



10/07/13

## Technical Report for

**XTO Energy**

**FRU 197-31A**

**1111-02A Cut 2 Contents**

**Accutest Job Number: D51122**

**Sampling Date: 09/30/13**

### Report to:

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**Total number of pages in report: 147**



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.

A handwritten signature in black ink, appearing to read 'Scott Heideman'.

**Scott Heideman**  
**Laboratory Director**

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

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Test results relate only to samples analyzed.

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Sample Summary

XTO Energy

Job No: D51122

FRU 197-31A

Project No: 1111-02A Cut 2 Contents

Sample Number	Collected		Time By	Received	Matrix		Client Sample ID
	Date				Code	Type	
D51122-1	09/30/13	12:35	DS	10/01/13	SO	Soil	CUT 2 CONTENTS
D51122-1A	09/30/13	12:35	DS	10/01/13	SO	Soil	CUT 2 CONTENTS

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

## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** XTO Energy

**Job No** D51122

**Site:** FRU 197-31A

**Report Date** 10/7/2013 3:17:19 PM

On 10/01/2013, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 3.3 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D51122 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:** V5V1763

- All samples were 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.

### 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.
- Sample(s) D51039-1MS, D51039-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

### Volatiles by GC By Method SW846 8015B

**Matrix:** SO

**Batch ID:** GGB1230

- All samples were analyzed within the recommended method holding time.
- Sample(s) D51008-1MS, D51008-1MSD 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:** OP8666

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D51127-1MS, D51127-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

## 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:** MP11267

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D51122-1MS, D51122-1MSD, D51122-1SDL were used as the QC samples for the metals analysis.
- The matrix spike duplicate (MSD) recovery(s) of Zinc are outside control limits. Probable cause due to matrix interference.
- The matrix spike (MS) recovery(s) of Barium are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- The serial dilution RPD(s) for Cadmium, Selenium, Silver are outside control limits for sample MP11267-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- MP11267-SD1 for Nickel, Zinc: Serial dilution indicates possible matrix interference.

## Metals By Method SW846 6020A

**Matrix:** SO

**Batch ID:** MP11268

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D51122-1MS, D51122-1MSD, D51122-1SDL were used as the QC samples for the metals analysis.

## Metals By Method SW846 7471B

**Matrix:** SO

**Batch ID:** MP11269

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D51122-1MS, D51122-1MSD 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:** GN22110

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

## Wet Chemistry By Method SW846 3060A/7196A

**Matrix:** SO

**Batch ID:** GP11063

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D51041-1MS, D51041-1MSD, D51041-1DUP were used as the QC samples for the Chromium, Hexavalent analysis.
- The duplicate RPD(s) for Chromium, Hexavalent are outside control limits for sample GP11063-D1. RPD acceptable due to low duplicate and sample concentrations.

### Wet Chemistry By Method SW846 3060A/7196A M

**Matrix:** SO

**Batch ID:** R18902

- The data for SW846 3060A/7196A M meets quality control requirements.
- D51122-1 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

### Wet Chemistry By Method SW846 9045D

**Matrix:** SO

**Batch ID:** GN22127

- The following samples were run outside of holding time for method SW846 9045D: D51122-1

**Matrix:** SO

**Batch ID:** GN22170

- The following samples were run outside of holding time for method SW846 9045D: D51122-1

### Wet Chemistry By Method USDA HANDBOOK 60

**Matrix:** SO

**Batch ID:** MP11305

- D51122-1A for Sodium Adsorption Ratio: Calculated as:  $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

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:** D51122  
**Account:** XTO Energy  
**Project:** FRU 197-31A  
**Collected:** 09/30/13



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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### D51122-1 CUT 2 CONTENTS

Toluene	0.445	0.15	0.074	mg/kg	SW846 8260B
Ethylbenzene	0.205	0.15	0.028	mg/kg	SW846 8260B
Xylene (total)	0.591	0.29	0.15	mg/kg	SW846 8260B
Chrysene	0.0310	0.010	0.0054	mg/kg	SW846 8270C BY SIM
Naphthalene	0.383	0.014	0.013	mg/kg	SW846 8270C BY SIM
Pyrene	0.0208	0.010	0.0054	mg/kg	SW846 8270C BY SIM
TPH-GRO (C6-C10)	30.1	15	7.4	mg/kg	SW846 8015B
TPH-DRO (C10-C28)	790	8.2	6.2	mg/kg	SW846-8015B
Arsenic	10.7	0.12		mg/kg	SW846 6020A
Barium	2780	1.2		mg/kg	SW846 6010C
Chromium	23.5	1.2		mg/kg	SW846 6010C
Copper	30.0	1.2		mg/kg	SW846 6010C
Lead	17.7	6.1		mg/kg	SW846 6010C
Nickel	14.5	3.6		mg/kg	SW846 6010C
Zinc	50.9	3.6		mg/kg	SW846 6010C
Specific Conductivity	13900	1.0		umhos/cm	SM 2510B-2011 MOD
Chromium, Trivalent <sup>a</sup>	23.5	2.2		mg/kg	SW846 3060A/7196A M
Redox Potential Vs H2	133			mv	ASTM D1498-76M
pH	11.23			su	SW846 9045D

### D51122-1A CUT 2 CONTENTS

Calcium	15.7	2.0		mg/l	SW846 6010C
Sodium	2910	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio <sup>b</sup>	199			ratio	USDA HANDBOOK 60

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

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



Sample Results

Report of Analysis

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## Report of Analysis

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<b>Client Sample ID:</b>	CUT 2 CONTENTS	<b>Date Sampled:</b>	09/30/13
<b>Lab Sample ID:</b>	D51122-1	<b>Date Received:</b>	10/01/13
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.6
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	FRU 197-31A		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V29343.D	1	10/01/13	BD	n/a	n/a	V5V1763
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.04 g	5.0 ml	100 ul
Run #2			

## Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.074	0.037	mg/kg	
108-88-3	Toluene	0.445	0.15	0.074	mg/kg	
100-41-4	Ethylbenzene	0.205	0.15	0.028	mg/kg	
1330-20-7	Xylene (total)	0.591	0.29	0.15	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	97%		64-130%
460-00-4	4-Bromofluorobenzene	97%		62-131%
17060-07-0	1,2-Dichloroethane-D4	93%		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

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## Report of Analysis

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<b>Client Sample ID:</b>	CUT 2 CONTENTS	
<b>Lab Sample ID:</b>	D51122-1	<b>Date Sampled:</b> 09/30/13
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b> 10/01/13
<b>Method:</b>	SW846 8270C BY SIM SW846 3546	<b>Percent Solids:</b> 80.6
<b>Project:</b>	FRU 197-31A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G16540.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	0.010	0.0054	mg/kg	
120-12-7	Anthracene	ND	0.010	0.0054	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.010	0.0054	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.010	0.0054	mg/kg	
207-08-9	Benzo(k)fluoranthene	ND	0.010	0.0054	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.010	0.0054	mg/kg	
218-01-9	Chrysene	0.0310	0.010	0.0054	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	0.010	0.0054	mg/kg	
206-44-0	Fluoranthene	ND	0.010	0.0054	mg/kg	
86-73-7	Fluorene	ND	0.010	0.0062	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.010	0.0054	mg/kg	
91-20-3	Naphthalene	0.383	0.014	0.013	mg/kg	
129-00-0	Pyrene	0.0208	0.010	0.0054	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	66%		10-175%
321-60-8	2-Fluorobiphenyl	72%		25-130%
1718-51-0	Terphenyl-d14	107%		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

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## Report of Analysis

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<b>Client Sample ID:</b>	CUT 2 CONTENTS	<b>Date Sampled:</b>	09/30/13
<b>Lab Sample ID:</b>	D51122-1	<b>Date Received:</b>	10/01/13
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.6
<b>Method:</b>	SW846 8015B		
<b>Project:</b>	FRU 197-31A		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB22382.D	1	10/02/13	EV	n/a	n/a	GGB1230
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	30.1	15	7.4	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	75%		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

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## Report of Analysis

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<b>Client Sample ID:</b>	CUT 2 CONTENTS	<b>Date Sampled:</b>	09/30/13
<b>Lab Sample ID:</b>	D51122-1	<b>Date Received:</b>	10/01/13
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.6
<b>Method:</b>	SW846-8015B SW846 3546		
<b>Project:</b>	FRU 197-31A		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI09506.D	1	10/03/13	TU	10/02/13	OP8666	GFI637
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)	790	8.2	6.2	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	100%		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

<b>Client Sample ID:</b>	CUT 2 CONTENTS	<b>Date Sampled:</b>	09/30/13
<b>Lab Sample ID:</b>	D51122-1	<b>Date Received:</b>	10/01/13
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.6
<b>Project:</b>	FRU 197-31A		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	10.7	0.12	mg/kg	5	10/02/13	10/04/13 JB	SW846 6020A <sup>3</sup>	SW846 3050B <sup>5</sup>
Barium	2780	1.2	mg/kg	1	10/02/13	10/02/13 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Cadmium	< 1.2	1.2	mg/kg	1	10/02/13	10/02/13 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Chromium	23.5	1.2	mg/kg	1	10/02/13	10/02/13 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Copper	30.0	1.2	mg/kg	1	10/02/13	10/02/13 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Lead	17.7	6.1	mg/kg	1	10/02/13	10/02/13 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Mercury	< 0.11	0.11	mg/kg	1	10/04/13	10/04/13 JB	SW846 7471B <sup>2</sup>	SW846 7471B <sup>6</sup>
Nickel	14.5	3.6	mg/kg	1	10/02/13	10/02/13 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Selenium	< 6.1	6.1	mg/kg	1	10/02/13	10/02/13 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Silver	< 3.6	3.6	mg/kg	1	10/02/13	10/02/13 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Zinc	50.9	3.6	mg/kg	1	10/02/13	10/02/13 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>

- (1) Instrument QC Batch: MA4027  
(2) Instrument QC Batch: MA4035  
(3) Instrument QC Batch: MA4036  
(4) Prep QC Batch: MP11267  
(5) Prep QC Batch: MP11268  
(6) Prep QC Batch: MP11269

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b>	CUT 2 CONTENTS	<b>Date Sampled:</b>	09/30/13
<b>Lab Sample ID:</b>	D51122-1	<b>Date Received:</b>	10/01/13
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.6
<b>Project:</b>	FRU 197-31A		

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
<b>prep: DEPT.OF AG, BOOK N9</b>							
Specific Conductivity	13900	1.0	umhos/cm	1	10/03/13	JD	SM 2510B-2011 MOD
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	10/02/13	JD	SW846 3060A/7196A
Chromium, Trivalent <sup>a</sup>	23.5	2.2	mg/kg	1	10/02/13 15:52	JM	SW846 3060A/7196A M
Redox Potential Vs H2	133		mv	1	10/04/13	AK	ASTM D1498-76M
Solids, Percent	80.6		%	1	10/01/13	SWT	SM2540B-2011 M
pH	11.23		su	1	10/04/13 12:15	AK	SW846 9045D

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

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	CUT 2 CONTENTS	<b>Date Sampled:</b>	09/30/13
<b>Lab Sample ID:</b>	D51122-1A	<b>Date Received:</b>	10/01/13
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.6
<b>Project:</b>	FRU 197-31A		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	15.7	2.0	mg/l	1	10/04/13	10/04/13 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Magnesium	< 1.0	1.0	mg/l	1	10/04/13	10/04/13 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Sodium	2910	2.0	mg/l	1	10/04/13	10/04/13 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>

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

RL = Reporting Limit



Report of Analysis

**Client Sample ID:** CUT 2 CONTENTS  
**Lab Sample ID:** D51122-1A  
**Matrix:** SO - Soil  
**Project:** FRU 197-31A

**Date Sampled:** 09/30/13  
**Date Received:** 10/01/13  
**Percent Solids:** 80.6

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio <sup>a</sup>	199		ratio	1	10/04/13 20:28	JM	USDA HANDBOOK 60

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

RL = Reporting Limit

## Misc. Forms

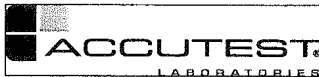
5

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody



## CHAIN OF CUSTODY

PAGE 1 OF 1

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

FED-EX Tracking #		Bottle Order Control #	
Accutest Quote #		Accutest Job # <b>D51122</b>	
Client / Reporting Information		Project Information	
Company Name <b>KRW Consulting</b>		Project Name <b>XTO FRU 197-31A</b>	
Street Address <b>8000 West 14th Street, Suite 200</b>		Street	
City <b>Lakewood, CO 80214</b>		City State	
Project Contact <b>Dwayne Knudson</b>		Billing Information (if different from Report to) Company Name <b>XTO Energy</b>	
Phone # <b>970-488-1098</b>		Street Address <b>21459 CR 5</b>	
Sample(s) Name(s) <b>David Sanders 970-488-1098</b>		City <b>Rifle, CO 81650</b>	
Project Manager <b>Joe Hess</b>		Attention <b>Jessica Dooling</b>	
Field ID / Point of Collection <b>Cut 2 Contents</b>		MECH/DI Val #	
Date <b>9/30/13</b>		Time <b>1239</b>	
Sampled by <b>DS</b>		Matrix <b>SO</b>	
# of bottles <b>5</b>		HCl	
NaOH		HNO3	
H2SO4		NONE	
DI Water		MECH	
ENCODE		Blankette	
LAB USE ONLY		Matrix Codes	
DW - Drinking Water		GW - Ground Water	
WW - Water		SW - Surface Water	
SO - Soil		SC - Sludge	
SED - Sediment		OI - Oil	
LIQ - Other Liquid		AIR - Air	
SOL - Other Solid		WIP - Wipe	
FB - Field Blank		EB - Equipment Blank	
RB - Rinse Blank		TB - Trip Blank	
Turnaround Time (Business days)		Data Deliverable Information	
Approved By (Accutest PM): / Date:		Comments / Special Instructions	
<input type="checkbox"/> Std. 10 Business Days		<input type="checkbox"/> Commercial "A" (Level 1)	
<input checked="" type="checkbox"/> Std. 5 Business Days (By contract only)		<input type="checkbox"/> Commercial "B" (Level 2)	
<input type="checkbox"/> 3 Day Emergency		<input type="checkbox"/> COMMBN	
<input type="checkbox"/> 2 Day Emergency		<input type="checkbox"/> COMMBN+	
<input type="checkbox"/> 1 Day Emergency		<input type="checkbox"/> State Forms Required	
Emergency & Rush T/A data available VIA Lablink		<input type="checkbox"/> Send Forms to State	
		<input type="checkbox"/> Report by Fax	
		<input checked="" type="checkbox"/> Report by PDF ONLY	
		<input type="checkbox"/> EDD Format	
		Commercial "A" = Results Only	
		Commercial "B" = Results + QC Summary	
		Commercial BN = Results/QC/Narrative (= = chromatograms)	
Sample Custody must be documented below each time samples change possession, including courier delivery.		Please email to: <b>KRW Piceance Team</b>	
Relinquished By: <b>Service Center</b>	Date Time: <b>9/30/13 1700</b>	Relinquished By:	Date Time:
Received By:	Date Time:	Received By:	Date Time:
Relinquished By:	Date Time:	Relinquished By:	Date Time:
Received By:	Date Time:	Received By:	Date Time:
Relinquished By:	Date Time:	Relinquished By:	Date Time:
Received By:	Date Time:	Received By:	Date Time:
Custody Seal # <b>60</b>	Intact <input checked="" type="checkbox"/> Not intact <input type="checkbox"/>	Preserved where applicable <input type="checkbox"/>	On Ice <input checked="" type="checkbox"/> Cooler Temp. <b>3.3</b>

D51122: Chain of Custody

Page 1 of 2

## Accutest Laboratories Sample Receipt Summary

**Accutest Job Number:** D51122

**Client:** KRW

**Immediate Client Services Action Required:** No

**Date / Time Received:** 10/1/2013 11:50:00 AM

**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: <input checked="" type="checkbox"/> <input type="checkbox"/> | 3. COC Present: <input checked="" type="checkbox"/> <input type="checkbox"/>       |
| 2. Custody Seals Intact: <input checked="" type="checkbox"/> <input type="checkbox"/>  | 4. Smpl Dates/Time OK <input checked="" type="checkbox"/> <input type="checkbox"/> |

**Cooler Temperature**
**Y or N**

- |   |              |
|---|--------------|
| 1. Temp criteria achieved: <input checked="" type="checkbox"/> <input type="checkbox"/> | Infrared gun |
| 2. Cooler temp verification:  | Ice (bag)    |
| 3. Cooler media:  |              |

**Quality Control Preservation**
**Y or N**
**N/A**

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input type="checkbox"/> |                                     |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input type="checkbox"/> |                                     |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**Sample Integrity - Documentation**
**Y or N**

- |  |  |
|--|--|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> <input type="checkbox"/> |

**Sample Integrity - Condition**
**Y or N**

- |                                  |  |
|----------------------------------|--|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 3. Condition of sample:          | Intact   |

**Sample Integrity - Instructions**
**Y or N N/A**

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume rec'd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Comments

 Accutest Laboratories  
 V: (303) 425-6021

 4036 Youngfield Street  
 F: (303) 425-6854

 Wheat Ridge, CO  
 www.accutest.com

## 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**

Page 1 of 1

**Job Number:** D51122  
**Account:** XTOKRWR XTO Energy  
**Project:** FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V1763-MB	5V29325.D	1	10/01/13	BD	n/a	n/a	V5V1763

The QC reported here applies to the following samples:

Method: SW846 8260B

D51122-1

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	98% 64-130%
460-00-4	4-Bromofluorobenzene	87% 62-131%
17060-07-0	1,2-Dichloroethane-D4	105% 70-130%

## Blank Spike Summary

Page 1 of 1

**Job Number:** D51122  
**Account:** XTOKRWR XTO Energy  
**Project:** FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V1763-BS	5V29326.D	1	10/01/13	BD	n/a	n/a	V5V1763

The QC reported here applies to the following samples:

Method: SW846 8260B

D51122-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	2500	2650	106	70-130
100-41-4	Ethylbenzene	2500	2840	114	70-130
108-88-3	Toluene	2500	2740	110	70-130
1330-20-7	Xylene (total)	7500	8900	119	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	103%	64-130%
460-00-4	4-Bromofluorobenzene	101%	62-131%
17060-07-0	1,2-Dichloroethane-D4	93%	70-130%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** D51122  
**Account:** XTOKRWR XTO Energy  
**Project:** FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D51039-1MS	5V29328.D	1	10/01/13	BD	n/a	n/a	V5V1763
D51039-1MSD	5V29329.D	1	10/01/13	BD	n/a	n/a	V5V1763
D51039-1	5V29327.D	1	10/01/13	BD	n/a	n/a	V5V1763

The QC reported here applies to the following samples:

Method: SW846 8260B

D51122-1

CAS No.	Compound	D51039-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		3620	3780	104	3940	109	4	64-139/30
100-41-4	Ethylbenzene	ND		3620	3880	107	3890	107	0	68-136/30
108-88-3	Toluene	ND		3620	3640	101	3610	100	1	60-130/30
1330-20-7	Xylene (total)	ND		10900	12300	113	12400	114	1	58-142/30

CAS No.	Surrogate Recoveries	MS	MSD	D51039-1	Limits
2037-26-5	Toluene-D8	95%	93%	97%	64-130%
460-00-4	4-Bromofluorobenzene	108%	107%	96%	62-131%
17060-07-0	1,2-Dichloroethane-D4	94%	94%	99%	70-130%

\* = Outside of Control Limits.



GC/MS Volatiles

Raw Data

7

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5100113.S\  
 Data File : 5V29343.D  
 Acq On : 1 Oct 2013 9:52 pm  
 Operator : BRETD  
 Sample : D51122-1  
 Misc : MS6474,V5V1763,5.041,,100,5,1  
 ALS Vial : 21 Sample Multiplier: 1

Quant Time: Oct 02 09:24:42 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	166371	50.00	ug/l	0.00
37) 1,4-Difluorobenzene	12.412	114	223274	50.00	ug/l	0.00
56) Chlorobenzene-d5	15.061	117	229167	50.00	ug/l	0.00
77) 1,4-Dichlorobenzene-d4	17.025	152	164203	50.00	ug/l	-0.01

## System Monitoring Compounds

35) 1,2-Dichloroethane-d4	12.013	102	15680	46.38	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	92.76%
64) Toluene-d8	13.805	98	250795	48.31	ug/l	-0.01
Spiked Amount	50.000	Range	70 - 130	Recovery	=	96.62%
72) 4-Bromofluorobenzene	16.008	95	117120	48.40	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	96.80%

## Target Compounds

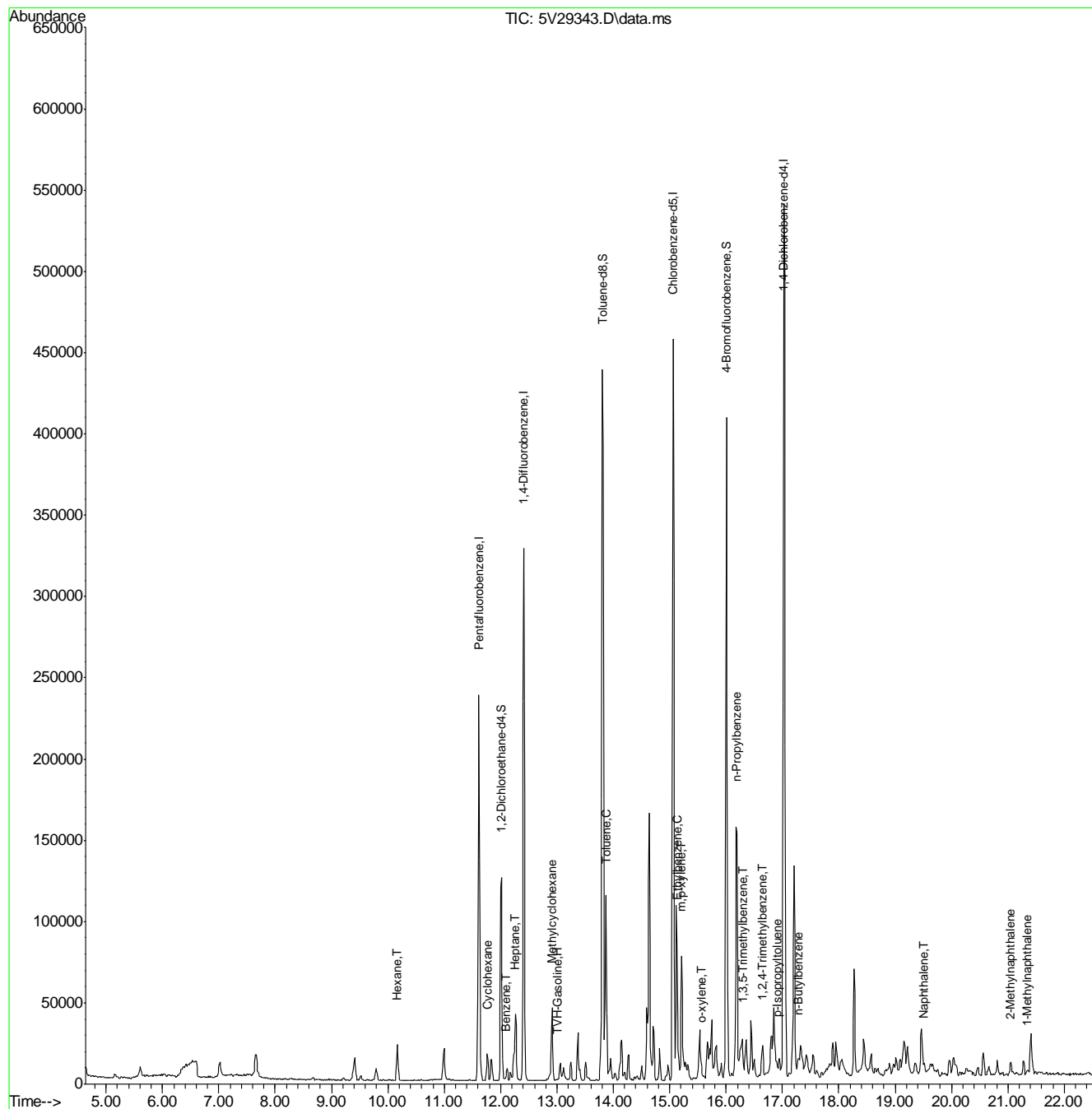
					Qvalue
1) TVH-Gasoline	13.006	TIC	2434343m	234.90	ug/l
33) Cyclohexane	11.761	56	8516	27.34	ug/l 83
43) Hexane	10.163	57	9420	4.11	ug/l 100
45) Heptane	12.264	43	20366	5.52	ug/l 93
47) Methylcyclohexane	12.914	83	10828	5.42	ug/l # 83
53) Benzene	12.092	78	1745	0.35	ug/l 100
65) Toluene	13.874	92	21524	6.05	ug/l 100
69) Ethylbenzene	15.129	91	17111	2.79	ug/l 95
75) m,p-xylene	15.209	106	19436	7.27	ug/l 98
76) o-xylene	15.563	106	1997	0.76	ug/l 87
80) n-Propylbenzene	16.180	91	7007	0.97	ug/l 85
83) 1,3,5-Trimethylbenzene	16.294	105	1581m	0.82	ug/l
85) 1,2,4-Trimethylbenzene	16.648	105	6139	1.46	ug/l 86
89) p-Isopropyltoluene	16.899	119	4544	1.33	ug/l 83
91) n-Butylbenzene	17.276	91	3591	1.12	ug/l 81
94) Naphthalene	19.513	128	5563	1.55	ug/l 100
97) 2-Methylnaphthalene	21.043	142	4294	2.40	ug/l 87
98) 1-Methylnaphthalene	21.340	142	2245	1.91	ug/l # 83

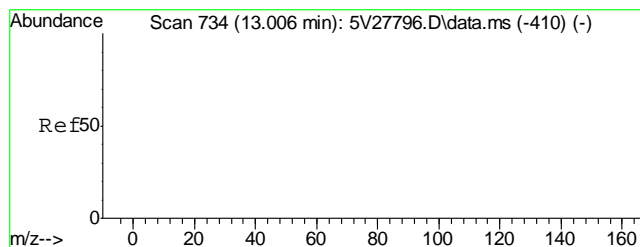
(#) = qualifier out of range (m) = manual integration (+) = signals summed

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5100113.S\  
Data File : 5V29343.D  
Acq On : 1 Oct 2013 9:52 pm  
Operator : BRETD  
Sample : D51122-1  
Misc : MS6474,V5V1763,5.041,,100,5,1  
ALS Vial : 21 Sample Multiplier: 1

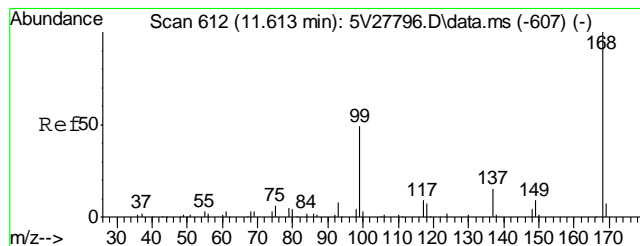
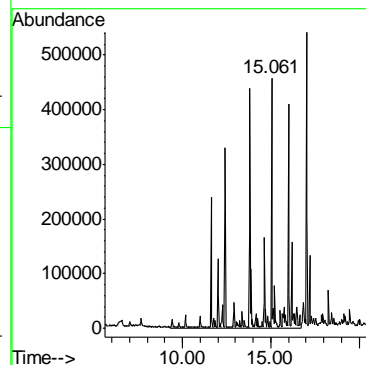
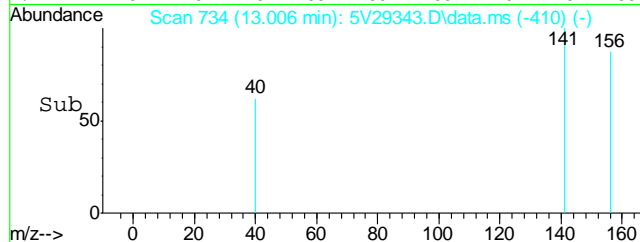
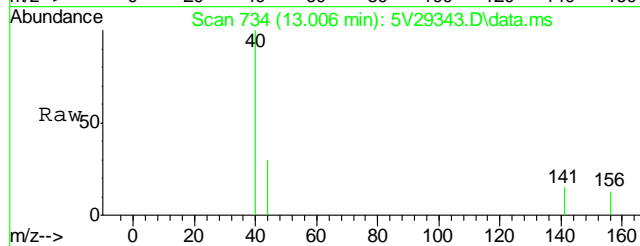
Quant Time: Oct 02 09:24:42 2013  
Quant Method : C:\msdchem\1\METHODS\V5AP1728TVH1728.M  
Quant Title : 8260  
QLast Update : Tue Aug 20 09:59:22 2013  
Response via : Initial Calibration





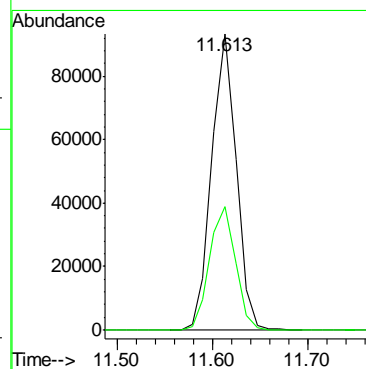
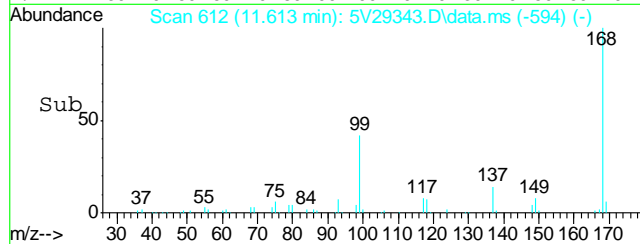
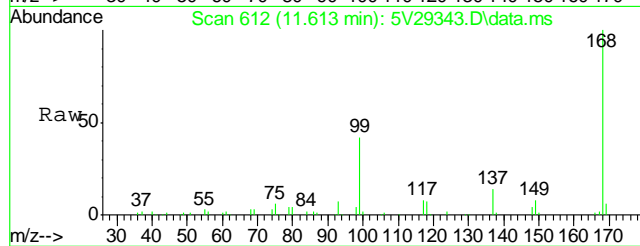
#1  
TVH-Gasoline  
Concen: 234.90 ug/l m  
RT: 13.006 min Scan# 734  
Delta R.T. 0.000 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

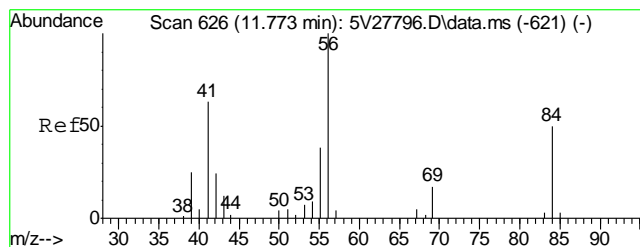
Tgt Ion:TIC Resp: 2434343



#2  
Pentafluorobenzene  
Concen: 50.00 ug/l  
RT: 11.613 min Scan# 612  
Delta R.T. 0.000 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

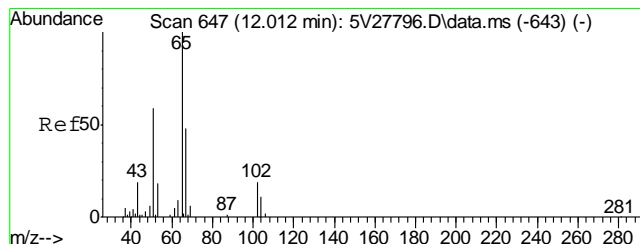
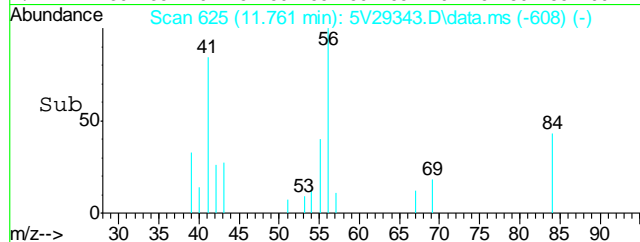
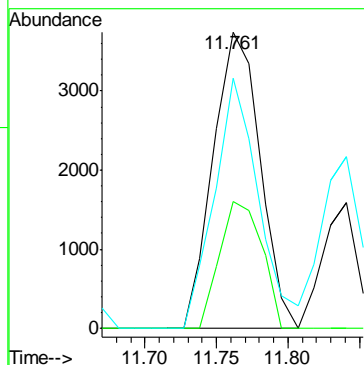
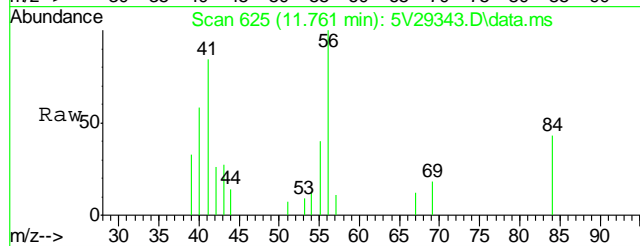
Tgt Ion:168 Resp: 166371  
Ion Ratio Lower Upper  
168 100  
99 43.9 41.4 62.2





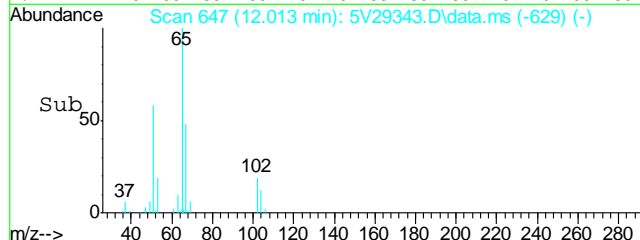
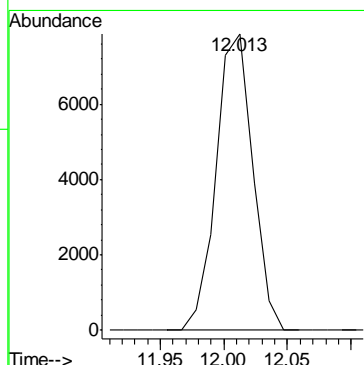
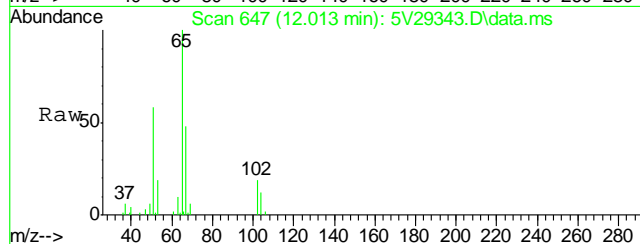
#33  
Cyclohexane  
Concen: 27.34 ug/l  
RT: 11.761 min Scan# 625  
Delta R.T. -0.011 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

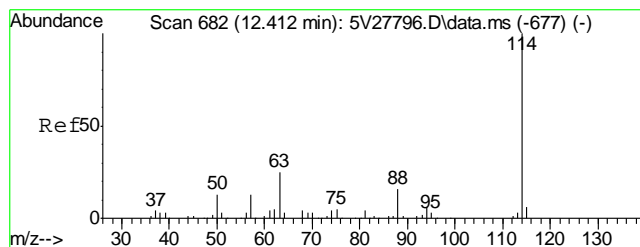
Tgt Ion	Resp	Lower	Upper
56	100		
84	38.5	29.4	69.4
41	80.0	46.0	86.0



#35  
1,2-Dichloroethane-d4  
Concen: 46.38 ug/l  
RT: 12.013 min Scan# 647  
Delta R.T. 0.000 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

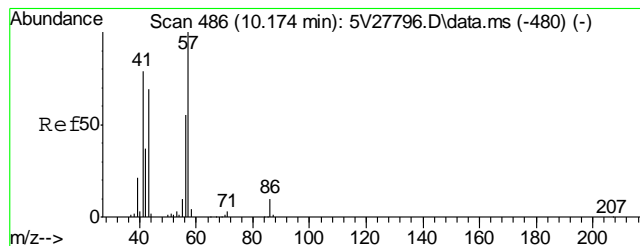
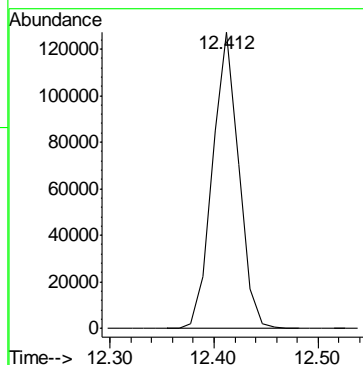
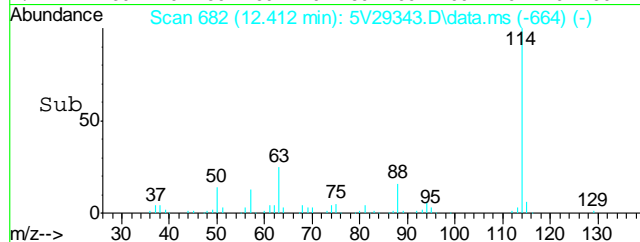
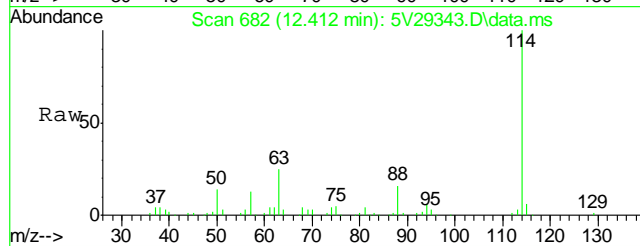
Tgt Ion	Resp
102	15680





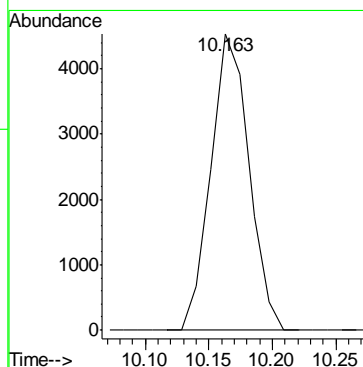
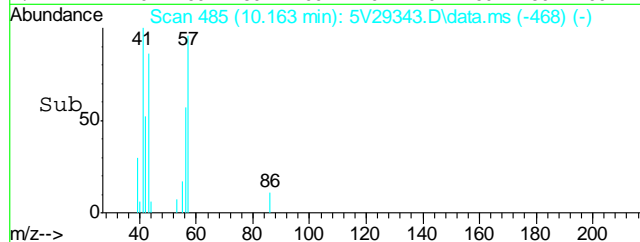
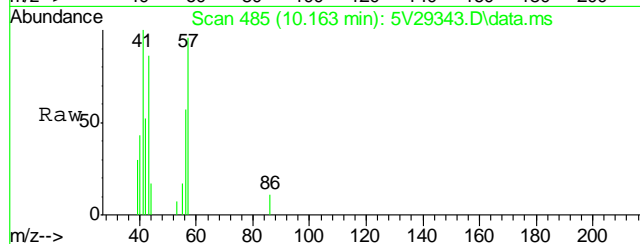
#37  
1,4-Difluorobenzene  
Concen: 50.00 ug/l  
RT: 12.412 min Scan# 682  
Delta R.T. 0.000 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

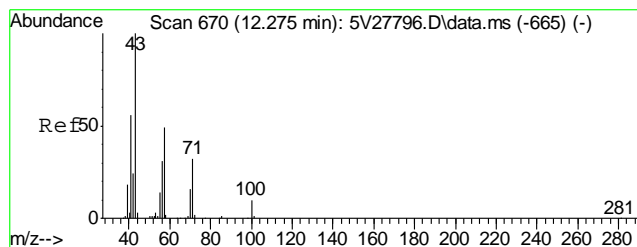
Tgt Ion: 114 Resp: 223274



#43  
Hexane  
Concen: 4.11 ug/l  
RT: 10.163 min Scan# 485  
Delta R.T. -0.011 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

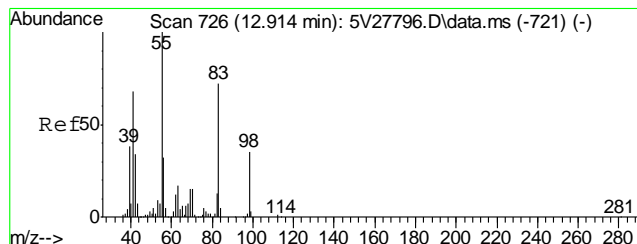
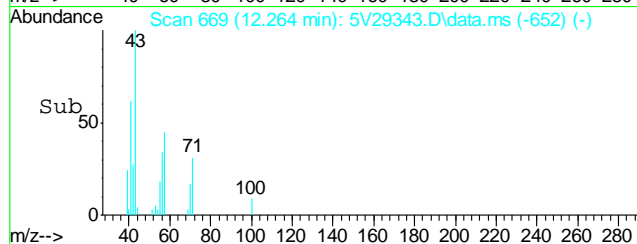
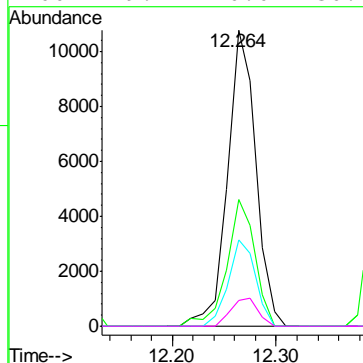
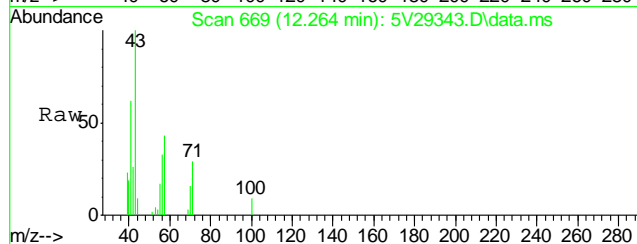
Tgt Ion: 57 Resp: 9420





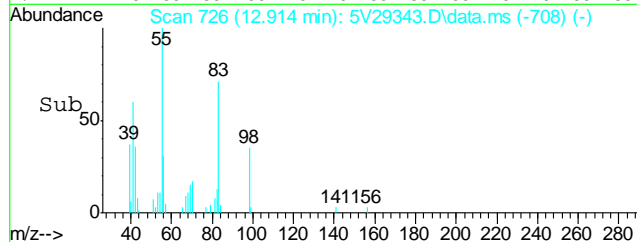
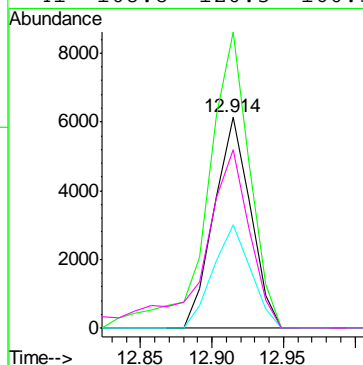
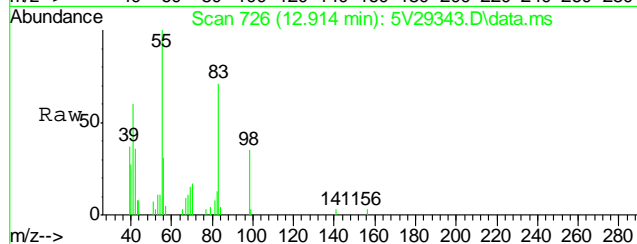
#45  
Heptane  
Concen: 5.52 ug/l  
RT: 12.264 min Scan# 669  
Delta R.T. -0.010 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

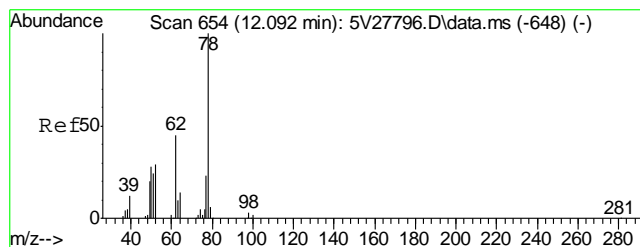
Tgt Ion:	43	Resp:	20366
Ion Ratio	Lower	Upper	
43	100		
57	42.7	28.7	68.7
71	27.9	11.3	51.3
100	9.1	0.0	30.2



#47  
Methylcyclohexane  
Concen: 5.42 ug/l  
RT: 12.914 min Scan# 726  
Delta R.T. 0.000 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

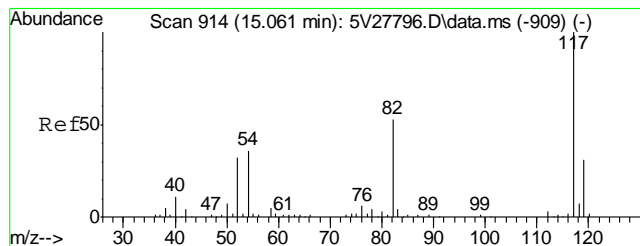
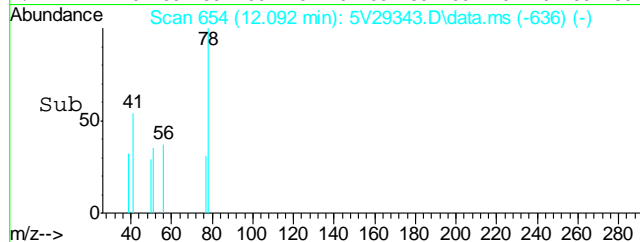
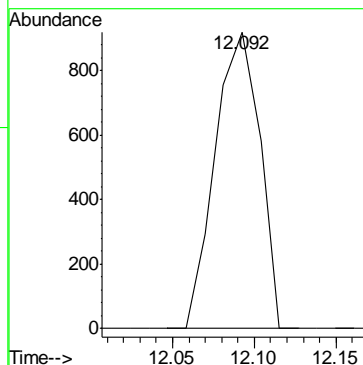
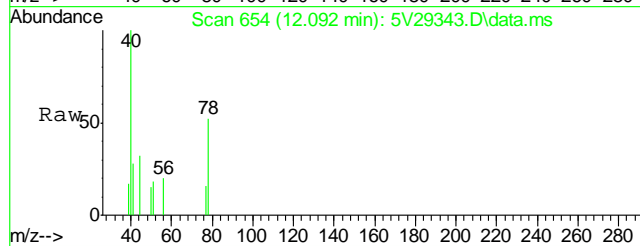
Tgt Ion:	83	Resp:	10828
Ion Ratio	Lower	Upper	
83	100		
55	161.8	124.5	164.5
98	50.4	29.2	69.2
41	108.8	120.5	160.5#





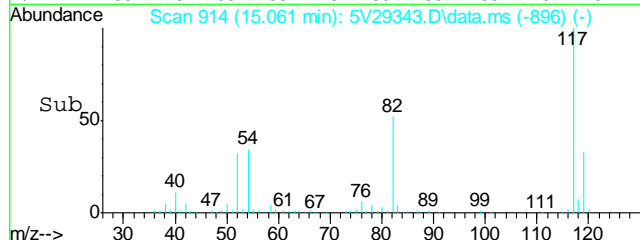
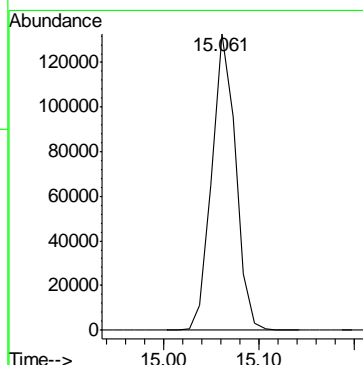
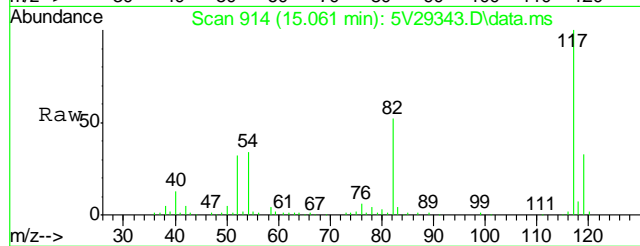
#53  
Benzene  
Concen: 0.35 ug/l  
RT: 12.092 min Scan# 654  
Delta R.T. 0.000 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

Tgt Ion: 78 Resp: 1745

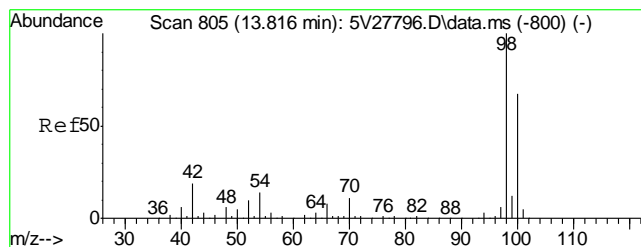


#56  
Chlorobenzene-d5  
Concen: 50.00 ug/l  
RT: 15.061 min Scan# 914  
Delta R.T. 0.000 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

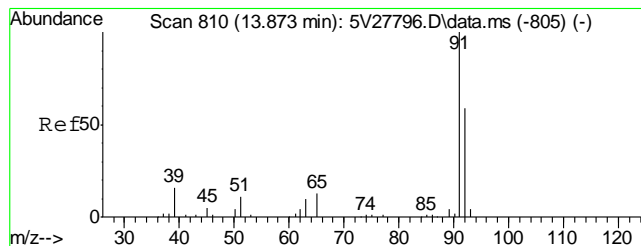
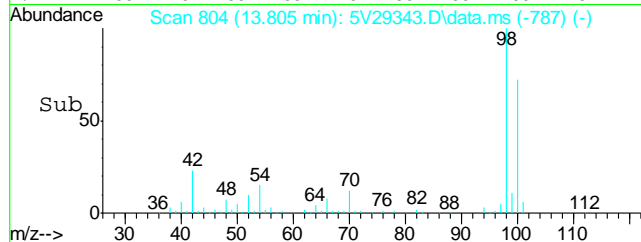
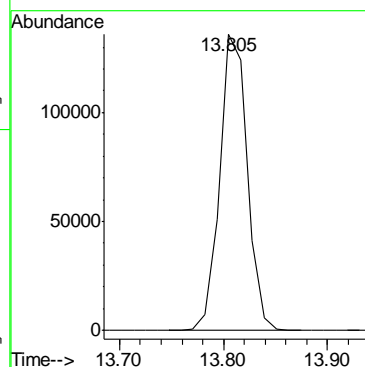
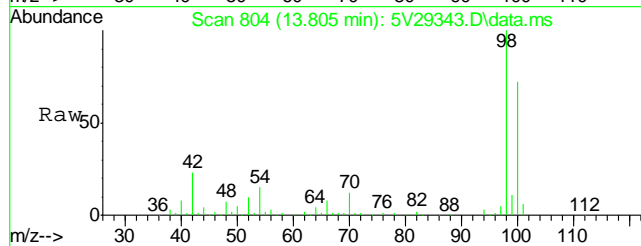
Tgt Ion: 117 Resp: 229167



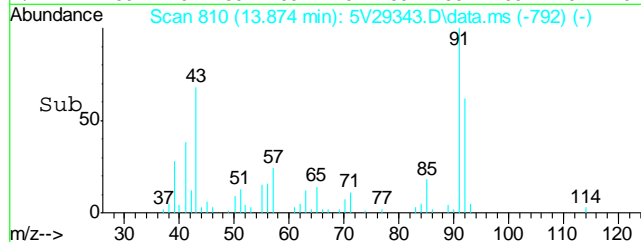
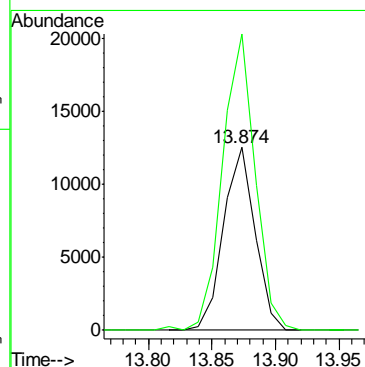
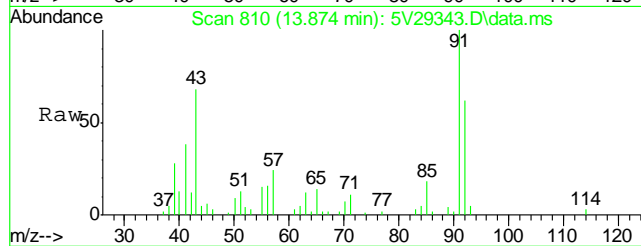


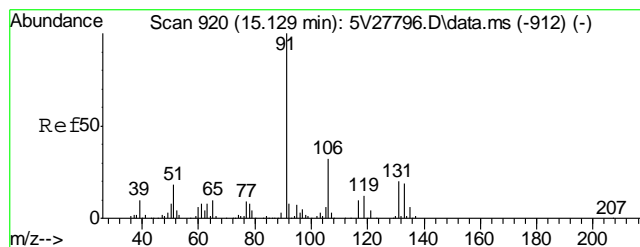


#64  
Toluene-d8  
Concen: 48.31 ug/l  
RT: 13.805 min Scan# 804  
Delta R.T. -0.011 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm  
Tgt Ion: 98 Resp: 250795



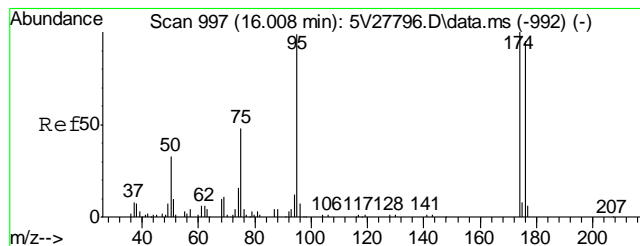
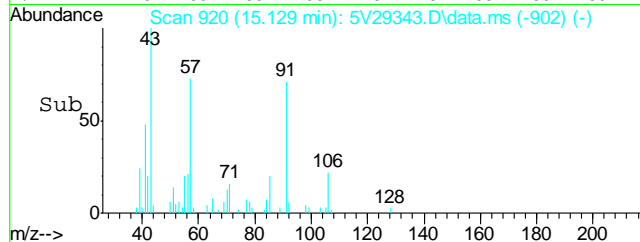
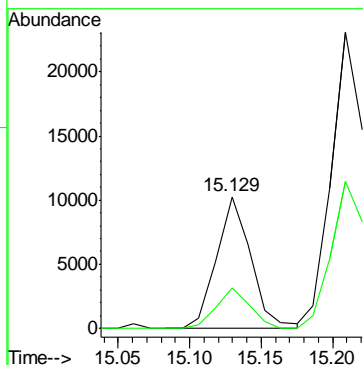
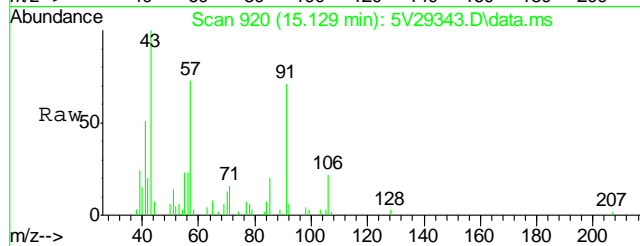
#65  
Toluene  
Concen: 6.05 ug/l  
RT: 13.874 min Scan# 810  
Delta R.T. 0.001 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm  
Tgt Ion: 92 Resp: 21524  
Ion Ratio Lower Upper  
92 100  
91 167.0 146.5 186.5





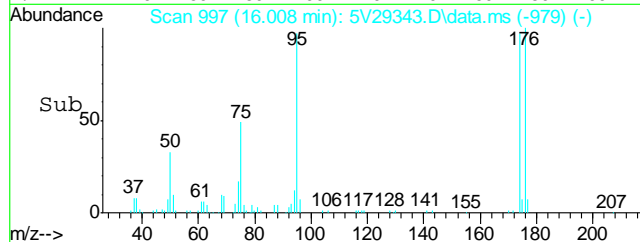
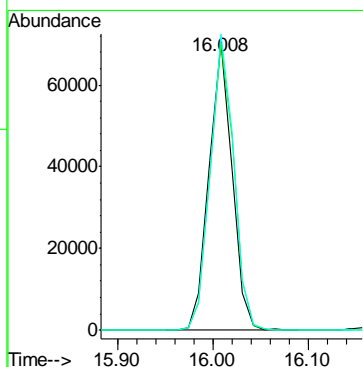
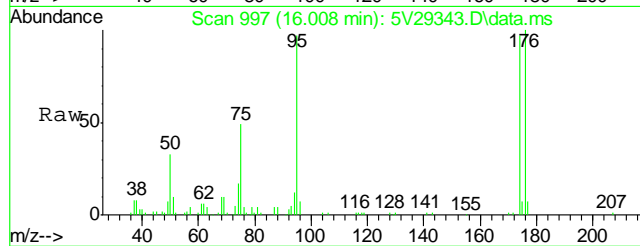
#69  
Ethylbenzene  
Concen: 2.79 ug/l  
RT: 15.129 min Scan# 920  
Delta R.T. 0.000 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

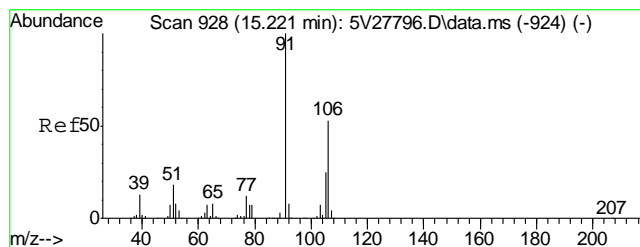
Tgt Ion: 91 Resp: 17111  
Ion Ratio Lower Upper  
91 100  
106 29.9 12.6 52.6



#72  
4-Bromofluorobenzene  
Concen: 48.40 ug/l  
RT: 16.008 min Scan# 997  
Delta R.T. 0.000 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

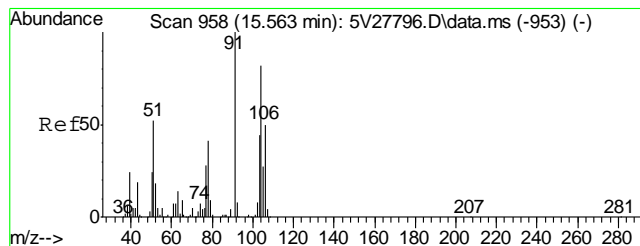
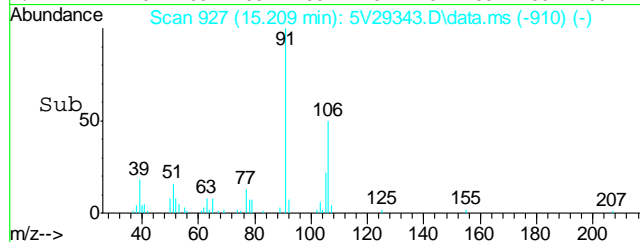
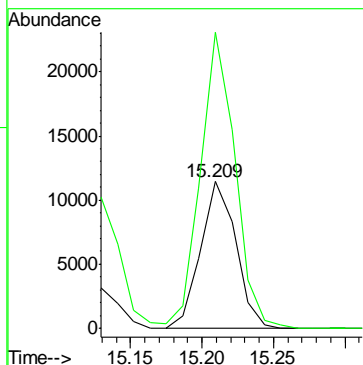
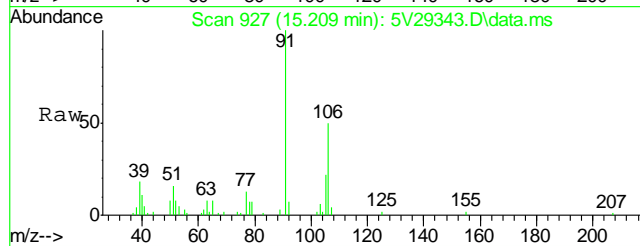
Tgt Ion: 95 Resp: 117120  
Ion Ratio Lower Upper  
95 100  
174 103.0 85.4 125.4  
176 104.8 80.6 120.6





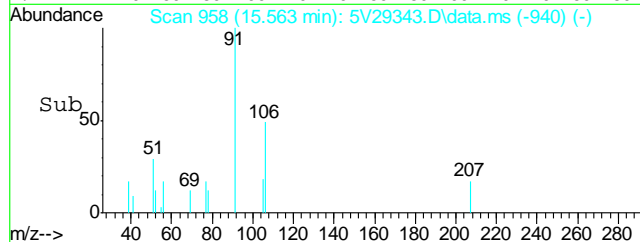
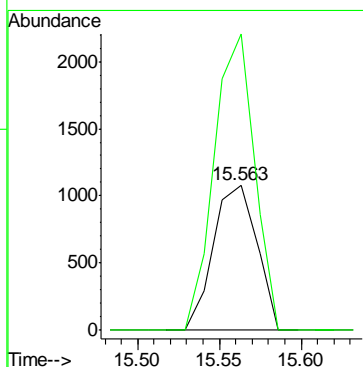
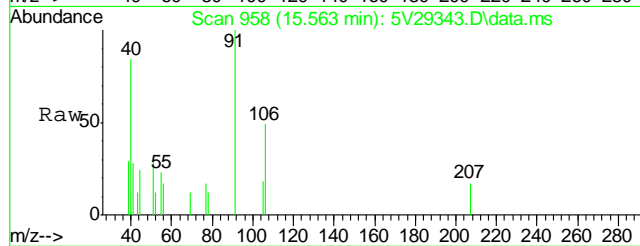
#75  
m,p-xylene  
Concen: 7.27 ug/l  
RT: 15.209 min Scan# 927  
Delta R.T. -0.011 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

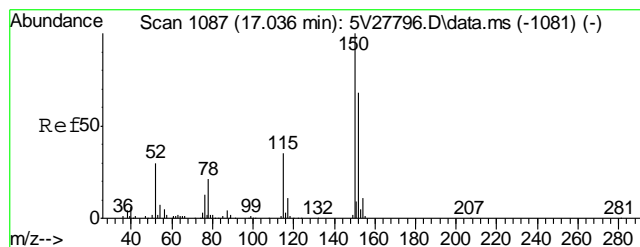
Tgt Ion	Ratio	Lower	Upper
106	100		
91	197.2	174.8	214.8



#76  
o-xylene  
Concen: 0.76 ug/l  
RT: 15.563 min Scan# 958  
Delta R.T. 0.001 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

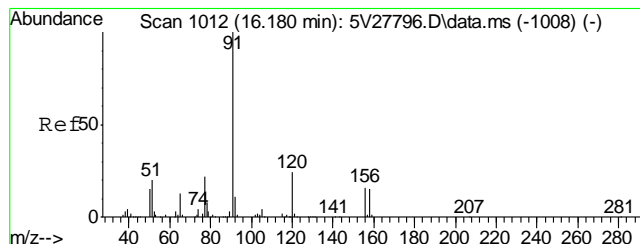
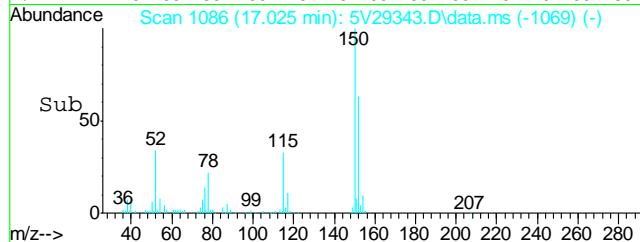
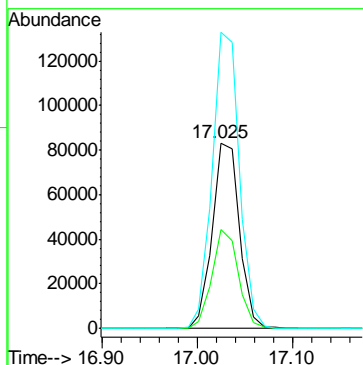
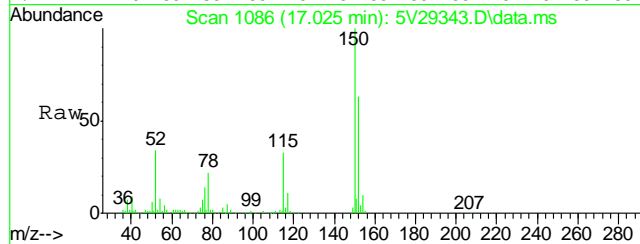
Tgt Ion	Ratio	Lower	Upper
106	100		
91	188.8	188.4	228.4





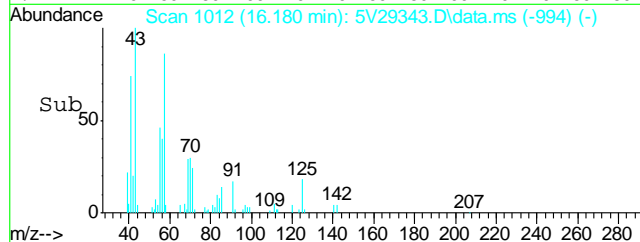
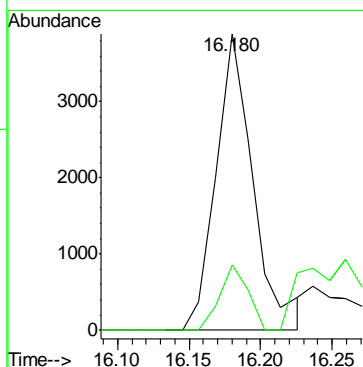
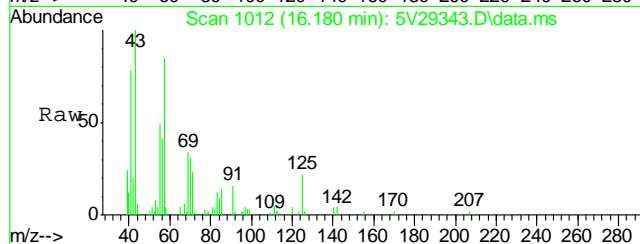
#77  
1,4-Dichlorobenzene-d4  
Concen: 50.00 ug/l  
RT: 17.025 min Scan# 1086  
Delta R.T. -0.011 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

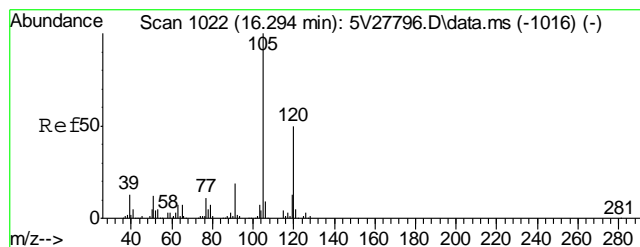
Tgt Ion	Ratio	Lower	Upper
152	100		
115	51.9	43.4	65.2
150	159.8	142.9	214.3



#80  
n-Propylbenzene  
Concen: 0.97 ug/l  
RT: 16.180 min Scan# 1012  
Delta R.T. 0.000 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

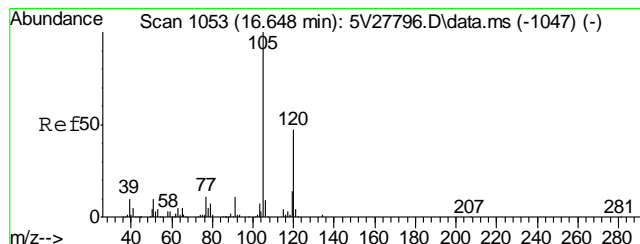
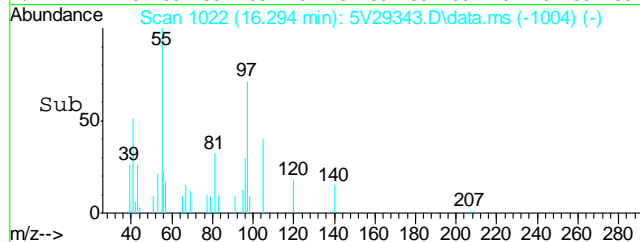
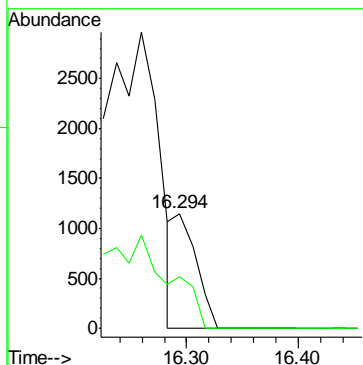
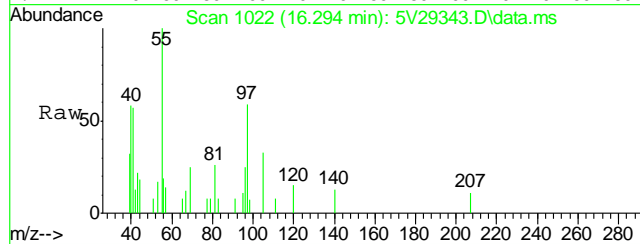
Tgt Ion	Ratio	Lower	Upper
91	100		
120	16.6	3.8	43.8





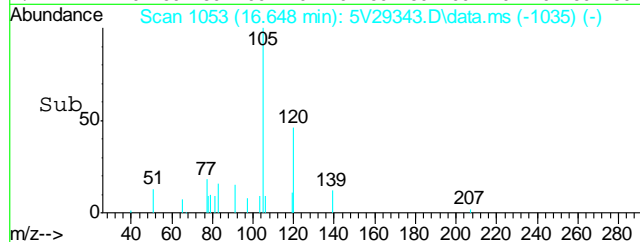
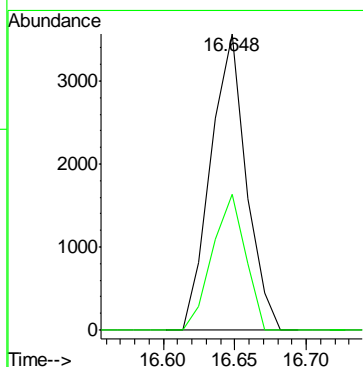
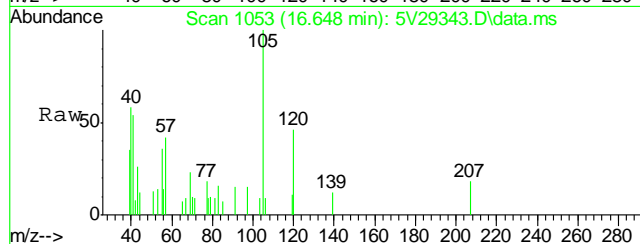
#83  
1,3,5-Trimethylbenzene  
Concen: 0.82 ug/l m  
RT: 16.294 min Scan# 1022  
Delta R.T. 0.001 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

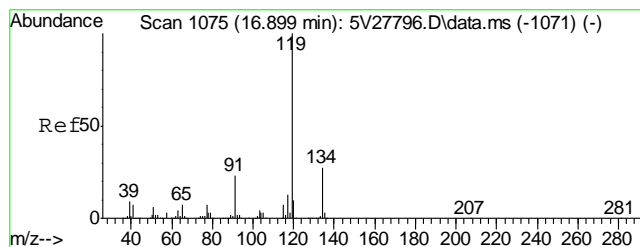
Tgt Ion	Ratio	Lower	Upper
105	100		
120	220.1	28.6	68.6#



#85  
1,2,4-Trimethylbenzene  
Concen: 1.46 ug/l  
RT: 16.648 min Scan# 1053  
Delta R.T. 0.001 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

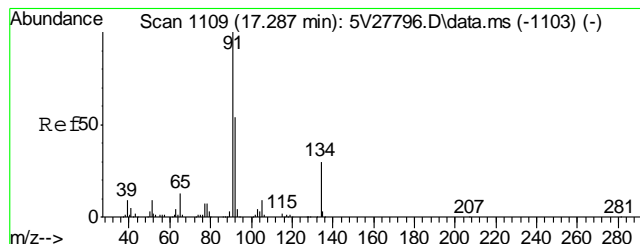
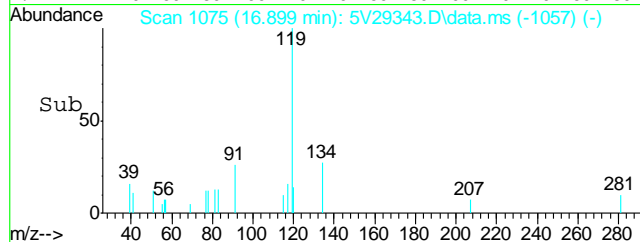
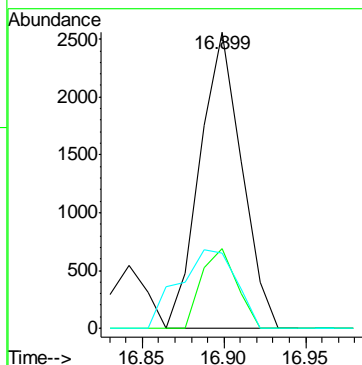
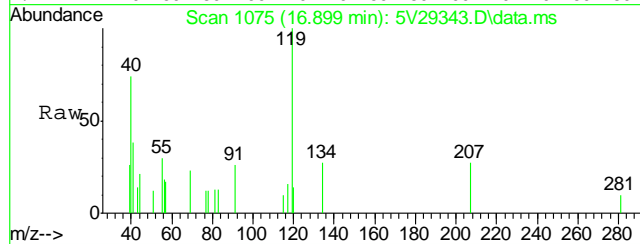
Tgt Ion	Ratio	Lower	Upper
105	100		
120	42.7	32.9	72.9





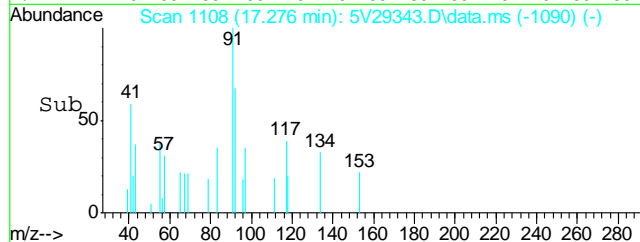
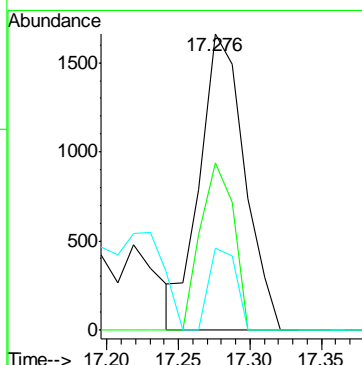
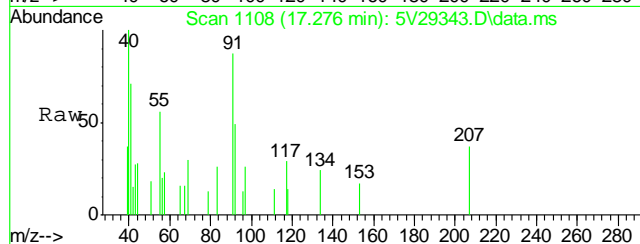
#89  
p-Isopropyltoluene  
Concen: 1.33 ug/l  
RT: 16.899 min Scan# 1075  
Delta R.T. 0.001 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

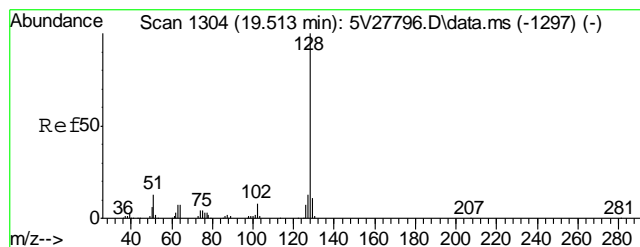
Tgt Ion:	119	Resp:	4544
Ion Ratio	100	Lower	Upper
119	100		
134	22.7	6.9	46.9
91	36.7	3.4	43.4



#91  
n-Butylbenzene  
Concen: 1.12 ug/l  
RT: 17.276 min Scan# 1108  
Delta R.T. 0.001 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

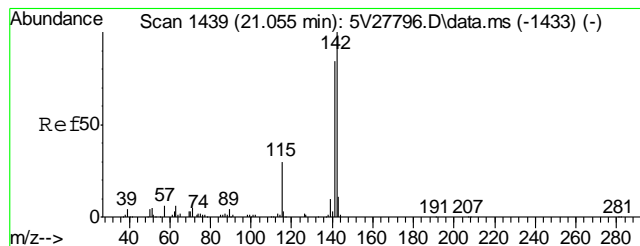
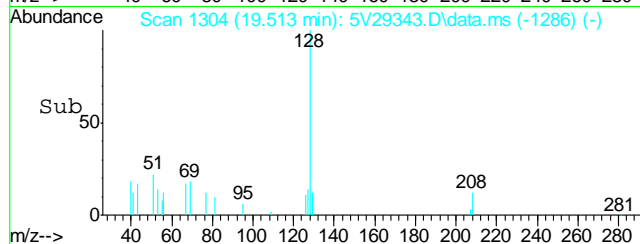
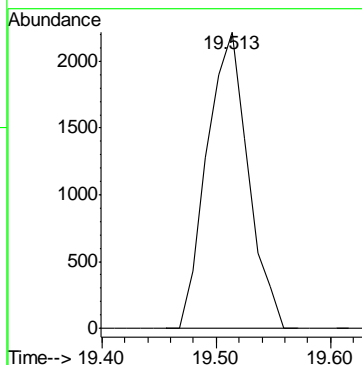
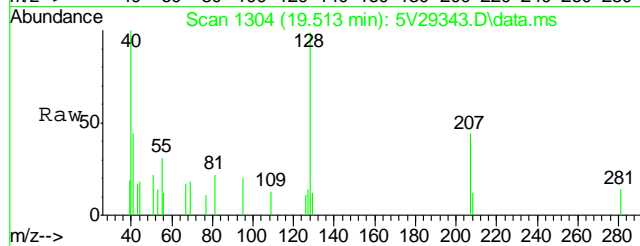
Tgt Ion:	91	Resp:	3591
Ion Ratio	100	Lower	Upper
91	100		
92	41.8	33.6	73.6
134	16.6	8.9	48.9





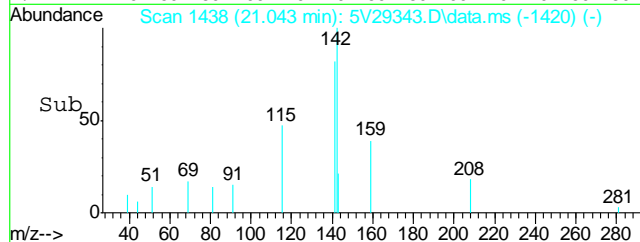
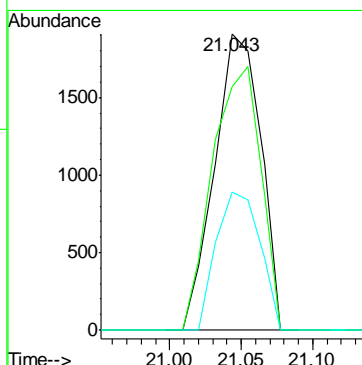
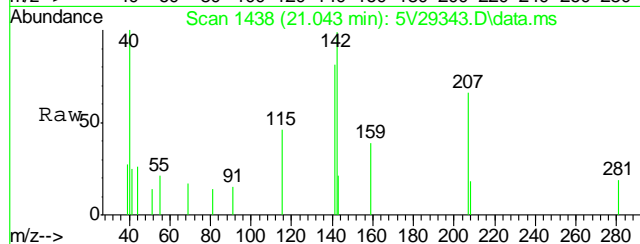
#94  
Naphthalene  
Concen: 1.55 ug/l  
RT: 19.513 min Scan# 1304  
Delta R.T. 0.000 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

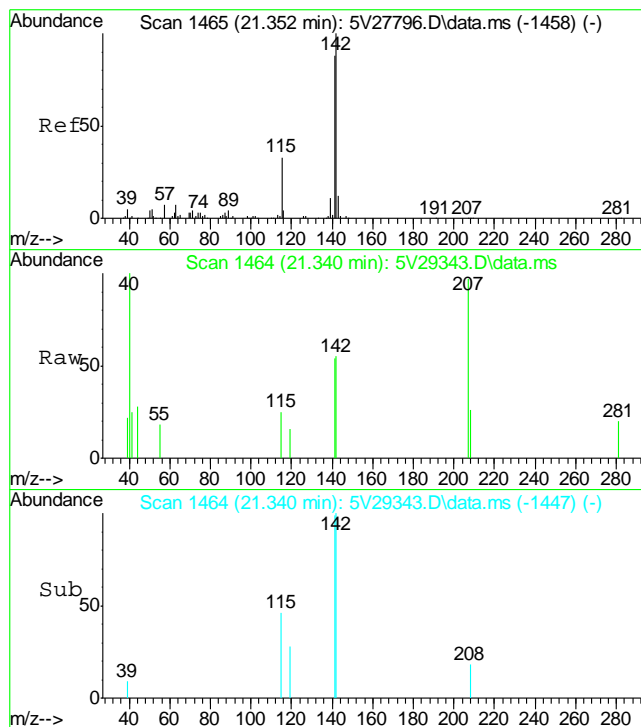
Tgt Ion:128 Resp: 5563



#97  
2-Methylnaphthalene  
Concen: 2.40 ug/l  
RT: 21.043 min Scan# 1438  
Delta R.T. 0.000 min  
Lab File: 5V29343.D  
Acq: 1 Oct 2013 9:52 pm

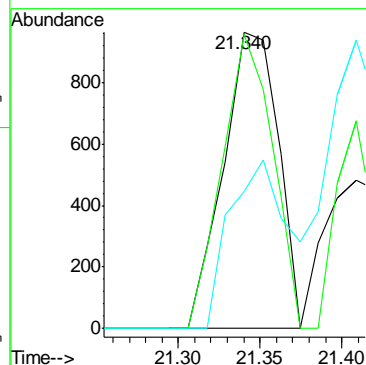
Tgt Ion:142 Resp: 4294  
Ion Ratio Lower Upper  
142 100  
141 92.7 64.7 104.7  
115 44.1 11.4 51.4





#98  
 1-Methylnaphthalene  
 Concen: 1.91 ug/l  
 RT: 21.340 min Scan# 1464  
 Delta R.T. -0.011 min  
 Lab File: 5V29343.D  
 Acq: 1 Oct 2013 9:52 pm

Tgt Ion: 142	Resp: 2245
Ion Ratio	Lower Upper
142	100
141	92.1 68.1 108.1
115	61.1 13.1 53.1#



7.1.1  
7



## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5100113.S\  
 Data File : 5V29325.D  
 Acq On : 1 Oct 2013 12:31 pm  
 Operator : BRETD  
 Sample : MB  
 Misc : MS6474,V5V1763,5.000,,100,5,1  
 ALS Vial : 3 Sample Multiplier: 1

Quant Time: Oct 02 08:53:24 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	154496	50.00	ug/l	0.00
37) 1,4-Difluorobenzene	12.412	114	212347	50.00	ug/l	0.00
56) Chlorobenzene-d5	15.061	117	210906	50.00	ug/l	0.00
77) 1,4-Dichlorobenzene-d4	17.024	152	145782	50.00	ug/l	-0.01

## System Monitoring Compounds

35) 1,2-Dichloroethane-d4	12.012	102	16515	52.60	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	105.20%
64) Toluene-d8	13.816	98	233743	48.92	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	97.84%
72) 4-Bromofluorobenzene	16.008	95	96915	43.52	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	87.04%

## Target Compounds

					Qvalue
1) TVH-Gasoline	13.006	TIC	-5250m	57.41	ug/l
18) Methylene Chloride	9.375	84	967	0.75	ug/l # 89
94) Naphthalene	19.502	128	671	0.91	ug/l 100

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

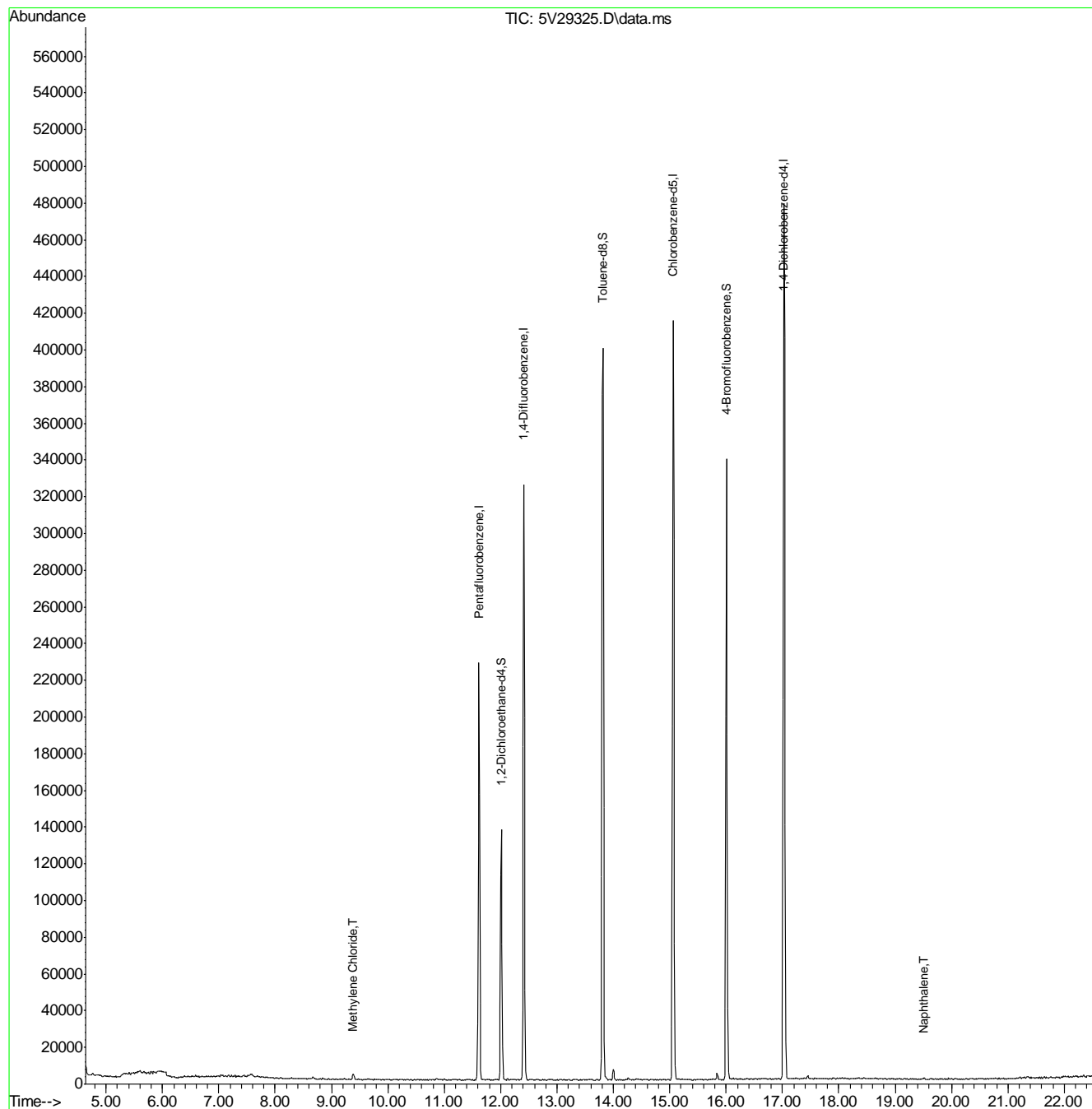
7.2.1

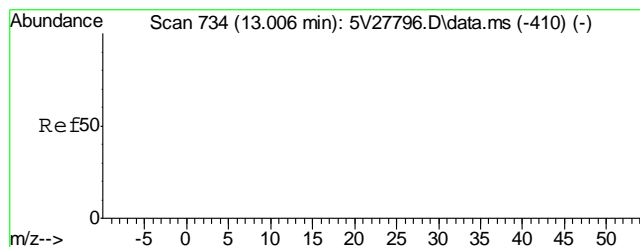
7

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5100113.S\  
Data File : 5V29325.D  
Acq On : 1 Oct 2013 12:31 pm  
Operator : BRETD  
Sample : MB  
Misc : MS6474,V5V1763,5.000,,100,5,1  
ALS Vial : 3 Sample Multiplier: 1

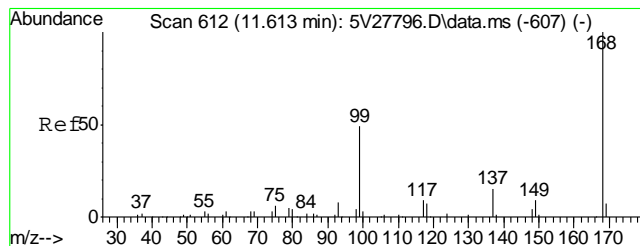
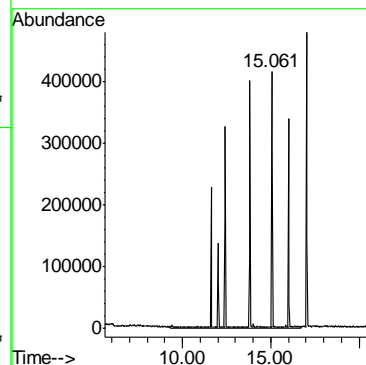
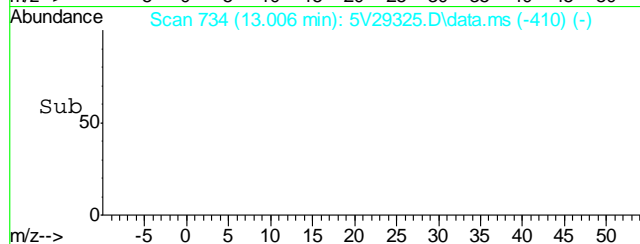
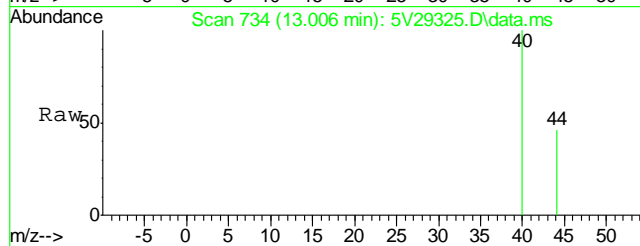
Quant Time: Oct 02 08:53:24 2013  
Quant Method : C:\msdchem\1\METHODS\V5AP1728TVH1728.M  
Quant Title : 8260  
QLast Update : Tue Aug 20 09:59:22 2013  
Response via : Initial Calibration





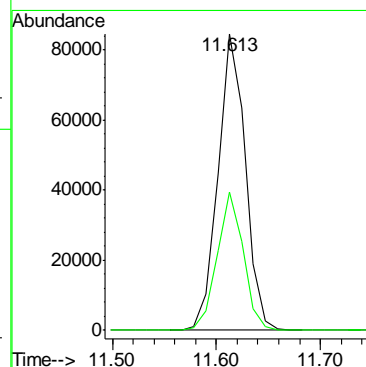
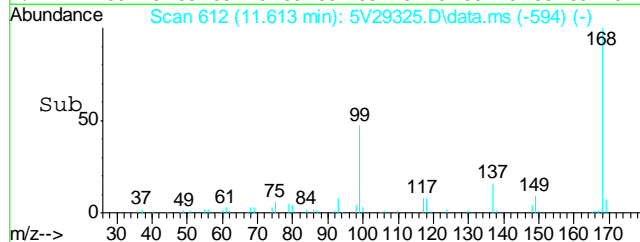
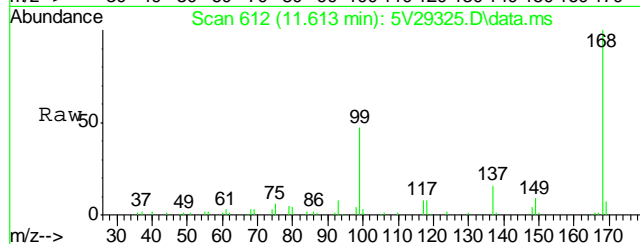
#1  
TVH-Gasoline  
Concen: 57.41 ug/l m  
RT: 13.006 min Scan# 734  
Delta R.T. 0.000 min  
Lab File: 5V29325.D  
Acq: 1 Oct 2013 12:31 pm

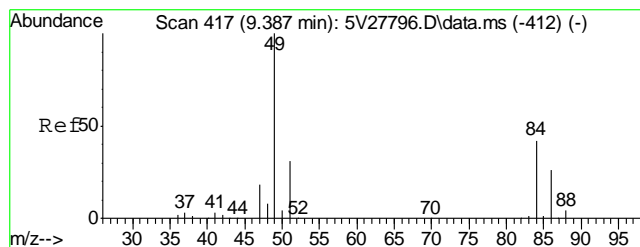
Tgt Ion:TIC Resp: -5250



#2  
Pentafluorobenzene  
Concen: 50.00 ug/l  
RT: 11.613 min Scan# 612  
Delta R.T. 0.000 min  
Lab File: 5V29325.D  
Acq: 1 Oct 2013 12:31 pm

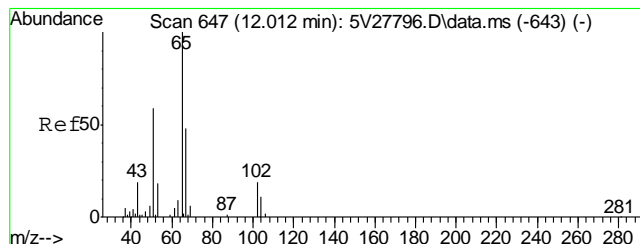
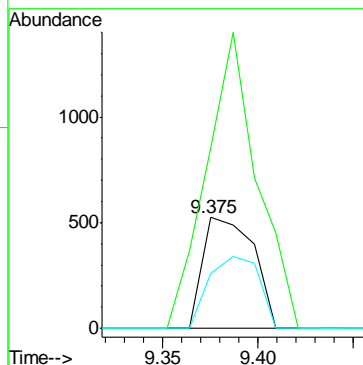
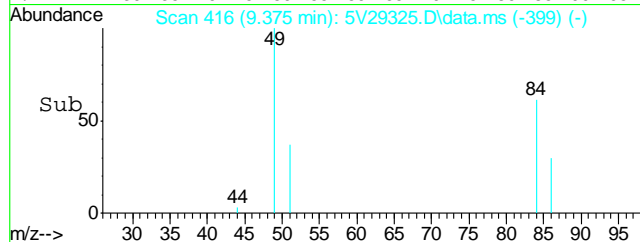
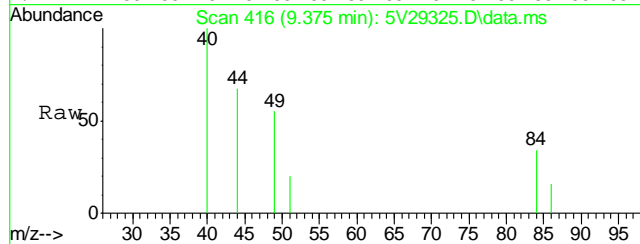
Tgt Ion:168 Resp: 154496  
Ion Ratio Lower Upper  
168 100  
99 44.7 41.4 62.2





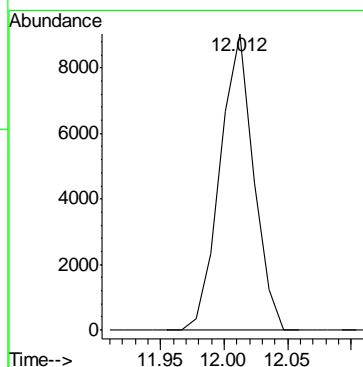
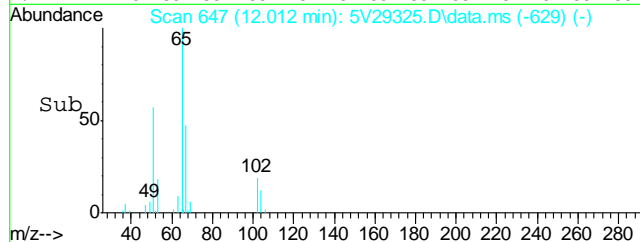
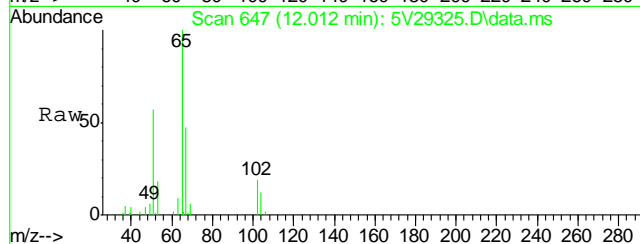
#18  
Methylene Chloride  
Concen: 0.75 ug/l  
RT: 9.375 min Scan# 416  
Delta R.T. -0.011 min  
Lab File: 5V29325.D  
Acq: 1 Oct 2013 12:31 pm

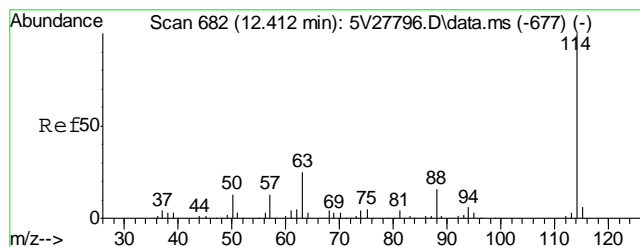
Tgt Ion	84	Resp	967
Ion Ratio	Lower	Upper	
84	100		
49	268.7	224.8	264.8#
86	64.2	44.5	84.5



#35  
1,2-Dichloroethane-d4  
Concen: 52.60 ug/l  
RT: 12.012 min Scan# 647  
Delta R.T. 0.000 min  
Lab File: 5V29325.D  
Acq: 1 Oct 2013 12:31 pm

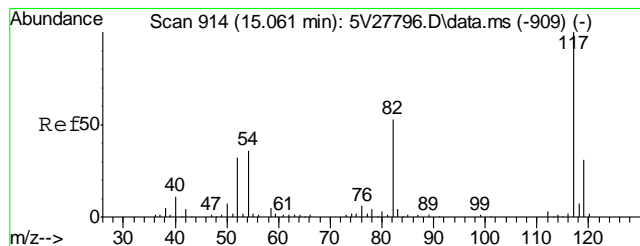
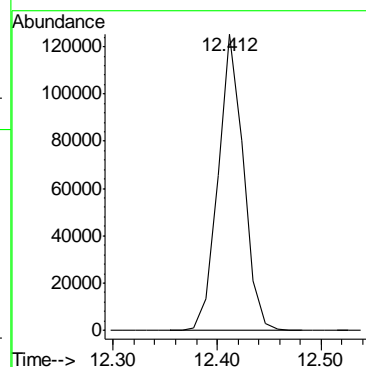
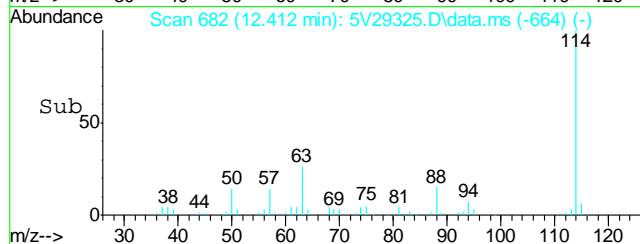
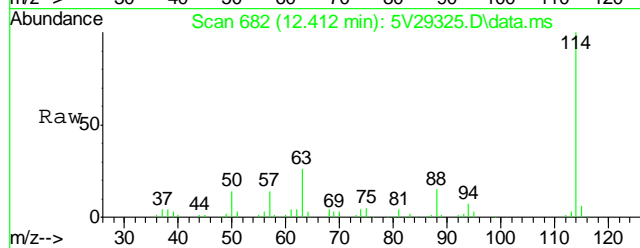
Tgt Ion: 102 Resp: 16515





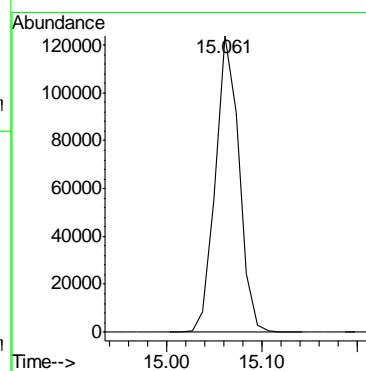
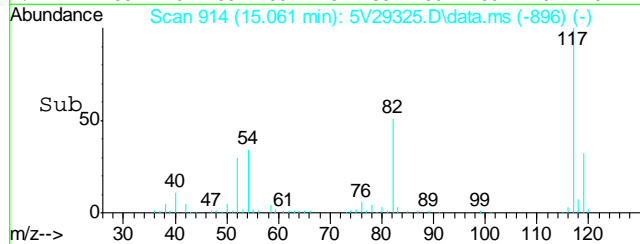
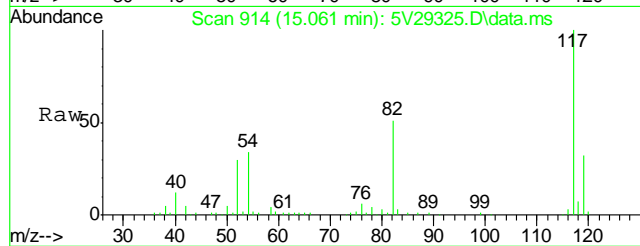
#37  
1,4-Difluorobenzene  
Concen: 50.00 ug/l  
RT: 12.412 min Scan# 682  
Delta R.T. 0.000 min  
Lab File: 5V29325.D  
Acq: 1 Oct 2013 12:31 pm

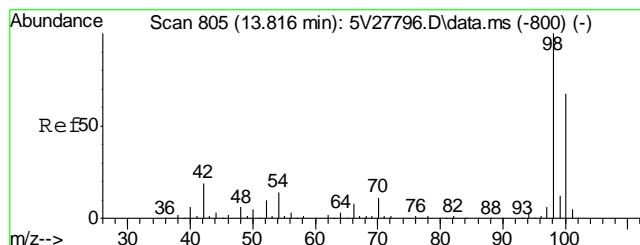
Tgt Ion:114 Resp: 212347



#56  
Chlorobenzene-d5  
Concen: 50.00 ug/l  
RT: 15.061 min Scan# 914  
Delta R.T. 0.000 min  
Lab File: 5V29325.D  
Acq: 1 Oct 2013 12:31 pm

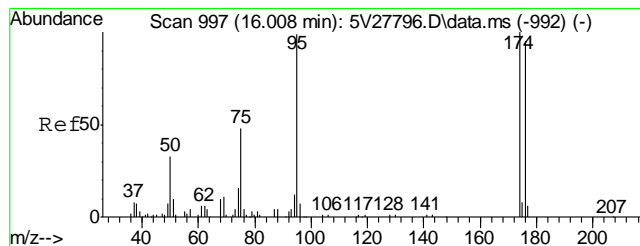
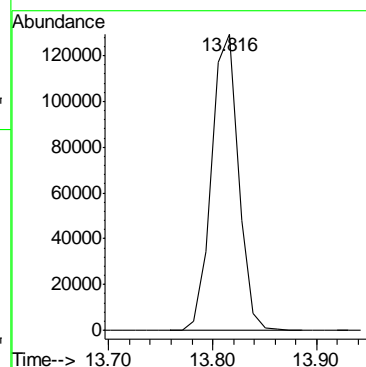
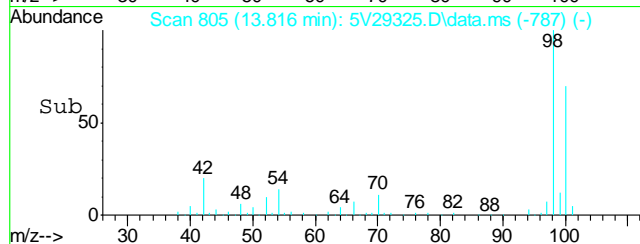
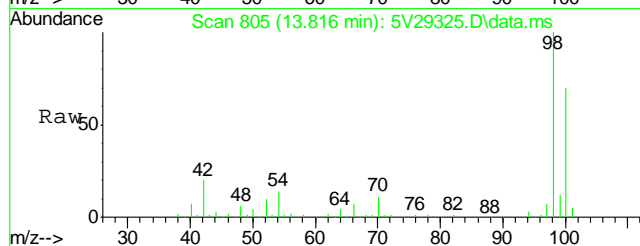
Tgt Ion:117 Resp: 210906





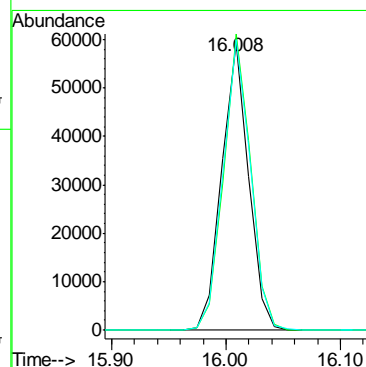
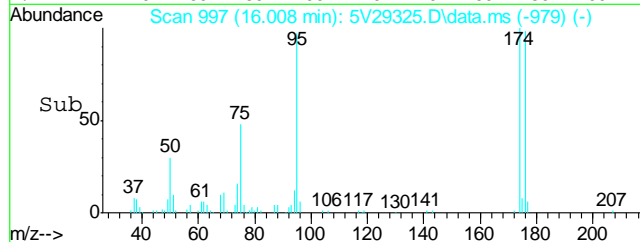
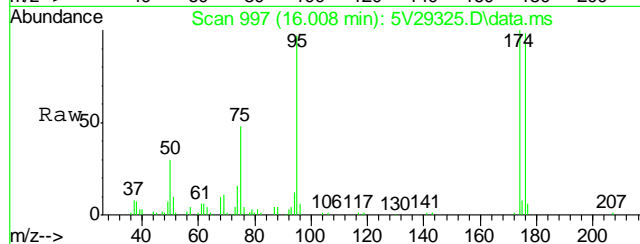
#64  
Toluene-d8  
Concen: 48.92 ug/l  
RT: 13.816 min Scan# 805  
Delta R.T. 0.000 min  
Lab File: 5V29325.D  
Acq: 1 Oct 2013 12:31 pm

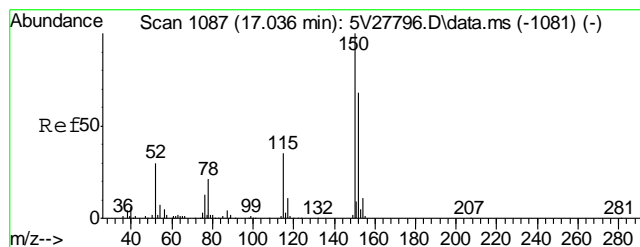
Tgt Ion: 98 Resp: 233743



#72  
4-Bromofluorobenzene  
Concen: 43.52 ug/l  
RT: 16.008 min Scan# 997  
Delta R.T. 0.000 min  
Lab File: 5V29325.D  
Acq: 1 Oct 2013 12:31 pm

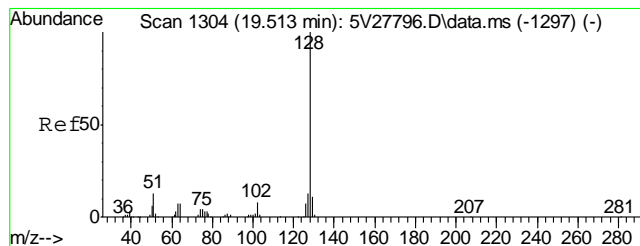
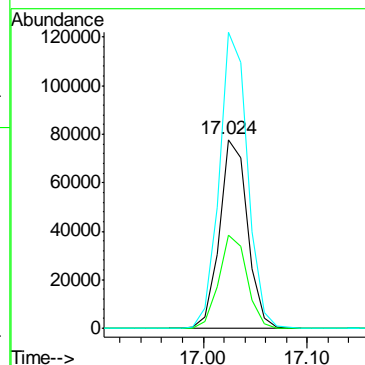
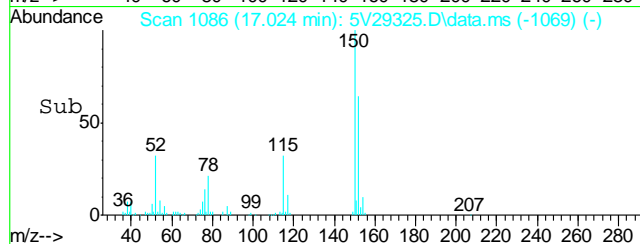
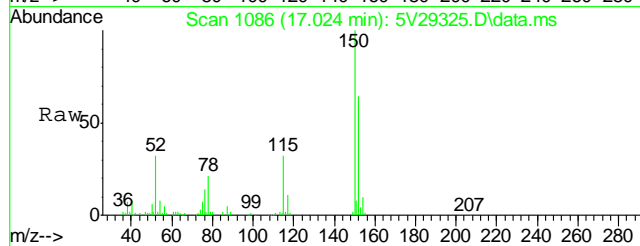
Tgt Ion: 95 Resp: 96915  
Ion Ratio Lower Upper  
95 100  
174 103.7 85.4 125.4  
176 103.5 80.6 120.6





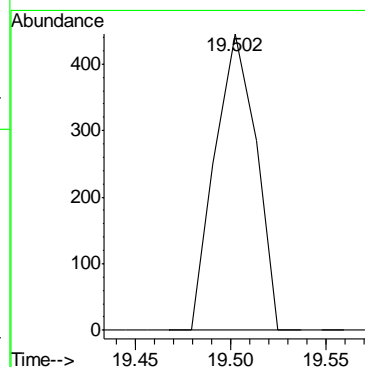
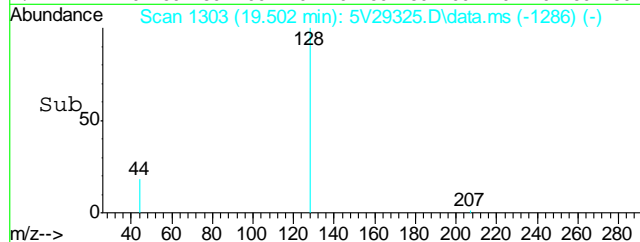
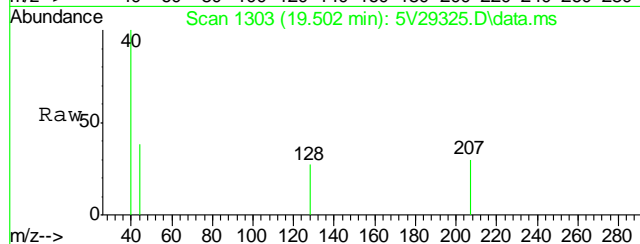
#77  
1,4-Dichlorobenzene-d4  
Concen: 50.00 ug/l  
RT: 17.024 min Scan# 1086  
Delta R.T. -0.011 min  
Lab File: 5V29325.D  
Acq: 1 Oct 2013 12:31 pm

Tgt Ion:	152	Resp:	145782
Ion Ratio	Lower	Upper	
152	100		
115	49.8	43.4	65.2
150	158.8	142.9	214.3



#94  
Naphthalene  
Concen: 0.91 ug/l  
RT: 19.502 min Scan# 1303  
Delta R.T. -0.011 min  
Lab File: 5V29325.D  
Acq: 1 Oct 2013 12:31 pm

Tgt Ion:128 Resp: 671



## GC/MS Semi-volatiles

### QC Data Summaries

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Includes the following where applicable:

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



**Method Blank Summary**

Page 1 of 1

**Job Number:** D51122  
**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

D51122-1

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%

8.1.1

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## Blank Spike Summary

Page 1 of 1

**Job Number:** D51122  
**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

D51122-1

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

Page 1 of 1

**Job Number:** D51122  
**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

D51122-1

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.

GC/MS Semi-volatiles

Raw Data

6

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\100313\  
 Data File : 3g16540.D  
 Acq On : 3 Oct 2013 10:07 pm  
 Operator : DONC  
 Sample : D51122-1  
 Misc : OP8670,E3G817,30.02,,,1,1  
 ALS Vial : 27 Sample Multiplier: 1

Quant Time: Oct 04 15:06:47 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	200423	4.0000	ug/mL	0.00
6) Acenaphthene-d10	7.398	164	115290	4.0000	ug/mL	0.00
15) Phenanthrene-d10	8.880	188	171747	4.0000	ug/mL	0.00
19) Chrysene-d12	11.508	240	142188	4.0000	ug/mL	0.00
24) Perylene-d12	12.886	264	109569	4.0000	ug/mL	0.02

## System Monitoring Compounds

2) Nitrobenzene-d5	4.996	82	838207	33.2485	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	66.50%		
7) 2-Fluorobiphenyl	6.736	172	1608704	35.8143	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	71.62%		
21) Terphenyl-d14	10.471	244	1444128	53.6798	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	107.36%		

## Target Compounds

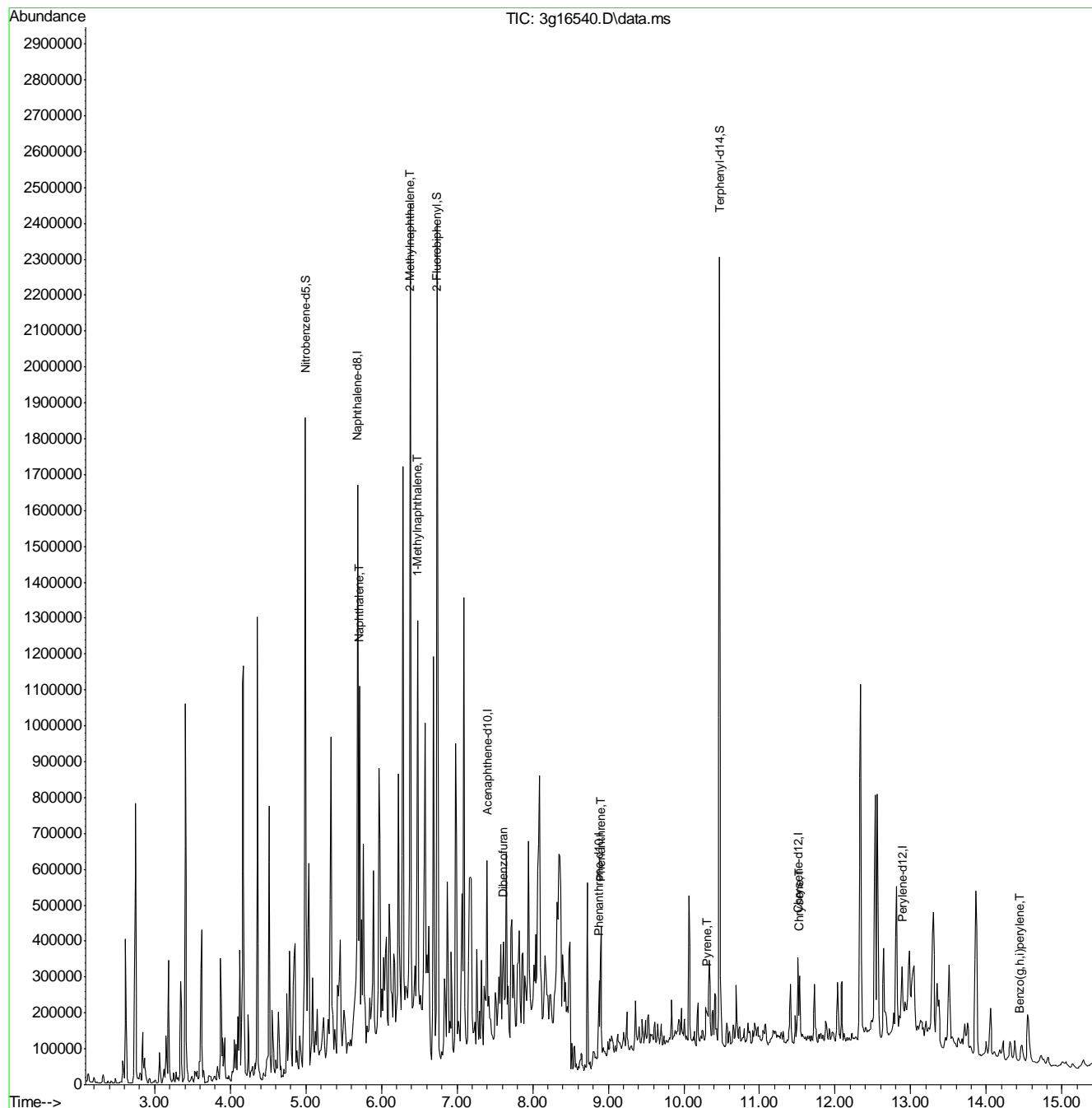
					Qvalue
3) N-Nitrosodimethylamine	2.385	74	148	N.D.	
4) N-Nitrosodi-propylamine	0.000	70	0	N.D. d	
5) Naphthalene	5.707	128	672504	9.2752	ug/mL 71
8) 2-Methylnaphthalene	6.380	142	847223	18.2964	ug/mL 94
9) 1-Methylnaphthalene	6.480	142	458416	11.6714	ug/mL 95
10) Acenaphthylene	0.000	152	0	N.D. d	
11) Acenaphthene	0.000	154	0	N.D. d	
12) Dibenzofuran	7.610	168	67740	1.2876	ug/mL 75
13) Fluorene	0.000	166	0	N.D. d	
14) Diphenylamine	0.000	169	0	N.D. d	
16) Phenanthrene	8.904	178	240330	3.4391	ug/mL 75
17) Anthracene	0.000	178	0	N.D. d	
18) Fluoranthene	0.000	202	0	N.D. d	
20) Pyrene	10.304	202	33403	0.5027	ug/mL# 54
22) Benzo(a)anthracene	0.000	228	0	N.D. d	
23) Chrysene	11.528	228	48054	0.7502	ug/mL 70
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	14.443	276	9260	0.2295	ug/mL# 25

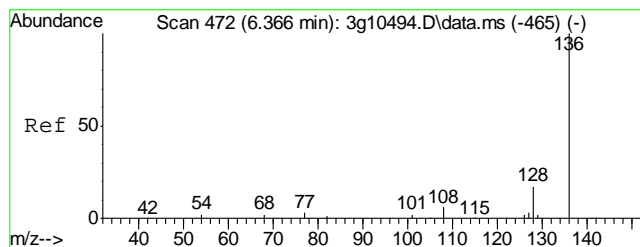
(#) = qualifier out of range (m) = manual integration (+) = signals summed

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\100313\  
Data File : 3g16540.D  
Acq On : 3 Oct 2013 10:07 pm  
Operator : DONC  
Sample : D51122-1  
Misc : OP8670,E3G817,30.02,,,1,1  
ALS Vial : 27 Sample Multiplier: 1

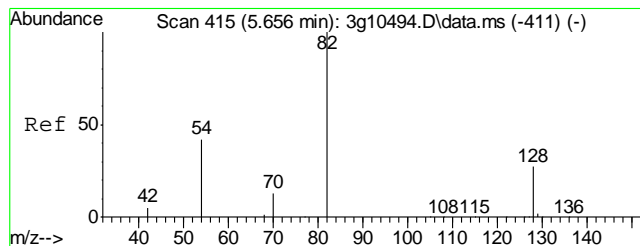
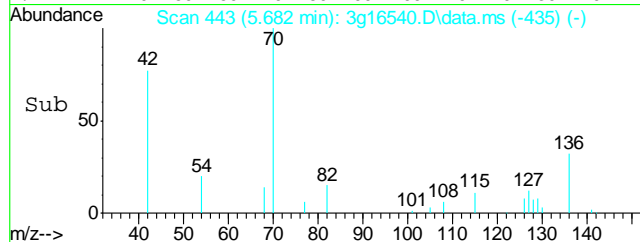
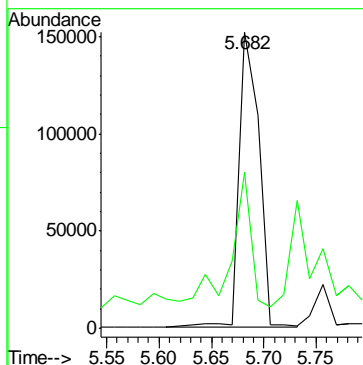
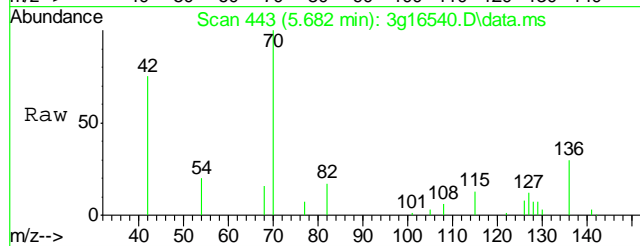
Quant Time: Oct 04 15:06:47 2013  
Quant Method : C:\msdchem\1\METHODS\SIMPE3G810.M  
Quant Title : PAHSIM BASE  
QLast Update : Tue Sep 24 08:29:29 2013  
Response via : Initial Calibration





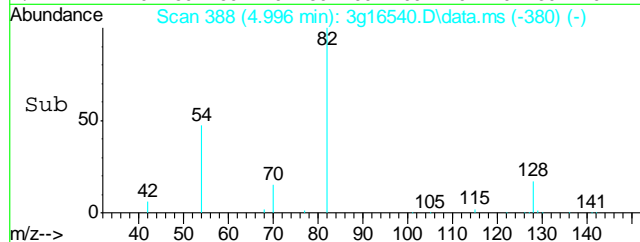
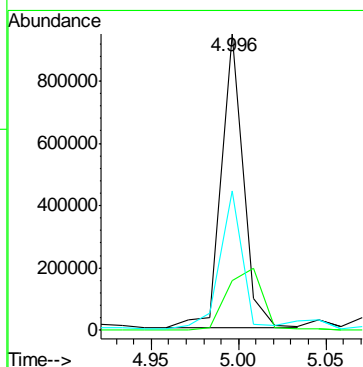
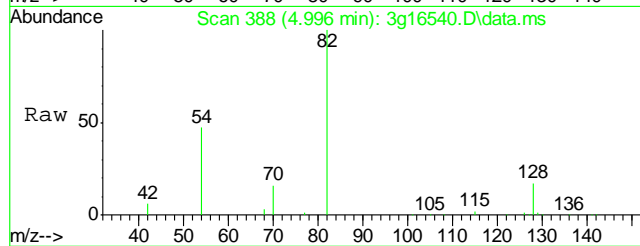
#1  
Naphthalene-d8  
Concen: 4.0000 ug/mL  
RT: 5.682 min Scan# 443  
Delta R.T. 0.000 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

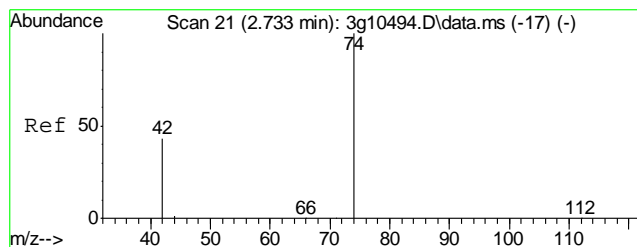
Tgt Ion	Ratio	Lower	Upper
136	100		
68	45.6	0.0	21.1#



#2  
Nitrobenzene-d5  
Concen: 33.2485 ug/mL  
RT: 4.996 min Scan# 388  
Delta R.T. 0.000 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

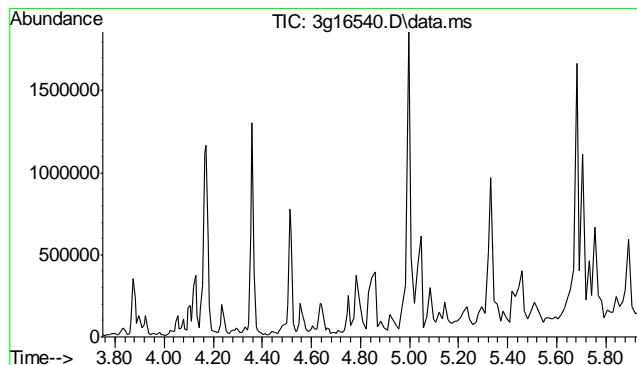
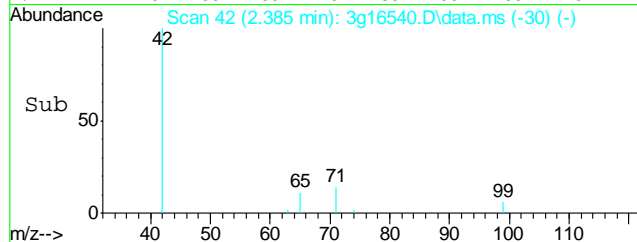
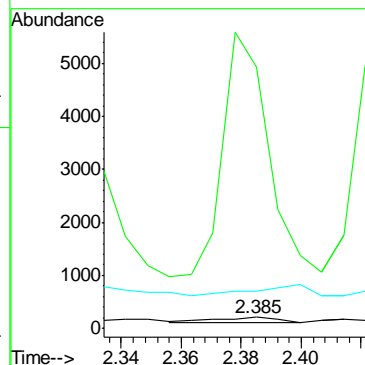
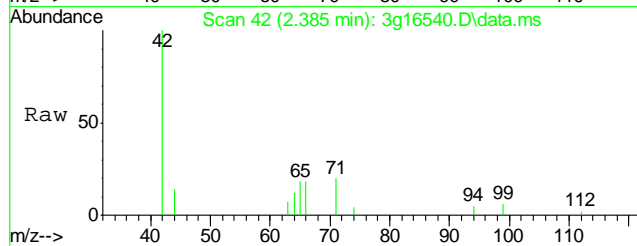
Tgt Ion	Ratio	Lower	Upper
82	100		
128	33.2	36.8	76.8#
54	47.1	40.5	80.5





#3  
N-Nitrosodimethylamine  
Concen: Below ug/mL  
RT: 2.385 min Scan# 42  
Delta R.T. -0.015 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

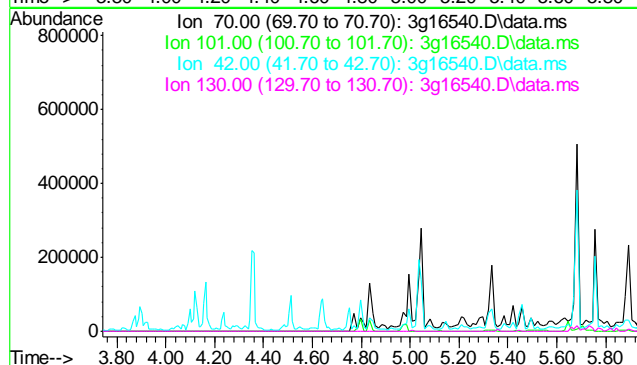
Tgt Ion	Resp	Lower	Upper
74	100		
42	3370.3	58.5	98.5#
44	162.8	0.0	24.0#



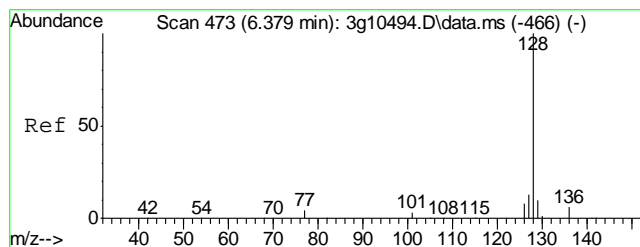
#4  
N-Nitrosodi-propylamine  
Concen: N.D. ug/mL  
Expected RT: 4.85 min

Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

Tgt Ion	Sig	Exp Ratio
70	100	
101	11.9	
42	57.4	
130	21.7	

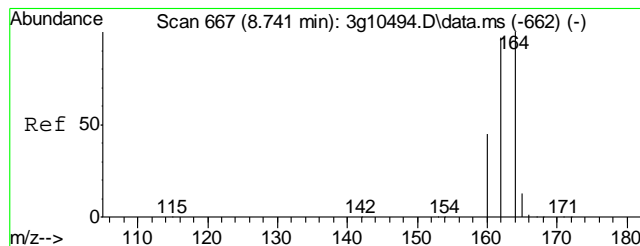
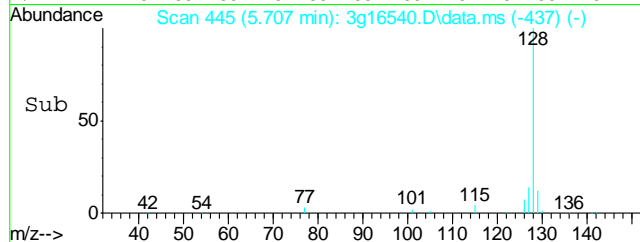
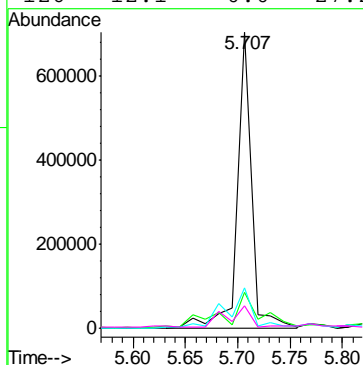
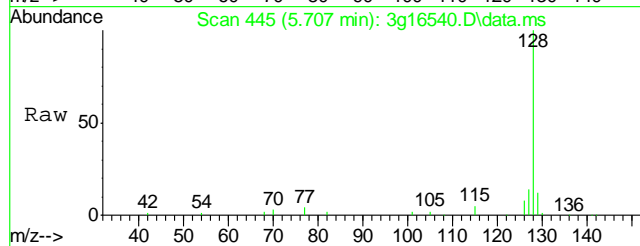






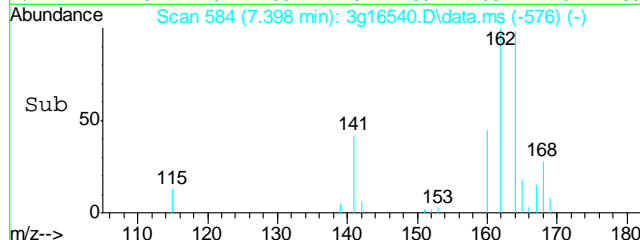
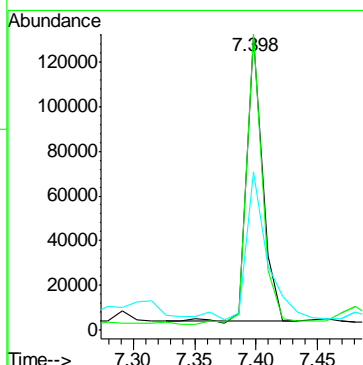
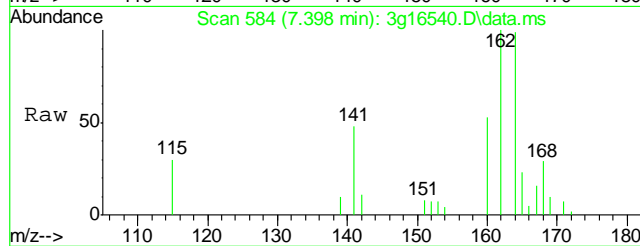
#5  
Naphthalene  
Concen: 9.2752 ug/mL  
RT: 5.707 min Scan# 445  
Delta R.T. 0.000 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

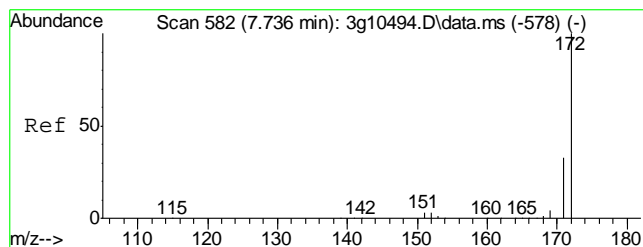
Tgt Ion:	128	Resp:	672504
Ion Ratio	Lower	Upper	
128	100		
129	25.2	0.0	31.2
127	24.1	0.0	32.4
126	12.1	0.0	27.2



#6  
Acenaphthene-d10  
Concen: 4.0000 ug/mL  
RT: 7.398 min Scan# 584  
Delta R.T. 0.000 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

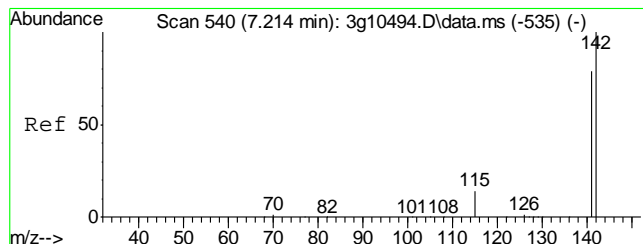
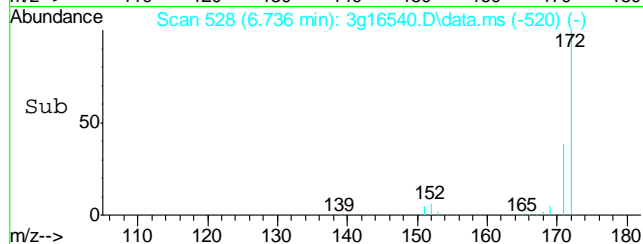
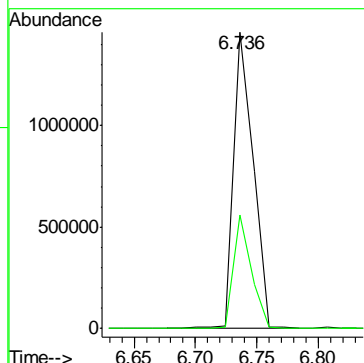
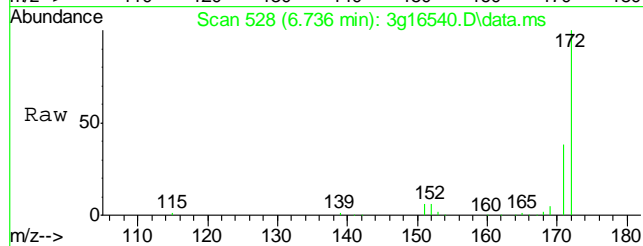
Tgt Ion:	164	Resp:	115290
Ion Ratio	Lower	Upper	
164	100		
162	103.0	83.7	123.7
160	66.1	31.9	71.9





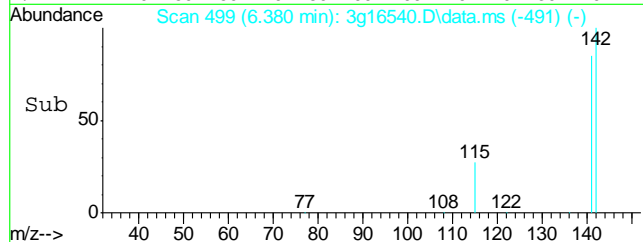
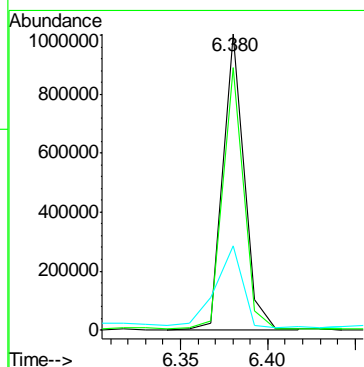
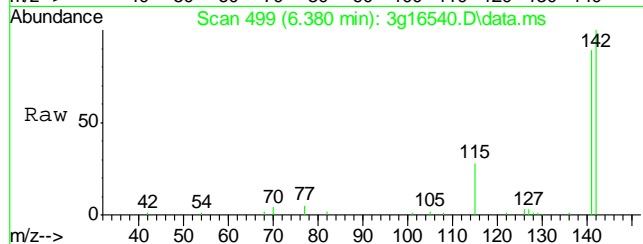
#7  
2-Fluorobiphenyl  
Concen: 35.8143 ug/mL  
RT: 6.736 min Scan# 528  
Delta R.T. 0.000 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

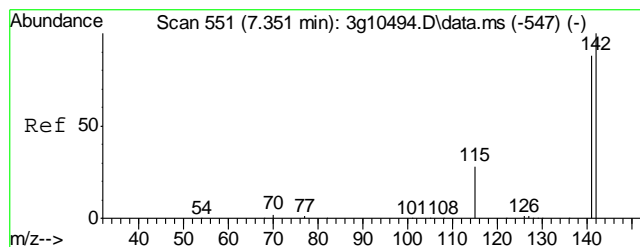
Tgt Ion	Ratio	Lower	Upper
172	100		
171	34.8	12.2	52.2



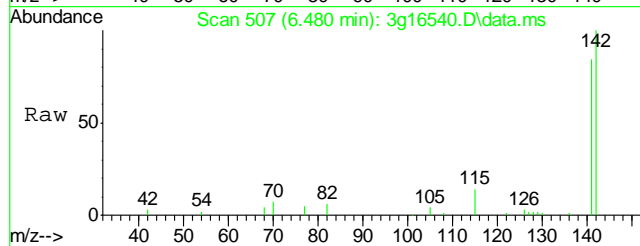
#8  
2-Methylnaphthalene  
Concen: 18.2964 ug/mL  
RT: 6.380 min Scan# 499  
Delta R.T. 0.000 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

Tgt Ion	Ratio	Lower	Upper
142	100		
141	86.4	62.0	102.0
115	35.5	11.3	51.3

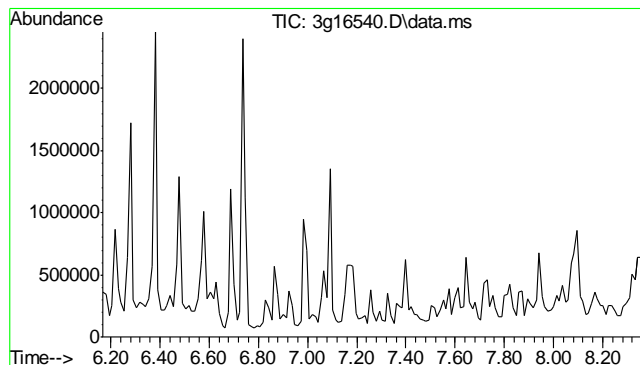
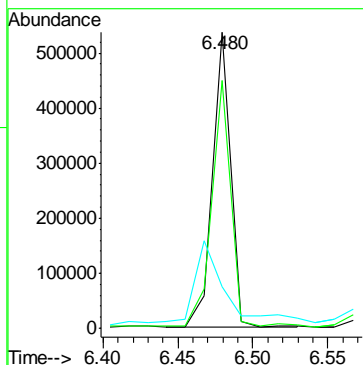
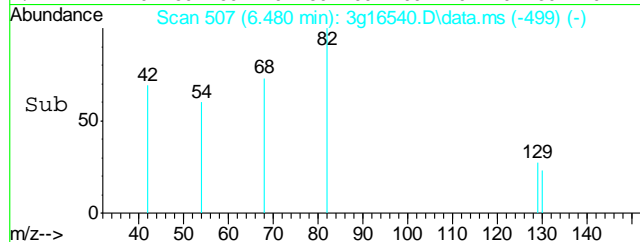




#9  
1-Methylnaphthalene  
Concen: 11.6714 ug/mL  
RT: 6.480 min Scan# 507  
Delta R.T. 0.000 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

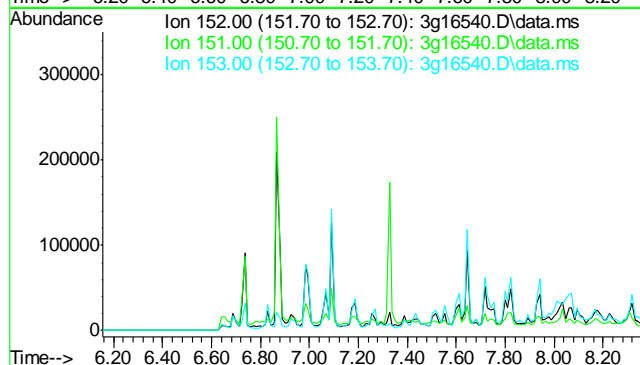


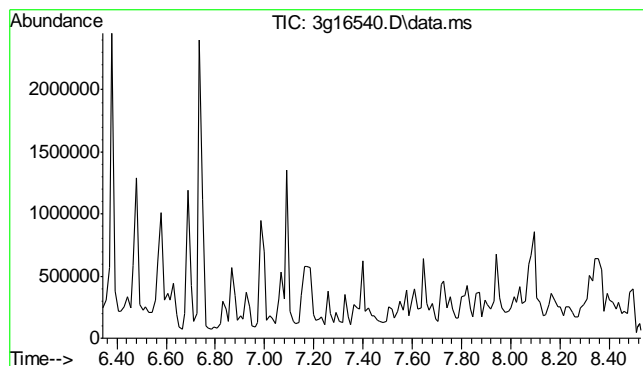
Tgt Ion	Ratio	Lower	Upper
142	100		
141	87.2	67.5	107.5
115	49.6	19.4	59.4



#10  
Acenaphthylene  
Concen: N.D. ug/mL  
Expected RT: 7.26 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

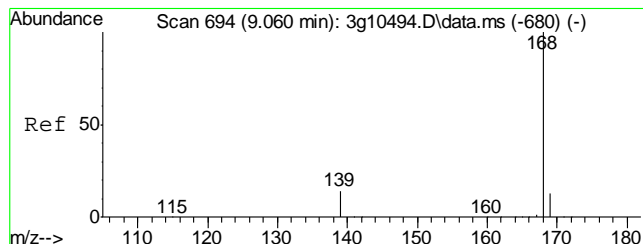
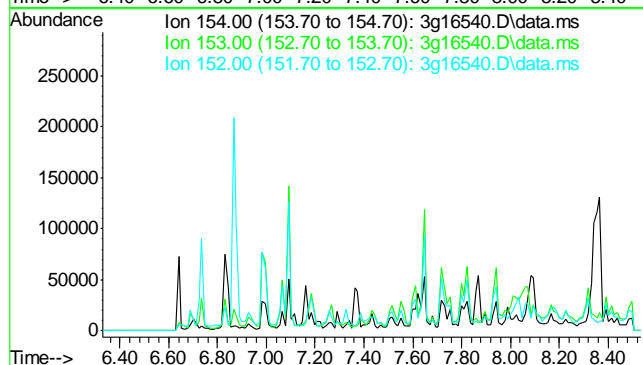
Tgt Ion	Sig	Exp Ratio
152	100	
151	19.2	
153	12.9	





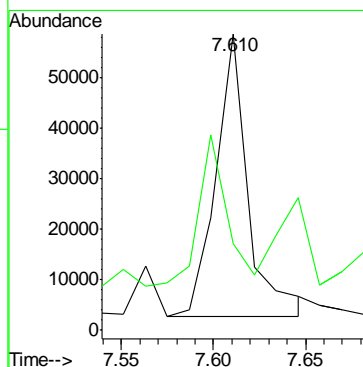
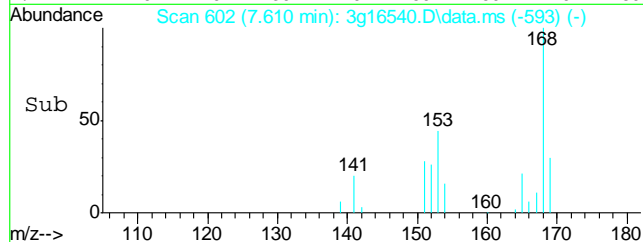
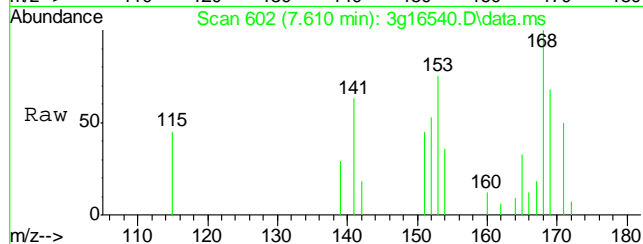
#11  
Acenaphthene  
Concen: N.D. ug/mL  
Expected RT: 7.43 min  
  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

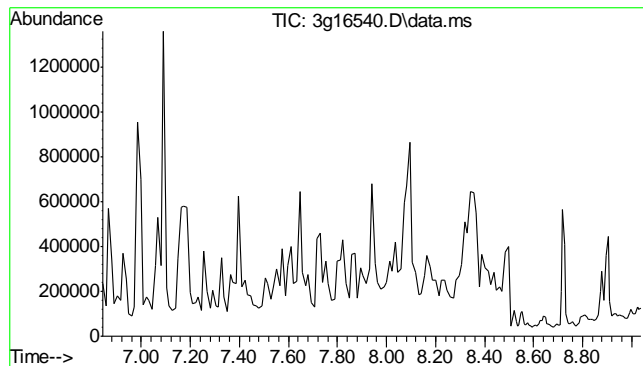
Tgt Ion: 154  
Sig Exp Ratio  
154 100  
153 102.4  
152 50.0



#12  
Dibenzofuran  
Concen: 1.2876 ug/mL  
RT: 7.610 min Scan# 602  
Delta R.T. 0.012 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

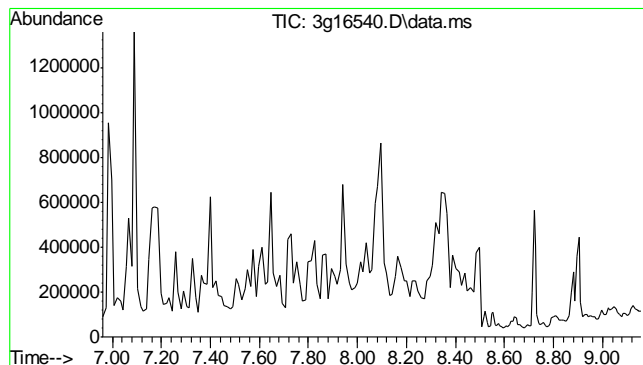
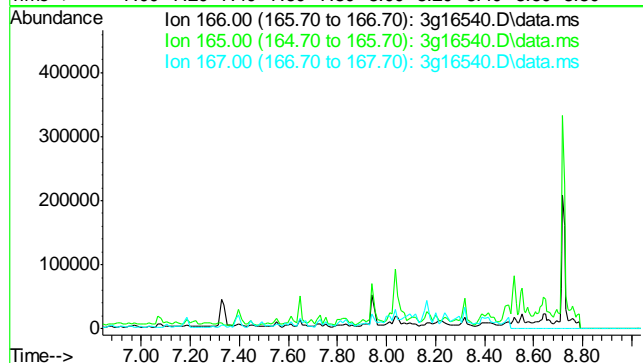
Tgt Ion: 168 Resp: 67740  
Ion Ratio Lower Upper  
168 100  
139 47.5 13.4 53.4





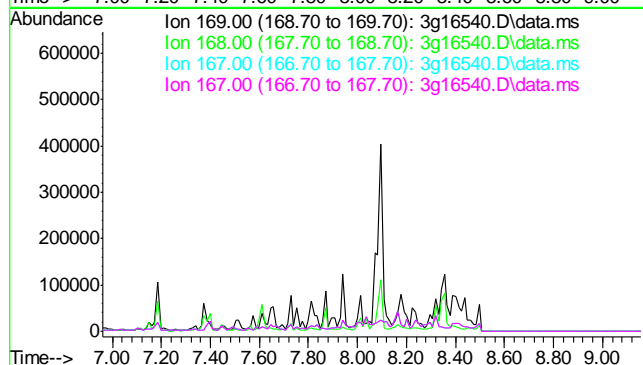
#13  
 Fluorene  
 Concen: N.D. ug/mL  
 Expected RT: 7.94 min  
  
 Lab File: 3g16540.D  
 Acq: 3 Oct 13 10:07 pm

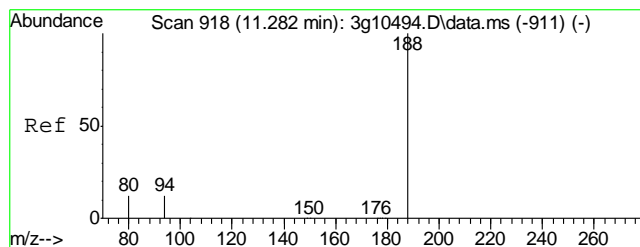
Tgt Ion	Exp Ratio
166	100
165	92.0
167	13.1



#14  
 Diphenylamine  
 Concen: N.D. ug/mL  
 Expected RT: 8.06 min  
  
 Lab File: 3g16540.D  
 Acq: 3 Oct 13 10:07 pm

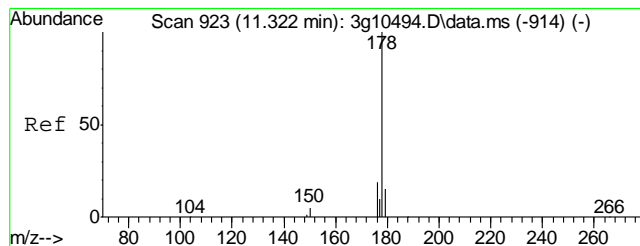
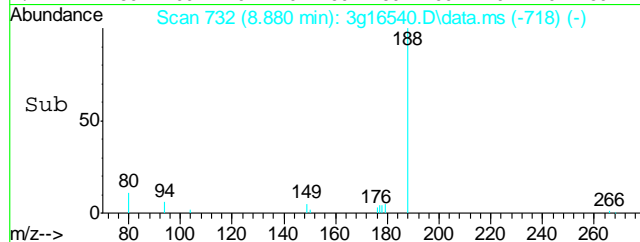
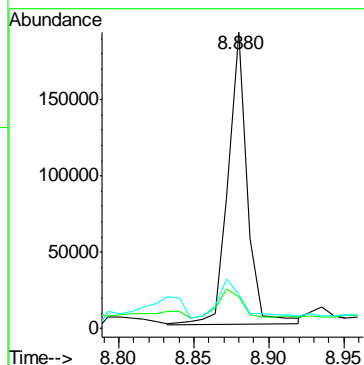
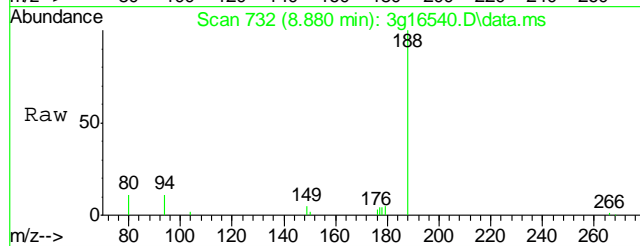
Tgt Ion	Exp Ratio
169	100
168	61.7
167	34.1
167	34.1





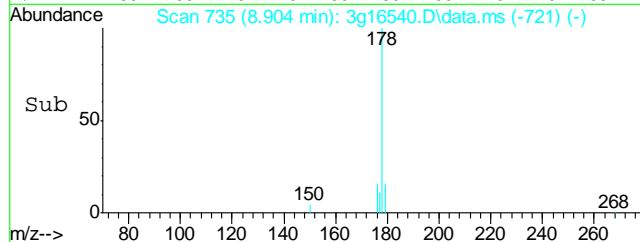
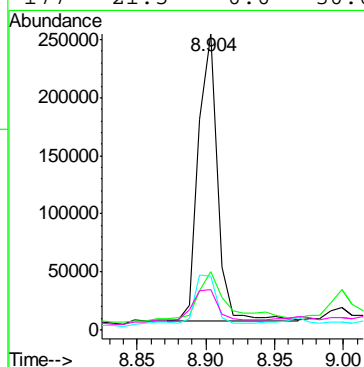
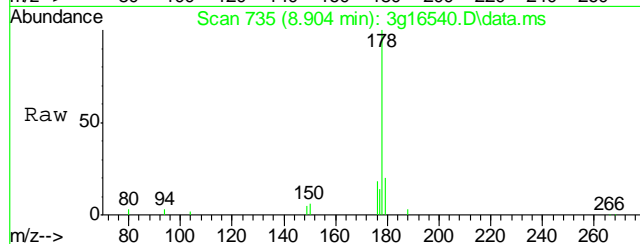
#15  
Phenanthrene-d10  
Concen: 4.0000 ug/mL  
RT: 8.880 min Scan# 732  
Delta R.T. 0.008 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

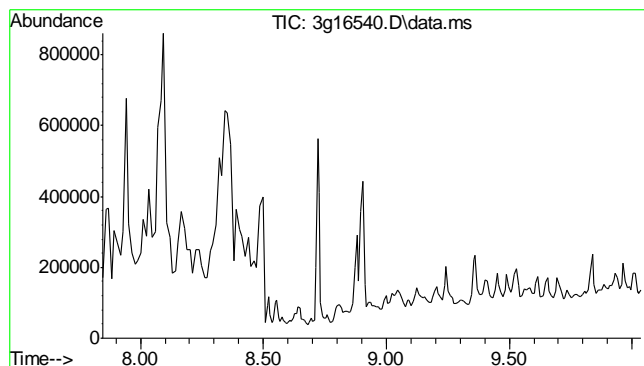
Tgt Ion:188	Resp:	171747
Ion Ratio	Lower	Upper
188	100	
94	12.3	0.0 28.3
80	20.4	0.0 27.8



#16  
Phenanthrene  
Concen: 3.4391 ug/mL  
RT: 8.904 min Scan# 735  
Delta R.T. 0.008 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

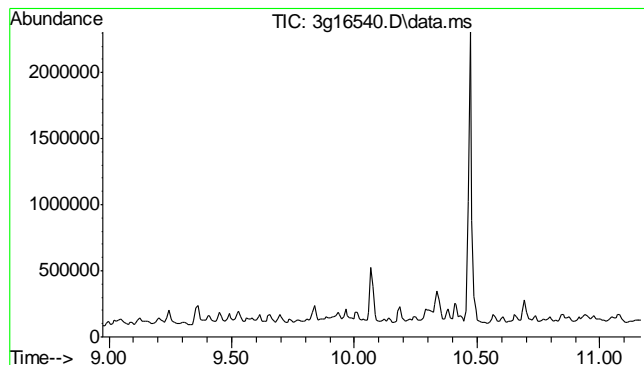
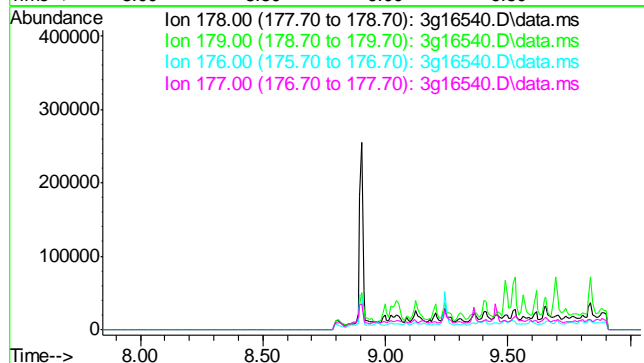
Tgt Ion:178	Resp:	240330
Ion Ratio	Lower	Upper
178	100	
179	30.6	0.0 35.2
176	24.1	0.0 38.6
177	21.5	0.0 30.0





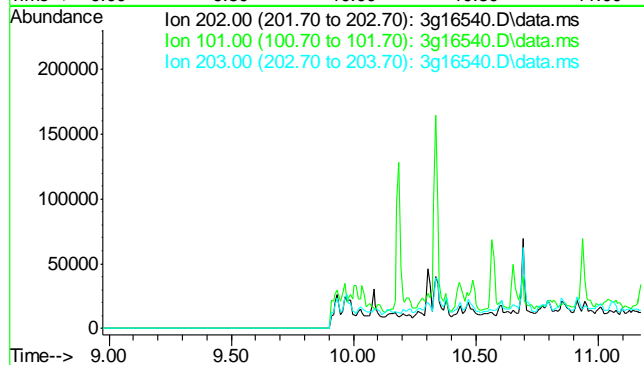
#17  
 Anthracene  
 Concen: N.D. ug/mL  
 Expected RT: 8.94 min  
  
 Lab File: 3g16540.D  
 Acq: 3 Oct 13 10:07 pm

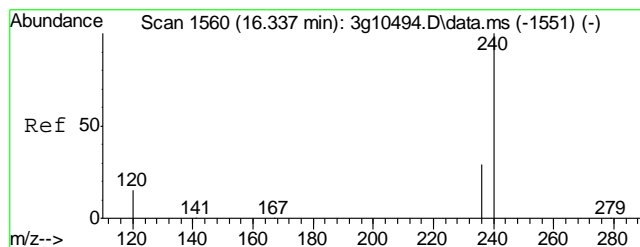
Tgt Ion	Exp Ratio
178	100
179	15.1
176	18.2
177	8.7



#18  
 Fluoranthene  
 Concen: N.D. ug/mL  
 Expected RT: 10.07 min  
  
 Lab File: 3g16540.D  
 Acq: 3 Oct 13 10:07 pm

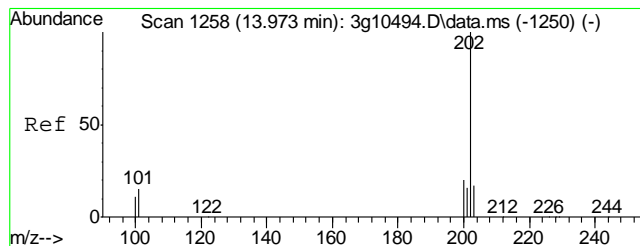
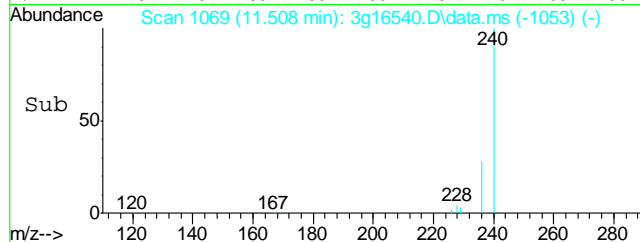
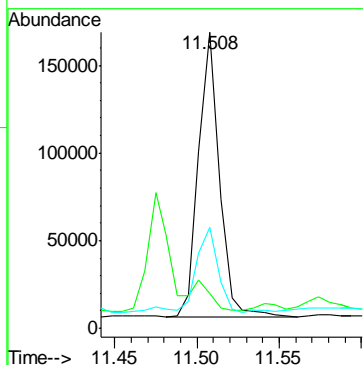
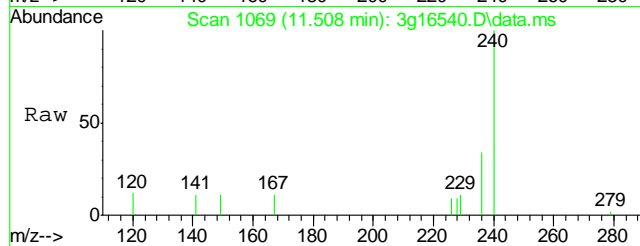
Tgt Ion	Exp Ratio
202	100
101	12.6
203	17.4





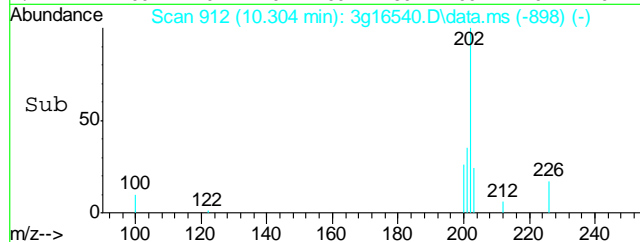
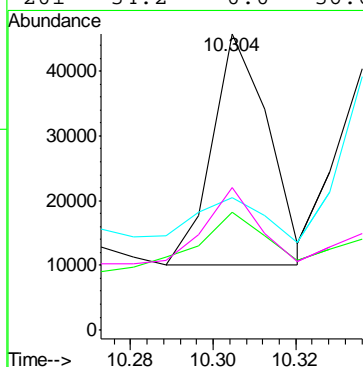
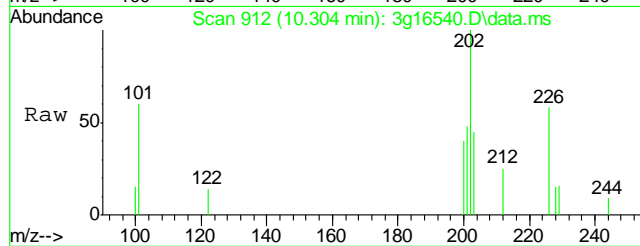
#19  
Chrysene-d12  
Concen: 4.0000 ug/mL  
RT: 11.508 min Scan# 1069  
Delta R.T. 0.007 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

Tgt Ion	Ratio	Lower	Upper
240	100		
120	43.4	0.2	40.2#
236	32.9	8.8	48.8

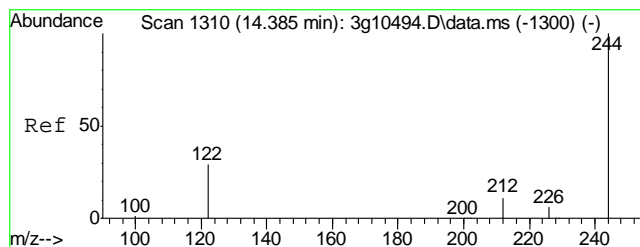


#20  
Pyrene  
Concen: 0.5027 ug/mL  
RT: 10.304 min Scan# 912  
Delta R.T. 0.008 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

Tgt Ion	Ratio	Lower	Upper
202	100		
200	32.9	0.2	40.2
203	50.0	0.0	37.8#
201	34.2	0.0	36.6

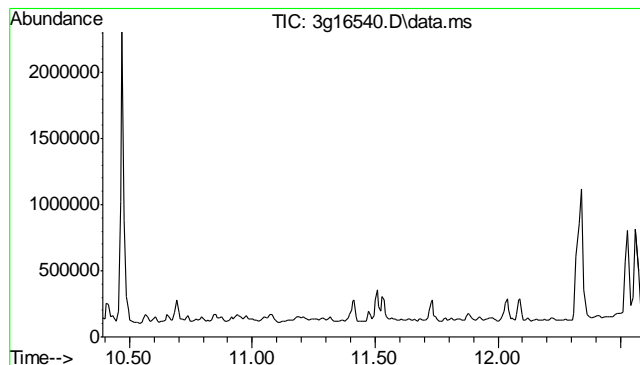
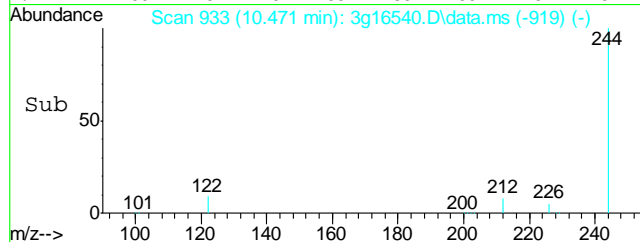
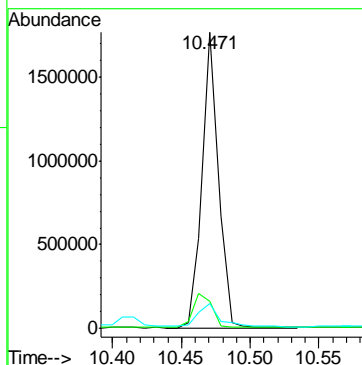
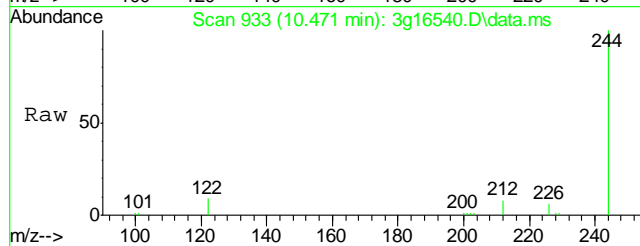






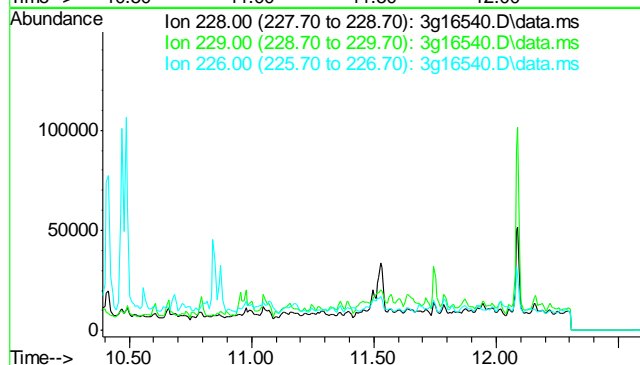
#21  
Terphenyl-d14  
Concen: 53.6798 ug/mL  
RT: 10.471 min Scan# 933  
Delta R.T. 0.008 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

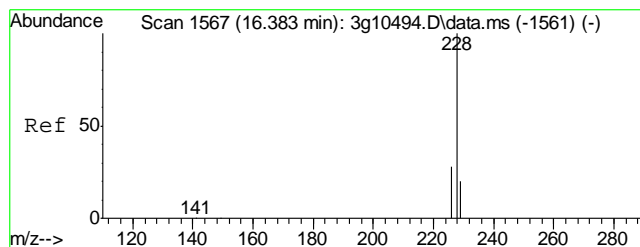
Tgt Ion	Ratio	Lower	Upper
244	100		
122	13.2	7.8	47.8
212	10.0	0.0	32.8



#22  
Benzo(a)anthracene  
Concen: N.D. ug/mL  
Expected RT: 11.49 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

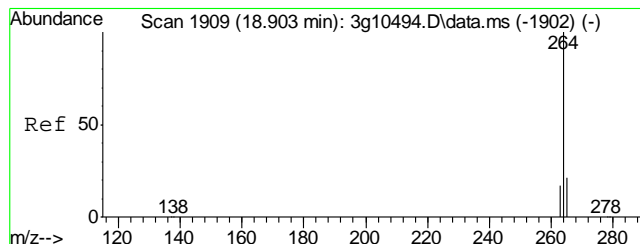
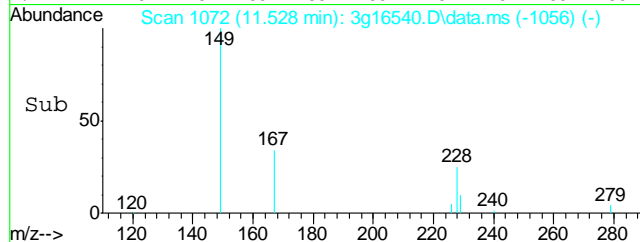
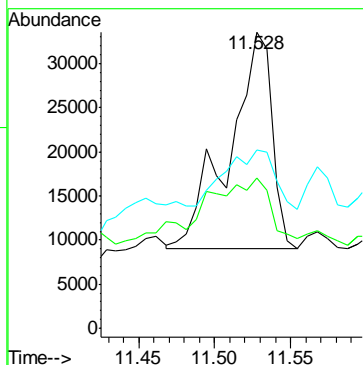
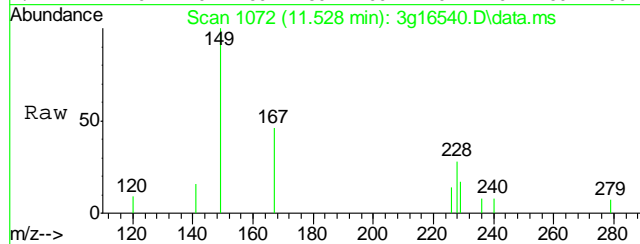
Tgt Ion	Sig	Exp Ratio
228	100	
229	19.4	
226	26.6	





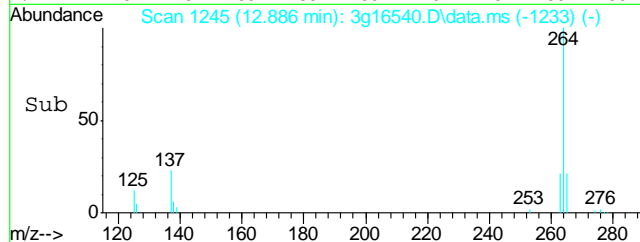
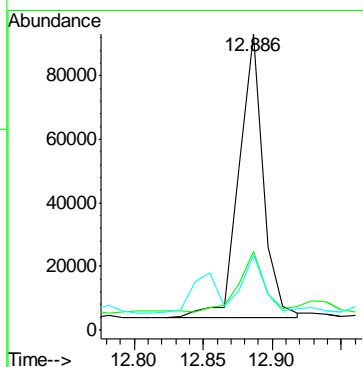
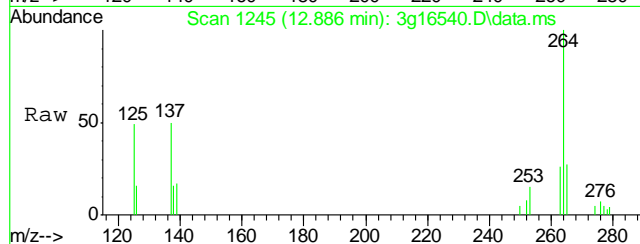
#23  
Chrysene  
Concen: 0.7502 ug/mL  
RT: 11.528 min Scan# 1072  
Delta R.T. 0.007 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

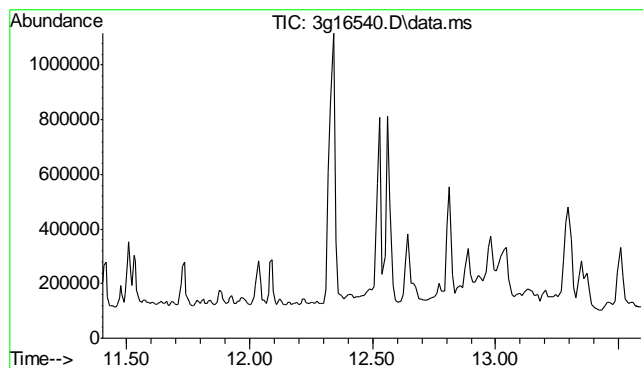
Tgt Ion:	228	Resp:	48054
Ion Ratio	100	Lower	Upper
228	100		
226	46.1	8.6	48.6
229	31.2	0.0	39.4



#24  
Perylene-d12  
Concen: 4.0000 ug/mL  
RT: 12.886 min Scan# 1245  
Delta R.T. 0.021 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

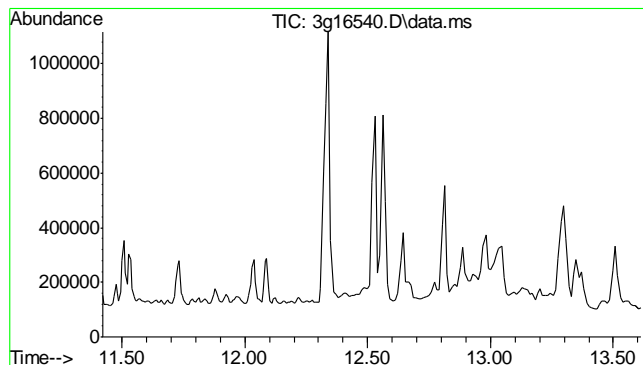
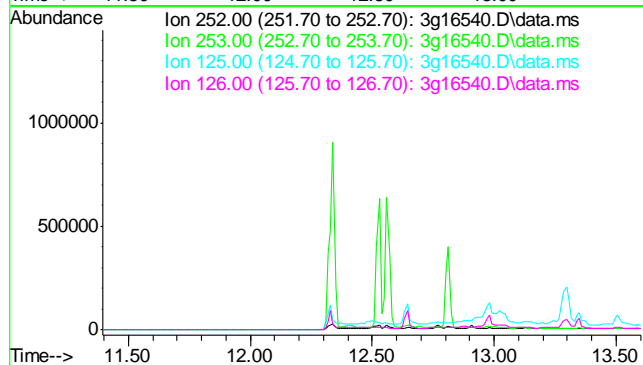
Tgt Ion:	264	Resp:	109569
Ion Ratio	100	Lower	Upper
264	100		
265	22.8	1.2	41.2
263	16.3	0.7	40.7





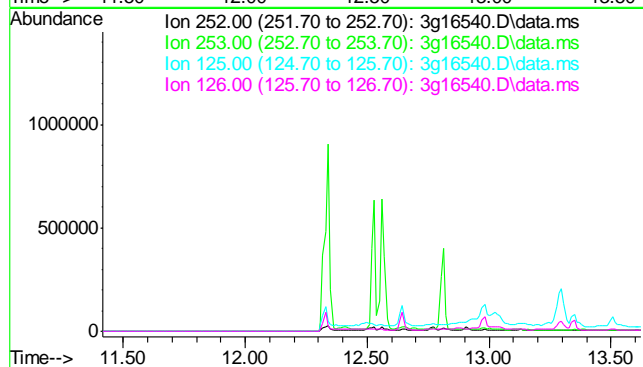
#25  
Benzo(b)fluoranthene  
Concen: N.D. ug/mL  
Expected RT: 12.50 min  
  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

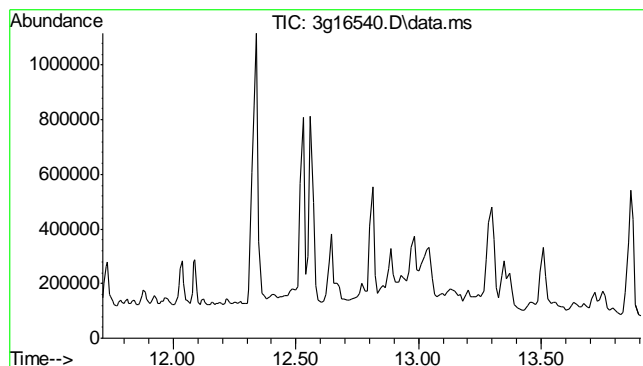
Tgt Ion	Sig	Exp Ratio
252	100	
253	51.5	
125	13.2	
126	46.9	



#26  
Benzo(k)fluoranthene  
Concen: N.D. ug/mL  
Expected RT: 12.52 min  
  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

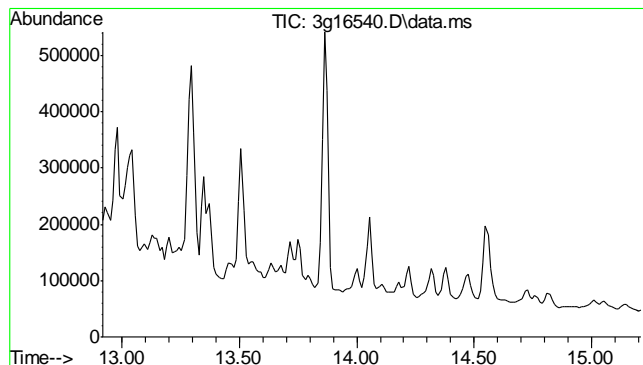
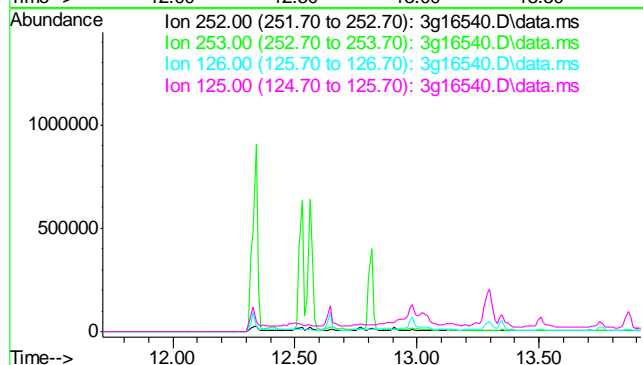
Tgt Ion	Sig	Exp Ratio
252	100	
253	37.3	
125	9.6	
126	34.1	





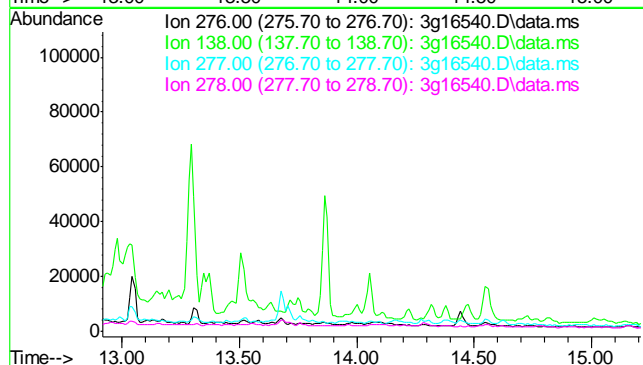
#27  
Benzo(a)pyrene  
Concen: N.D. ug/mL  
Expected RT: 12.81 min  
  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

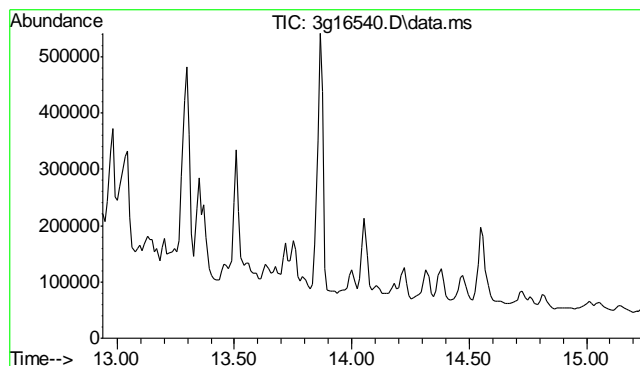
Tgt Ion	Sig	Exp Ratio
252	100	
253	21.5	
126	20.4	
125	14.5	



#28  
Indeno(1,2,3-cd)pyrene  
Concen: N.D. ug/mL  
Expected RT: 14.06 min  
  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

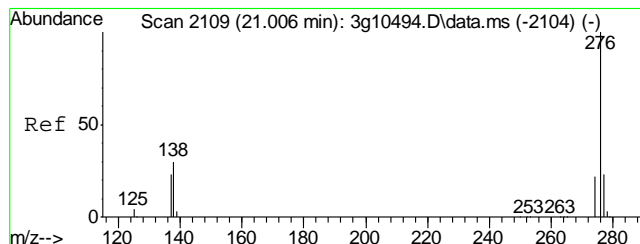
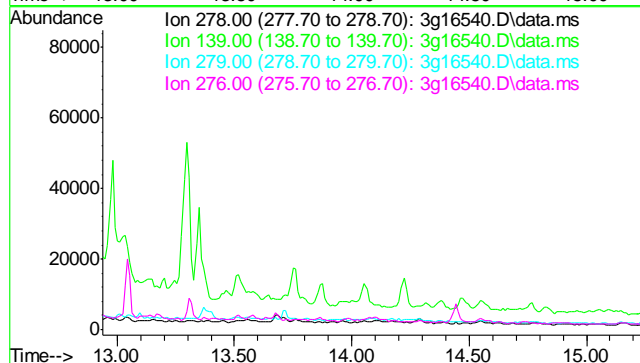
Tgt Ion	Sig	Exp Ratio
276	100	
138	40.0	
277	24.8	
278	76.2	





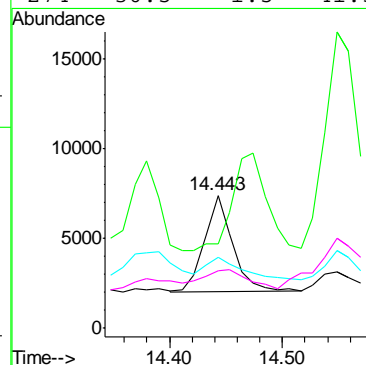
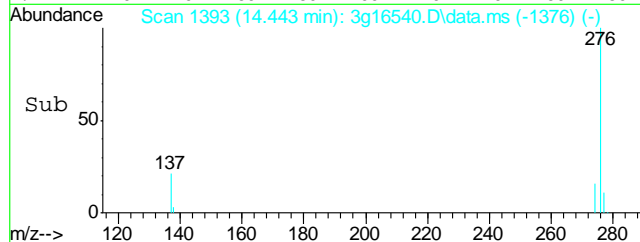
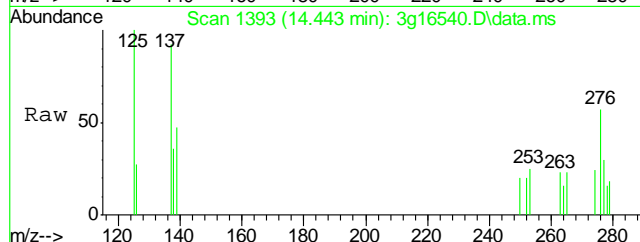
#29  
Dibenz(a,h)anthracene  
Concen: N.D. ug/mL  
Expected RT: 14.09 min  
  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

Tgt Ion: 278  
Sig Exp Ratio  
278 100  
139 30.8  
279 22.9  
276 131.2



#30  
Benzo(g,h,i)perylene  
Concen: 0.2295 ug/mL  
RT: 14.443 min Scan# 1393  
Delta R.T. 0.032 min  
Lab File: 3g16540.D  
Acq: 3 Oct 13 10:07 pm

Tgt Ion: 276 Resp: 9260  
Ion Ratio Lower Upper  
276 100  
138 123.8 15.1 55.1#  
277 28.1 3.3 43.3  
274 30.5 1.5 41.5



## 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

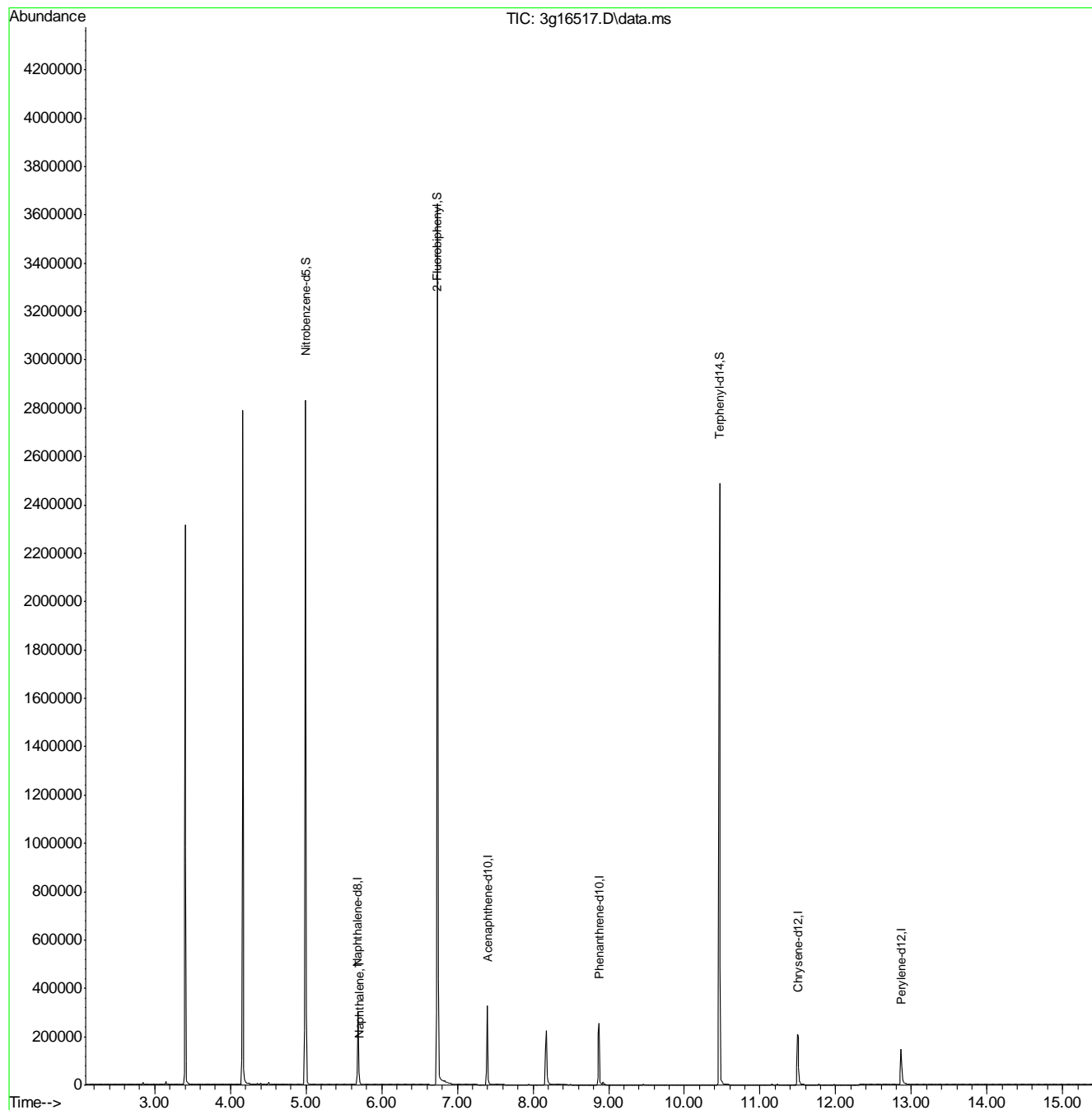
					Qvalue
3) N-Nitrosodimethylamine	0.000	74	0	N.D.	d
4) N-Nitrosodi-propylamine	0.000	70	0	N.D.	d
5) Naphthalene	5.707	128	6089	0.0773	ug/mL 98
8) 2-Methylnaphthalene	6.380	142	1089	N.D.	
9) 1-Methylnaphthalene	6.480	142	479	N.D.	
10) Acenaphthylene	7.256	152	63	N.D.	
11) Acenaphthene	7.422	154	1060	N.D.	
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

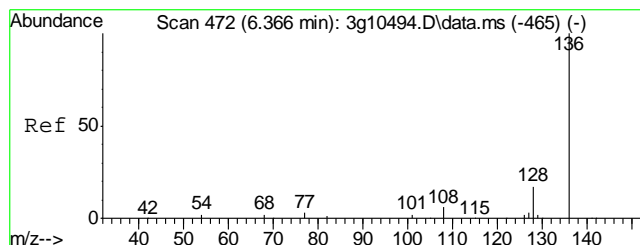
(#) = qualifier out of range (m) = manual integration (+) = signals summed

## 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

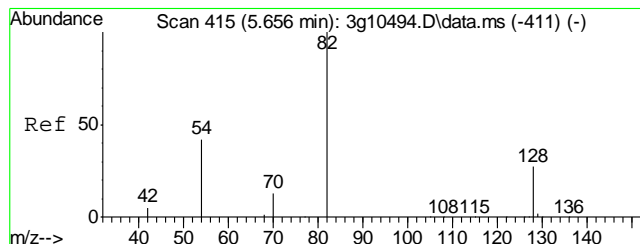
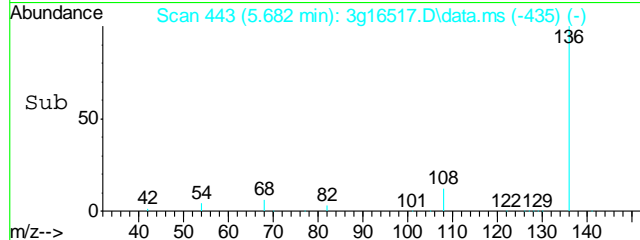
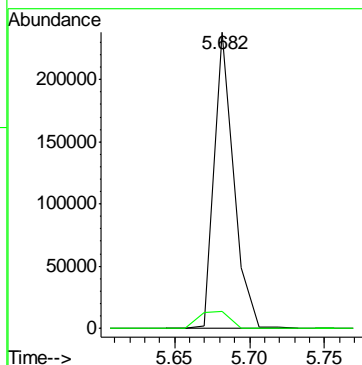
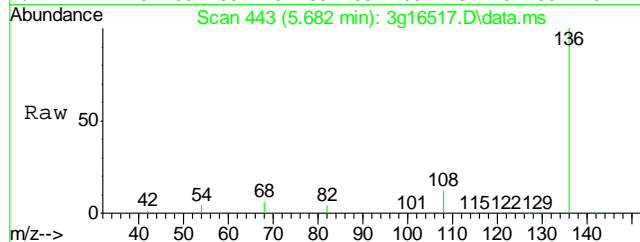
Quant Time: Oct 04 13:28:03 2013  
Quant Method : C:\msdchem\1\METHODS\SIMPE3G810.M  
Quant Title : PAHSIM BASE  
QLast Update : Tue Sep 24 08:29:29 2013  
Response via : Initial Calibration





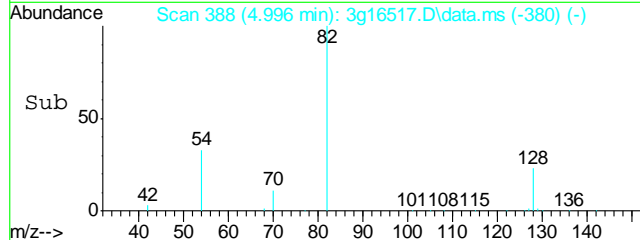
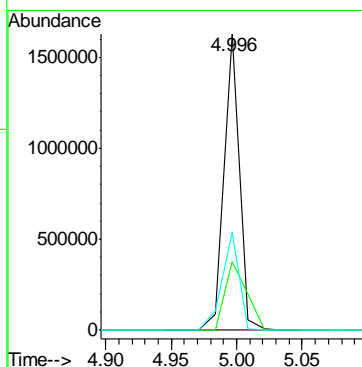
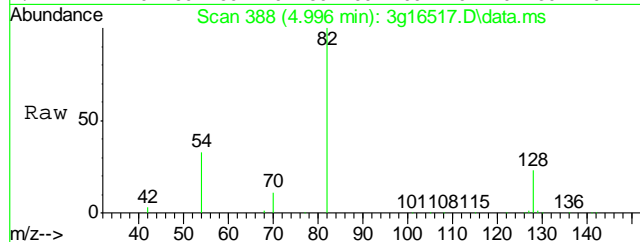
#1  
Naphthalene-d8  
Concen: 4.0000 ug/mL  
RT: 5.682 min Scan# 443  
Delta R.T. 0.000 min  
Lab File: 3g16517.D  
Acq: 3 Oct 13 12:54 pm

Tgt Ion:	136	Resp:	217864
Ion Ratio	Lower	Upper	
136	100		
68	8.8	0.0	21.1

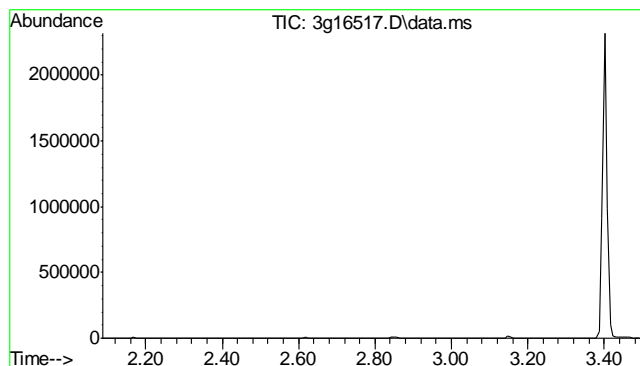


#2  
Nitrobenzene-d5  
Concen: 48.5730 ug/mL  
RT: 4.996 min Scan# 388  
Delta R.T. 0.000 min  
Lab File: 3g16517.D  
Acq: 3 Oct 13 12:54 pm

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#



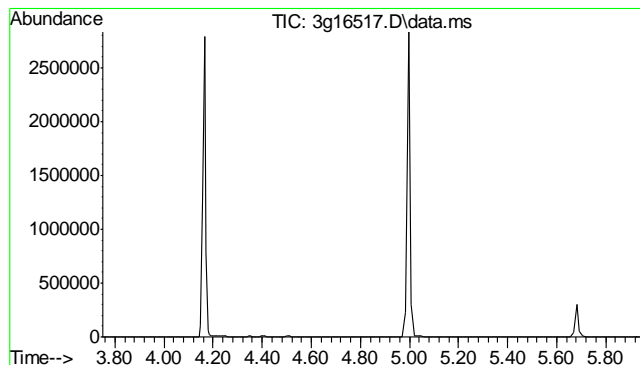
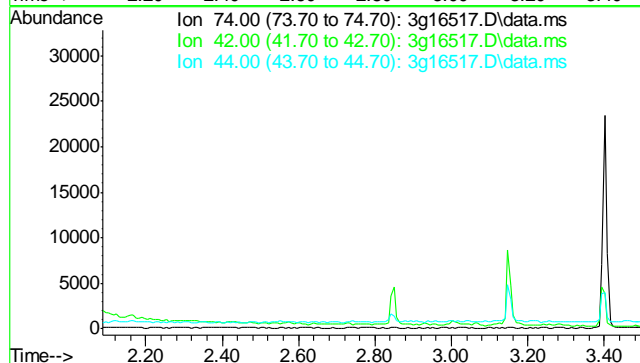




#3  
N-Nitrosodimethylamine  
Concen: N.D. ug/mL  
Expected RT: 2.40 min

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

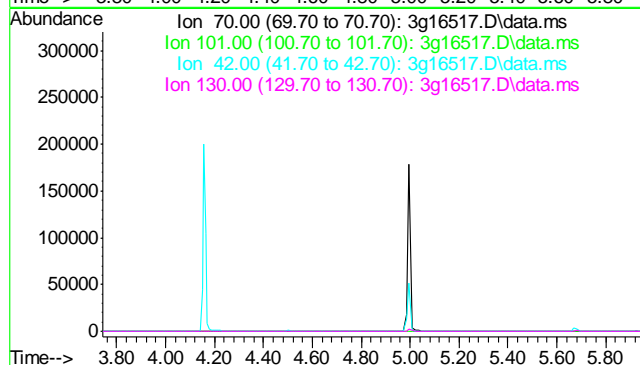
Tgt Ion:	74
Sig	Exp Ratio
74	100
42	78.5
44	4.0

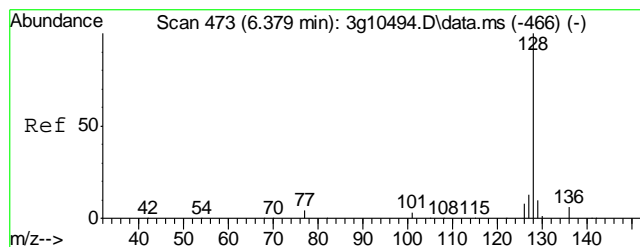


#4  
N-Nitrosodi-propylamine  
Concen: N.D. ug/mL  
Expected RT: 4.85 min

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

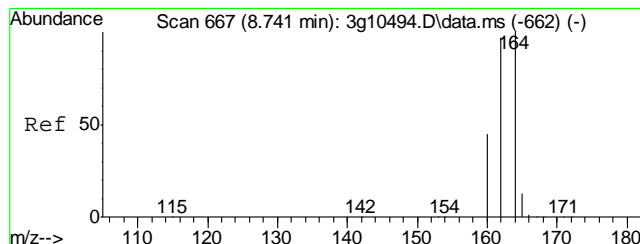
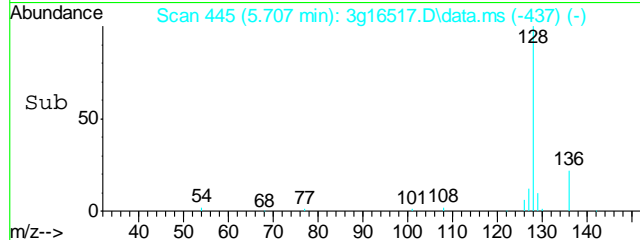
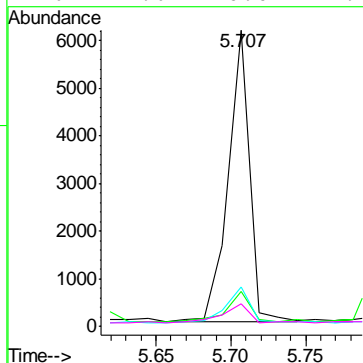
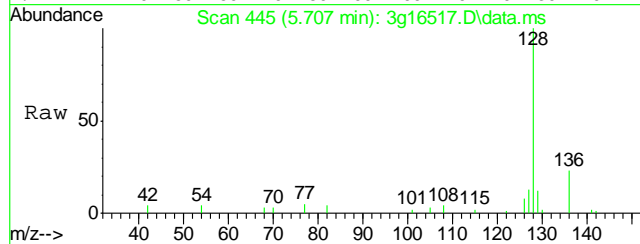
Tgt Ion:	70
Sig	Exp Ratio
70	100
101	11.9
42	57.4
130	21.7





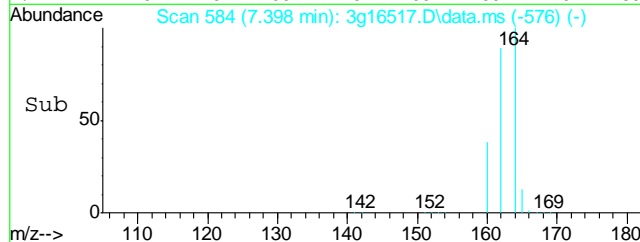
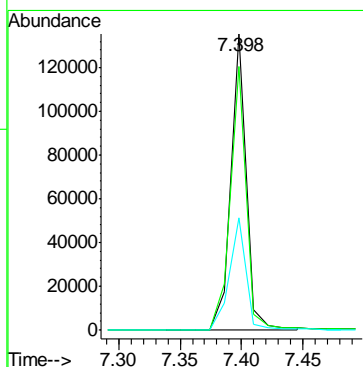
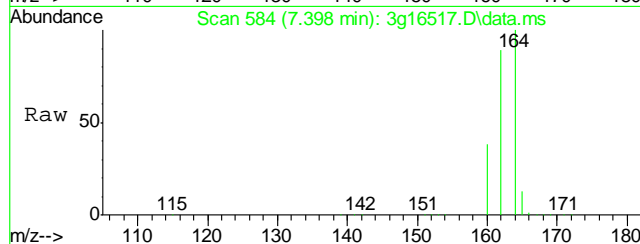
#5  
Naphthalene  
Concen: 0.0773 ug/mL  
RT: 5.707 min Scan# 445  
Delta R.T. 0.000 min  
Lab File: 3g16517.D  
Acq: 3 Oct 13 12:54 pm

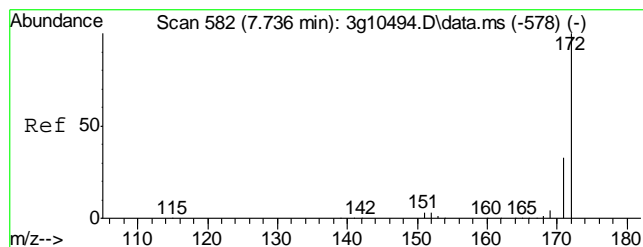
Tgt Ion:	128	Resp:	6089
Ion	Ratio	Lower	Upper
128	100		
129	10.9	0.0	31.2
127	13.6	0.0	32.4
126	7.6	0.0	27.2



#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

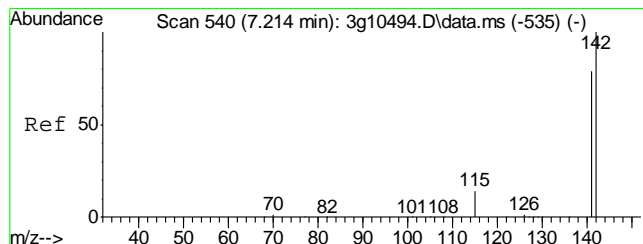
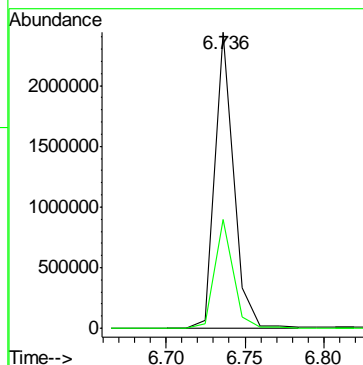
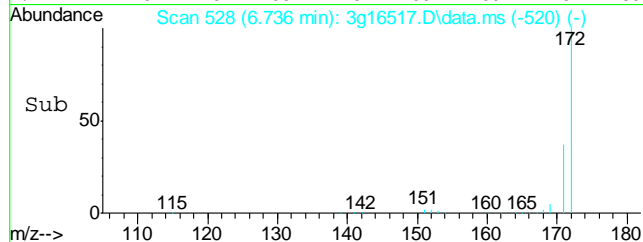
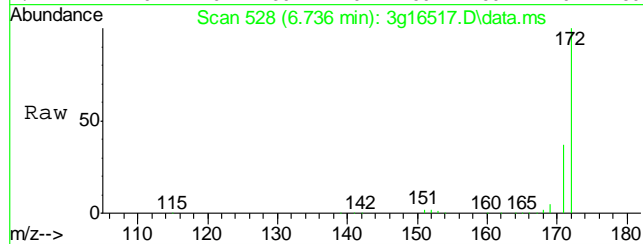
Tgt Ion:	164	Resp:	117785
Ion	Ratio	Lower	Upper
164	100		
162	92.1	83.7	123.7
160	40.9	31.9	71.9





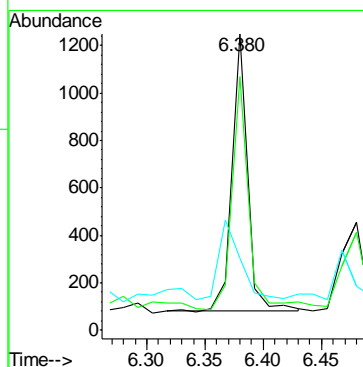
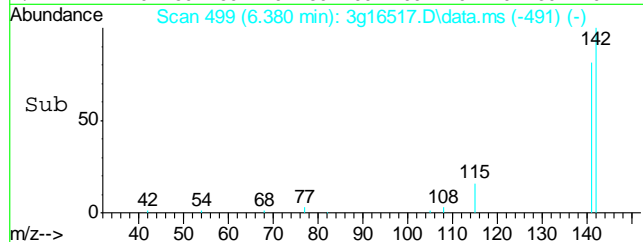
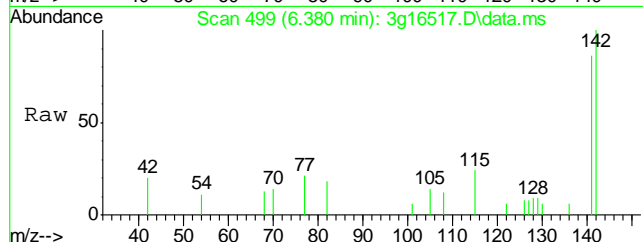
#7  
2-Fluorobiphenyl  
Concen: 44.6998 ug/mL  
RT: 6.736 min Scan# 528  
Delta R.T. 0.000 min  
Lab File: 3g16517.D  
Acq: 3 Oct 13 12:54 pm

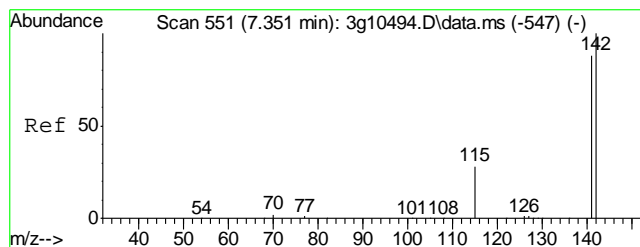
Tgt Ion:172 Resp: 2051275  
Ion Ratio Lower Upper  
172 100  
171 36.0 12.2 52.2



#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

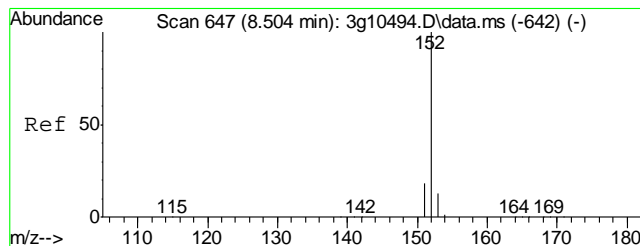
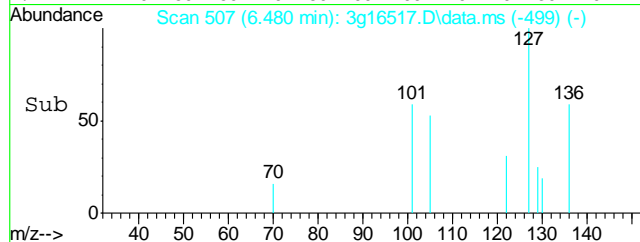
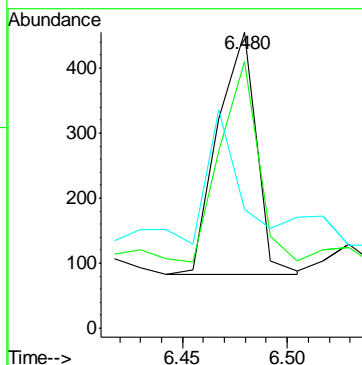
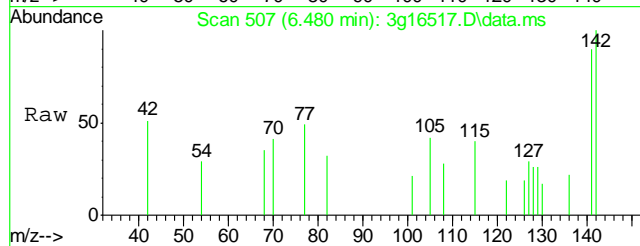
Tgt Ion:142 Resp: 1089  
Ion Ratio Lower Upper  
142 100  
141 86.3 62.0 102.0  
115 39.8 11.3 51.3





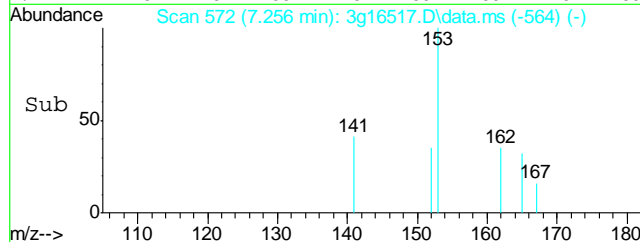
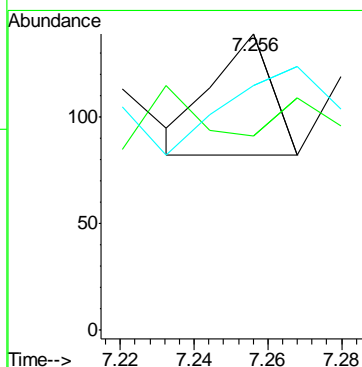
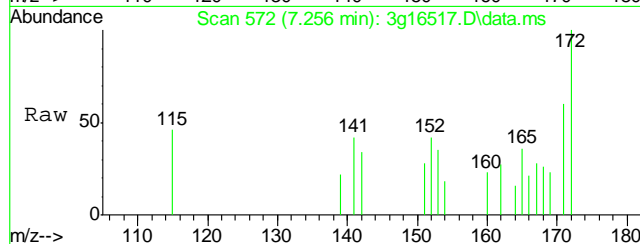
#9  
1-Methylnaphthalene  
Concen: Below ug/mL  
RT: 6.480 min Scan# 507  
Delta R.T. 0.000 min  
Lab File: 3g16517.D  
Acq: 3 Oct 13 12:54 pm

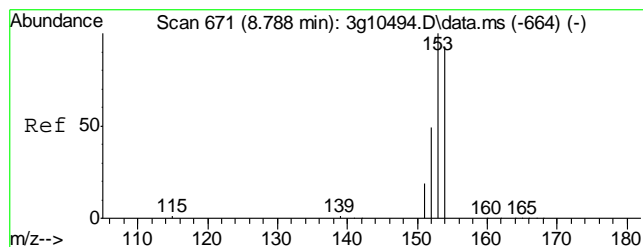
Tgt Ion:142	Resp:	479
Ion Ratio	Lower	Upper
142	100	
141	80.2	67.5 107.5
115	67.6	19.4 59.4#



#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

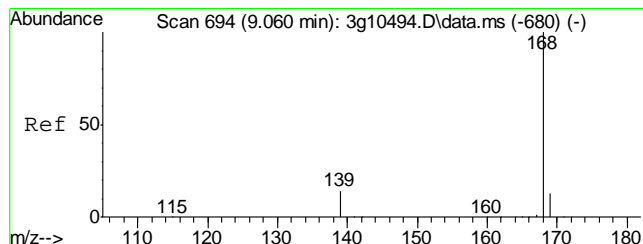
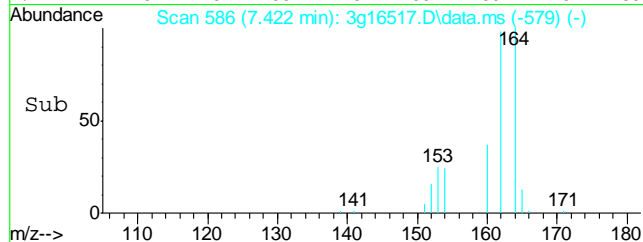
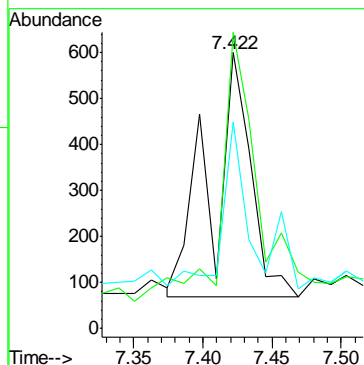
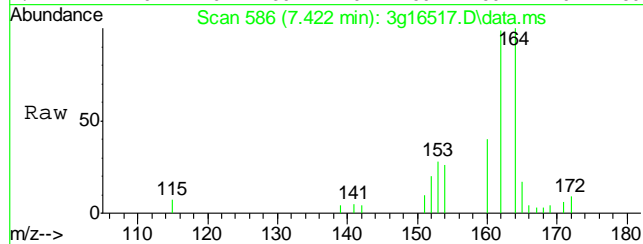
Tgt Ion:152	Resp:	63
Ion Ratio	Lower	Upper
152	100	
151	76.2	0.0 39.2#
153	154.0	0.0 32.9#





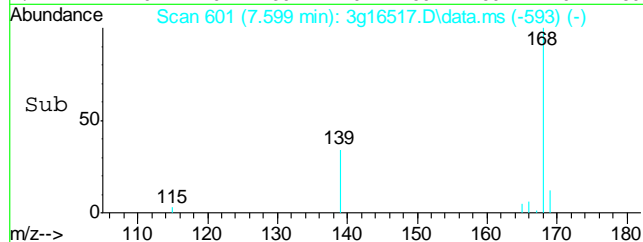
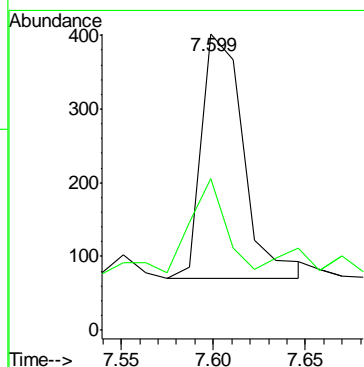
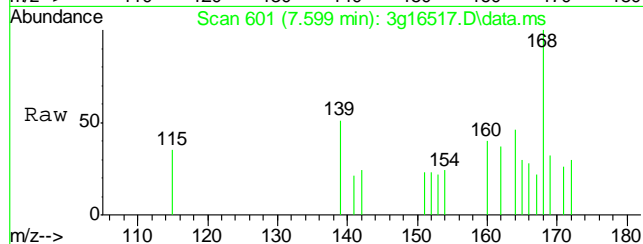
#11  
Acenaphthene  
Concen: Below ug/mL  
RT: 7.422 min Scan# 586  
Delta R.T. -0.012 min  
Lab File: 3g16517.D  
Acq: 3 Oct 13 12:54 pm

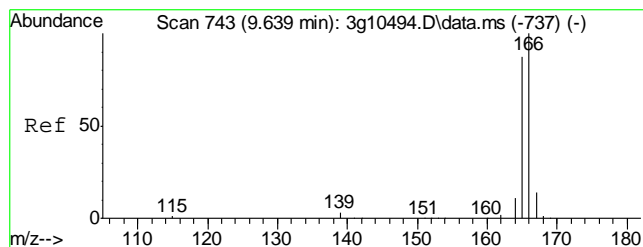
Tgt Ion:	154	Resp:	1060
Ion Ratio	Lower	Upper	
154	100		
153	82.0	82.4	122.4#
152	37.2	30.0	70.0



#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

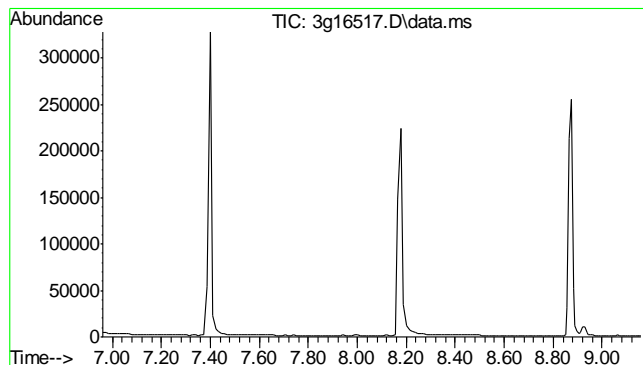
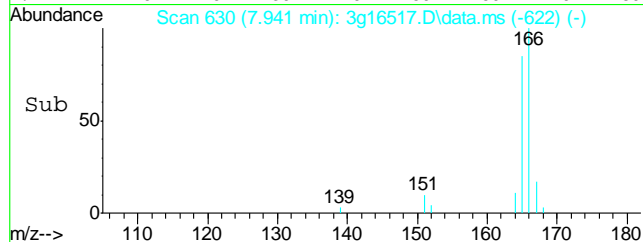
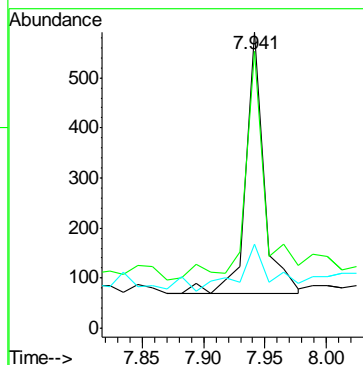
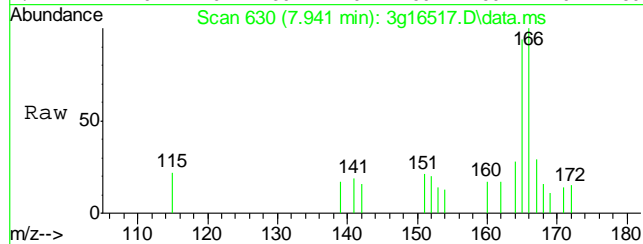
Tgt Ion:	168	Resp:	528
Ion Ratio	Lower	Upper	
168	100		
139	36.7	13.4	53.4





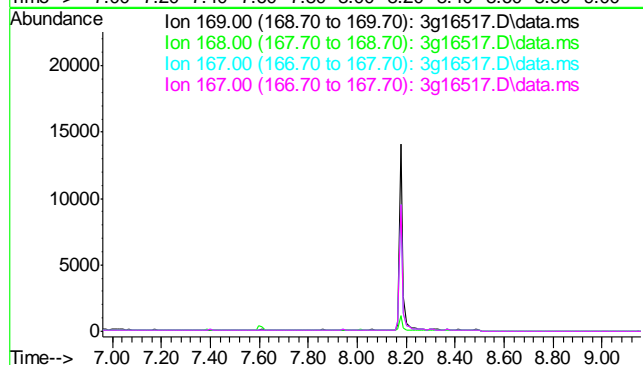
#13  
Fluorene  
Concen: Below ug/mL  
RT: 7.941 min Scan# 630  
Delta R.T. 0.000 min  
Lab File: 3g16517.D  
Acq: 3 Oct 13 12:54 pm

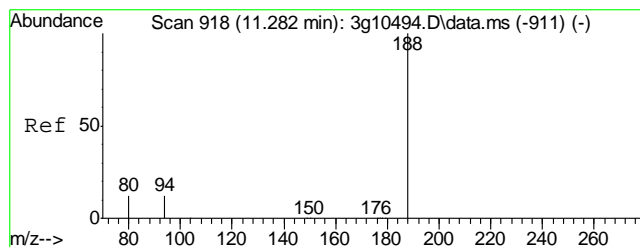
Tgt Ion:	166	Resp:	540
Ion Ratio	Lower	Upper	
166	100		
165	95.4	72.0	112.0
167	31.3	0.0	33.1



#14  
Diphenylamine  
Concen: N.D. ug/mL  
Expected RT: 8.06 min  
Lab File: 3g16517.D  
Acq: 3 Oct 13 12:54 pm

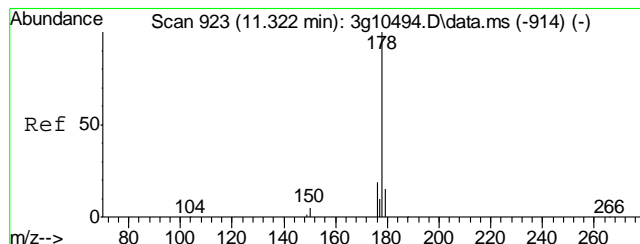
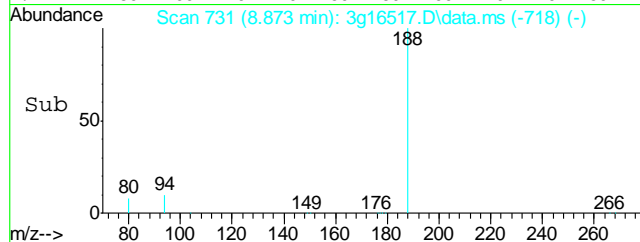
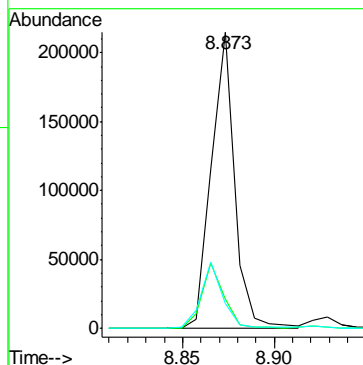
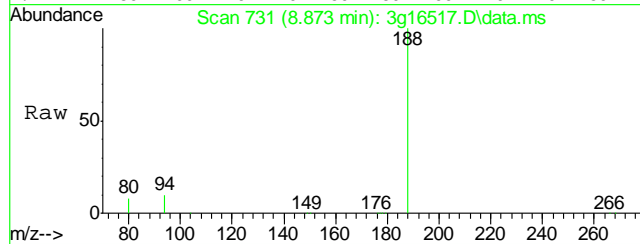
Tgt Ion:	169
Sig	Exp Ratio
169	100
168	61.7
167	34.1
167	34.1





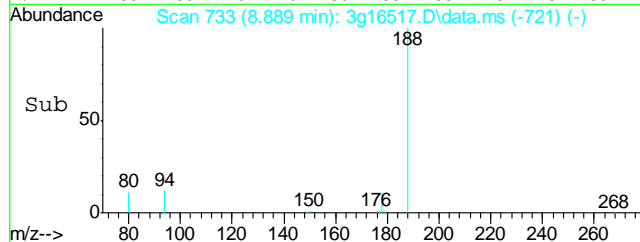
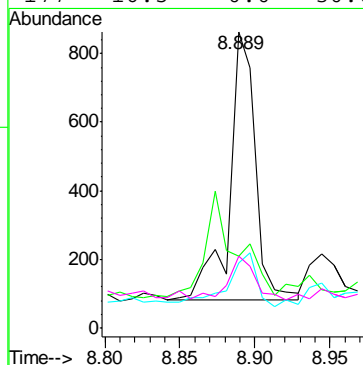
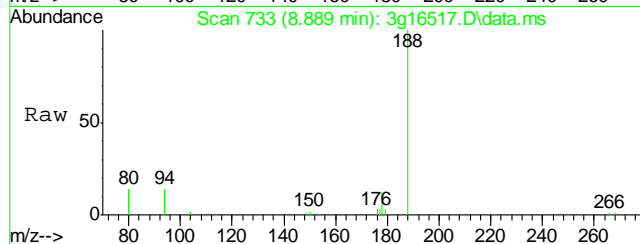
#15  
Phenanthrene-d10  
Concen: 4.0000 ug/mL  
RT: 8.873 min Scan# 731  
Delta R.T. 0.001 min  
Lab File: 3g16517.D  
Acq: 3 Oct 13 12:54 pm

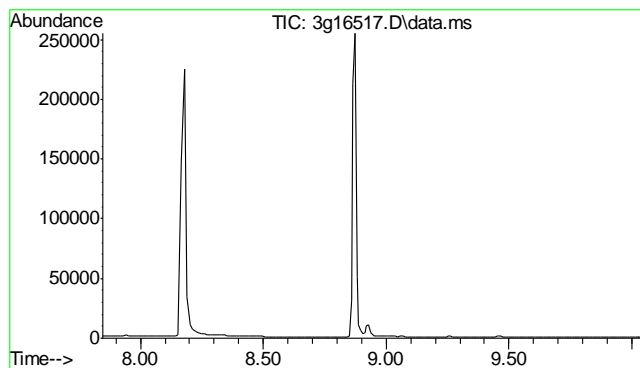
Tgt Ion	Ratio	Lower	Upper
188	100		
94	20.9	0.0	28.3
80	20.8	0.0	27.8



#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	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

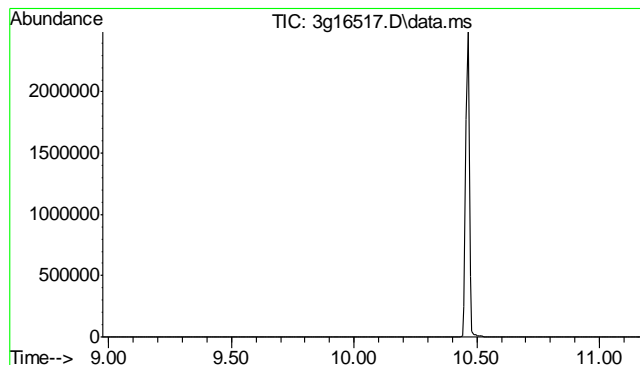
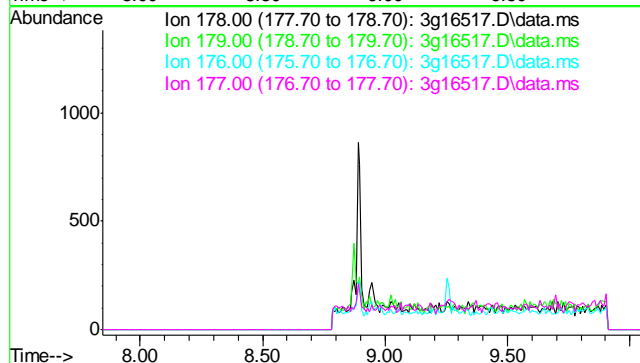




#17  
Anthracene  
Concen: N.D. ug/mL  
Expected RT: 8.94 min

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

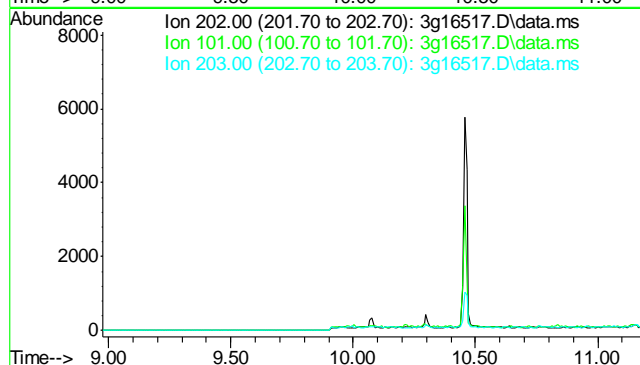
Tgt Ion:	178
Sig	Exp Ratio
178	100
179	15.1
176	18.2
177	8.7



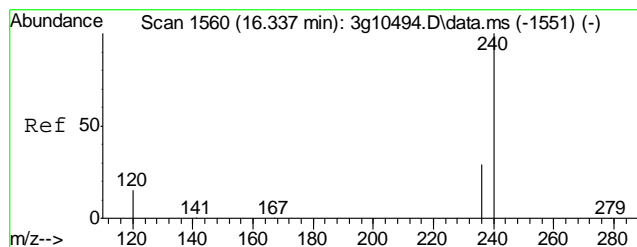
#18  
Fluoranthene  
Concen: N.D. ug/mL  
Expected RT: 10.07 min

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

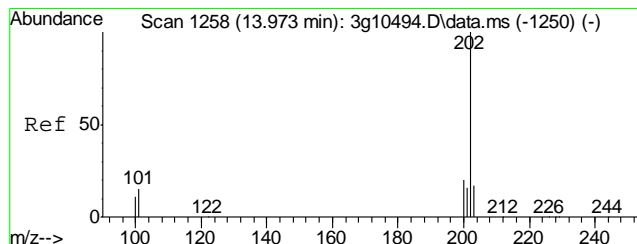
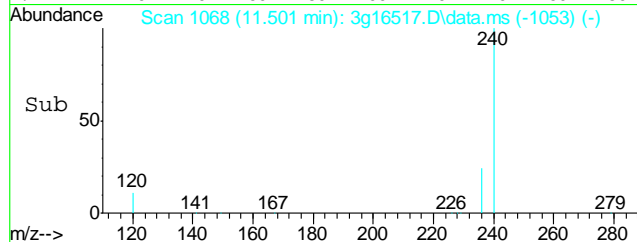
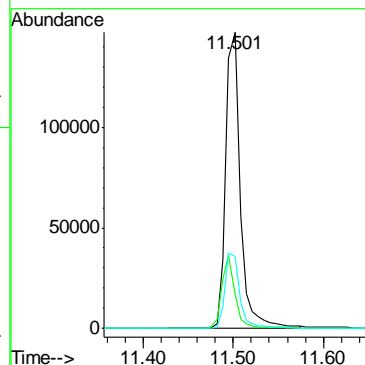
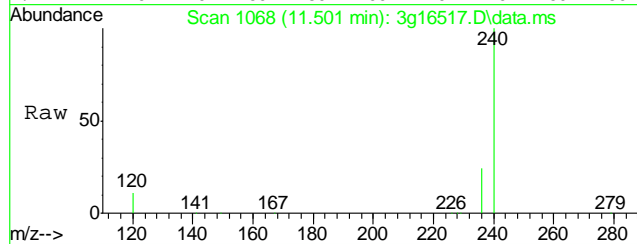






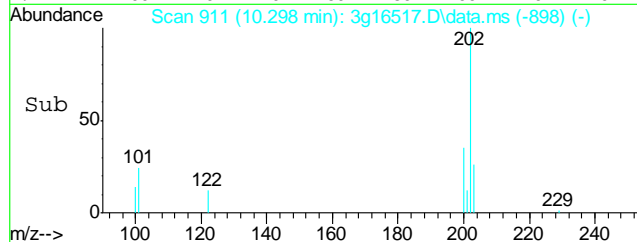
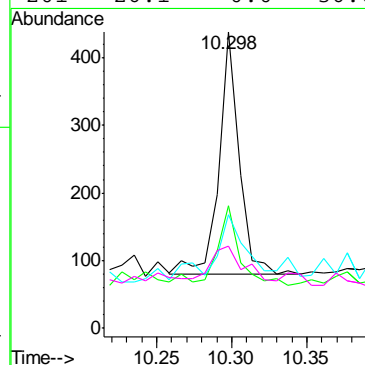
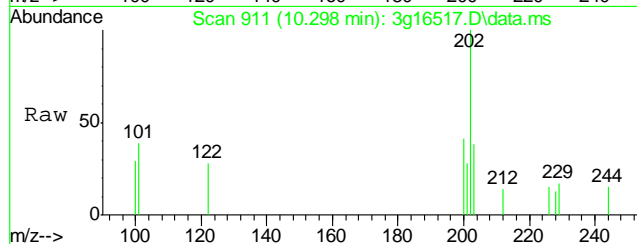
#19  
Chrysene-d12  
Concen: 4.0000 ug/mL  
RT: 11.501 min Scan# 1068  
Delta R.T. 0.000 min  
Lab File: 3g16517.D  
Acq: 3 Oct 13 12:54 pm

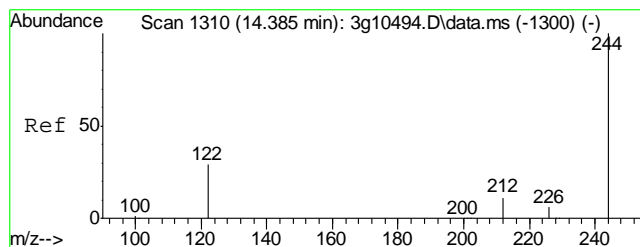
Tgt Ion	Ratio	Lower	Upper
240	100		
120	22.3	0.2	40.2
236	25.7	8.8	48.8



#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

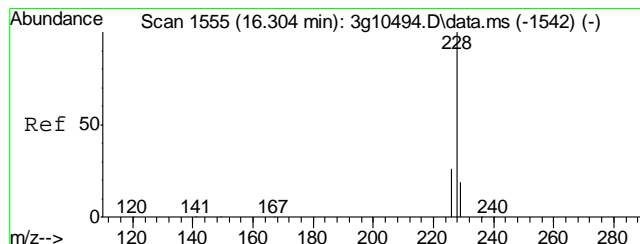
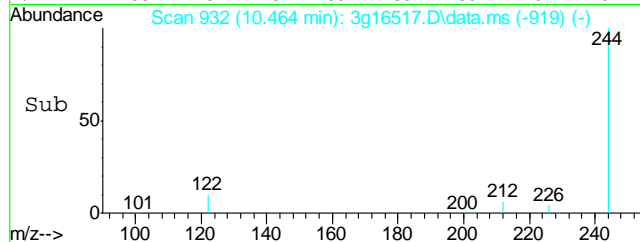
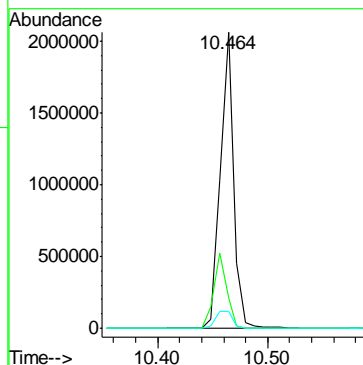
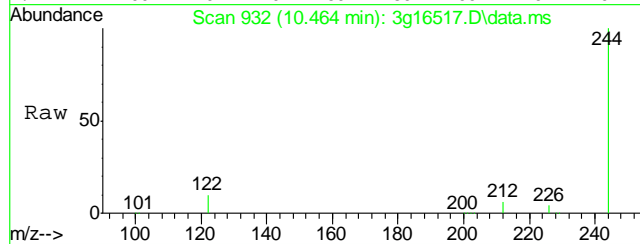
Tgt Ion	Ratio	Lower	Upper
202	100		
200	35.3	0.2	40.2
203	49.9	0.0	37.8#
201	26.1	0.0	36.6





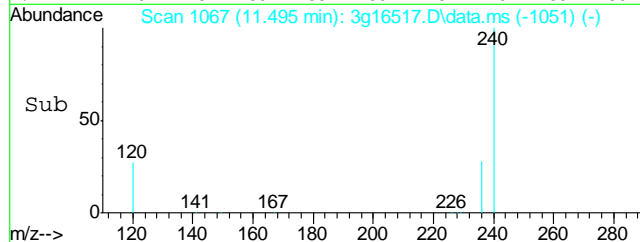
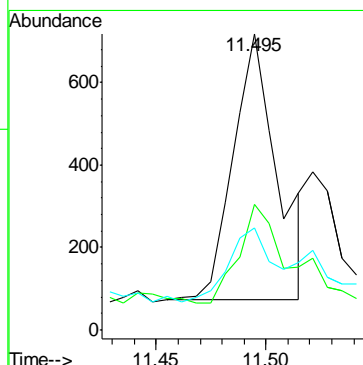
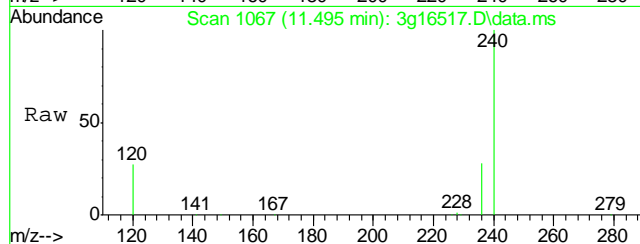
#21  
Terphenyl-d14  
Concen: 55.7722 ug/mL  
RT: 10.464 min Scan# 932  
Delta R.T. 0.001 min  
Lab File: 3g16517.D  
Acq: 3 Oct 13 12:54 pm

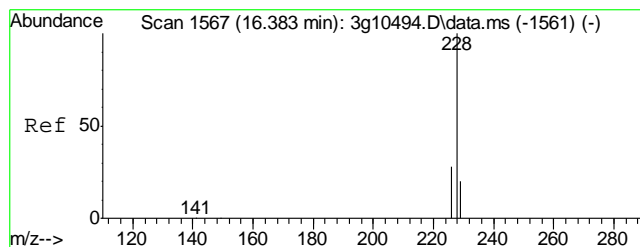
Tgt Ion:244 Resp: 1754721  
Ion Ratio Lower Upper  
244 100  
122 24.9 7.8 47.8  
212 7.3 0.0 32.8



#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

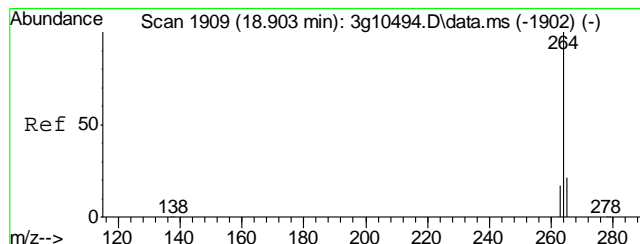
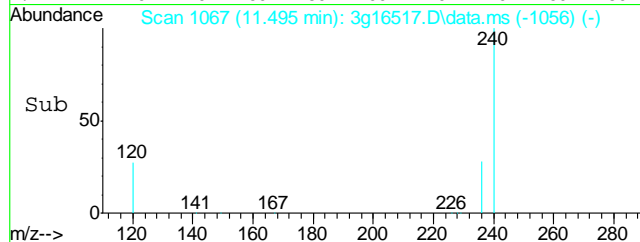
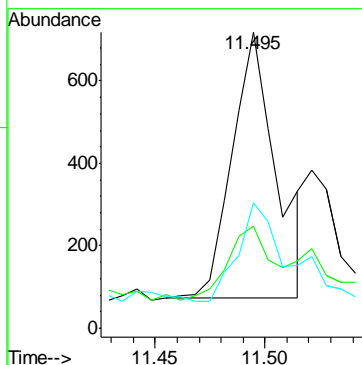
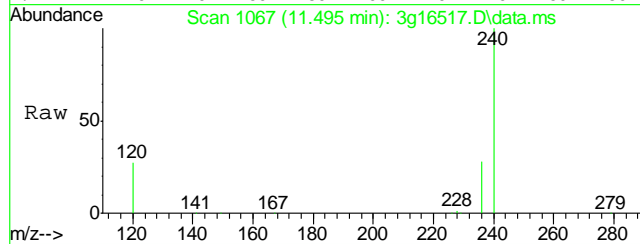
Tgt Ion:228 Resp: 896  
Ion Ratio Lower Upper  
228 100  
229 43.1 0.0 39.4#  
226 27.5 6.6 46.6





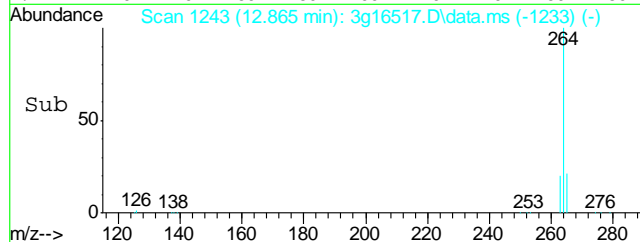
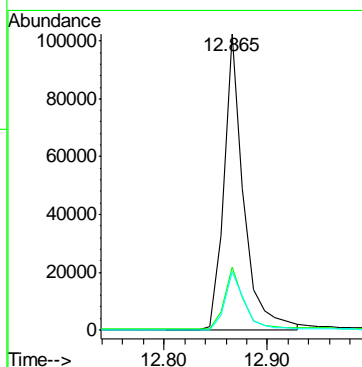
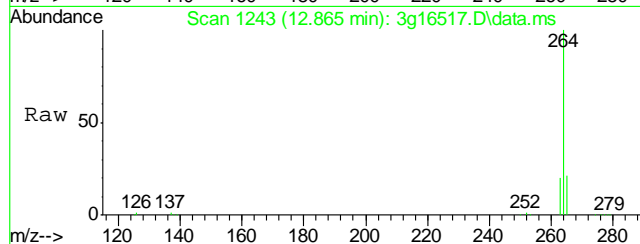
#23  
Chrysene  
Concen: Below ug/mL  
RT: 11.495 min Scan# 1067  
Delta R.T. -0.026 min  
Lab File: 3g16517.D  
Acq: 3 Oct 13 12:54 pm

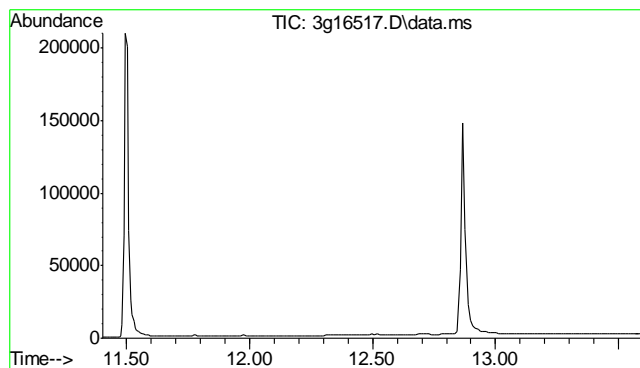
Tgt Ion:	228	Resp:	896
Ion Ratio	Lower	Upper	
228	100		
226	27.5	8.6	48.6
229	43.1	0.0	39.4



#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

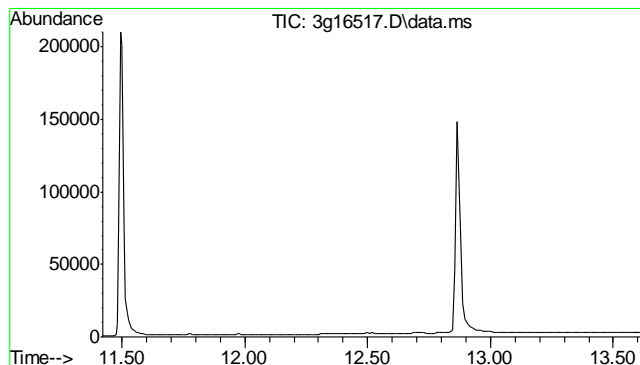
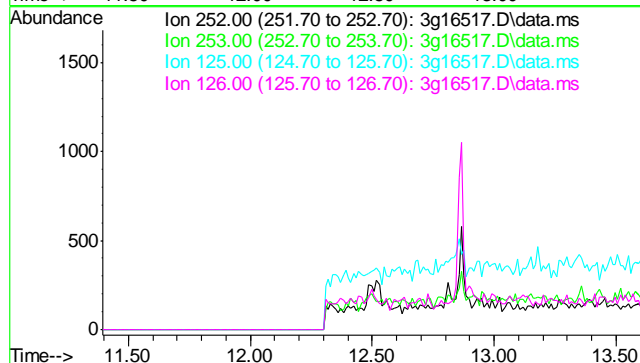




#25  
Benzo(b)fluoranthene  
Concen: N.D. ug/mL  
Expected RT: 12.50 min

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

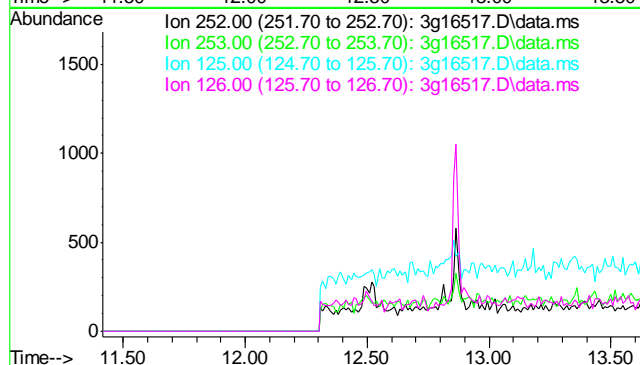
Tgt Ion: 252	
Sig	Exp Ratio
252	100
253	51.5
125	13.2
126	46.9

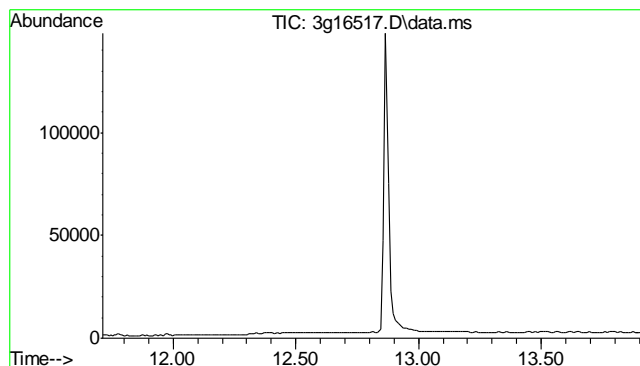


#26  
Benzo(k)fluoranthene  
Concen: N.D. ug/mL  
Expected RT: 12.52 min

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

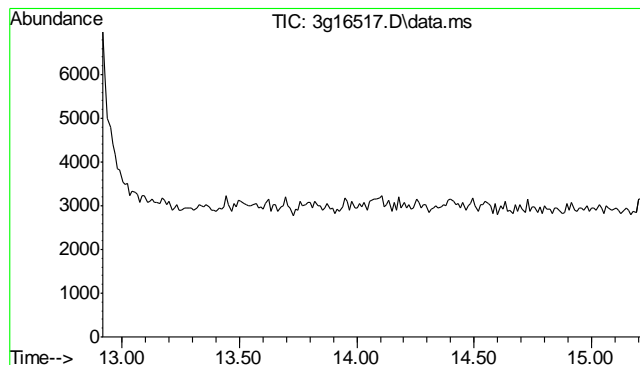
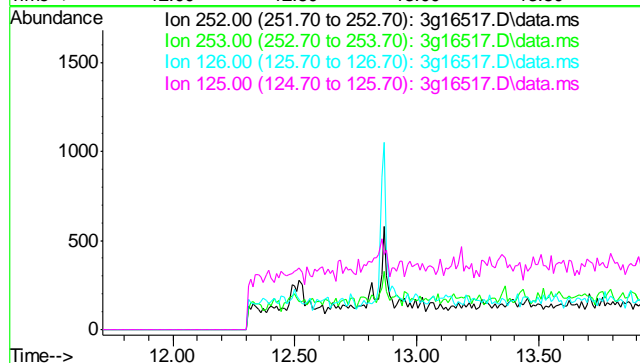




#27  
Benzo(a)pyrene  
Concen: N.D. ug/mL  
Expected RT: 12.81 min

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

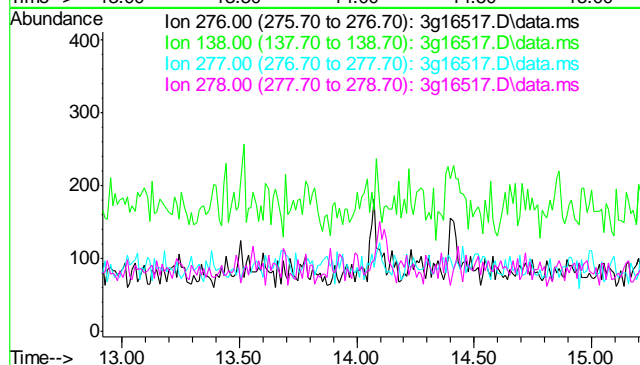
Tgt Ion:	252
Sig	Exp Ratio
252	100
253	21.5
126	20.4
125	14.5

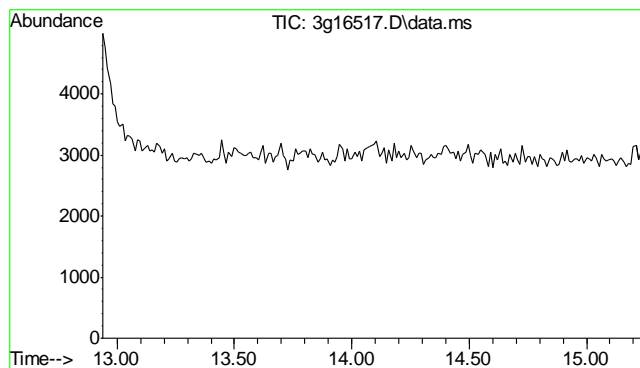


#28  
Indeno(1,2,3-cd)pyrene  
Concen: N.D. ug/mL  
Expected RT: 14.06 min

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

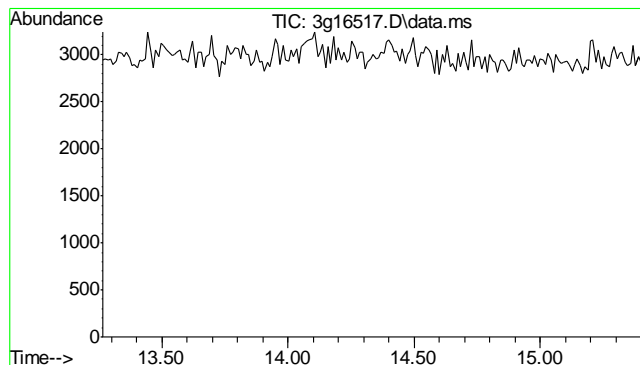
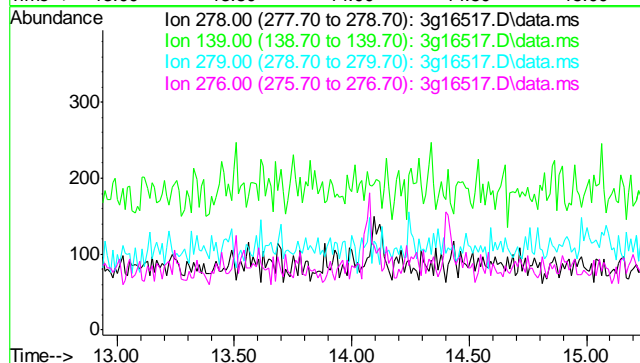




#29  
Dibenz(a,h)anthracene  
Concen: N.D. ug/mL  
Expected RT: 14.09 min

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

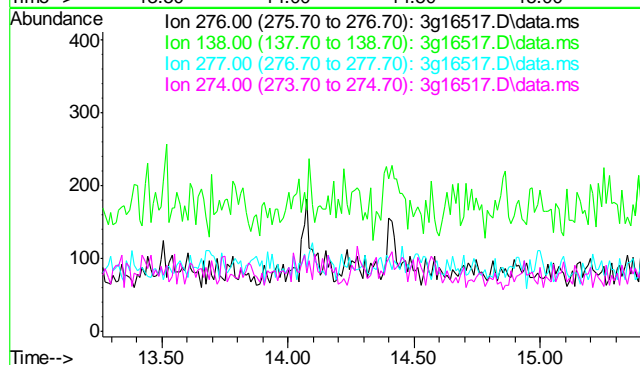
Tgt Ion:	278
Sig	Exp Ratio
278	100
139	30.8
279	22.9
276	131.2



#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



## 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: D51122  
Account: XTOKRWR XTO Energy  
Project: FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB1230-MB	GB22358.D	1	10/01/13	EV	n/a	n/a	GGB1230

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

D51122-1

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%

10.1.1  
10



## Blank Spike Summary

Page 1 of 1

**Job Number:** D51122  
**Account:** XTOKRWR XTO Energy  
**Project:** FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB1230-BS	GB22359.D	1	10/01/13	EV	n/a	n/a	GGB1230

The QC reported here applies to the following samples:

Method: SW846 8015B

D51122-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	110	112	102	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	94%	60-140%

\* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D51122  
Account: XTOKRWR XTO Energy  
Project: FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D51008-1MS	GB22361.D	1	10/01/13	EV	n/a	n/a	GGB1230
D51008-1MSD	GB22362.D	1	10/01/13	EV	n/a	n/a	GGB1230
D51008-1	GB22360.D	1	10/01/13	EV	n/a	n/a	GGB1230

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

D51122-1

CAS No.	Compound	D51008-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND		138	141	102	141	102	0	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D51008-1	Limits
120-82-1	1,2,4-Trichlorobenzene	92%	94%	84%	60-140%

\* = Outside of Control Limits.

GC Volatiles

Raw Data



Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\100113\GB22382.D\FID1A.CH Vial: 28  
Signal #2 : Y:\1\DATA\100113\GB22382.D\FID2B.CH  
Acq On : 2 Oct 2013 1:09 am Operator: ELISEV  
Sample : D51122-1 Inst : GC/MS Ins  
Misc : GC3911,GGB1230,5.041,,100,5,1 Multiplr: 1.00  
IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E  
Quant Time: Oct 02 08:44:15 2013 Quant Results File: TB1125GB1125SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB1125GB1125SOIL.M (Chemstation Integrator)  
Title : 8015B/8021B TVH/BTEX  
Last Update : Wed Oct 02 08:35:36 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	2276331	75.348 %	m
10) S	1,2,4-Trichlorobenzene (P)	14.35	10837320	82.070 %	m
Target Compounds					
1) H	TVH-Gasoline	7.31	28731367	0.410 mg/L	
4) T	Methyl-t-butyl-ether	0.00	0	N.D.	ug/L d
5) T	Benzene	4.15	183770	0.479 ug/L	m
6) T	Toluene	7.65	3040680	8.216 ug/L	m
7) T	Ethylbenzene	10.28	1016072	3.260 ug/L	m
8) T	m,p-Xylene	10.46	3963289	10.499 ug/L	m
9) T	o-Xylene	10.96	361829	1.159 ug/L	m
11) T	Naphthalene	14.54	347723	2.018 ug/L	m

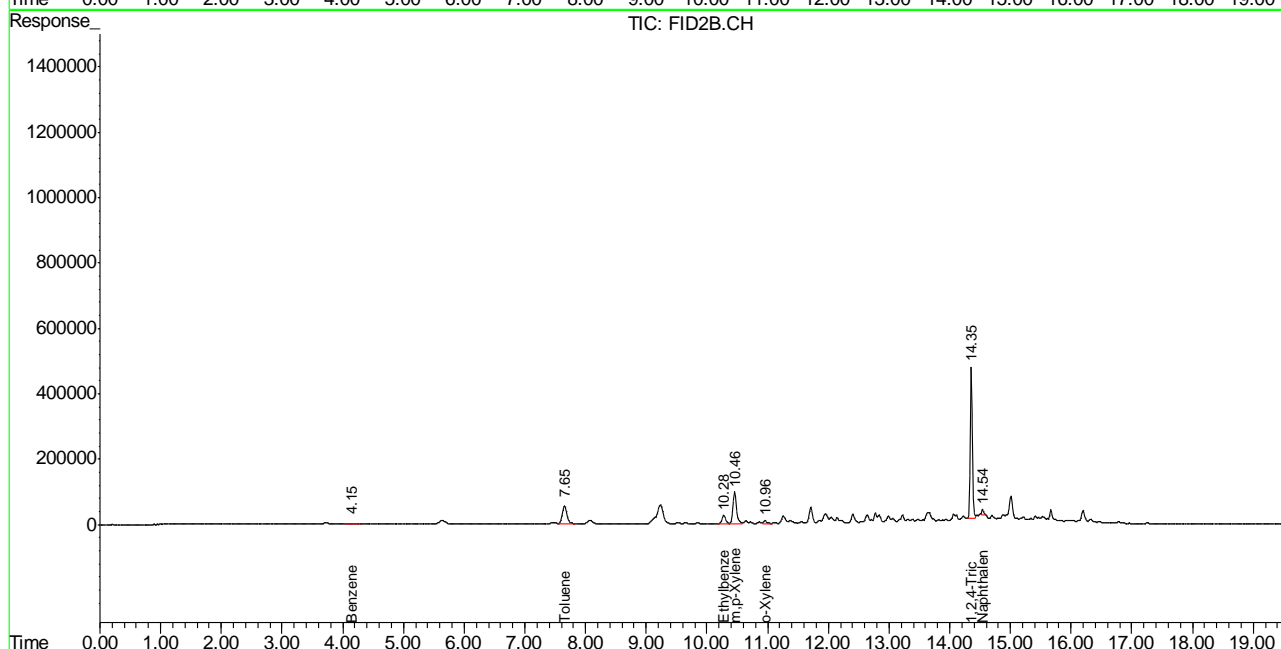
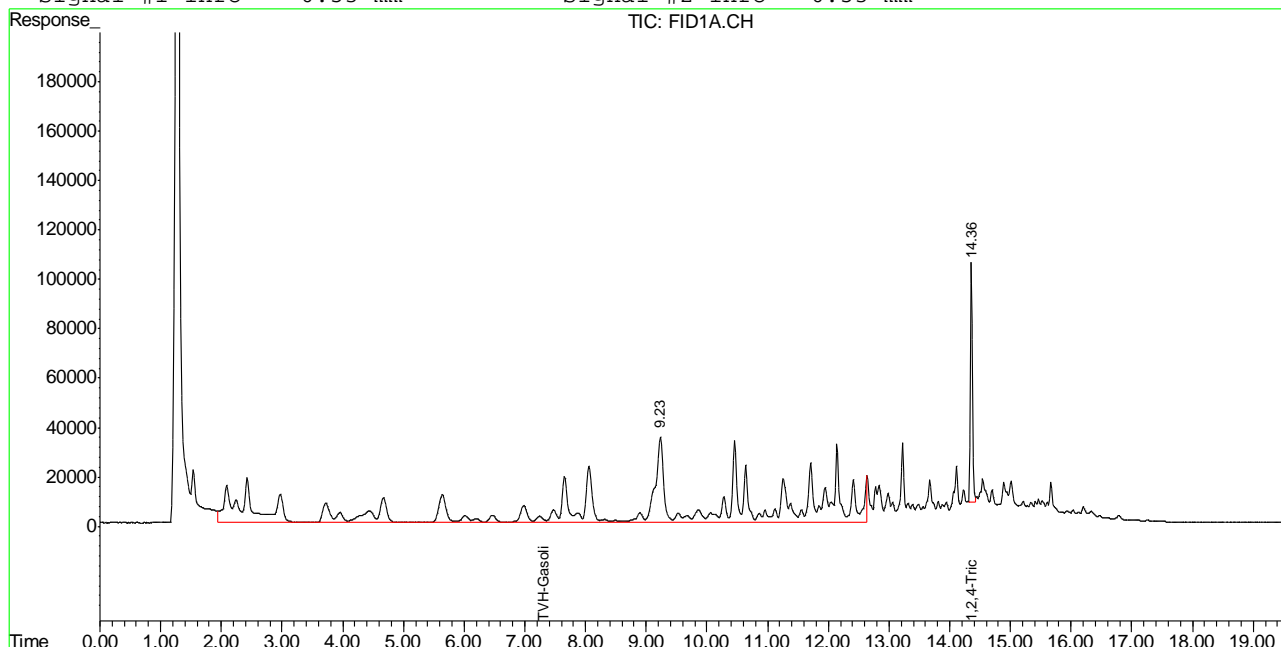
11.1.1  
11

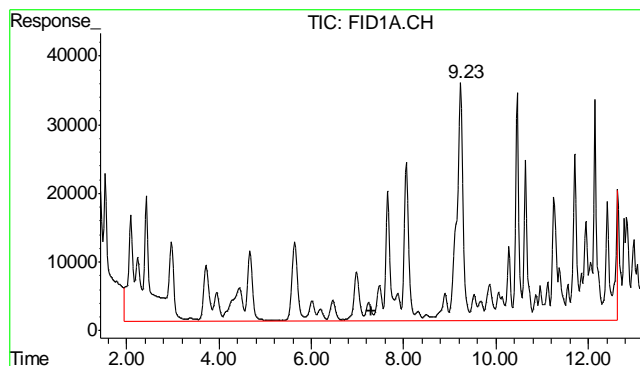
Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\100113\GB22382.D\FID1A.CH Vial: 28  
 Signal #2 : Y:\1\DATA\100113\GB22382.D\FID2B.CH  
 Acq On : 2 Oct 2013 1:09 am Operator: ELISEV  
 Sample : D51122-1 Inst : GC/MS Ins  
 Misc : GC3911,GGB1230,5.041,,100,5,1 Multiplr: 1.00  
 IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E  
 Quant Time: Oct 2 9:21 2013 Quant Results File: TB1125GB1125SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB1125GB1125SOIL.M (Chemstation Integrator)  
 Title : 8015B/8021B TVH/BTEX  
 Last Update : Wed Oct 02 08:35:36 2013  
 Response via : Multiple Level Calibration  
 DataAcq Meth : TVB4.M

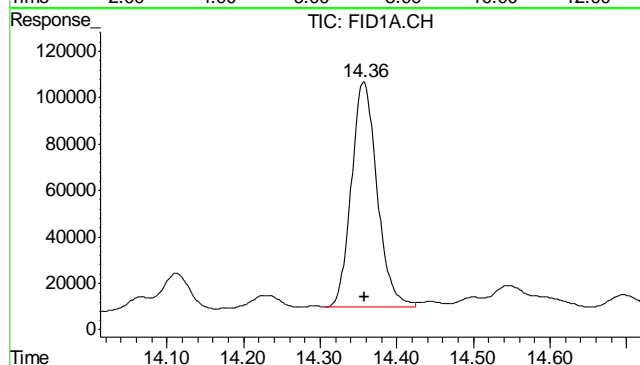
Volume Inj. :  
 Signal #1 Phase : DB-624 Signal #2 Phase: DB-624  
 Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm





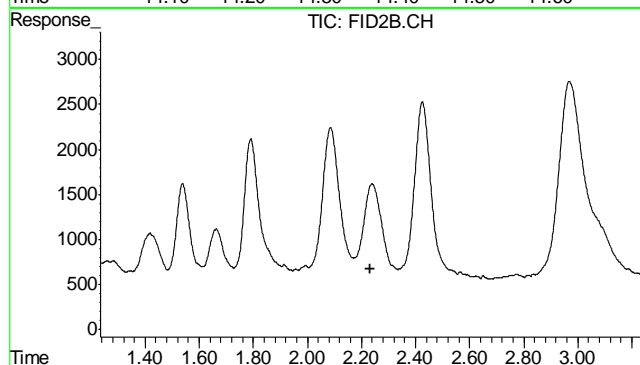
#1 TVH-Gasoline

R.T.: 7.310 min  
Delta R.T.: 0.000 min  
Response: 28731367  
Conc: 0.41 mg/L m



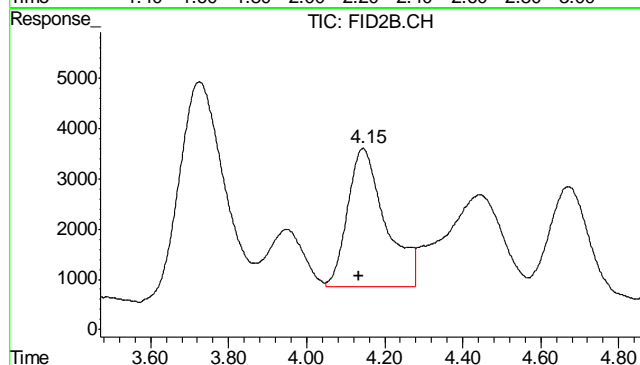
#2 1,2,4-Trichlorobenzene

R.T.: 14.356 min  
Delta R.T.: -0.002 min  
Response: 2276331  
Conc: 75.35 % m



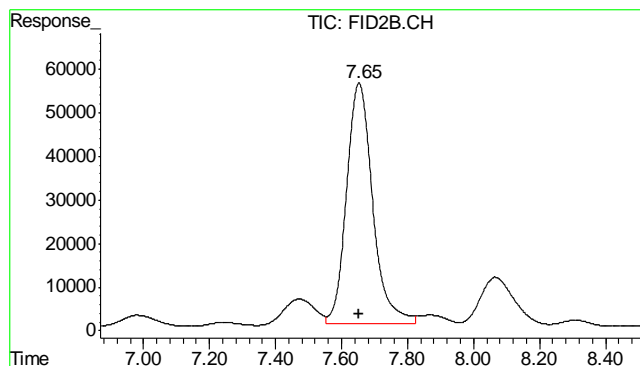
#4 Methyl-t-butyl-ether

R.T.: 0.000 min  
Exp R.T.: 2.234 min  
Response: 0  
Conc: N.D.



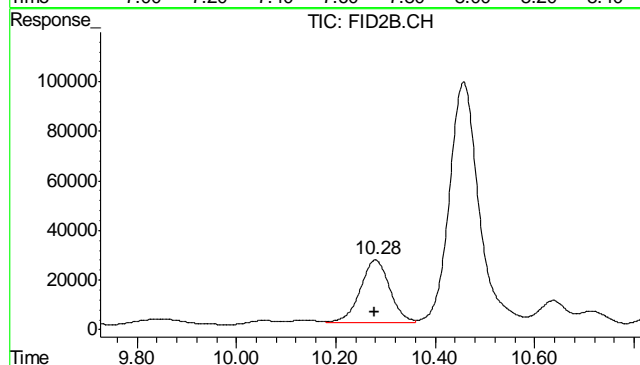
#5 Benzene

R.T.: 4.145 min  
Delta R.T.: 0.012 min  
Response: 183770  
Conc: 0.48 ug/L m



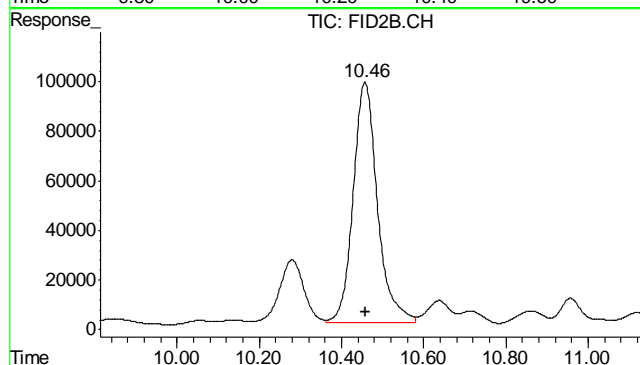
#6 Toluene

R.T.: 7.652 min  
Delta R.T.: 0.000 min  
Response: 3040680  
Conc: 8.22 ug/L m



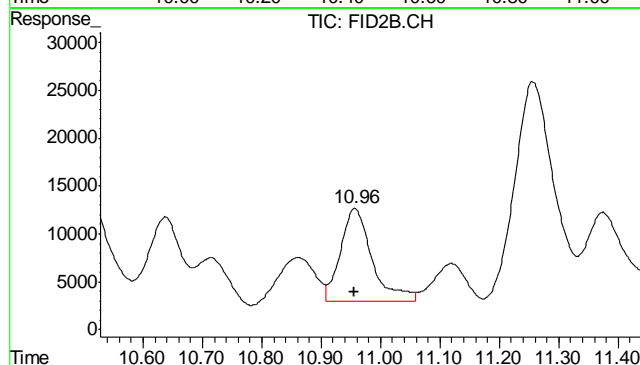
#7 Ethylbenzene

R.T.: 10.279 min  
Delta R.T.: 0.000 min  
Response: 1016072  
Conc: 3.26 ug/L m



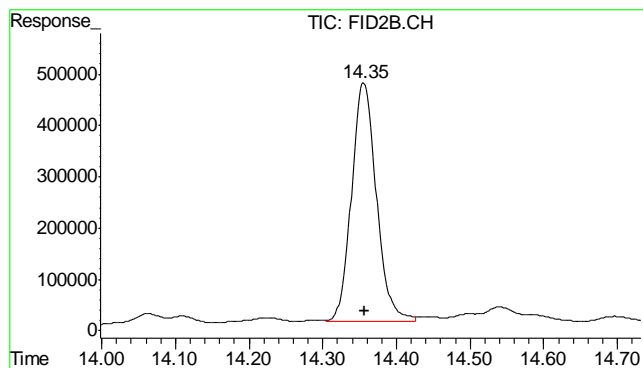
#8 m,p-Xylene

R.T.: 10.456 min  
Delta R.T.: -0.003 min  
Response: 3963289  
Conc: 10.50 ug/L m



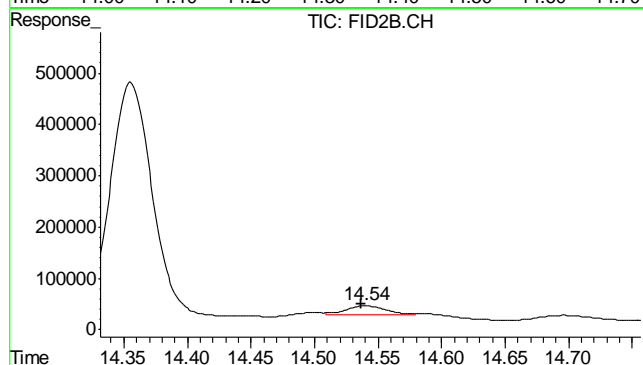
#9 o-Xylene

R.T.: 10.956 min  
Delta R.T.: 0.000 min  
Response: 361829  
Conc: 1.16 ug/L m



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

R.T.: 14.355 min  
Delta R.T.: -0.001 min  
Response: 10837320  
Conc: 82.07 % m



#11 Naphthalene

R.T.: 14.539 min  
Delta R.T.: 0.002 min  
Response: 347723  
Conc: 2.02 ug/L m

11.1.1  
11



Jennifer Laidlaw  
10/02/13 14:07

## Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\100113\GB22358.D\FID1A.CH Vial: 4  
Signal #2 : Y:\1\DATA\100113\GB22358.D\FID2B.CH  
Acq On : 1 Oct 2013 10:44 am Operator: ELISEV  
Sample : MB, S Inst : GC/MS Ins  
Misc : GC3911,GGB1230,5.000,,100,5,1 Multiplr: 1.00  
IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E  
Quant Time: Oct 02 08:42:47 2013 Quant Results File: TB1125GB1125SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB1125GB1125SOIL.M (Chemstation Integrator)  
Title : 8015B/8021B TVH/BTEX  
Last Update : Wed Oct 02 08:35:36 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	14.35	2552889	84.502 %	m
10) S	1,2,4-Trichlorobenzene (P)	14.35	11821067	89.520 %	m
Target Compounds					
1) H	TVH-Gasoline	7.31	3539480	0.050 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	7.64	115021	0.311 ug/L	m
7) T	Ethylbenzene	0.00	0	N.D. ug/L	d
8) T	m,p-Xylene	10.46	136889	0.363 ug/L	
9) T	o-Xylene	0.00	0	N.D. ug/L	d
11) T	Naphthalene	14.53	259461	1.506 ug/L	m

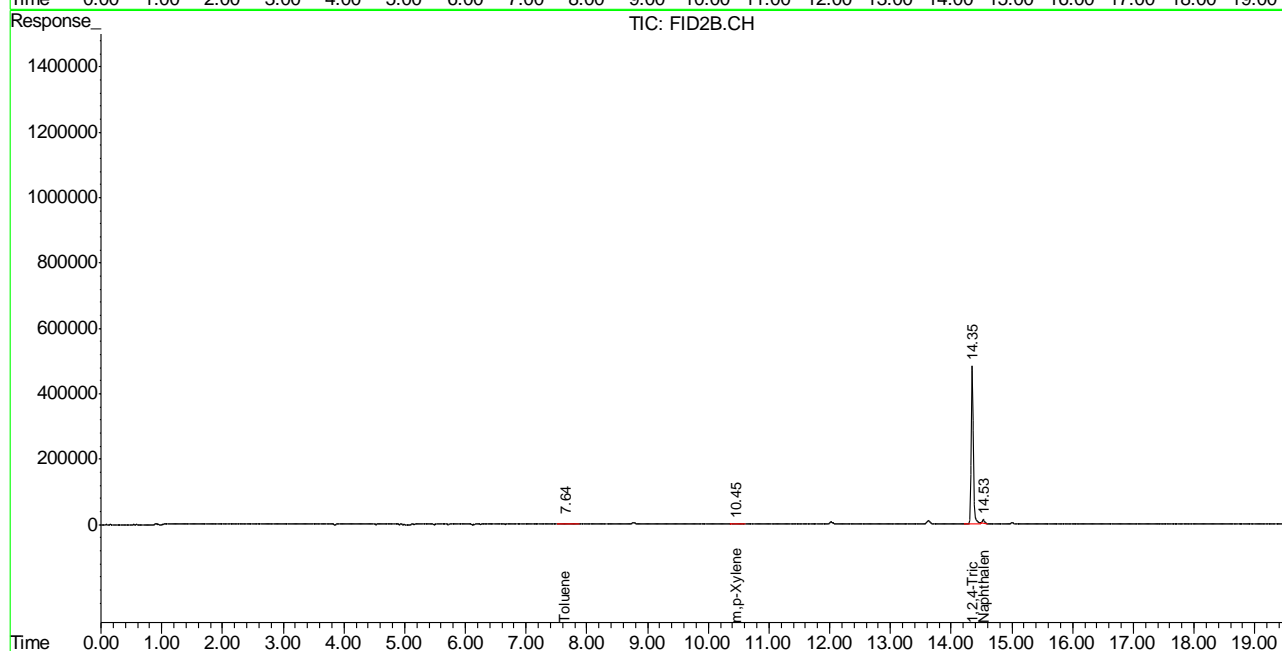
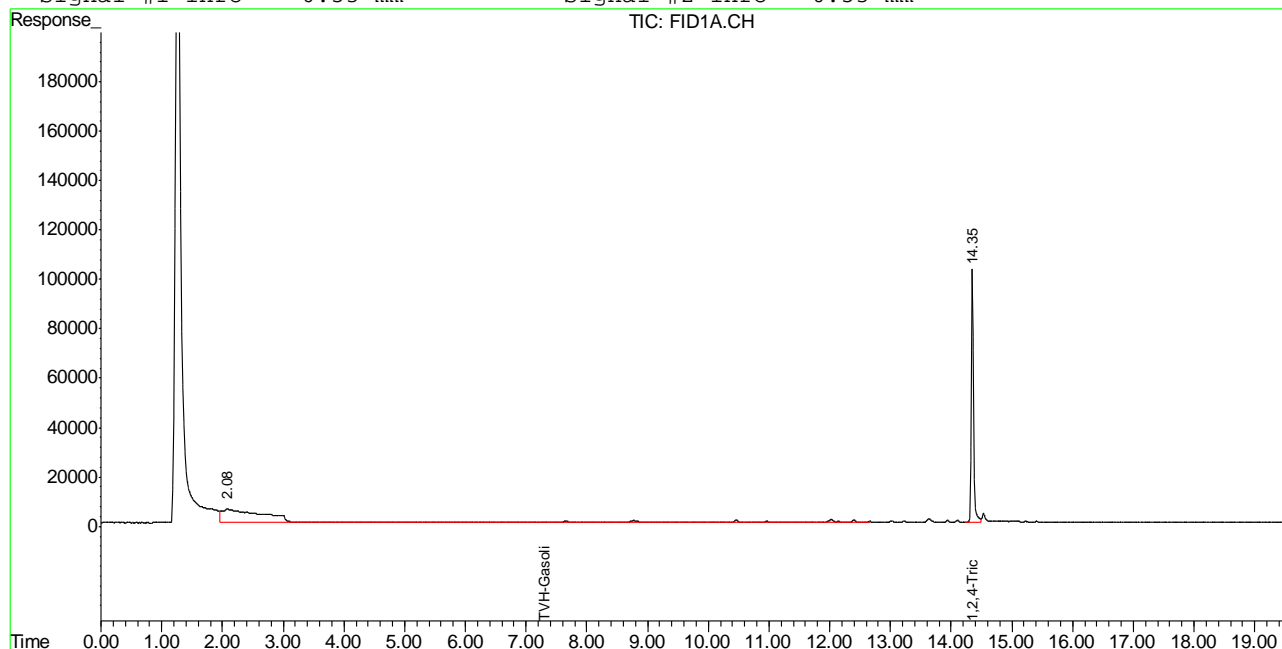
-----  
(f)=RT Delta > 1/2 Window (m)=manual int.  
GB22358.D TB1125GB1125SOIL.M Wed Oct 02 09:23:22 2013 GC

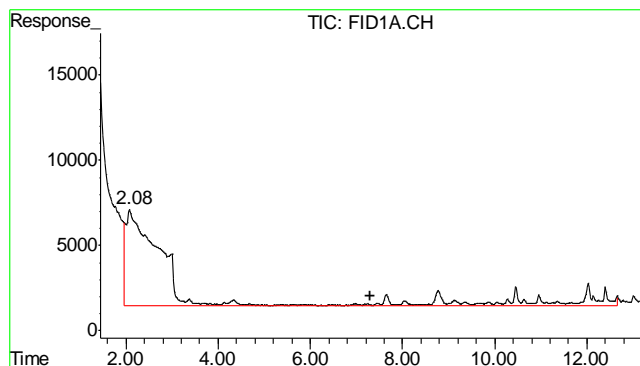
## Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\100113\GB22358.D\FID1A.CH Vial: 4  
Signal #2 : Y:\1\DATA\100113\GB22358.D\FID2B.CH  
Acq On : 1 Oct 2013 10:44 am Operator: ELISEV  
Sample : MB, S Inst : GC/MS Ins  
Misc : GC3911,GGB1230,5.000,,100,5,1 Multiplr: 1.00  
IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E  
Quant Time: Oct 2 8:54 2013 Quant Results File: TB1125GB1125SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB1125GB1125SOIL.M (Chemstation Integrator)  
Title : 8015B/8021B TVH/BTEX  
Last Update : Wed Oct 02 08:35:36 2013  
Response via : Multiple Level Calibration  
DataAcq Meth : TVB4.M

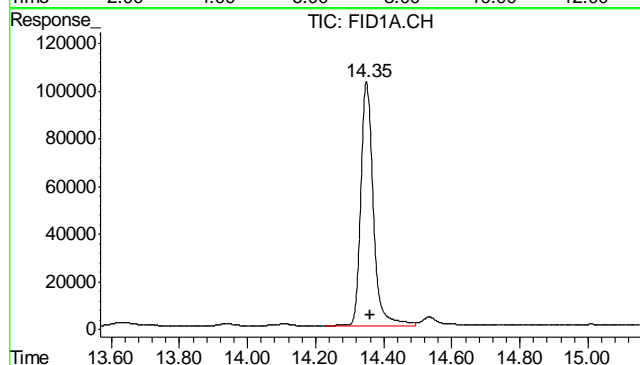
Volume Inj. :  
Signal #1 Phase : DB-624 Signal #2 Phase: DB-624  
Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm





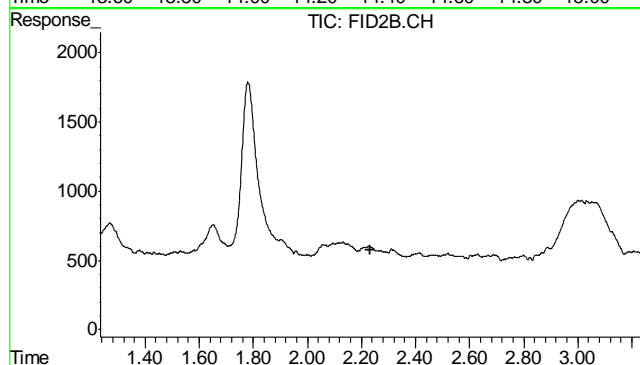
#1 TVH-Gasoline

R.T.: 7.310 min  
Delta R.T.: 0.000 min  
Response: 3539480  
Conc: 0.05 mg/L m



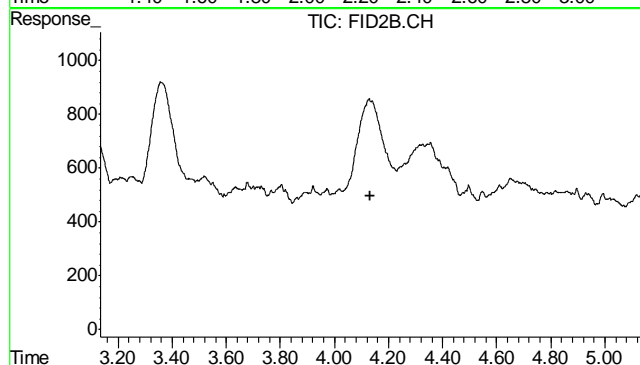
#2 1,2,4-Trichlorobenzene

R.T.: 14.349 min  
Delta R.T.: -0.009 min  
Response: 2552889  
Conc: 84.50 % m



#4 Methyl-t-butyl-ether

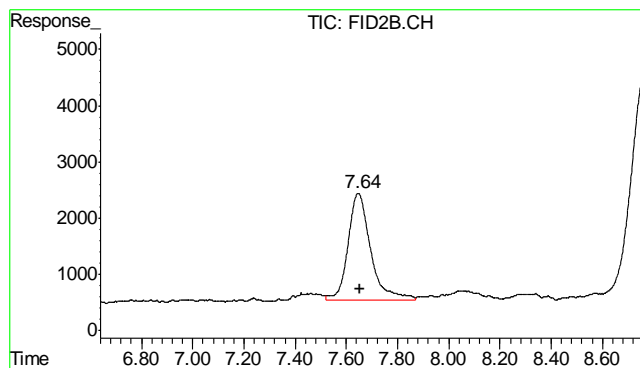
R.T.: 0.000 min  
Exp R.T.: 2.234 min  
Response: 0  
Conc: N.D.



#5 Benzene

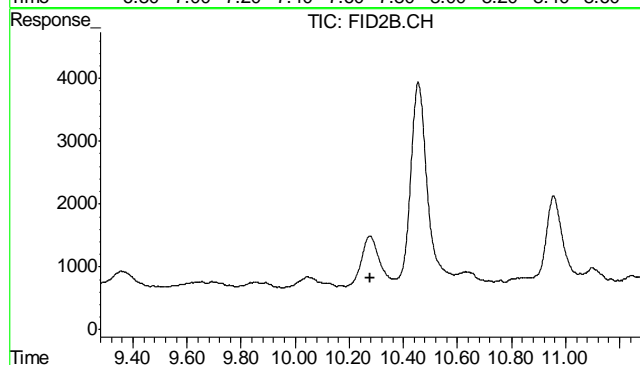
R.T.: 0.000 min  
Exp R.T.: 4.134 min  
Response: 0  
Conc: N.D.

11.21  
11



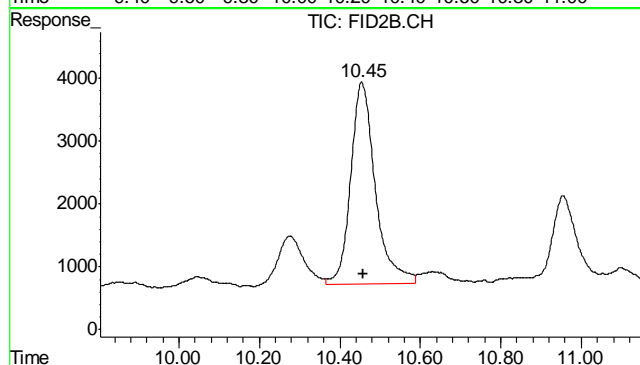
#6 Toluene

R.T.: 7.644 min  
Delta R.T.: -0.008 min  
Response: 115021  
Conc: 0.31 ug/L m



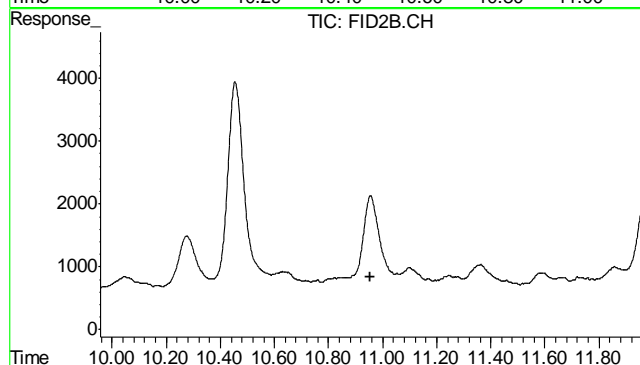
#7 Ethylbenzene

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



#8 m,p-Xylene

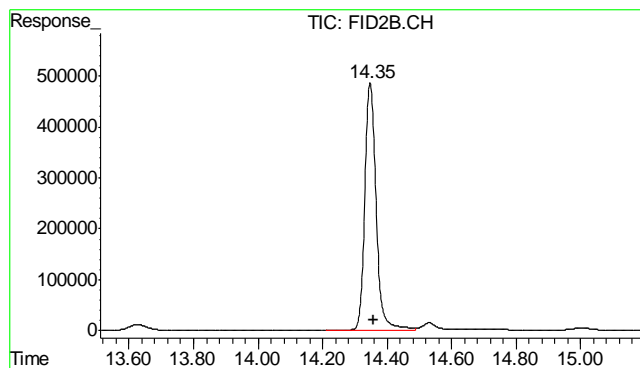
R.T.: 10.455 min  
Delta R.T.: -0.004 min  
Response: 136889  
Conc: 0.36 ug/L



#9 o-Xylene

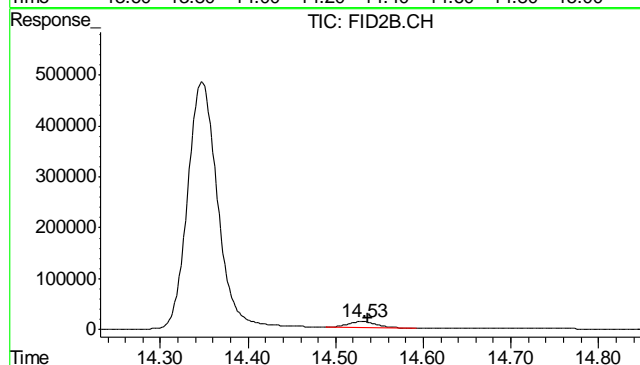
R.T.: 0.000 min  
Exp R.T.: 10.956 min  
Response: 0  
Conc: N.D.

11.21  
11



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

R.T.: 14.347 min  
Delta R.T.: -0.009 min  
Response: 11821067  
Conc: 89.52 % m



#11 Naphthalene

R.T.: 14.530 min  
Delta R.T.: -0.007 min  
Response: 259461  
Conc: 1.51 ug/L m

11.2.1  
11

## 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**

Page 1 of 1

**Job Number:** D51122  
**Account:** XTOKRWR XTO Energy  
**Project:** FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8666-MB	FH013648.D	1	10/03/13	TU	10/02/13	OP8666	GFH720

The QC reported here applies to the following samples:

Method: SW846-8015B

D51122-1

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	71% 20-130%

12.1.1  
12

## Blank Spike Summary

Page 1 of 1

**Job Number:** D51122  
**Account:** XTOKRWR XTO Energy  
**Project:** FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8666-BS	FH013650.D	1	10/03/13	TU	10/02/13	OP8666	GFH720

The QC reported here applies to the following samples:

Method: SW846-8015B

D51122-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	667	422	63	42-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	64%	20-130%

\* = Outside of Control Limits.



# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** D51122  
**Account:** XTOKRWR XTO Energy  
**Project:** FRU 197-31A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8666-MS	FH013672.D	10	10/03/13	TU	10/02/13	OP8666	GFH722
OP8666-MSD	FH013673.D	10	10/03/13	TU	10/02/13	OP8666	GFH722
D51127-1	FH013674.D	10	10/03/13	TU	10/02/13	OP8666	GFH722

The QC reported here applies to the following samples:

Method: SW846-8015B

D51122-1

CAS No.	Compound	D51127-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	10500		727	11100	83	11800	179* a	6	20-150/30

CAS No.	Surrogate Recoveries	MS	MSD	D51127-1	Limits
84-15-1	o-Terphenyl	82%	92%	74%	20-130%

(a) Outside control limits due to high level in sample relative to spike amount.

\* = Outside of Control Limits.

GC Semi-volatiles

Raw Data

Quantitation Report (QT Reviewed)

Data File : C:\FID6\_DATA\FI100313.SEC\FI09506.D Vial: 63  
Acq On : 3 Oct 2013 8:22 pm Operator: TIMU  
Sample : D51122-1 Inst : Fid6  
Misc : OP8666,GFI637,30.11,,,1,1 Multiplr: 1.00  
IntFile : autoint1.e  
Quant Time: Oct 04 08:32:57 2013 Quant Results File: ORO-RR-GFI585.RES

Quant Method : C:\MSDCHEM\1...\ORO-RR-GFI585.M (Chemstation Integrator)  
Title : 8015B TEH Front detector  
Last Update : Thu Oct 03 11:49:33 2013  
Response via : Initial Calibration  
DataAcq Meth : DUAL\_B2.M

Volume Inj. : 1ul  
Signal Phase : RTX-5  
Signal Info : 530um

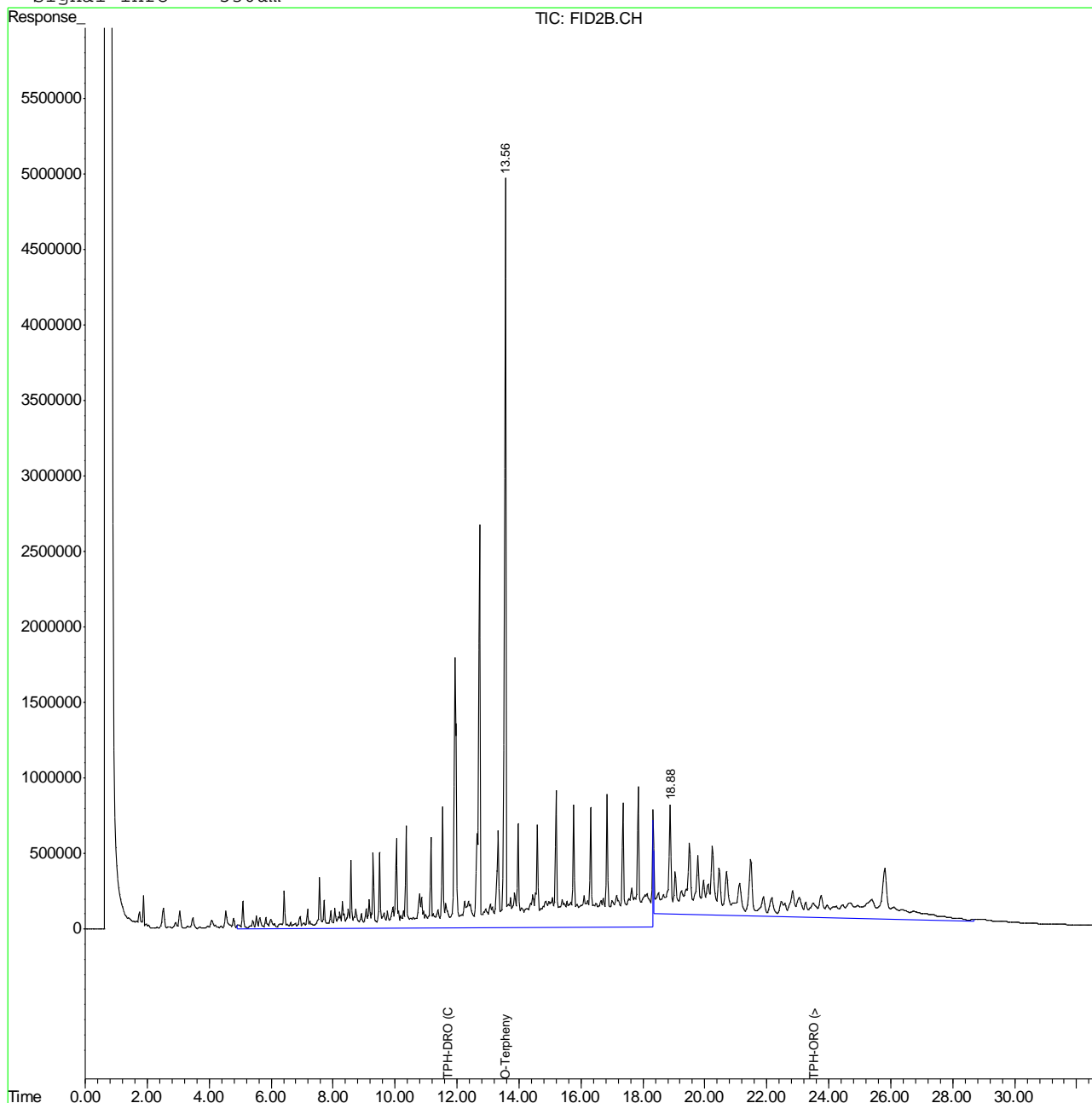
Compound	R.T.	Response	Conc Units
-----			
System Monitoring Compounds			
1) S O-Terphenyl	13.57	145584243	2008.548 mg/L
Target Compounds			
2) H TPH-DRO (C10-C28)	11.71	1228406649	19167.566 mg/L
3) H TPH-ORO (>C28-C40)	23.52	617817780	14807.850 mg/L

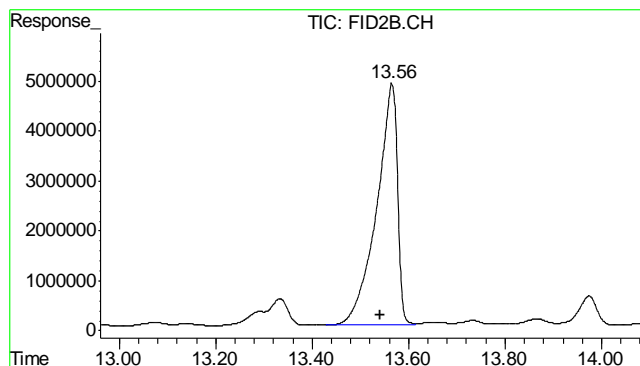
Quantitation Report (QT Reviewed)

Data File : C:\FID6\_DATA\FI100313.SEC\FI09506.D Vial: 63  
Acq On : 3 Oct 2013 8:22 pm Operator: TIMU  
Sample : D51122-1 Inst : FID6  
Misc : OP8666,GFI637,30.11,,,1,1 Multiplr: 1.00  
IntFile : autoint1.e  
Quant Time: Oct 4 8:36 2013 Quant Results File: ORO-RR-GFI585.RES

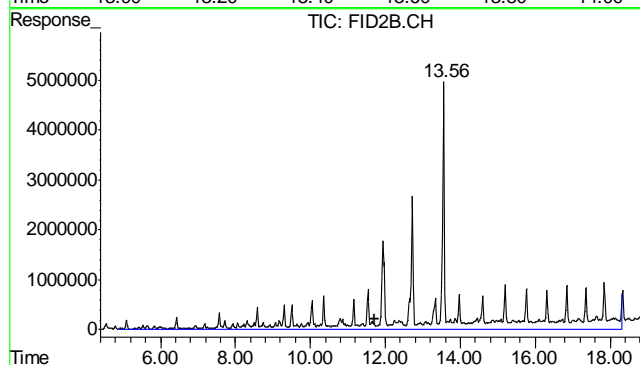
Quant Method : C:\MSDCHEM\1...\ORO-RR-GFI585.M (Chemstation Integrator)  
Title : 8015B TEH Front detector  
Last Update : Thu Oct 03 11:49:33 2013  
Response via : Multiple Level Calibration  
DataAcq Meth : DUAL\_B2.M

Volume Inj. : 1ul  
Signal Phase : RTX-5  
Signal Info : 530um

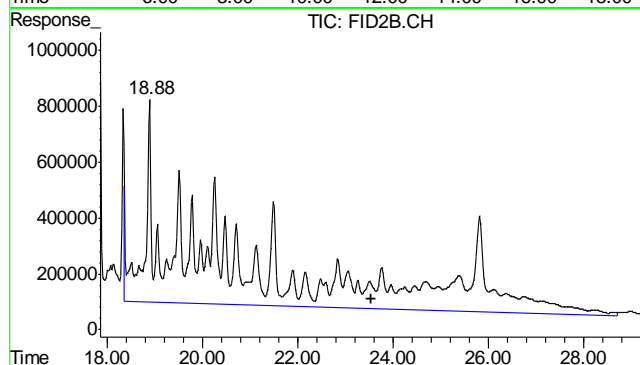




#1 O-Terphenyl  
 R.T.: 13.565 min  
 Delta R.T.: 0.025 min  
 Response: 145584243  
 Conc: 2008.55 mg/L



#2 TPH-DRO (C10-C28)  
 R.T.: 11.710 min  
 Delta R.T.: 0.000 min  
 Response: 1228406649  
 Conc: 19167.57 mg/L m



#3 TPH-ORO (>C28-C40)  
 R.T.: 23.523 min  
 Delta R.T.: 0.000 min  
 Response: 617817780  
 Conc: 14807.85 mg/L m

13.1.1  
 13

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\FH100213.SEC\  
Data File : FH013648.D  
Signal(s) : FID2B.ch  
Acq On : 3 Oct 2013 4:58 am  
Operator : TIMU  
Sample : OP8666-MB  
Misc : OP8666,GFH720,30.00,,,1,1  
ALS Vial : 78 Sample Multiplier: 1

Integration File: events.e  
Quant Time: Oct 03 08:21:13 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	12.169	2478226606	1428.275 ug/ml
Target Compounds			
2) H TPH-DRO (C10-C28)	9.818	150985896	107.343 ug/ml
-----			

(f)=RT Delta > 1/2 Window

(m)=manual int.

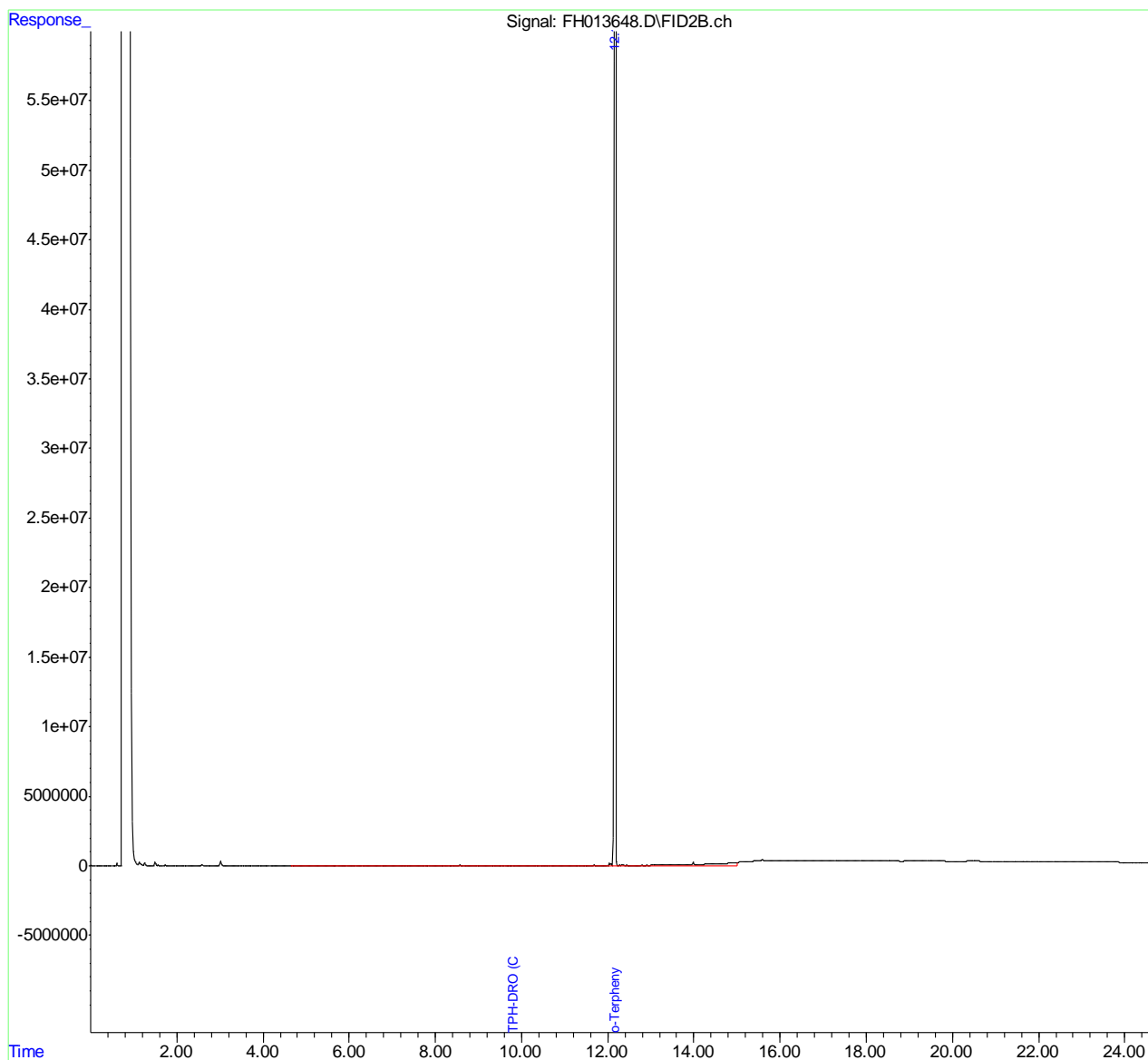
13.2.1  
13

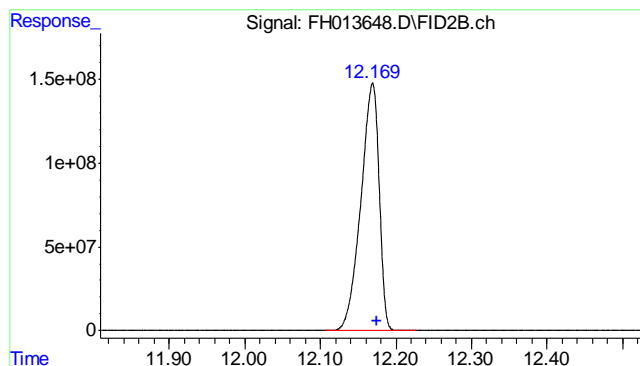
## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\FH100213.SEC\  
Data File : FH013648.D  
Signal(s) : FID2B.ch  
Acq On : 3 Oct 2013 4:58 am  
Operator : TIMU  
Sample : OP8666-MB  
Misc : OP8666,GFH720,30.00,,,1,1  
ALS Vial : 78 Sample Multiplier: 1

Integration File: events.e  
Quant Time: Oct 03 08:21:13 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

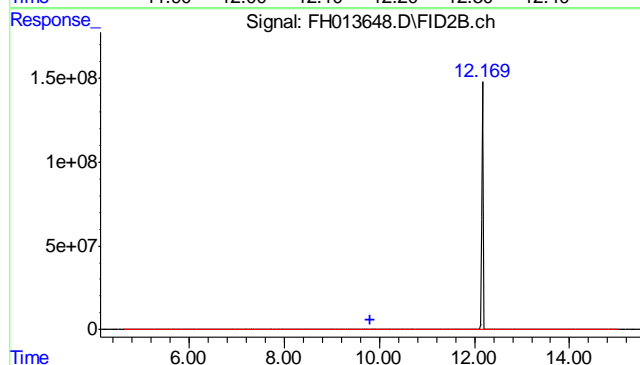
Volume Inj. :  
Signal Phase :  
Signal Info :





#1 o-Terphenyl

R.T.: 12.169 min  
Delta R.T.: -0.006 min  
Response: 2478226606  
Conc: 1428.27 ug/ml



#2 TPH-DRO (C10-C28)

R.T.: 9.818 min  
Delta R.T.: 0.000 min  
Response: 150985896  
Conc: 107.34 ug/ml m

13.2.1  
13



## 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: D51122  
Account: XTOKRWR - XTO Energy  
Project: FRU 197-31A

QC Batch ID: MP11267  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 10/02/13

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	1.1	1.8		
Antimony	3.0	.21	.5		
Arsenic	2.5	.38	.63		
Barium	1.0	.02	.36	0.040	<1.0
Beryllium	1.0	.09	.06		
Boron	5.0	.08	.16		
Cadmium	1.0	.02	.28	0.030	<1.0
Calcium	40	.24	6.8		
Chromium	1.0	.03	.03	0.040	<1.0
Cobalt	0.50	.05	.039		
Copper	1.0	.08	.13	-0.020	<1.0
Iron	7.0	.15	1.8		
Lead	5.0	.21	.25	0.080	<5.0
Lithium	0.50	.04	.13		
Magnesium	20	.68	1.8		
Manganese	0.50	.05	.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	-0.47	<5.0
Silicon	5.0	.47	1.1		
Silver	3.0	.03	.05	-0.030	<3.0
Sodium	40	.73	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	0.34	<3.0

Associated samples MP11267: D51122-1

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

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D51122  
Account: XTOKRWR - XTO Energy  
Project: FRU 197-31A

QC Batch ID: MP11267  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51122  
Account: XTOKRWR - XTO Energy  
Project: FRU 197-31A

QC Batch ID: MP11267  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 10/02/13

Metal	D51122-1 Original MS		Spikelot ICPAL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium	2780	2690	248	-36.3(a)	75-125
Beryllium					
Boron					
Cadmium	1.0	51.4	62	81.2	75-125
Calcium					
Chromium	23.5	71.7	62	77.7	75-125
Cobalt					
Copper	30.0	87.0	62	91.9	75-125
Iron					
Lead	17.7	118	124	80.8	75-125
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel	14.5	64.3	62	80.3	75-125
Phosphorus					
Potassium					
Selenium	2.8	115	124	90.4	75-125
Silicon					
Silver	0.036	23.0	24.8	92.5	75-125
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	50.9	101	62	80.8	75-125

Associated samples MP11267: D51122-1

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

14.1.2  
14

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51122  
Account: XTOKRWR - XTO Energy  
Project: FRU 197-31A

QC Batch ID: MP11267  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested  
(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51122  
Account: XTOKRWR - XTO Energy  
Project: FRU 197-31A

QC Batch ID: MP11267  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 10/02/13

Metal	D51122-1 Original	MSD	Spikelot ICPAL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	2780	3100	251	127.7(a)	14.2	20
Beryllium						
Boron						
Cadmium	1.0	51.5	62.7	80.6	0.2	20
Calcium						
Chromium	23.5	75.6	62.7	83.1	5.3	20
Cobalt						
Copper	30.0	81.0	62.7	81.4	7.1	20
Iron						
Lead	17.7	117	125	79.2	0.9	20
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel	14.5	63.0	62.7	77.4	2.0	20
Phosphorus						
Potassium						
Selenium	2.8	113	125	87.9	1.8	20
Silicon						
Silver	0.036	23.1	25.1	92.0	0.4	20
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	50.9	97.7	62.7	74.7N(b)	3.3	20

Associated samples MP11267: D51122-1

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51122  
Account: XTOKRWR - XTO Energy  
Project: FRU 197-31A

QC Batch ID: MP11267  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested  
(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.  
(b) Spike recovery indicates possible matrix interference.

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D51122  
 Account: XTOKRWR - XTO Energy  
 Project: FRU 197-31A

QC Batch ID: MP11267  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 10/02/13

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	192	200	96.0	80-120
Beryllium				
Boron				
Cadmium	45.5	50	91.0	80-120
Calcium				
Chromium	48.8	50	97.6	80-120
Cobalt				
Copper	47.2	50	94.4	80-120
Iron				
Lead	94.1	100	94.1	80-120
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	46.7	50	93.4	80-120
Phosphorus				
Potassium				
Selenium	96.1	100	96.1	80-120
Silicon				
Silver	20.2	20	101.0	80-120
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	44.9	50	89.8	80-120

Associated samples MP11267: D51122-1

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



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D51122  
Account: XTOKRWR - XTO Energy  
Project: FRU 197-31A

QC Batch ID: MP11267  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D51122  
Account: XTOKRWR - XTO Energy  
Project: FRU 197-31A

QC Batch ID: MP11267  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: ug/l

Prep Date: 10/02/13

Metal	D51122-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	22800	24900	9.0	0-10
Beryllium				
Boron				
Cadmium	8.40	7.00	16.7 (a)	0-10
Calcium				
Chromium	193	207	7.3	0-10
Cobalt				
Copper	247	246	0.5	0-10
Iron				
Lead	146	160	9.5	0-10
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	119	134	12.4*(b)	0-10
Phosphorus				
Potassium				
Selenium	23.4	0.00	100.0(a)	0-10
Silicon				
Silver	0.300	3.50	1066.7(a)	0-10
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	419	483	15.3*(b)	0-10

Associated samples MP11267: D51122-1

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

SERIAL DILUTION RESULTS SUMMARY

Login Number: D51122  
Account: XTOKRWR - XTO Energy  
Project: FRU 197-31A

QC Batch ID: MP11267  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

(b) Serial dilution indicates possible matrix interference.

14.1.4  
14

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D51122  
Account: XTOKRWR - XTO Energy  
Project: FRU 197-31A

QC Batch ID: MP11268  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 10/02/13

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.55	.75		
Antimony	0.20	.0011	.029		
Arsenic	0.10	.0085	.024	0.0070	<0.10
Barium	1.0	.008	.16		
Beryllium	0.10	.008	.049		
Boron	20	.25	.07		
Cadmium	0.050	.018	.038		
Calcium	200	2.8	13		
Chromium	1.0	.027	.11		
Cobalt	0.10	.0025	.0085		
Copper	1.0	.03	.1		
Iron	5.0	1.8	1.8		
Lead	0.25	.004	.0075		
Magnesium	50	.65	.65		
Manganese	0.50	.06	.07		
Molybdenum	0.50	.025	.046		
Nickel	1.0	.0044	.17		
Phosphorus	30	1.3	4.9		
Potassium	100	1.5	2.5		
Selenium	0.20	.03	.13		
Silver	0.050	.00095	.01		
Sodium	250	2.5	5.5		
Strontium	10	.005	.027		
Thallium	0.10	.0012	.0075		
Tin	5.0	.032	2.3		
Titanium	1.0	.03	.085		
Uranium	0.25	.00085	.0015		
Vanadium	2.0	.019	.11		
Zinc	5.0	.11	1.4		

Associated samples MP11268: D51122-1

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

14.2.1  
14

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51122  
Account: XTOKRWR - XTO Energy  
Project: FRU 197-31A

QC Batch ID: MP11268  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 10/02/13

Metal	D51122-1 Original MS		Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	10.7	132	124	97.8	75-125
Barium					
Beryllium					
Boron					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP11268: D51122-1

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

14.2.2  
14

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51122  
Account: XTOKRWR - XTO Energy  
Project: FRU 197-31A

QC Batch ID: MP11268  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 10/02/13

Metal	D51122-1 Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	10.7	132	125	96.8	0.0	20
Barium						
Beryllium						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silver						
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP11268: D51122-1

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: D51122  
Account: XTOKRWR - XTO Energy  
Project: FRU 197-31A

QC Batch ID: MP11268  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 10/02/13

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	94.6	100	94.6	80-120
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP11268: D51122-1

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

14.2.3  
14

SERIAL DILUTION RESULTS SUMMARY

Login Number: D51122  
Account: XTOKRWR - XTO Energy  
Project: FRU 197-31A

QC Batch ID: MP11268  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: ug/l

Prep Date: 10/02/13

Metal	D51122-1			QC	
	Original	SDL 5:25	%DIF	Limits	
Aluminum					
Antimony					
Arsenic	88.0	82.1	6.6	0-10	
Barium					
Beryllium					
Boron					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP11268: D51122-1

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

14.2.4  
14



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D51122  
Account: XTOKRWR - XTO Energy  
Project: FRU 197-31A

QC Batch ID: MP11269  
Matrix Type: SOLID

Methods: SW846 7471B  
Units: mg/kg

Prep Date: 10/04/13

Metal	RL	IDL	MDL	MB	
				raw	final
Mercury	0.10	.0011	.008	-0.0011	<0.10

Associated samples MP11269: D51122-1

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: D51122  
 Account: XTOKRWR - XTO Energy  
 Project: FRU 197-31A

QC Batch ID: MP11269  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 10/04/13

Metal	D51122-1		SpikeLot		QC
	Original	MS	HGWSR1	% Rec	Limits
Mercury	0.034	0.50	0.428	108.9	75-125

Associated samples MP11269: D51122-1

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: D51122  
 Account: XTOKRWR - XTO Energy  
 Project: FRU 197-31A

QC Batch ID: MP11269  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 10/04/13

Metal	D51122-1 Original	MSD	Spikelot HGWSR1	% Rec	MSD RPD	QC Limit
Mercury	0.034	0.47	0.407	107.2	6.2	20

Associated samples MP11269: D51122-1

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: D51122  
 Account: XTOKRWR - XTO Energy  
 Project: FRU 197-31A

QC Batch ID: MP11269  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 10/04/13

Metal	BSP Result	Spikelot HGWSR1	% Rec	QC Limits
Mercury	0.42	0.4	105.0	80-120

Associated samples MP11269: D51122-1

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: D51122  
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: D51122-1A

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

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D51122  
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: D51122  
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 ICPAL2	% 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: D51122-1A

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

14.4.2  
14

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51122  
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

14.4.2  
14



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51122  
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: D51122-1A

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

14.4.2  
14

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D51122  
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: D51122  
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: D51122-1A

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

14.4.3  
14

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D51122  
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: D51122  
 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: D51122-1A

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

14.4.4  
14

SERIAL DILUTION RESULTS SUMMARY

Login Number: D51122  
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

14.4.4  
14

## General Chemistry

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### QC Data Summaries

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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: D51122  
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	GP11063/GN22129	1.0	0.0	mg/kg	106	101	94.7	80-120%
Specific Conductivity	GP11068/GN22136			umhos/cm	9979	9840	98.6	90-110%
pH	GN22170			su	8.00	8.00	100.0	99.3-100.7%

Associated Samples:  
Batch GN22170: D51122-1  
Batch GP11063: D51122-1  
Batch GP11068: D51122-1  
(\*) Outside of QC limits



DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D51122  
Account: XTOKRWR - XTO Energy  
Project: FRU 197-31A

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chromium, Hexavalent	GP11063/GN22129	D51041-1	mg/kg	0.12	0.0	47.2(a)	0-20%
Redox Potential Vs H2	GN22168	D51122-1	mv	133	130	2.3	0-20%

Associated Samples:

Batch GN22168: D51122-1

Batch GP11063: D51122-1

(\*) Outside of QC limits

(a) RPD acceptable due to low duplicate and sample concentrations.

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D51122  
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	GP11063/GN22129	D51041-1	mg/kg	0.12	40.0	36.3	90.9	75-125%

Associated Samples:  
Batch GP11063: D51122-1  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D51122  
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	GP11063/GN22129	D51041-1	mg/kg	0.12	40.0	37.6	3.5	20%

Associated Samples:  
Batch GP11063: D51122-1  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits