

CAS No.	Compound	D51084-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		4170	4230	102	4120	99	3	64-139/30
100-41-4	Ethylbenzene	ND		4170	4180	100	4140	99	1	68-136/30
108-88-3	Toluene	ND		4170	3740	90	3810	91	2	60-130/30
1330-20-7	Xylene (total)	ND		12500	13200	106	13000	104	2	58-142/30

CAS No.	Surrogate Recoveries	MS	MSD	D51084-1	Limits
2037-26-5	Toluene-D8	98%	101%	102%	64-130%
460-00-4	4-Bromofluorobenzene	119%	118%	125%	62-131%
17060-07-0	1,2-Dichloroethane-D4	92%	96%	91%	70-130%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D51202
Account: XTOKRWR XTO Energy
Project: FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D51084-1MS	5V29359.D	1	10/02/13	BD	n/a	n/a	V5V1764
D51084-1MSD	5V29360.D	1	10/02/13	BD	n/a	n/a	V5V1764
D51084-1	5V29356.D	1	10/02/13	BD	n/a	n/a	V5V1764

The QC reported here applies to the following samples: **Method:** SW846 8260B

D51202-1

CAS No.	Compound	D51084-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD

CAS No.	Surrogate Recoveries	MS	MSD	D51084-1	Limits
2037-26-5	Toluene-D8	106%	102%	102%	64-130%
460-00-4	4-Bromofluorobenzene	127%	126%	125%	62-131%
17060-07-0	1,2-Dichloroethane-D4	87%	87%	91%	70-130%

* = Outside of Control Limits.

Mountain States ACCUTEST LABORATORIES

GC/MS Volatiles

Raw Data

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5100213.S\
Data File : 5V29361.D
Acq On : 2 Oct 2013 6:20 pm
Operator : BRETD
Sample : D51202-1
Misc : MS6481,V5V1764,5.063,,100,5,1
ALS Vial : 15 Sample Multiplier: 1

Quant Time: Oct 03 09:12:56 2013
Quant Method : C:\msdchem\1\METHODS\V5AP1728TVH1728.M
Quant Title : 8260
QLast Update : Tue Aug 20 09:59:22 2013
Response via : Initial Calibration

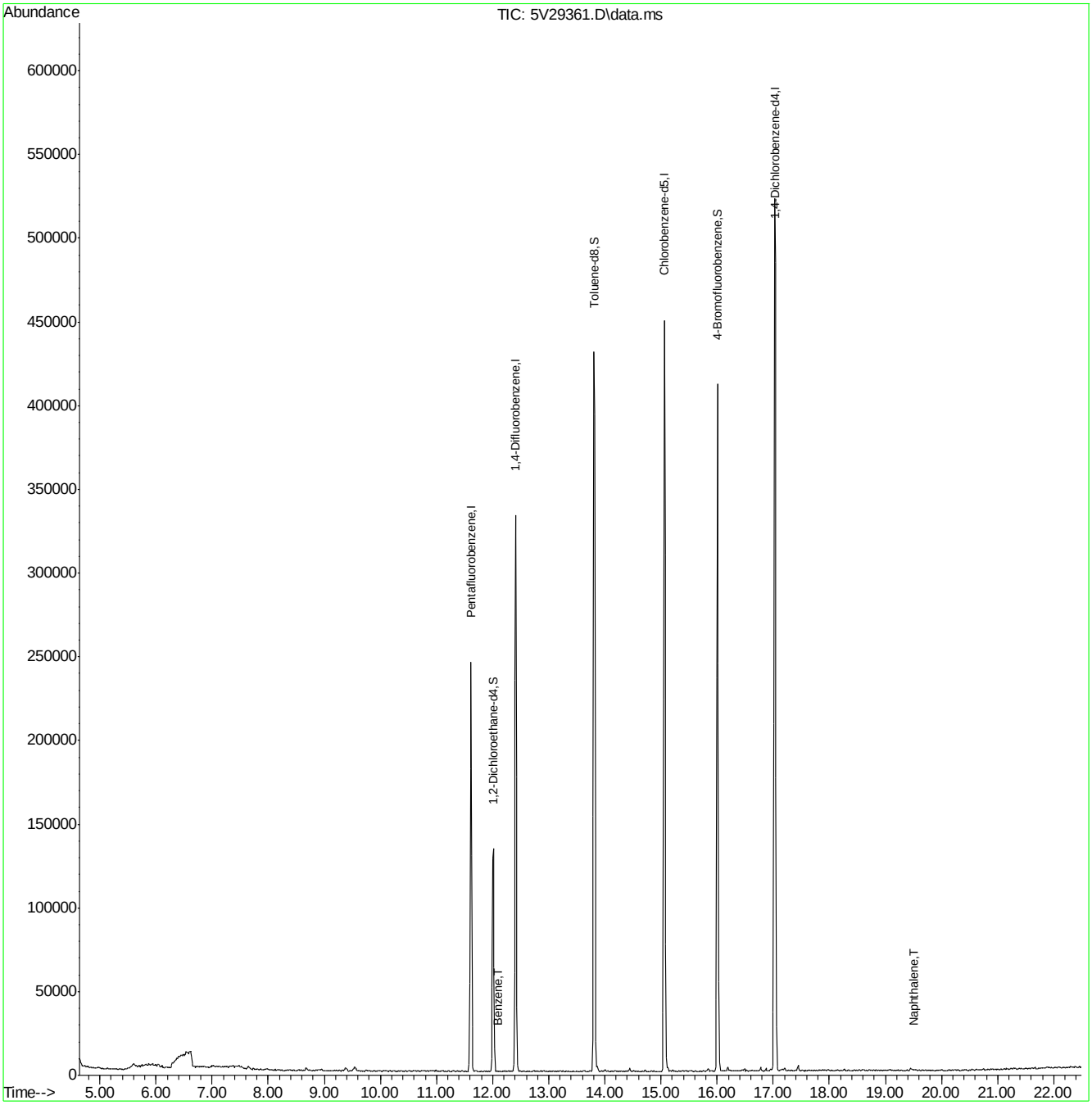
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
2) Pentafluorobenzene	11.613	168	169661	50.00	ug/l	0.00
37) 1,4-Difluorobenzene	12.412	114	224361	50.00	ug/l	0.00
56) Chlorobenzene-d5	15.061	117	226575	50.00	ug/l	0.00
77) 1,4-Dichlorobenzene-d4	17.036	152	160728	50.00	ug/l	0.00
System Monitoring Compounds						
35) 1,2-Dichloroethane-d4	12.013	102	16764	48.62	ug/l	0.00
Spiked Amount 50.000	Range 70 - 130		Recovery = 97.24%			
64) Toluene-d8	13.805	98	251037	48.91	ug/l	-0.01
Spiked Amount 50.000	Range 70 - 130		Recovery = 97.82%			
72) 4-Bromofluorobenzene	16.009	95	119609	49.99	ug/l	0.00
Spiked Amount 50.000	Range 70 - 130		Recovery = 99.98%			
Target Compounds						Qvalue
1) TVH-Gasoline	13.006	TIC	-7312m	57.26	ug/l	
53) Benzene	12.093	78	184	0.04	ug/l	100
94) Naphthalene	19.514	128	398	0.87	ug/l	100

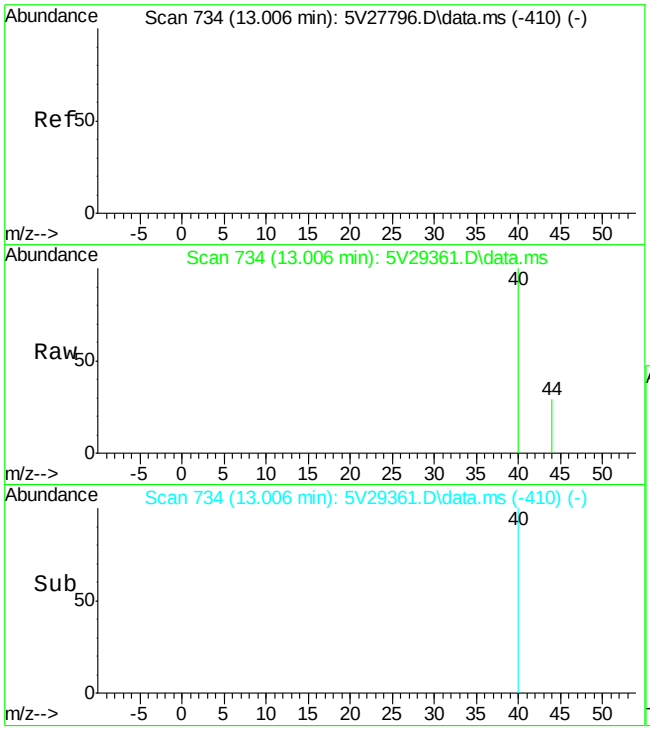
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5100213.S\
Data File : 5V29361.D
Acq On : 2 Oct 2013 6:20 pm
Operator : BRETD
Sample : D51202-1
Misc : MS6481,V5V1764,5.063,,100,5,1
ALS Vial : 15 Sample Multiplier: 1

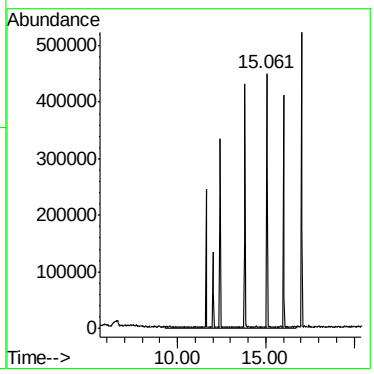
Quant Time: Oct 03 09:12:56 2013
Quant Method : C:\msdchem\1\METHODS\V5AP1728TVH1728.M
Quant Title : 8260
QLast Update : Tue Aug 20 09:59:22 2013
Response via : Initial Calibration

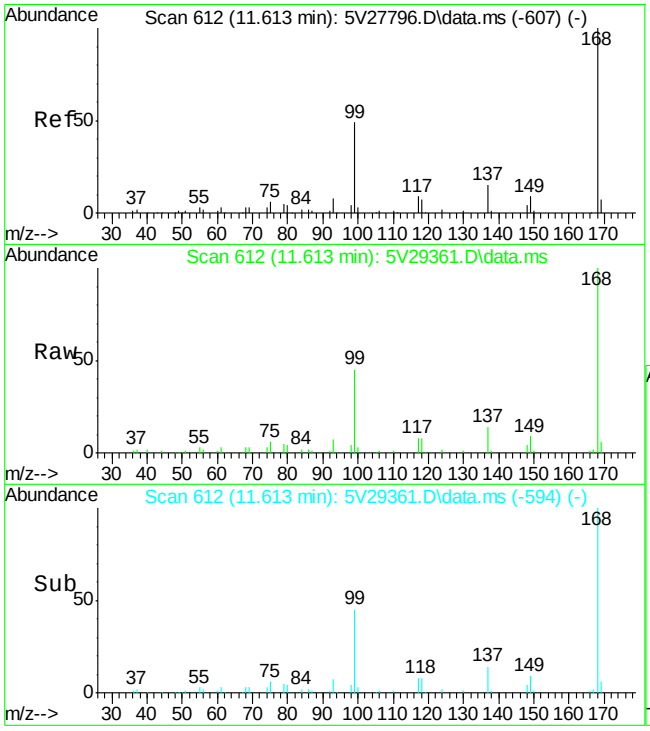




#1
TVH-Gasoline
Concen: 57.26 ug/l m
RT: 13.006 min Scan# 734
Delta R.T. 0.000 min
Lab File: 5V29361.D
Acq: 2 Oct 2013 6:20 pm

Tgt Ion:TIC Resp: -7312

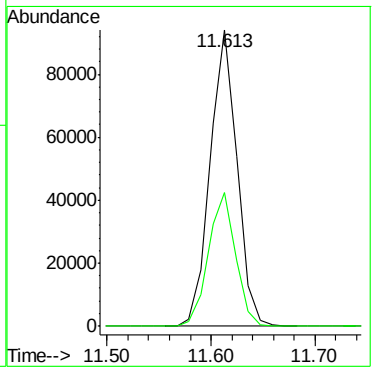


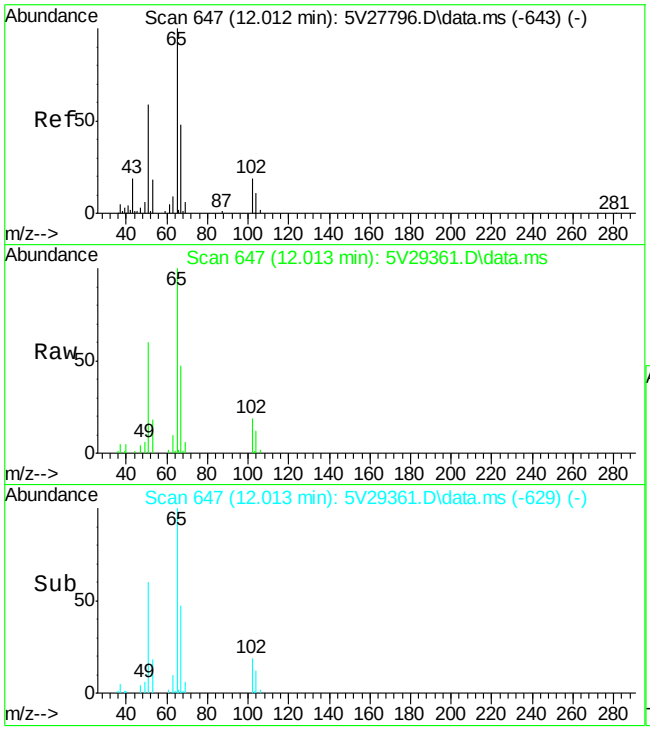


#2
Pentafluorobenzene
Concen: 50.00 ug/l
RT: 11.613 min Scan# 612
Delta R.T. 0.000 min
Lab File: 5V29361.D
Acq: 2 Oct 2013 6:20 pm

Tgt Ion:168 Resp: 169661

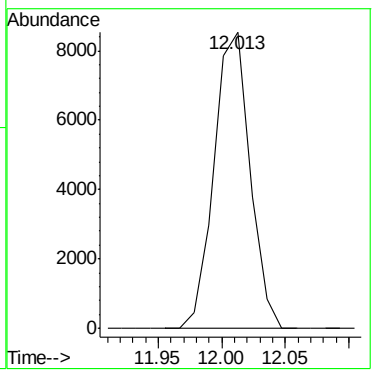
Ion	Ratio	Lower	Upper
168	100		
99	45.4	41.4	62.2

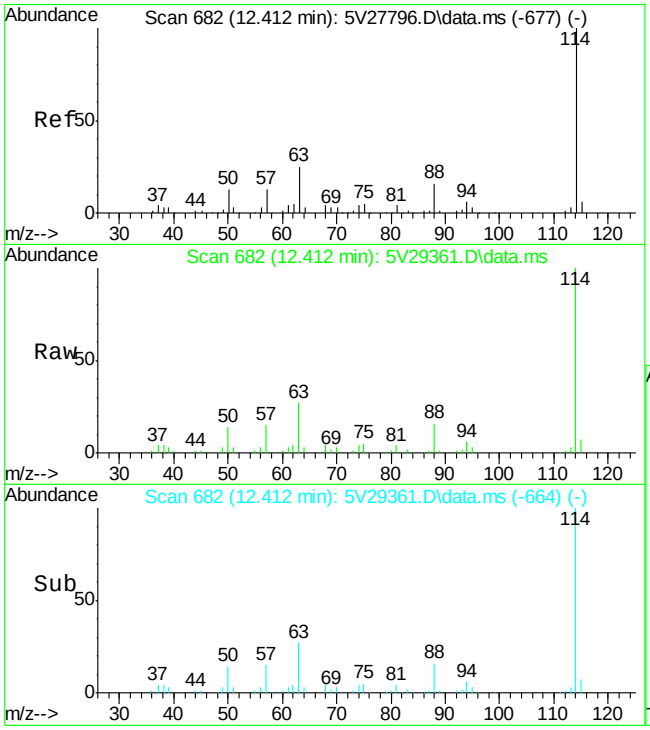




#35
1,2-Dichloroethane-d4
Concen: 48.62 ug/l
RT: 12.013 min Scan# 647
Delta R.T. 0.000 min
Lab File: 5V29361.D
Acq: 2 Oct 2013 6:20 pm

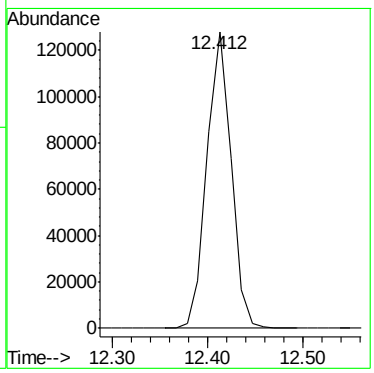
Tgt Ion:102 Resp: 16764

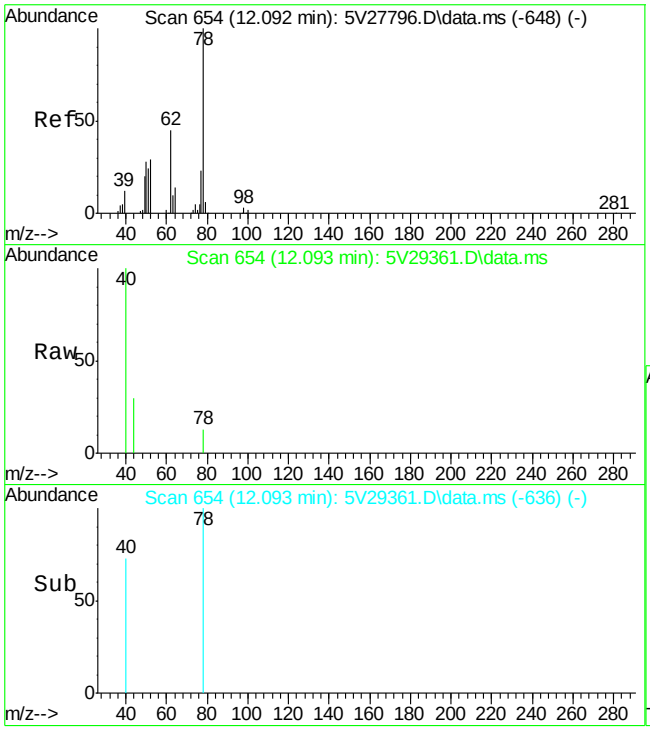




#37
1,4-Difluorobenzene
Concen: 50.00 ug/l
RT: 12.412 min Scan# 682
Delta R.T. 0.000 min
Lab File: 5V29361.D
Acq: 2 Oct 2013 6:20 pm

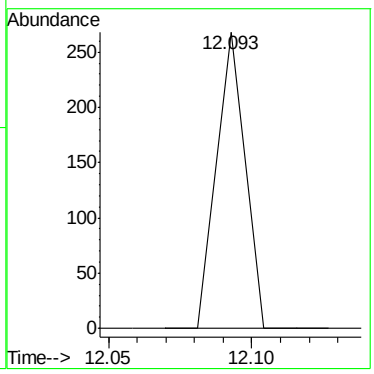
Tgt Ion:114 Resp: 224361

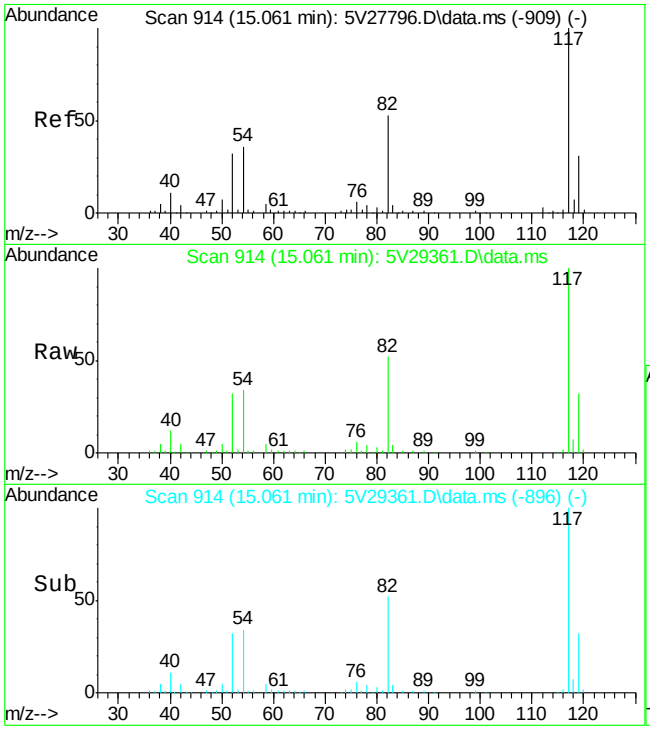




#53
Benzene
Concen: 0.04 ug/l
RT: 12.093 min Scan# 654
Delta R.T. 0.000 min
Lab File: 5V29361.D
Acq: 2 Oct 2013 6:20 pm

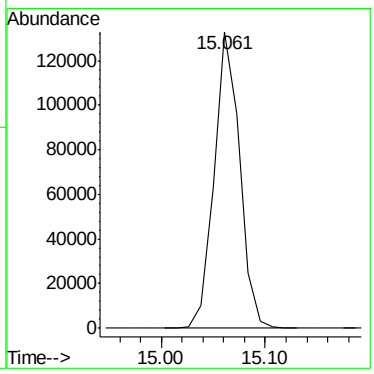
Tgt Ion: 78 Resp: 184

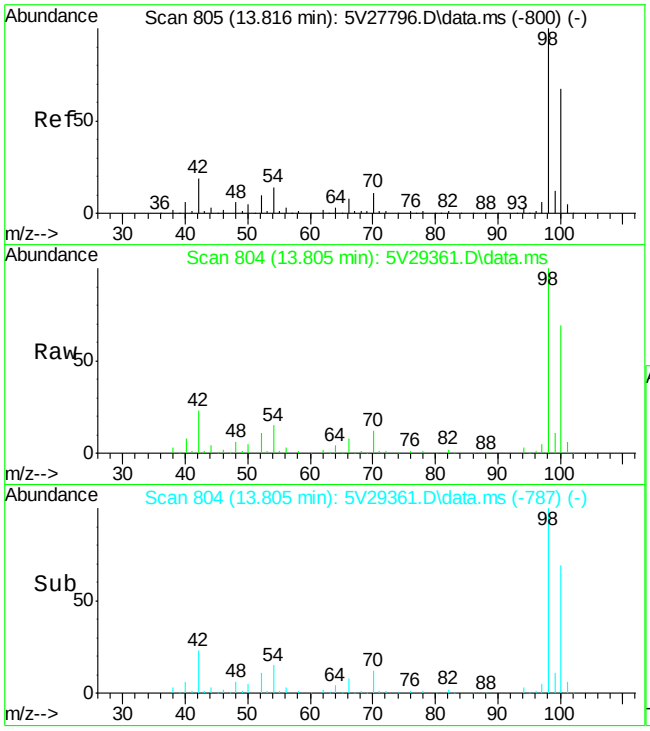




#56
Chlorobenzene-d5
Concen: 50.00 ug/l
RT: 15.061 min Scan# 914
Delta R.T. 0.000 min
Lab File: 5V29361.D
Acq: 2 Oct 2013 6:20 pm

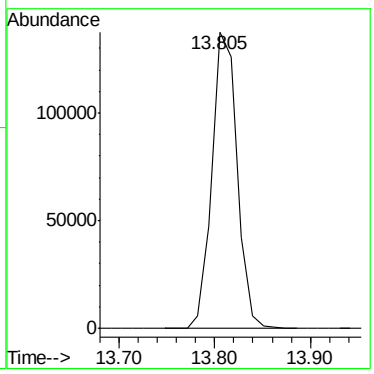
Tgt Ion:117 Resp: 226575

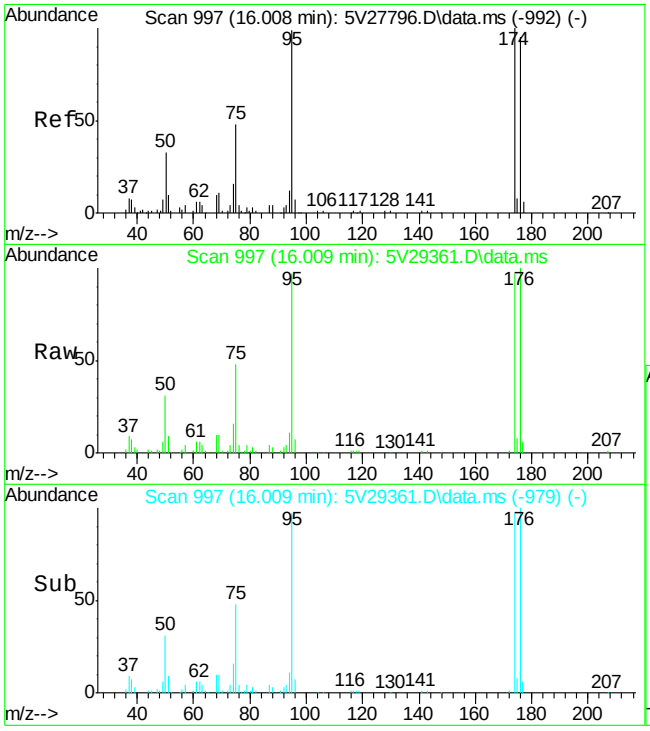




#64
Toluene-d8
Concen: 48.91 ug/l
RT: 13.805 min Scan# 804
Delta R.T. -0.011 min
Lab File: 5V29361.D
Acq: 2 Oct 2013 6:20 pm

Tgt Ion: 98 Resp: 251037

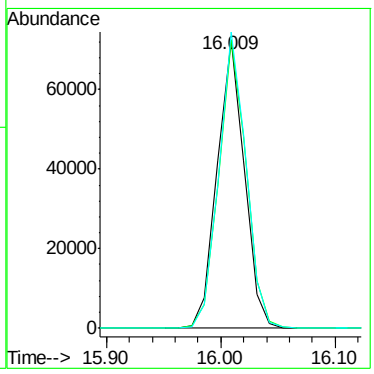


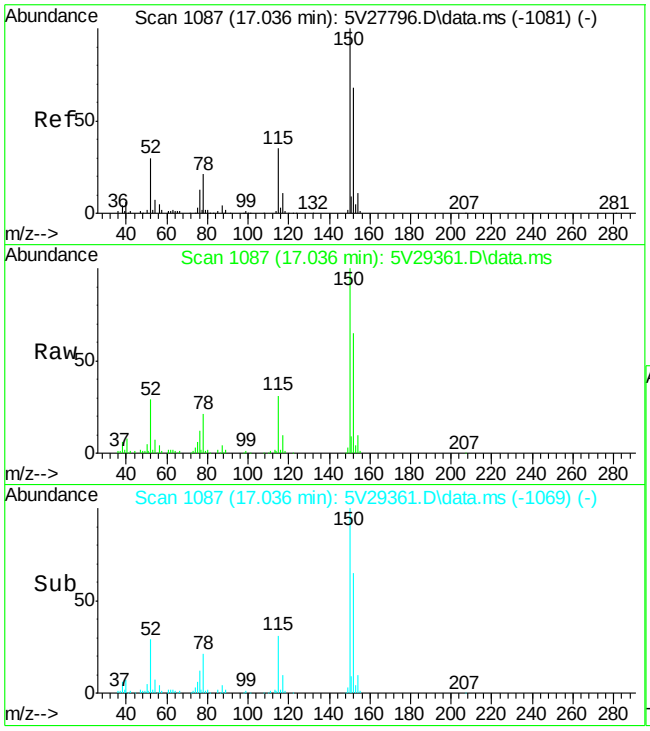


#72
4-Bromofluorobenzene
Concen: 49.99 ug/l
RT: 16.009 min Scan# 997
Delta R.T. 0.000 min
Lab File: 5V29361.D
Acq: 2 Oct 2013 6:20 pm

Tgt Ion: 95 Resp: 119609

Ion	Ratio	Lower	Upper
95	100		
174	101.1	85.4	125.4
176	102.5	80.6	120.6

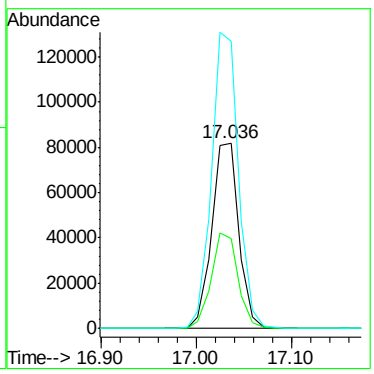


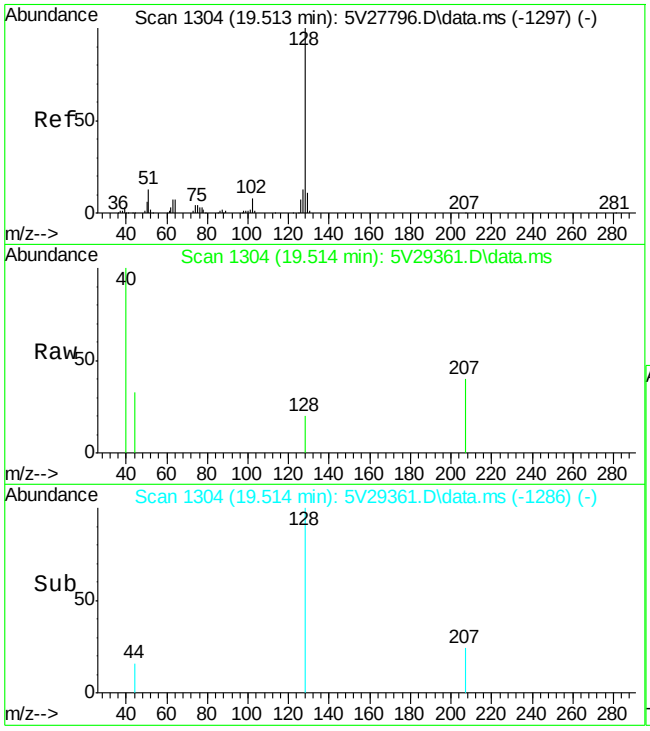


#77
1,4-Dichlorobenzene-d4
Concen: 50.00 ug/l
RT: 17.036 min Scan# 1087
Delta R.T. 0.000 min
Lab File: 5V29361.D
Acq: 2 Oct 2013 6:20 pm

Tgt Ion:152 Resp: 160728

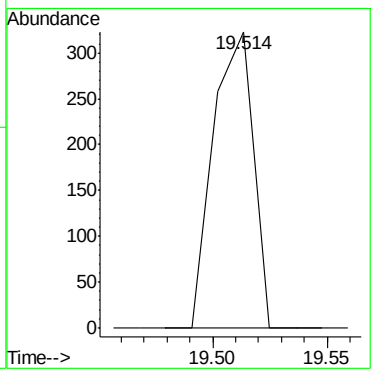
Ion	Ratio	Lower	Upper
152	100		
115	50.5	43.4	65.2
150	158.0	142.9	214.3





#94
Naphthalene
Concen: 0.87 ug/l
RT: 19.514 min Scan# 1304
Delta R.T. 0.001 min
Lab File: 5V29361.D
Acq: 2 Oct 2013 6:20 pm

Tgt Ion:128 Resp: 398



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5100213.S\
Data File : 5V29351.D
Acq On : 2 Oct 2013 1:07 pm
Operator : BRETD
Sample : MB
Misc : MS6481,V5V1764,5.000,,100,5,1
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Oct 03 09:15:35 2013
Quant Method : C:\msdchem\1\METHODS\V5AP1728TVH1728.M
Quant Title : 8260
QLast Update : Tue Aug 20 09:59:22 2013
Response via : Initial Calibration

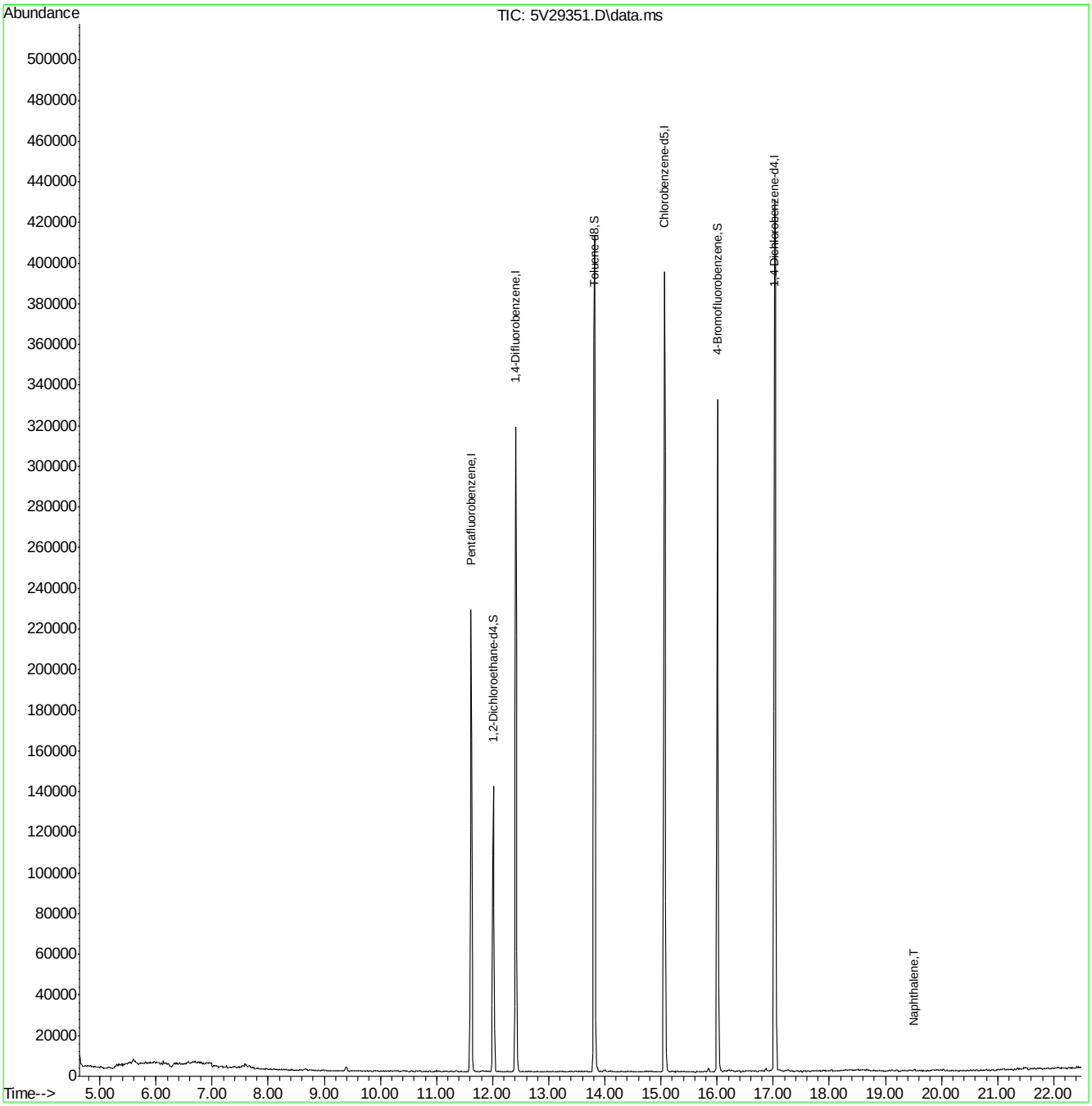
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
2) Pentafluorobenzene	11.613	168	155231	50.00	ug/l	0.00
37) 1,4-Difluorobenzene	12.412	114	212288	50.00	ug/l	0.00
56) Chlorobenzene-d5	15.061	117	202438	50.00	ug/l	0.00
77) 1,4-Dichlorobenzene-d4	17.025	152	132604	50.00	ug/l	-0.01
System Monitoring Compounds						
35) 1,2-Dichloroethane-d4	12.013	102	15972	50.63	ug/l	0.00
Spiked Amount 50.000	Range 70 - 130		Recovery = 101.26%			
64) Toluene-d8	13.816	98	231512	50.48	ug/l	0.00
Spiked Amount 50.000	Range 70 - 130		Recovery = 100.96%			
72) 4-Bromofluorobenzene	16.008	95	89552	41.89	ug/l	0.00
Spiked Amount 50.000	Range 70 - 130		Recovery = 83.78%			
Target Compounds						Qvalue
1) TVH-Gasoline	13.006	TIC	-9922m	57.07	ug/l	
94) Naphthalene	19.513	128	995	0.98	ug/l	100

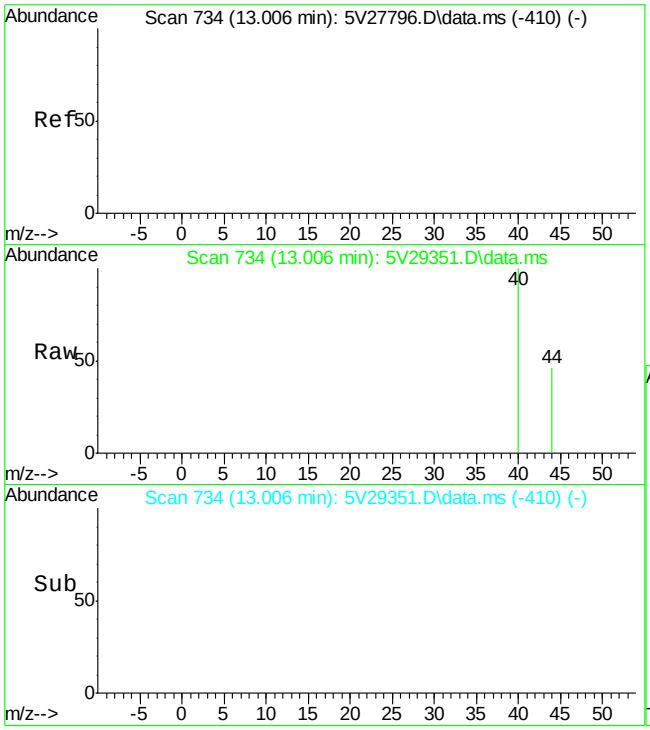
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5100213.S\
Data File : 5V29351.D
Acq On : 2 Oct 2013 1:07 pm
Operator : BRETD
Sample : MB
Misc : MS6481,V5V1764,5.000,,100,5,1
ALS Vial : 5 Sample Multiplier: 1

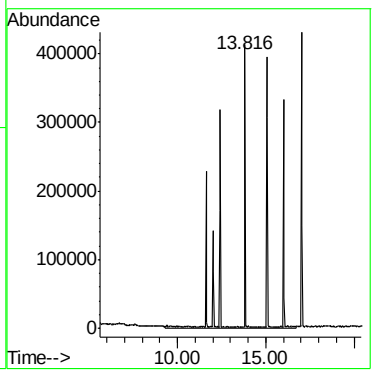
Quant Time: Oct 03 09:15:35 2013
Quant Method : C:\msdchem\1\METHODS\V5AP1728TVH1728.M
Quant Title : 8260
QLast Update : Tue Aug 20 09:59:22 2013
Response via : Initial Calibration

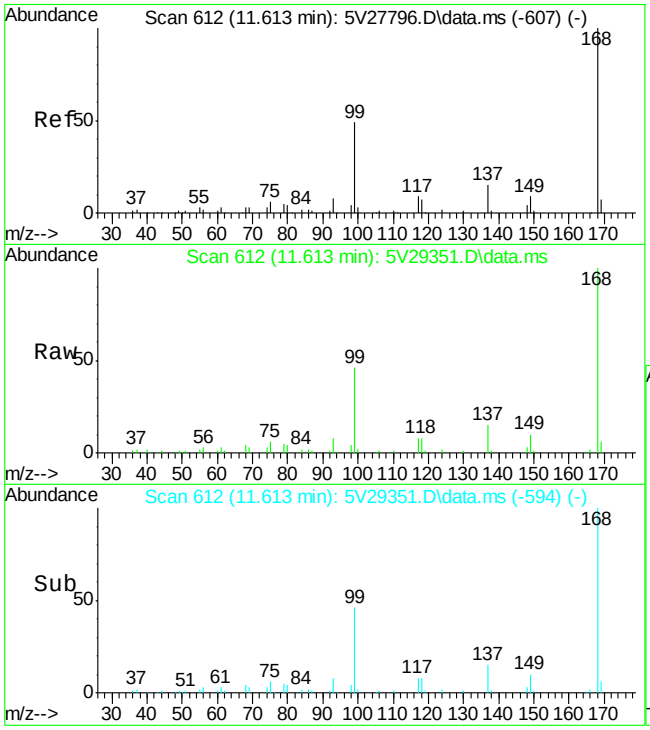




#1
TVH-Gasoline
Concen: 57.07 ug/l m
RT: 13.006 min Scan# 734
Delta R.T. 0.000 min
Lab File: 5V29351.D
Acq: 2 Oct 2013 1:07 pm

Tgt Ion:TIC Resp: -9922

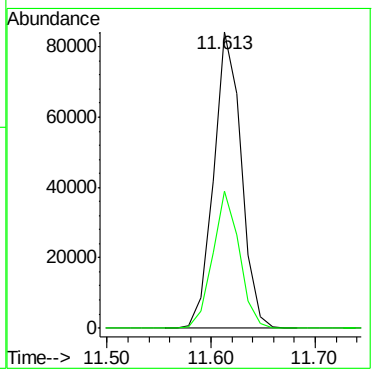


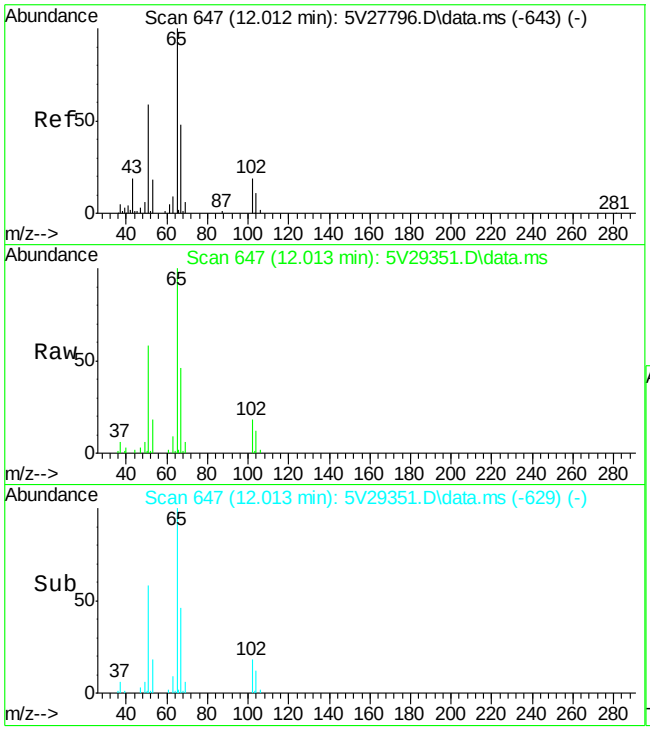


#2
Pentafluorobenzene
Concen: 50.00 ug/l
RT: 11.613 min Scan# 612
Delta R.T. 0.000 min
Lab File: 5V29351.D
Acq: 2 Oct 2013 1:07 pm

Tgt Ion:168 Resp: 155231

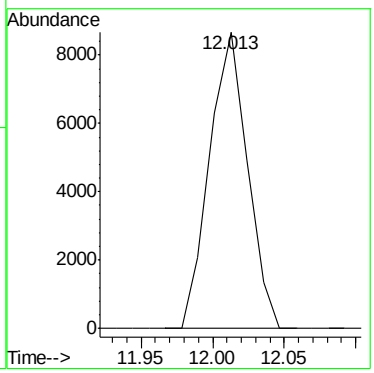
Ion	Ratio	Lower	Upper
168	100		
99	44.5	41.4	62.2

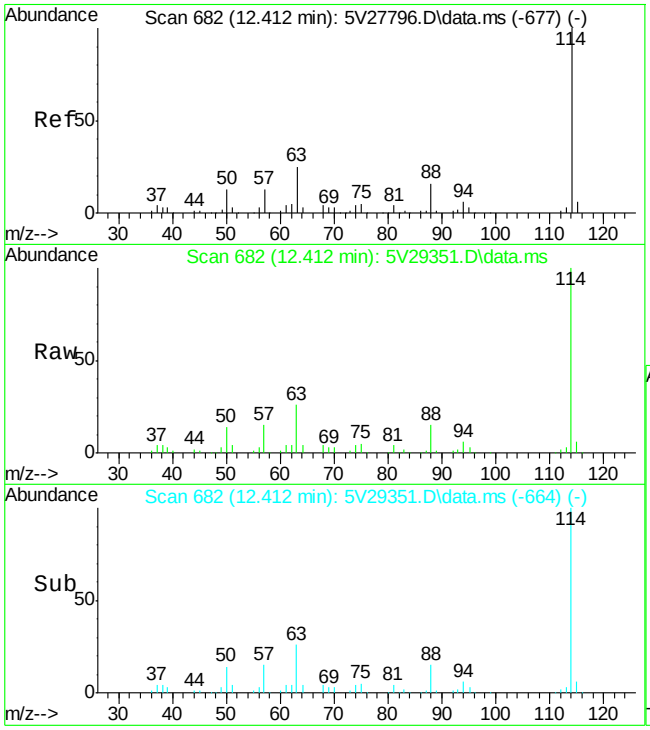




#35
1,2-Dichloroethane-d4
Concen: 50.63 ug/l
RT: 12.013 min Scan# 647
Delta R.T. 0.000 min
Lab File: 5V29351.D
Acq: 2 Oct 2013 1:07 pm

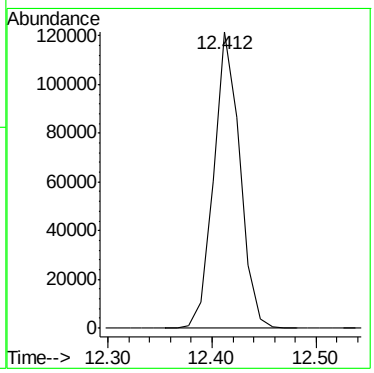
Tgt Ion:102 Resp: 15972

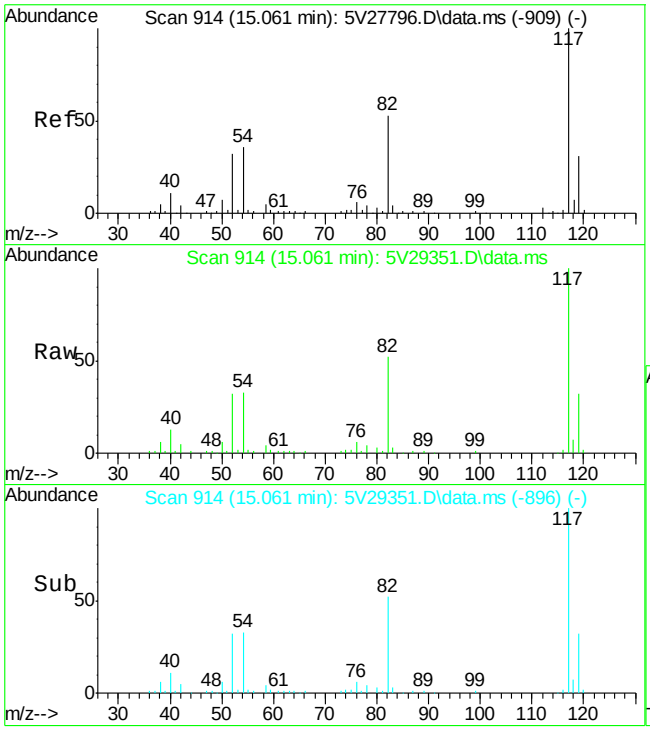




#37
1,4-Difluorobenzene
Concen: 50.00 ug/l
RT: 12.412 min Scan# 682
Delta R.T. 0.000 min
Lab File: 5V29351.D
Acq: 2 Oct 2013 1:07 pm

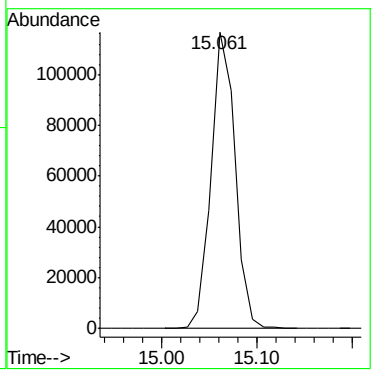
Tgt Ion:114 Resp: 212288

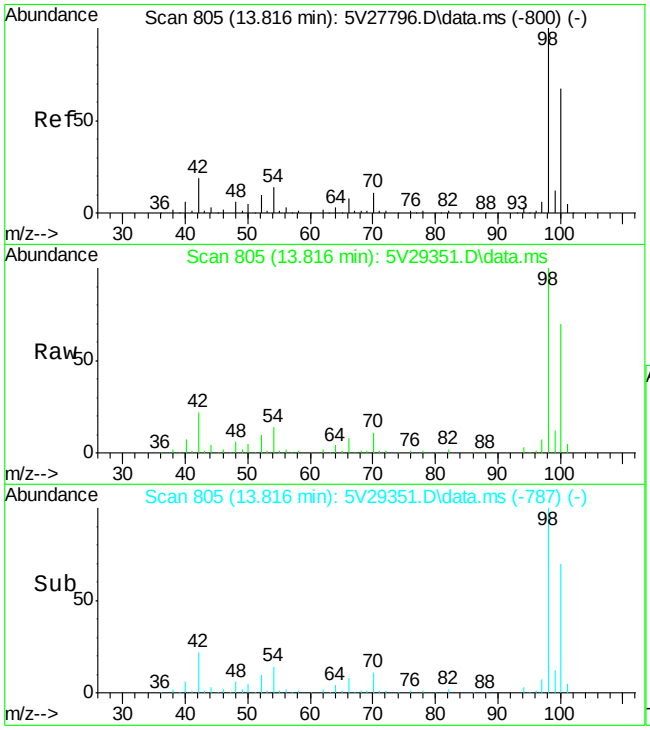




#56
Chlorobenzene-d5
Concen: 50.00 ug/l
RT: 15.061 min Scan# 914
Delta R.T. 0.000 min
Lab File: 5V29351.D
Acq: 2 Oct 2013 1:07 pm

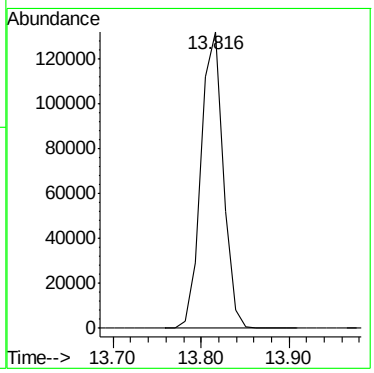
Tgt Ion:117 Resp: 202438

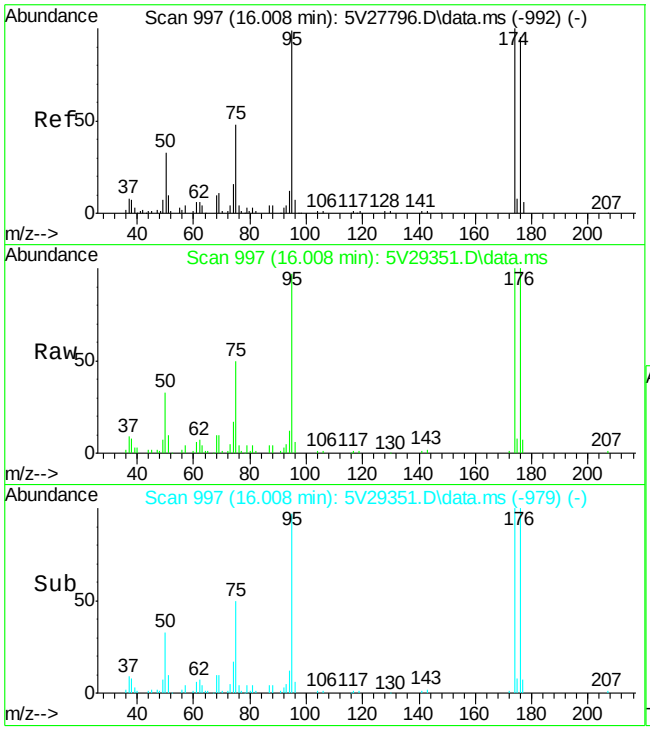




#64
Toluene-d8
Concen: 50.48 ug/l
RT: 13.816 min Scan# 805
Delta R.T. 0.000 min
Lab File: 5V29351.D
Acq: 2 Oct 2013 1:07 pm

Tgt Ion: 98 Resp: 231512

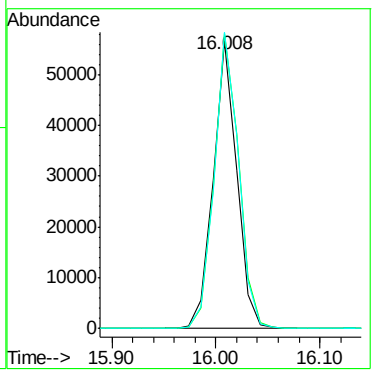


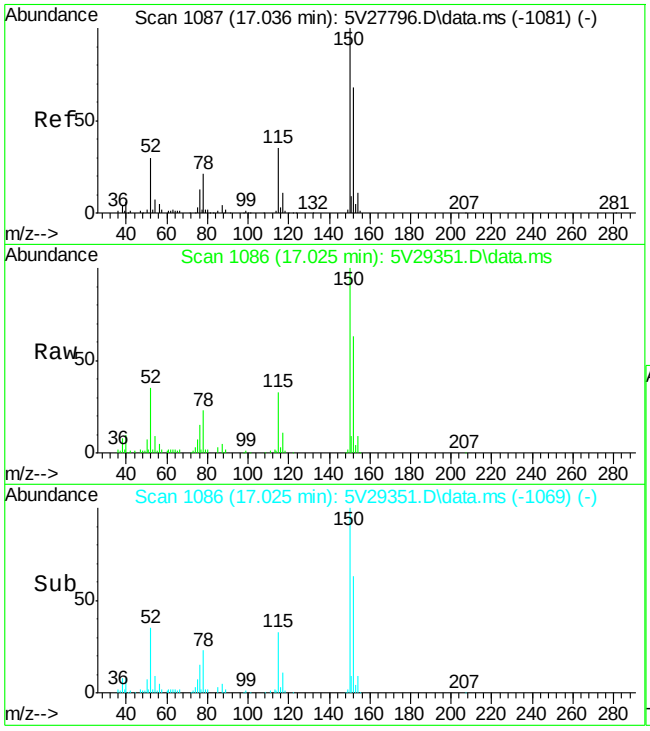


#72
4-Bromofluorobenzene
Concen: 41.89 ug/l
RT: 16.008 min Scan# 997
Delta R.T. 0.000 min
Lab File: 5V29351.D
Acq: 2 Oct 2013 1:07 pm

Tgt Ion: 95 Resp: 89552

Ion	Ratio	Lower	Upper
95	100		
174	106.7	85.4	125.4
176	105.8	80.6	120.6

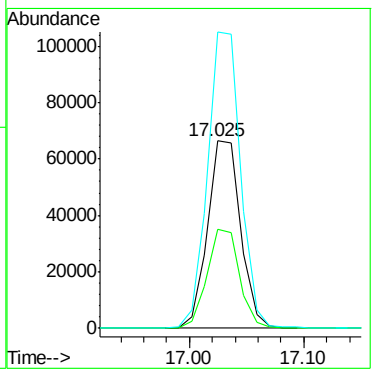


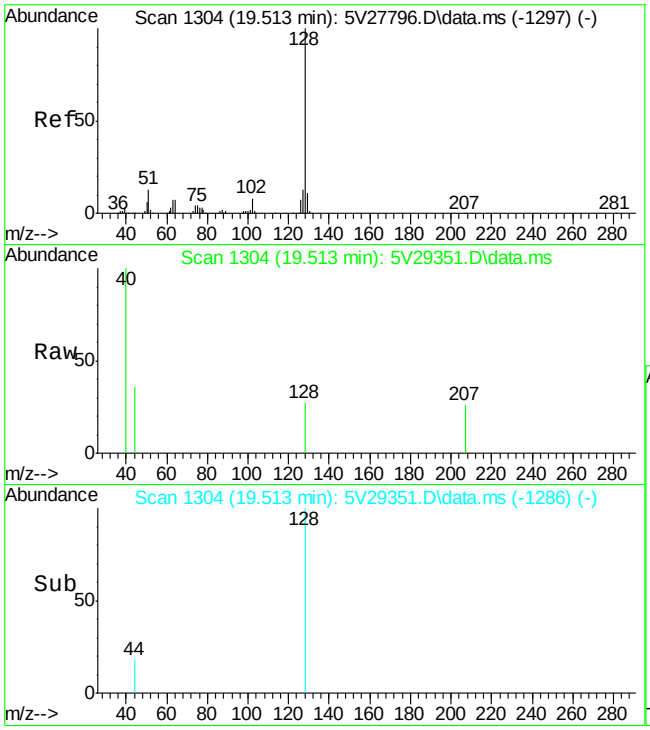


#77
1,4-Dichlorobenzene-d4
Concen: 50.00 ug/l
RT: 17.025 min Scan# 1086
Delta R.T. -0.011 min
Lab File: 5V29351.D
Acq: 2 Oct 2013 1:07 pm

Tgt Ion:152 Resp: 132604

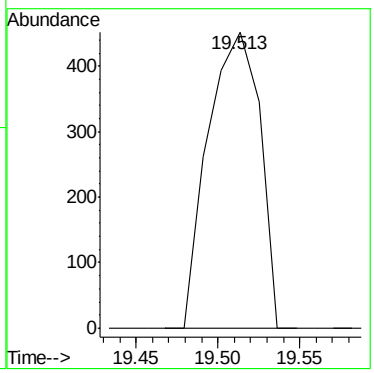
Ion	Ratio	Lower	Upper
152	100		
115	51.6	43.4	65.2
150	158.5	142.9	214.3





#94
Naphthalene
Concen: 0.98 ug/l
RT: 19.513 min Scan# 1304
Delta R.T. 0.000 min
Lab File: 5V29351.D
Acq: 2 Oct 2013 1:07 pm

Tgt Ion:128 Resp: 995



7.2.1

7

Mountain States ACCUTEST LABORATORIES

GC/MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D51202
Account: XTOKRWR XTO Energy
Project: FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8670-MB	3G16517.D	1	10/03/13	DC	10/03/13	OP8670	E3G817

The QC reported here applies to the following samples: **Method:** SW846 8270C BY SIM

D51202-1

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	8.3	4.3	ug/kg	
120-12-7	Anthracene	ND	8.3	4.3	ug/kg	
56-55-3	Benzo(a)anthracene	ND	8.3	4.3	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	8.3	4.3	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	8.3	4.3	ug/kg	
50-32-8	Benzo(a)pyrene	ND	8.3	4.3	ug/kg	
218-01-9	Chrysene	ND	8.3	4.3	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	8.3	4.3	ug/kg	
206-44-0	Fluoranthene	ND	8.3	4.3	ug/kg	
86-73-7	Fluorene	ND	8.3	5.0	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.3	4.3	ug/kg	
91-20-3	Naphthalene	ND	12	10	ug/kg	
129-00-0	Pyrene	ND	8.3	4.3	ug/kg	

CAS No.	Surrogate Recoveries		Limits
4165-60-0	Nitrobenzene-d5	97%	10-175%
321-60-8	2-Fluorobiphenyl	89%	25-130%
1718-51-0	Terphenyl-d14	112%	41-133%

Blank Spike Summary

Job Number: D51202
Account: XTOKRWR XTO Energy
Project: FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8670-BS	3G16518.D	1	10/03/13	DC	10/03/13	OP8670	E3G817

The QC reported here applies to the following samples: **Method:** SW846 8270C BY SIM

D51202-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	83.3	71.6	86	55-130
120-12-7	Anthracene	83.3	65.3	78	60-130
56-55-3	Benzo(a)anthracene	83.3	70.3	84	62-130
205-99-2	Benzo(b)fluoranthene	83.3	77.2	93	55-130
207-08-9	Benzo(k)fluoranthene	83.3	57.0	68	59-130
50-32-8	Benzo(a)pyrene	83.3	63.2	76	64-130
218-01-9	Chrysene	83.3	68.3	82	70-130
53-70-3	Dibenzo(a,h)anthracene	83.3	63.1	76	56-130
206-44-0	Fluoranthene	83.3	62.6	75	59-130
86-73-7	Fluorene	83.3	73.5	88	58-130
193-39-5	Indeno(1,2,3-cd)pyrene	83.3	62.9	75	60-130
91-20-3	Naphthalene	83.3	69.2	83	56-130
129-00-0	Pyrene	83.3	72.0	86	65-130

CAS No.	Surrogate Recoveries	BSP	Limits
4165-60-0	Nitrobenzene-d5	100%	10-175%
321-60-8	2-Fluorobiphenyl	91%	25-130%
1718-51-0	Terphenyl-d14	105%	41-133%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D51202
Account: XTOKRWR XTO Energy
Project: FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8670-MS1	3G16520.D	1	10/03/13	DC	10/03/13	OP8670	E3G817
OP8670-MSD1	3G16521.D	1	10/03/13	DC	10/03/13	OP8670	E3G817
D51039-1	3G16519.D	1	10/03/13	DC	10/03/13	OP8670	E3G817

The QC reported here applies to the following samples: **Method:** SW846 8270C BY SIM

D51202-1

CAS No.	Compound	D51039-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND		102	79.3	78	74.9	73	6	29-139/30
120-12-7	Anthracene	ND		102	76.5	75	80.3	79	5	10-182/30
56-55-3	Benzo(a)anthracene	ND		102	84.3	82	89.9	88	6	35-149/30
205-99-2	Benzo(b)fluoranthene	ND		102	68.5	67	72.1	71	5	22-174/30
207-08-9	Benzo(k)fluoranthene	ND		102	82.8	81	89.3	88	8	10-185/30
50-32-8	Benzo(a)pyrene	ND		102	72.7	71	76.7	75	5	10-168/30
218-01-9	Chrysene	ND		102	77.0	75	83.1	81	8	10-168/30
53-70-3	Dibenzo(a,h)anthracene	ND		102	69.4	68	73.0	72	5	12-160/30
206-44-0	Fluoranthene	ND		102	75.4	74	79.9	78	6	20-156/30
86-73-7	Fluorene	ND		102	86.3	84	84.4	83	2	10-164/30
193-39-5	Indeno(1,2,3-cd)pyrene	ND		102	69.6	68	72.7	71	4	29-136/30
91-20-3	Naphthalene	ND		102	76.3	75	68.8	67	10	10-258/30
129-00-0	Pyrene	ND		102	86.6	85	93.6	92	8	10-196/30

CAS No.	Surrogate Recoveries	MS	MSD	D51039-1	Limits
4165-60-0	Nitrobenzene-d5	86%	80%	64%	10-175%
321-60-8	2-Fluorobiphenyl	77%	75%	67%	25-130%
1718-51-0	Terphenyl-d14	94%	107%	102%	41-133%

* = Outside of Control Limits.

Mountain States ACCUTEST LABORATORIES

GC/MS Semi-volatiles

Raw Data

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\100313\
Data File : 3g16536.D
Acq On : 3 Oct 2013 8:32 pm
Operator : DONC
Sample : D51202-1
Misc : OP8670,E3G817,30.01,,,1,1
ALS Vial : 23 Sample Multiplier: 1

Quant Time: Oct 04 15:01:51 2013
Quant Method : C:\msdchem\1\METHODS\SIMPE3G810.M
Quant Title : PAHSIM BASE
QLast Update : Tue Sep 24 08:29:29 2013
Response via : Initial Calibration

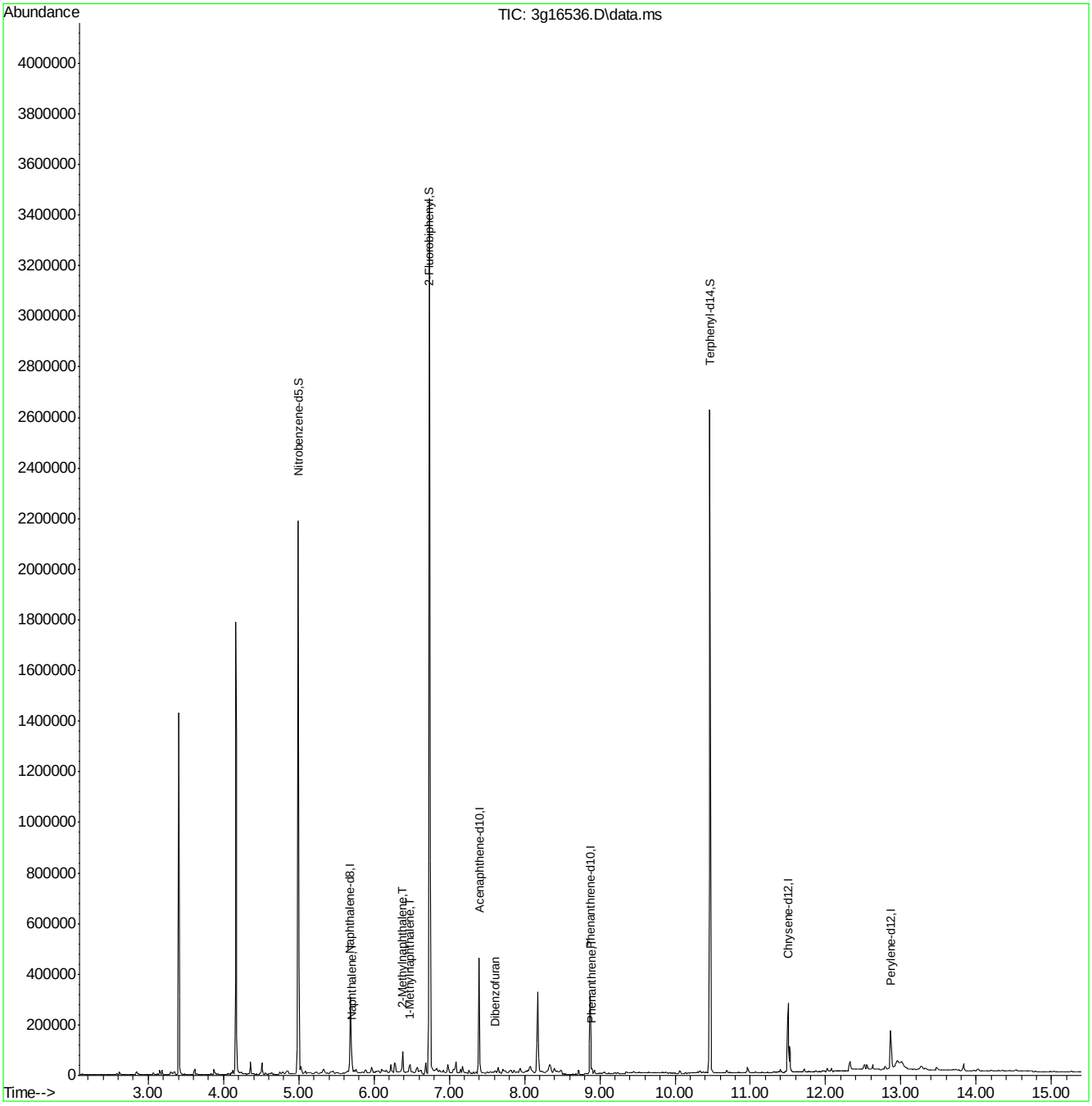
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Naphthalene-d8	5.682	136	213107	4.0000	ug/mL	0.00
6) Acenaphthene-d10	7.398	164	148422	4.0000	ug/mL	0.00
15) Phenanthrene-d10	8.872	188	225444	4.0000	ug/mL	0.00
19) Chrysene-d12	11.501	240	184463	4.0000	ug/mL	0.00
24) Perylene-d12	12.865	264	131165	4.0000	ug/mL	0.00
System Monitoring Compounds						
2) Nitrobenzene-d5	4.996	82	983563	36.6921	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery = 73.38%			
7) 2-Fluorobiphenyl	6.736	172	2131034	36.8522	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery = 73.70%			
21) Terphenyl-d14	10.463	244	1802036	51.6324	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery = 103.26%			
Target Compounds						Qvalue
3) N-Nitrosodimethylamine	2.400	74	70	N.D.		
4) N-Nitrosodi-propylamine	0.000	70	0	N.D. d		
5) Naphthalene	5.707	128	21914	0.2842	ug/mL	65
8) 2-Methylnaphthalene	6.380	142	33631	0.5642	ug/mL	97
9) 1-Methylnaphthalene	6.480	142	17231	0.3408	ug/mL	90
10) Acenaphthylene	7.256	152	1278	N.D.		
11) Acenaphthene	7.433	154	912	N.D.		
12) Dibenzofuran	7.611	168	2700	0.0399	ug/mL	76
13) Fluorene	0.000	166	0	N.D. d		
14) Diphenylamine	0.000	169	0	N.D. d		
16) Phenanthrene	8.896	178	12455	0.1358	ug/mL	84
17) Anthracene	0.000	178	0	N.D. d		
18) Fluoranthene	0.000	202	0	N.D. d		
20) Pyrene	10.305	202	1850	N.D.		
22) Benzo(a)anthracene	11.495	228	1575	N.D.		
23) Chrysene	11.521	228	983	N.D.		
25) Benzo(b)fluoranthene	0.000	252	0	N.D. d		
26) Benzo(k)fluoranthene	0.000	252	0	N.D. d		
27) Benzo(a)pyrene	0.000	252	0	N.D. d		
28) Indeno(1,2,3-cd)pyrene	0.000	276	0	N.D. d		
29) Dibenz(a,h)anthracene	0.000	278	0	N.D. d		
30) Benzo(g,h,i)perylene	0.000	276	0	N.D. d		

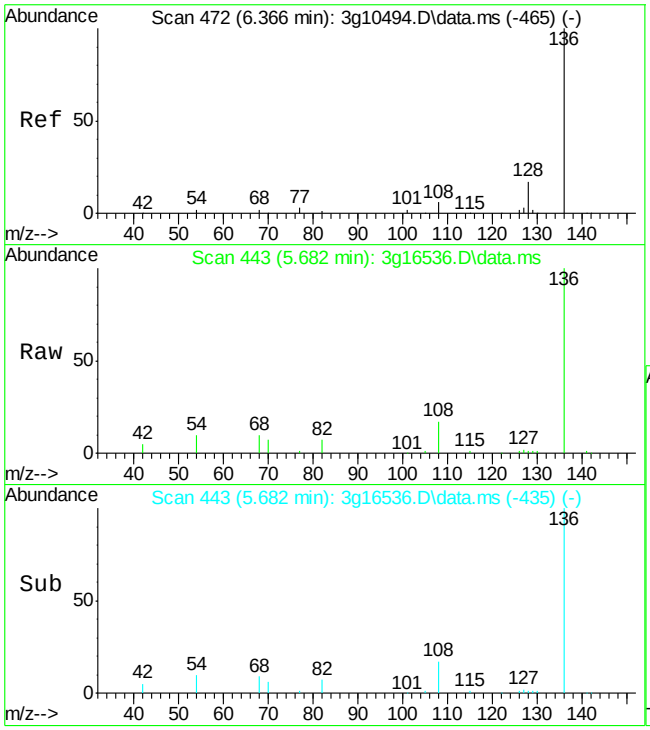
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\100313\
Data File : 3g16536.D
Acq On : 3 Oct 2013 8:32 pm
Operator : DONC
Sample : D51202-1
Misc : OP8670,E3G817,30.01,,,1,1
ALS Vial : 23 Sample Multiplier: 1

Quant Time: Oct 04 15:01:51 2013
Quant Method : C:\msdchem\1\METHODS\SIMPE3G810.M
Quant Title : PAHSIM BASE
QLast Update : Tue Sep 24 08:29:29 2013
Response via : Initial Calibration

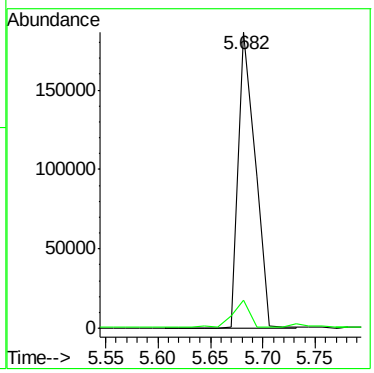


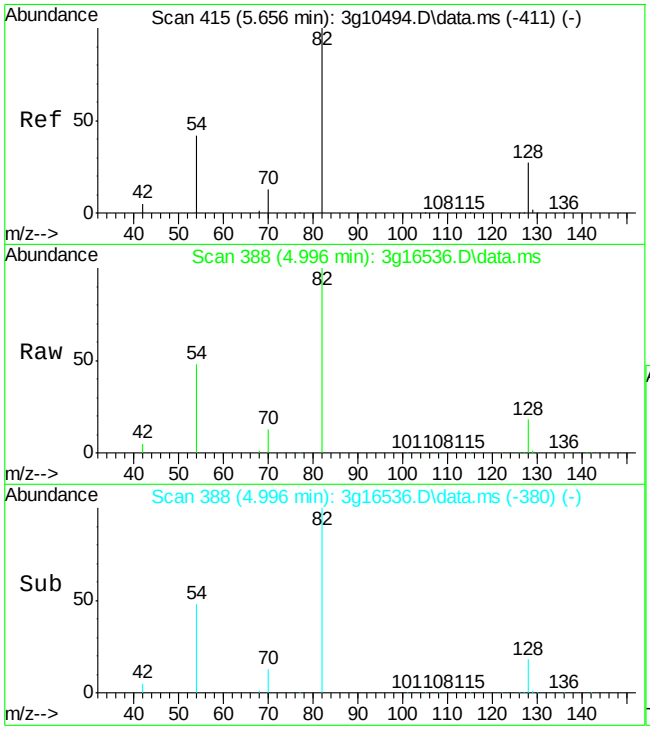


#1
Naphthalene-d8
Concen: 4.0000 ug/mL
RT: 5.682 min Scan# 443
Delta R.T. 0.000 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion:136 Resp: 213107

Ion	Ratio	Lower	Upper
136	100		
68	8.9	0.0	21.1

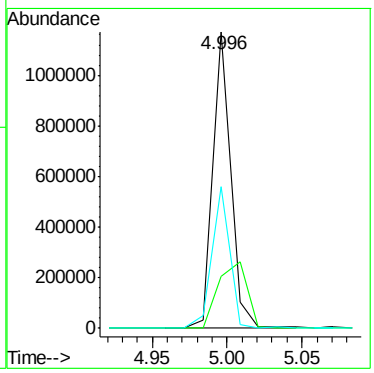


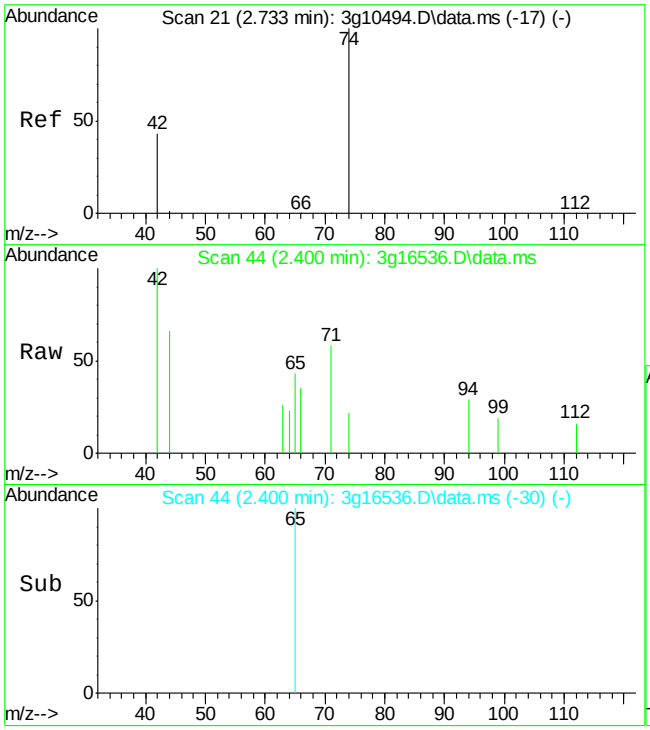


#2
Nitrobenzene-d5
Concen: 36.6921 ug/mL
RT: 4.996 min Scan# 388
Delta R.T. 0.000 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion: 82 Resp: 983563

Ion	Ratio	Lower	Upper
82	100		
128	36.1	36.8	76.8#
54	47.7	40.5	80.5

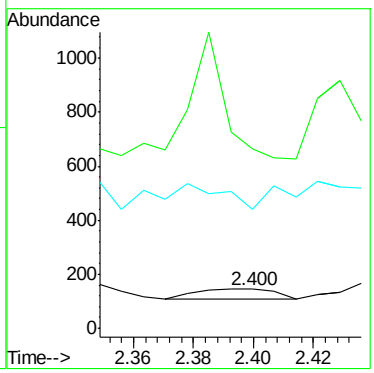


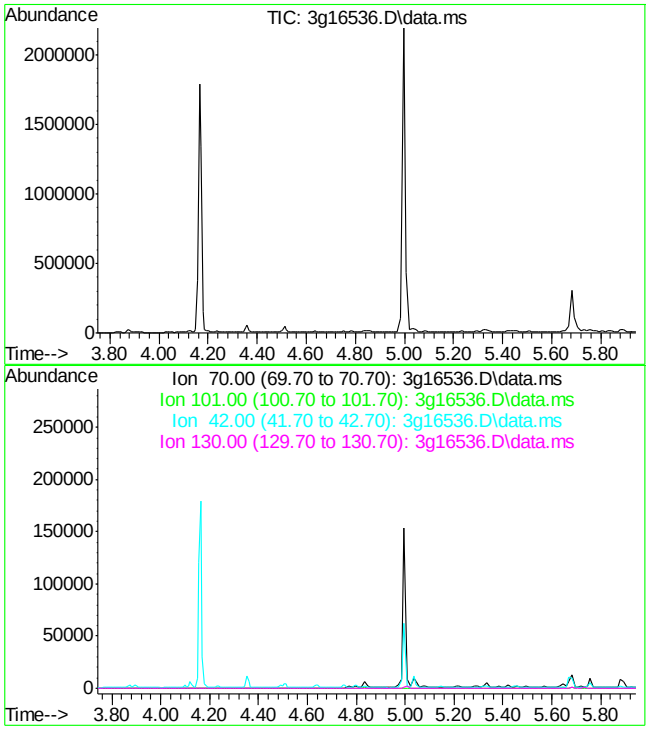


#3
N-Nitrosodimethylamine
Concen: Below ug/mL
RT: 2.400 min Scan# 44
Delta R.T. 0.000 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion: 74 Resp: 70

Ion	Ratio	Lower	Upper
74	100		
42	555.7	58.5	98.5#
44	205.7	0.0	24.0#



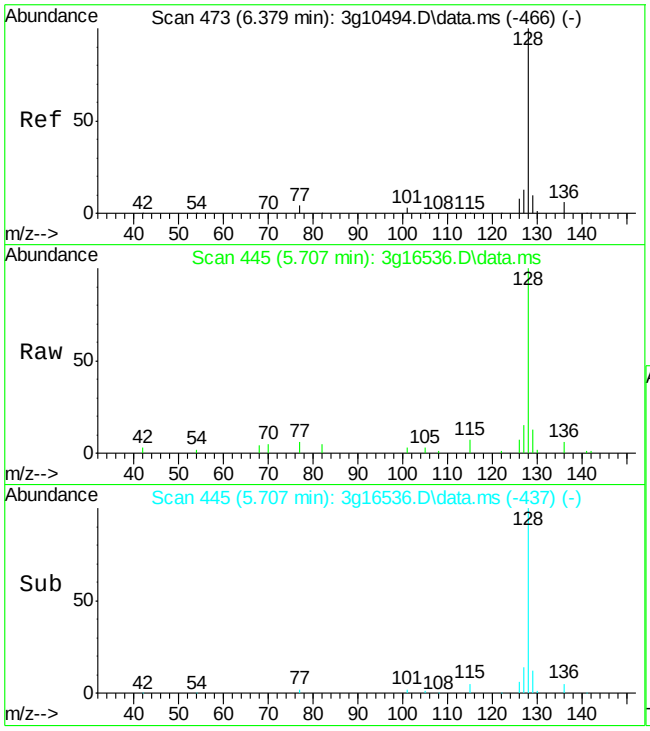


#4
N-Nitrosodi-propylamine
Concen: N.D. ug/mL
Expected RT: 4.85 min

Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion: 70

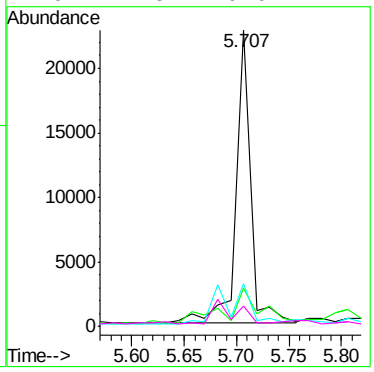
Sig	Exp Ratio
70	100
101	11.9
42	57.4
130	21.7

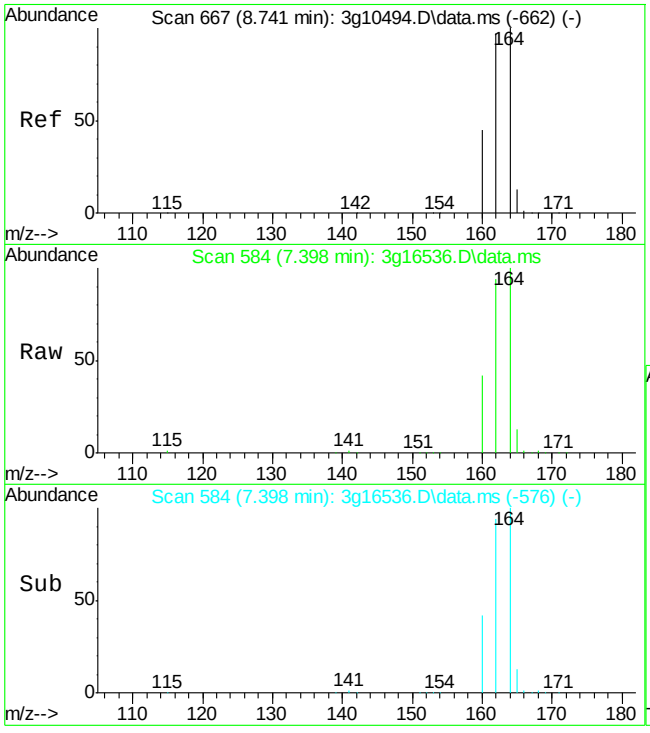


#5
Naphthalene
Concen: 0.2842 ug/mL
RT: 5.707 min Scan# 445
Delta R.T. 0.000 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion:128 Resp: 21914

Ion	Ratio	Lower	Upper
128	100		
129	26.8	0.0	31.2
127	28.1	0.0	32.4
126	12.5	0.0	27.2

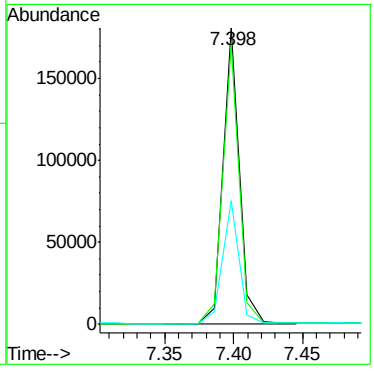


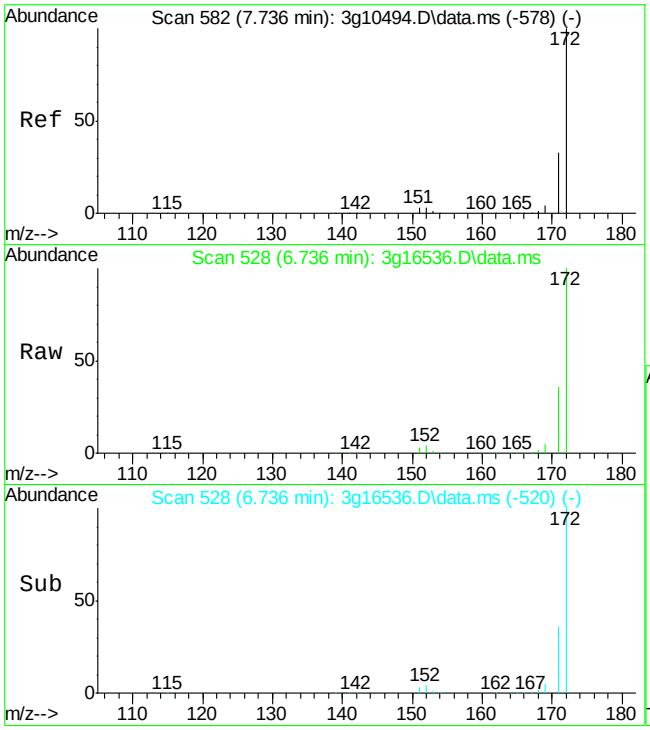


#6
Acenaphthene-d10
Concen: 4.0000 ug/mL
RT: 7.398 min Scan# 584
Delta R.T. 0.000 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion:164 Resp: 148422

Ion	Ratio	Lower	Upper
164	100		
162	94.4	83.7	123.7
160	42.3	31.9	71.9

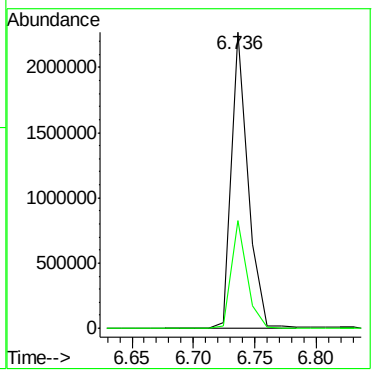


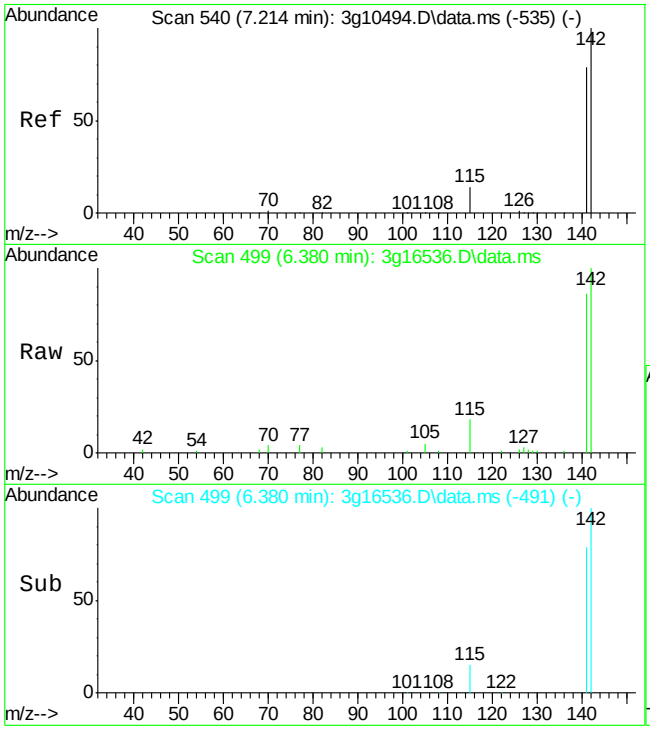


#7
2-Fluorobiphenyl
Concen: 36.8522 ug/mL
RT: 6.736 min Scan# 528
Delta R.T. 0.000 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion:172 Resp: 2131034

Ion	Ratio	Lower	Upper
172	100		
171	34.3	12.2	52.2

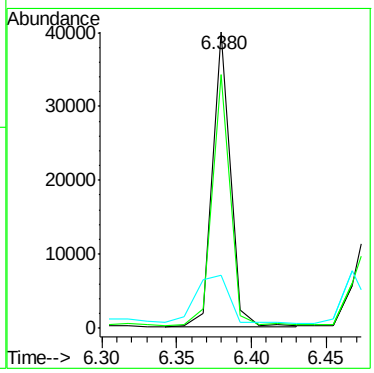


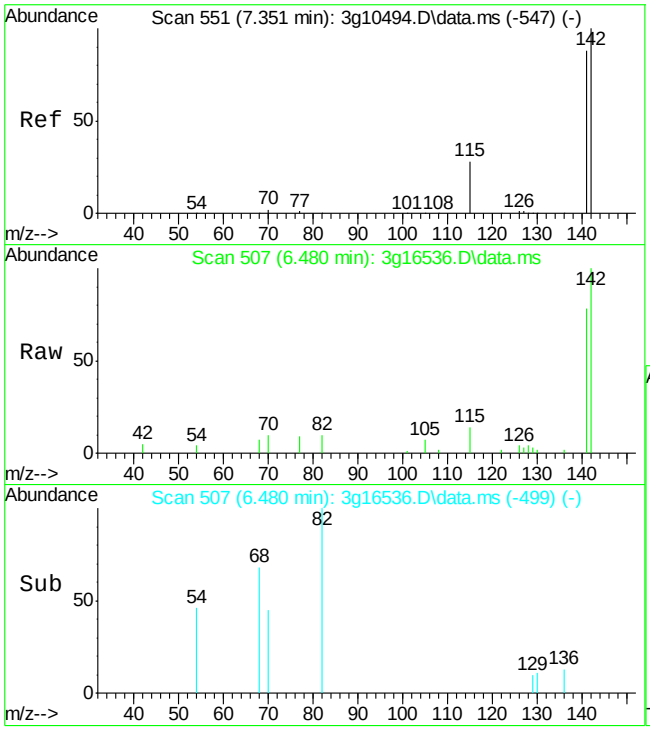


#8
2-Methylnaphthalene
Concen: 0.5642 ug/mL
RT: 6.380 min Scan# 499
Delta R.T. 0.000 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion:142 Resp: 33631

Ion	Ratio	Lower	Upper
142	100		
141	84.5	62.0	102.0
115	30.3	11.3	51.3

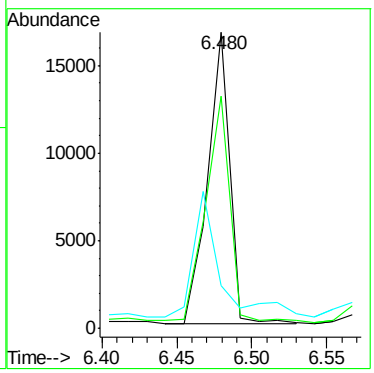


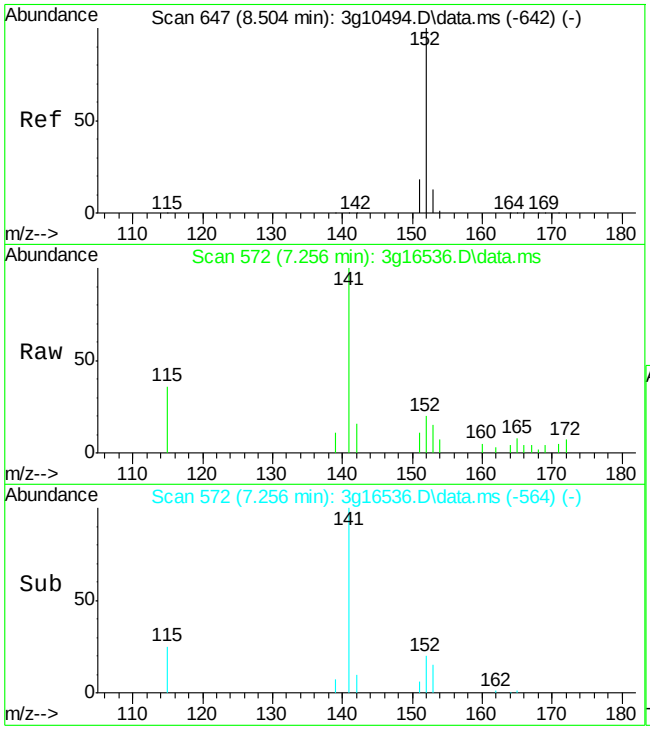


#9
1-Methylnaphthalene
Concen: 0.3408 ug/mL
RT: 6.480 min Scan# 507
Delta R.T. 0.000 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion:142 Resp: 17231

Ion	Ratio	Lower	Upper
142	100		
141	82.3	67.5	107.5
115	50.6	19.4	59.4

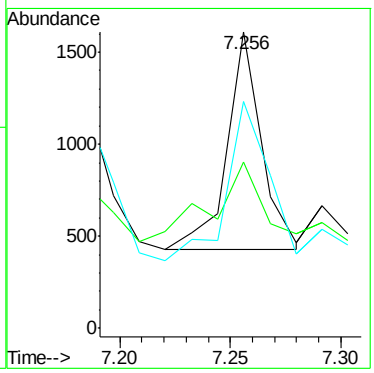


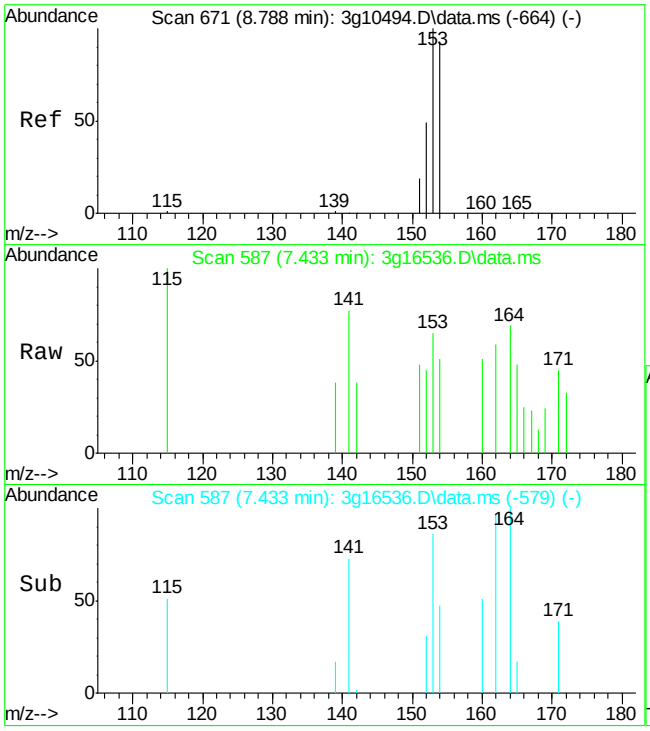


#10
Acenaphthylene
Concen: Below ug/mL
RT: 7.256 min Scan# 572
Delta R.T. 0.000 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion:152 Resp: 1278

Ion	Ratio	Lower	Upper
152	100		
151	52.7	0.0	39.2#
153	102.0	0.0	32.9#

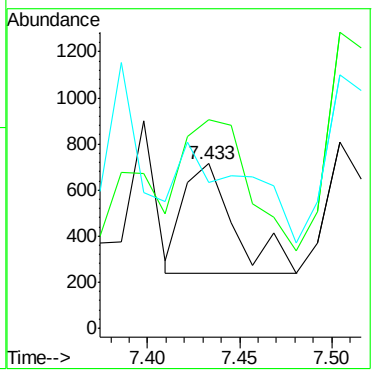


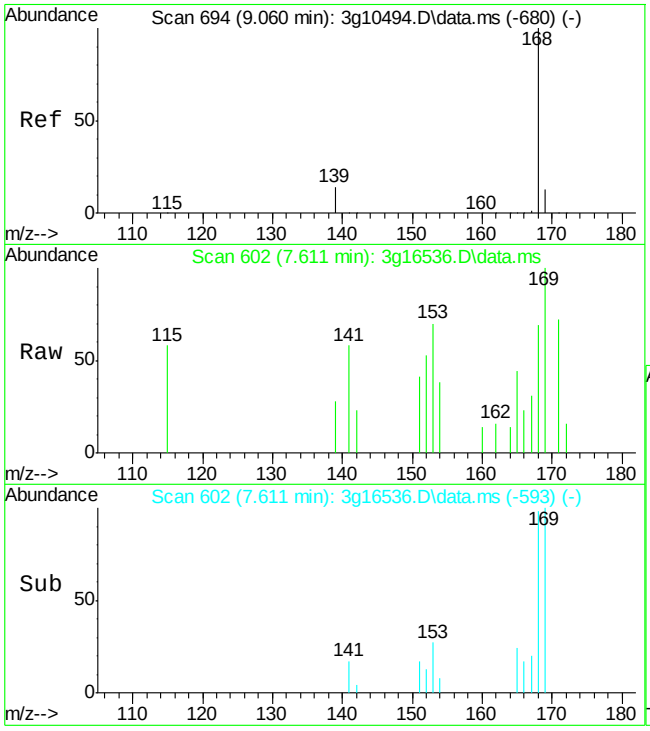


#11
Acenaphthene
Concen: Below ug/mL
RT: 7.433 min Scan# 587
Delta R.T. 0.000 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion:154 Resp: 912

Ion	Ratio	Lower	Upper
154	100		
153	218.0	82.4	122.4#
152	119.3	30.0	70.0#

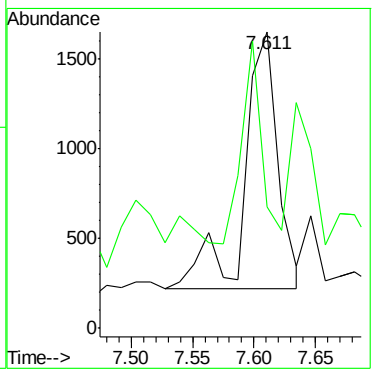


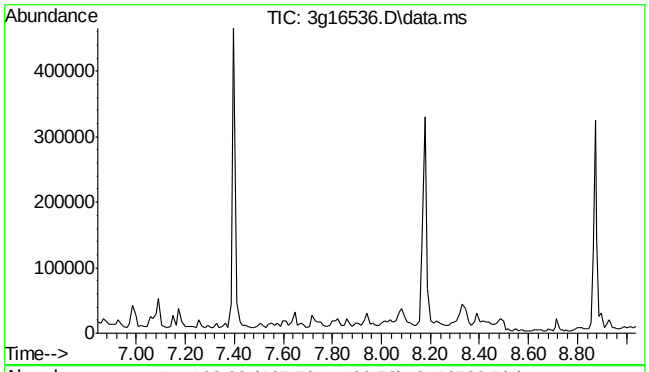


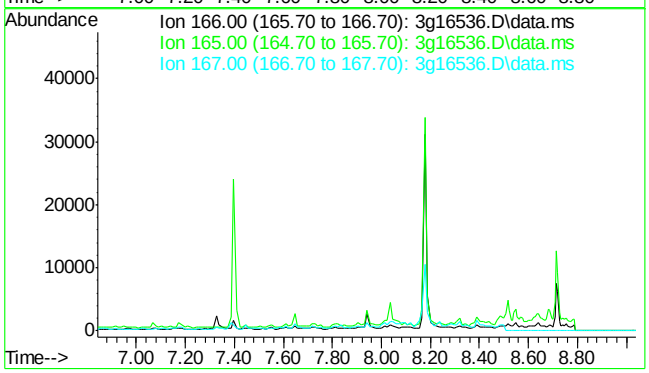
#12
Dibenzofuran
Concen: 0.0399 ug/mL
RT: 7.611 min Scan# 602
Delta R.T. 0.012 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion:168 Resp: 2700

Ion	Ratio	Lower	Upper
168	100		
139	47.0	13.4	53.4





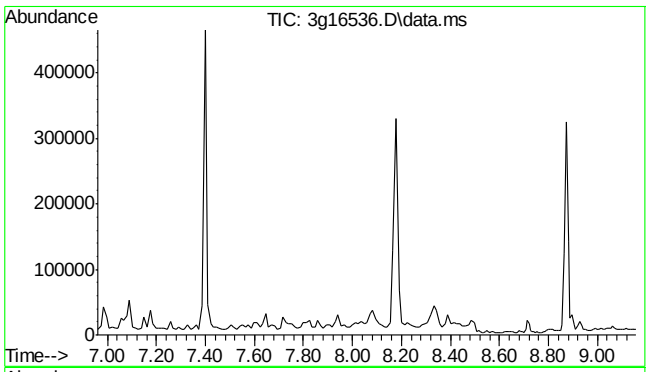


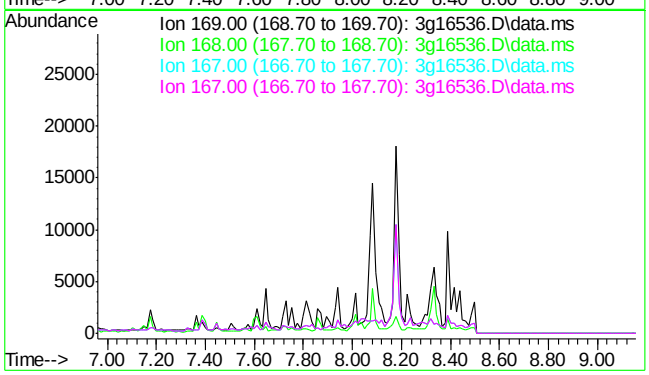
#13
Fluorene
Concen: N.D. ug/mL
Expected RT: 7.94 min

Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion: 166

Sig	Exp Ratio
166	100
165	92.0
167	13.1



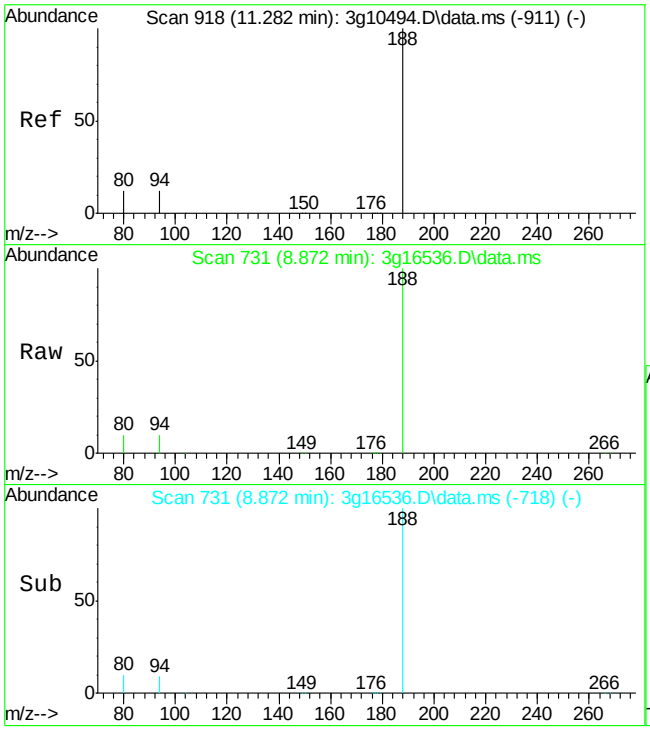


#14
Diphenylamine
Concen: N.D. ug/mL
Expected RT: 8.06 min

Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion: 169

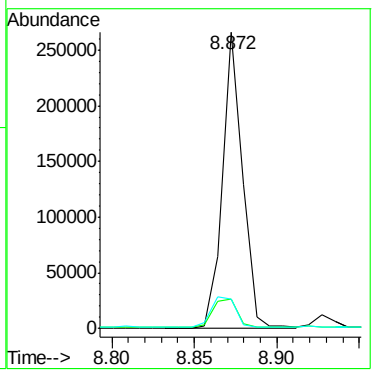
Sig	Exp Ratio
169	100
168	61.7
167	34.1
167	34.1

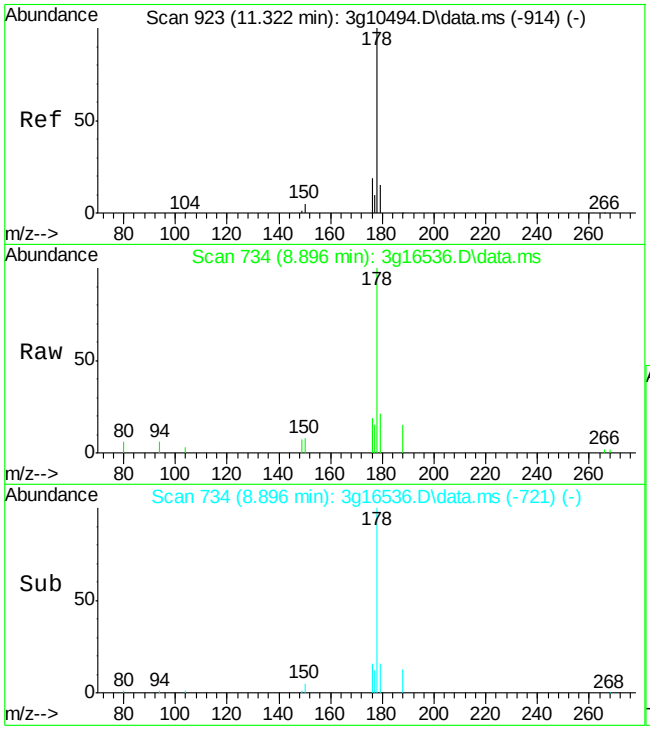


#15
Phenanthrene-d10
Concen: 4.0000 ug/mL
RT: 8.872 min Scan# 731
Delta R.T. 0.000 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion:188 Resp: 225444

Ion	Ratio	Lower	Upper
188	100		
94	11.5	0.0	28.3
80	13.3	0.0	27.8

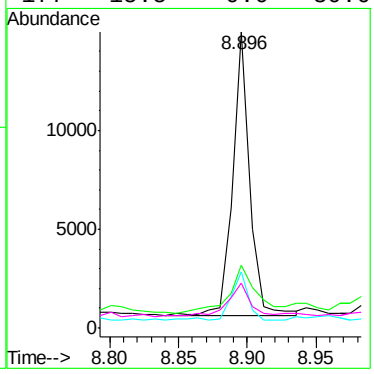


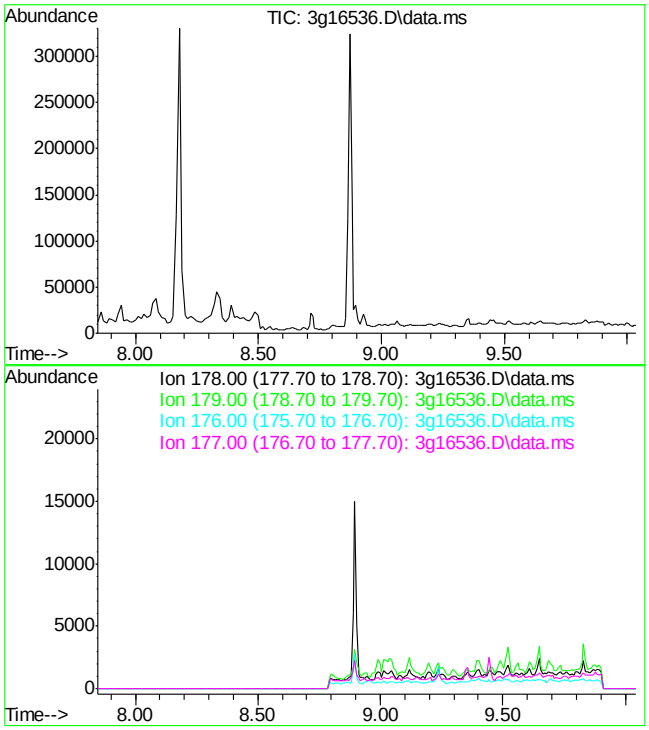


#16
Phenanthrene
Concen: 0.1358 ug/mL
RT: 8.896 min Scan# 734
Delta R.T. 0.000 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion:178 Resp: 12455

Ion	Ratio	Lower	Upper
178	100		
179	28.2	0.0	35.2
176	16.2	0.0	38.6
177	15.5	0.0	30.0



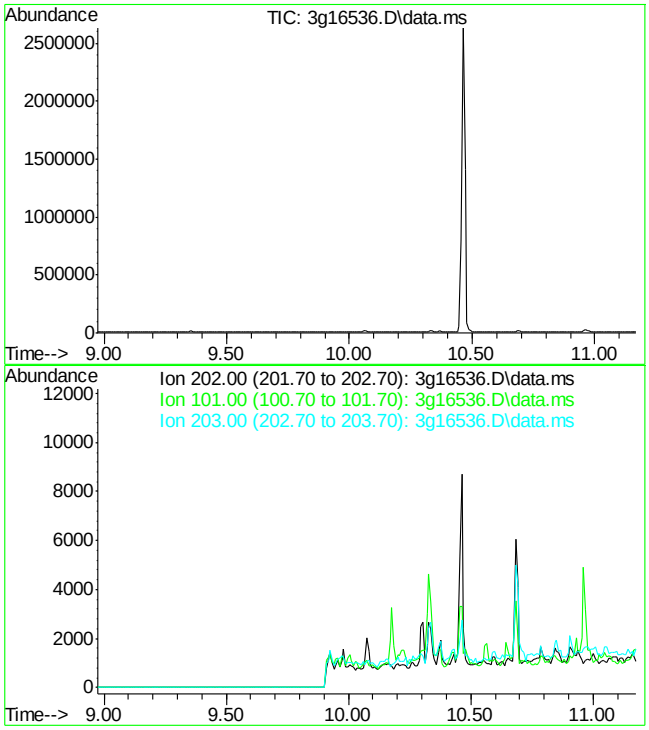


#17
Anthracene
Concen: N.D. ug/mL
Expected RT: 8.94 min

Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion: 178

Sig	Exp Ratio
178	100
179	15.1
176	18.2
177	8.7

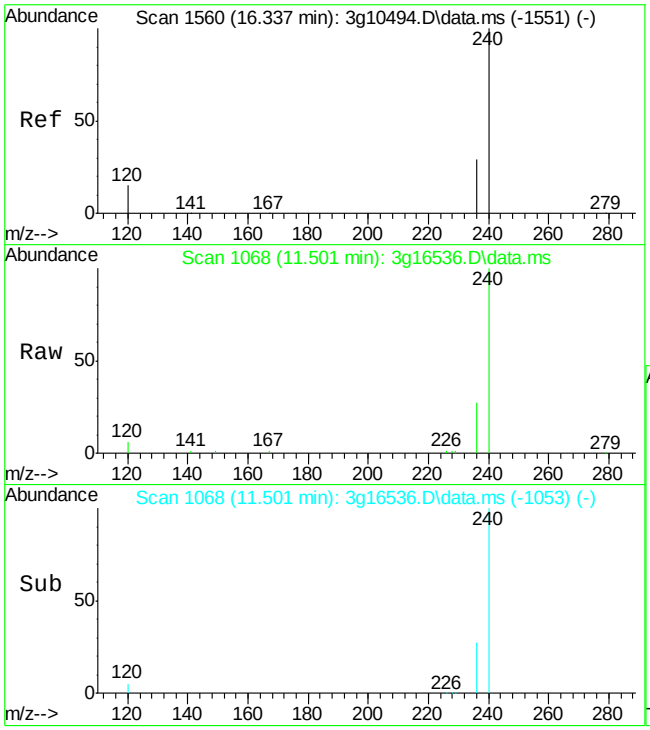


#18
Fluoranthene
Concen: N.D. ug/mL
Expected RT: 10.07 min

Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion: 202

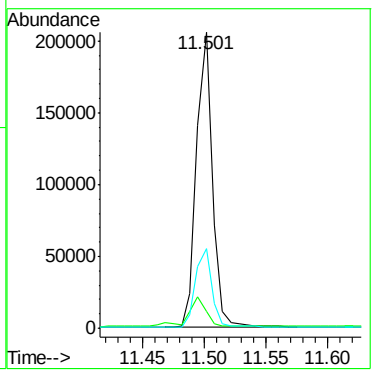
Sig	Exp Ratio
202	100
101	12.6
203	17.4

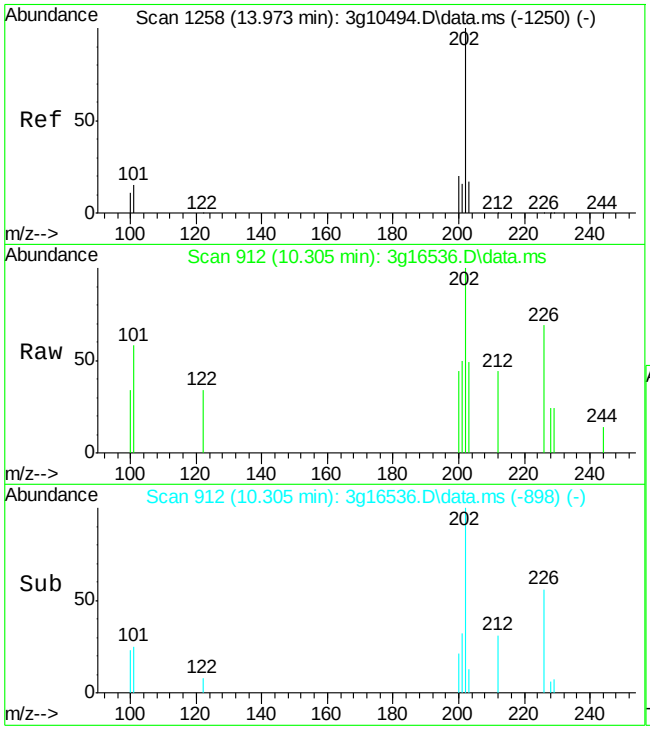


#19
Chrysene-d12
Concen: 4.0000 ug/mL
RT: 11.501 min Scan# 1068
Delta R.T. 0.000 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion:240 Resp: 184463

Ion	Ratio	Lower	Upper
240	100		
120	11.3	0.2	40.2
236	27.8	8.8	48.8

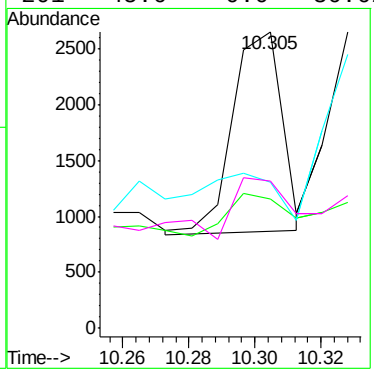


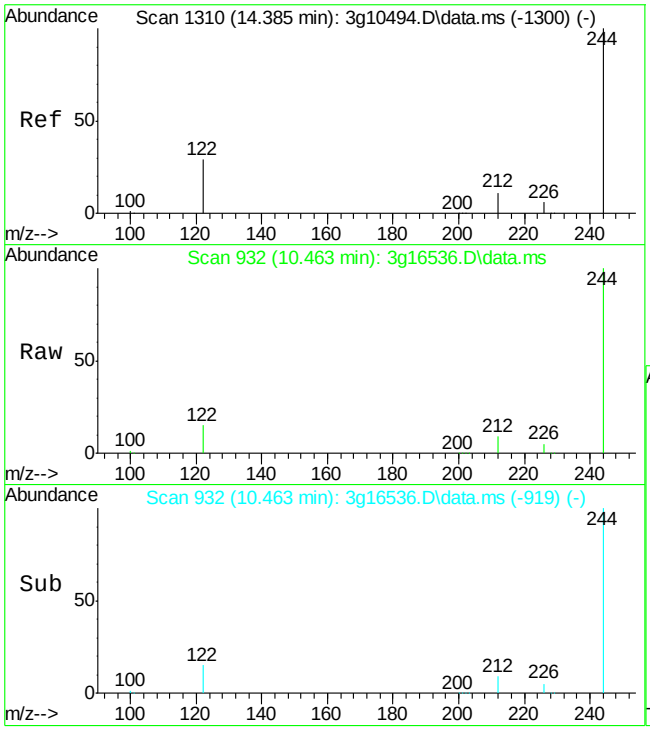


#20
Pyrene
Concen: Below ug/mL
RT: 10.305 min Scan# 912
Delta R.T. 0.008 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion:202 Resp: 1850

Ion	Ratio	Lower	Upper
202	100		
200	25.6	0.2	40.2
203	72.2	0.0	37.8#
201	45.6	0.0	36.6#

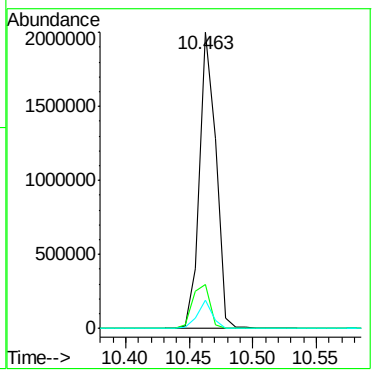


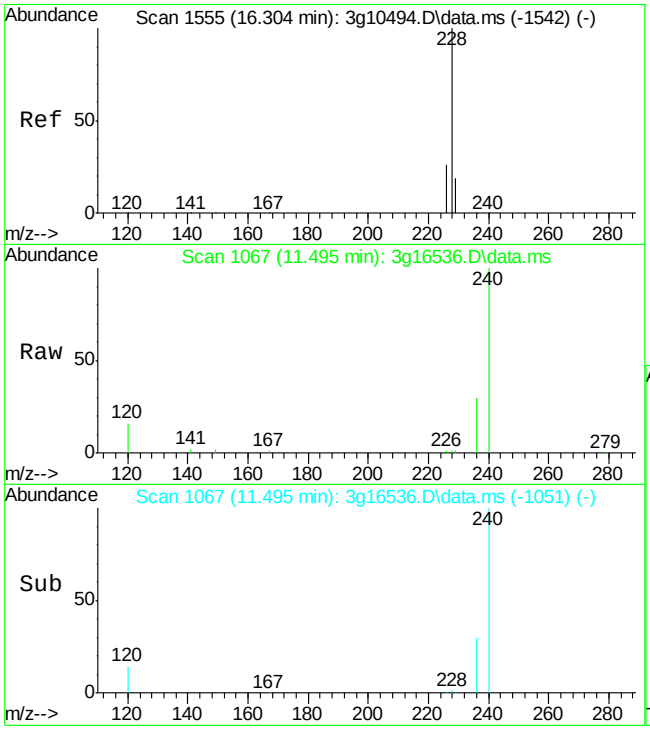


#21
Terphenyl-d14
Concen: 51.6324 ug/mL
RT: 10.463 min Scan# 932
Delta R.T. 0.000 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion:244 Resp: 1802036

Ion	Ratio	Lower	Upper
244	100		
122	15.8	7.8	47.8
212	8.4	0.0	32.8

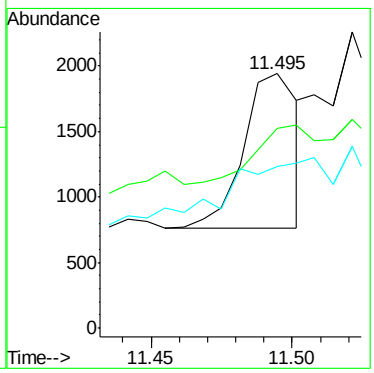


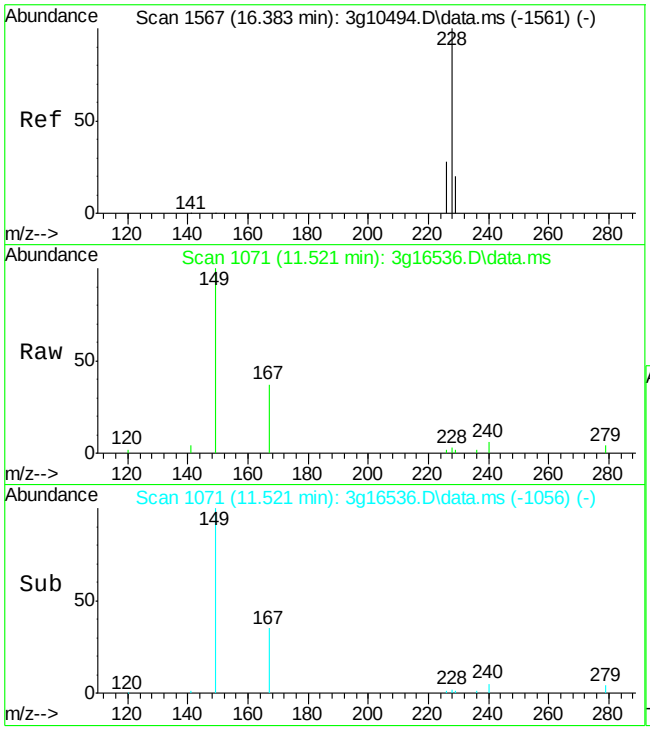


#22
Benzo(a)anthracene
Concen: Below ug/mL
RT: 11.495 min Scan# 1067
Delta R.T. 0.007 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion:228 Resp: 1575

Ion	Ratio	Lower	Upper
228	100		
229	39.0	0.0	39.4
226	0.0	6.6	46.6#

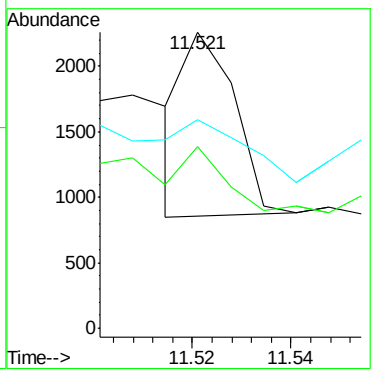


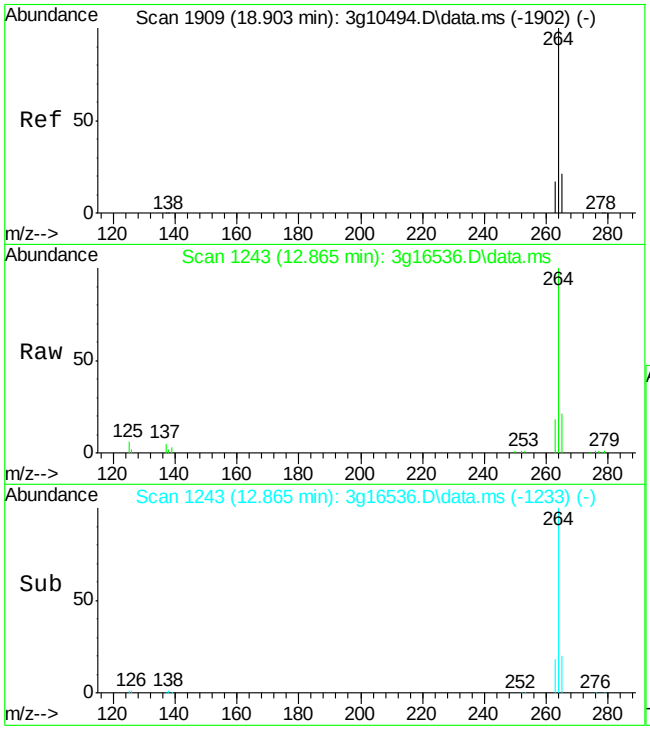


#23
Chrysene
Concen: Below ug/mL
RT: 11.521 min Scan# 1071
Delta R.T. 0.000 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion:228 Resp: 983

Ion	Ratio	Lower	Upper
228	100		
226	179.7	8.6	48.6#
229	0.0	0.0	39.4

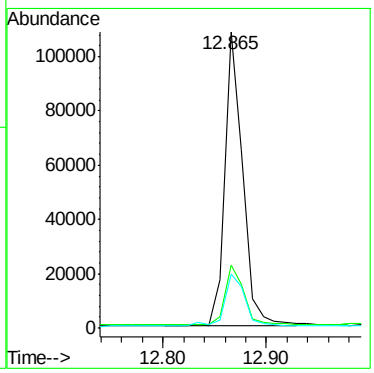


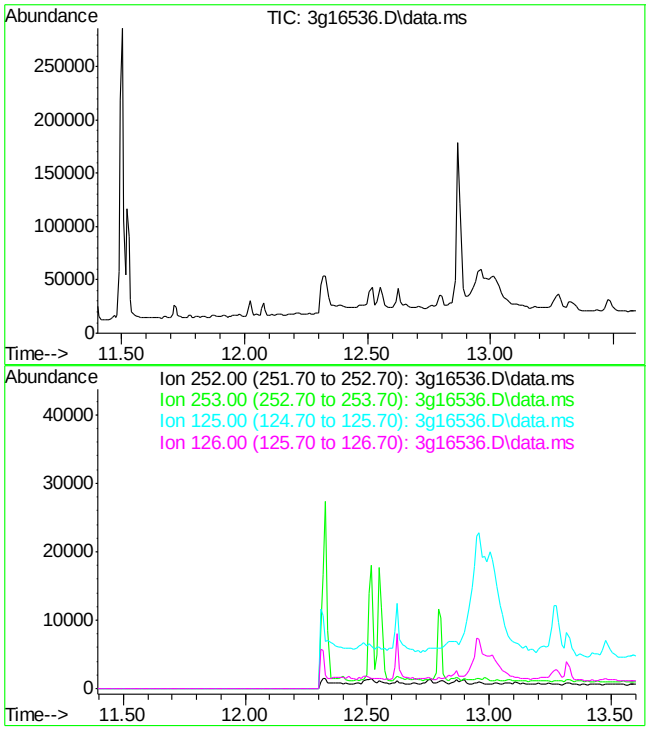


#24
Perylene-d12
Concen: 4.0000 ug/mL
RT: 12.865 min Scan# 1243
Delta R.T. 0.000 min
Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion:264 Resp: 131165

Ion	Ratio	Lower	Upper
264	100		
265	21.5	1.2	41.2
263	20.3	0.7	40.7



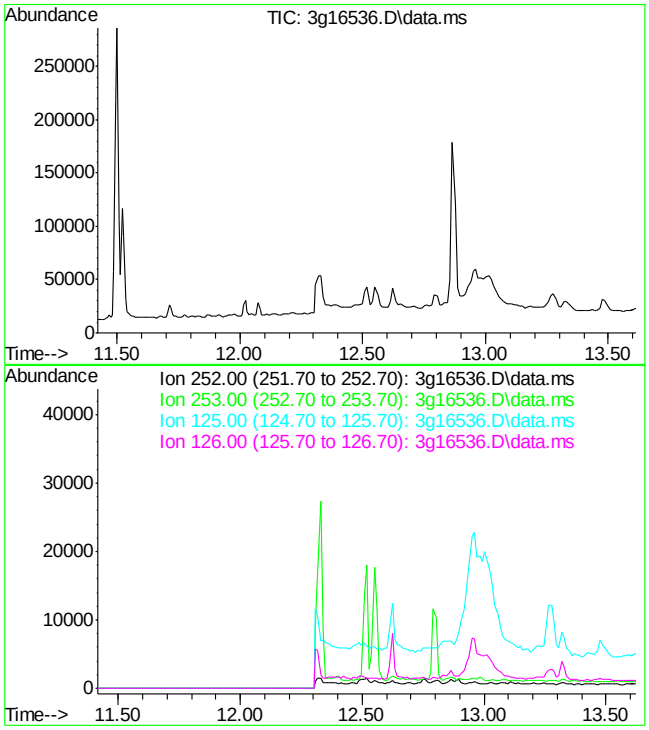


#25
Benzo(b)fluoranthene
Concen: N.D. ug/mL
Expected RT: 12.50 min

Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion: 252

Sig	Exp Ratio
252	100
253	51.5
125	13.2
126	46.9

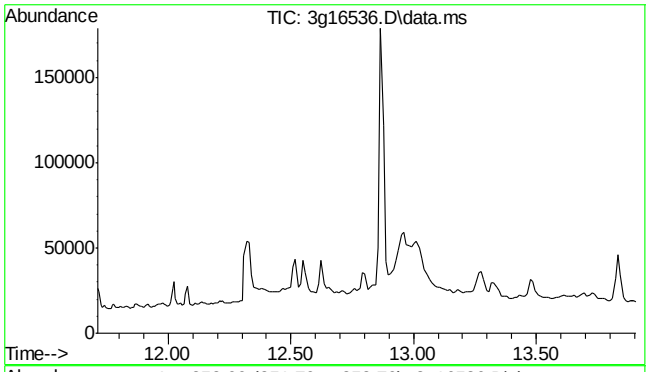


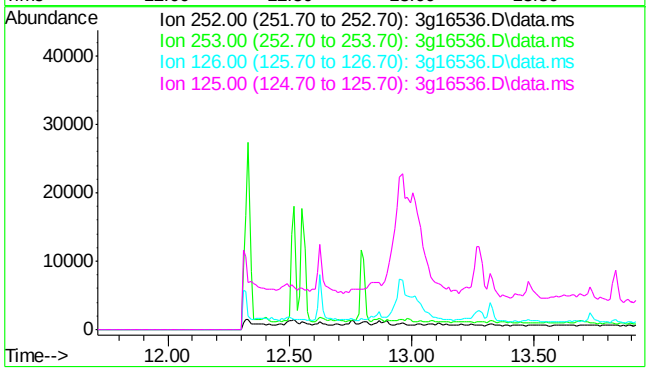
#26
Benzo(k)fluoranthene
Concen: N.D. ug/mL
Expected RT: 12.52 min

Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion: 252

Sig	Exp Ratio
252	100
253	37.3
125	9.6
126	34.1



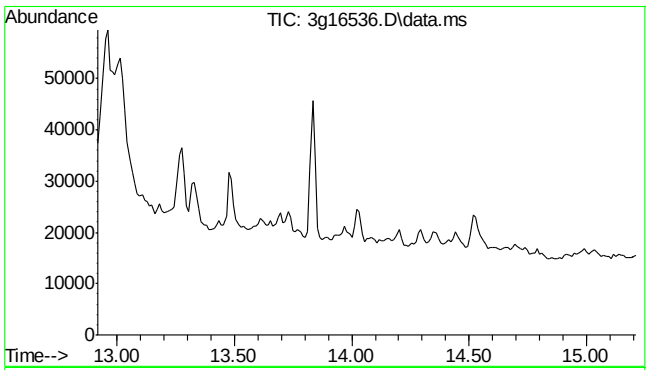


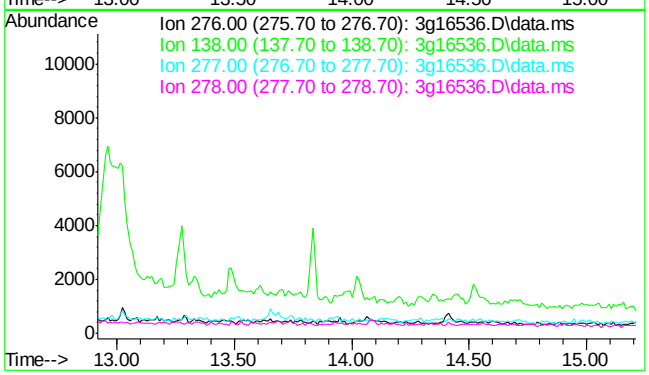
#27
Benzo(a)pyrene
Concen: N.D. ug/mL
Expected RT: 12.81 min

Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion: 252

Sig	Exp Ratio
252	100
253	21.5
126	20.4
125	14.5



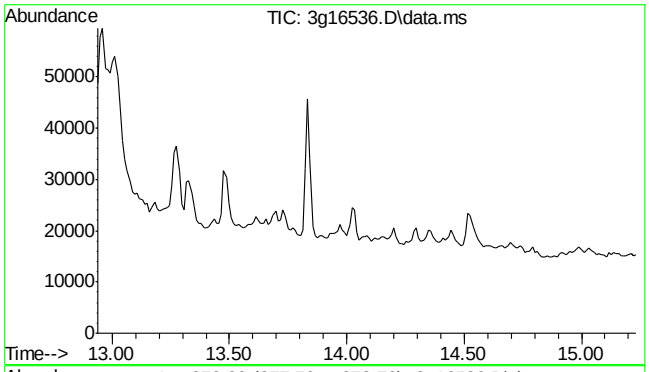


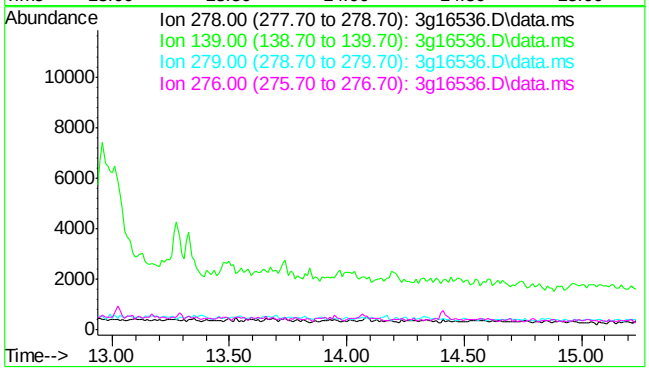
#28
Indeno(1,2,3-cd)pyrene
Concen: N.D. ug/mL
Expected RT: 14.06 min

Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion: 276

Sig	Exp Ratio
276	100
138	40.0
277	24.8
278	76.2



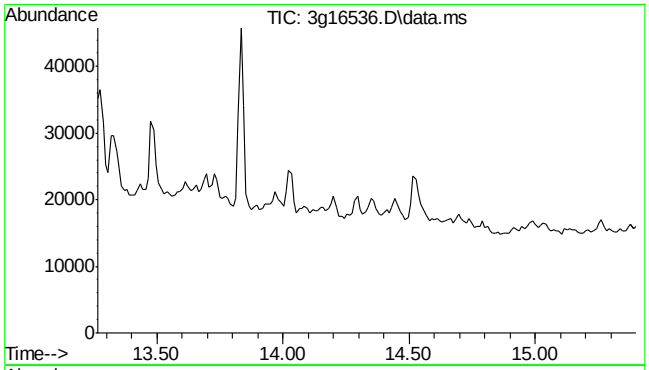


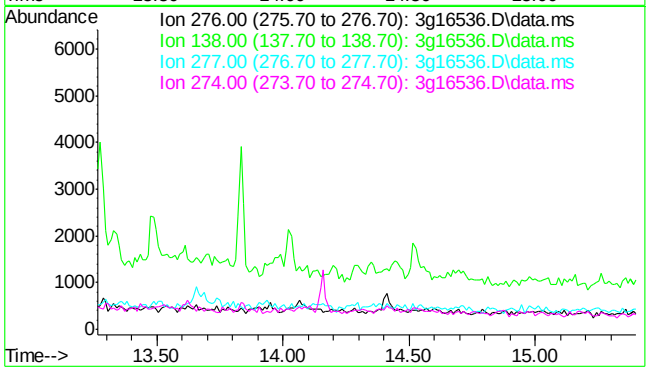
#29
Dibenz(a,h)anthracene
Concen: N.D. ug/mL
Expected RT: 14.09 min

Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion: 278

Sig	Exp Ratio
278	100
139	30.8
279	22.9
276	131.2





#30
Benzo(g,h,i)perylene
Concen: N.D. ug/mL
Expected RT: 14.41 min

Lab File: 3g16536.D
Acq: 3 Oct 13 8:32 pm

Tgt Ion: 276

Sig	Exp Ratio
276	100
138	35.1
277	23.3
274	21.5

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\100313\
Data File : 3g16517.D
Acq On : 3 Oct 2013 12:54 pm
Operator : DONC
Sample : OP8670-MB
Misc : OP8670,E3G817,30.00,,,1,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 04 13:28:03 2013
Quant Method : C:\msdchem\1\METHODS\SIMPE3G810.M
Quant Title : PAHSIM BASE
QLast Update : Tue Sep 24 08:29:29 2013
Response via : Initial Calibration

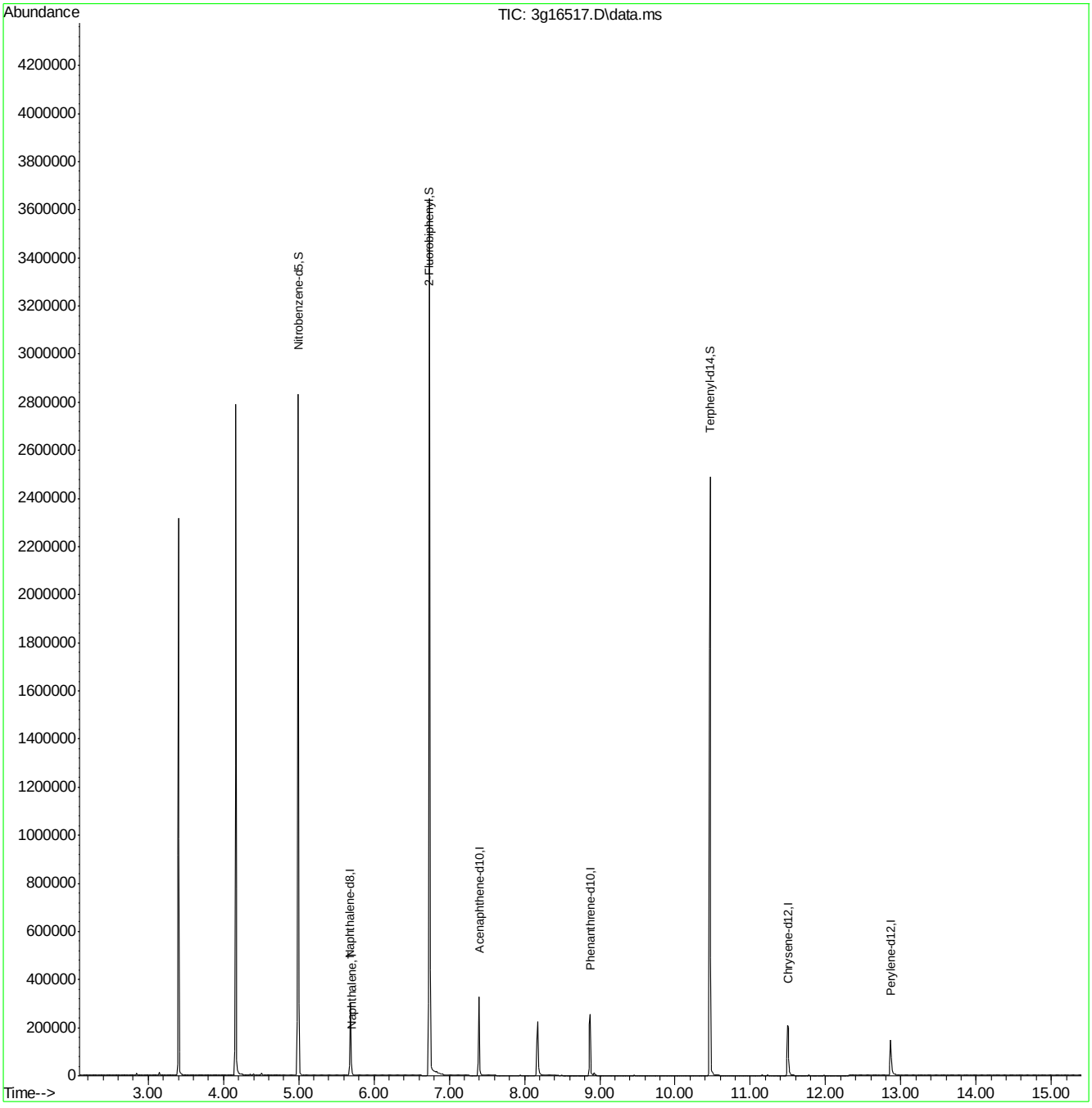
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Naphthalene-d8	5.682	136	217864	4.0000	ug/mL	0.00
6) Acenaphthene-d10	7.398	164	117785	4.0000	ug/mL	0.00
15) Phenanthrene-d10	8.873	188	188996	4.0000	ug/mL	0.00
19) Chrysene-d12	11.501	240	166287	4.0000	ug/mL	0.00
24) Perylene-d12	12.865	264	135532	4.0000	ug/mL	0.00
System Monitoring Compounds						
2) Nitrobenzene-d5	4.996	82	1331104	48.5730	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery = 97.14%			
7) 2-Fluorobiphenyl	6.736	172	2051275	44.6998	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery = 89.40%			
21) Terphenyl-d14	10.464	244	1754721	55.7722	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery = 111.54%			
Target Compounds						Qvalue
3) N-Nitrosodimethylamine	0.000	74	0	N.D.	d	
4) N-Nitrosodi-propylamine	0.000	70	0	N.D.	d	
5) Naphthalene	5.707	128	6089	0.0773	ug/mL	98
8) 2-Methylnaphthalene	6.380	142	1089	N.D.		
9) 1-Methylnaphthalene	6.480	142	479	N.D.		
10) Acenaphthylene	7.256	152	63	N.D.		
11) Acenaphthene	7.422	154	1060	N.D.		
12) Dibenzofuran	7.599	168	528	N.D.		
13) Fluorene	7.941	166	540	N.D.		
14) Diphenylamine	0.000	169	0	N.D.	d	
16) Phenanthrene	8.889	178	943	N.D.		
17) Anthracene	0.000	178	0	N.D.	d	
18) Fluoranthene	0.000	202	0	N.D.	d	
20) Pyrene	10.298	202	337	N.D.		
22) Benzo(a)anthracene	11.495	228	896	N.D.		
23) Chrysene	11.495	228	896	N.D.		
25) Benzo(b)fluoranthene	0.000	252	0	N.D.	d	
26) Benzo(k)fluoranthene	0.000	252	0	N.D.	d	
27) Benzo(a)pyrene	0.000	252	0	N.D.	d	
28) Indeno(1,2,3-cd)pyrene	0.000	276	0	N.D.	d	
29) Dibenz(a,h)anthracene	0.000	278	0	N.D.	d	
30) Benzo(g,h,i)perylene	0.000	276	0	N.D.	d	

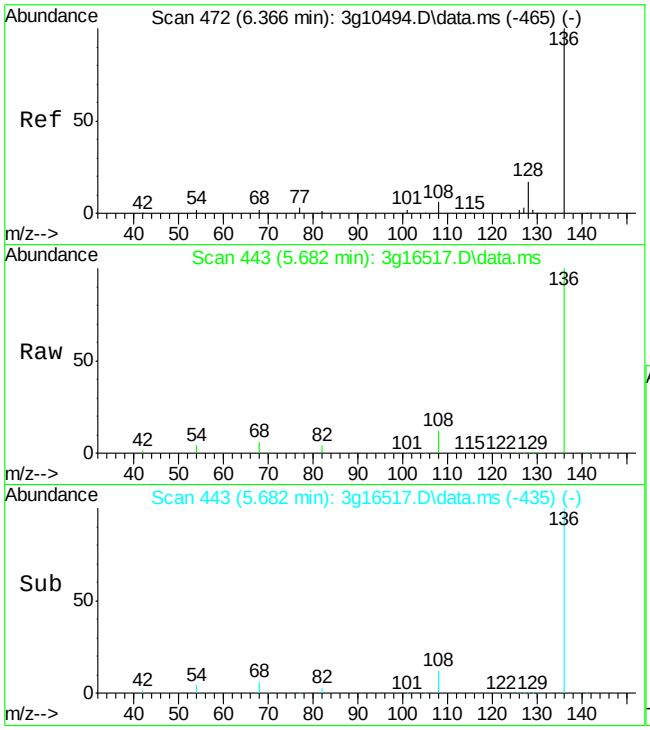
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\100313\
Data File : 3g16517.D
Acq On : 3 Oct 2013 12:54 pm
Operator : DONC
Sample : OP8670-MB
Misc : OP8670,E3G817,30.00,,,1,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 04 13:28:03 2013
Quant Method : C:\msdchem\1\METHODS\SIMPE3G810.M
Quant Title : PAHSIM BASE
QLast Update : Tue Sep 24 08:29:29 2013
Response via : Initial Calibration

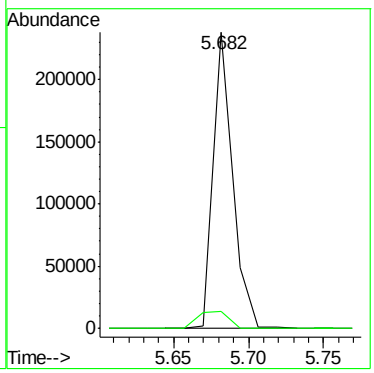


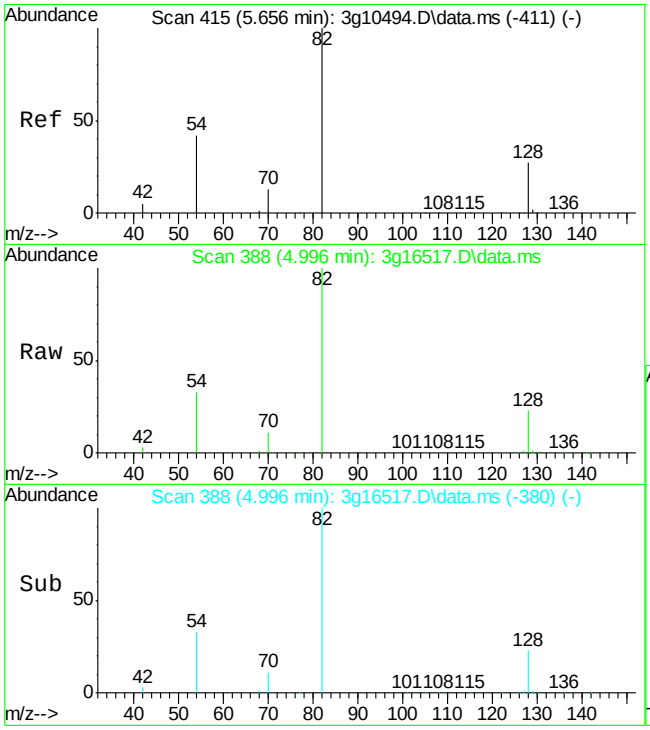


#1
Naphthalene-d8
Concen: 4.0000 ug/mL
RT: 5.682 min Scan# 443
Delta R.T. 0.000 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:136 Resp: 217864

Ion	Ratio	Lower	Upper
136	100		
68	8.8	0.0	21.1

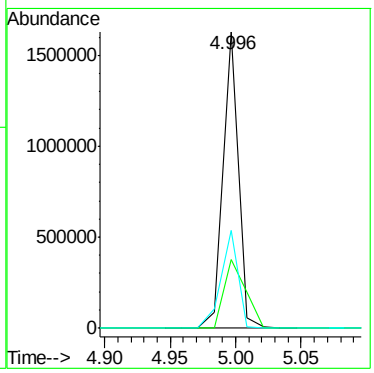


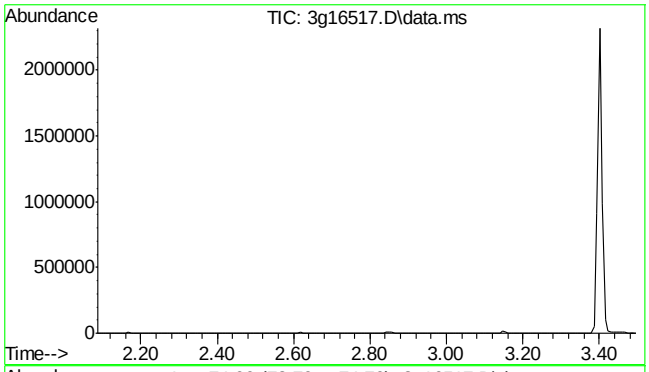


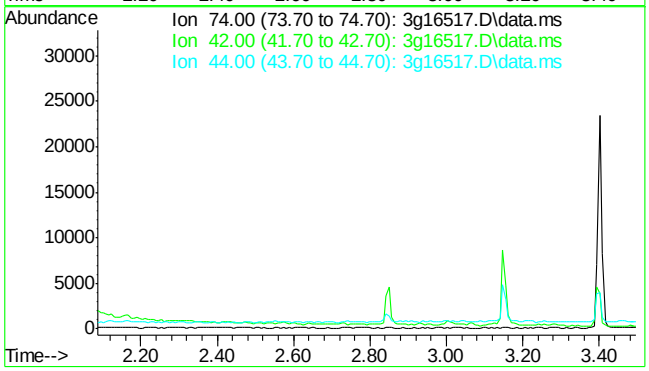
#2
Nitrobenzene-d5
Concen: 48.5730 ug/mL
RT: 4.996 min Scan# 388
Delta R.T. 0.000 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion: 82 Resp: 1331104

Ion	Ratio	Lower	Upper
82	100		
128	32.9	36.8	76.8#
54	36.6	40.5	80.5#





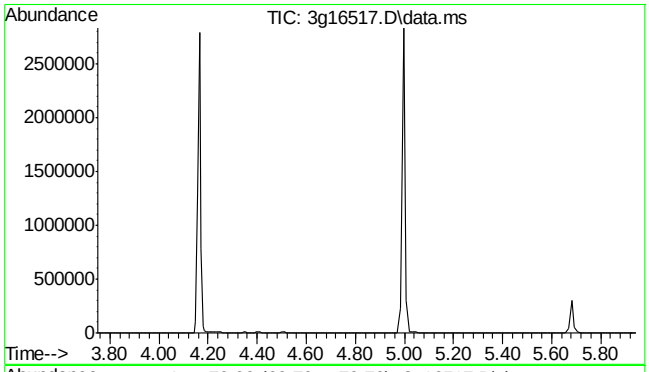


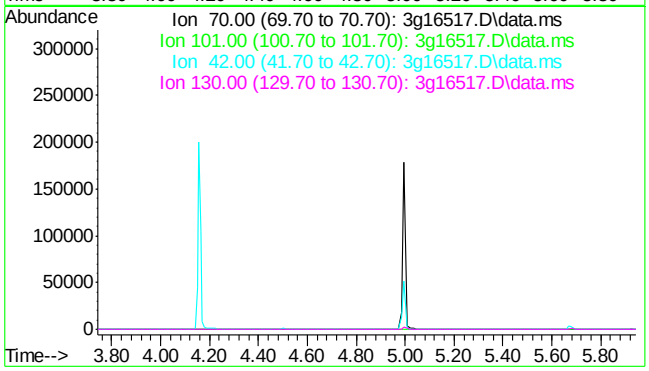
#3
N-Nitrosodimethylamine
Concen: N.D. ug/mL
Expected RT: 2.40 min

Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion: 74

Sig	Exp Ratio
74	100
42	78.5
44	4.0



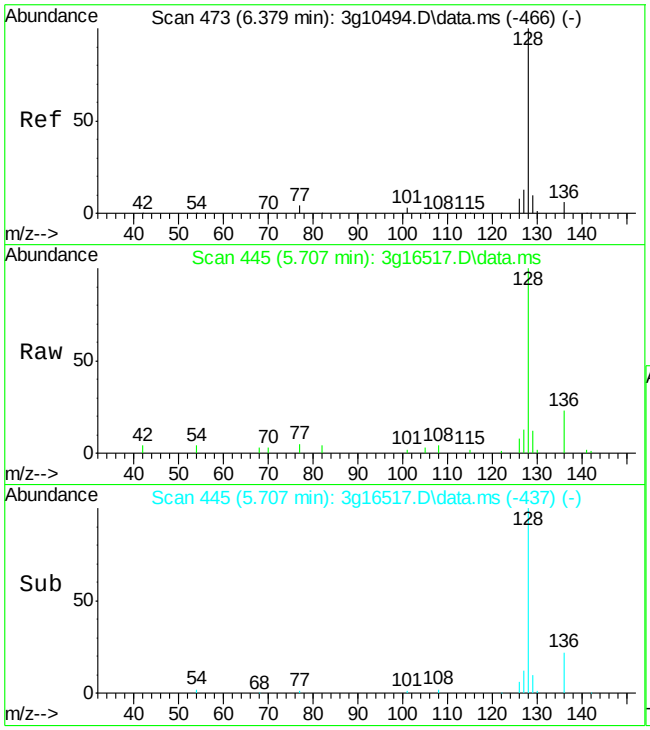


#4
N-Nitrosodi-propylamine
Concen: N.D. ug/mL
Expected RT: 4.85 min

Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion: 70

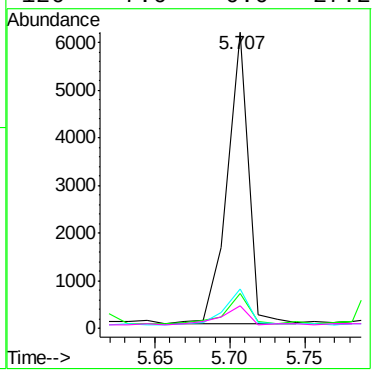
Sig	Exp Ratio
70	100
101	11.9
42	57.4
130	21.7

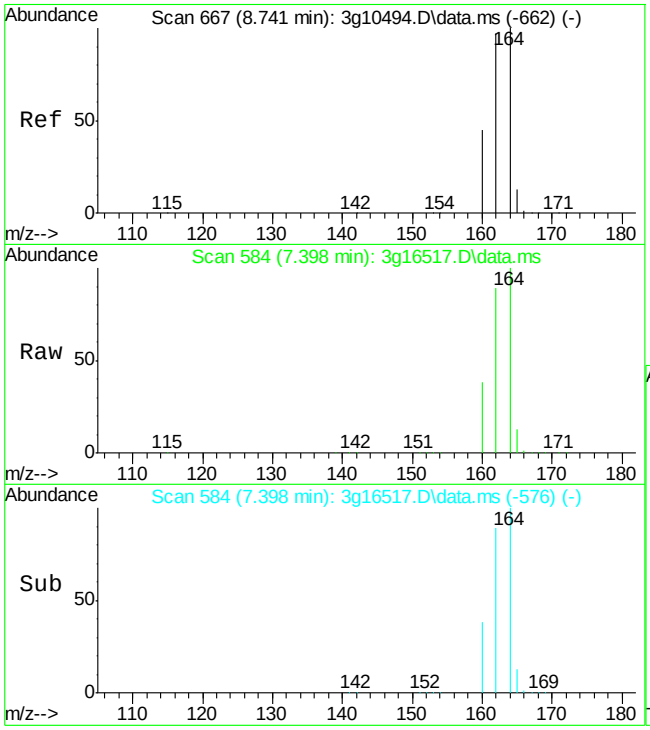


#5
Naphthalene
Concen: 0.0773 ug/mL
RT: 5.707 min Scan# 445
Delta R.T. 0.000 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:128 Resp: 6089

Ion	Ratio	Lower	Upper
128	100		
129	10.9	0.0	31.2
127	13.6	0.0	32.4
126	7.6	0.0	27.2

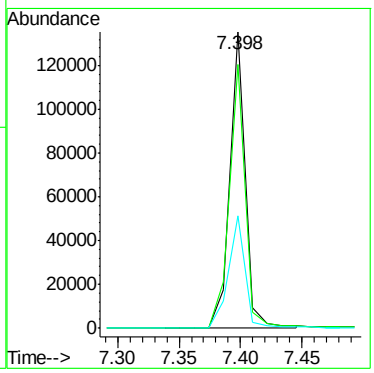


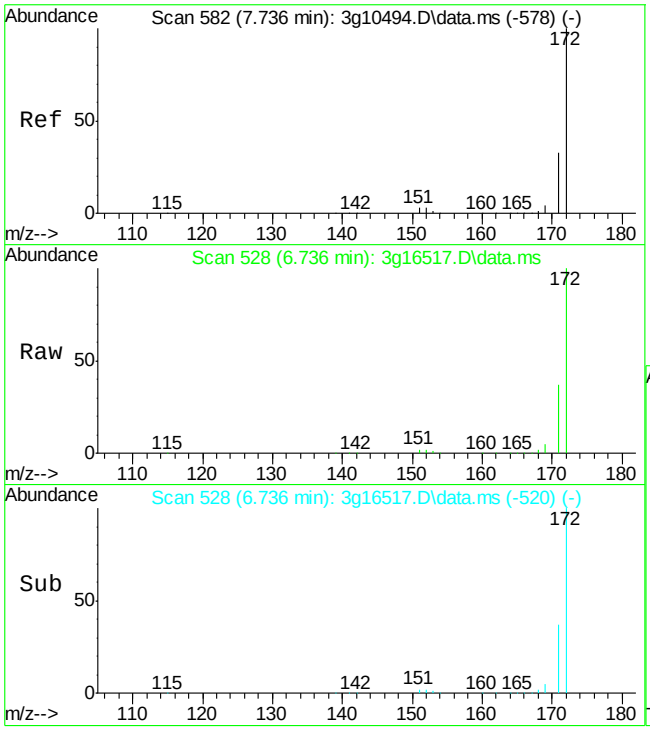


#6
Acenaphthene-d10
Concen: 4.0000 ug/mL
RT: 7.398 min Scan# 584
Delta R.T. 0.000 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:164 Resp: 117785

Ion	Ratio	Lower	Upper
164	100		
162	92.1	83.7	123.7
160	40.9	31.9	71.9

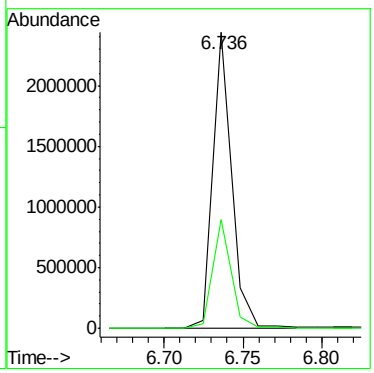


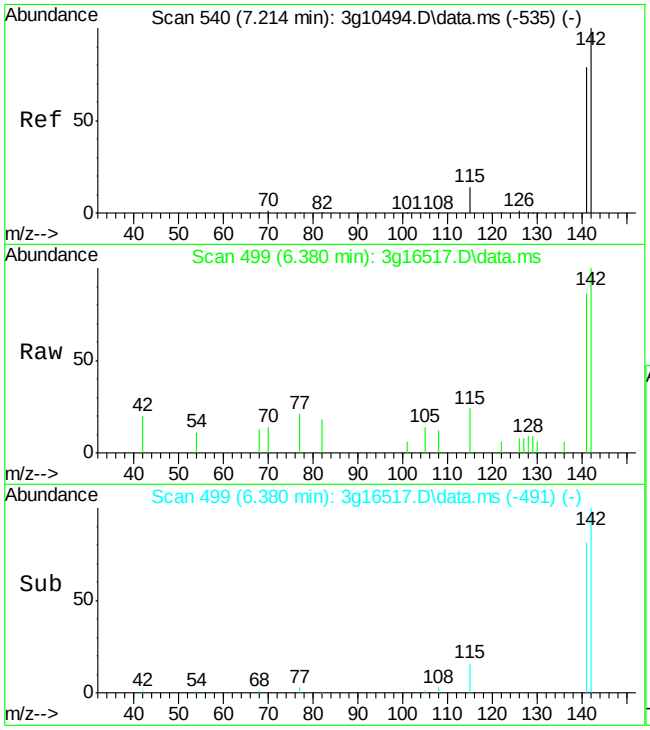


#7
2-Fluorobiphenyl
Concen: 44.6998 ug/mL
RT: 6.736 min Scan# 528
Delta R.T. 0.000 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:172 Resp: 2051275

Ion	Ratio	Lower	Upper
172	100		
171	36.0	12.2	52.2

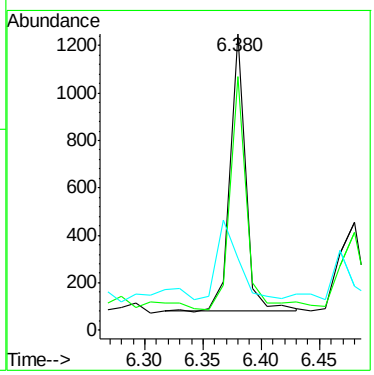


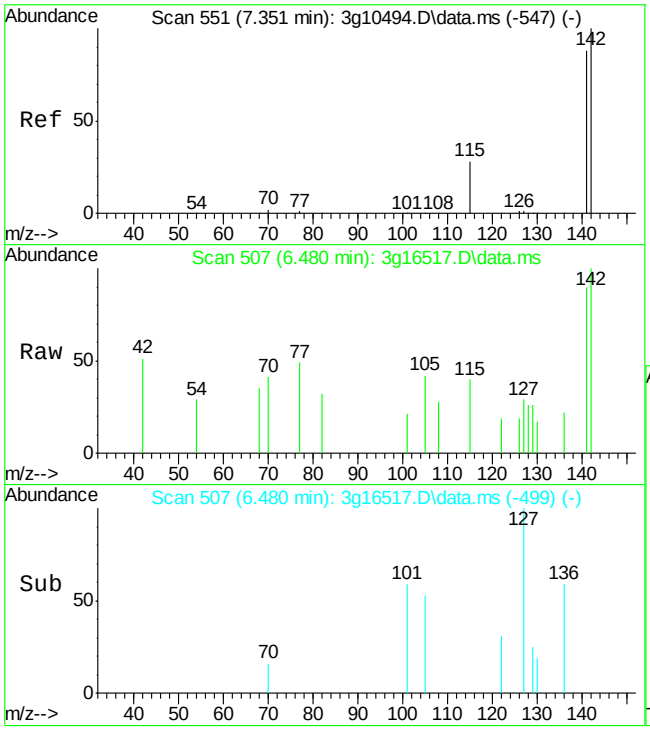


#8
2-Methylnaphthalene
Concen: Below ug/mL
RT: 6.380 min Scan# 499
Delta R.T. 0.000 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:142 Resp: 1089

Ion	Ratio	Lower	Upper
142	100		
141	86.3	62.0	102.0
115	39.8	11.3	51.3

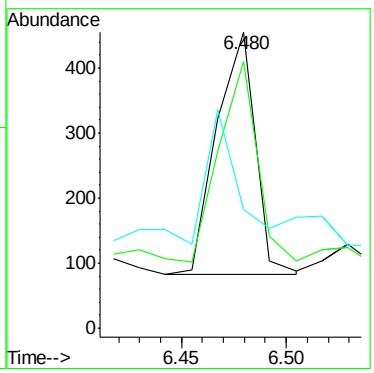


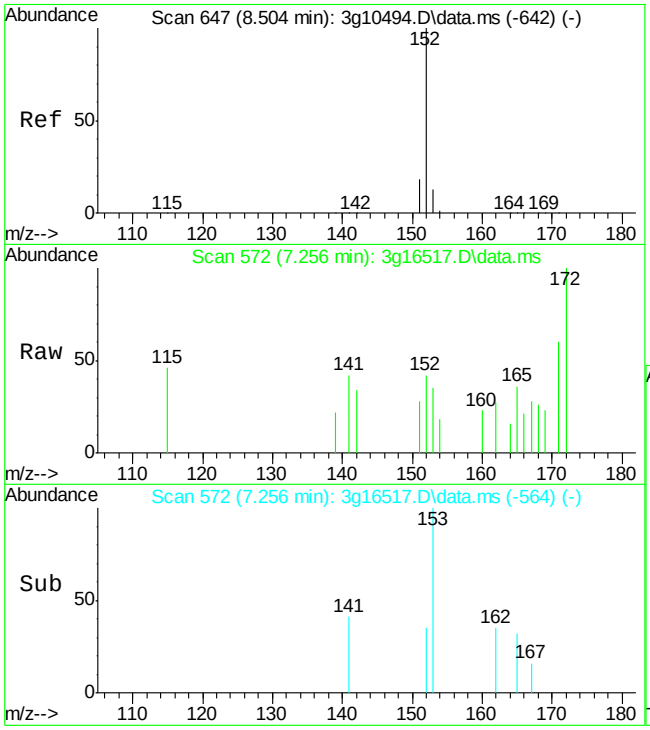


#9
1-Methylnaphthalene
Concen: Below ug/mL
RT: 6.480 min Scan# 507
Delta R.T. 0.000 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:142 Resp: 479

Ion	Ratio	Lower	Upper
142	100		
141	80.2	67.5	107.5
115	67.6	19.4	59.4#

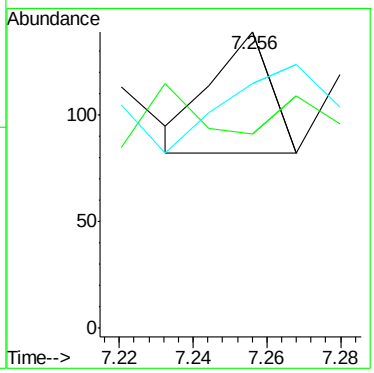


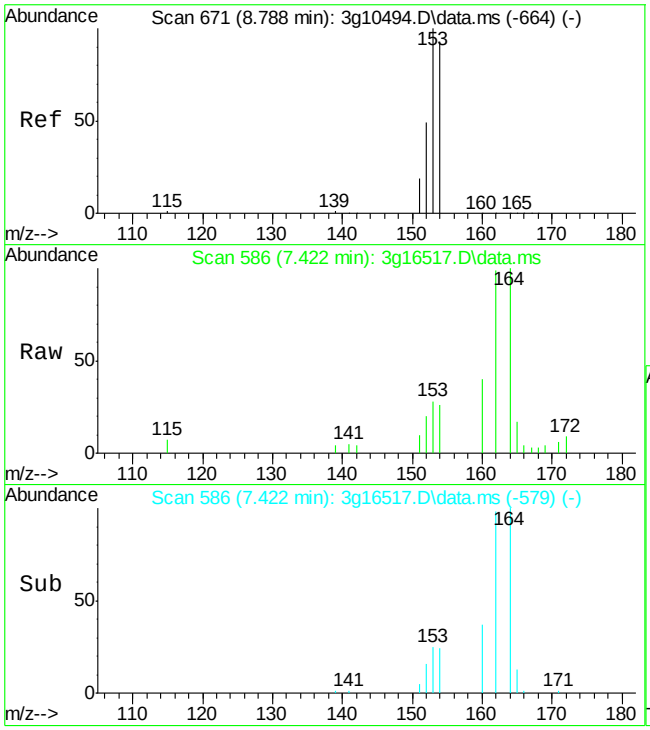


#10
Acenaphthylene
Concen: Below ug/mL
RT: 7.256 min Scan# 572
Delta R.T. 0.000 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:152 Resp: 63

Ion	Ratio	Lower	Upper
152	100		
151	76.2	0.0	39.2#
153	154.0	0.0	32.9#

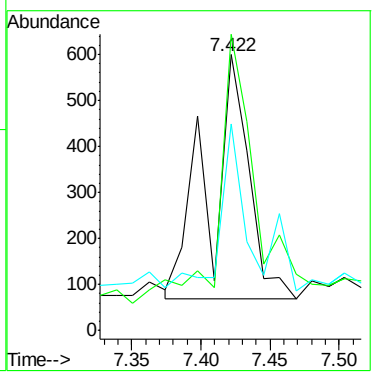


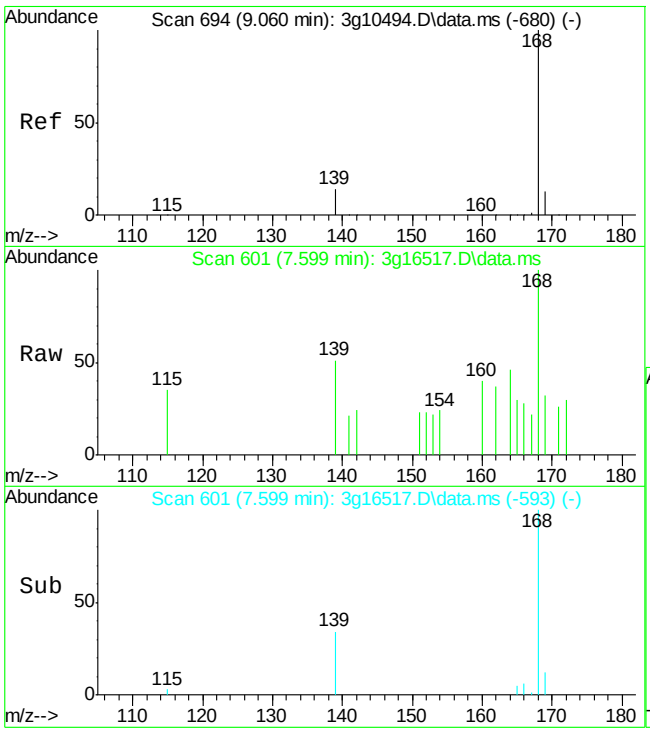


#11
Acenaphthene
Concen: Below ug/mL
RT: 7.422 min Scan# 586
Delta R.T. -0.012 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:154 Resp: 1060

Ion	Ratio	Lower	Upper
154	100		
153	82.0	82.4	122.4#
152	37.2	30.0	70.0

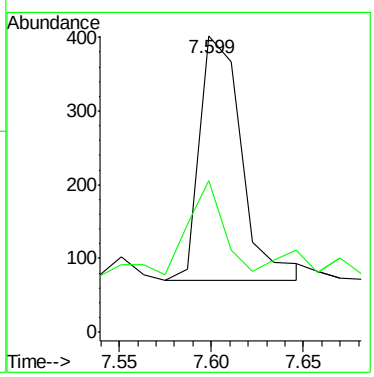


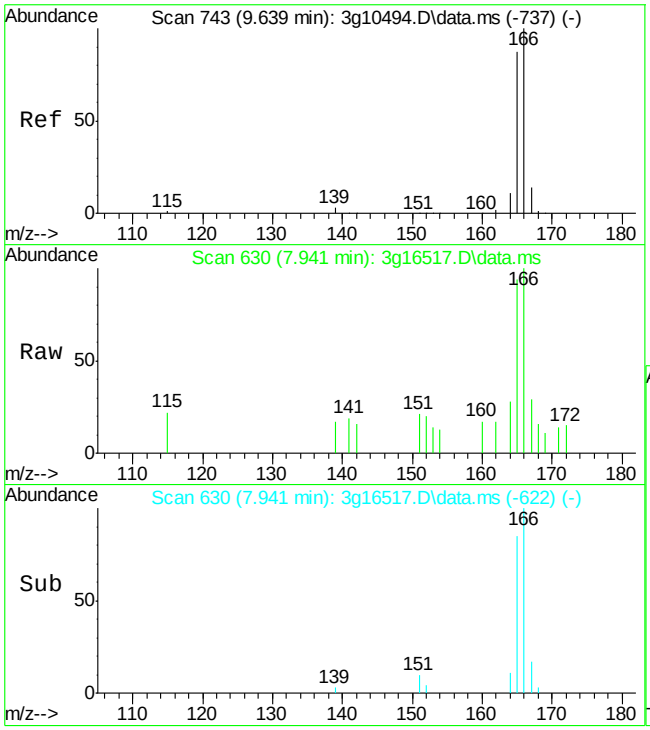


#12
Dibenzofuran
Concen: Below ug/mL
RT: 7.599 min Scan# 601
Delta R.T. 0.000 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:168 Resp: 528

Ion	Ratio	Lower	Upper
168	100		
139	36.7	13.4	53.4

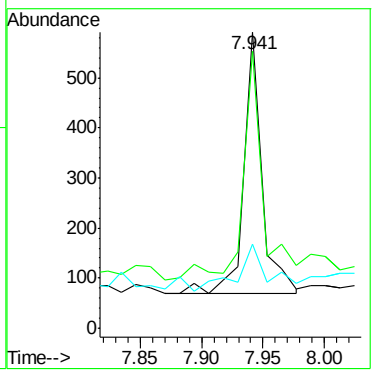


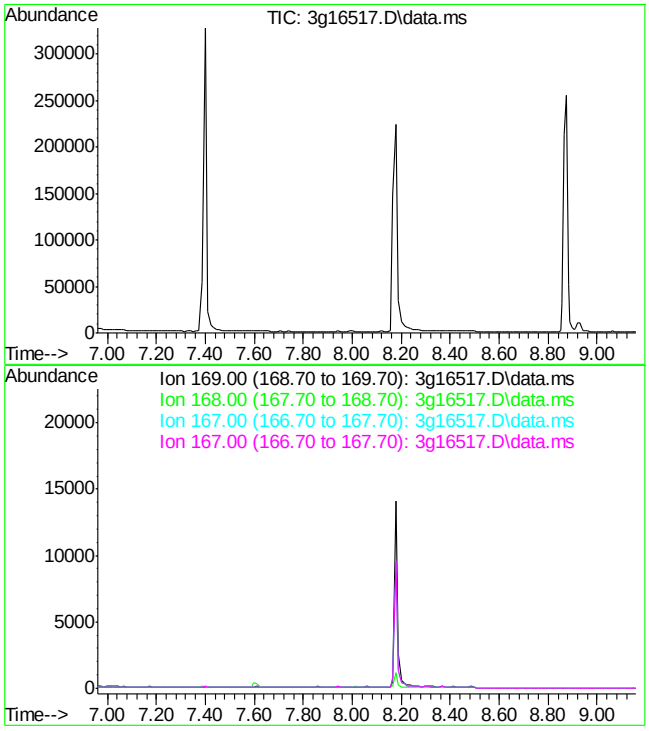


#13
Fluorene
Concen: Below ug/mL
RT: 7.941 min Scan# 630
Delta R.T. 0.000 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:166 Resp: 540

Ion	Ratio	Lower	Upper
166	100		
165	95.4	72.0	112.0
167	31.3	0.0	33.1



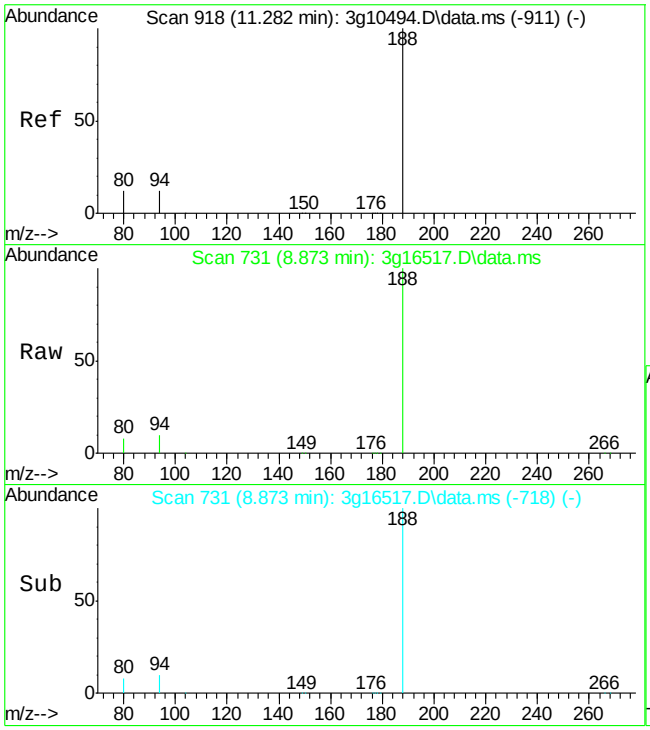


#14
Diphenylamine
Concen: N.D. ug/mL
Expected RT: 8.06 min

Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion: 169

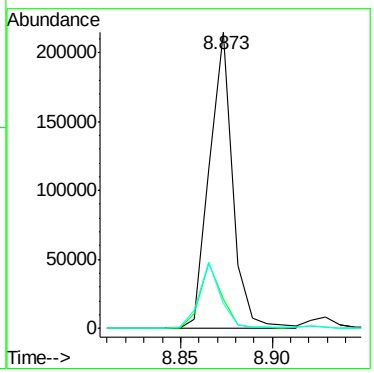
Sig	Exp Ratio
169	100
168	61.7
167	34.1
167	34.1

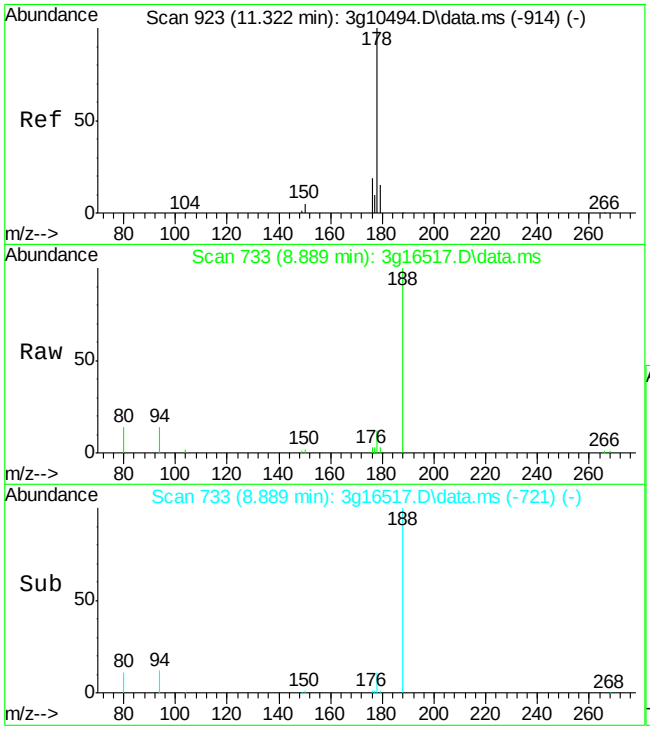


#15
Phenanthrene-d10
Concen: 4.0000 ug/mL
RT: 8.873 min Scan# 731
Delta R.T. 0.001 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:188 Resp: 188996

Ion	Ratio	Lower	Upper
188	100		
94	20.9	0.0	28.3
80	20.8	0.0	27.8

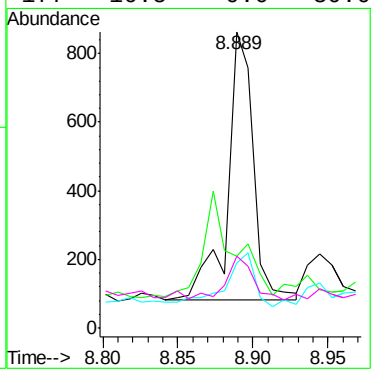


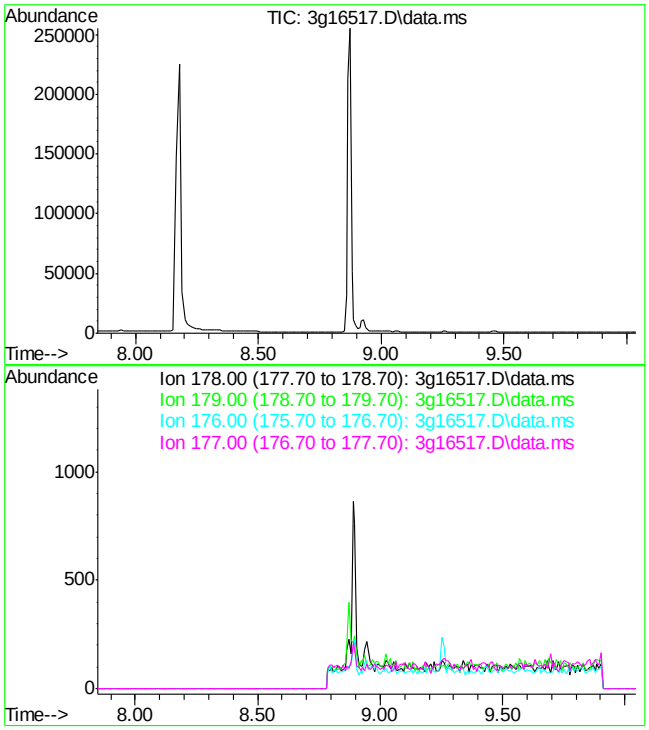


#16
Phenanthrene
Concen: Below ug/mL
RT: 8.889 min Scan# 733
Delta R.T. -0.007 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:178 Resp: 943

Ion	Ratio	Lower	Upper
178	100		
179	47.3	0.0	35.2#
176	23.6	0.0	38.6
177	16.5	0.0	30.0



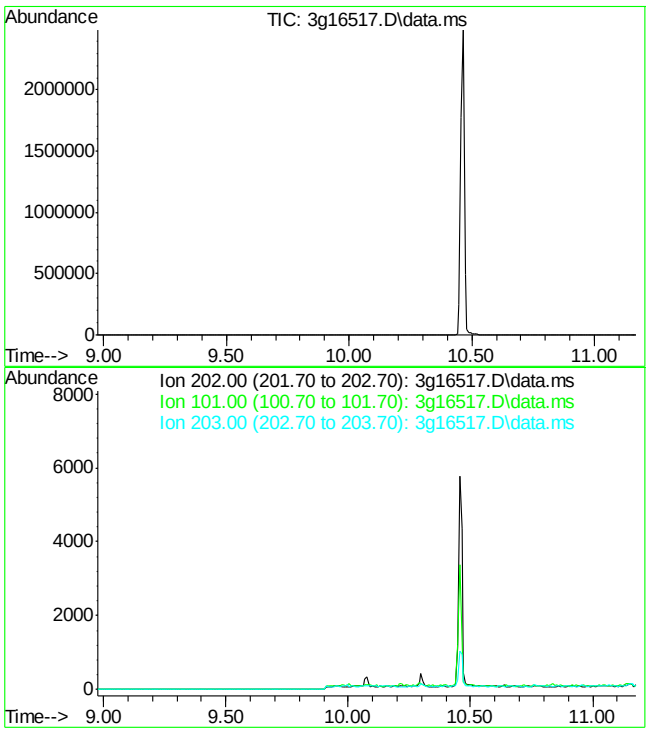


#17
Anthracene
Concen: N.D. ug/mL
Expected RT: 8.94 min

Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion: 178

Sig	Exp Ratio
178	100
179	15.1
176	18.2
177	8.7

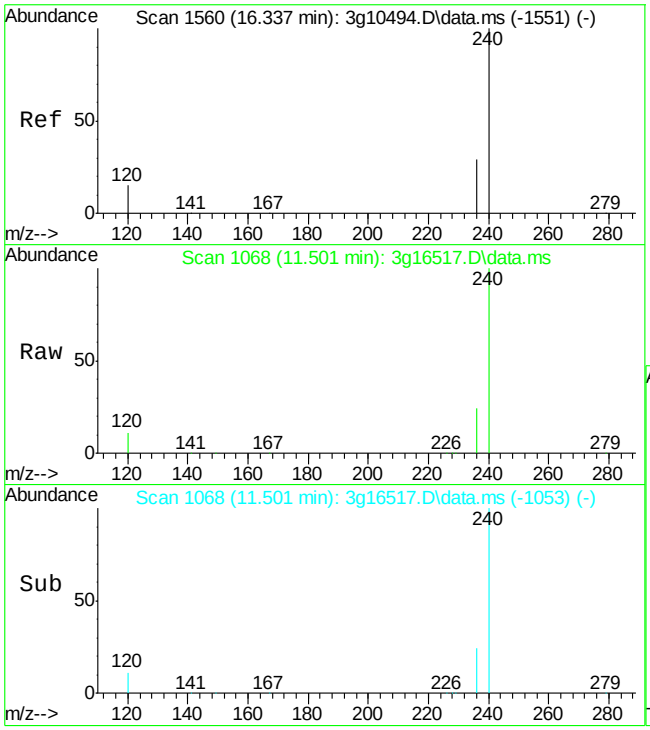


#18
Fluoranthene
Concen: N.D. ug/mL
Expected RT: 10.07 min

Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion: 202

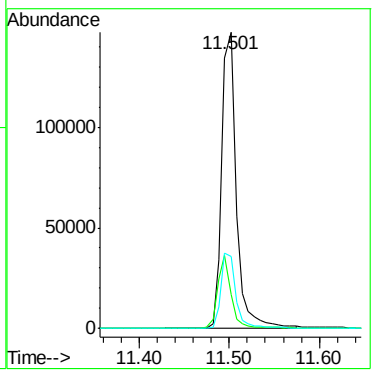
Sig	Exp Ratio
202	100
101	12.6
203	17.4

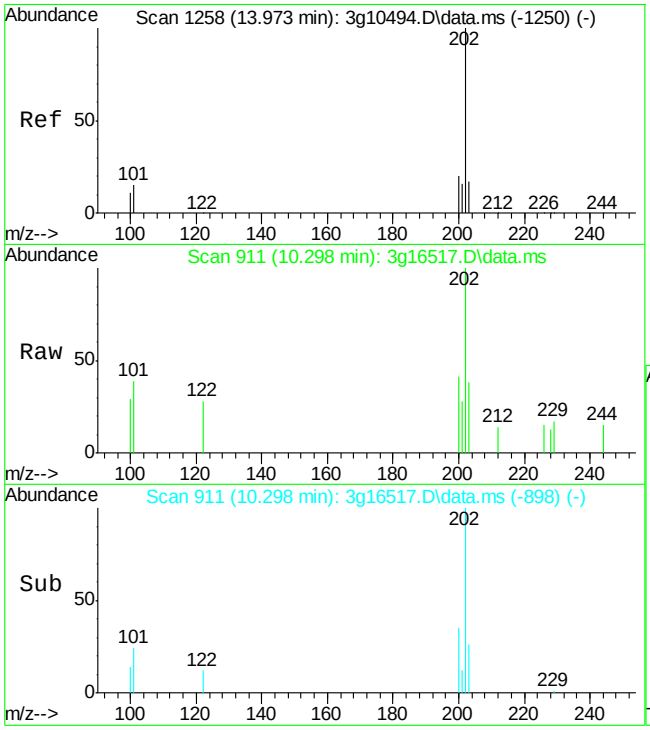


#19
Chrysene-d12
Concen: 4.0000 ug/mL
RT: 11.501 min Scan# 1068
Delta R.T. 0.000 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:240 Resp: 166287

Ion	Ratio	Lower	Upper
240	100		
120	22.3	0.2	40.2
236	25.7	8.8	48.8

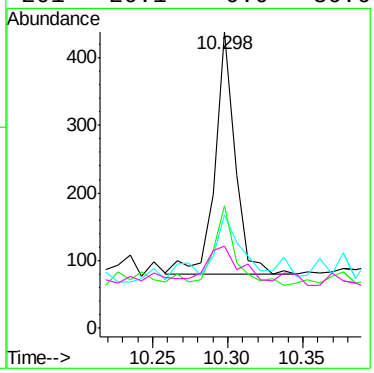


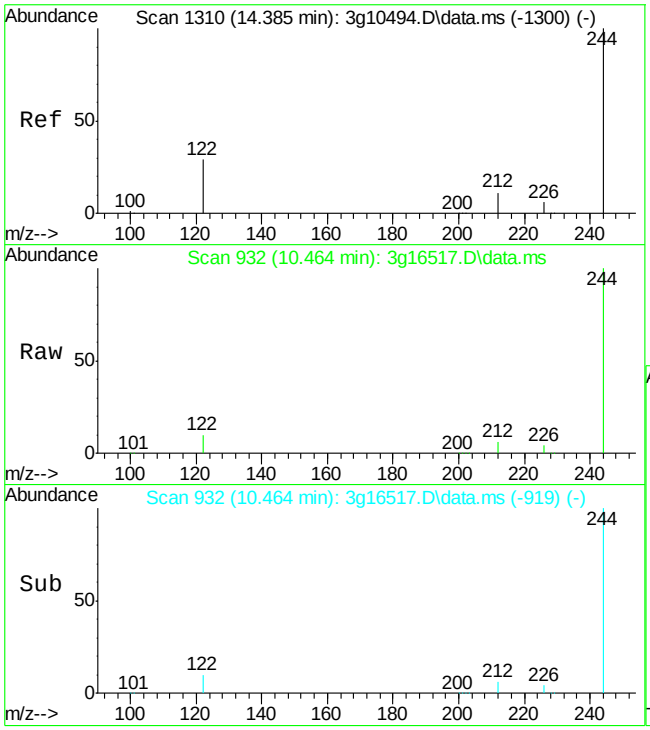


#20
Pyrene
Concen: Below ug/mL
RT: 10.298 min Scan# 911
Delta R.T. 0.001 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:202 Resp: 337

Ion	Ratio	Lower	Upper
202	100		
200	35.3	0.2	40.2
203	49.9	0.0	37.8#
201	26.1	0.0	36.6

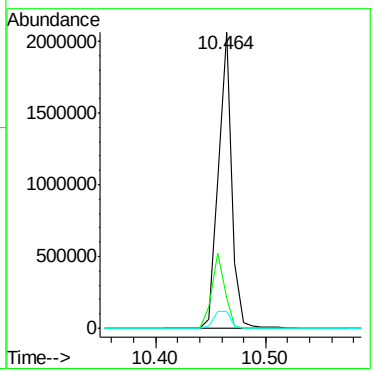


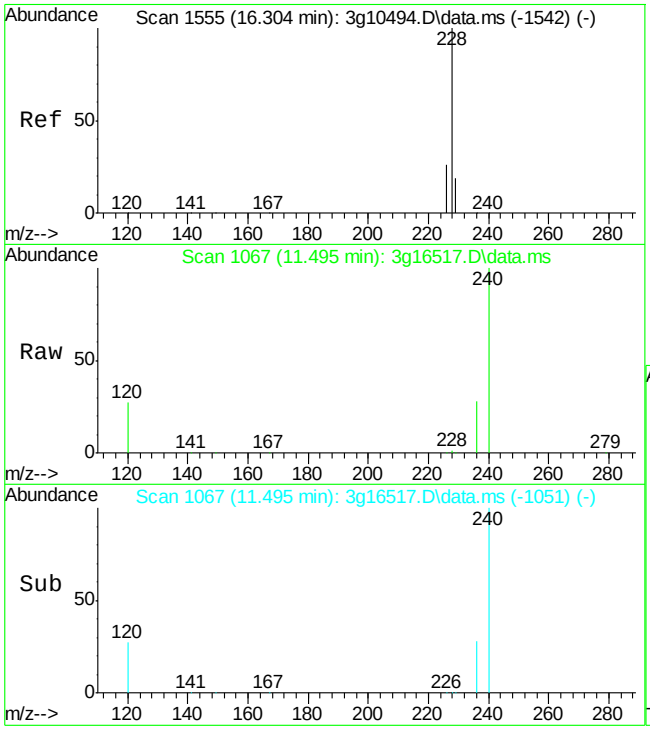


#21
Terphenyl-d14
Concen: 55.7722 ug/mL
RT: 10.464 min Scan# 932
Delta R.T. 0.001 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:244 Resp: 1754721

Ion	Ratio	Lower	Upper
244	100		
122	24.9	7.8	47.8
212	7.3	0.0	32.8

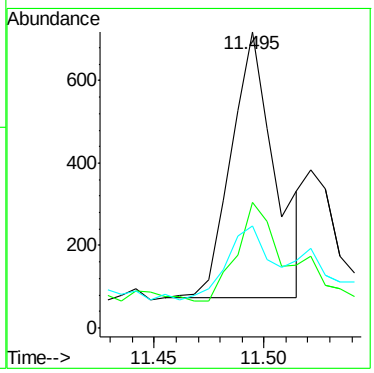


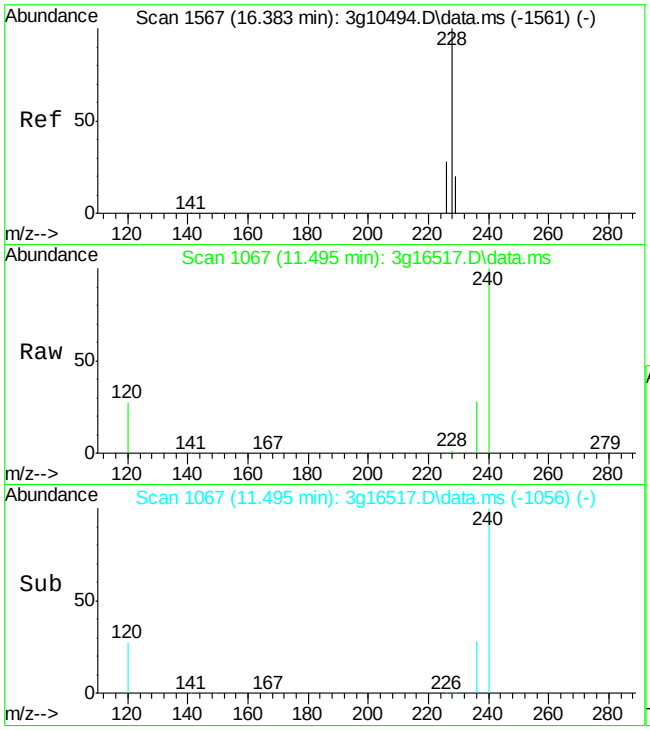


#22
Benzo(a)anthracene
Concen: Below ug/mL
RT: 11.495 min Scan# 1067
Delta R.T. 0.007 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:228 Resp: 896

Ion	Ratio	Lower	Upper
228	100		
229	43.1	0.0	39.4#
226	27.5	6.6	46.6

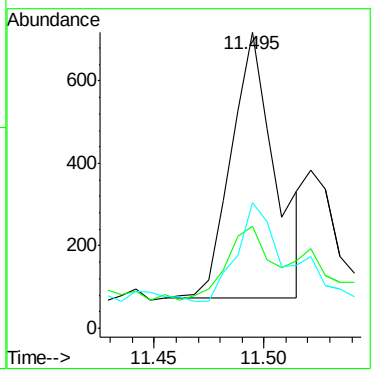


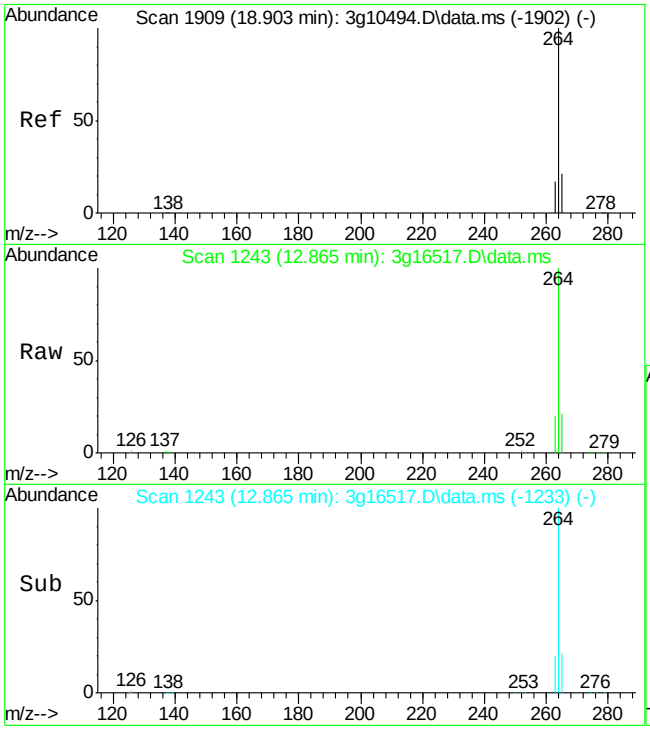


#23
Chrysene
Concen: Below ug/mL
RT: 11.495 min Scan# 1067
Delta R.T. -0.026 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:228 Resp: 896

Ion	Ratio	Lower	Upper
228	100		
226	27.5	8.6	48.6
229	43.1	0.0	39.4#

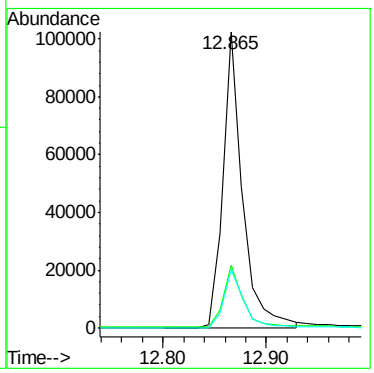


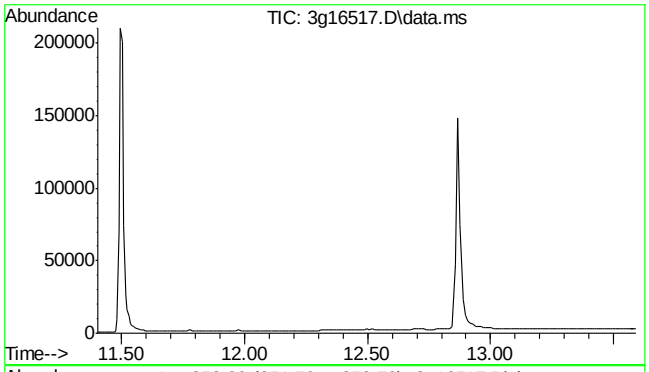


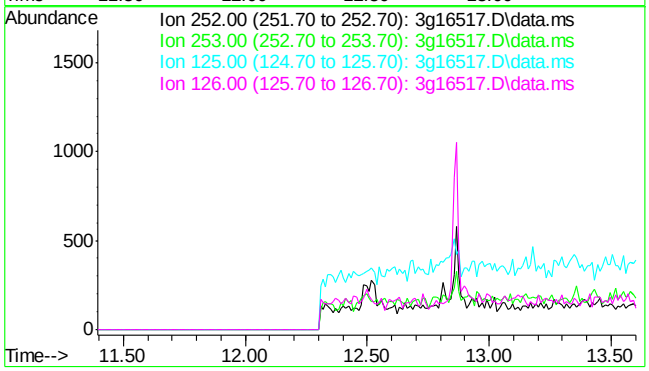
#24
Perylene-d12
Concen: 4.0000 ug/mL
RT: 12.865 min Scan# 1243
Delta R.T. 0.000 min
Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion:264 Resp: 135532

Ion	Ratio	Lower	Upper
264	100		
265	21.0	1.2	41.2
263	20.2	0.7	40.7





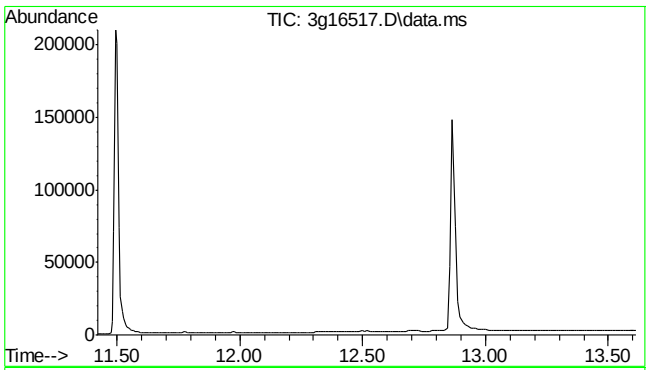


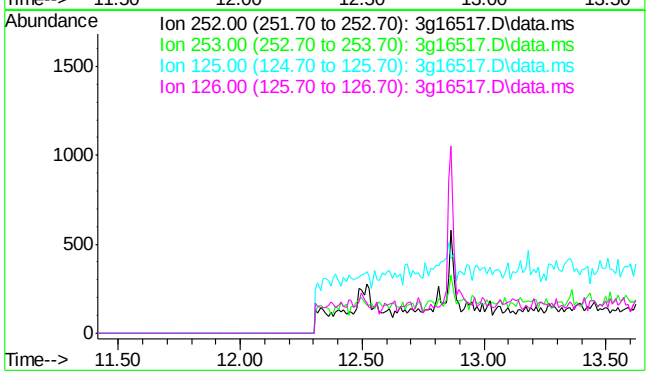
#25
Benzo(b)fluoranthene
Concen: N.D. ug/mL
Expected RT: 12.50 min

Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion: 252

Sig	Exp Ratio
252	100
253	51.5
125	13.2
126	46.9



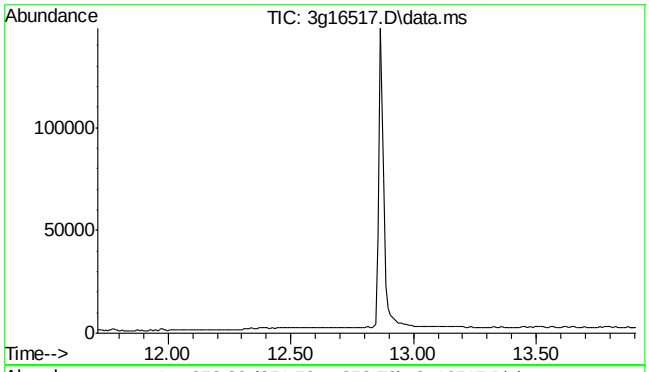


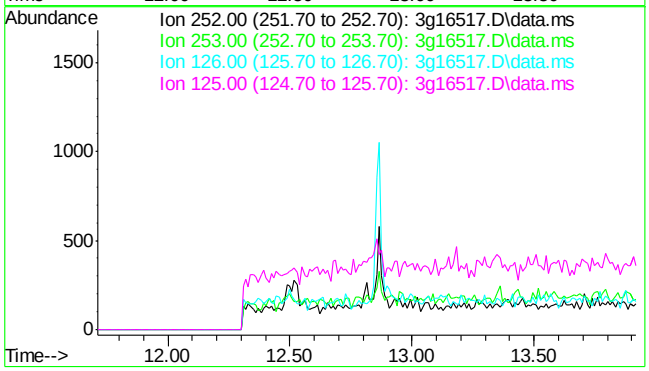
#26
Benzo(k)fluoranthene
Concen: N.D. ug/mL
Expected RT: 12.52 min

Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion: 252

Sig	Exp Ratio
252	100
253	37.3
125	9.6
126	34.1



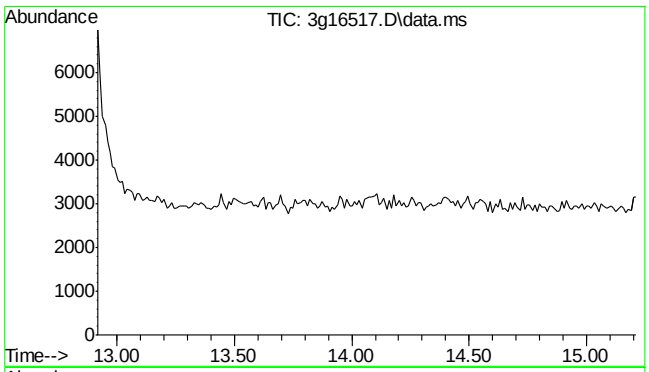


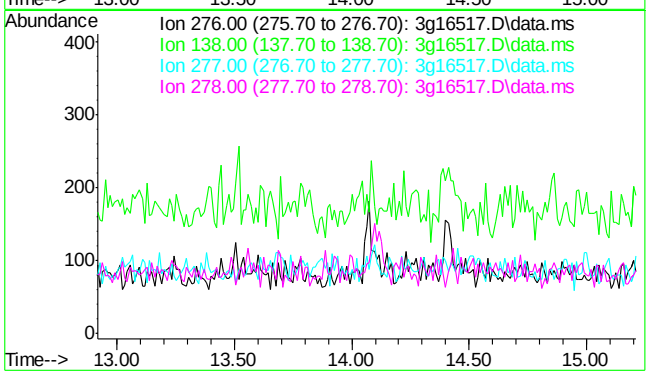
#27
Benzo(a)pyrene
Concen: N.D. ug/mL
Expected RT: 12.81 min

Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion: 252

Sig	Exp Ratio
252	100
253	21.5
126	20.4
125	14.5



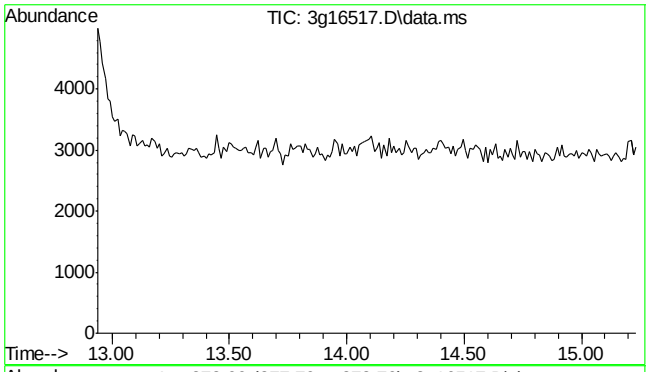


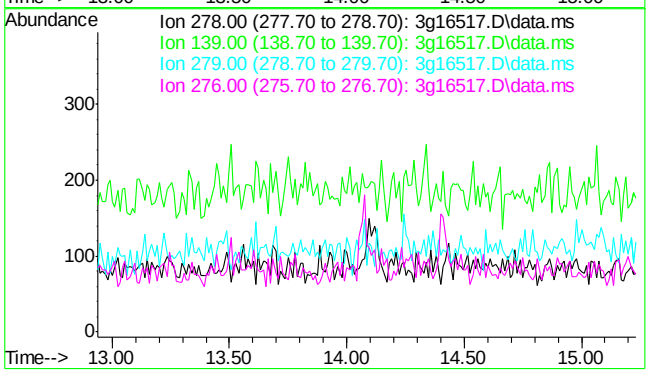
#28
Indeno(1,2,3-cd)pyrene
Concen: N.D. ug/mL
Expected RT: 14.06 min

Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion: 276

Sig	Exp Ratio
276	100
138	40.0
277	24.8
278	76.2



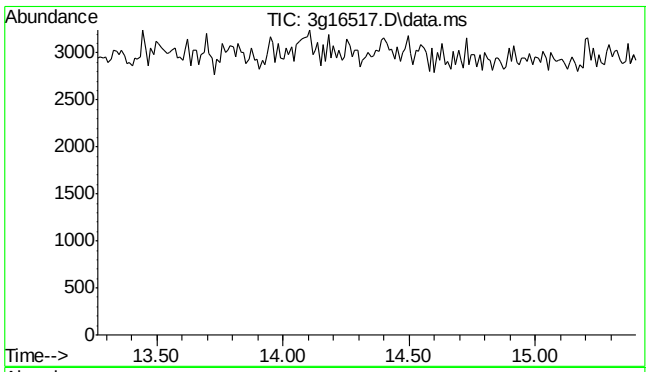


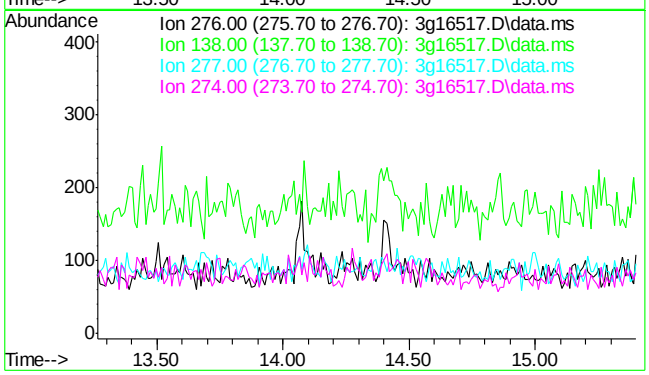
#29
Dibenz(a,h)anthracene
Concen: N.D. ug/mL
Expected RT: 14.09 min

Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion: 278

Sig	Exp Ratio
278	100
139	30.8
279	22.9
276	131.2





#30
Benzo(g,h,i)perylene
Concen: N.D. ug/mL
Expected RT: 14.41 min

Lab File: 3g16517.D
Acq: 3 Oct 13 12:54 pm

Tgt Ion: 276

Sig	Exp Ratio
276	100
138	35.1
277	23.3
274	21.5

Mountain States ACCUTEST LABORATORIES

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D51202
Account: XTOKRWR XTO Energy
Project: FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB1231-MB	GB22388.D	1	10/02/13	EV	n/a	n/a	GGB1231

The QC reported here applies to the following samples: **Method:** SW846 8015B

D51202-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	10	5.0	mg/kg	

CAS No.	Surrogate Recoveries		Limits
120-82-1	1,2,4-Trichlorobenzene	85%	60-140%

Blank Spike Summary

Job Number: D51202
Account: XTOKRWR XTO Energy
Project: FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB1231-BS	GB22387.D	1	10/02/13	EV	n/a	n/a	GGB1231

The QC reported here applies to the following samples: **Method:** SW846 8015B

D51202-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	110	116	105	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	92%	60-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D51202
Account: XTOKRWR XTO Energy
Project: FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D51200-1MS	GB22391.D	1	10/02/13	EV	n/a	n/a	GGB1231
D51200-1MSD	GB22392.D	1	10/02/13	EV	n/a	n/a	GGB1231
D51200-1	GB22390.D	1	10/02/13	EV	n/a	n/a	GGB1231

The QC reported here applies to the following samples: **Method:** SW846 8015B

D51202-1

CAS No.	Compound	D51200-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND		149	156	105	157	105	1	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D51200-1	Limits
120-82-1	1,2,4-Trichlorobenzene	93%	93%	86%	60-140%

10.3.1
10

* = Outside of Control Limits.

Mountain States ACCUTEST LABORATORIES

GC Volatiles

Raw Data

Manual Integrations APPROVED
(compounds with "m" flag)
Judy Melson
10/07/13 13:45

Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\100213\GB22394.D\FID1A.CH Vial: 9
Signal #2 : Y:\1\DATA\100213\GB22394.D\FID2B.CH
Acq On : 2 Oct 2013 8:23 pm Operator: ELISEV
Sample : D51202-1 Inst : GC/MS Ins
Misc : GC3914,GGB1231,5.063,,100,5,1 Multiplr: 1.00
IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E
Quant Time: Oct 03 08:08:10 2013 Quant Results File: TB1125GB1125SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB1125GB1125SOIL.M (Chemstation Integrator)
Title : 8015B/8021B TVH/BTEX
Last Update : Thu Oct 03 08:07:23 2013
Response via : Initial Calibration
DataAcq Meth : TVB4.M

Volume Inj. :
Signal #1 Phase : DB-624 Signal #2 Phase: DB-624
Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm

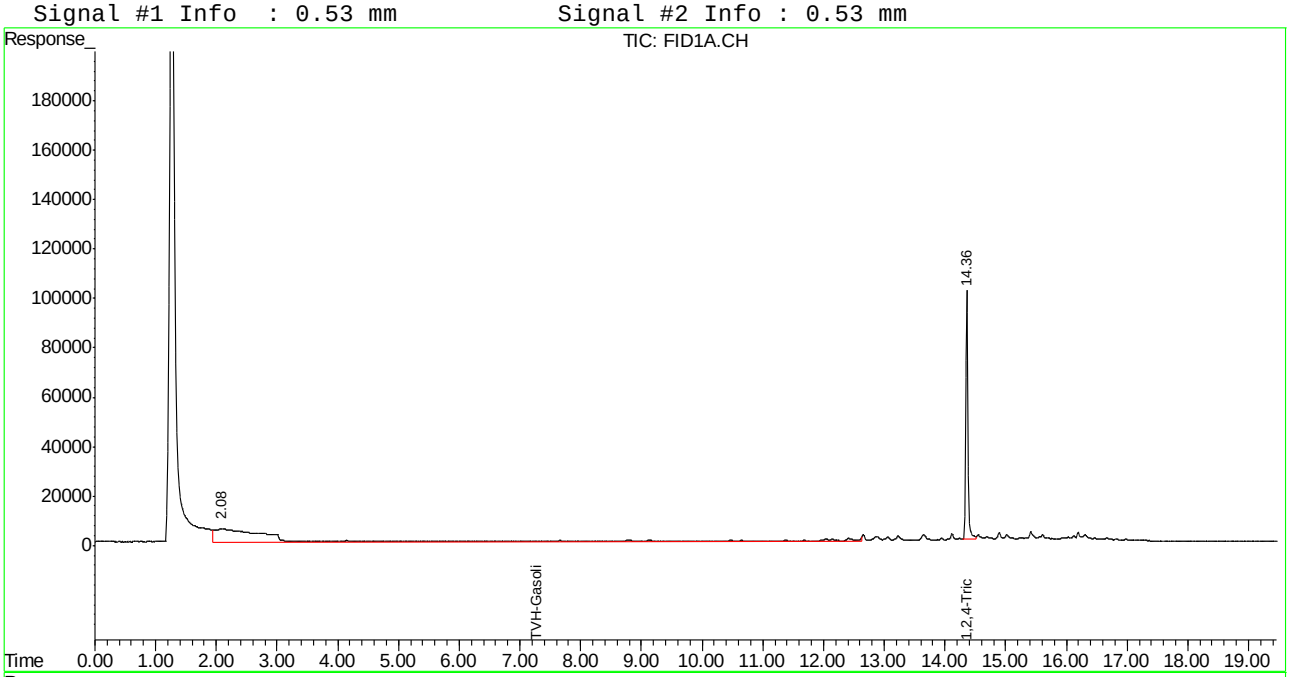
	Compound	R.T.	Response	Conc	Units	
	System Monitoring Compounds					
2) S	1,2,4-Trichlorobenzene	14.36	2445105	80.934	%	m
10) S	1,2,4-Trichlorobenzene (P)	14.36	11347168	85.931	%	m
	Target Compounds					
1) H	TVH-Gasoline	7.28	3716830	0.053	mg/L	
4) T	Methyl-t-butyl-ether	0.00	0	N.D.	ug/L	d
5) T	Benzene	0.00	0	N.D.	ug/L	d
6) T	Toluene	0.00	0	N.D.	ug/L	d
7) T	Ethylbenzene	0.00	0	N.D.	ug/L	d
8) T	m,p-Xylene	10.47	95202	0.252	ug/L	
9) T	o-Xylene	0.00	0	N.D.	ug/L	d
11) T	Naphthalene	14.54	81678	0.474	ug/L	m

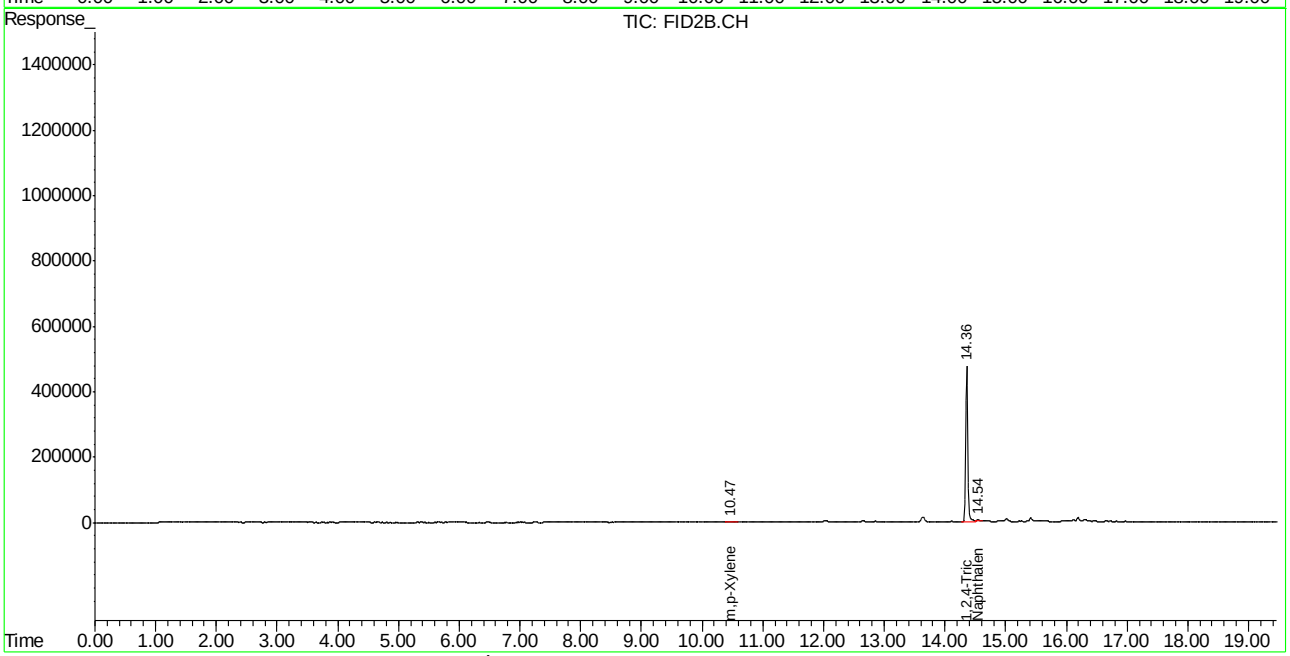
Quantitation Report (QT Reviewed)

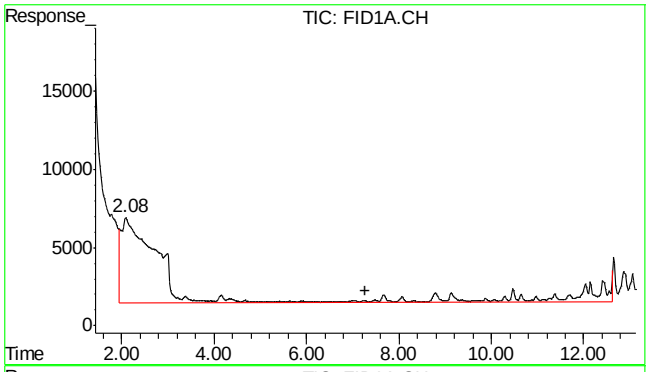
Signal #1 : Y:\1\DATA\100213\GB22394.D\FID1A.CH Vial: 9
Signal #2 : Y:\1\DATA\100213\GB22394.D\FID2B.CH
Acq On : 2 Oct 2013 8:23 pm Operator: ELISEV
Sample : D51202-1 Inst : GC/MS Ins
Misc : GC3914,GGB1231,5.063,,100,5,1 Multiplr: 1.00
IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E
Quant Time: Oct 3 8:24 2013 Quant Results File: TB1125GB1125SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB1125GB1125SOIL.M (Chemstation Integrator)
Title : 8015B/8021B TVH/BTEX
Last Update : Thu Oct 03 08:07:23 2013
Response via : Multiple Level Calibration
DataAcq Meth : TVB4.M

Volume Inj. :
Signal #1 Phase : DB-624 Signal #2 Phase: DB-624
Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm

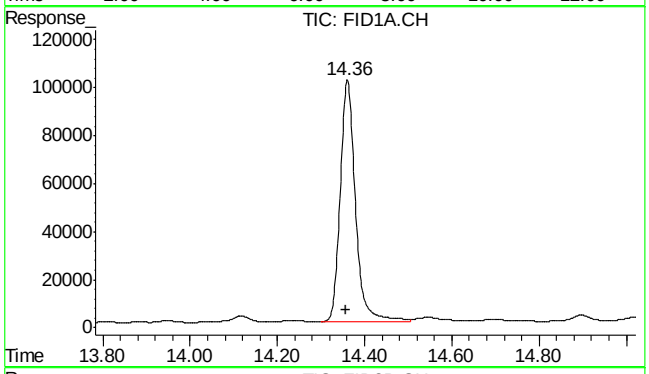






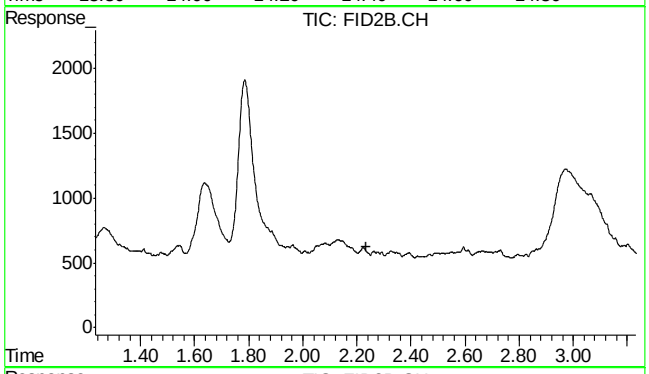
#1 TVH-Gasoline

R.T.: 7.280 min
Delta R.T.: 0.000 min
Response: 3716830
Conc: 0.05 mg/L m



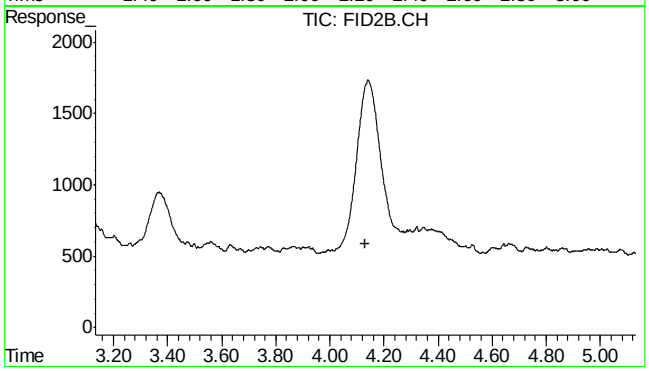
#2 1,2,4-Trichlorobenzene

R.T.: 14.360 min
Delta R.T.: 0.003 min
Response: 2445105
Conc: 80.93 % m



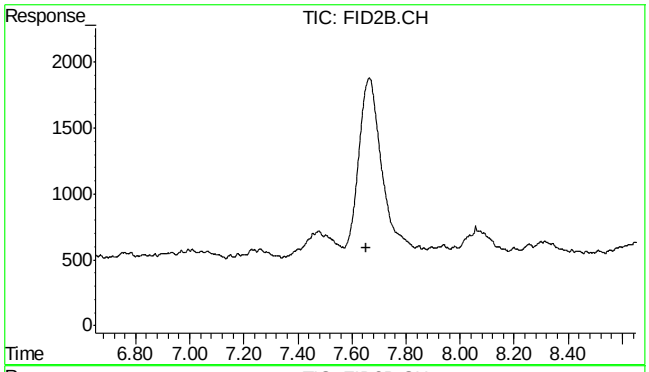
#4 Methyl-t-butyl-ether

R.T.: 0.000 min
Exp R.T. : 2.233 min
Response: 0
Conc: N.D.



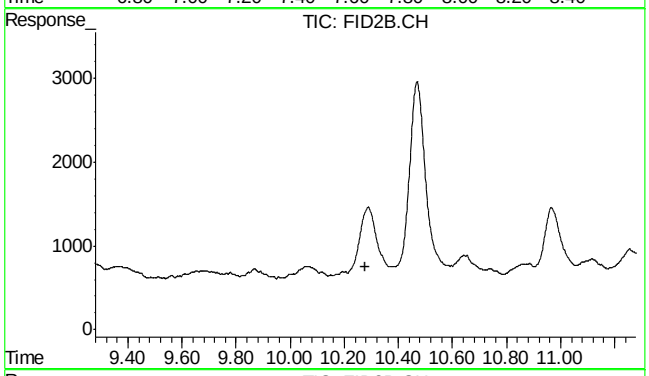
#5 Benzene

R.T.: 0.000 min
Exp R.T. : 4.132 min
Response: 0
Conc: N.D.



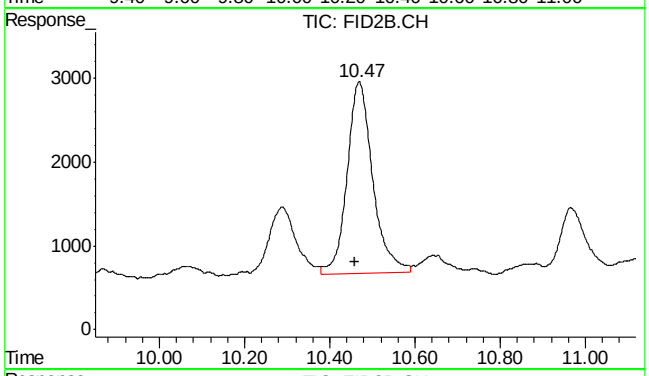
#6 Toluene

R.T.: 0.000 min
Exp R.T. : 7.651 min
Response: 0
Conc: N.D.



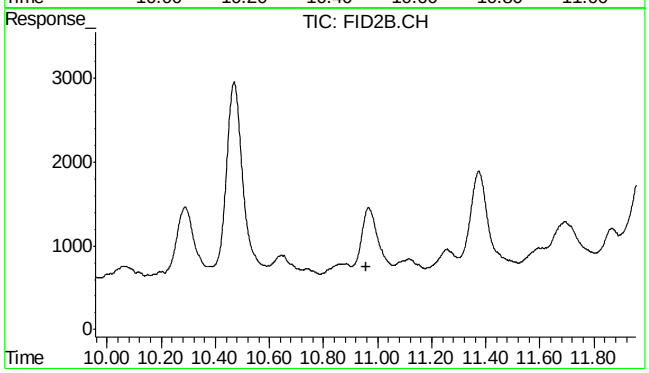
#7 Ethylbenzene

R.T.: 0.000 min
Exp R.T. : 10.279 min
Response: 0
Conc: N.D.



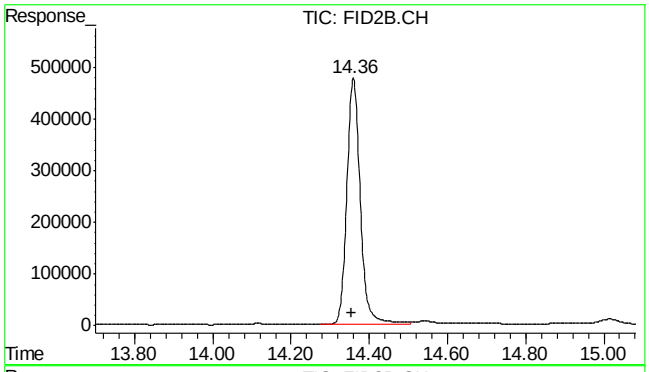
#8 m,p-Xylene

R.T.: 10.469 min
Delta R.T.: 0.010 min
Response: 95202
Conc: 0.25 ug/L



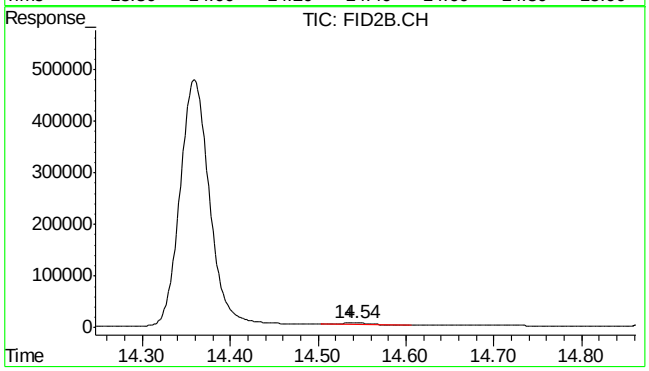
#9 o-Xylene

R.T.: 0.000 min
Exp R.T. : 10.956 min
Response: 0
Conc: N.D.



#10 1,2,4-Trichlorobenzene (P)

R.T.: 14.359 min
Delta R.T.: 0.003 min
Response: 11347168
Conc: 85.93 % m



#11 Naphthalene

R.T.: 14.542 min
Delta R.T.: 0.005 min
Response: 81678
Conc: 0.47 ug/L m

Manual Integrations APPROVED (compounds with "m" flag)
Jennifer Laidlaw 10/03/13 09:15

Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\100213\GB22388.D\FID1A.CH Vial: 3
Signal #2 : Y:\1\DATA\100213\GB22388.D\FID2B.CH
Acq On : 2 Oct 2013 4:51 pm Operator: ELISEV
Sample : MB, S Inst : GC/MS Ins
Misc : GC3914,GGB1231,5.000,,100,5,1 Multiplr: 1.00
IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E
Quant Time: Oct 03 08:07:46 2013 Quant Results File: TB1125GB1125SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB1125GB1125SOIL.M (Chemstation Integrator)
Title : 8015B/8021B TVH/BTEX
Last Update : Thu Oct 03 08:07:23 2013
Response via : Initial Calibration
DataAcq Meth : TVB4.M

Volume Inj. :
Signal #1 Phase : DB-624 Signal #2 Phase: DB-624
Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm

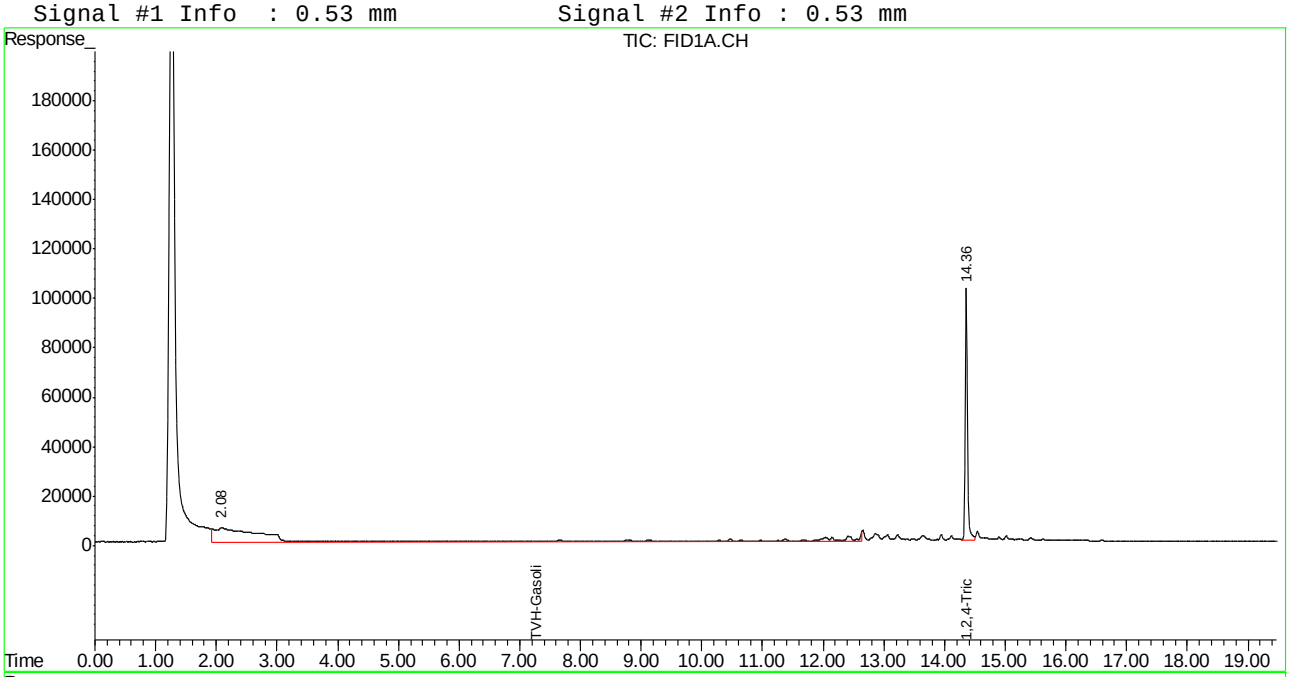
	Compound	R.T.	Response	Conc	Units	
	System Monitoring Compounds					
2) S	1,2,4-Trichlorobenzene	14.36	2563808	84.863	%	m
10) S	1,2,4-Trichlorobenzene (P)	14.36	11827632	89.570	%	m
	Target Compounds					
1) H	TVH-Gasoline	7.28	4113266	0.059	mg/L	
4) T	Methyl-t-butyl-ether	0.00	0	N.D.	ug/L	d
5) T	Benzene	0.00	0	N.D.	ug/L	d
6) T	Toluene	7.65	113265	0.306	ug/L	
7) T	Ethylbenzene	0.00	0	N.D.	ug/L	d
8) T	m,p-Xylene	10.46	150042	0.397	ug/L	m
9) T	o-Xylene	0.00	0	N.D.	ug/L	d
11) T	Naphthalene	14.54	260490	1.511	ug/L	m

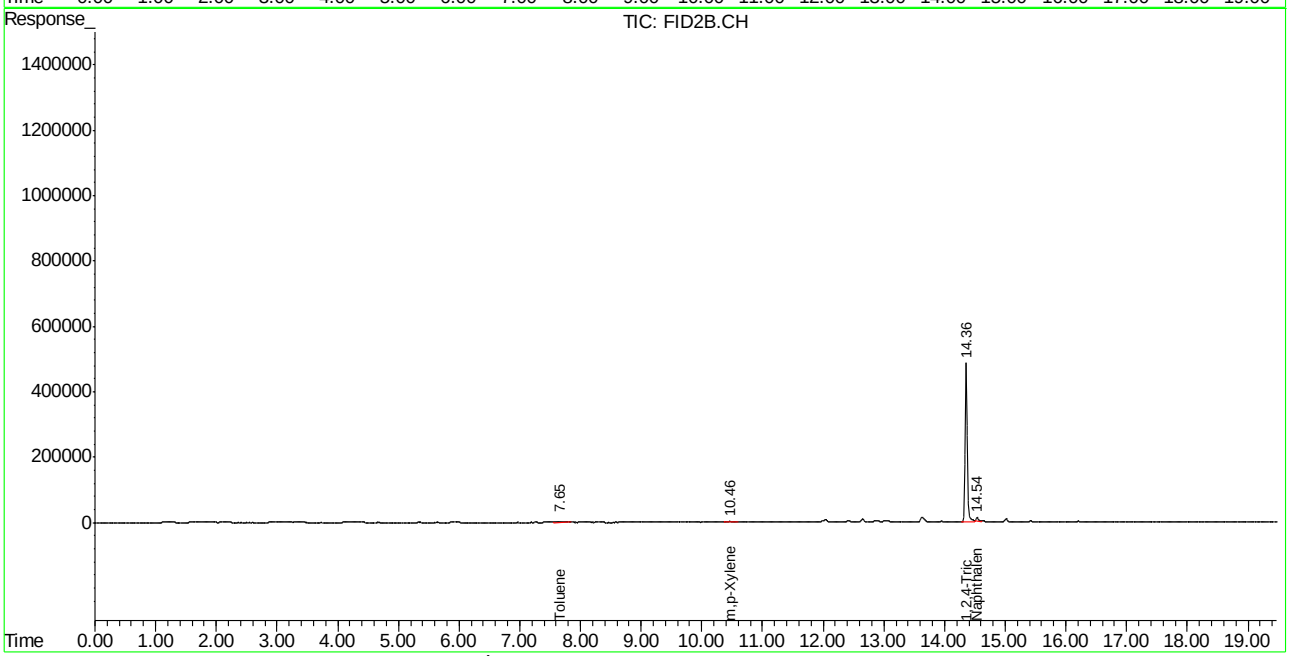
Quantitation Report (QT Reviewed)

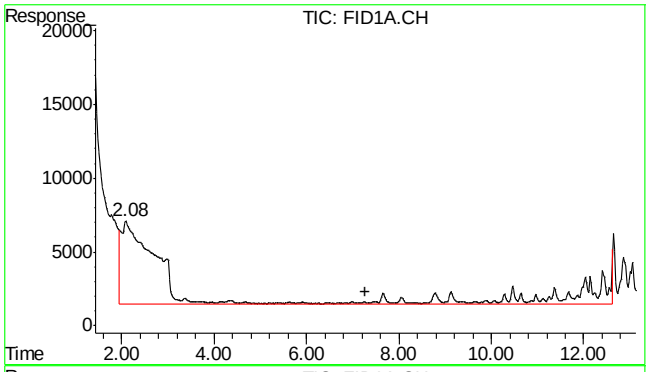
Signal #1 : Y:\1\DATA\100213\GB22388.D\FID1A.CH Vial: 3
Signal #2 : Y:\1\DATA\100213\GB22388.D\FID2B.CH
Acq On : 2 Oct 2013 4:51 pm Operator: ELISEV
Sample : MB, S Inst : GC/MS Ins
Misc : GC3914,GGB1231,5.000,,100,5,1 Multiplr: 1.00
IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E
Quant Time: Oct 3 8:17 2013 Quant Results File: TB1125GB1125SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB1125GB1125SOIL.M (Chemstation Integrator)
Title : 8015B/8021B TVH/BTEX
Last Update : Thu Oct 03 08:07:23 2013
Response via : Multiple Level Calibration
DataAcq Meth : TVB4.M

Volume Inj. :
Signal #1 Phase : DB-624 Signal #2 Phase: DB-624
Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm

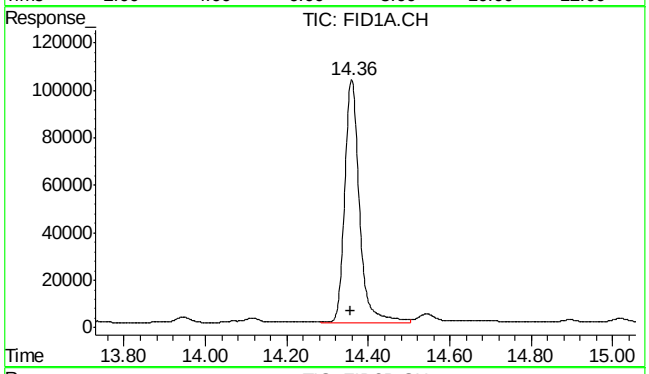






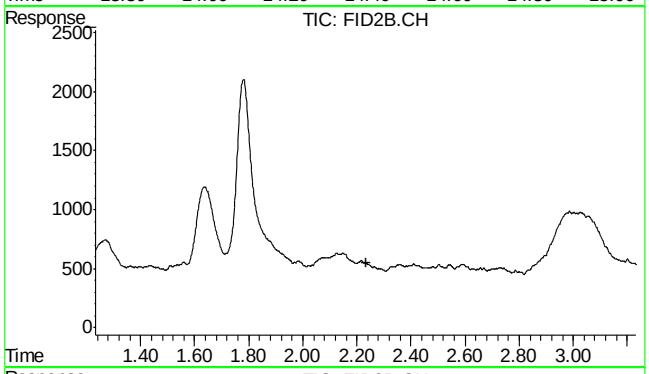
#1 TVH-Gasoline

R.T.: 7.280 min
Delta R.T.: 0.000 min
Response: 4113266
Conc: 0.06 mg/L m



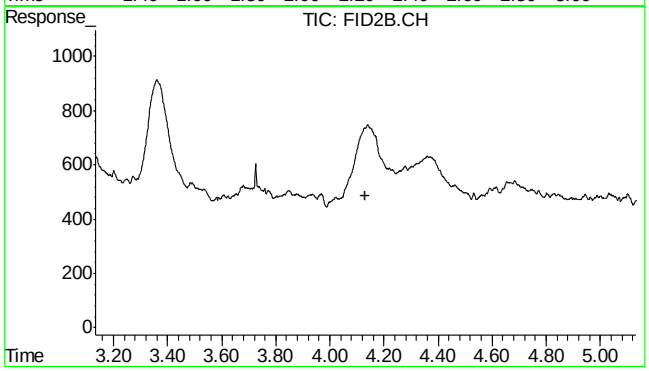
#2 1,2,4-Trichlorobenzene

R.T.: 14.358 min
Delta R.T.: 0.001 min
Response: 2563808
Conc: 84.86 % m



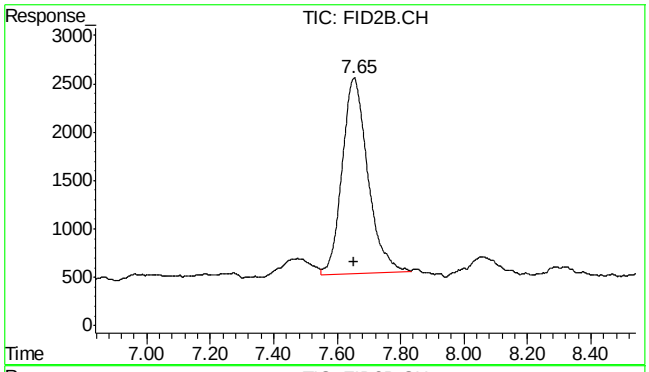
#4 Methyl-t-butyl-ether

R.T.: 0.000 min
Exp R.T. : 2.233 min
Response: 0
Conc: N.D.



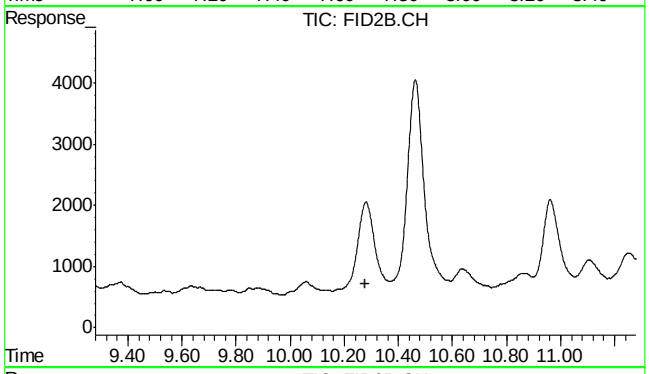
#5 Benzene

R.T.: 0.000 min
Exp R.T. : 4.132 min
Response: 0
Conc: N.D.



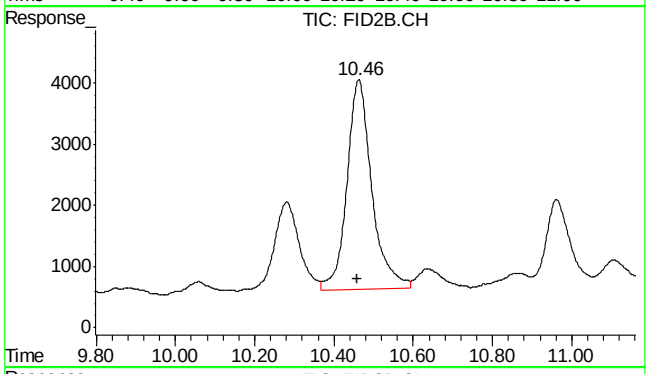
#6 Toluene

R.T.: 7.654 min
Delta R.T.: 0.002 min
Response: 113265
Conc: 0.31 ug/L



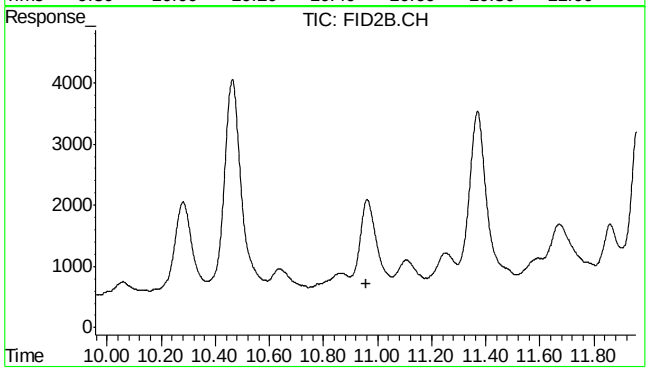
#7 Ethylbenzene

R.T.: 0.000 min
Exp R.T. : 10.279 min
Response: 0
Conc: N.D.



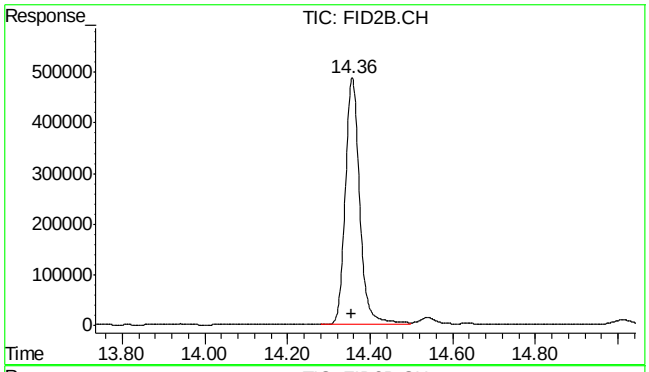
#8 m,p-Xylene

R.T.: 10.463 min
Delta R.T.: 0.003 min
Response: 150042
Conc: 0.40 ug/L m



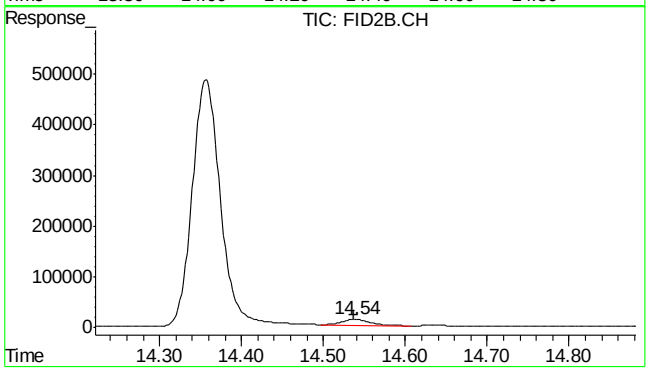
#9 o-Xylene

R.T.: 0.000 min
Exp R.T. : 10.956 min
Response: 0
Conc: N.D.



#10 1,2,4-Trichlorobenzene (P)

R.T.: 14.356 min
Delta R.T.: 0.000 min
Response: 11827632
Conc: 89.57 % m



#11 Naphthalene

R.T.: 14.539 min
Delta R.T.: 0.002 min
Response: 260490
Conc: 1.51 ug/L m

Mountain States ACCUTEST LABORATORIES

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D51202
Account: XTOKRWR XTO Energy
Project: FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8682-MB	FH013720.D	1	10/04/13	TU	10/04/13	OP8682	GFH723

The QC reported here applies to the following samples: **Method:** SW846-8015B

D51202-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	6.7	5.0	mg/kg	

CAS No.	Surrogate Recoveries		Limits
84-15-1	o-Terphenyl	80%	20-130%

Blank Spike Summary

Job Number: D51202
Account: XTOKRWR XTO Energy
Project: FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8682-BS	FH013722.D	1	10/04/13	TU	10/04/13	OP8682	GFH723

The QC reported here applies to the following samples: **Method:** SW846-8015B

D51202-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	667	582	87	42-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	86%	20-130%

12.2.1
12

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D51202
Account: XTOKRWR XTO Energy
Project: FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8682-MS	FH013724.D	10	10/04/13	TU	10/04/13	OP8682	GFH723
OP8682-MSD	FH013726.D	10	10/04/13	TU	10/04/13	OP8682	GFH723
D51224-3	FH013732.D	10	10/04/13	TU	10/04/13	OP8682	GFH723

The QC reported here applies to the following samples: **Method:** SW846-8015B

D51202-1

CAS No.	Compound	D51224-3 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	618		835	579	-5*	743	15*	25	20-150/30

CAS No.	Surrogate Recoveries	MS	MSD	D51224-3	Limits
84-15-1	o-Terphenyl	59%	74%	78%	20-130%

12.3.1
12

* = Outside of Control Limits.

Mountain States ACCUTEST LABORATORIES

GC Semi-volatiles

Raw Data

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\FH100413.SEC\
Data File : FH013758.D
Signal(s) : FID2B.ch
Acq On : 5 Oct 2013 4:07 am
Operator : TIMU
Sample : D51202-1
Misc : OP8682,GFH723,30.14,,,1,1
ALS Vial : 73 Sample Multiplier: 1

Integration File: events.e
Quant Time: Oct 07 08:24:13 2013
Quant Method : C:\msdchem\1\METHODS\DRO-GFH689R.M
Quant Title : DRO-ORO REAR
QLast Update : Wed Sep 11 09:58:51 2013
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

	Compound	R.T.	Response	Conc	Units
System Monitoring Compounds					
1) s	o-Terphenyl	12.163	2316400837	1335.010	ug/ml
Target Compounds					
2) H	TPH-DRO (C10-C28)	9.818	854392645	607.426	ug/ml

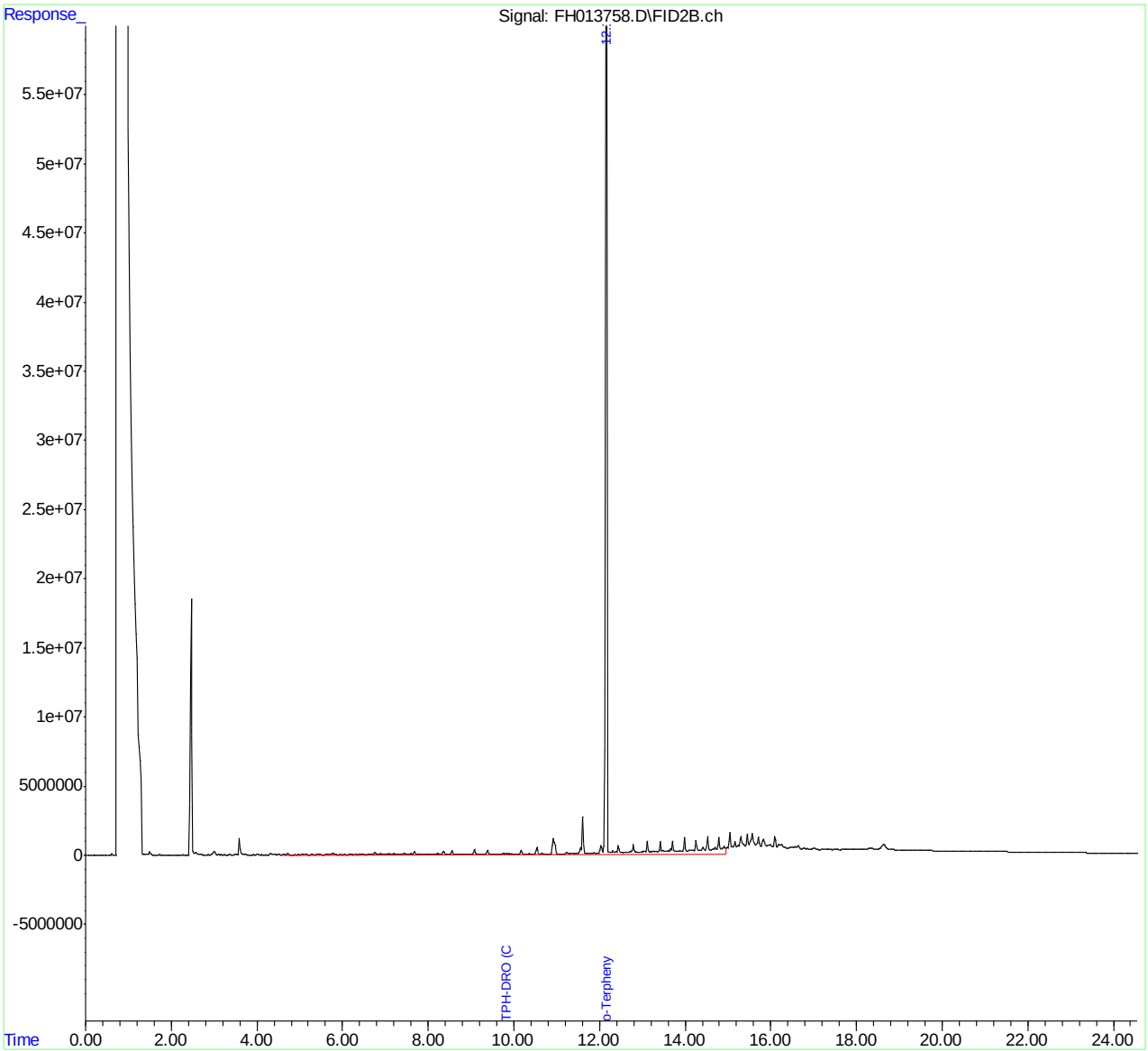
(f)=RT Delta > 1/2 Window (m)=manual int.

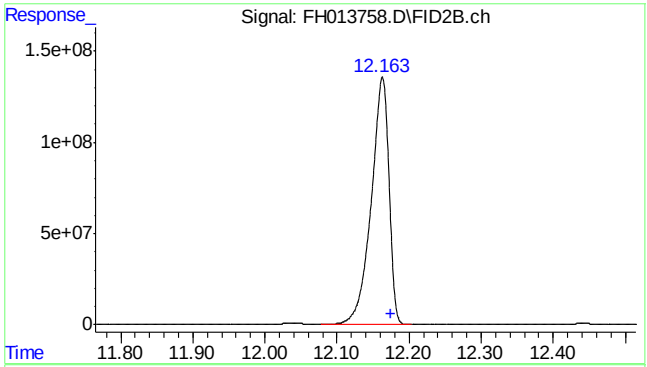
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\FH100413.SEC\
Data File : FH013758.D
Signal(s) : FID2B.ch
Acq On : 5 Oct 2013 4:07 am
Operator : TIMU
Sample : D51202-1
Misc : OP8682,GFH723,30.14,,,1,1
ALS Vial : 73 Sample Multiplier: 1

Integration File: events.e
Quant Time: Oct 07 08:24:13 2013
Quant Method : C:\msdchem\1\METHODS\DRO-GFH689R.M
Quant Title : DRO-ORO REAR
QLast Update : Wed Sep 11 09:58:51 2013
Response via : Initial Calibration
Integrator: ChemStation

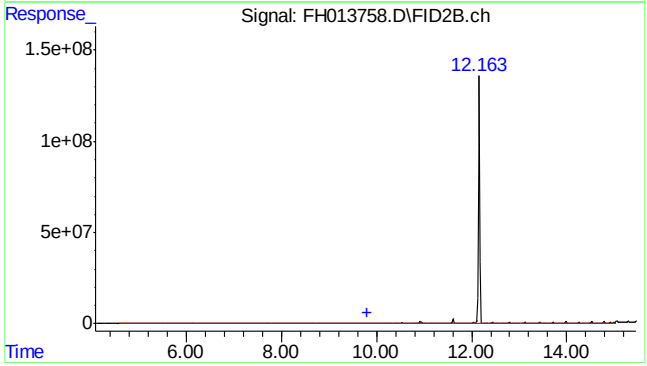
Volume Inj. :
Signal Phase :
Signal Info :





#1 o-Terphenyl

R.T.: 12.163 min
Delta R.T.: -0.012 min
Response: 2316400837
Conc: 1335.01 ug/ml



#2 TPH-DRO (C10-C28)

R.T.: 9.818 min
Delta R.T.: 0.000 min
Response: 854392645
Conc: 607.43 ug/ml m

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\FH100413.SEC\
Data File : FH013720.D
Signal(s) : FID2B.ch
Acq On : 4 Oct 2013 4:50 pm
Operator : TIMU
Sample : OP8682-MB
Misc : OP8682,GFH723,30.00,,,1,1
ALS Vial : 54 Sample Multiplier: 1

Integration File: events.e
Quant Time: Oct 07 08:29:11 2013
Quant Method : C:\msdchem\1\METHODS\DRO-GFH689R.M
Quant Title : DRO-ORO REAR
QLast Update : Wed Sep 11 09:58:51 2013
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

	Compound	R.T.	Response	Conc	Units
System Monitoring Compounds					
1) s	o-Terphenyl	12.171	2782035293	1603.368	ug/ml
Target Compounds					
2) H	TPH-DRO (C10-C28)	9.818	77975044	55.436	ug/ml

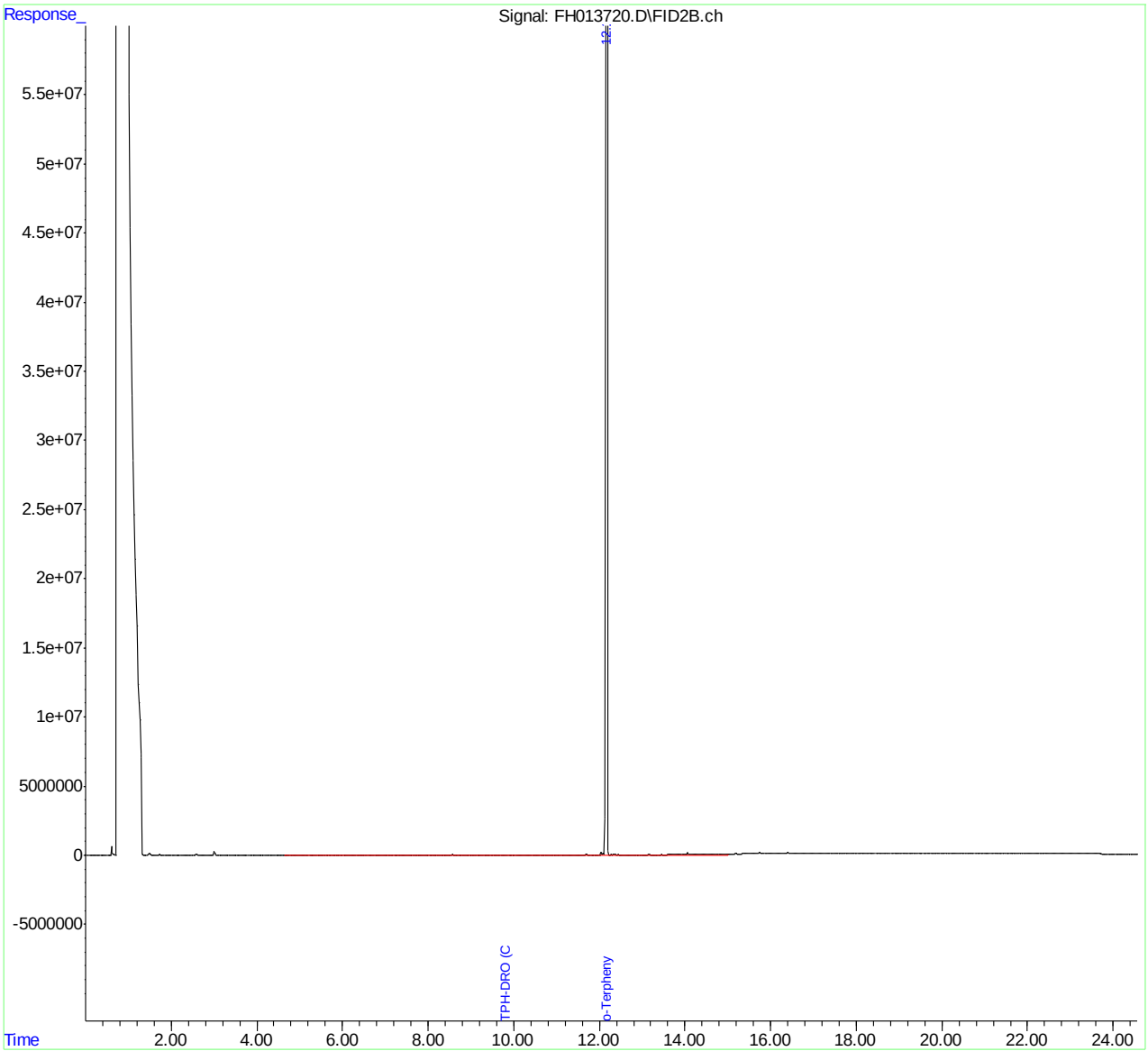
(f)=RT Delta > 1/2 Window (m)=manual int.

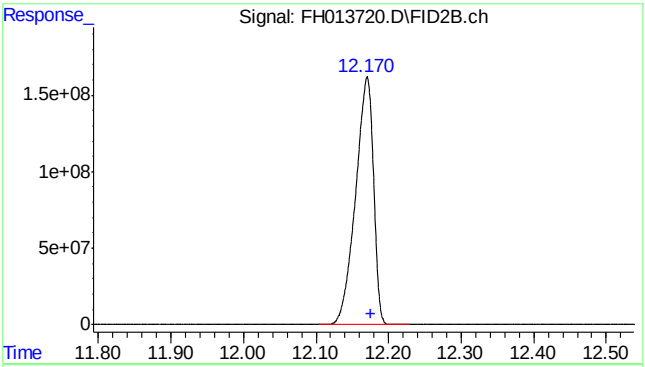
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\FH100413.SEC\
Data File : FH013720.D
Signal(s) : FID2B.ch
Acq On : 4 Oct 2013 4:50 pm
Operator : TIMU
Sample : OP8682-MB
Misc : OP8682,GFH723,30.00,,,1,1
ALS Vial : 54 Sample Multiplier: 1

Integration File: events.e
Quant Time: Oct 07 08:29:11 2013
Quant Method : C:\msdchem\1\METHODS\DRO-GFH689R.M
Quant Title : DRO-ORO REAR
QLast Update : Wed Sep 11 09:58:51 2013
Response via : Initial Calibration
Integrator: ChemStation

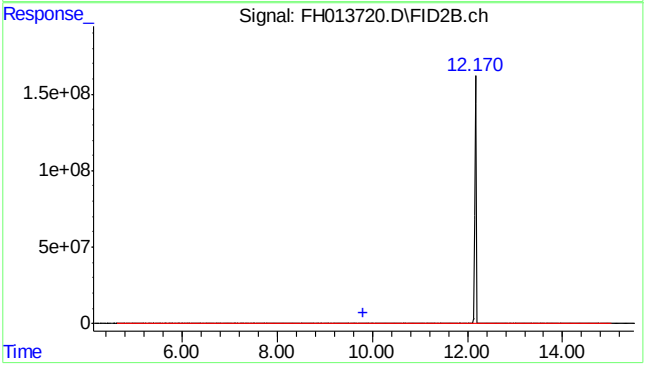
Volume Inj. :
Signal Phase :
Signal Info :





#1 o-Terphenyl

R.T.: 12.171 min
Delta R.T.: -0.004 min
Response: 2782035293
Conc: 1603.37 ug/ml



#2 TPH-DRO (C10-C28)

R.T.: 9.818 min
Delta R.T.: 0.000 min
Response: 77975044
Conc: 55.44 ug/ml m

Mountain States ACCUTEST LABORATORIES

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11290
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 10/03/13

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	.86	1.8		
Antimony	3.0	.21	.5		
Arsenic	2.5	.38	.63		
Barium	1.0	.02	.36	0.030	<1.0
Beryllium	1.0	.08	.06		
Boron	5.0	.08	.16		
Cadmium	1.0	.02	.28	0.010	<1.0
Calcium	40	.22	6.8		
Chromium	1.0	.03	.03	0.030	<1.0
Cobalt	0.50	.04	.039		
Copper	1.0	.12	.13	0.13	<1.0
Iron	7.0	.15	1.8		
Lead	5.0	.21	.25	-0.21	<5.0
Lithium	0.50	.04	.13		
Magnesium	20	.68	1.8		
Manganese	0.50	.001	.038		
Molybdenum	1.0	.04	.13		
Nickel	3.0	.05	.07	-0.020	<3.0
Phosphorus	10	1.5	1.2		
Potassium	200	9.9	12		
Selenium	5.0	.71	1.1	0.29	<5.0
Silicon	5.0	.47	1.1		
Silver	3.0	.03	.05	-0.050	<3.0
Sodium	40	.49	3.7		
Strontium	5.0	.001	.022		
Thallium	1.0	.18	.46		
Tin	5.0	1.2	2.3		
Titanium	1.0	.01	.46		
Uranium	5.0	.29	.31		
Vanadium	1.0	.04	.043		
Zinc	3.0	.04	.16	0.21	<3.0

Associated samples MP11290: D51202-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11290
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11290
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 10/03/13

Metal	D51202-1 Original	MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium	225	467	235	102.2	75-125
Beryllium					
Boron	anr				
Cadmium	0.13	51.1	58.7	86.9	75-125
Calcium					
Chromium	42.0	97.2	58.7	94.9	75-125
Cobalt					
Copper	7.0	66.8	58.7	101.9	75-125
Iron					
Lead	8.1	110	117	86.8	75-125
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel	14.2	63.3	58.7	85.5	75-125
Phosphorus					
Potassium					
Selenium	0.0	105	117	89.5	75-125
Silicon					
Silver	0.15	22.3	23.5	94.4	75-125
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	34.8	83.4	58.7	82.8	75-125

Associated samples MP11290: D51202-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11290
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11290
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 10/03/13

Metal	D51202-1 Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	225	494	228	117.2	5.6	20
Beryllium						
Boron	anr					
Cadmium	0.13	48.3	57	84.6	5.6	20
Calcium						
Chromium	42.0	89.1	57	83.5	8.7	20
Cobalt						
Copper	7.0	64.7	57	101.3	3.2	20
Iron						
Lead	8.1	105	114	85.0	4.7	20
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel	14.2	60.9	57	83.9	3.9	20
Phosphorus						
Potassium						
Selenium	0.0	100	114	87.8	4.9	20
Silicon						
Silver	0.15	21.0	22.8	91.5	6.0	20
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	34.8	79.8	57	79.0	4.4	20

Associated samples MP11290: D51202-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11290
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11290
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 10/03/13

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	196	200	98.0	80-120
Beryllium				
Boron	anr			
Cadmium	47.4	50	94.8	80-120
Calcium				
Chromium	50.5	50	101.0	80-120
Cobalt				
Copper	52.0	50	104.0	80-120
Iron				
Lead	97.5	100	97.5	80-120
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	48.3	50	96.6	80-120
Phosphorus				
Potassium				
Selenium	98.7	100	98.7	80-120
Silicon				
Silver	20.6	20	103.0	80-120
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	47.1	50	94.2	80-120

Associated samples MP11290: D51202-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11290
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11290
Matrix Type: SOLID

Methods: SW846 6010C
Units: ug/l

Prep Date: 10/03/13

Metal	D51202-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	1960	2150	10.2*(a)	0-10
Beryllium				
Boron	anr			
Cadmium	1.10	0.00	100.0(b)	0-10
Calcium				
Chromium	358	403	12.6*(a)	0-10
Cobalt				
Copper	61.0	67.0	11.9 (b)	0-10
Iron				
Lead	91.7	59.5	14.3 (b)	0-10
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	112	131	16.1*(a)	0-10
Phosphorus				
Potassium				
Selenium	0.00	0.00	NC	0-10
Silicon				
Silver	1.30	1.50	15.4 (b)	0-10
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	321	357	19.0*(a)	0-10

Associated samples MP11290: D51202-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

SERIAL DILUTION RESULTS SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11290
Matrix Type: SOLID

Methods: SW846 6010C
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested
(a) Serial dilution indicates possible matrix interference.
(b) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11291 Methods: SW846 6020A
Matrix Type: SOLID Units: mg/kg

Prep Date: 10/03/13

Metal	RL	IDL	MDL	MB raw	final
Arsenic	0.10	.0085	.024	0.0076	<0.10

Associated samples MP11291: D51202-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11291 Methods: SW846 6020A
Matrix Type: SOLID Units: mg/kg

Prep Date: 10/03/13

Metal	D51202-1 Original	MS	Spikelot ICPALL2	% Rec	QC Limits
Arsenic	7.0	123	117	98.8	75-125

Associated samples MP11291: D51202-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11291 Methods: SW846 6020A
Matrix Type: SOLID Units: mg/kg

Prep Date: 10/03/13

Metal	D51202-1 Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Arsenic	7.0	118	114	97.4	4.1	20

Associated samples MP11291: D51202-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11291
Matrix Type: SOLID

Methods: SW846 6020A
Units: mg/kg

Prep Date: 10/03/13

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Arsenic	96.8	100	96.8	80-120

Associated samples MP11291: D51202-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11291
Matrix Type: SOLID

Methods: SW846 6020A
Units: ug/l

Prep Date: 10/03/13

Metal	D51202-1 Original	SDL 5:25	%DIF	QC Limits
Arsenic	60.0	60.9	1.6	0-10

Associated samples MP11291: D51202-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11292 Methods: SW846 7471B
Matrix Type: SOLID Units: mg/kg

Prep Date: 10/04/13

Metal	RL	IDL	MDL	MB raw	final
Mercury	0.10	.0011	.008	-0.00086	<0.10

Associated samples MP11292: D51202-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11292
Matrix Type: SOLID

Methods: SW846 7471B
Units: mg/kg

Prep Date: 10/04/13

Metal	D51148-1 Original	MS	Spikelot HGWSR1	% Rec	QC Limits
Mercury	0.037	0.45	0.389	106.2	75-125

Associated samples MP11292: D51202-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11292 Methods: SW846 7471B
Matrix Type: SOLID Units: mg/kg

Prep Date: 10/04/13

Metal	D51148-1 Original	MSD	Spikelot HGWSR1	% Rec	MSD RPD	QC Limit
Mercury	0.037	0.42	0.364	105.3	6.9	20

Associated samples MP11292: D51202-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11292
Matrix Type: SOLID

Methods: SW846 7471B
Units: mg/kg

Prep Date: 10/04/13

Metal	BSP Result	Spikelot HGWSR1	% Rec	QC Limits
Mercury	0.41	0.4	102.5	80-120

Associated samples MP11292: D51202-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11305
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 10/04/13

Metal	RL	IDL	MDL	MB raw	final
Aluminum	500	55	210		
Antimony	150	11	95		
Arsenic	130	19	28		
Barium	50	1	7		
Beryllium	50	4.5	6		
Boron	250	4	33		
Cadmium	50	1	1.8		
Calcium	2000	12	210	-29	<2000
Chromium	50	1.5	2		
Cobalt	25	2.5	2.9		
Copper	50	4	9.5		
Iron	350	7.5	48		
Lead	250	11	110		
Lithium	25	2	14		
Magnesium	1000	34	95	16.0	<1000
Manganese	25	2.5	2.3		
Molybdenum	50	2	4.2		
Nickel	150	2.5	4.4		
Phosphorus	500	75	100		
Potassium	5000	500	1400		
Selenium	250	36	55		
Silicon	250	24	26		
Silver	150	1.5	3		
Sodium	2000	37	850	-140	<2000
Strontium	25	.05	.6		
Thallium	50	9	20		
Tin	250	60	80		
Titanium	50	.5	11		
Uranium	250	15	28		
Vanadium	50	2	2		
Zinc	150	2	16		

Associated samples MP11305: D51202-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11305
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11305
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 10/04/13

Metal	D51224-6A Original MS		Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron					
Cadmium					
Calcium	19600	148000	125000	102.7	75-125
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Lithium					
Magnesium	5170	127000	125000	97.5	75-125
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium	16500	137000	125000	96.4	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP11305: D51202-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11305
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11305
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 10/04/13

Metal	D51224-6A Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron						
Cadmium						
Calcium	19600	149000	125000	103.5	0.7	20
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Lithium						
Magnesium	5170	128000	125000	98.3	0.8	20
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium	16500	137000	125000	96.4	0.0	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP11305: D51202-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11305
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11305
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 10/04/13

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	130000	125000	104.0	80-120
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	122000	125000	97.6	80-120
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	121000	125000	96.8	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP11305: D51202-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11305
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11305
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 10/04/13

Metal	D51224-6A Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	3920	3920	0.2	0-10
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	1030	1100	6.3	0-10
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	3300	3260	0.9	0-10
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP11305: D51202-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

SERIAL DILUTION RESULTS SUMMARY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

QC Batch ID: MP11305
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

Mountain States ACCUTEST LABORATORIES

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chromium, Hexavalent	GP11117/GN22215	1.0	0.32	mg/kg	106	104	97.7	80-120%
Chromium, Hexavalent	GP11117/GN22215	1.0	0.36	mg/kg	106	104	97.9	80-120%
Specific Conductivity	GP11110/GN22203			umhos/cm	9979	9980	100.0	90-110%
pH	GN22154			su	8.00	8.03	100.4	99.3-100.7%

Associated Samples:
Batch GN22154: D51202-1
Batch GP11110: D51202-1
Batch GP11117: D51202-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chromium, Hexavalent	GP11117/GN22215	D51202-1	mg/kg	0.38	0.50	26.2(a)	0-20%
Redox Potential Vs H2	GN22168	D51122-1	mv	133	130	2.3	0-20%

Associated Samples:
Batch GN22168: D51202-1
Batch GP11117: D51202-1
(*) Outside of QC limits
(a) RPD acceptable due to low duplicate and sample concentrations.

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chromium, Hexavalent	GP11117/GN22215	D51202-1	mg/kg	0.38	40	35.8	89.5	75-125%

Associated Samples:
Batch GP11117: D51202-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D51202
Account: XTOKRWR - XTO Energy
Project: FRU 197-31A

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Chromium, Hexavalent	GP11117/GN22215	D51202-1	mg/kg	0.38	40	35.4	1.2	20%

Associated Samples:
Batch GP11117: D51202-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits